



Western earthmovers watch with interest as —

Tandem scrapers tackle big cut

Contractor at Carquinez Bridge approach attaches a LeTourneau-Westinghouse RU to a Caterpillar DW20 to speed earthmoving on 8,500,000-cu. yd. highway cut. It's the first time two scrapers have been pulled by rubber tires—it could start a trend. A 27-ton ripper moved with two Cat D9s also meets with success.

WHAT IS THE CHEAPEST way to move 8,500,000 cu. yd. of earth 8,000 ft.? That is the question that faced contractors late last year when the California Division of Highways invited bids on the Carquinez Project. Contractors competing for the job, assisted by construction experts and consultants of all descriptions, came up with many different answers.

Most of the bids were about 30 cents per cu. yd. but the methods for doing the job differed widely. One contractor felt that bottom-dump trucks would be the best bet, another planned to use a long conveyor belt, and another thought that standard rubber-tired scrapers would be the cheapest.

But the winner, a joint venture of Ferry Bros., John M. Ferry, Peter L. Ferry, L. A. and R. S. Crow, had a different idea—a fleet of tandem rigs consisting of a LeTourneau-West-

inghouse RU pulled by a Caterpillar DW20—and came in with an estimate of 25.6 cents per cu. yd., fully \$500,000 below the next low bidder.

The expected cries of, "It can't be done," didn't worry contractors Ferry and Crow. They knew it could be done and they are quite confident that they can do it for less than their very low bid of 25.6 cents. Why are they so sure? Because one of the participants in the joint venture, L. A. Crow, did it once before back in 1950! On that job he pulled two LeTourneau-Westinghouse RUs with a Caterpillar D8, quite a bit different from the present operation involving a high speed rubber-tired tractor, but he learned a lot about what such a combination would do. He used the double rig for just a short time wishing only to get some performance data. The information obtained from that experiment was

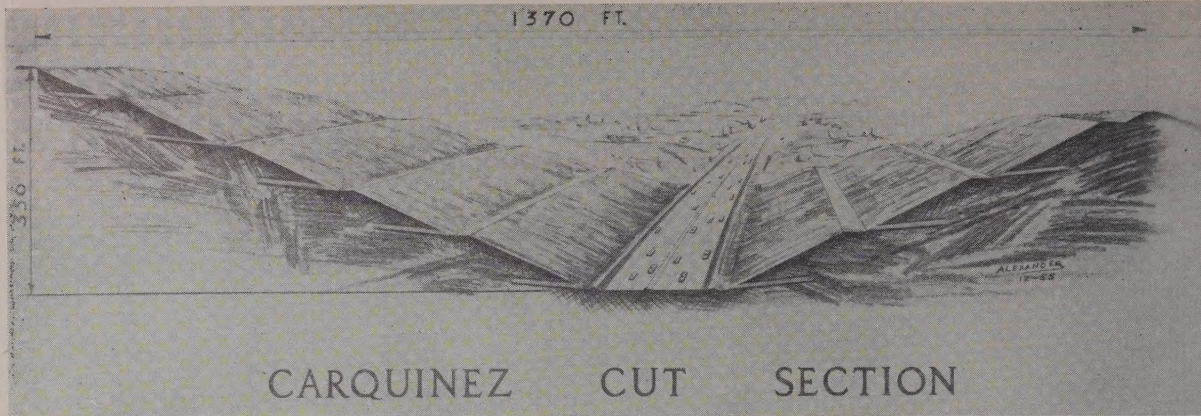
classified top secret, waiting for the right job to come along. The Carquinez Project was it.

The Carquinez Project

The development as a whole involves relocating 7.9 mi. of freeway, eliminating one of the worst bottlenecks in Northern California. Construction is being carried out under four contracts financed by a \$46,000,000 bond issue. The subject of this article is the "Big Cut," by far the largest earthmoving job ever attempted. The substructure for the new Carquinez Straits bridge is being built under a \$5,500,000 contract held by Mason & Hangar, Silas Mason Co., Inc., and F. S. Rolandi, Jr. (WC-Sept. 1956, p. 31). The bridge superstructure will be erected by United States Steel under a \$9,500,000 contract, the largest ever awarded by the California Division of Highways. The approaches and interchange at the south end of the bridge are being built by Peter Kiewit Sons' Co. for \$4,660,000. Kiewit is using slip forms for piers, the first time this technique has been used on bridges in the 11 Western states (Western Construction—Sept. 1956, p. 25).

Adjoining the Carquinez Project at the south is a 4.9 mi. freeway job being built by McCammon-Wunderlich Co. and Wunderlich Corp. which

1370 FT.



CARQUINEZ CUT SECTION

THE BIG CUT is 1,370 ft. wide at the top and 350 ft. deep. Total yardage to be moved is 8,500,000, making this the

biggest highway cut ever attempted. Material must be moved about 8,000 ft. Contractor hopes to hit 40,000 yd. a day.

involves 5,300,000 cu. yd. of excavation. This job is being built out of State gasoline tax money.

Any contractor who delays the October 1958 opening date for the freeway will be penalized \$7,900 per day in liquidated damages. This figure is the anticipated daily toll revenue.

The Ferry and Crow project is 2.9 mi. long and includes, in addition to the 8,500,000-cu. yd. cut, a 625,000-cu. yd. cut and an 800,000-cu. yd. cut. Most of the material from the big cut must be hauled through the adjoining cut to a fill and waste area beyond. This is a distance of between 7,000 and 9,000 ft. and results in a tremendous amount of overhaul—almost 455,000,000 sta.-yd.

At present the rigs are operating on a haul of about 3,500 ft., carrying material from the big cut to the adjoining fill. Early next year the intervening cut will be completed permitting the tandem rigs to make the long haul of 9,000 ft. on a road of only $\frac{1}{2}\%$ down grade. This is the situation which the contractor visualized when bidding the job. This is where the three factors which make the use of tandem scrapers feasible will be present in the most favorable way. These factors are: a large volume of earth, to make the equipment modifications justifiable; a long haul road, so that the slightly longer time needed for loading and dumping the double rigs becomes a small percentage of the total cycle time; and a flat haul road, so that the rigs can reach top speed on the trip to the fill.

First time with tired tractor

As previously stated, this job marks the first time two scrapers have been pulled by a rubber-tired tractor but not the first time two have been pulled by a crawler. Many years ago, when earth movers were small it was not uncommon to see two scrapers hooked together pulled by a crawler. The first known use of this technique was in 1933 on a job in Dunsuir, California, when two 12-yd. LeTourneau-Westinghouse scrapers were

pulled by a Caterpillar 75 crawler. The contractor on that job? Crow Bros. Construction Co., a firm managed by the same two men who tried the idea with big modern rigs in 1950 and who are now using the experience to maximum advantage on the Carquinez Project.

Problems faced

Pulling two scrapers on rubber means high speeds and Ferry and Crow had plenty of problems to solve. How could speed be controlled, especially on the first part of the job when grade of the haul road would be around 10%? This was a tough one and the first plan was to wait until the middle cut had been opened up and the haul road grade had been reduced. But after the job got started it was decided to try 3 or 4 of the doubles to see if a braking device could be worked out. When they first went into action in July the haul distance was about 3,500 ft. and the steepest part of the road about 11%. On the first few trips a speed of around 50 mph. was reached—too high for comfort.

The contractor experimented for weeks with oil retarders to slow down the equipment. These devices are often attached to the drive-shafts of trucks to dissipate energy on a downhill run. The principle of an oil retarder is similar to that of a fluid drive in an automobile—fans immersed in an oil bath. Unfortunately, it was difficult to attach the retarders behind the transmission of the DW20s. Attached in front of the transmission the fans revolved too fast and, in addition, made it impossible for the operator to shift gears. The idea was finally dropped, even though the contractor hit on a plan that might have worked—attaching the retarder at a convenient place and connecting it through a chain drive to the drive shaft behind the transmission.

It was found that a standard method of slowing down a single scraper—dragging the blade—also

worked for the doubles. The rear blade is dragged, of course, to prevent jack-knifing. This demands a skilled operator and is a little hard on the scraper cutting edge but is entirely workable.

Another problem which had to be worked out was transmitting power from the tractor to the rear scraper. This was solved by reversing the gears in a standard model 25 Caterpillar power take-off and mounting it on brackets at front of the DW20. Cables run from PTO along each side of the tractor to pulleys mounted on an A-frame at the top rear of the tractor (see picture on front cover). From there the cables are strung to pulleys mounted on an A-frame at the rear of the front scraper and then down to the activating mechanism of the rear scraper. The A-frames are made from steel channels and welded in place on the job. Two control levers for the rear scraper are mounted within easy reach of the operator.

The connection between the two scrapers is simple. The push-plate of the front scraper was removed and replaced with a flat steel plate to which was welded two steel eyes. A steel pin dropped through the eyes holds the drawbar of the rear scraper securely in place.

Tough on the veterans

The LeTourneau-Westinghouse RUs are holding up and functioning surprisingly well considering that they are from 12 to 14 years old, and are being subjected to stresses far beyond their original design. It is necessary, however, to beef up certain points. The most critical area is where the gooseneck joins the drawbar. Extremely high stresses occur here during loading when there is a tendency to jack-knife. Several layers of steel plate have been added for additional strength.

Caterpillar D9s with torque-converter drives and rear-mounted Atco rippers do the push loading in the

ut. Jack-knifing is combatted two ways. The rear scraper is loaded first, which adds weight to the ball joint at the drawbar and makes it more difficult for it to turn out of line. Also, the loading is done in a slight trench, when possible. The trench is the same width as the equipment and therefore guides the wheels and keeps them in line.

Skill in handling

Coordination and communication between the scraper operator and the pusher operator is important. It is difficult, too, because when the rear scraper has a heaping load the pusher operator can't see the front scraper or the scraper operator. Sometimes it is necessary for both operators to stand up and raise their arms to signal to one another. Experience in listening to the sound of the other's engine is often all that is needed.

Only the most skilled operators are used on the doubles. They work under an old union classification set up when doubles were first pulled behind crawlers and receive 33 cents per hour above the standard operating rate.

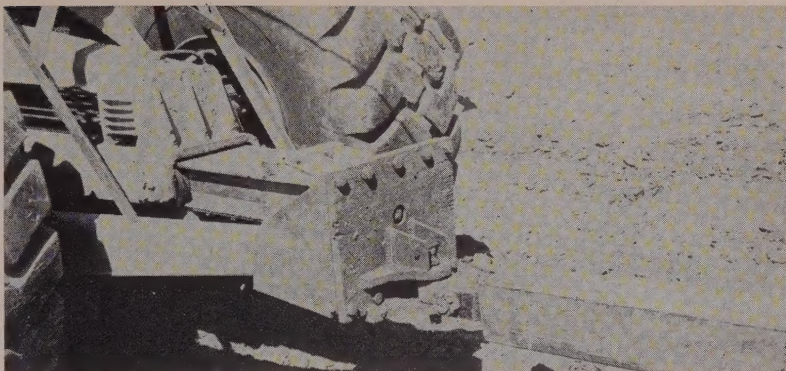
Loading takes about 60 sec. as compared to 30 sec. with a single unit. Unloading takes just a few seconds longer for the doubles. The front one is unloaded first so that there will be no interruption in spread of material on the ground. Also, the material from the front scraper is given some compaction by the loaded rear scraper.

Operation of doubles

Another unusual situation occurs when the doubles make the trip back to the cut on the steep haul road. Because of the grade they can't obtain their top speed. Whenever a single DW20 comes up behind one of the doubles it gives it a boost instead of passing it. Sometimes as many as three single units can be seen helping one of the doubles up the slope. A lineup of equipment like this looks much like a freight train, lacking only a caboose.

The significant thing about the operation of the doubles so far is that it has been profitable in spite of the 11% grade and the relatively short 3,500 ft. haul distance. So far they have been averaging about 60 cu. yd. per hr. more than the singles. The average total yardage moved by all rigs in a two-shift day is about 32,000. The peak will be next summer when 40,000 cu. yd. per day will be reached.

As on most California highway jobs the contractor has his choice of compaction methods provided the required end result is obtained—90% of maximum density at optimum moisture content. Ferry and Crow have 6 Southwest sheepsfoot rollers at work along with one Ferguson pneumatic roller pulled by a Cat DW21.



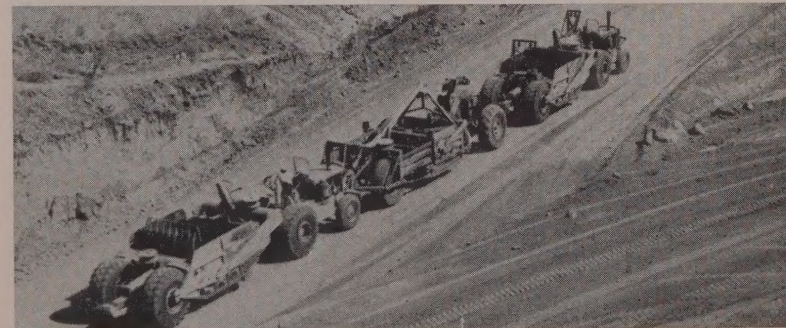
CONNECTION between the Cat DW20 and the LeTourneau-Westinghouse RU is simple. Push-plate is replaced by a flat plate, two steel eyes and a vertical pin.



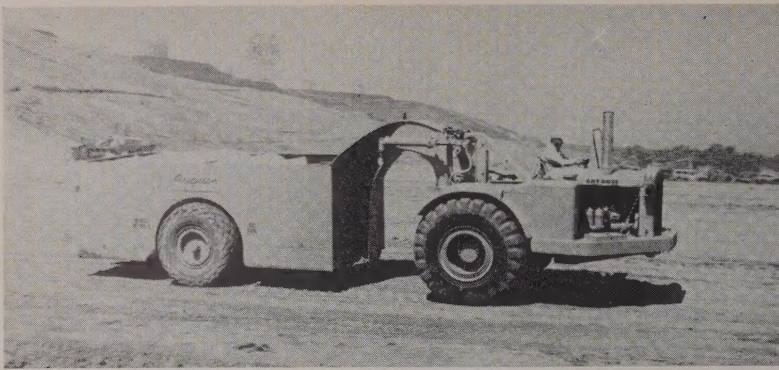
LOADING requires skilled operators. Notice how the D9 operator stands so that he can see arm signal of scraper operator when front scraper is full. Tendency to jack-knife is diminished by loading back scraper first and loading in slight trench.



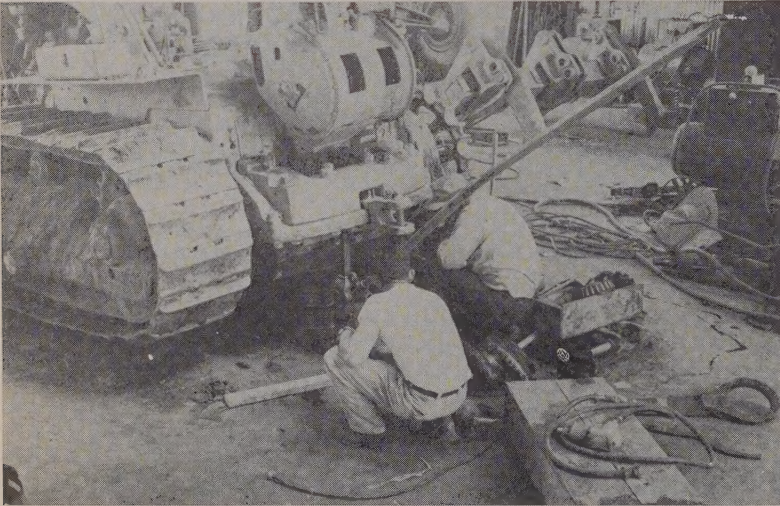
LOADING is watched by grade foreman Obie Hall. Note front power take-off and cables passing through pulleys on A-frames to rear scraper. Operator has two extra levers for front PTO. Similar view is enlarged on the front cover.



EARTHMOVING TRAIN results when single DW20s help push double units up the steep (10% grade) haul road. Haul road is rapidly becoming less steep. For most of work, grade will be ½ %, permitting doubles to reach top speed unassisted.



COMPACTION is handled by six Southwest sheepfoot tamperers and this Ferguson 50-ton pneumatic roller pulled by a Cat DW21 tractor. Only the end result of compaction is specified at 90% maximum, leaving method up to the contractor.



MAINTENANCE shop on the job is well equipped, can handle major repairs. The double scrapers have to be beefed up in spots to withstand greater stresses.



SPRINKLING is done with this water wagon consisting of a 5,000-gal. Southwest tank pulled by a Euclid tractor. Driver is shown filling it with salt water obtained from nearby oil refinery. Salt helps to diminish the dust nuisance on the fill.

The material in the big cut is being loaded without blasting and little ripping. The material is mostly shale and sandstone. On the cut between the big cut and the main waste area, however, considerable blasting and ripping is being done. It is estimated that there is about 150,000 cu. yd. of hard sandstone to be removed. Cat D9 tractors equipped with rear-mounted Ateco rippers are handling the work. Only two teeth can be used in most cases and sometimes only one. The teeth have to be replaced every six hours. There is no doubt that big ripping units are saving a lot of blasting.

Record ripper tried

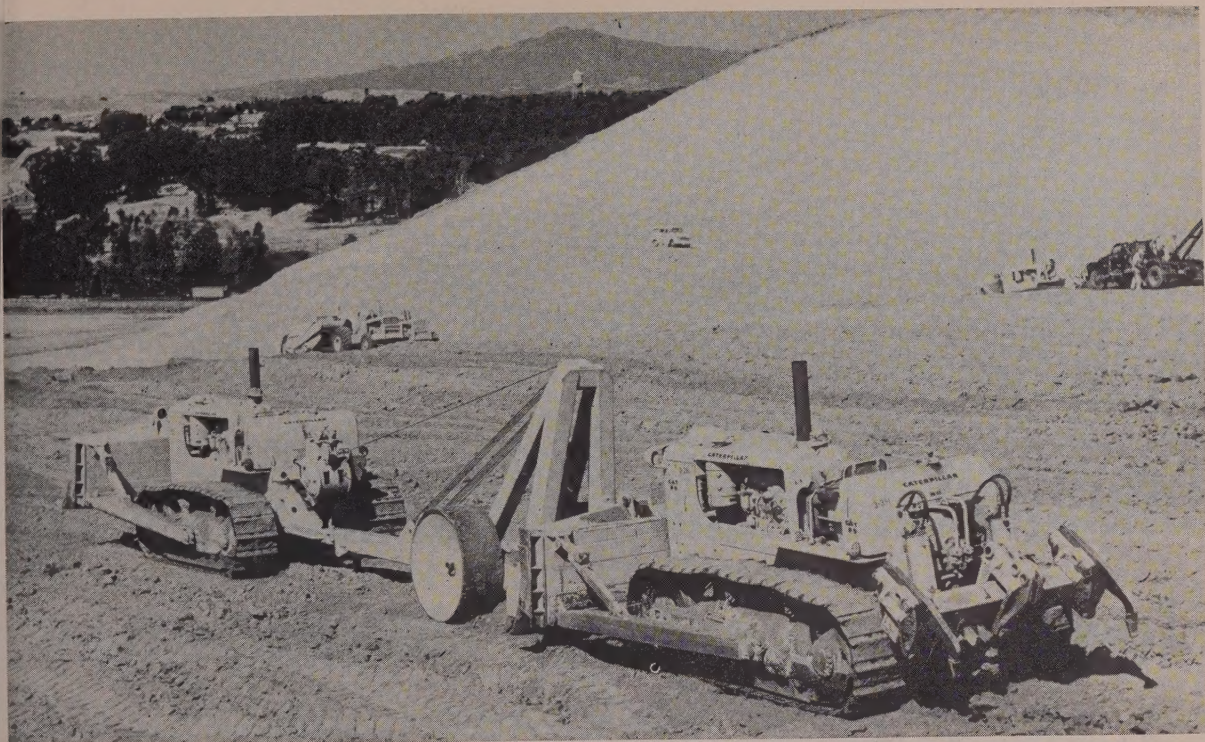
In an effort to reduce the blasting even further, Ferry and Crow tried a 17-ton ripper being used by McCammon-Wunderlich on their project. The ripper was tested on a Sunday in the tough sandstone and was returned to McCammon-Wunderlich on Monday. Ferry and Crow do not intend to use the ripper because by the time one could be fabricated and delivered they expect to be finished with their heavy rock work.

The ripper is being used with great success, though, on the McCammon-Wunderlich job—which includes one cut of 1,850,000 cu. yd. It is an adaptation of a 17-ton ripper originally developed in 1953 for deep penetration in de-watering borrow pits by Peterson Tractor & Equipment Co., San Leandro, Calif. For the McCammon-Wunderlich job, Peterson lengthened the tongue 4 ft., bringing the total overall length to 30 ft., added heavy steel plate, and filled the body with steel slugs, bringing the total weight to 54,000 lb. It is probably the heaviest ripper available.

It can accommodate 3 teeth, the center one penetrating to 60 in. and the 2 outside teeth to 48 in. On the McCammon-Wunderlich job a single tooth is used, positioned for a 36 to 38-in. depth, with a D9 pulling and another D9 pushing.

Before putting the big ripper in the cut, the contractor tried breaking the material with rear-mounted rippers on D9 tractors. The rippers penetrated to 23 in. but in harder areas tended to ride out of the ground. The big ripper was tried next with a D9 pulling but would again ride out in the hard spots. Adding weight and lengthening the ripper turned the trick. The ripper makes passes about 8 ft. apart, 500 to 600 ft. long. D9s with tractor-mounted rippers often follow in between the big ripper passes for more complete breakage.

The mass diagram on the Ferry and Crow job shows all material being moved in one direction. The contractor, however, is doing some cross-hauling at the rock cut in order to open it up as soon as possible and give the doubles the 9,000-ft. haul. When this happens early in 1957 the full fleet of 12 doubles will be put into



RIPPER weighing 27 tons is being used successfully by contractor McCammon-Wunderlich on their contract to the

south of Ferry and Crow's "big cut." The cut shown here is not exactly small—it's 1,850,000 cu. yd.

operation. Only 4 are being used at present.

Work through winter

Work is expected to continue through the winter rainy season. Fills and cuts will be kept steep enough to drain the water. The material is excellent for withstanding rain, and in the several rains that have occurred so far, only the top inch was moistened. This was easily removed with a blade.

Sprinkling is being done by two 5,000-gal. Euclid water wagons. Salt water is used, coming from a nearby Union Oil Co. refinery. Salt water is an advantage since salt tends to reduce dustiness.

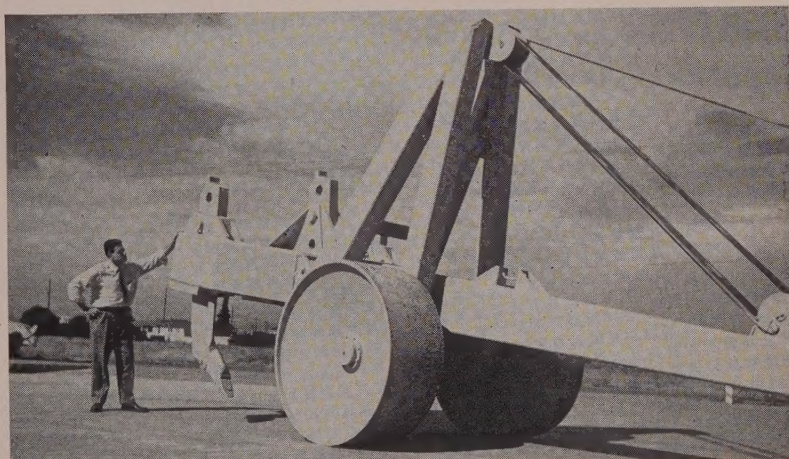
Structures and paving on the Ferry and Crow project are being handled by subcontractor Gordon H. Ball.

Personnel

For the California Division of Highways, B. W. Booker is assistant highway engineer of District 4 in charge of the overall freeway south of the Carquinez Straits bridge. L. A. Weymouth is district engineer of operations, Vincent Smith is construction engineer. Charles P. Sweet, Jr., is resident engineer on the Ferry and Crow job. Frank T. White is resident engineer on the McCammon-Wunderlich job.

For Ferry and Crow, R. C. Philbert is general superintendent, assisted by Norman Gilliam and Pat Ferry.

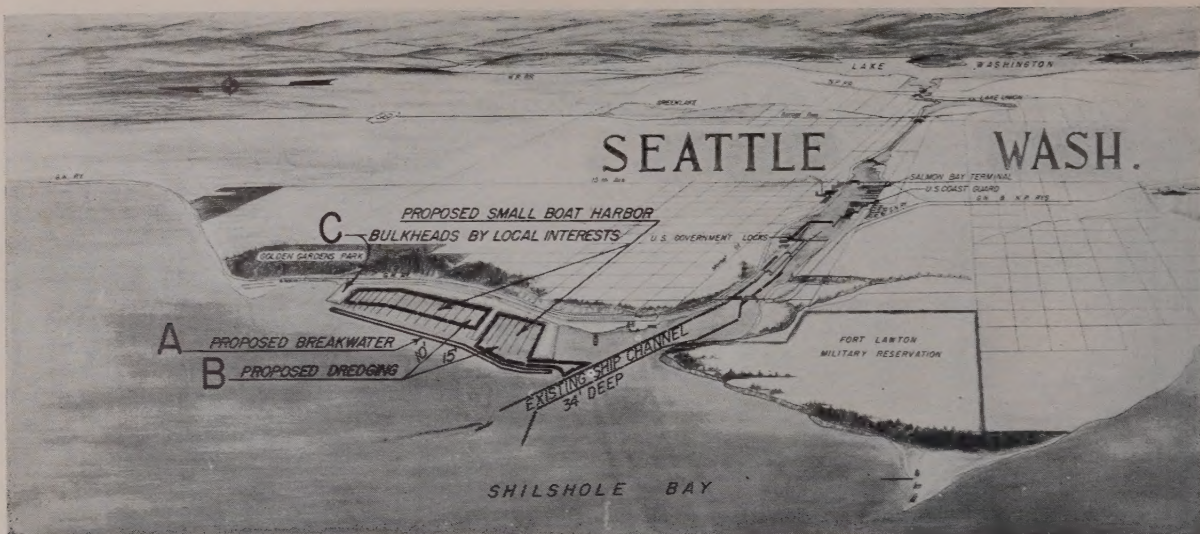
Floyd Helm is general superintendent on the McCammon-Wunderlich job.



BIG RIPPER is shown in yard of manufacturer, Peterson Tractor and Equipment Co., San Leandro, Calif. A single tooth is being used in hard sandstone with a penetration of about 37 in. Tongue is 30 ft. long. Probably world's biggest ripper.



MEN IN CHARGE—Left to right are: Charles Sweet, resident engineer; R. Philbert, superintendent for contractor Ferry and Crow; H. Tunks, assistant resident engineer; G. Kelly, chief of surveys. See end of article for other personnel.



January bid call for Shilshole Bay

Long-planned project at Seattle will provide small-boat basin. Dredging is to start next year.

THE SHILSHOLE BAY small-boat basin at Seattle now has received Congressional and Presidential action, adopting the project in accordance with recommendations of the Corps of Engineers and appropriating \$400,000 to begin construction this fiscal year. Design for the project has been completed in the Seattle District Office of the Corps of Engineers and plans and specifications are being developed. Congress last year appropriated \$50,000 of planning funds for use in fiscal year 1956, which enabled the District Engineer's staff to be prepared for action when Congress should make available construction funds.

At the west entrance to the Lake Washington Ship Canal, Shilshole Bay extends three miles northeasterly from West Point, near Fort Lawton, to the point near the northern end of Golden Gardens Park. Shilshole Bay small-boat basin just north of the canal entrance will be an important harbor development not only for Seattle but also for boating on Puget Sound in general.

Improvement of this bay has been envisioned for nearly 27 years, first by a few individuals who foresaw its potentialities, then by local commercial and civic groups, by small boat navigation interests, and finally by community-wide interests.

Call for bids

Call for contract bids is expected to be issued in January, with work to be started next spring, using the

\$400,000 appropriated this July by Congress for fiscal year 1957 (current). Additional funds are expected to be appropriated for fiscal year 1958 (which begins July 1, 1957) so that the contract work may continue without interruption.

Breakwater first job

Construction of the breakwater will be the first job to be undertaken on the project. It will require an estimated 17 months to complete. Dredging will begin shortly after initiation of the breakwater work; some of the dredged material is to be used in constructing the breakwater.

Modification of the breakwater design from that originally contemplated has resulted in reduction of the estimated Federal Government's cost from the previous approved project estimate of \$3,630,000 to \$2,200,000. The previous design called for a rock breakwater, requiring 660,000 tons of rock, and dredging of 694,000 cu. yd. from the basin.

Dredging work

The new plan will use a composite of dredged material, gravel, intermediate size rock and armor rock. The present estimate will increase the amount of dredging, particularly on the 15-ft.-depth area, to a total of 883,000 cu. yd.; but utilization of part of this dredged material, and gravel obtained from other sources, for more than one half the total material required in the breakwater, will result in an overall reduction of cost.

The Federal work would include some 880,000 cu. yd. of dredging, and construction of a breakwater 4,200 ft. long, north of the canal entrance. The breakwater would be 20 ft. high above mean lower low water. The southerly part of the inclosed basin would be dredged to a depth of 15 ft. below mean lower low water and the northerly part to 10 ft. The basin would total nearly 73 ac. in area.

The Port of Seattle is expected to begin installing bulkheads in Shilshole Bay early next year. On completion of the dredging, the Port will put in mooring facilities and other items needed for public use of the basin, and will control development of parking areas, concessions and other conveniences on the shoreside of the bay. The non-Federal, or local, investment in the project is estimated to be about \$2,500,000.

Ample justification for the Shilshole Bay moorage was found, in the course of the most recent studies, in view of the increased canal traffic. Vessels through the Lake Washington Ship Canal locks (now renamed Hiram M. Chittenden Locks) rose to an all-time high of 64,931 in 1955, a net increase of more than 5,000 over the total lockages during 1954. Comparative figures show that more than one-half of the 1955 vessel traffic was contributed by pleasure craft, which numbered 34,573, a 2,953 increase over 1954's business.

Shilshole Bay small-boat basin will be a typical example of a Federal river-and-harbor project, with the characteristic elements including a definite need, a sound plan based on adequate study, ample justification, and co-operation of local interests with the Federal Government in accordance with respective benefits.



Washington highway job at Bay City features —

Hydraulic fill for bridge approach

Lack of suitable material in local vicinity presented major problem—solved by placing approach fill by hydraulic dredging. Job was successful, but took skillful handling of the dredge.

By JACK W. JASPER

Resident Engineer
Washington Highway Department

THIS SUMMER the dredge H. W. McCurdy, leased by the prime contractor, Osberg Construction Co., began operations on a Washington State Highway Commission contract at Bay City, Wash. In 38 days the dredge removed 60,000 cu. yd. of unsuitable material and placed 240,000 cu. yd. of embankment for the new South Bay Bridge approaches.

While the dredging operations were going on, Peter Kiewit Sons' Co., the bridge contractor, was rushing completion of the new 1,308-ft. hollow box girder structure which consists of three 90 ft. x 120 ft. x 90-ft. units and one 120 ft. x 165 ft. x 120-ft. unit crossing the main channel.

The dredge started excavating the

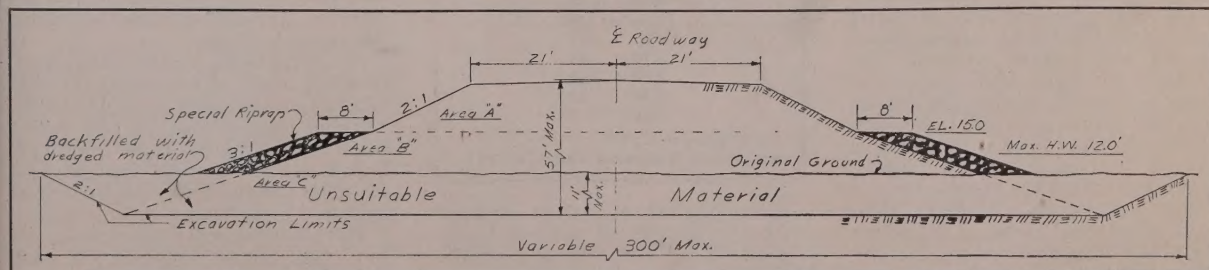
unsuitable material at the east end of the bridge at Pier No. 1 on the downstream side. Because of its 44-ft. beam, 144-ft. length, plus the 80-ft. ladder, material was excavated beyond the design widths. Then too, because of the 10-ft. draft required for flotation, excavation below grade was necessary at the contractor's expense. Within seven days the dredge had completed 40,000 cu. yd. of unsuitable excavation within the design limits and moved around the east end of the bridge and into the borrow pit located upstream from the bridge. The unsuitable material was wasted in a nearby swampy area on shore that was provided for in the contract.

Backfilling of the excavated area was carried out with little difficulty on the east side. The 24-in. discharge pipe was floated near Pier No. 1. As soon as sufficient material had been

placed, two D8 Cats began making dikes and recovery of the dredged material was greatly accelerated. Additional lengths were added to the discharge pipe and within five days an embankment of 93,000 cu. yd. had been placed to elev. 15.0.

The dredge then moved to the west side and began excavating unsuitable material just upstream from Pier 13. At this time, the contractor started riprapping the east embankment at elev. 15.0. Eighteen trucks were used to haul riprap from the closest quarry 18 mi. from the project. One D8 Cat was sufficient to place and shape the riprap in the 3:1 slopes. Riprap consisted of 12-in. - 0-in. quarry rock.

The bridge contractor's falsework piles and work dock that were in the unsuitable excavation area presented quite a problem for the dredge. This area was at first by-passed and dredging continued around the downstream side of Pier 13 and shoreward, allowing time for the upper falsework and the west end of the work dock to be removed. During the periods of extremely low water, the contractor maneuvered the discharge pipe between the falsework piles and satis-



TYPICAL CROSS-SECTION shows areas used for payment. Earthwork, except unsuitable excavation, was measured and

paid for as "embankment in place," by the cubic yard as measured to the neat lines of the cross-section.

factorily removed the major portion of the unsuitable material by sluicing. Within twelve days the dredge had excavated 20,000 cu. yd. of unsuitable material and placed 83,000 cu. yd. of embankment to elev. 15.0 including embankment in three shallow fills beyond the west shoreline.

The discharge was then returned to the east embankment near Pier 1 and material dredged in to elev. 30.0. Shore pipe was laid on top of the embankment and underneath the existing timber trestle bridge. The embankment was then completed between the old bridge and the shore to subgrade elevations. Within four days the dredge had placed 24,000 cu. yd. of embankment. A sufficient amount of material was stockpiled on the beach to be placed on the upper portion of the roadway that was too high to dredge in economically. This material was later placed with two Allis-Chalmers TS 300 scrapers to elev. 35.0.

While riprapping operations were nearing completion on the west side, the dredge returned and started placing embankment above elev. 15.0. The outlet was moved to elev. 32.0 and within five days the dredge completed the remaining 40,000 cu. yd. of embankment and moved from the project. The scrapers took over from here and placed the dredged material from the stockpile on the west side to a final elevation of 42.0 ft.

Difficulty in placing riprap on the face of the west approach was encountered because of the bridge contractor's work dock and approach trestle. This problem was solved by removing the dock and placing sufficient additional riprap to provide an adequate roadway for the bridge contractor.

Because of the limited vertical clearance of 47 ft. at M.L.L.W., the removal of the dredge presented an interesting problem. Floating equipment for removing the 20-ton spuds was not available locally and to dredge a deep channel for dragging the spuds along the bottom through span 6 would endanger the foundation piling in the piers. The final solution consisted of dredging a deep hole in the borrow pit, lowering the 72-ft. long spuds and cutting off the top 15 ft. The dredge then moved into a position with its cutter head extended through span 6. The cutter head and ladder was lowered on a barge; stern fuel and bilge compartments were filled and the spuds raised up off the bottom, lowering the dredge even more. Utilizing an extremely low tide, the dredge moved through span 6 with only one inch clearance between the spud tower and the bottom slab of the girders.

While working the borrow pit, the dredge maintained a 15-ft. to 25-ft. bank of material ahead of the cutter for obtaining maximum production. Stripping of the pit was not necessary because the fine sands mixed with the coarser materials in the pit to



BRIDGE FALSEWORK in the excavation area presented a problem for the dredge. Much of the material was successfully sluiced away during periods of low tide.



PORTIONS OF EXISTING BRIDGE were removed and traffic was routed over new fill to the old bridge as soon as new fill was up to grade. Cat D8 is building dike.

form a dense uniform grading when placed in the embankment. Much of the top silty materials were carried off by tidal action at the cutter head and the remainder floated out through the timber crib outlets. The gravelly material from the borrow pit had the following approximate grading when placed in the embankment:

COARSE AGGREGATE	
Passing	%
2 inches	100
1 1/2	99
1 1/4	99
3/4	98
3/8 inches	93
1/4	88
FINE AGGREGATE	
Passing	%
1/4 inches	100
#4	97
#10	82
#20	62
#40	37
#200	2
Sand Equivalent = 80	
Stabilometer Resistance Value "R" 71	

The roadway was then surfaced with 3 in. of crushed stone surfacing ($\frac{3}{8}$ in - 0 in.) and 3 in. of asphaltic concrete.

This contract deviated from others in that payment for earthwork (ex-

cept unsuitable excavation) was measured and paid for as "Embankment in Place"; by the cubic yard as measured to the neat lines of the cross sections. Field work for determining the pay quantities proved to be very simple. Referring to the cross-section, original ground elevations were taken for Area "C" and Area "B" along with catch points or toe of slopes for these areas. Area "B" was then computed utilizing computed shoulder distances at elev. 15.0. Area "A" was computed in the office without any field work. Soundings were taken while Area "C" was being excavated and any deviations inside the design limits were remeasured. The total yardage for Area "C" was paid for as "Excavation of Unsuitable Material" and also as "Embankment in Place."

K. C. Williams, resident engineer, deserves much of the credit for the location design work on this project. Various comparisons of cost were made concerning additional length of bridge against placing dredged approaches and the dredged approaches appeared to be the most economical.

Marq. Gorton was project manager for Puget Sound Dredging Co. and Bob Morton was dredge captain. John Osberg was in charge of the project for Osberg Construction Co.



Plant balance in capacity, portability and quality feature—

New Mexico highway paving job

—an example of Western practice

A MEDIUM SIZE, highly productive bituminous paving plant, owned by Henry Thygesen & Co. of Albuquerque, is solving the triple problems of portability, production and paving quality for its owner and the New Mexico State Highway Department. The plant is a Model 81 Pioneer. On its most recent job it moved 400 mi. from Las Cruces to Gallup, set up, was calibrated, and began running again—all within a week.

At the Gallup location the plant had a 14,000-ton paving assignment which it handled at about 110 tons per hour. The 4-mi. contract, on U. S. 666 north of the city, is a good example of the small-to-moderate size job which paving contractors handle regularly throughout the Intermountain West.

Factors influence plant

Five factors influence paving and paving plant selection on such jobs as this. Mountainous terrain is usually expensive to grade to high-speed modern alignment, so the overall cost of a job limits its length to how far the existing money will stretch. Because there is a plentiful supply of rock pits for aggregates, and numerous asphalt sources in the oil refineries, asphalt construction is favored because of its lower cost.

Third, the relatively short length

of projects limits paving tonnage. Distances between jobs are vast because states in the Intermountain West are big. And the working season is short; it lasts only six months at most and coincides with the time of the year when traffic is heaviest.

What paving contractors must do, in view of these five conditions, is to develop the right balance in a paving plant. It must have the ability to move long distances fast, and yet turn out a good quality paving mix at production high enough to cover eight or ten jobs per season. Thygesen's plant was picked as an answer to all these considerations.

Dual-unit setup

Thygesen's bituminous plant is of the continuous mix type, and consists essentially of two units. There is a Pioneer No. 375 dust collection unit, and a Pioneer 81 central mix plant. Both units are fully portable for travel over the highways on their own rubber. The dust collection unit includes the drier, burner, dust collection mechanism, and a return boot for routing fines back to the hot elevator where they rejoin the mix. The central mix plant includes screens, storage bins, feeder, pugmill mixer, asphalt metering machinery, and a truck loading hopper for discharging the finished mix.

Two centralized control stations,

with push-button starting and stopping of various electric motors, make the plant's operation simple. One such station is on the mixer unit; the other near the burners at the drier. All movement of material between the cold and hot elevators is controlled from the drier station. The mixer station takes care of the vibrating screens, apron feeder, the mixer bucket elevator and the pugmill. A manual lever is also located on the mixer platform, through which a steam ram opens the truck hopper gates.

Rounding out these two basic plant components are several pieces of auxiliary equipment. There is a Pioneer apron feeder and a 24-in. elevating conveyor for loading raw aggregates into the plant. Two Caterpillar diesel electric sets generate power for operating the plant's various motors. There are two 11,000-gal. tanks for asphalt storage, and a 9,000-gal. tank for burner fuel storage. A Childers circulating oil heater is used for maintaining a continuous circulation of hot oil through the coils which heat the asphalt and fuel tanks.

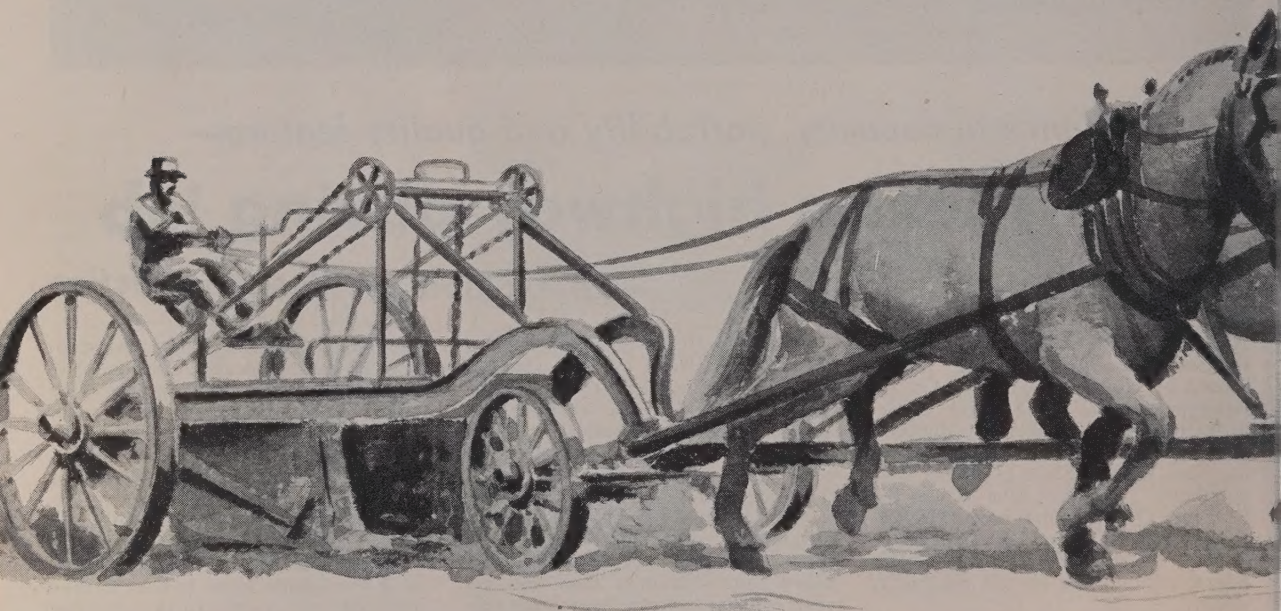
Mineral aggregates for the mix were crushed at the site during the winter, and stockpiled for use when May weather permitted paving to begin. The mix consists of 44% coarse material ($\frac{3}{4}$ to $\frac{3}{8}$ -in.) 26% interme-

(Continued on page 50)

Your tractor

is the **WHEELHORSE**

of your equipment fleet



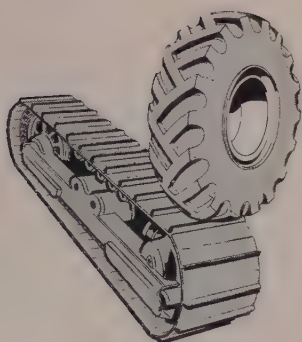
Each earthmoving job has certain characteristics that necessitate the use of certain specialized abilities of your equipment. The kind of materials, length of haul, conditions underfoot, time limitations, and other important factors, all have a direct bearing on your equipment selection.

Take heavy-duty earthmoving tractors, for example. Your requirements of a tractor today are entirely different from those of only a few years ago. You used to evaluate tractors strictly on drawbar pull or push — a combination of engine horsepower and the amount of traction developed. Only these two dimensions — *power* and *traction* — were considered important. These two dimensions gave the necessary performance to load yesterday's scrapers in yesterday's fleets. They handled a good share of clearing and

pioneering with considerable saving in explosives; they dozed and finished grades in work areas of their day, and there was time to move them to other heavy-duty assignments as needed.

But today's larger jobs, shorter time restrictions, and increased cost of labor, have added *two more dimensions* to your tractor requirements. These extra dimensions are *speed* and *mobility*.

Wider right-of-ways and longer construction job-units increase job-travel area. Wider grades and shoulders, better drainage, add yardage to be moved. Shorter completion time calls for faster movement. Because of reduced grade tolerances there is more and longer-haul dirt, more variation in equipment requirements from one job section to the next. Time limits and continual increases in labor costs call



Work problems today demand modern equipment that can do specific jobs faster and at lower cost. Tournatractor is a modern tractor designed to take advantage of all the four dimensions... *power*, *traction*, *speed* and *mobility*. It does not offer as much drawbar horsepower at speeds below

2 miles per hour as do track-type tractors of equal engine horsepower. But, if your job conditions are such that you can capitalize on the third and fourth dimensions — *speed* and *mobility* — with a machine that delivers comparable traction at present day speeds, we suggest you consider the *new* LeTourneau-Westinghouse Tournatractor. The cost is 10% below that of track-type tractors with torque converters and comparable engine horsepower.

Evaluate:

- 1 — Your demands for power
- 2 — Requirements for traction
- 3 — Advantages of speed
- 4 — Need for mobility

After giving careful consideration to all of these factors when selecting a tractor, questions in regard to your specific application may still be in your mind. The best way to dispel all doubt about the dimension qualifications of any tractor is to see it perform on your job. We suggest you request...

an ON-THE-JOB DEMONSTRATION . . .

Your LeTourneau-Westinghouse Distributor will be happy to arrange the demonstration of a Tournatractor on your job, to prove that its third and fourth dimensions — *speed* and *mobility* — can pay off for you. Ask him...or write the factory. No obligation!

Reprints of this 14-page advertisement on the four dimensions of earthmoving will be furnished on request.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company



Manufacturing Facilities at: Peoria, Illinois — Toccoa, Georgia — Indianapolis, Indiana — Paris, Ontario — Sydney, Australia — Campinas, Brazil.

Manufacturers of: Tournapulls*, Tournatractors*, Angledozer*, Flat-bed Haulers, Rear-Dumps, Bottom-Dumps, Snow-Plows, Cranes, Logging Equipment, Scrapers, SwitchMobile**, SwitchTractor, Power Control Units, Rooters*, Rollers, Tournarope*, Adams Motor Graders, and TravelLoaders.

New Mexico paving

(Continued from page 35)

diate material (No. 4 through No. 10), and 30% fine material (No. 10 through No. 200). Gradation of the aggregate, with tolerances, was as follows:

Size Screen	Per Cent Passing
3/4-in.	100
1/2-in.	70-100
3/8-in.	55-85
No. 4	40-65
No. 10	30-50
No. 40	15-33
No. 80	10-30
No. 200	5-12

Bitumen for the mix is an 85-100 penetration asphalt, which is being added at the rate of 7.5% to compensate for the high fines content in the mix. The Marshall method of laboratory control governs field preparation of the hot mix.

Paving done fast

The 110-tph. paving rate established as an average by Thygesen's plant and crews has pushed the 14,000-ton job rapidly. When the plant components arrived on the project, the setup was made in short order, assembling the tanks and pipelines with the help of flexible connections. After a short calibration run, the plant was ready to run.

The aggregate stockpile had a 4 1/2% moisture content which the drier had to remove. Normally mineral aggregates in the Gallup area of New Mexico are considerably drier than this, but the stockpiles here had been exposed to winter and spring storms. The drier on the plant had no difficulty removing the moisture and heating the crushed rock to its mixing temperature of 285 deg.

Trucks hauling the mix from the plant had hardly any dead haul, and the travel to each end was not long. For this reason it was unnecessary to cover the loads during the trip.

On moderate size jobs such as this, paving tends to be a routine affair. A conventional paver was used here to lay three 12-ft. lanes of paving mix 1 1/2 in. thick as a base course. Then



PAUL CROSS is superintendent on the project for Henry Thygesen & Co.



ONE OF TWO control stations for operating the entire plant. The other is near the burners at the drier. Dumping from the Continuflo surge hopper eliminates segregation of the mix. Bitumen is an 85-100 penetration asphalt.



INGENUITY is better than hand pumping. This crew is using one of the drive belts off the compressor to operate the fuel pump out of the stationary tank.

two 12-ft. riding lanes of 1 1/2-in. thickness were centered on the roadbed for the riding surface. Single-penetration treatment with asphalt and cover chips over the paved course will complete the shoulder portion of the road.

From the standpoint of job time, paving took only 10%, which points up the importance of hot plant balance. Work began Sept. 16, 1955 when the first Cats and scrapers were moved in to grade the new roadbed through the high-elevation rolling plateau lands. More weeks were then needed through the late winter as a 1-ft. thickness of 2-in. minus ballast course and 3 in. of leveling course were laid and rolled.

Personnel

Paul Cross, general superintendent, was in charge of Thygesen's field op-

erations. Field engineering for the New Mexico State Highway Commission was supervised by Meyler W. Gibbs, project engineer at Gallup. The job was further directed by Charles O'Bannon, District Engineer at Albuquerque, reporting to L. I. Wilson, state highway engineer at Santa Fe.

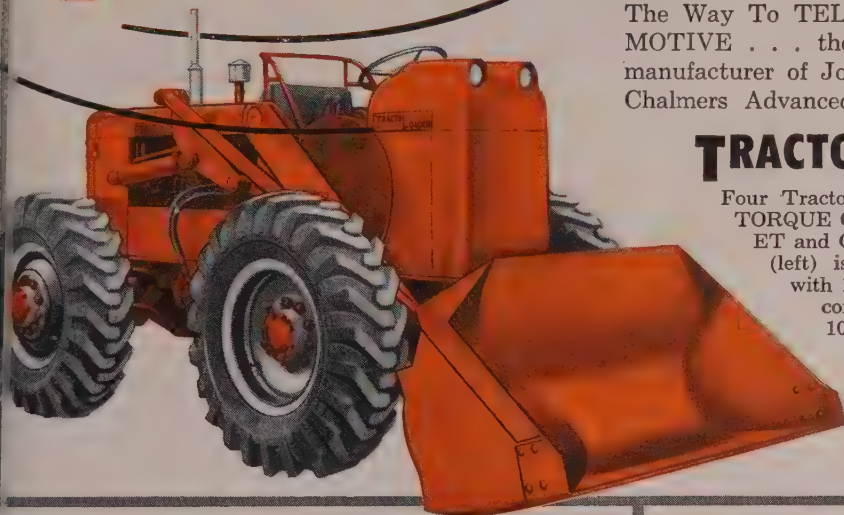
New 350-mi. pipeline

NEXT IMPORTANT ADDITION to the pipeline network of the Western states will be a 350-mi. crude oil line to be built by Northwest Pipeline Corp. from the San Juan Basin in New Mexico to Salt Lake City. The \$15,000,000 project will be a 8-in. line and is scheduled to be operation within the next 12 months. Capacity will be 15,000 barrels per day.

TRACTO

A sure sign of modern design

The Way To TELL is to TRY! TRY TRACTO-MOTIVE . . . the Leader In Loader Design and manufacturer of Job-Matched Equipment For Allis-Chalmers Advanced-Design Crawler Tractors.



TRACTO LOADERS

Four Tractomotive models — all with HYDRAULIC TORQUE CONVERTER DRIVE, TIP-BACK BUCKET and CLUTCH-TYPE TRANSMISSION. TL-1 (left) is a rugged, 4-wheel drive excavator-loader with 1½-cu yd bucket. TL-6 (below) is ideal for confined area work — has ½-cu yd bucket. TL-10 and TL-11 are general-purpose loaders — speed materials handling indoors and outdoors — have 1-cu yd buckets.



TRACTO SHOVELS

For all models of Allis-Chalmers crawler tractors. Standard buckets — 1½ to 4-cu yd capacity. Light materials handling buckets from 2¼ to 7-cu yd. Other special buckets and interchangeable attachments.



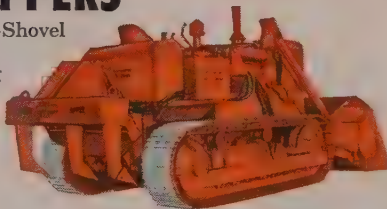
TRACTO SIDE BOOMS

for handling big and small pipe. Drop-proof safety counterweights; enclosed, internal expanding brakes; strongly constructed booms — for Allis-Chalmers HD-11, HD-16 and HD-21 Tractors.



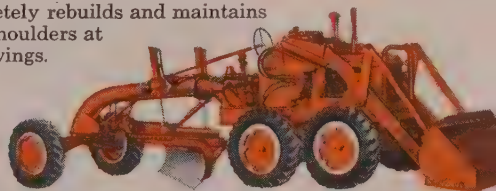
TRACTO RIPPERS

For speed dozing, Tracto-Shovel and scraper loading. Loosen toughest going — save blasting. Available for all new models of Allis-Chalmers crawler tractors and HD-5, HD-9, HD-15, HD-19 and HD-20.



TRACTO GRADER

FOR ALLIS-CHALMERS MODEL D MOTOR GRADER — rear mounted, ⅝-cu yd, hydraulically operated. Interchangeable with Shoulder Maintainer. This combination completely rebuilds and maintains road shoulders at big savings.



SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER

ARIZONA

Neil B. McGinnis Equipment Company—Phoenix

NORTHERN CALIFORNIA

Industrial Tractor Sales—Sacramento
Shasta Truck & Equipment Sales—Redding
Aikins Tractor Co.—Eureka and Willits

SOUTHERN CALIFORNIA

San Joaquin Tractor Co.—Bakersfield
Shaw Sales & Service Co.—Los Angeles and San Diego

IDAHO

Southern Idaho Equipment Co.—
Idaho Falls and Twin Falls
Southern Idaho Equipment Co. of Boise, Inc.—Boise

MONTANA

Mountain Tractor Company—Missoula
Richland Machinery Company—Sidney
Seitz Machinery Company, Inc.—
Billings and Great Falls

NEVADA

A D Machinery Company, Inc.—Elko and Las Vegas
Reno Equipment Sales Co.—Reno

OREGON

Hauptert Tractor Company—
Medford and Klamath Falls
Wood Tractor Company—Portland

UTAH

Cale Equipment Company, Inc.—Salt Lake City

WASHINGTON

Pacific Hoist & Derrick Company—Seattle
American Machine Company—Spokane
Mid-State Equipment Company—Wenatchee

WYOMING

Snyder Tractor & Equipment Company—Casper

The law makes specification writing tough for —

Equipment purchasing by a county

EVERY GOVERNMENT AGENCY, particularly county or city, has a serious problem in obtaining proper operating equipment. It is also a problem that has many difficulties.

Sometime in the history of each municipal corporation there has been imposed the "bid law, to keep 'em honest." The majority of these read so that the purchase of any item of equipment in excess of \$500 must be done on an open, public call for bids.

These bid laws have three purposes:

1—There is the assumption that every government official is automatically crooked (so that I burn internally each time I comply). These public villains must at all costs be prevented from raking in a fat 10% kickback. Yet in my experience, I have found no more, or less dishonesty than Joe Blow buying as

By **PAT THOMSON**

County Engineer
Waterville, Wash.

purchasing agent for John Doe's construction firm.

2—Everyone must have full opportunity to participate, from the tin can producers on up. We don't even restrict it to our own country and manufacturers; international bidders must also be considered. Nothing, absolutely, in all our righteousness, must be tinged with the taint of collusive action.

3—By actual law (which everyone tries to ignore) there can be no hint of specialization. Suppose you have worked for five years with six different units side by side in operation. Production and cost records show one far superior to the others. Yet you cannot say, "I'll take a dozen of those." No siree—naughty, naughty

—and you'll get your wrists slapped with a pair of government issue handcuffs.

This is not true, you say. You write your bids tight and do not necessarily take the lowest bid. All I can say is, "Pardner, you've been lucky." Court cases I know of have forced government agencies to take low bid on general specifications even when the equipment did not meet job qualifications.

And so we arrive at the real problem. How to write standard, conventional truck specifications so that all manufacturers can enjoy the privilege of bidding. This is a problem pondered not only by truck manufacturers, but, believe me, by most purchasing agents of the political agencies.

Few states have equivalent regulations of operation. Therefore, it is almost impossible for manufacturers to classify or identify their equipment to one state so that it will meet the regulations of every other state. Industry is continuously improving engine operation to take advantage of higher fuel octane ratings. Bidders often cannot use these improved characteristics because they are restrictive.

Often the bid writer attempts to define the mechanical characteristics desired, soon becoming patterned after one certain engine. This creates an illegal proprietary specification. Attempts to go into mechanical detail become a mere interpretation of what the individual engine manufacturer feels his engine needs to be to meet the services he wishes to perform.

Thus, fool that we are, we hope to compute a general specification. But we find this business of writing a universal specification is not only troublesome but nigh impossible. By threshing out all the information we have been able to round up, we have arrived at eight major items and you can take it from there.

Job Qualification: For his own bidding interest, the bidder would like to know what you are going to do with the truck. And you would be surprised at the number of bids that give no inkling of prospective use. Are you going to be in continuous movement on undeveloped roads axle deep in mud or snow, or on comparatively easy highway going? This gives each competitive bidder the opportunity to bid the equipment to meet the work involved. He won't be bidding a 6x6 when a 4x2 will do the job. And therefore, the bidder, if he knows the job, won't have any caustic remarks to make about unclassified specifications.



INTERNATIONAL truck on county-road work handling concrete guardrail posts.

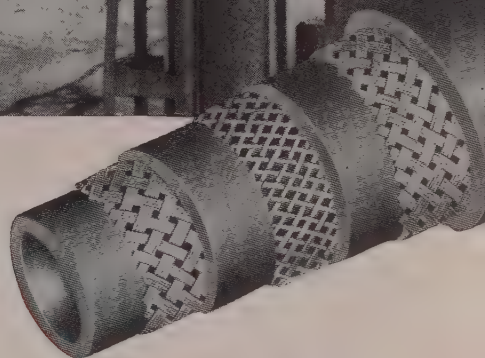


DODGE pickup truck serves as a grease wagon for county construction unit.



DOWN TIME... ZERO

Nothing gives hose a worse beating than a pile driver. And here's hose built to take it . . . day in and day out! Thermoid Powerflex Pile Driving Hose has the brute strength that assures longer wear, fewer replacements. *You can forget about down time.* Yet Powerflex is lightweight, flexible, kink-resistant, easy to handle.



No wonder it's tough . . . look how it's made

- Heat and oil resistant tube.
 - High tensile braided steel wire reinforcement prevents bursting . . . gives flexibility.
 - Special pattern of the wire braid develops positive lock of tube and cover to reinforcing structure. Mechanically bonded insulating plies assure
- homogeneous body structure.
 - Internal stress of the hose under pressure is completely absorbed by the wire braids, not the insulating plies.
 - Tough, specially compounded cover resists abrasion and aging.

Thermoid Powerflex Pile Driving Hose is only one of many types of Thermoid hose built to give the construction industry longer service and lower operating costs. The Thermoid Distributor in your

area carries a complete line of Thermoid Hose, Multi-V Belts and Conveyor Belting, to meet the most exacting needs of every job.

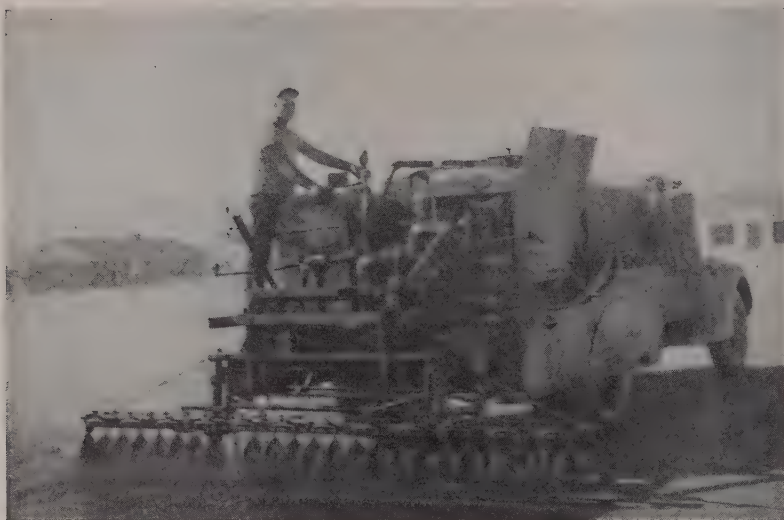
Cut costs with Thermoid
Conveyor Belting . . .

. . . and Thermoid Multi-V Belts.



Thermoid
Western Co.

Offices and Factories:



FORD truck carrying 1,000-gal. distributor gives light treatment to county road.



GMC truck with 6-yd. load on scales at crusher before moving to stockpile.



CHEVROLET truck converted to crane unloads culvert pipe from Mack truck.

Gross Vehicle Weight: A GVW rating is almost a must in any bid call for trucks. What kind of a load are you going to haul? Is heavy snow removal anticipated? What weight of payload is being considered? Does the truck body construction match the GVW rating? These are questions that must be answered. But here again inconsistencies are encountered. For some manufacturers will rate a truck at one single GVW while another will give a truck of the same class a large spread running from a minimum to a maximum GVW rating.

Consequently, a range of GVW must be considered so that there is no restriction outlawing competitive units having comparable capacity components. Chassis weight should also be included in this specification to determine if GVW rating is overrated.

Frames: Frame specifications can be written in several different ways. The most commonly used factor now is section modulus. In the case of like members, say two different sized rails from the same steel alloy, section modulus is a good indication. For instance, two members measure $9 \times 3 \frac{1}{4}$ and $8 \frac{1}{4} \times 3 \times \frac{3}{8}$ respectively. Without considering section modulus, it would be easy to assume the first member stronger. Section modulus determination indicates member one as 8.3 in 3 and member two as LL.6 in 3, clearly showing member two as far stronger.

However, all manufacturing companies do not use the same materials for frame side rails; then, section modulus is not a true valuation because it does not consider the type of material used. A more accurate ratio could be determined using a combination of section modulus and bending moment.

Transmission: Fit the gear ratio to the job the truck unit must perform. Depending upon what the truck must do, how many speeds forward and reverse are needed? Most firms will recommend a minimum of 10 speeds forward for snow plowing of any depth and density. If you have proper transmission speeds, it is always possible to select a gear ratio that will permit one to operate at maximum horsepower, and deliver maximum torque to the hub at proper speed.

Axles: The most desirable procedure for the bid writer is to determine what capacity axle will do the job satisfactorily. He must determine then which name axle will do the job and specify that or equal. The biggest drawback is that axle capacity is not consistent among the manufacturers even for identical sized axles. Suppose you desire a 17,000-lb. rear axle. If the specification is capacity, some may offer a Timken H140 rated at 16,000 while others may offer the Timken L140 rated at 18,000 lb. The H140 hub would be the cheapest since it is the lightest.

(Continued on page 101)



Giant helicopters . . . atomic-powered and capable of lifting vast tonnages . . . some day may transport homes intact from winter to summer locations . . . enable people to move with a minimum of disorder and effort.

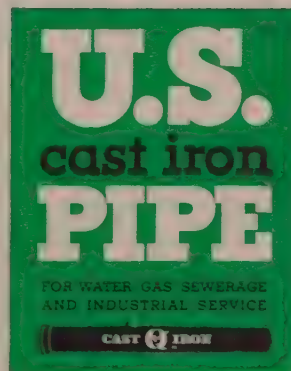
100 years from now...

WE MAY MOVE HOUSES BY AIR!

Many incredible changes in the world of tomorrow. But even then, our water and gas will still be carried by that dependable public servant—the cast iron pipe being laid today.

Records show that cast iron mains installed over a hundred years ago are still serving effectively for more than seventy American water and gas utilities. Moreover, the modernized cast iron pipe of today . . . centrifugally cast and quality controlled . . . is even stronger, tougher, more serviceable.

U.S. Pipe is proud to be one of the leaders in a forward-looking industry whose service to the world is measured in centuries.

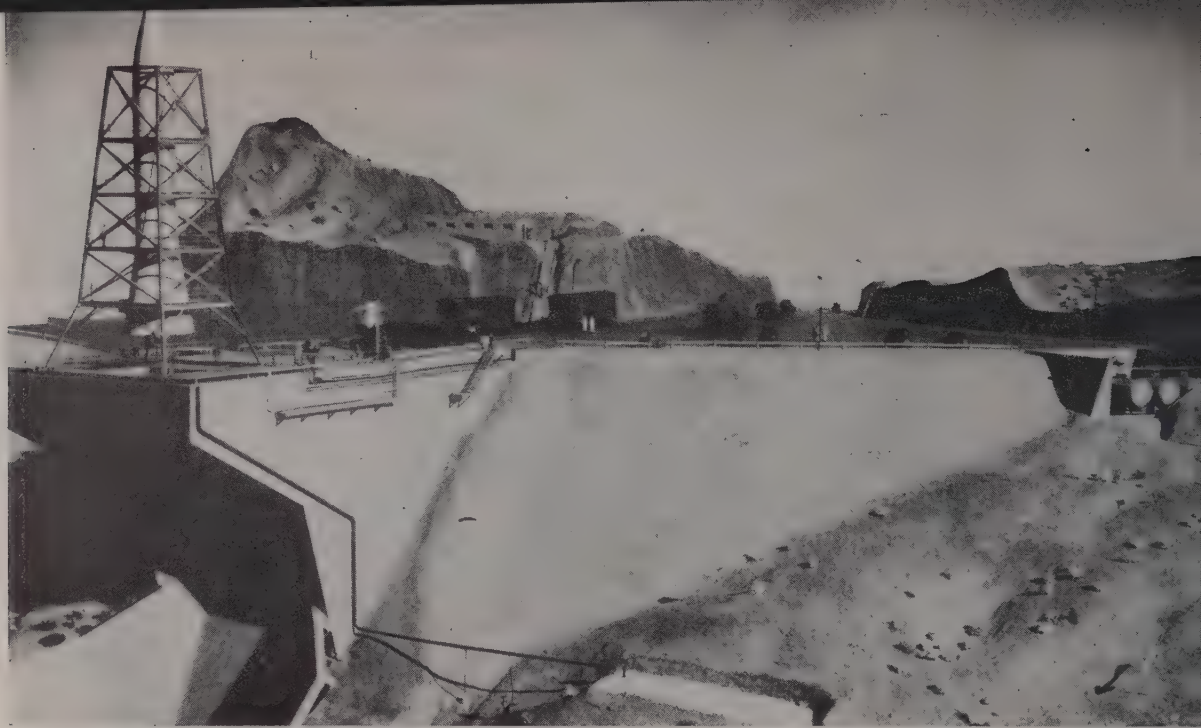


U. S. PIPE AND FOUNDRY COMPANY, General Office: Birmingham 2, Alabama

A WHOLLY INTEGRATED PRODUCER FROM MINES AND BLAST FURNACES TO FINISHED PIPE.

October 1956—WESTERN CONSTRUCTION

55



Rugged stand for anchored rockets

Largest concrete test stand built by Air Force to take 1,000,000 lb. of thrust and 2,000-deg. temperature—Model pictured above shows arrangement of facilities.

IN CALIFORNIA'S MOJAVE DESERT the Air Force is completing a concrete test stand for testing rocket engines and missile components having up to 1,000,000 lb. of thrust. The stand is the largest constructed by the Air Force to date.

Anchored some 60 ft. into solid rock, with an overall length of 200 ft., the stand includes a 54-ft. concrete cantilever, 15 ft. at the outer end and 40 ft. thick at the haunch. This cantilever extends 150 ft. over a flame deflector pit which will lead the gases from the test vehicles away from the stand.

Design features

Major problem in structural design of the new test stand was devising a means to carry the loading to bedrock—and there are two opposite types of loadings. The structure must be able to support extremely high dead loads, while at the same time providing sufficient uplift resistance to the 1,000,000-lb. thrust developed during static test firing. The tests are referred to as "static" because the missile components are fired while anchored to the test stand. The cantilever must be capable of withstanding the upward force generated at

the time of the firings, which will put the bottom edge of the cantilever arm in tension.

The stand is based on two massive concrete footings which fit deep into the rock. One is located across the transverse axis of the stand at the rear of the structure. The other was dug deeper into the rock and rests 146 ft. below the deck of the stand. This footing is 30 ft. wide, 120 ft. long and 20 ft. deep. Both footings are solid mass concrete with no reinforcing except on the face of the concrete.

A unique problem faced in building the test stand was that of providing falsework for casting the concrete cantilever, for the deck of the big arm juts out 15 stories above the sloping canyon hillside. Several support methods were studied by the contractor, the George A. Fuller Company of Los Angeles. A heavy timber tower, able to resist earthquake stresses should a temblor occur during the concreting, was selected. Manufacture and erection of this huge falsework tower was subcontracted to Timber Structures, Inc., of California, who in turn called in John J. Gould and H. J. Degenkolb of San Francisco to design the structure. This tower was made up

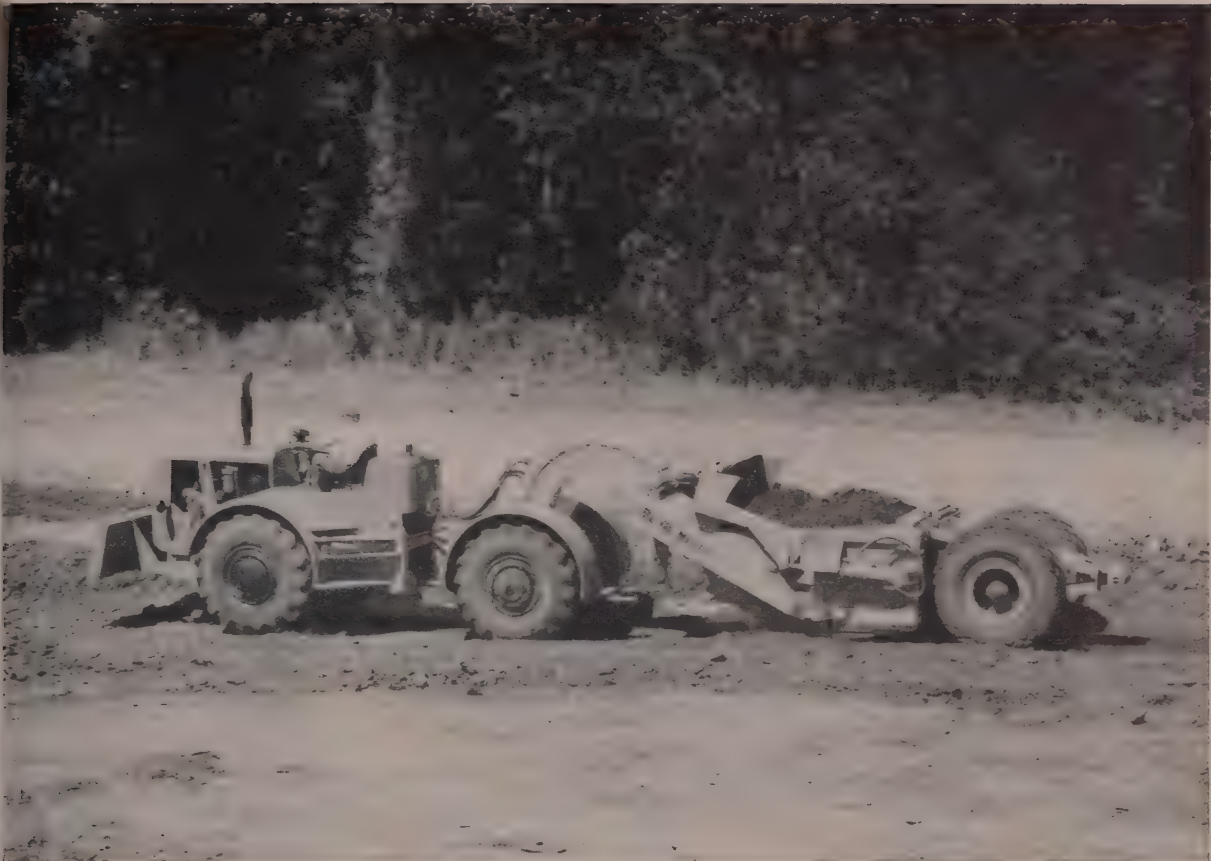
of more than 240,000 board feet of lumber, 120,000 fbm. of which was 12x12-in. heavy timbers extending over 100 ft. (or 10 stories) from the base. The tower cost nearly \$100,000, excluding labor costs, but much of this is being recovered in salvage value.

Concreting operations

Because it is entirely constructed of mass concrete, resonant vibration will not be as troublesome in the new stand as in other installations.

Test borings taken of the area revealed excellent granite at desired footing depths. However, work above this was faulty and since this upper rock was to provide support for the walls, the upper material was to be removed and replaced with grouted rock. A study revealed it would be cheaper to replace the material with lean concrete. All aggregate for construction in the western part of the Mojave Desert has to be transported a prohibitive distance, for locally available rock is of poor quality. Accordingly, Air Force installation engineers approved the use of lean concrete.

Over 26,000 cu. yd. of class A concrete are being used in the structure. At the bottom of the stand, walls are as much as 8 to 10 ft. thick. Although a small portion of this concrete was handled by crane and bucket, most of it was pumped into place. While pouring beams and walls with cranes, a Pumpcrete machine pumped the



Wagner Model IND-14 Tractor equipped with Fuller R-96 ROADRANGER Transmission.

Wagner Earthmoving Tractors geared with **FULLER** semi-automatic **TRANSMISSIONS**

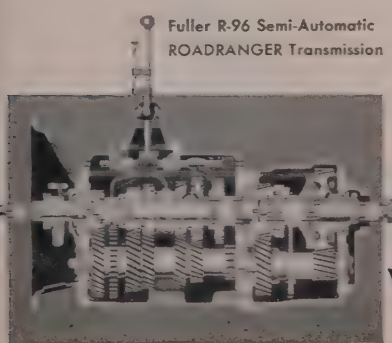
Sturdy Wagner IND-14 Tractors equipped with Fuller 10-speed R-96 Semi-Automatic ROADRANGER Transmissions handle tough construction

jobs. Above, a Wagner Tractor is shown pulling a Be-Ge Scraper, moving heavy loads with ease.

Easier shifting and faster acceleration are features that make Wagner Tractors equipped with Fuller Transmissions real time savers. The R-96 ROADRANGER makes work easier for engines of the 960 cubic inch class in off-highway construction applications

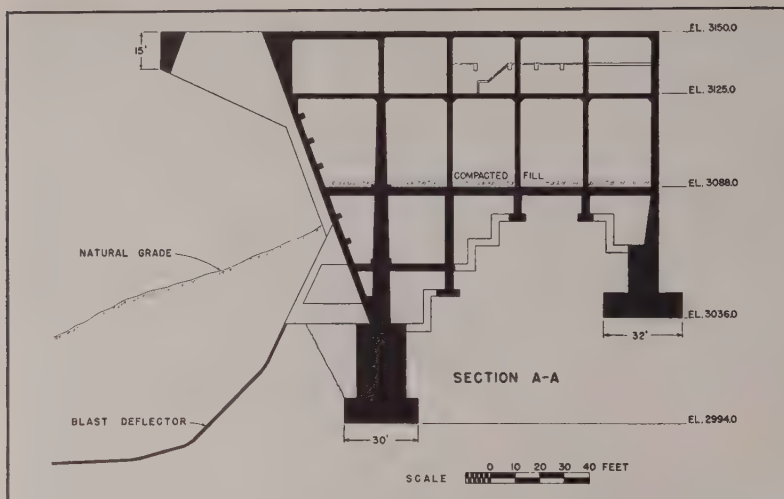
... the short, even steps between gear ratios keep the rpm in the maximum horsepower range.

There is no gear splitting ... the 10 selective ratios are evenly and progressively spaced, averaging short 28% steps. One shift lever controls all 10 forward speeds. Range shifts are pre-selected ... automatic and synchronized.



FULLER MANUFACTURING COMPANY
 Transmission Division, Kalamazoo, Michigan

Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.



SECTION THROUGH STAND SHOWS 54-FT. CANTILEVER

concrete. In order to complete all concreting in a period of six months, the contractor set up a 2-shift operation. All formwork was placed by the day shift for it was found that forms are placed quicker and better during daylight hours. At night the concrete was placed in the forms. Carbo Construction Co. of California is subcontractor for the concrete work.

The body of the test stand went up in 12-ft. lifts. The arm sections were poured in five increments. The first lift was 15 ft. followed by three lifts of 7 ft. each, and a final lift of 4 ft. This last lift contains the deck reinforcing.

More than 30 tons of reinforcing steel is being used in the concrete. Steel work is unique in that many of the rods being handled in one piece measure up to 150 ft. (or 15 stories)

in length. Subcontractor for steel work is Ryerson Steel, Los Angeles.

The deck of the cantilever has a 32-ft. square opening through which exhaust gases and flames can be carried to the deflector pit. While test preparations are under way the opening in the arm will be closed by a steel cover plate.

With the casting of the cantilever complete and the falsework tower removed, excavation work has started for the flame deflection pit which is 60 ft. deep and lies 150 ft. below the deck of the stand.

Before a test setup rocket fuels are cooled to as low as -300 deg. F. which is necessary to keep the volatile propellant mixtures from chemically reacting with each other and exploding. However, tremendous heat is generated by the rocket fuels

when they are fired. The deflector pit is designed to withstand temperatures up to $+2,000$ deg. F. The bottom slab and walls of the pit are of 18-in. thick concrete, with the top 4 in. of this made of a special refractory gunite. A steel deflector surface, adequately water cooled to withstand the jet impingement, has been deleted from this stand by the use of this special heat resistant gunited concrete. This is a significant advance over present techniques inasmuch as water is at a premium in the Mojave Desert.

Supporting facilities

Included in the project are a reinforced concrete instrumentation and control building, camera and observation posts, ready rocket fuel, oxidizers, and high pressure gas storage facilities.

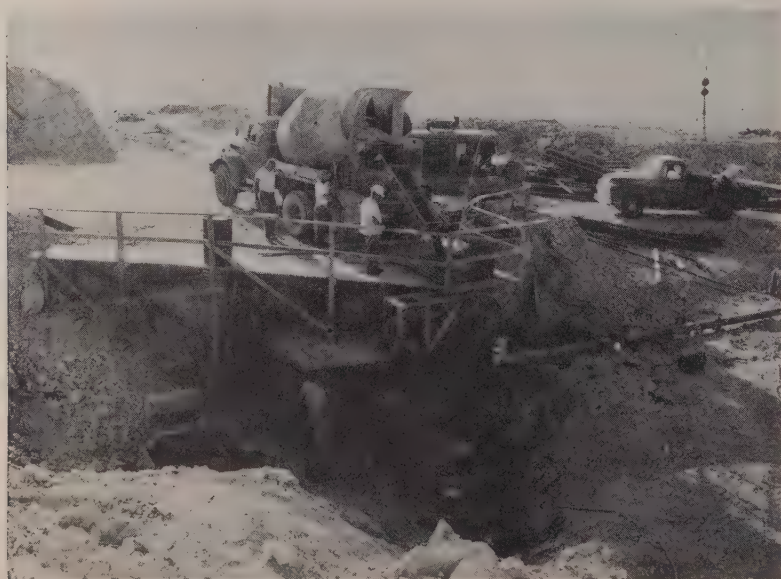
The Instrumentation and Control Building, built almost entirely underground, is connected to the test stand by a 300-ft. long tunnel. This building will house the various instruments to be used during testing. The face of the building directed toward the test stand is covered by several feet of earth in order to reduce the intensity of the resulting shock waves on the structure. The main floor of the building provides space for technical personnel in addition to an attached observation area for test personnel during firing operations. The lower level provides space for instrumentation and recording facilities, test areas, repair shops and storage areas. The instrumentation system of the facility was designed to accommodate all the present and foreseeable future requirements of large missile static testing.

Three separate reinforced concrete structures are provided as camera and observation posts. These posts are air conditioned and furnished with an air supply to operate 30 min. at maximum occupancy with all inlets and exhaust ducts closed.

Storage facilities for propellant fuels and high pressure gas are under construction. This includes the fabrication and erection of several large storage facilities for oxidizers, high pressure gas and fuel.

Criteria for the facility were developed by U. S. Air Force engineers. Lt. Col. Henry W. Yagel, Installations Engineer for Edwards AFB, supervised the project for the Air Force. Administrator for the project is Col. Edwin M. Eads, AF installations Representative, South Pacific Region.

Design and construction contract responsibility is that of the South Pacific Region, Corps of Engineers, U. S. Army, headed by Brig. Gen. William F. Cassidy. Contracts were let through the Los Angeles District, Corps of Engineers, headed by Col. Arthur H. Frye, Jr. Bruce Bennett is resident engineer for rocket base.



PUMPCRETE, supplied by truck mixer, handled most of the 26,000 cu. yd. of Class A concrete. Bottom slab of the pit is 18 in. thick, with top 4 in. of gunite.



OPERATING EASE, SAFETY:

Big 20-inch main-drum clutch, self-adjusting.

Main operating levers on antifriction, self-aligning bearings.

Automatic crawler traction-brakes.

Independent traction optional.

SIMPLE, HEAVY-DUTY DESIGN:

Only 2 main-shafts in upper machinery, fewer parts, less maintenance.

Splined shafts, antifriction bearings.

Extra-long, extra-wide crawlers available to suit work conditions.

Welded, high-strength steels.

Butt- or pin-connected crane boom.

205 WORK CAPACITIES:

10-ton lift as crawler crane.

15-ton lift on rubber — (truck or 21.5 m.p.h. Cruiser).

½ to ¾-yard clamshell, dragline.

½-yard dipper as shovel, hoe.



K698R

17¾ FEET DEEP with ½-yard 205

There are several reasons why you'll want to look into this Koehring heavy-duty ½-yard hoe. For one thing, consider wide work range for basements, footings, sewers, mains, pipelines. It digs 17¾ feet below crawlers — places spoil bank well beyond edge of cut — has 8¾-foot clearance height (at beginning of dump) to load trucks. Maximum width is 31 inches, over side-cutters. ½-yard dipper pulls up close to boom, avoids spillage.

Next, check 205 work capacity as clamshell, dragline, crane, shovel. See ratings at left. In addition to crawler mounting, it's available on truck with optional remote control — or on 21.5 m.p.h. Cruiser TM for 1-man operation. Want more facts? Call Koehring distributor today. He's listed below.



AMERICAN MACHINE CO., Spokane, Washington
PACIFIC HOIST & DERRICK CO., Seattle, Washington
COLUMBIA EQUIPMENT CO., Portland, Oregon
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STANDARD MACHINERY CO., San Francisco, California

KIMBALL EQUIPMENT CO., Salt Lake City, Utah
NEIL B. MCGINNIS CO., Phoenix, Arizona
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SAN JOAQUIN TRACTOR CO., Bakersfield, California
ENGINEERING SALES SERVICE, INC., Boise, Idaho
McKELVY MACHINERY CO., Denver, Colorado

Seattle's Alaskan Way extended

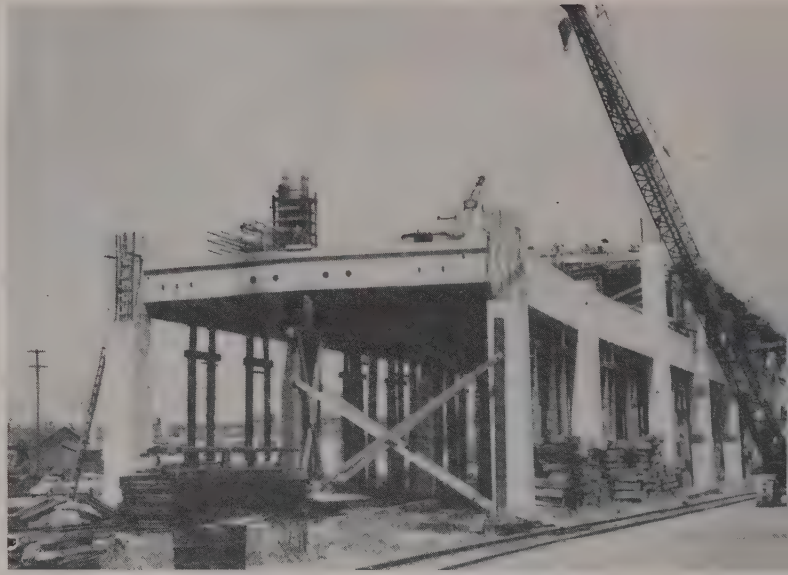
Two contracts totaling \$3,600,000 will add 4,400 ft. to the two-level bypass of downtown Seattle—Wheels on pouring platform speed concreting on decks—Two railroads under structure complicate falsework—Column forms backed by steel are adjustable.

SEATTLE'S ALASKAN WAY, which carries traffic on two levels along the waterfront past the downtown district, is being extended.

Rumsey & Co. is finishing up an \$800,000 contract which adds 1,000 ft. to the 1.6-mi. long reinforced concrete structure, and a joint venture of Rumsey & Co. and Morrison-Knudsen Co. Inc., has started a \$2,826,000 project which will add another 3,400 ft.

In October of 1956 the next section will go out for bids, a 4,500-ft. long six-lane freeway at ground level running adjacent to East Marginal Way to a point just north of Hanford St. Finally a contract will be awarded for the construction of a structure to carry traffic over the Spokane St. overcrossing. Traffic will not be allowed to use any of the new facilities until all are completed in 1959. Looking further into the future Washington State Highway engineers see an eventual extension southward to the recently completed 1st Avenue Bridge over the Duwamish Waterway.

The present Rumsey & Co. contract started in October of 1955 and



will be finished in October of this year. Both decks have a 40-ft. roadway, with the columns 47 ft. apart center to center. Bent spacing varies from about 56 ft. to 84 ft. The upper deck is 55 ft. above the ground and motorists have a good view of the city skyline and the waterfront docks. A newly-designed guardrail consisting of two small tilted horizontal members keeps visual obstruction to a minimum.

Foundations for the columns are Armcoc 12-in. spiral welded pipe, with about 40 ft. of penetration, filled with concrete. There are from 9 to 22 under each column. Pipe driving is being carried out by subcontractor Manson Construction Co. of Seattle.

Rumsey has devised a very successful column form. The forms are made on the job and consist of 2 x 12's faced with 1/4-in. plywood backed

by a welded steel frame. The vertical members of the frame, one at each side, are 7 x 4 x 3/8 angles. The horizontal members are 6 x 3 1/2 x 3/8 angles spaced at 1 ft. 9 in. The forms are 29 ft. high. The columns are rectangular, with a constant 4-ft. lateral dimension. All of the variation in the size of the columns is in the longitudinal direction. So half of the forms were built 4 ft. wide and the other half 6 1/2 ft. wide, the maximum longitudinal dimension. When positioning the forms the two wide ones are allowed to overlap the required amount. Thus a set of four forms can be used for any column and can be re-used as many as five times, when a new plywood face is usually needed. Beam and girder reinforcing includes the new No. 18 bar, equivalent to a 2-in. square, supplied by Bethlehem Pacific.

Falsework for the lower deck is complicated by the fact that a 16-ft. passageway must be maintained for a railroad that runs under the structure. All the falsework is carried on horizontal H beams (12BP53) which rest on temporary timber piles. For each H beam there are six piles, two at each side of the structure and two near the middle. The temporary pile are driven to a 35-ton capacity and are cut off below ground surface when they have served their purpose.

The Rumsey-M-K contract which is just beginning will have an even tougher falsework problem as there will be two railroad tracks under the structure to be kept alive at all time as well as several tracks entering and leaving the area on the diagonal.

The plan is to continue with the present system, with the pile and H beam bents moved closer together.

When the concrete in the lower



TOP DECK VIEW—Lateral pouring platform mounted on wheels is visible in foreground. Wheels resting on center longitudinal screed can be seen in left center. Concrete pouring progresses without the usual interruptions for repositioning.

leak has hardened, work begins on the upper deck. The same sort of falsework is used, as a passageway must be provided for concrete trucks to reach the point of pour on the lower deck. Traffic conditions under the structure rule out placing concrete by crane and bucket from ground level. Best pour so far in eight hours is 400 cu. yd.

Since the weight of the fresh concrete in the upper deck is carried by the lower deck, part of the falsework for the lower deck is left in place. Forms remain in place for about 14 days.

Transit trucks travel over the completed section of the structure to discharge into 5 Gar-Bro Power Carts which handle concrete placement on both decks. This is where the contractor has come up with an idea that saves him a lot of time. The transverse wooden runway from which the buggies dump their loads into the forms is mounted on wheels so it doesn't have to be picked up and repositioned as the pour progresses. The wheels (from some old mine cars the contractor had in his yard) run on the 4x6 longitudinal screeds. There are three screeds, one at each curb line and one in the center. To enable the wooden pouring platform to reach from one screed to the other (they are 20 ft. apart) it is reinforced underneath with small steel beams.

The danger of this system is that the weight of the buggies on the screeds could depress the screeds resulting in the slab depth being too small. To make sure this doesn't happen the screeds are supported from the bottom forms in two ways. In addition to 1x4s spaced every 3 ft., sufficient to support a few men with strike-off floats, Richmond Offset screed chairs are being used. This is a patented accessory which has a heavy wire tripod which threads onto a bolt running through a drilled hole in the screed. Two nuts hold the screed the proper distance away from the lower forms.

This double support keeps the screeds right on grade despite the weight of the buggies and enables the pouring to be carried out without the interruption of repositioning the platform. When the concrete has hardened, the vertical bolts in the screed chairs are screwed out for re-use.

An average of 35 men are working on the project on a 40-hr. week. Major equipment includes three crawler cranes, a Bucyrus-Erie, a P & H, and a Koehring. Form stripping is done with a Towmoter fork lift truck.

Resident engineer is P. C. Leonard, who has 29 years experience with the Washington Department of Highways. Inge Trigstad is chief of party, W. B. Lee is office engineer, and R. C. Thomasson is chief inspector.

For Rumsey & Co., Bob Nesser is superintendent, and John Rumsey, Jr., is project manager.



FALSEWORK is supported on temporary timber piles driven to 35-ton capacity and later cut off below ground.



COLUMN FORMS consist of 2x12s faced with 1/4-in. plywood backed with a welded steel frame.



WORKMEN SET guardrails which permit good visibility. Note upturned wooden screed behind men with screed chairs in position.



FALSEWORK for upper deck is similar to that for lower deck. Here, too, a passageway is kept clear, in this case for transit trucks bringing concrete to the end of the lower deck. Lateral horizontal beams are 12BP53.

The **Euclid TC-12** gives you more work-ability than other Crawlers



The first really new tractor concept in years...
with **ALL** the performance features you've wanted

Euclid's Model TC-12 Twin-Power Crawler establishes an entirely new standard of tractor performance. It's built to deliver unequalled drawbar horsepower, easy operation and a smooth, steady flow of power to meet any job requirement. It provides easy accessibility of all major components and all lubrication, check and adjustment points are located for maximum convenience. Unitized assemblies permit service or removal without a major tear-down of other parts.

Powered by two 194 h.p. engines at rated speed, 365 h.p. is delivered to the power

train. Each of the tracks is driven independently through separate Torqmatic Drives giving the TC-12 faster, easier steering and greater drawbar pull at higher speed. There's no clutch—shifting from one of the three speed ranges to another is done under full power—top speed in forward or reverse is 8.3 mph.

Have your Euclid dealer give you all the facts on the TC-12—compare with your present big tractor equipment and you'll know why so many owners have proved that ***Euclids are your best investment.***



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



Years Ahead in Performance

on today's tough jobs!

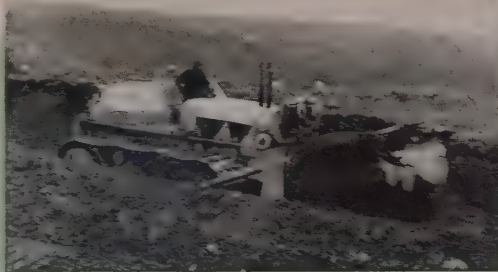


Another job where the TC-12 proved its ability to get more work done faster—land clearing in Virginia. Excellent maneuverability in tight quarters, steady flow of power, and typical Euclid brute strength, make this Twin-Crawler a dependable top performer for this kind of big tractor work.



The TC-12 has no equal for pushloading large scrapers or pulling big earthmoving equipment. Each track is driven by a separate engine and Torqmatic Drive giving the Euclid tractor outstanding maneuverability. On their Indiana Turnpike contract, Union Builders kept the job ahead of schedule with a fleet of "Euc" scrapers pushloaded with the TC-12.

Compare the accessibility and performance of the TC-12 with your present big tractor equipment—your Euclid dealer has facts and figures from all kinds of jobs.



A. E. Dick Construction Co. is using 2 Twin-Power TC-12 "Eucs" for stripping overburden at a big open pit anthracite operation in Pennsylvania. Tremendous power and traction, unequalled in any other crawler, gives them more work-ability on tough jobs as well as on routine earthmoving work.



Equipped with a Tipdozer, this TC-12 proved a versatile machine on a big subdivision grading job. It pushloaded a fleet of big Euclid scrapers—getting heaped loads of 21 and more yards in a hurry—and did a lot of land leveling and clean up work itself.



Codell and Oman put their first TC-12 to work pushloading "Euc" Scrapers on a 3 million yard railroad job in Georgia. Independent track drive, good visibility for the operator and power marched to the job requirement enables the TC-12 to maintain maximum scraper production.



Easy operation of the TC-12—Torqmatic Drive eliminates master clutch and manual gear shifting—makes this "Euc" a high production machine. For a relocation project on U. S. Route 16 in Michigan, Sugden and Sivier used a cable controlled blade for dozing.

EUCLID DIVISION

GENERAL MOTORS CORPORATION
Cleveland 17, Ohio





GUIDE PILES are being driven through the cofferdam crib as it rests in position on floating barge. When the crib

is fastened to the guide piles at each corner (picture next page) water is admitted into the barge, for its removal.

Piers go down for Portland bridge

THE FIRST OF TWO main piers of the Morrison Street bridge in Portland, Ore., is ready for concrete. The sheet pile cofferdam is completed, the cofferdam crib has been positioned near the bottom, and foundation piles are being driven. The contractor, Manson Construction & Engineering Co. of Seattle, has completed a 700-ft. temporary pile trestle over which transit-mix trucks will bring concrete to the pier.

The bridge, a Multnomah County project, is being built under four major contracts. Manson received a \$1,900,000 award in October of 1955 for the construction of the river piers. This work is to be completed by May of 1957. American Bridge Division of U. S. Steel Corp. received a \$2,200,000 contract in June of 1956 for the fabrication and erection of the superstructure. In May of 1956 a \$3,000,000 contract for the east approaches was

awarded to Kuckenberg Construction Company of Portland. The west approaches will be built by Donald M. Drake Co. under a \$1,200,000 contract awarded in August of 1956.

When the structure is completed in April of 1958, there will be a six-lane roadway 78 ft. wide with a main bascule span 285 ft. long. The overwater portion of the bridge is about 900 ft. long.

Manson is working two eight-hour shifts in an effort to get the pier above water by November when the Willamette River normally rises. The water will reach another high in June when the level is determined by flood waters of the nearby Columbia River. This means that the contractor has a period of only about four months in which to work in the stream during relatively low water levels.

In this year's June flood the water came very near to topping the cofferdam of one of the smaller piers being constructed near the shore. To keep the water out it was necessary to plug the handling holes at the top of the sheet piles and even to slow down passing boats so that the wash would not top the cofferdam. The water receded after coming within inches of the top.

First step in the construction of the main pier now being built was predredging by clamshell with a floating rig. Next the cofferdam crib was floated into place on a barge. The crib extended far enough on each side of the barge to permit guide piles to be driven through it into the stream bed. The crib was then attached to the guide piles at each corner by tackles. The crib is 71 by



THE BARGE has been floated out of the way and the crib is being lowered by the tackles. When crib is in place near bottom sheet piling is driven around it. Tackles are transferred to the sheet piling and the guide piles are removed.

90 ft. in plan and 35 ft. high. When it was secured, water was admitted to the barge to lower it a foot or two, permitting it to be drawn out of the way. Then the crib was lowered to about 8 feet above mudline.

After sheet piling had been placed around the crib and the guide piles had been removed, transferring the tackles to the sheeting, pile-driving began. A total of 154 bearing piles, 14BP102, have been driven with a McKiernan-Terry 10-S hammer, capable of producing 32,500 ft. lb. per blow at 55 blows per min., with a 3¾-ft. stroke. This hammer followed the piles under water to the proper grade. The piles were left extending above the seal course bottom from 16 ft. to as high as 46 ft. to anchor securely into concrete of the pier.

The contractor decided that a temporary trestle would be the cheapest way to bring concrete to the pier. Timber piling up to 90 ft. long has been driven in 4 and 5-pile bents, with bent spacing about 15 ft.

Before pouring started a diver was sent down to check all the sheeting. The tremie seal is 26 ft. high with a total cubic yardage of 6,200. It took about 36 hours of continuous pouring to complete the job. After the water is pumped out a 10-ft. high section 64½ x 86 ft. will be formed and poured. On this foundation two shafts will be built, 10 ft. wide by 84 ft. long by 64 ft. high. The shafts have six interior cells, 7½ ft. x 5 ft.

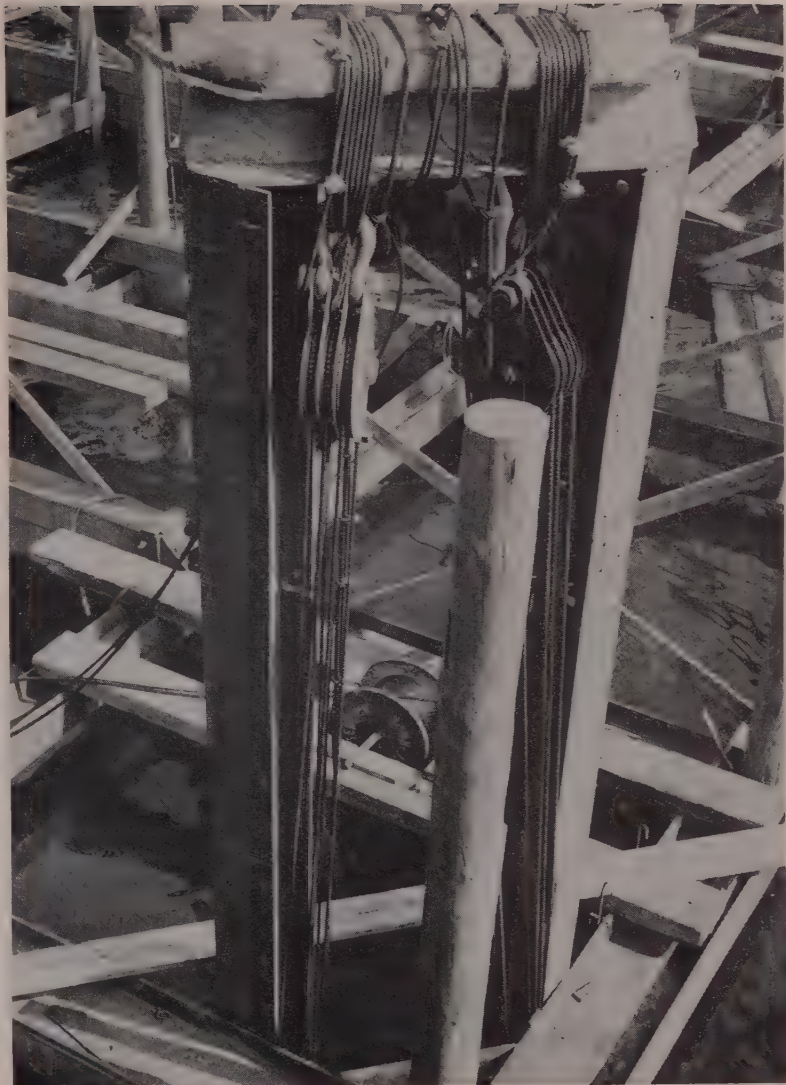
The forms for the shafts will be Universal Uni-forms which will be used from four to eight times. Special curved forms for each end of the shaft have been fabricated on the job by the contractor's carpenters. A total of about 7,800 cu. yd. of class A concrete (6.3 sacks per yd.) will be needed for each of the two main piers.

All of the sheet piling and part of the cofferdam crib trusses will be salvaged for re-use on the second pier.

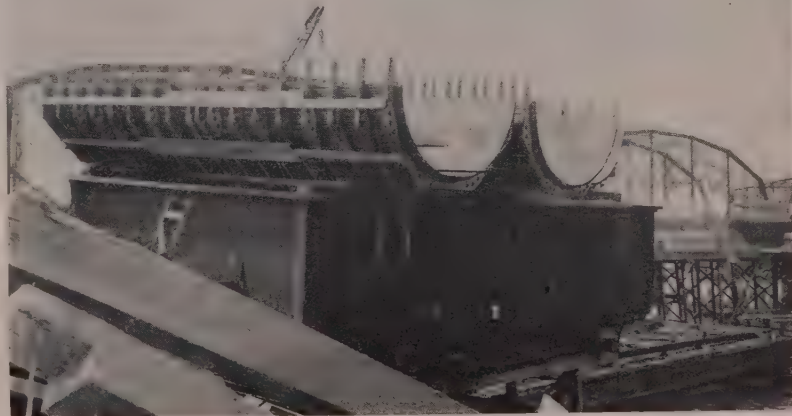
Manson has two diesel electric floating rigs on the job and an American 20-ton truck crane.

Two engineering firms by joint venture designed the bridge and are supervising construction for Multnomah County. Sverdrup and Parcel, Inc., of San Francisco and St. Louis designed the river bridge while Moffatt, Nichol and Taylor of Portland designed the bridge approaches. R. D. Bane is resident engineer. B. R. Smith is assistant resident engineer. Engineer assistants on the project are Robert McKeown, Tom Bye, John Paxton and Leo Shallansky.

For Manson Construction & Engineering Co., Walt Peterson is general superintendent, Clyde Sherman is job superintendent, and Bill Lindquist, office manager. Bill Booth is project engineer. Sam Allen, Paul Amundsen, Lee Mattson, Del Stephens, and Jerry Coday are foremen.



RIGGING SYSTEM shows up on this close-up of one of the four tackles used to lower cofferdam crib. Crib was built to height of 35 ft., lowered to near mudline.



STORAGE SPACE is scarce on the job site so these forms are stored on top of tool building. Forms were job made, will shape rounded end of piers.

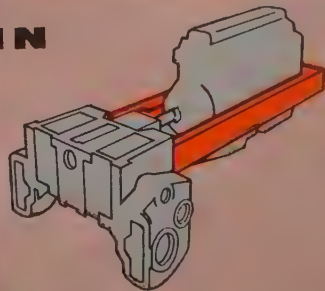
ALLIS-CHALMERS HD-21

Engineered to take
the Strain, the Shock,
and the Grind
Modern Construction Work

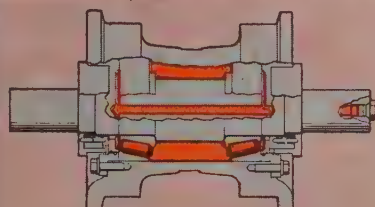


THE STRAIN

You encounter frame-twisting stress as you punch roads through rough, rocky terrain. Jobs like this prove the value of Allis-Chalmers exclusive all-steel, Box-A Main Frame. It is strong and flexible...soaks up vertical, horizontal and torsional strains. It is a complete unit... does *not* use the engine as a structural member. In addition, it allows more efficient equipment mounting, provides excellent weight distribution and makes possible unit construction for unmatched servicing ease.



A crawler tractor must handle many different jobs in construction operations... and every job tests its durability in a different way. Let's see how Allis-Chalmers engineers have anticipated these demanding conditions... and have designed the HD-21 to meet them.

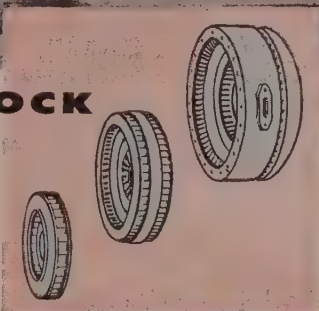


THE GRIND

These tracks churn all day in fine, abrasive stone... could be a serious threat to final drive, idler, truck wheel and support roller bearings. But this "grinding compound" never reaches the bearings on an Allis-Chalmers tractor. Exclusive design features make it possible to use tapered roller bearings with *Positive Seals* that keep dirt and moisture out and hold lubrication in for at least 1,000 hours without lubricating attention.

THE SHOCK

Sudden overloads are common in dozer operations. But hydraulic torque converter drive cushions the shock and protects the entire power train. This drive is standard equipment on the HD-21 and has been *proved* on Allis-Chalmers tractors since 1941.



HD-21

Approx. Weight (as illustrated)
with hydraulic bulldozer 51,265 lb
with cable bulldozer 52,650 lb
204 net engine hp

SEE YOUR **ALLIS-CHALMERS**

CONSTRUCTION MACHINERY DEALER

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Cate Equipment Company, Inc.—Salt Lake City

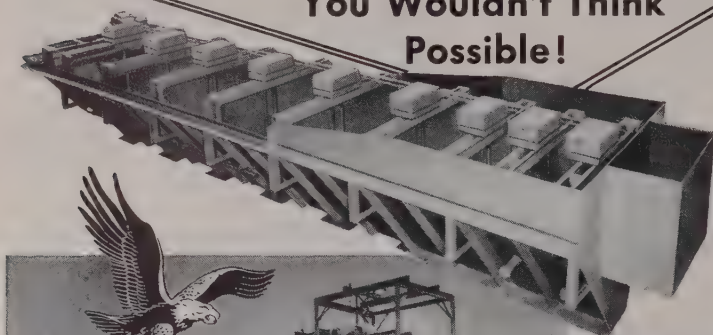
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The EAGLE Water Scalping-Classifying Tank Gives You Classification You Wouldn't Think Possible!



THE EAGLE Complete Washing-Classifying-Dehydrating Section at the eastern aggregate plant shown, has a 24' tank equipped with 9 automatic, power-operated bleeder valves. Pit run sand is segregated into 9 distinct classifications, each flowing from one of the 9 valves.

"Splitter" gates below each valve, in conjunction with the Multi-Cell Collecting-Blending Flume below the tank, permit directing of any percentage from each valve to any of the three Eagle Screw Washer-Classifiers-Dehydrators. Or, any percentage from any valve can be wasted. Complete flexibility to produce any gradation—or variety of gradations—material to meet specifications.

You can increase the efficiency of your present Eagle Fine Material Washer or Washers—or other make—by installing an Eagle Water Scalping-Classifying Tank—whether yours is a dry pit operation, as shown, or a pumping operation. Send for the facts in Catalog 55.

EAGLE IRON WORKS, 203 Holcomb Ave., Des Moines, Iowa

Brown-Bevis-Industrial Equip. Co.
Los Angeles, Calif.
Coast Equipment Co.
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N. C. Ribble Co.
Albuquerque, N. M.
Western Construction Equip. Co.
Billings, Missoula, Great Falls,
Bozeman, Mont.

Structural Design Chart—III



By
THOMAS HARAN
Civil Engineer

THE ILLUSTRATED data presented on the opposite page is the third of a series of twelve such sheets on "The ACI 318-51," which first appeared in **Western Construction** two months ago. These sheets represent the author's interpretation of the structural design requirements of the Code.

Sheet 3 is a graphic condensation of the data concerning structural analysis of flat slabs (illustrated data on the design of flat slabs will be presented in a future issue). This sheet is self-explanatory to the experienced design engineer. It presents the three methods of structural analysis recognized by the Code and notes or illustrates various requirements and permissible assumptions that are entered in the Code. The actual coefficients that are used in the third method are on Sheet No. 4 which will be published next month.

The symbols and abbreviations are those in current use and are in most cases as they appear in the Code.

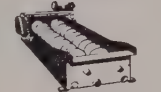
For the benefit of the reader who may have missed the first two charts of this series published in the August and September issues of **Western Construction**, the twelve sheets are arranged in the following order:

1. Structural Analysis of One-Way Reinforced Floor Members
2. Structural Analysis of Two-way Reinforced Floor Slabs
3. Structural Analysis of Flat Slab Floors
4. Structural Analysis of Flat Slab Floors (continued)
5. Structural Design of Floor Slabs
6. Structural Design of Floor Beams
7. Anchorage and Shear
8. Structural Analysis and Design of Columns
9. Structural Analysis and Design of Walls
10. Structural Design of Walls with Minimum Steel
11. Structural Analysis and Design of Isolated Footings
12. Miscellaneous Supplementary Data

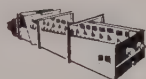
The EAGLE LINE



FINE MATERIAL WASHERS



COARSE MATERIAL WASHERS



LOG WASHERS



WATER SCALPING—CLASSIFYING TANKS.



"SWINTEK" DREDGE LADDERS



COMPLETE DREDGES



BREAKER BALLS & PILE HAMMERS.

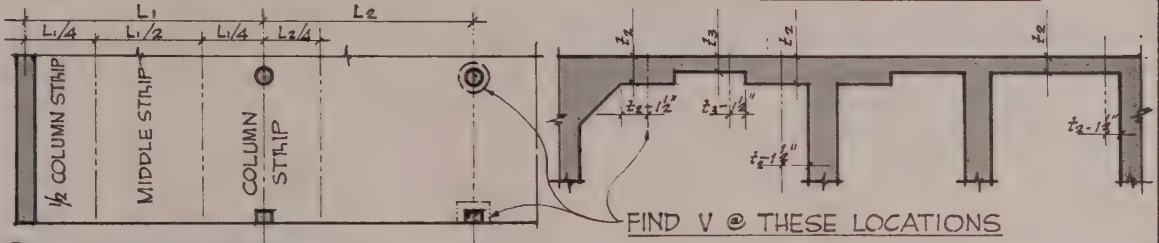
A.C.I. STRUCTURAL ANALYSIS OF FLOORS

Flat-Slab Floors

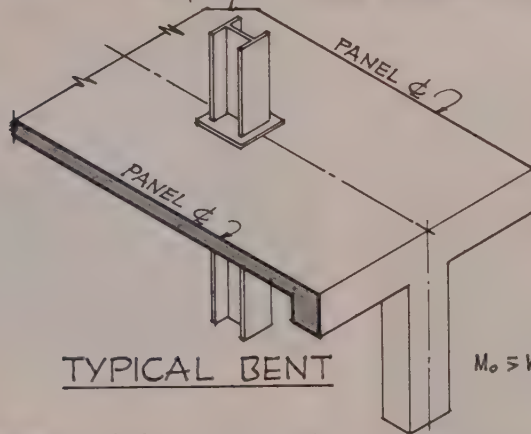
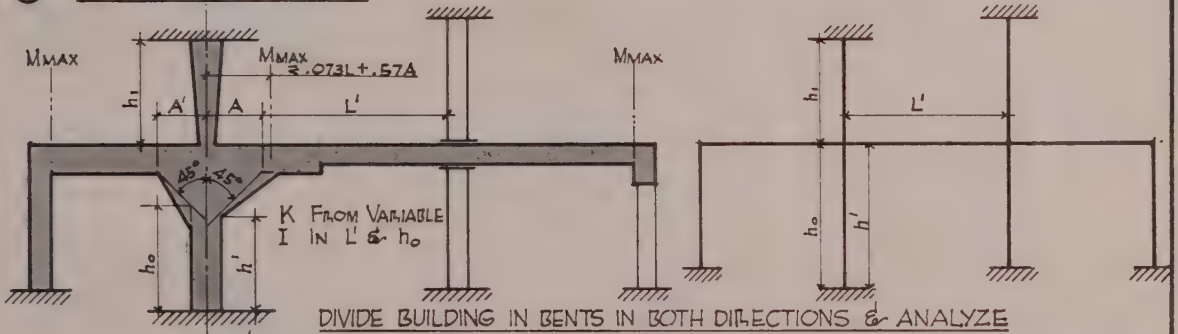
© FLAT SLABS SHALL BE ANALYZED BY 1 OF THE FOLLOWING METHODS:

REQUIREMENTS OF ALL METHODS:

PROVIDE FOR M'S & SLAB OPENINGS OK



① CONTINUOUS FRAMES

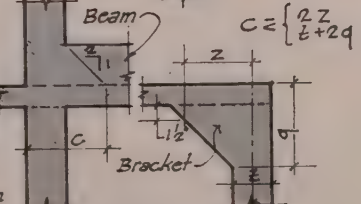
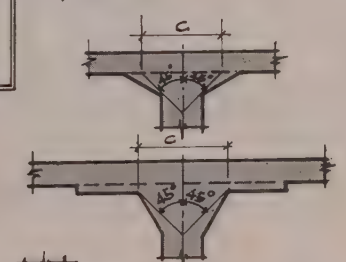
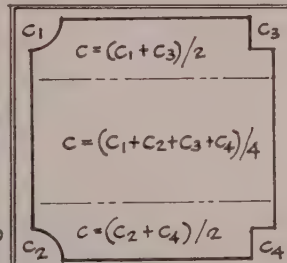


IF BENT > 4 PANELS, FOR M @ SUPPORT, SLAB MAY BE ASSUMED FIXED @ ANY SUPPORT 2 SPANS AWAY WHERE SLAB IS CONTINUOUS.

IF LL $\geq \frac{3}{4}$ DL Max. M MAY BE FIGURED BY LOADING ALL SPANS.

Apportion Max. M's to Column & Middle Strips in proportion to coefficients of Method ③.

$$M_o \geq W_{AV} L (1 - 4 A_{AV} / 3L)^2 / 10$$



② ELASTIC ANALYSIS BY RECOGNIZED METHODS

③ M - COEFFICIENTS

PANEL LENGTH ≥ 1.33 PANEL WIDTH.

3 SPANS MIN. BOTH WAYS.

LONGER SPAN ≥ 1.2 ADJACENT SHORT SPANS

MAY VARY COEFFICIENTS 6% IF Σ IN PANEL NOT REDUCED.

Mmax. @ PANEL Φ , COLUMN STRIP Φ , & CAPITAL PERIMETER.

PANELS WITH MARGINAL BEAMS @ OPPOSITE EDGES SHALL BE DESIGNED AS 1-WAY OR 2-WAY SLABS.



T. HARAN

The Dalles Dam set for final closing in March

FINAL CLOSURE at The Dalles Dam project, according to present schedule, will be carried out by completion of the embankment between the Oregon shore and the non-over-flow section next March. This completion schedule has recently been announced by Col. Jackson Graham, District Engineer at Portland, Oregon.

Following completion of the embankment, first closure of the gates will take place March 16 and 17 raising the water level behind the dam to elev. 130. A week later the pool will be raised to the minimum elev. of 155 and this will automatically drown out Celilo Falls, the fishing site of the Indians used by the local tribes for many generations. Information on closure dates has been made available to the Indian tribes in accordance with their agreements signed with the Corps of Engineers.

First power unit at The Dalles multi-purpose project will go into service in 1957 and all 14 units are scheduled for operation by 1960. Total installed capacity will be 1,120,000 kw. Space is provided for additional power units and their installation will be dependent on further storage and upstream regulation.

Adding to AEC plant

AN ADDITION to the Reactor Testing Station of the Atomic Energy Commission at Idaho Falls, estimated to cost \$1,600,000 is ready for bidding. Work will include construction of a 285 x 150-ft. addition to and a second floor over some of the existing buildings in addition to outside facilities. The additions will have a structural steel frame with corrugated asbestos walls. An important part of the project will be the installation of stainless steel for waste disposal and provisions for water treatment.

Baldock ends career as Oregon highway chief

RESPECTED BY EVERYONE in the highway industry of these Western states, and known to all as "Sam," Robert Hugh Baldock has resigned as Chief Engineer of the Oregon State Highway Commission. He held the position for 24 years, and his total service with the Oregon Highway organization extends almost 41 years. For the next two years he will head a mission to Iraq as an advisor to that government on highway matters.

No other highway engineering executive of the West has received such a wide variety of national honors as Baldock during his career. He served



R. H. "Sam" Baldock



CONCRETE PLACING STARTS AT TULLOCH DAM OF TRI-DAM

First concrete for Tulloch Dam, the third unit of California's Tri-Dam Project on the Stanislaus River, was poured August 6, with officials of the sponsoring Oakdale and South San Joaquin Irrigation Districts on hand for the ceremonies. The concrete gravity type dam, when completed, will be 1,600 ft. in length and 200 ft. high. Its reservoir will have a storage capacity of 68,400 ac.-ft. covering an area of 1,260 ac. The concrete pour will continue at the rate of 125 cu. yd. hourly, 40 hr. a week. Cement is being transported by truck and trailer from the Calaveras Cement Company plant at San Andreas, and aggregate comes from the Standard Materials plant on the Stanislaus River west of Knights Ferry. Ernie Snyder, general superintendent for Arundel Corporation and L. E. Dixon Company, expects the project to be completed on or before March 15, 1958. Tudor-Goodenough are the project engineers.

as president of the American Association of State Highway Officials in 1948 and in 1950 received their highest honor, the Geo. S. Bartlett award for outstanding contributions to highway progress in America. Only two years ago he was selected as Engineer of the Year by the professional engineers of Oregon.

He has been one of the leaders of the Western Association of State Highway Officials for many years, and instrumental in helping this group in the study of highway problems peculiar to these Western states.

A native of Colorado, he has an engineering degree from the University of Colorado, and a professional degree from the same institution. He

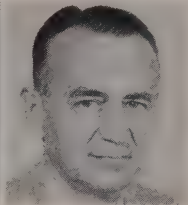
(Continued on page 76)

Portland Cement Association opens regional office to serve the West

THE PORTLAND CEMENT ASSOCIATION has announced the opening of a new Regional Office at 816 W. Fifth St. in Los Angeles to supervise activities of its district offices in Los Angeles and Seattle, Wash. These two offices serve cement users in the states of Washington and Arizona, and in parts of California, Nevada and Idaho.



Barnes



McNerney

Hugh Barnes, former Los Angeles district engineer, has been appointed regional manager and John M. McNerney has been chosen to succeed him as district engineer.

Opening of the Los Angeles Regional Office is part of the largest single expansion of the Association's field services to cement users since the end of World War II.

This expansion of field activities closely follows announcement of a \$1,800,000 expansion of the Association's research and development laboratories near Chicago, Ill., the largest in the world devoted exclusively to research on cement and concrete.

The new Western regional manager, Hugh Barnes, joined the Association in 1937 as a regional highway engineer and has been district engineer in charge of the Los Angeles District Office since 1942. Before joining the Association, he was with the Kansas Highway Commission for seven years, where he was successively construction engineer, State Highway Engineer, and chief of highway planning.

John M. McNerney, appointed district engineer in charge of the Los Angeles office to succeed Barnes, has been with the Association since 1941 except for 2½ years' service as a Naval officer during World War II. He has been successively a soil-cement paving engineer for several of the Association's offices and a statewide paving engineer for the Los Angeles office. Before joining the Association, he was employed by the Missouri Highway Department for 11 years, reaching the position of assistant to the head of the Department of Geology and Soils.

The Association's district offices serve as clearing houses for the latest information on construction, design and research advances, and provide

technical information and educational services aimed at the best possible utilization of cement and concrete. The Association's research, technical service and educational work are supported by the voluntary contributions of some 70 member companies in the U. S. and Canada, who produce a very large proportion of all portland cement used in the two countries.

International meeting on irrigation scheduled

DELEGATES of 34 member countries from every corner of the globe will assemble in San Francisco next spring for the Third Congress of the International Commission on Irrigation and Drainage.

The sessions in the Sheraton-Palace Hotel April 29 to May 4 will be the first held in the United States. The Third Congress follows highly successful congresses in India in 1951 and in Algeria in 1954. The United States National Committee will be host. Walter E. Blomgren, Denver, Colorado, consulting engineer, is the committee's chairman. Prof. Frederick L. Hotes of the University of

California at Berkeley is chairman of the San Francisco steering committee making local arrangements.

The program will cover papers on four topics of "Questions"—canal lining; soil-water relationship in irrigation; hydraulic structures on irrigation and drainage systems; and the inter-relationship between irrigation and drainage.

Each participating country or national committee has been invited also to submit reports on problems in irrigation and drainage development and practice, and in associated problems of freeboard in irrigation channels, weed control, and ground water.

An inspection of irrigation development and research at the University of California's agricultural experiment station at Davis will be available to all who participate in the study tours. Thereafter, two simultaneous tours will take in other work and activities, including structures and lands in the Sacramento River valley, the dams, canals, and irrigation systems in the Central Valley, and the Department of Agriculture's salinity laboratory at Riverside. A later study tour is planned for the Bureau of Reclamation's Columbia Basin Project.

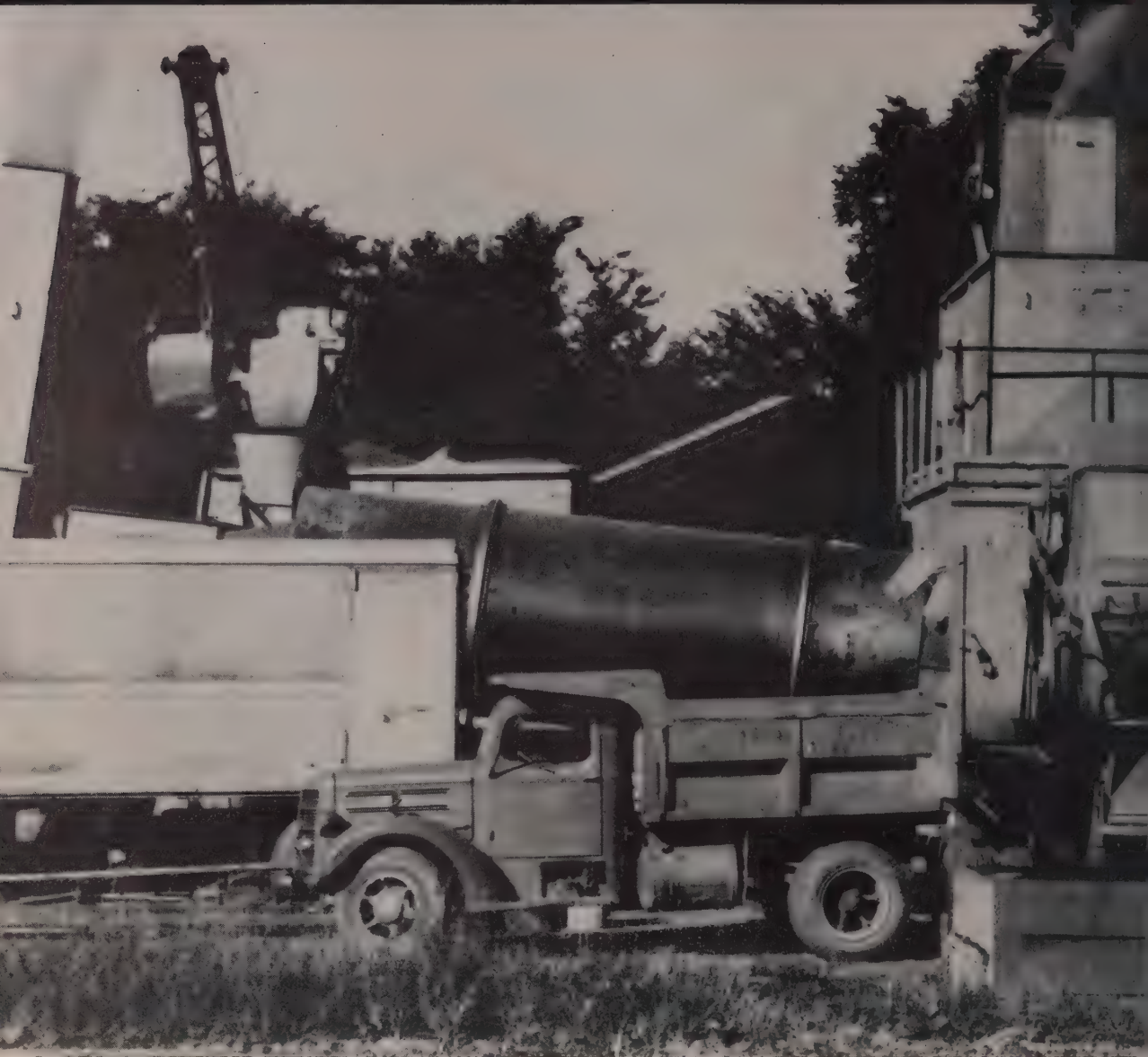
Information about the Third Congress may be obtained from the United States National Committee, International Commission on Irrigation and Drainage, Post Office Box 7826, Denver 15, Colo.



ARBA FORMS GROUP TO ADMINISTER ENGINEERING AND RESEARCH

ARBA's broad technical activities will be brought together administratively in a new Engineering and Research Division. From left to right: Stephen H. Meem, new managing director, ARBA Engineering and Research Division; Maj. Gen. Louis W. Prentiss (USA-ret.), ARBA executive vice president; and Burton F. Miller, ARBA deputy executive vice president.

General Prentiss has named Stephen H. Meem to serve as Managing Director of ARBA's expanded program of services. Meem will direct increased work to promote the practical application of research findings and other technical data to encourage improved construction and maintenance methods and better utilization of materials and equipment. The new Division director will step up information to the ARBA membership on the use of new engineering techniques in the design and construction of roads and in the use of new electronic devices. He will also take charge of the publication of more frequent ARBA technical bulletins and preparation of special reports of interest to the highway industry. Meem began his career with the State Road Commission of West Virginia in 1933, and through the years has done engineering work on construction of hydroelectric dams, industrial buildings and other varied projects.



Portable plant produces hot-mix at 175 tph clip from wet river gravel

TAKES ONLY 1.8 GALLONS OF FUEL TO DRY A TON OF WET MATERIAL

Fuel consumption of 1.8 gallons per ton while drying *wet river gravel* to produce a high type hot-mix at a 175 tph clip is outstanding performance in any contractor's language.

That was the record compiled by this PIONEER *Continusflo* Model 102 Asphalt Plant between Belleville and Ravenswood, West Virginia, where Route 2 hugs the Ohio River.

Gravel for the job was scooped up from the river bottom by a modern floating dredge. It was still saturated with Ohio River water when delivered to the plant.

The happy contractor was Tri-

State Asphalt Corporation of Martins Ferry, Ohio.

Tri-State already owned 8 stationary or semi-stationary mixing plants, but needed a high-tonnage, highly mobile plant to help it maintain a competitive advantage in the 5-state area of Ohio, Pennsylvania, West Virginia, Maryland, and Kentucky where it regularly operated.

Highly Mobile

It was after placing its order for the new PIONEER Model 102 *Continusflo* Plant that Tri-State submitted the low bid on the 50,000 ton

Route 2 paving job mentioned above.

Its exceptional mobility was one of the features which influenced Tri-State in selecting a *Continusflo* Plant. *There are only 2 units to move.* The combination drier and dust collector is mounted on one rubber-tired chassis; the combination gradation mixing unit is on another. No extra piping or breeching is needed to connect dust collector with drier. It's a simple matter to pull in, hook up lay pipes, and go to work.

Economical, too

One of the reasons Tri-State's *Continusflo* Drying Unit requires so little fuel and power is that the direct



straight-line connection between drier and dust collector offers less resistance to air flow than old-fashioned plants with their multi-sized piping and breeching. Less heat is wasted, and since more heated air is pulled through the drier for each pound of input to the induction fan, less power is needed to do the job. Another major saving is made possible by the high efficiency of PIONEER's multi-clone dust collector which saves on the cost of mineral oil by recovering up to 20 tons of wasted fines per hour and feeding them back into the mixer.

4-Compartment Bin

Another feature of the 102 Plant which has helped influence Tri-State was the fact that it offered a 4-compartment bin. Specifications of both the Ohio and Pennsylvania Highway Departments call for 4-bin separation of

bituminous mix aggregates, and even where this is not required, the high output of the 102 Plant puts Tri-State in an advantageous position when bidding is close.

Accurate Proportioning

Three other important *Continusflo* advantages make it easy to maintain near-perfect uniformity of mix to meet even the most exacting specifications.

FIRST... gradation bin gates are calibrated to make it easy to proportion dry aggregate.

SECOND... hot, dry aggregates are mixed before bitumen is added.

THIRD... aggregates feeder and bitumen pump drives are *mechanically interlocked* to maintain correct proportioning.

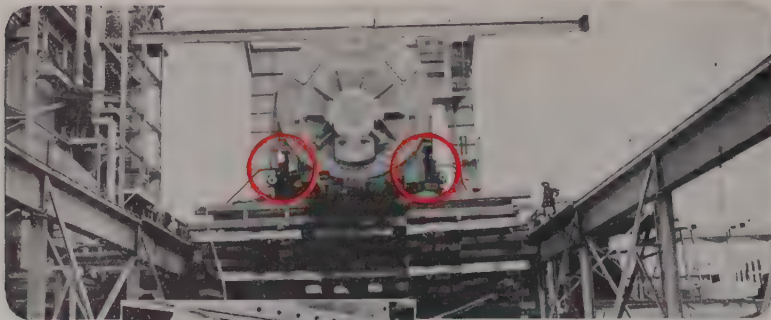
A specially designed double gate

on the truck-loading hopper reduces segregation to a minimum and quick-acting controls give the operator instant and positive command over all mixing functions.

The Model 102 *Continusflo* Plant is available with diesel, diesel-electric, or all-electric power. All-electric plants are controlled from a central push-button panel.

For more information on the 102 or other PIONEER *Continusflo* Bituminous Plants, write Pioneer Engineering Works, Inc., Minneapolis, Minnesota (a subsidiary of Poor & Company, Chicago) or see your nearest PIONEER Distributor.

Pioneer
Continusflo EQUIPMENT



Duff-Norton air jacks

Raise Big Loads—and Profits

By ingenious use of Duff-Norton air jacks, a Dallas contractor finds that he lowers costs, speeds work, gets greater dependability and safety with these portable tools on difficult installations of big equipment.

Using two 100-ton capacity Duff-Norton jacks, the mechanical contractor, E. E. Farrow Company, raised a 240,000 lb. turbo-generator 22 ft. at the plant of the Western Farmers Electric Co-operative. Three men completed the job in 2½ days with a jacking-blocking procedure which resulted in a savings of \$400.

Duff-Norton air motor jacks were also used to raise a 210-ton, 100,000-kw generator 13 ft. at the Dallas Power & Light Company, Parkdale Station. These same jacks helped cut costs of similar jobs at Haskell, Lone Star, Corpus Christi and Riesel, Texas.

Duff-Norton air motor jacks have a lift of 14 to 30 inches and are mounted on rubber-tired, roller bearing wheels for easy positioning by one man. They operate on 80 to 100 lb. air pressure.

The six Duff-Norton models range in capacity from 20 to 100 tons—weigh from 238 to 530 pounds. A sturdy base prevents tipping or settling. Safe operation is assured by an automatic shut-off which stops motor when safe limit is reached. Keyway in ram prevents the head from turning and shifting load. Lowering and lifting speed is controlled by air motor. Jacks will not creep or drop the load.

For data on these cost reducing jacks and name of nearest distributor write Duff-Norton Co., P.O. Box 1889, Pittsburgh 30, Pa. Ask for bulletin AD-11-A.

DUFF-NORTON

Giving Industry A
Lift Since 1883

Jacks

Branch Office: 1016 Howard Street, San Francisco, Calif.

Baldock leaves Oregon

(Continued from page 70)

received an honorary Doctor of Science degree from the University of Oregon. Following several years of engineering work, including service with a railroad, a utility and a construction company he joined the Oregon State Highway Department in 1915 as a district engineer. He advanced through several positions of wider responsibility, becoming Chief Engineer in 1932.

Outstanding during his long career has been his interest in highway maintenance and the development of asphalt construction. He has always been a firm believer that an engineer could not be a successful builder of highways until he had served in the maintenance department and had the difficult assignment of trying to hold together and patch up existing roads. Learning why highways go to pieces and the best of methods of keeping them in repair were regarded by Sam Baldock as essential training for construction engineers and those with administrative responsibilities. This principle long established and adhered to may be credited with making the Oregon highway system the model that it is today.

Almost 30 years ago he pioneered in the development of oiled macadam surfacing to develop low cost and durable roads, particularly in the eastern side of the state. Oregon technique and success in perfecting this type of roadway design and construction received national recognition.

Baldock was one of the leaders in designing and building highways based on the driving speed which engineers considered proper for the existing conditions. He is also an authority on highway financing and particularly a student of highway taxation.

One of the major achievements carried out under his direction was the bridging of the five rivers along the Oregon Coast replacing ferries and modernizing this scenic route. Another important accomplishment was the modern highway along the Columbia River.

When Sam Baldock joined the Oregon State Highway Department in 1915 it consisted of 50 employees and when he left on August 16, 1956, the size and importance was indicated by the fact that the employees now exceed more than 3000.

Staff changes and promotions

Following the resignation of Baldock the Oregon State Highway Commission named W. C. Williams, former Deputy State Highway Engineer, to the position of State Highway Engineer effective August 16. Taking over the position of Deputy will be Forrest Cooper who was formerly Construction Engineer.

Tom Edwards, who was Division

Engineer at Roseburg, becomes Construction Engineer at Salem headquarters. His position will be filled by advancing Frank D. Morgan, Assistant Division Engineer, to the position of Division Engineer at Roseburg.

D. J. Barbee who formerly had the title of Urban Engineer has been named Assistant Construction Engineer at the Salem headquarters. Lloyd P. Shaw has been named to the post of Urban Engineer at Salem.

Fred B. Klaboe has been named Assistant Division Engineer at Roseburg to fill the position vacated by the advancement of Frank Morgan. Raymon D. Asbury has been named Assistant Division Engineer with headquarters in Salem, and Gerald Wimer has the same title.

George C. Baker has been promoted from District Maintenance Superintendent with headquarters at Coquille, to Assistant Division Engineer at Roseburg.

All of these appointments were effective August 16.

Equipment starts moving to Ice Harbor Dam job

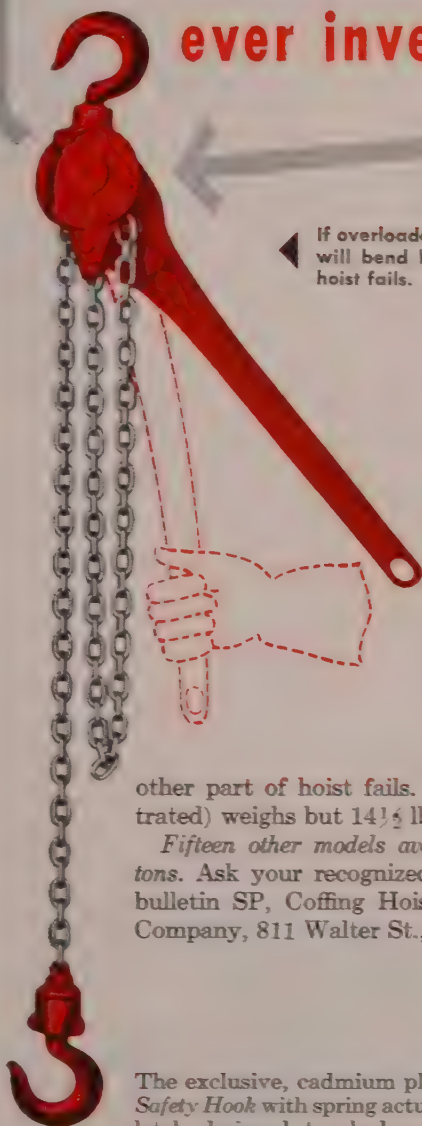
A FLOATING pile-driver barge is now on its way upriver from Portland, Oregon, and 600 tons of salvaged cofferdam steel is also being barged upriver to make possible the starting of the first step cofferdam at Ice Harbor Dam. Guy F. Atkinson Company has the contract.

Steel netting sufficient to complete wire-bound riprap protection on the north shore has been received at the damsite and the contractor estimates the necessary excavation of approximately 410,000 cu. yd. of dirt along the north shore to be 85% complete. About 3,550 sq. yd. of steel fabric and 11,500 tie rods will be used along with 3,000 cu. yd. of heavy revetment rock and 500 cu. yd. of grout in binding down the protection slope along the north shore of the Snake River at the damsite. This protection slope is necessary to prevent damage and erosion when the first step cofferdam swings the entire flow of the river against the north bank.

About 1,000 tons of salvaged cofferdam steel used at McNary Dam will be trucked to the south shore workings at Ice Harbor within the next few weeks to augment the steel cofferdam pile already on hand. The work forces at the dam now consisting mostly of heavy equipment operators should reach near the 200 mark as the first step cofferdam work starts.

Oiling of the access roads on both north and south shores is expected to start within the next week and should be completed within 30 days. As originally planned, no housing is contemplated at the damsite itself and workers will commute by car from surrounding areas.

Here's the safest ratchet lever hoist ever invented!



◀ If overloaded, "safety valve handle" will bend before any other part of hoist fails.

It's the original Coffing Safety Pull, a ratchet lever hoist with dual pawls and ratchet that keep load from slipping. Safety stops prevent spinning out of control and if overloaded, "safety valve handle" will bend before any

other part of hoist fails. The $\frac{3}{4}$ -ton model (illustrated) weighs but 14 $\frac{1}{2}$ lbs.

Fifteen other models available handling up to 15 tons. Ask your recognized distributor or write for bulletin SP, Coffing Hoist Division, Duff-Norton Company, 811 Walter St., Danville, Ill.

The exclusive, cadmium plated *Coffing Safety Hook* with spring actuated locking latch designed to shed, not snag, on wires or other objects is available for the $\frac{3}{4}$ -ton, 1 $\frac{1}{4}$ -ton and 3-ton models at slightly additional cost.



COFFING HOIST

Division of Duff-Norton Company

Branch Office: 1016 Howard Street, San Francisco, Calif.

Pacific Northwest program of the Corps of Engineers is outlined

CURRENT and future construction projects in the civil works program of the Corps of Engineers in the Pacific Northwest were recently reviewed by Brig. Gen. L. H. Foote, Division Engineer. Future work will be established by the present review study of the Columbia River 308 Report (House Document 531) which has included five public hearings held by the division office in different locations to obtain comments of various interested groups. Full consideration will be given these views in producing a realistic, feasible and generally acceptable plan of development (**Western Construction**—Sept. 1956, page 59). Additional hearings will be held in 1957 after specific proposals have been developed.

The present program was recently reviewed by the Division Engineer as follows:

Congress appropriated approximately \$91,000,000 for the fiscal year 1957 civil works construction program of the Corps of Engineers in the North Pacific Division, including the Pacific Northwest and Alaska. This sum includes slightly more than \$2,000,000 for advance engineering and design. An additional \$10,500,000 was appropriated for operation and maintenance of projects completed or nearing completion.

This compares with \$86,400,000 expended for civil works construction in the fiscal year just ended.

The additional reservoir and multiple-purpose projects, as well as several large continuing navigation works for which funds were appropriated for fiscal year 1957, will keep civil works appropriations at a con-

tinued high level for a number of years to come.

Of particular interest is the fact that 23 new starts, including 18 River and Harbor and 5 Flood Control projects, are provided for in the funds appropriated by Congress for the 1957 fiscal year program. Five of the new starts on navigation projects—Craig Harbor, Elfin Cove, Ketchikan Harbor, Kodiak Harbor and Pelican Harbor—are in Alaska. The other navigation projects for which funds have been provided for starting construction are as follows:

Chetco Harbor—This project near Brookings on the southern Oregon coast received \$225,000. The proposed work includes stabilization of the channel through the bar at the mouth of the Chetco River by construction of jetties and dredging. Total cost of this project is expected to be less than \$500,000.

Columbia River at Baker Bay—This work located near the Port of Ilwaco, Washington, dock, providing for a mooring basin 10 to 12 ft. deep, and deepening of the west approach channel to 10 ft., received \$70,000. Also included in the project are protecting breakwaters. Total estimated cost of the completed project is \$601,000.

Skipanon Channel—For construction of a mooring basin 12 ft. deep at Warrenton, Ore., near the mouth of the Skipanon River, \$185,000 was appropriated which is enough to complete the project. A ship channel extending from the Columbia River to Warrenton, together with a turning basin, was completed in 1939.

Bellingham Harbor—For starting

construction of a small-boat basin to supplement improvements already completed \$400,000 was appropriated. The work includes the removal by local interests of the existing breakwater southeasterly of Squalicum Creek waterway and construction by the Federal Government of a new breakwater seaward of the existing one having a total length of 3,920 ft. The Federal cost is estimated at \$1,478,000.

Blaine Harbor—Enlargement of an existing locally built small-boat basin is made possible by appropriation of \$116,000, the total estimated Federal cost of which is \$471,000. The project involves dredging an area of 14.7 ac. to a depth of 12 ft. and construction of additional breakwater protection.

Everett Harbor—Improvement of the ship channel and harbor is provided for with funds in the amount of \$120,000. The channel will be deepened to 15 ft. with widths of 150 to 425 ft., extending from deep water in Port Gardner Bay to the settling basin, deepening the basin to 20 ft., and constructing a spur dike. Cost of the project is estimated at \$436,000.

Grays Harbor—Construction of a third breakwater—Breakwater C—will be started with \$61,000 appropriated for further improvements in Grays Harbor where much work has already been accomplished, including two breakwaters. Estimated cost of completing this third breakwater is \$352,000.

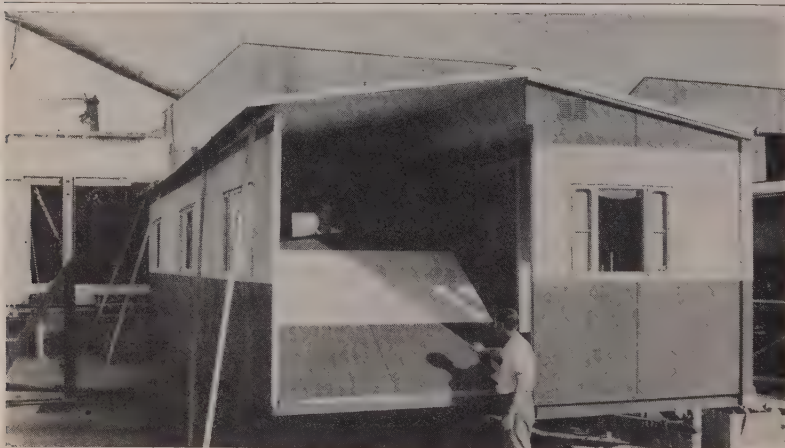
Quillayute River—For construction of a channel 10 ft. deep and 100 ft. wide, extending 2,000 ft. upstream from deep water into a basin 10 ft. deep, 300 to 425 ft. wide and 2,400 ft. long, \$444,000 was appropriated. Accomplishment of this work will complete the authorized project.

Willapa Harbor—Providing for channel improvements, mooring basins and breakwater protection at four different points in vicinity of Tokeland, Nahcotta, South Bend, and Raymond, Washington, \$130,000 was appropriated. For completion of the project an estimated \$1,035,000 will be required.

Shilshole Bay—For starting construction of a small-boat basin with a 10 to 15-ft. depth, including a breakwater 4,200 ft. long, north of Lake Washington Ship Canal entrance, \$400,000 was appropriated. The estimated cost of the completed project is \$2,200,000.

An important new feature of the Corps of Engineers' construction program approved by Congress is the provision of \$2,500,000 as an addition to the budget to take care of the highest priority of small authorized projects costing less than \$150,000 each. These are projects in the active authorized program having economic justification and for which there is an urgent need.

Four small authorized projects in this category in the North Pacific Division—three of them River and Harbor projects—received appropria-



FOLDING TYPE PORTABLE HOME FOR GOVERNMENT ENGINEERS

Transa Homes Corp., Fullerton, Calif., will deliver nearly one million dollars in mountable, semi-permanent dwellings to agencies of the U. S. Government within the next few months. Family-sized units will be acquired by the Department of Interior for use on the Colorado Storage and Central Valley projects of the Bureau of Reclamation. Each mobile unit will contain living room, kitchen, two bedrooms and bathroom with the total areas substantially exceeding 500 sq. ft. An unusual construction design permits the dwelling to be folded into a 35x8 ft. trailer on wheels.

This Asphalt Plant
required over
40 YEARS
to develop!

Take a long
hard look ...



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IN ASPHALT PLANTS!**

The new **STANDARD** Model R-B Plant.
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in the design and manufacturing of
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PARTS WAREHOUSES IN LOS ANGELES AND NEW JERSEY

tions totaling \$388,000 and are included in the new construction starts scheduled for fiscal year 1957. The largest is **Anacortes Harbor** which provides for extending the present channel and construction of a mooring basin to be protected by a pile breakwater, for which \$150,000 was appropriated. Also qualifying with an appropriation of \$54,000 is a small project supplementing completed improvements on the **Umpqua River** near Reedsport, Oregon, providing for a channel 12 feet deep and generally 100 feet wide in the **Scholfeld River** from its confluence with the Umpqua for a distance of two miles. The third such navigation project provides for improvements in the **Valdez Harbor** in Alaska for which \$129,000 was appropriated. A small

flood control project, **Malheur Improvement District**, on the Snake River near Weiser, Idaho, also received \$55,000 in this list of urgently needed works.

If like amounts are appropriated each year for high priority projects which have been authorized, but on which construction has been deferred, we can hope to reduce the large backlog on our construction program, including many small navigation projects which have been determined to be economically justified.

Turning now to the new fiscal year construction appropriations for our multiple-purpose projects, the largest individual item in this important phase of the program is \$49,000,000 to continue construction on **The Dalles Dam**, scheduled for comple-

tion in November 1960. With the current fiscal year funds we will be able to complete the navigation lock, east fishladder, north fishladder and non-overflow dams adjacent to the spillway. We will also continue construction of the powerhouse superstructure, closure dam and cofferdam removal, among other items of work.

With construction nearing completion on the Corps of Engineers' two other large multiple-purpose projects under way on the main stem of the Columbia River, smaller appropriations were received: **McNary Dam** was allotted \$2,828,000 which will be used to install final generating units in the powerhouse and other items of work. Twelve units are now on the line and the remaining two are scheduled to be placed in operation by December of this year. The entire project will be completed by the end of the calendar year 1958. **Chief Joseph Dam** received \$9,500,000, a large part of which will be used for procurement of turbines, generators, transformers, and other operating equipment. The fifth generating unit will go on the line this month and the remaining eleven of the initial installation will be placed in operation periodically with the final unit scheduled to be activated in December 1958. The entire project is to be completed by July 1959.

For construction of **Ice Harbor Dam** on the lower Snake River, \$8,000,000 was appropriated. These funds will be applied to lands and damages, relocations, first-step cofferdam, south shore construction contract, turbine and generator contracts, and construction facilities.

We received \$6,300,000 to continue construction work in connection with **Eagle Gorge Dam**, a flood control project on the Green River near Seattle. An appropriation of \$2,125,000 for **Hills Creek Reservoir** and \$1,650,000 for **Cougar Reservoir**, flood control and power project in the Willamette Valley, will provide funds to continue construction on these two projects which, when completed, will provide additional flood protection in this important sub-basin.

Construction of **John Day Dam** on the Columbia River 28 mi. upstream from The Dalles, moved a long step nearer the start of actual construction with an appropriation of \$1,450,000 for advance engineering and design. We expect to virtually complete all pre-construction planning with these funds. In fact, it would be possible to call for bids on rail and highway relocations on the north bank of the Columbia and also to invite bids on the first-step cofferdam by the early part of 1958 on this important navigation and power project. This will provide the last link in the chain of dams creating a continuous slack water navigation channeled from tidewater, at Bonneville, to the Pasco-Richland inland area and up the Snake River to Ice Harbor, first of the four dams on the lower Snake

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Permanente maintains a fleet of bulk cement ships with a cargo capacity of over 100,000 barrels—to serve its coast-wide system of distribution plants and provide its customers with all the advantages of a multi-plant system.

To keep the distribution silos filled and flowing, Permanente has just increased production by 1,500,000 barrels annually, has a new plant coming into production this fall, and is engineering another for completion next year. This is Permanente's contribution to Western plans for adequate highway programs, improved flood, irrigation and power projects.

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On the Job, on Time from these Permanente Distribution plants

PERMANENTE
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**JOB
TAILORED**

**ON THE JOB—ON TIME
EVERYWHERE IN THE WEST**

Air Force Academy work advances at fast rate; water supply ready

COMPLETION of the potable water system for the Air Force Academy is announced by Col. A. E. Stoltz, Director of the Air Force Academy Construction Agency.

Col. Stoltz said that the pipeline system, built under a \$399,235 contract with Wade Lahar Construction Company, Tulsa, has been accepted by the Agency. It is the second major construction contract completed, the first being for the sanitary sewage system, which was under a \$270,000 contract to Brown & Olds Plumbing and Heating Corp.

The Wade Lahar contract was awarded on August 19, 1955, and has been completed for several weeks with the exception of testing and minor adjustments to certain mechanical valves. It included some 38,000 ft. of pipeline, in varying sizes of steel water pipe and cast iron pipe.

Agreement with Colorado Springs

Also a part of the job was the construction of a 390-ft. tunnel through the Rampart Range, which carried the pipeline from the city's water supply system. Under agreement with the City of Colorado Springs, the Air Force Academy is guaranteed a maximum of five million gallons of water daily, although Air Force authorities anticipate that quantity will not be needed for ordinary usage.

Elder Construction Company, Denver, and Northwood Construction Company, Woodland Park, were subcontractors on the water system job.

Progress on contracts

Progress of other construction projects, as reported in the first week of August, was as follows:

First increment of primary road system, Nowers Construction Co., scheduled 70.5%, actual 87.8%.

Three 800,000-gal. potable water reservoirs, Matelich & Hanson, Inc., scheduled 100%, actual 85.5%.

Second increment of primary road system, Jack Adams & Haake Construction Co., scheduled 25%, actual 46%.

Relocation of portion of U. S. Highway 85-87 and control of Kettle Creek, Mountain States Construction Co., scheduled 38.4%, actual 61%.

Grading of cadet-academic area, parade, drill, and athletic fields and construction of retaining walls, T. F. Scholes, Inc., scheduled 39.5%, actual 27.4%.

Third increment of primary road system, Nowers Construction Co., scheduled 26%, actual 55%.

Grading of services and supply area, Colorado Constructors, Inc., scheduled 41.66%, actual 65.35%.

Contracts recently awarded include construction of a sewage treatment plant, Frederic Raff Co.; construction of buildings for the service and supply area, J. W. Bateson, Inc.; foundation caissons for the academic building and cadet quarters, A. H. Beck Foundation Co. and Saxet Foundation Co.

Power plans for Alaska

CENTRAL ALASKA Power Association, Inc., of Anchorage, Alaska, has filed an application with the Federal Power Commission seeking a preliminary permit for a hydroelectric project on the Copper River in the Territory of Alaska.

The proposed project would entail the construction of a concrete gravity dam 660 ft. high with a crest length of 1,750 ft.; diversion tunnels; intake and spillway sections; penstock; and appurtenant facilities. The dam would create a reservoir 51 mi. long on the Copper River and 55 mi. long on the Chitina River, forming an active storage capacity of 14,000,000 ac.-ft.

The power plant would have an ultimate installed capacity of 1,100,000 kw. (1,475,000 hp.) Domestic commercial and municipal requirements would be about 60,000 kw. The bulk of the output would be used by industrial firms, mainly for aluminum and newsprint production.

A preliminary permit, if issued, would not authorize any construction. It would give the applicant priority in filing for an FPC license while conducting the necessary surveys and investigations.

This is the same project for which the Commission issued a preliminary permit to Harvey Aluminum, Inc., in August 1954; however, Harvey Aluminum recently advised the Commission that it wishes to surrender its permit.

Ariz. to expand use of Univac in highway work

NEW APPLICATIONS being considered for programming on Univac at the Arizona Highway Department include various stages of bridge design, soil screen analysis and traverse closures problems, according to Glen Ryden, chief computer, who returned recently from a special Univac schooling conducted by Remington Rand in Los Angeles. In addition to Ryden, the following personnel from the Highway Department attended the school: James Webster, Mapping Section; Nicholas Karan, Bridge Division; Joseph Grossette, Traffic Division; Kenneth Stokoe and W. E.

Gray, Plans Division; Lester Mayne, Laboratory; E. C. Carey, Location Division; Charles Betancourt, Tabulating Division, and Edsel Allred, Accounting Division.

Ryden pointed out that with trained personnel from nearly all divisions, the programming time will be shortened and it will now be possible to get more application programmed on the Univac. At present, the Univac is being used for program alignment data and grade slope stake construction note area and volumes, reducing of plus or minus readings, road readings to elevations, and computing preliminary earthwork areas and volumes. In addition the Univac is being used by the Accounting Division for payroll, gas tax distribution and shop inventory. Ryden said that in time many other applications will be programmed on the Univac. Arizona was the second state to use the large Univac 120 and was first to pioneer and develop the computation of cuts and fills and the establishment of a balanced profile.

Lewis River hydro plan to cost \$56,000,000

PACIFIC POWER & LIGHT CO. of Portland, Ore., and Public Utility District No. 1 of Cowlitz County in Washington, Longview, Wash., have filed applications with the Federal Power Commission seeking license for the proposed Swift Hydroelectric Project on the Lewis River.

In December 1955, Pacific has filed an application for a license to construct the entire project. The new applications request that Pacific be authorized to construct the portion of the project known as Swift No. 1 and that the PUD be authorized to construct the Swift No. 2 portion.

The power output would be shared by Pacific and the PUD. Pacific would purchase the PUD's share of the output until such time as it is required by the PUD in the operation of its own system.

The entire project would have a total installed capacity of 256,000 kw. and is estimated to cost approximately \$56,000,000—(Swift No. 1: \$44,000,000; Swift No. 2: \$12,000,000).

The Swift No. 1 Development would include a 410-ft. high dam forming a reservoir extending about 12 mi. upstream. A 1,580-ft. powerhouse would branch into three penstock tunnels extending to a powerhouse immediately downstream from the dam. The powerhouse would contain three turbines, each rated at 80,000 hp. and direct-connected to generator with a 63,000-kw. nameplate rating.

The Swift No. 2 Development would include a power canal a forebay extending 3½ mi. between the two Swift developments.



HOW MOBILE CAT* POWER PAYS OFF FOR LAMBERT BROS., INC.



A D397 Mobile Electric Set provides crusher power on a job for Lambert Bros., Inc., near Greenback, Tennessee. The 315 KW D397, Caterpillar's biggest trailer-mounted electric set, is well within highway weight and size restrictions.

When Lambert Bros., Inc., Knoxville, Tennessee, received the contract to furnish 26,000 tons of base material for road construction near Greenback, it set up the operation pictured here. The company provided its own power with this Cat D397 Mobile Electric Set. The 315 KW unit provided the power to run the Cedarapids crusher, working 8 hours a day, 5 days a week. Output averaged about 900 tons a day. Said Lambert's Ben L. Greene: "I like the D397 because it gives us a maximum amount of operation with a minimum amount of maintenance."

For dependable electric power, *when* it's needed and *where* it's needed, you can't beat Caterpillar Electric Sets. They're available in a complete range of sizes, up to 315 KW, for use in emergency or full-time operation. Each is a complete unit, mounted on skids, semi-trailer or trailer. Easy to hook up and easy to op-

erate, they deliver steady voltage. There's one that fits your needs and—as Mr. Greene points out—provides maximum performance with minimum maintenance.

Wherever you move these sets, you always have the plus of prompt service, right on the spot, from your nearby Caterpillar Dealer. For complete information about these versatile power plants, see him soon.

Caterpillar Tractor Co., San Francisco, Calif.; Peoria, Ill., U. S. A.

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**MODERN, HEAVY-DUTY
PORTABLE ELECTRIC POWER**

Program for Alaska civil projects announced by Corps of Engineers

A \$7,000,000 program of harbor and flood control improvements for Alaska will get under way this fiscal year with seven civil works projects scheduled to be placed under contract by the U. S. Army Corps of Engineers, the office of the Alaska District at Anchorage announced.

The projects—to be advertised for bids between September 1956 and March 1957—include small boat harbors at Ketchikan, Kodiak, Valdez, Craig and Pelican; channel dredging at Elfin Cove; and flood control improvements for Gold Creek at Juneau.

Work involved at each site includes:

Ketchikan—Provides for a small boat harbor, 18 ac. in area dredged to a depth of 15 ft. at Bar Point near the city's western limits. Estimates for completion of the harbor total \$4,000,000 of which \$500,000 has been appropriated to cover construction during the current fiscal year. The project will be advertised for bids in February 1957.

Kodiak—Provides for a 12-ac. small boat harbor dredged to depths of 12 and 8 ft. and protected by two stone breakwaters. The water is estimated at \$2,000,000, of this \$500,000 has been appropriated for construction during the current fiscal year. The project will be advertised for bids this December.

Valdez—Provides for the erection of a rock-gravel breakwater and a pile breakwater to protect the existing small boat and seaplane basin from southeasterly and westerly winds. \$129,000 has been appropriated to complete the project. The work will be advertised for bids this October.

Pelican—Provides for a small boat basin, nearly 6 ac. in area dredged to a 12-ft. depth, and protected by a rock breakwater. \$362,000 has been appropriated to complete the job. The project will be advertised for bids in February 1957.

Craig—Provides for the dredging of a small boat harbor in a narrow slip between Craig Island and Prince of Wales Island with an entrance channel from Bucareli Bay. The boat basin will be 3 ac. in area dredged to a depth of 11 ft. \$365,000 has been appropriated to complete the project. Advertisement is scheduled for February 1957.

Elfin Cove—Provides for the dredging of channels into Elfin Cove for the access of small boats seeking shelter from storms. A channel 60 ft. wide and 10 ft. deep will be dredged through the outer entrance, and the second—40 ft. wide and 8 ft. deep through the inner entrance. Elfin Cove is situated on Chichagof Island at the head of the Inside Passage.

\$173,000 has been appropriated to complete the project. Advertisement is scheduled for March 1957.

Gold Creek Flood Control at Juneau—Provides for the improvement of alignment, grade and section, and paving the existing channel of Gold Creek through the city of Juneau. The project plan provides for paving 2,119 ft. of the existing channel with concrete and 100 ft. with derrick stone. \$393,000 has been appropriated to complete the project. Advertisement for bids is scheduled for next month.

Oregon highway plans

STEPPING UP highway construction in line with the Federal program, the Oregon Highway Commission recently approved a two year program totaling \$103,000,000. In addition, the commission studied plans for a further three years of construction activity to form a master five year plan. According to W. C. Williams, State Highway Engineer of Oregon, the Federal aid money for the state is expected to total more than \$640,000,000 during the 13-year program.

Sections of the interstate system, where most of the Federal funds will be expended, include U. S. 30, the east-west route from Portland to Idaho and U. S. 99 where Federal funds will ultimately finance a four lane freeway from the Washington border to California.

Denver asks for rights to develop more water

AN APPLICATION has been filed with the Federal Power Commission by the City and County of Denver, Colo., requesting a license for a proposed hydroelectric project on the Williams River in Grand County, Colo.

The application was filed by the City and County of Denver acting by, through and for the use of its Board of Water Commissioners. The project, estimated to cost \$2,930,000, would be located in the region of Hot Sulphur Springs and Parshall.

The proposed project would include the enlargement of an existing dam, creating a reservoir with a capacity of 93,637 ac.-ft. A powerhouse at the downstream toe of the dam would contain a single turbine rated at 4,250 hp. and connected to a 3,000-kw. generator.

The project is primarily a water supply project and its use for the generation of electrical energy would be incidental, the application says.

The energy would be delivered to the United States Government under the applicant's obligation to replace the energy which otherwise could be generated at the Government's Green Mountain Reservoir on the Blue River by water which the City and County of Denver will be diverting from that river for their municipal water supply system.

New prestressing plant for Southern California

PLANS for a new precast-prestressed concrete plant in Southern California have been announced by Robert H. Singer, of Ben C. Gerwick, Inc., San Francisco, one of the leading companies in the rapidly expanding precast-prestressed concrete industry.

"The general location of our new plant, which will be in the Los Angeles-Long Beach area, has been selected and planning is now under way," Singer said. "We hope to have our pretensioning beds installed and ready for production in the near future."

Products which will be manufactured at the new Gerwick plant include precast-prestressed piles, bridge girders and building members. In addition to sale of these products to all recognized contractors or companies, design service will also be available.

T. Y. Lin and Associates, recognized authorities on prestressed concrete, who have served as consultants to Ben C. Gerwick, Inc., on prestressed concrete work in Northern California, will also be technical consultants for the Southern California operations.

Engineers and architects who would like to consider the use of prestressed concrete on their Southern California projects are requested to contact the Gerwick office in San Francisco for further information.

An office will be established in the Los Angeles-Long Beach area soon for handling inquiries, as well as rendering design and estimating service on precast-prestressed concrete work.

Dam near Great Falls

CONSTRUCTION has started on the fifth dam to be built on the Missouri River near Great Falls, Montana, by the Montana Power Co. The Cochrane Dam, which is scheduled for completion next fall, will produce 60,000 kw. and represents an estimated expenditure of \$13,000,000. Present operations on a \$5,000,000 contract include cofferdam and concrete work being carried out by Winston Bros. and Green Construction Co. Construction equipment is already on the site. Site of the work is about 8 mi. northeast of Great Falls.



HELLMUTH, YAMANSKI & LEINWEBER, St. Louis, architects; Wm. C. E. Baker, St. Louis, engineer. Portable false work fabricated by Timber

Structures Inc., Portland, Ore., to design of Roberts & Schaefer Co., Chicago, Ill. L&R Construction Co., Inc., St. Louis, Mo., contractor.

It was pouring when they roofed St. Louis Airport terminal

THREE SECTIONS of intersecting thin-shell concrete vaults, supported only at their four corners and cast as a unit in one continuous pour, form the unconventional roof of the otherwise conventionally constructed Lambert-St. Louis Municipal Airport Terminal.

Each section covers a 14,400 sq. ft. area. The bays between the arches bring the total roof area to 420' x 120'. The

shells are 32' high at crown and of 4 1/2" uniform thickness. Their arch ribs are 18" wide and taper from 10' depth at corners to 3' 9" at top.

Each roof section, including ribs, required 400 cu. yds. of concrete. To cast them in one pour called for careful preparation. Two cranes with buckets and a hoisting tower delivering to concrete buggies placed the first section. Adding

two more cranes (one at each corner) cut placement time in half on the other two sections.

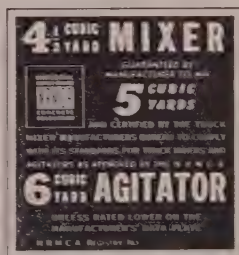
An uninterrupted flow of specification concrete was essential to the operation. It was insured by on-schedule deliveries in truck mixers having proper design, capacity, mixing speed and accuracy of water control as certified by Bureau Rating Plate.



BOLTS THROUGH CONCRETE BLOCKS placed between rib forms and deck form tie forms together. Shell and ribs were poured at same time. C&E Staff Photos.



FALSEWORK SYSTEM was designed in 11 separate sections to roll on rails from one pour to next.



You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

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Plainfield, N. J.

Water plan, first step

A POSITIVE STEP toward the reduction of flood hazard in California has been taken by the State Water Board in presenting a \$61,000,000 plan that will be submitted to the Legislature for approval. If approved, the program would call for expenditures totaling \$30,000,000 in the Los Angeles area, about the same amount in the Sacramento River area, and \$9,000,000 in coastal projects. The latter would include a \$6,000,000 plan for flood control on the Russian River.

Application for hydro

CALIFORNIA OREGON POWER CO., of Yreka, Calif., has filed an application with the Federal Power Commission seeking a license for the proposed Rinchel development on the McCloud River in Shasta and Siskiyou Counties, Calif.

The proposed project would consist of a rock-fill dam; a reservoir about four miles long with a usable storage capacity of 16,000 ac.-ft.; a tunnel intake; a 15-ft. diam. tunnel about 1¼ mi. long; a surge tank; a powerhouse containing two outdoor-type generating units, each comprised of a 44,000-hp. turbine connected to a 32,500-kw. generator; a substation; and appurtenant facilities.

The proposed Rinchel development is one of six units contemplated for the development of the McCloud River Basin. The estimated cost for the proposed Rinchel development is \$17,933,000.

ARBA has committee on photogrammetry

A TECHNICAL COMMITTEE that will serve as a clearing house for information on photogrammetry has been established by ARBA. William C. Cude, Chief of the Army Topographic Engineering Department, The Engineer Research and Development Laboratories, Fort Belvoir, Va., and National President of the American Society of Photogrammetry, has been named chairman of the newly-formed Committee of the American Road Builder's Association.

Chief function of the new group will be to keep ARBA members posted on the latest developments in a field that is coming to the forefront as a time and manpower saver in highway construction. Among the Committee duties will be the preparation of reports on the accomplishments of photogrammetry and the latest developments by manufacturers of equipment needed for the work.

DEATHS

Whetsel Ord, Jr., 31, an assistant civil engineer with the Los Angeles Board of Public Works, died at his home in Pasadena, Calif.

* * *

J. C. Unger died after a sudden illness. He was well known in the Northwest for his work in support of public utility districts.

* * *

Harold F. Hess, executive vice president of the Construction Industry Manufacturers Association (ARBA Manufacturers Division) since 1949, died suddenly in Chicago.

* * *

Roy N. Alexander, 57, assistant division engineer for Los Angeles County, Calif., died recently.

* * *

Roy L. Adamson, 69, industrial engineer of the Union Pacific Railroad at Los Angeles for nearly 20 years, died following a heart attack.

Large contracts let in the West

ARIZONA

Fisher Contracting Co. of Phoenix submitted two low bids for road work in Maricopa and Pinal Counties. \$353,729 for grading and surfacing the Yuma-Casa Grande highway in Maricopa County and \$144,048 for grading, surfacing and incidental work on the Oracle Junction-Globe highway in Pinal County. Western Constructors, Inc. of Phoenix submitted a low bid of \$184,321 for grading and draining 1.8 mi. of the Oracle Jet-Globe highway in Pinal County. Cyr & Evans Contracting Co., Tempe, submitted a low bid of \$102,486 for grading and surfacing the Hillside-Bagdad Highway in Yavapai County. A low bid of \$94,534 was submitted by Palmer Contracting Co., Phoenix, for grading and surfacing the Globe-Young highway in Gila County. W. J. Henson, contractor of Prescott, submitted a low bid of \$177,583 for 1.4 mi. of grading and surfacing the Prescott-Ashford Highway in Yavapai County. A low bid of \$83,863 was submitted by Hagen Construction Co., Globe, for grading and surfacing the Globe-Show Low highway in Gila and Navajo Counties. Tucson Pavers, Inc., Tucson, submitted a low bid of \$96,304 for grading and surfacing the Benson-Douglas highway in Cochise County. A low bid of \$349,399 was submitted by Sorensen Construction Co., Murray, Utah, for 13.1 mi. of grading and surfacing the Williams-Grand Canyon Highway in the Kaibab National Forest, Grand Canyon National Park. Heiskell Construction

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COMPANY**

Cheyenne, Wyo. Branches: Casper, Sheridan and Rock Springs, Wyo.

**YUKON EQUIPMENT CO.
(for Alaska)**

Seattle, Wash. Branches at Fairbanks and Anchorage, Alaska

EXTRA VALUE... IN A 1/2-YD. MACHINE!
EXTRA PERFORMANCE

THE LORAIN 15



EXTRA HOE VALUES! — Buckets from 24" to 40" (3/4 yd.) — 2 Boom lengths — 14' and 16'.

Though nominally rated as a 1/2-yd. machine, the extra weight, strength and stability of the Lorain-15 enable it to match the productive capacity of many higher rated, more costly machines. As a shovel, hoe or dragline, it can do those *extra-size* jobs... with long life... freedom from operating delays... at greater profit to you. The Lorain-15 proves these points... if you will check the brief listing of features below and then check with your Thew-Lorain Distributor, you will see what we mean by "extra values." You make the comparison—then decide!

BIG-TIME FEATURES in the 1/2-yd. L-15



**TURNTABLE
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- 5 identical interchangeable shoe clutches • One-piece, all-welded, truss-reinforced, rigid turntable bed
- 19 anti-friction bearings on power shafts and clutch drums alone • Oil-enclosed cut gears • "E-Z" operating controls—effortless action; fast response; longer clutch life • "Hydra-Ease" power control of crawler steering, tread lock, house lock, and shifting of swing-travel jaw clutches.



**CRAWLER
FEATURES**

- 16" cast-steel tread shoes—22" & 29" available
- Oil-enclosed crawler travel mechanism • 4-way position tread and travel lock, hydraulically powered and operated • Replaceable tread pin bushings available.



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FEATURES**

- Usable as shovel, crane, clamshell, dragline, hoe
- Crane boom of square-tubular-chord design; minimum weight, maximum capacity and reach • Power load lowering standard • Ability to "back-down-the-load"
- Precision boom lowering device for cranes • Independent crawler travel available—a big help in drag and hoe operations. Permits simultaneous hoist, swing and travel.



EXTRA CRANE BOOM VALUES! — For dragline, clamshell and lifting service feature new square-tubular-chord boom that permits maximum lifting capacities, greater digging ranges.

THE THEW SHOVEL CO., Lorain, Ohio

THEW LORAIN®

Co., Phoenix, submitted a low bid of \$139,520 for 2.9 mi. of grading and surfacing in Maricopa County. A low bid of \$139,278 submitted by **B. L. Gustafson** of Phoenix, consists of 7.8 mi. of grading and surfacing in Maricopa County.

CALIFORNIA

Schutt Construction Co. of Springfield, Oregon, submitted a low bid of \$1,144,500 for clearing reservoir area for the Monticello Dam, Napa and Yolo Counties. **Peter Kiewit Sons' Co.** of Medford, Oregon, submitted a low bid of \$951,500 for construction of 35 mi. of roadbed and construction

of three bridges in Siskiyou County. **Stolte, Inc. and Gallagher & Burk, Inc.**, Oakland, submitted low bid of \$797,818 for 3.6 mi. of grading and surfacing in Contra Costa County. **W. F. Maxwell Co.**, Los Angeles, submitted a low bid of \$1,098,618 for construction of two bridges and one to be widened in the city of Long Beach, Los Angeles County. A low bid of \$611,833 was submitted by **Arthur B. Siri, Inc.**, Santa Rosa, for grading, surfacing and construction of one steel bridge in Mendocino County. **Match Construction Co.**, Colton, submitted a low bid of \$442,202 for 4.8 mi. of grading and surfacing in Orange County. **Thomas Con-**

struction Co., Fresno, submitted a low bid of \$243,916 for grading, surfacing and misc. work near Douglas City in Trinity County. A low bid of \$364,903 was submitted by **Harms Bros.**, Sacramento, for 15.7 mi. of grading and surfacing at various locations on Route 23, Alpine County. **F. E. Young Construction Co.** of San Diego received a \$1,421,624 award for construction of special weapons training facility, Naval Air Station, San Diego. **Charles L. Harney, Inc.** of San Francisco received a \$504,578 contract for construction of an overhead structure south of Forbes Station in Marin County. **Gordon H. Ball and Erickson, Phillips and Weisberg**, Danville, received a \$2,528,993 contract for building 4.5 mi. of freeway with interchanges, ramps and frontage roads, three steel and two concrete bridges in Atwater, Merced County.

SAWING or FINISHING Concrete



If the job calls for cutting contraction joints instead of hand forming; trimming completely through 4½" slab; breaking up concrete for replacement or handling a variety of cutting operations . . . Wisconsin-powered CLIPPER Concrete Saws, made by Clipper Mfg. Co., Kansas City, Mo., will slice through limestone concrete at a rate of 10 ft. per minute . . . or 12 ft. per minute through asphalt.

On the other hand, if the job calls for smooth finishing of concrete surfaces, a unit such as the Superior Power Trowel, made by Superior Cement Tool Corporation, of Lynwood, Calif., will handle the assignment with speed and efficiency.

Wherever there's a tough, rugged job to be done, you can depend on Wisconsin heavy-duty construction and foolproof AIR-COOLING at all operating temperatures from low sub-zero to 140° F. to get the job done on schedule. Wisconsin Engines are built to "take it" and keep on coming back for more of the same.

You can't do better than to specify "Wisconsin Power" for your equipment. Write for "Spec" Bulletin S-188.



Clipper Concrete Saw working on Lincoln Memorial Bridge job, Washington, D.C., holding cutting depth to 3" to avoid cutting bridge steel beams.



Superior Power Trowel, powered by Wisconsin Engine because "it was the only engine combining light weight plus hp. — a big factor in power trowel design."

COLORADO

McMillon Construction Co., Englewood, submitted a low bid of \$358,161 for grading, structures and surfacing State Highway No. 10, west of Mancos in Montezuma County. **Peter Kiewit Sons' Co.**, Denver, submitted a low bid of \$827,660 for grading and surfacing in El Paso County. A low bid of \$285,257 was submitted by **Pioneer Construction Co.**, Pueblo, for grading, surfacing and structures on 5.8 mi. in Rio Grande County. **San Ore Construction Co.** of McPherson, Kansas, submitted a low bid of \$154,845 for grading, stabilizing and structures in Delta, Delta County. **Gapner Construction Co.** of Denver submitted a low bid of \$106,238 for construction of a bridge over Cherry Creek and approaches in the city and county of Denver. **Colorado Constructors, Inc.**, Denver, submitted a low bid of \$569,029 for grading, surfacing 3.6 mi. and structures between Granby and Tavernash on State Highway No. 2 in Grand County. A low bid of \$195,401 was submitted by **Siegrist Construction Co.**, Denver, for 8.4 mi. of grading, surfacing and structures between Woodrow and Last Chance in Washington County. **Latimer Construction Co.**, Denver, submitted a low bid of \$105,293 for construction of overpass at 38th Street and approaches in the city and county of Denver. A low bid of \$318,616 was submitted by **Colorado Constructors, Inc.**, Denver, for 1.8 mi. of grading, surfacing and structures from Mt. Harris extending west on State Highway No. 2 in Routt County. A low bid of \$248,239 was submitted by **McMillon Construction Co.**, Inglewood, for 4.5 mi. of grading and surfacing in Summit County. A low bid of \$812,688 was submitted by **Lowdermilk Bros.**, Englewood, for 3.9 mi. of grading, surfacing and structures between Durango and Silverton in San Juan County.

(Continued on page 92)



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ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

MORE JOBS THAN EVER—More persons than ever before in the history of Alaska are holding down construction jobs as the 1956 construction season draws to an end. Autumn comes to Alaska stealthily and briefly and all of a sudden it is winter. The falling leaves, the thin dust of snow on the Chugach Mountains, the clear cold nights of interior Alaska all are clear signs to construction men that the peak of the construction season has passed . . . that winter's cold and snow with its curtailed construction is at hand. But right now, in these September days, the bitter cold and the darkness of Alaskan winter seem far away. Construction projects are at peak payroll, with more than 24,000 persons holding down jobs in the Anchorage area alone. Still, there are a few projects which already are beginning to pare personnel in preparation for the coming shutdown.

THE BARS, THE BEARS—Anchorage, Alaska's hub, seems to have an unusually large number of construction men on its streets these days—and in its bars. The shout of "timber," so seldom heard in the drinking palaces, is ringing out happily once more since well-heeled workers have started emerging from the vast wilderness that surrounds this metropolitan community. "One guy timbered the joint eight times," said one bar owner. "That's some kind of a record around here." A large number of construction men have quit their jobs to go moose, caribou and bear hunting. Airlines are jammed with returning construction workers. Southbound traffic on the Alaska Highway is heavy. All the signs of wrapping up another banner year of construction are there.

AND YET . . . Despite the onset of wintertime working conditions in Alaska, a number of construction projects will be pushed right through the snow, ice and blizzard season. Projects in this category are principally those involving vital defense facilities. These are projects with a deadline—and no amount of cost is being spared to push them through to a successful conclusion. It is not news to men in the construction fraternity that you can get a job done, even in Alaska, despite terrible weather conditions. The question of cost is the main factor to be considered. When cost is no longer an element, American ingenuity goes to work on the project. One builder even constructed a big circus-type tent over his job so weather wouldn't halt it.

A SOMBER NOTE—Employment service officials here caution that despite record employment at the present time, the period of greatest unemployment in Alaska lies directly ahead. One top official in a position to know told me that unemployment will rise sharply throughout September. Unemployment in Alaska has a greater impact than virtually anywhere else because the cost of living here is so much more than it is anywhere in the States. The employment service reports that a large volume of mail is still being received from persons in the States requesting information on work here. They again ask that these persons look closer to home for their job opportunities.

JOBS AVAILABLE—A typical list of job openings now listed by the Anchorage office of the Territorial Employment Service includes harvest hands, carpenters, equipment operators, electricians, firemen, dragline operators, auto mechanics, taxi drivers, service station attendants, waitresses and bartenders. Most of these jobs can be filled by persons now in Alaska, officials emphasize.

MUNICIPAL, COMMERCIAL—A drop in municipal and commercial construction has been noted in Anchorage and elsewhere. In Anchorage, for example, building permits during the week in which this is written slumped from an average of about \$100,000 a week to \$14,200 for the last week reported. Similar slumps have been reported in other areas of Alaska.

PRECAST CONCRETE—Use of precast concrete construction instead of on-job pour is growing in Anchorage commercial construction. The method of using precast concrete slabs in commercial constructions was used for the first time in downtown Anchorage early in September. Method was very successful and enthusiastically received by builders as an advance in building techniques formerly in use.

KETCHIKAN DAM TROUBLE—Fears that the dams which back up water in lakes in the mountains above Ketchikan are so weakened that they could break and cause a major disaster in the Ketchikan area have been expressed. C. R. Weller regional engineer for the Forest Service recently inspected dams at Ketchikan and Fawn lakes. He said portions of the structures are rotten and there is evidence of considerable seepage under

them. The Forest Service engineer said the main structure at Ketchikan Lake is in such poor shape that it is extremely doubtful that it could withstand overtopping even for a short period. In case of a failure of the Ketchikan Lake dam, there would be a maximum of 11,000 acre-feet of water released, which could flood Ketchikan. The Fawn Lake dam leaks so badly that overtopping is "a very remote possibility," Weller reported.

DEWLINE ESKIMOS—Employment of Alaska Eskimos at DEW (Distant Early Warning) Line sites is being urged by Alaska's Delegate, E. L. (Bob) Bartlett. Bartlett met with officials of the Federal Electric Corporation who are charged with maintenance and operation of the projects and said he found company officials most cooperative. "They are willing to do everything possible to give permanent employment to Eskimos who have or may acquire in training periods the necessary skills," Bartlett said. As long ago as last fall, Bartlett urged that contractors doing business in Alaska give consideration to hiring of Eskimos. Bartlett says he feels Eskimos would make excellent employees because of their mechanical aptitudes and because many of the problems which arise when white persons are brought into contact with Alaskan conditions in remote areas would not be encountered if Eskimos were hired. Bartlett said officials of Federal Electric expected to work closely with the Alaska Native Service which will appoint a placement officer soon.

NEXT YEAR'S JOBS—An indication of the scope of next year's construction season can be obtained from a breakdown of 1957 Alaska appropriations by the Federal government. For example, a total of \$60,188,100 has been appropriated for the Defense Department. This includes \$32,202,000 for the Alaskan Air Command, \$12,491,100 for the Navy and \$7,952,000 for the Army.

APPROPRIATION SUMMARY—Interior Department total funds of \$32,060,665 for the next fiscal year in Alaska include \$7,800,000 for road construction, \$3,625,000 for road maintenance, and \$4,968,000 for the Alaska Public Works program. Projects under the Public Works Program will be the Fairbanks High School auditorium and gymnasium, Ketchikan arterial addition, Knik arm outfall sewer, a dormitory building at the University of Alaska, a high school building at Valdez and a schoolroom addition at Kenai. The Geologic Survey received \$1,122,000 for topographic surveys and mapping, and \$978,000 for geological and mineral surveys. A total of \$320,000 was allowed for water resource investigations.



Specially Engineered Equipment

This Yuba dredge, built for Charles T. Hover, general engineering contractor, Burlingame, Calif., has hull 7' x 40' x 140', is designed so its 6-yd. clamshell rig can easily be removed for land use. Like Yuba bucket ladder and hydraulic dredges, it's built to fit the job.

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Contract Awards

(Continued from page 88)

IDAHO

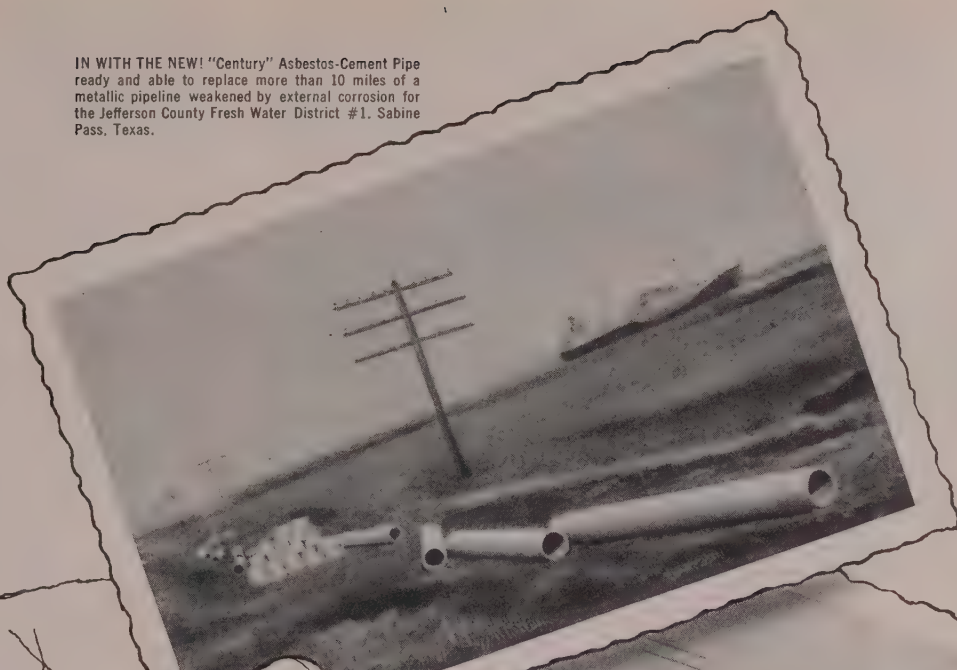
Twin Falls Construction Co. of Twin Falls, received two contracts for roadwork in Jerome and Gooding Counties. A \$622,110 contract for reconstructing the roadway and surface treatment on 13.5 mi. of State Highway No. 24, east of Hazelton in Jerome County and \$151,965 for resurfacing and placing a bituminous surfacing on 7.6 mi. of U. S. Highway 30 in Gooding County. Marion J. Hess, contractor of Malad, received a \$673,246 award for constructing the roadway and a 26.7-ft. bridge on 6.9 mi. of the State Highway No. 34 from Thatcher to Niter. in Franklin and Caribou Counties. J. F. Konen Construction Co., Lewiston, submitted a low bid of \$91,462 for 4.7 mi. of the Thorn Creek-Uniontown road in Latah County. North Side Construction Co. of Jerome submitted a low bid of \$134,732 for earthwork and structures. Main Canal West, Michaud Flats Project. Carl Woodall of Boise received a \$86,810 contract for grading and surfacing in Elmore County. Idaho Rock, Inc., of Twin Falls, submitted a low bid of \$80,800 for stockpiling approximately 15,000 tons of road aggregate, located in the northern portion of the NRTS.

MONTANA

A joint venture bid by four firms is low for street paving and improvements in the Kiwanis district, Great Falls. The low bid of \$4,186,721 was submitted by McLaughlin, Inc., S. Birch & Sons, Nilson-Smith Construction Co. and S. Birch, Inc., all of Great Falls. Albert Lalonde of Sidney received a \$421,639 award for 11.2 mi. of grading and gravel surfacing the Baker-Wibaux highway in Wibaux County. Kiely Construction Co. of Butte received a \$230,556 contract for 5.2 mi. of grading, surfacing and construction of one timber bridge on the Wisdon-Divide highway in Beaverhead County. A \$362,832 contract was received by Carl E. Nelson Construction Co. of Logan, Utah, for 4.3 mi. of grading and surfacing the Butte West and Brewery by-pass highway in Silver Bow County. Earl L. McNutt Co. of Eugene, Oregon, was awarded two contracts for State Highway work in Montana. \$315,068 for 7 mi. of grading and surfacing the Ovando-Rogers Pass in Powell County, and \$359,812 for 8.2 mi. of grading and surfacing the Shelby-Chester highway in Toole & Liberty Counties. Bud King Construction Co. of Missoula received a \$163,412 award for 4 mi. of grading and surfacing the Drummond-Helmville-

(Continued on Page 102)

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SUPERVISING the jobs



Saari Pollack Morrison



Perry Leaf Rooks

Bill Perry, general superintendent for Gus J. Bouten Construction Co., is in charge of construction of a 4-story reinforced concrete, brick veneer, convent building in connection with Sacred Heart Hospital, Spokane, Wash. Job engineer is **Burton Rooks**. The following are foremen: **K. W. Irvine**, labor; **Jim Zimmerman**, fitter; "**Doug**" **King**, plumber; **Howard Morrison**, electrical; **Bill Perkins**, mason, and **Lloyd Leaf**, ironworker. Construction began May 15 and the building is expected to be ready for occupancy early in 1957. Bid price was in the neighborhood of \$300,000.

Bouten also has the contract for addition to the hospital. This work has been under way since May and is expected to be finished in November.

A. T. Saari is superintending. Plumbing foreman is **John Pollack**. **Howard Morrison** is electrical foreman on this job, too, in addition to the residence building mentioned above.

* * *

Dan J. Moats, project superintendent, **Wayne Manweiler**, office engineer, and **Frank Powell**, assistant superintendent, for **Bentson Contracting Co., Inc.**, are top supervisors on company's recent award for 11.7 mi. of grading and surfacing in Maricopa County, Ariz. This \$429,271 job involves 100,000 tons select, 60,000 tons base course, 32,000 tons plant-mix surface; 3,000 lin. ft. pipe culverts, and 5,000 sq. yd. cement treated base. A 300-day contract, job got under way the first of July.

James D. Cave, member of the contracting firm of **Robertson & Cave, Inc.**, of which **Jim Robertson** is president, is acting as project manager of the company's recent award from the City of Great Falls, Mont., for storm drain construction to cost \$654,000. **Paul Janetski** is general superintendent,

and **J. C. Castner**, superintendent, with **J. E. Rounds** in the assistant spot. **Gordon Blossom** is engineer. **Sam Lucero** manages the contractor's office, and **David Blackmore** is job office manager. **Buck Willis** is grade superintendent, and **Harley Combs** is master mechanic. Among

William Propst, project superintendent for **Ross B. Hammond Co.**, is supervising two recent awards to this contractor at Oregon State College, Corvallis, one at \$1,104,597, and one at \$1,446,798. Structures include a biological and agricultural building, including utility tunnel; and two men's dormitories and a cafeteria building. Another key man on the work is **Richard Hardt**, job superintendent. Work got under way in June and Hammond expects to have the project completed about August, next year.

* * *

B. V. "Barney" Fredrickson, as superintendent, heads the construction crew on the \$2,272,537 contract recently awarded to **Fredrickson & Watson Construction Co.** for a 3.4-mi. stretch of highway grading, paving and widening of bridge, and construction of six bridges, to provide a 4-lane divided freeway in Santa Barbara County, Calif. Other important personnel are **Elmo King**, concrete superintendent; **Wayne Willcox**, grading superintendent; **Magor Bailey**, paving foreman; **Vic King**, form superintendent, and **J. Gahan**, timekeeper. Under way since June, work will probably be finished about June 1957.

* * *

Virgil Smith, contractor, is directing work on his own recent award for 9.8 mi. of grading and surfacing in Garfield County, Mont. Foreman **Carl King**, and **Floyd Osborn**, crusher superintendent, are two key men on this \$135,549 job just completing.

* * *

Harry Norgaard, grading superintendent, and "**Swede**" **Hilling**, gravel superintendent, head the crew working on 9.3 mi. of grading and surfacing west of Wolf Point-North Dakota line in Roosevelt County, Mont. **Norgaard & Hilling** was awarded the

the foremen are **Paul Luchsinger**, labor; **Lawrence Woolf**, in charge of compaction; **L. L. Miller**, gravel. Heavy duty mechanics are **Chris Johnson** and **Russell Furlong**; heavy duty welder is **Jim Williams**. This job started the middle of March and will soon be completed.



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CROSS SECTION view of equipment installing sub-drain under main slab on Churf Bros., Inc., and Sandkay Contractors' \$830,000 contract for concrete lining of a 100,000,000-gal. water storage facility at McMillin, Wash. In the other view, **James W. Churf** (in plaid jacket) stands with **Jim Malone**, project superintendent. **Jim Churf**, together with **Marvin**, make up Churf Bros. The other joint venturer, Sandkay Contractors, is headed by **Roy Johnson** and **Tom Barber**. The facing machine shown here is a 34E Koehring dual-drum twin-batcher. The slab in the foreground is poured in 40 x 40-ft. sections; the pouring is continuous, rather than by the skip-section method used in some reservoirs. Project engineer on this facility, being constructed for the city of Tacoma, is **Oscar Verlo**. **Chris J. Rogers** is in charge of purchasing. Another key man is "**Koke**" **Thompson**, master mechanic.

contract at \$350,451, started the job June 1, and expects to have it completed Nov. 1.

E. H. Elwin, project manager, **Ole Kvernenes**, project superintendent, **E. C. Reiter**, project engineer, and **R. H. Penwarden**, office manager, comprise the key personnel on Denali Engineering Co.'s \$1,794,593 award for construction of a high school at Juneau, Alaska. A 400-day job, work got under way the first of July.

R. S. Brown, area manager for S. S. Mullen, Inc., **Dan Moen**, project superintendent, **Harry Claterbos**, excavation superintendent, **John Tryon**, general superintendent, and **W. L. Bergman**, project engineer, are top men on Mullen's recent award for construction of barracks, mess hall, power and heating plant, and miscellaneous buildings at the Naval Station, Kodiak, Alaska. This is a \$3,477,306, 360-day job which has been in progress since May 1, 1956.

E. L. McColl is superintendent on Inland Construction Co.'s \$645,027 contract for 1.7 mi. of grading, surfacing and construction of a bridge in Park County, Wyo. Work is starting Sept. 15 and will probably run for 250 days.

Jim Holland, job sponsor, **Don Rodgers**, superintendent, **Mac McKenzie**, assistant superintendent, **Ed Eastman**, office manager, and **Jack Lyons**, master mechanic, are chief supervisors on Peter Kiewit Sons' Co.'s contract covering 3.5 mi. of grading and surfacing, Dry Creek to Steptoe, in Whitman County, Wash. Kiewit started working here May 7.

Max A. Boesiger is directing his own recent contract award for construction of squadron operations

buildings at Mountain Home AFB, Utah. Superintending the job for him is **Dewey Comstock**. **Vern Gillespie** is general foreman, and the office is in charge of **Fred Latimore**. Work got under way the first of April and is expected to run for 280 days.

W. H. Frank has been named project manager by H. C. Smith Construction Co. and Myers Bros., joint venture recently awarded the contract for erection of a clay tile plant at Corona, Calif., by Gladding, McBean & Co. Purchasing and general contract administration is under the direction of **W. P. Frank**, vice president of the Smith company. **Frank Granich** is field office manager. Mechanical superintendent is **Herman Barbaglia**. The new \$5,000,000 manufacturing plant will house 600-ft. long tunnel kiln plus ten periodical kilns designed to produce 6,000 tons of vitrified clay pipe per month, with ultimate capacity 12,000 tons per month. Building will include storage bins, a grinding and screening building, and offices

John B. Tipton, superintendent, assisted by **Harold Hasse**, carpenter foreman, and **Lawrence Rovedo**, steel foreman, is in charge of construction of a bridge in Denver County, Colo., a 120-day contract awarded to Gardner Construction Co. at \$107,649.

Frank Gamarra is supervising a \$273,769 award to Schmidt Construction, Inc., for grading, surfacing and structures on 12.8 mi. of road in Baca and Las Animas counties, Colo.

Douglas Holmes and **Sam Welch**, foreman for J. C. Compton, supervised a \$131,638 recent job in Clark County, Wash., of 7.5 mi. of grading and surfacing on Highway 99.

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ENGINEERS on the move

E. V. Miller recently resigned as Idaho State Highway Engineer. He returned to Phoenix to join the firm of Johannessen and Girand, consulting engineers of Phoenix and Tucson, as engineer in charge of its highway division. Miller returns to familiar territory in Arizona where he served 28 years in the State Highway



Miller



Bennett

Department before accepting the Idaho post in 1951. He is a former president of the Western Association of State Highway Officials.

G. Bryce Bennett was named by the Idaho Board of Highway Directors to succeed Miller. Starting with the Department in 1940, Bennett is well acquainted with Idaho's construction problems and needs. He has held the position of assistant state highway engineer since September 1955.

Carl W. Appleford, a member of the Pacific Gas and Electric Co.'s engineering department since 1920, is appointed chief civil engineer, according to announcement by **Walter Dreyer**, PG&E vice president and chief engineer. Appleford will be in charge of civil engineering and economic investigation and designs of hydroelectric developments and civil engineering associated with planning and designing of steam power plants and other facilities of the company. He succeeds **Henry V. Lutge**, who has reached retirement age.

Raymond L. Nordlund, civil engineer, has been appointed district manager for British Columbia, Alberta, Yukon and Western northwest territories for Raymond Concrete Pile Co., Ltd. The company is opening offices at 1104 Hornby St., Vancouver, B. C., Sept. 1.

George Saunders is the newly elected president of San Diego Section, American Society of Civil Engi-

neers. Serving with him are the following officers: **Charles A. Smith**, 1st vice president; **Bert C. Wilkas**, 2nd vice president; **Lloyd G. Jeffries**, treasurer, and **William D. Myers**, secretary.

Joseph W. Trigueiro has joined the consulting firm of Clair A. Hill & Associates at Redding, Calif., as junior civil engineer.

Frank J. Bennett is construction inspector for the Department of Interior, Alaska Public Works, at Seward, Alaska, where a hospital building for the Navy Department is under construction at a cost of \$750,000. Bennett, who was formerly located at the Klamath Falls Air Base, is administering the contract and inspecting the work.

The 1956 annual Lamme Award, highest honor in the country for engineering educators, has been awarded to **Dean L. M. K. Boelter** of the College of Engineering of the University of California at Los Angeles.

Col. Michael J. Blew, USAR, Ret., has joined the staff of the National Society of Professional Engineers as field representative handling liaison with affiliate state societies and local chapters. He was formerly chief of the sanitation branch in the Office of the Chief of Engineers in Washington, D. C.

Maj. Gen. Emerson C. Itschner becomes Chief of Engineers, U. S. Army, effective October 1, succeeding **Lt. Gen. Samuel D. Sturgis**, who is retiring. General Itschner is one of



Maj. Gen.
Emerson C.
Itschner

the youngest officers to be appointed to the top post in the Corps of Engineers. He is a former district engineer at Seattle, from 1949 to 1950. After service in Korea, he was assigned as North Pacific division engineer at Portland, Ore., in 1952. Since September 1953 General Itschner has been assistant chief of engineers for civil works at Washington, D. C.

Lt. Gen. (retired) Eugene Reybold has been appointed special representative in Washington, D. C., for the Jay Company, manufacturer of earth tamping and asphalt cutting and tamping equipment. General Reybold was until April of this year executive vice president of the American Road Builders' Association. Previous to that he had served 38 years of active duty with the U. S. Army, 29 of which were in the Corps of Engineers. For four years he served as Chief of Engineers throughout World War II.

Earl V. Akerlow has been appointed an assistant division manager in the engineering department of Kaiser Engineers. Akerlow has had 24 years' experience in the engineering and construction industry. In his new position, he will be responsible for the coordination of the engineering of the current \$113,000,000 expansion program at the Kaiser Steel plant at Fontana, Calif.

San Francisco Post of the Society of American Military Engineers has conferred a sustaining membership in the Society on the firm of Skidmore, Owings & Merrill, international architects-engineers. **Brig. Gen. William F. Cassidy**, South Pacific Division Engineer, president of the San Francisco Post, called upon **Brig. Gen. Dwight F. Johns** (USA retired) to present the award to **William J. Watson** of the firm's San Francisco office at a recent meeting of the Post.

Clifford E. Plummer, chief engineer of the Modesto Irrigation District in California, is serving as a member of a survey team on an irrigation project in Afghanistan which is not working. **Tudor Engineering Co.** of San Francisco is making the survey at the request of the State Department.

J. A. Johannessen, partner of Johannessen and Girand, consulting engineers of Phoenix and Tucson, Ariz., has been elected president of the Phoenix area chapter of the Arizona Consulting Engineers Association.

Lt. Col. William F. Hart, Jr., until recently engineer and supply plans officer at Heidelberg, Germany, has now assumed his new duties as executive officer of the Walla Walla District, Wash., Corps of Engineers. He succeeds **Major Edward Bruce**, who has been reassigned.

Col. Jackson Graham, Portland District Engineer, announces the arrival of **Lt. Col. Joseph F. Garbacz** who will be his executive officer. Col. Garbacz fills the post left vacant by **Lt. Col. Francis G. McBride** who succeeds **Col. David S. Parker** as assistant district engineer.

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TRICKS of the TRADES



Record trussless steel roof

ERECTION of the world's largest trussless steel roof—a clear span 120 ft. wide—over the new Phoenix Coliseum under construction in Phoenix, Ariz., has been announced by the Wonder Building Corp., manufacturer of pre-engineered steel buildings. Called the Wonder Roof, it is the first in a new line of low-cost, long-span custom-engineered roof decks being marketed by the firm for convention halls, arenas, school gymnasiums, super-markets, hangars, and similar buildings where wide, unobstructed areas are required. Costs are said to be one-third less than conventional roof structures. At the Phoenix Coliseum, the unique roof was completely erected in 7½ days.

The new type of roof consists of curved 18-gauge galvanized corru-

gated steel sheets 2 ft. wide and from 6 to 10 ft. long, fastened together by nuts and bolts to form self-supporting arches. Its patented trussless design completely eliminated the need for pillars, posts, purlins, trusses or supports of any kind. Although less than 1/16 in. thick, the steel roof will withstand hurricane-force winds and will support loads up to 42 lb. per sq. ft. (equivalent to 5½ ft. of snow).

The Phoenix Coliseum is designed as a multi-purpose structure for conventions, horse shows, concerts and athletic events. Special provision has been made for ice shows, with pipes to circulate refrigerant built into the Coliseum's floor. A modern press box to provide complete radio and TV facilities is centered in the roof proper, thereby assuring unexcelled vision of all activities. The height of the roof—40 ft. at the center—will increase the building's potential for circuses and similar attractions.

Thermal insulation of the roof as well as acoustical treatment and fire protection are provided by a ½-in. layer of Zonolite Acoustical Plastic machine-sprayed directly to the metal underside following the pattern of the corrugated curved ceiling. The building is air-conditioned.

The Wonder Building firm, one of the country's largest manufacturers of pre-engineered trussless steel buildings, announced that a similar roof is being erected at Colorado Springs, Colo.

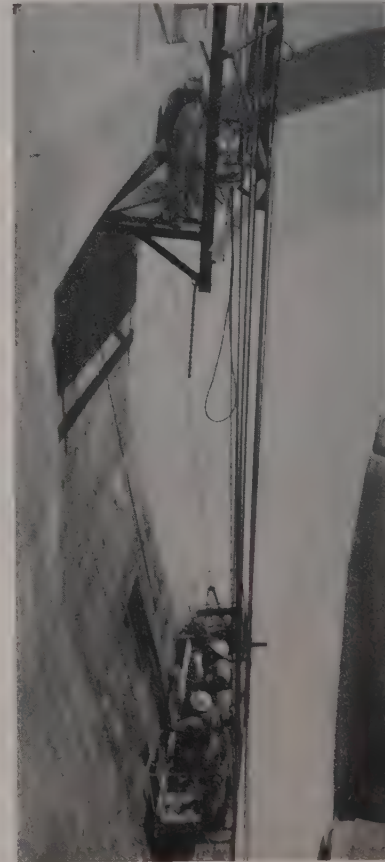


ASSEMBLING the 2-ft. width of sections with bolts to form the self-supporting arches for the 120-ft. span.

Painting the face of concrete dam

UNITED EFFORTS of the civil engineering, construction and maintenance departments, and painters of the Salt River Power District are combining to give Stewart Mountain Dam another heavy coat of paint. The dam was last painted in 1949. The novel paint rig was designed by Clarence Whalin, supervisor of civil engineering, and assembled by A. Martin of construction and maintenance and his crew. Purpose of the present paint job is to reflect heat and to diminish temperatures within the mass structure of the dam.

To reduce hazards and to increase efficiency of the paint job, Whalin decided to design a rolling rig on casters which could be moved manually across the crest of the dam. Also,



the rig enables painters to work close to the dam's face for better paint application. With a framework made of steel and decking of wood, this deck portion of the paint rig is 14 ft. long by 10 ft. wide. There is a 15-ft. overhang over the dam's edge. The compressor serves as a counterbalance.

Prior to applying paint, the workers wash down the face of the dam with air and water jet at 90-psi. and then apply the paint.

Caps for protecting ends of pipe or tubing

HERE'S an economical way to guard pipe and tubing against costly internal corruptions during storage. A Texas manufacturer (Protokap, Inc., 625 West Bldg., Houston) is offering slip-over and roll-on end caps made of neoprene that effectively seal out air, moisture, corrosive fumes, dust—and small animals.



By simply adding a small amount of dehydrating agent before slipping on the easily fitted caps, the inside of expensive tube stock is protected from corrosion. Ideal, too, for threaded pipe, the new caps retard drying of thread dope and keep the threads free of sand and grit. Two types are currently available: a lightweight roll-on cap for pipe 2 to 10 in. in diam.; and a heavier, slip-on cap for 2- to 20-in. piping. The standard slip-on covers have a wall thickness of about $\frac{3}{8}$ in.

Made of rugged neoprene, the new end caps will stand rough handling and repeated re-use. Unlike ordinary rubber, neoprene also is highly resistant to oil, acids and other chemicals, sunlight, and weather.

Hints for lengthening the life of wire rope

WICKWIRE SPENCER Steel Division of Colorado Fuel & Iron Corp. makes the following suggestions for lengthening the life of wire rope: (1) Shift rope periodically to distribute wear, and (2) Reverse position of the rope on the drum. According to Wickwire engineers, wire rope used for hoisting is usually subjected to the most severe wear at two or three critical points along its length. As a result, these spots wear out prematurely and make rope replacement necessary even though the major portion of the rope may still be serviceable.

These points of critical wear include that portion of the rope in contact with the sheaves as the load is

picked up, and also that point of the rope which winds on the drum as the load is accelerated. The section of rope which contacts the drum flange and rises to the next layer on the drum in multiple layer winding is also subject to excessive wear and distortion.

The reason for the greater degree of wear on the rope in contact with the sheaves is that during the pick-up period the rope speed is being increased, and this acceleration may cause slippage between the rope and the sheave. This acceleration also increases tension in the rope and increases the radial pressure between rope and sheave, causing greater pressure and rope wear.

A practical approach to distributing such severe wear over a longer length of rope is to shift the rope during its life. This may be accomplished

by purchasing slightly longer rope than required in the beginning so that as the rope is used, a precalculated length can be cut off periodically. This will advance the rope so that those sections that have not previously been subjected to severe service will now be placed in those spots subject to greatest damage. When it is possible to institute a procedure such as this, rope life can be considerably increased.

Another method occasionally followed on some operations, which will distribute wear, is to reverse the rope. This, however, will not result in greater service if the point of greatest wear is near the midpoint of the rope. Reversal of the rope under such condition would not change the position of the point of greatest wear, and so would not lengthen the life of the rope.

County equipment buying problems

(Continued from page 54)

Type of axle, single or double reduction, must be specified. Double reduction means more reduction can be taken thereby decreasing the load on all units between it and the engine. Greater ground clearance can be obtained with the single reduction because the differential gear can be made smaller.

Transfer Case: This needs brief mention, particularly if you intend to buy a 4-wheel drive rig. In this case, differential action or a front axle de-clutch provision is necessary since all tires do not turn the same revolutions in any given distance. For instance, in a 4-wheel drive turning a corner, the front tires will rotate faster than the rear because the front wheels travel a greater circle.

Brakes: It is necessary for the bid writer to specify type of brake service system, total brake line area on each axle, and total brake drum area on each axle.

Engine: This is the specification causing the most trouble in most every bid case. Truck transportation means moving a definite load a definite distance in a definite time. In its measurement, a yardstick having the same factors is needed. So we use horsepower. And in any machine, horsepower measures the load-time-distance ability.

In any motor, force of explosion corresponds to the load, stroke length the distance, and explosions per minute to the time factor. Changing any one of these factors has an effect on horsepower. If bore size is increased, size of explosion increases. If stroke is increased, explosion duration is extended. Increasing RPM's gives a greater number of explosions and greater effect. Actually air (oxygen) is the limiting factor of all engines. The power of any engine is directly proportional to the oxygen intake.

How to get a bid item from all of this? Cubic inch displacement indicates size of load. And this was an acceptable factor when all engines had the same number of cylinders, same compression ratio, and same speed. Displacement cannot be used to compare the modern design with older motors. Displacement does not necessarily measure the efficiency of any engine. A motor doesn't have to be big to be good.

A load-distance combination is known as torque. And torque is a good measure as long as all engines operate at the same RPM's. But torque, too, has its limitations, for torque is only potential. If it moves to accomplish work, then it is horsepower. New transmissions provide gear ratios to equalize torque.

RPM's used alone are also in disfavor. This is mostly because RPM's have been used to increase power by increasing stroke. But actually if new engines are designed for high speed RPM, the result is not destructive. The short stroke, high RPM motors have reduced weight, less wearing surface, and lower surface speed.

And so, today, the need is for a more efficient time-distance-load ratio giving more economical horsepower. Modern, high speed engines cannot be judged by any one factor alone, but by the direct combination of all in horsepower requirements. Performance standard of horsepower should be based on the Society of Automotive Engineers formulas for determining vehicle performance.

These are the major bid items, we feel, and the bid writer should call for them specifically in relation to the job he wants the truck to perform. The bidder must then answer as closely as his product regulations will allow. Then no one, bid writer or bidder, can complain.

Yes siree, clear as mud! Happy bidding.

Contract Awards

(Continued from page 92)

Blackfoot Canyon Highway in Powell County. **Francis H. Holland** of Bozeman submitted a low bid of \$342,348 for 7.8 mi. of grading, gravel surfacing and draining the Belgrade-Menard highway in Gallatin County. **Richardson Construction Co.** of Miles City received a \$316,244 contract for 10.7 mi. of grading and surfacing the Malta North and Malta-Loring highway in Phillips County.

NEW MEXICO

A \$593,452 contract was awarded to **Brown Contracting Co.** of Albuquerque for 4.5 mi. of grading and surfacing the Alamogordo-Tularosa road in Otero County. **Wylie Brothers Contracting Co.**, Albuquerque, received a \$705,213 contract for 11.1 mi. of grading and surfacing the Greenville-West road in Union County. **Mesilla Valley Construction Co.**, Las Cruces, received a \$211,759 award for grading and surfacing 16.3 mi. of highway in Grant and Hidalgo Counties. A \$430,501 contract was received by **Brown Contracting Co.** of Albuquerque for 8.9 mi. of grading and surfacing in San Miguel County. **Wylie Paving Co.**, Albuquerque, received a \$63,220 award for 45 mi. of reconstructing U. S. Highway No. 285 in Taos and Rio Counties.

NEVADA

Holcomb & Saxton Construction of Reno received a \$118,490 award for construction of a concrete bridge across the Carson River and approaches near Dayton in Lyon County. A \$131,420 contract was received by **Dodge Construction, Inc.** of Fallon, for 14.6 mi. of grading and surfacing in Esmeralda County.

OREGON

R. A. Heintz Construction Co., Portland, received a \$207,090 contract for construction of stone revetment, apron and drift barrier along the bank of the McKenzie River at Blankton north of Eugene. **Central Paving Co.**, Independence, submitted a low bid of \$307,503 for paving the Willamina-Salem highway in Polk County. **Fred H. Slate Co.** and **E. C. Hall Co.** of Portland submitted a low bid of \$258,593 for grading and paving the Pacific Highway in Jackson County. A low bid of \$221,422 was submitted by **Roy L. Houck & Sons**, Salem, for grading and paving the Pendleton-John Day Highway in Umatilla County. **Coos Bay Dredging Co., Inc.**, of Coos Bay submitted a low bid of \$234,778 for grading and paving in Coos County. **Funderburk Construction Corp.**, Sutherlin, submitted a low bid of \$276,215 for grad-

ing and paving the Elkton-Sutherlin Highway in Douglas County. **Sig Andersson** of North Bend submitted a low bid of \$222,903 for grading and paving the Cape Arago Highway in Coos County. **Lord Brothers**, contractors of Portland, submitted a low bid of \$426,302 for construction of Deadwood Tunnel, Talent Division, Rogue River Basin Project. A low bid of \$145,024 was submitted by **General Construction Co.** of Portland for bridge construction and grading in Multnomah County. A low bid of \$170,311 was submitted by **C. R. O'Neil** of Creswell for grading and paving the Pacific Highway in Josephine County. **Perkins Bros.**, Portland, submitted a low bid of \$106,366 for grading and paving the Country Club Road and 'A' Avenue in Clackamas County. **G. D. Dennis & Sons**, Portland, received a \$192,940 contract for revetment construction at three locations on the South Santiam River.

UTAH

A \$366,895 contract was awarded to **Thorn Construction Co.** of Springville for 5.5 mi. of grading and surfacing in Salt Lake County. **Gibbons & Reed** of Salt Lake City received a \$329,395 award for concrete surfaced road and bridge, South State Street and North Murray City Limits, Salt Lake County. **Duffy Reed Construction Co.**, Twin Falls, received a \$627,306 award for construction of roadway drainage, structure, etc., Nez Perce County. **Germer, Abbott & Waldron** of Tremonton received a \$329,395 award for grading and surfacing in San Juan County. **R. M. Jensen**, Salt Lake City, received a \$142,443 contract for construction of Utah Forest Highway, Provo River-Haydens Fork. **Arrington Construction Co.**, Idaho Falls, received a \$116,350 contract for construction of MTR reactor wing extension, National Testing Station. **L. A. Young Construction Co.** and **Vernal Sand & Gravel Co.**, Richfield, received a \$213,000 award for 3.5 mi. of grading and surfacing in Ashley National Forest, Uintah County. **Le Grand Johnson Construction Co., Inc.**, of Logan submitted a low bid of \$702,744 for grading, surfacing and construction of a bridge, Wellsville-Logan area, Cache County. **Dorland Construction** of Salt Lake City received a \$1,066,200 contract for construction of the City and County Hospital, Price.

WASHINGTON

K. L. Goulter & Son of Seattle received an \$868,375 award for 4.5 mi. of grading and surfacing in Kitsap County. **Cherf Brothers, Inc.**, of Ephrata submitted two low bids for earthwork and structures on the Columbia Basin Project; \$588,034 for block 77, west canal laterals, and \$413,962 for part 1, block 18. **George**

A. Grant and **A. R. Sime** of Pasco submitted a low bid of \$421,783 for earthwork, pipe line and structures, south block 46, east low canal laterals, Columbia Basin Project. **Donald M. Drake** of Portland, Oregon, submitted a low bid of \$449,032 for part 2, block 18, Columbia Basin Project. **N. Fiorito Co.**, Seattle, received a \$538,502 contract for 5.5 mi. of grading and surfacing highway No. 9 in Grays Harbor County. **Morrison-Knudsen Co., Inc.**, of Boise, Ida., received a \$674,552 award for the substructure only of the Maple Street Bridge, Spokane County. **C. B. Croy** of Bellingham received a \$147,205 contract for construction of the Nooksack River Bridge in Whatcom County. **Doolittle Construction Co.**, Seattle, received a \$147,548 award for 82.7 mi. of work, from Interstate Bridge to Thurston County Line, Clark, Cowlitz and Lewis counties. **D. A. Sullivan** of Spokane received a \$104,996 contract for 7.5 mi. of grading and surfacing in Lincoln County. **Troy T. Burnham Co.**, Seattle, received a \$102,134 award for construction of the Black Lake Boulevard crossing, Thurston County. **McCray Marine Construction Co.** of Seattle received a \$112,400 award for removal of the Chehalis River Bridge, Grays Harbor County. **Harold Kaeser Co.**, Seattle, submitted a low bid of \$289,447 for construction of bridge bar, pumping plants, Foster Creek Division, Chief Dam Project. **Northwest Construction Co.**, Seattle, received a \$231,513 contract for 2.6 mi. of grading Military Road in King County.

WYOMING

Long Construction Co., Billings, submitted a low bid of \$787,341 for earthwork and structures on the Big-horn Basin Division, Missouri River Basin Project, and received a \$633,000 award for 15.3 mi. of grading and surfacing in the Yellowstone National Park. **Platte Valley Construction Co.**, Grand Island, Nebraska, submitted a low bid of \$692,659 for schedules 1 and 2, for earthwork, structures, relocating and north grade raise, State Highway No. 87, Missouri River Basin Project.

ALASKA

M-B' Contracting Co., Seattle, Wash., received a \$1,302,144 contract for constructing the Sterling Highway, Section B-2. **Morrison-Knudsen Co., Inc.**, Seattle, Wash., submitted a low bid of \$1,702,652 for paving Aprons 2 and 3 at Ladd Air Force base. **Pacific Construction Co.** of Fairbanks received two contracts totaling \$369,803 for construction of the Klutina and Tonsina river and Moose Creek bridges and related road work. The Moose Creek bridge is on the Glenn Highway, the Klutina and Tonsina river bridges are at Miles 101 and 79, Richardson Highway.



Somebody mention replacing a piston? Remember . . .

Caterpillar pistons are of special aluminum alloy—light, yet extremely heat-resistant and strong. CAT* rings are cast from fine grain alloy iron; their honed sides and lapped faces mean better sealing, smoother break-in. *Chrome-plated* rings offer increased resistance to wear. And 21 complete quality-control checks insure the fit, performance and long life of each Cat liner. You're sure of top quality, throughout.

With substitute parts, can you be sure of anything?

Better see your Caterpillar Dealer's Parts Representative—and get Cat original parts every time.

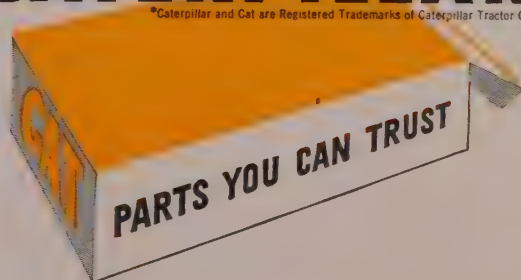
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Cat pistons, rings and liners are the result of years of Caterpillar experience and research. Their thousands of trouble-free working hours can cut your operating costs substantially. Why take a chance with substitutes?

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NEW LITERATURE

For your convenience in obtaining free copies of literature described, the company address is provided with each review.

Cat track production

"The Right Track," title of a new brochure just published by **Caterpillar Tractor Co.**, Peoria, Ill., tells the story on track performance and development. The 8-page brochure discusses the track construction piece by piece. Track link design, track shoes, track bolts, pins and bushings all are considered from a production viewpoint. The booklet (Form 31957-DE622) may be obtained from any Caterpillar dealer or by writing the company.

Technical data on alloy steels

Technical information on twelve of the most widely used 4100 series of alloy steels is presented in a new 4-page folder, TDC-184, issued by the Tubular Products Division, **Babcock & Wilcox Co.**, Beaver Falls, Pa. Included in the folder is condensed data on carburizing and thermal treatments, critical points, mechanical properties and suggestions on welding and machining of these steels.

Frameless trailer units

A six-page catalog folder featuring their new frameless trailer units is now available from the **Anthony Co.**, of Streator, Ill. This new folder contains complete feature details together with hoist specifications and load ratings for the Anthony single-axle and tandem-axle units.

Cedarapids mixing plant

A new 12-page bulletin describing the new Cedarapids Model H15 bituminous mixing plant, has been issued by **Iowa Manufacturing Co.**, Cedar Rapids, Iowa. Bulletin AP-23 gives complete specifications and engineering details of the batch-type plant, including full information about each sectionalized unit and component of the stack-up, tower-type design.

Construction equipment by Joy

Joy Manufacturing Co., manufacturer of heavy construction equipment, has released an 8-page bulletin describing their complete line of rock drilling equipment, compressed power equipment, electric power transmissions, core drilling and hoisting equipment. The well-illustrated bulletin, No. M-212, is available from the manufacturer, 4235 Clayton Ave., St. Louis 10, Mo.

Devices for traffic control

A new, revised catalog covering their complete line of traffic control signs and reflective materials has just been released by **Cataphote Corp.**,

Toledo 10, Ohio. All signs with standard legends are described in this buying guide plus special signs, posts and mounting accessories.

Allis-Chalmers tractor tools

A bulletin which illustrates and describes the complete line of OTC pulling and maintenance tools for Allis-Chalmers industrial tractors is announced by the **Owatonna Tool Co.**, 389 Cedar St., Owatonna, Minn. Bulletin AC-56 shows a complete set of service tools and gives step by step illustrated instructions for performing maintenance jobs on Allis-Chalmers heavy industrial tractors.

Pioneer conveyor manual

Detailed information concerning pre-engineered and job-engineered conveyors, belts and conveyor accessories, is contained in a 50-page catalog released by **Pioneer Engineering Works**. The fully-illustrated booklet includes data on features, capacities, and dimensions of complete conveyor units and their integral parts. Specification tables and diagrams are provided as aids in customer selection, and a check list itemizes points to be considered in buying a conveyor unit for specific job requirements. Request Form No. 612, **Pioneer Engineering Works**, 1515 Central Ave., Minneapolis 13, Minn.

25-ton Koehring excavator

A newly designed 25-ton lift, $\frac{3}{4}$ -cu. yd. dipper capacity 305 excavator is described in a new catalog recently published by the **Koehring Co.**, Milwaukee 16, Wis. The eight-page, two-color catalog tells the story of design, construction, work capacity and application of the new heavy-duty excavator. Well illustrated with 26 photographs and diagrams, the catalog gives concise description of the model 305 when equipped as a shovel, crane, hoe or dragline.

Asphalt distributor

A new bulletin, giving complete specifications of the model BX bituminous distributor is available from **E. D. Etnyre Co.**, Oregon, Ill. Standard and auxiliary equipment to the 80 to 4,000-gal. capacity units, is described in adjoining columns, so that the prospective buyer can see directly what he is getting regularly, and what is available at extra cost.

Emulsion and cut-back sprayers

Bulletin GG-34, "Littleford Cut-Back and Emulsion Sprayers" describes and illustrates the 120 to 200-gal. capacity unit, equipped with burner, fuel tank and heating unit and Littleford's Model 93-AH, a low cost operating unit that fits any standard size commercial drum. For copies, write **Littleford Bros., Inc.**, Box 100, 502 East Pearl St., Cincinnati, Ohio.

Condensed Punch-Lok catalog

A new condensed catalog on hose clamps, locking tools, fittings, accessories and how-to-order information has just been released by **Punch-Lok Co.**, 321 N. Justine St., Chicago 7, Ill. Also illustrated and described is a Clamp-Master Kit consisting of an assortment of 45 standard Punch-Lok clamps and a P-38 Loking Tool.

IH heavy-duty trucks

International Harvester Co. now is offering a new 20-page catalog which contains complete information on International four-wheel conventional and cab-over-engine heavy-duty trucks with 6-cylinder engines. Gasoline, liquefied petroleum gas, and diesel-powered models are covered in the attractive full-color and two-color booklet. A copy can be obtained by writing Consumer Relations Dept., **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill.

Colo. Fuel & Iron Corp. issues products catalog

The **Colorado Fuel and Iron Corp.** has made available a fully illustrated and indexed 70-page catalog describing the company's principal products. The product listing is divided into broad classifications which include semi-finished and hot-rolled steel, heavy and special steel items, wire and wire products, Wickwire rope, overhead conveying equipment, and other product lines. Also included in the bulletin is a directory of CF&I plants and sales offices throughout the country. Copies obtainable from the **Colorado Fuel and Iron Corp.**'s advertising office, 575 Madison Ave., New York City.

Spec data on steel tubing

Engineers, buyers and others involved with the problem of determining the proper specifications to apply to various carbon, alloy and stainless steel tubing, pipe, seamless welding fittings and flanges, will find pertinent information in a new four-page



"Our LIMA Truck Cranes give us fast, smooth, precise lifts on every job"

says F. S. Oldt Co., Dallas

"Our Lima truck cranes give us fast, smooth, precise lifts on every job . . . from erecting the 'Ole Man Texas' figure at the State Fair (above left) to standard erecting jobs like the 100 ft. tower (left)." That's the report from F. S. Oldt Company, Dallas, Texas.

They continue: "Truck mounted, the cranes move from job to job fast. Performance is tops, and downtime far below average. That kind of service has kept us coming back for more since 1945. Now we have six Limas . . . the two truck cranes (one Type 44 and one Type 34) plus four crawler mounted Type 34s."

Like F. S. Oldt Company, *you* can rely on Lima's quality design and construction to give you top service for every job. It will pay you to get the full story on Lima quality today. See your nearby Lima distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



DISTRIBUTORS—Our Seattle Office, 1932 First Avenue South, Seattle 4, Washington; Feenaughy Machinery Co., 112 S.E. Belmont Street, Portland 14, Oregon; Feenaughy Machinery Co., 600 Front Street, Boise, Idaho; Smith Booth Usher Company, 2001 Santa Fe Avenue, Los Angeles 54, California; Modern Machinery Co., 4412 Trent Avenue, Spokane 10 Washington; Acme Iron Works, 540 Gulebra Avenue, San Antonio, Texas; Cascade Industrial Supply, 4560 Highway 99 South, Redding, California; Shriver Machinery Company, 175 Grand Avenue, Phoenix, Arizona; N. C. Ribble Co., 1304 North Fourth Street, Albuquerque, New Mexico; Bay Cities Equipment, Inc., 2792 Cypress Street, Oakland 7, California; Bay Cities Equipment, Inc., 1178 West San Carlos Street, San Jose, California; Faris-Moritz Equipment Company, 1095 South Jason Street, Denver Colorado; McGaraghan Supply Company, 529 Broadway, Eureka, California; Heiner Equipment & Supply Co., 501 West 7th, South Salt Lake City, Utah; Hall-Perry Machinery Company, 902 Central Avenue, Billings Montana; Hall-Perry Machinery Company, 812 East Iron Street, Butte, Montana; Hall-Perry Machinery Company, 1116 15th Street North, Great Falls, Montana; Hall-Perry Machinery Company, 12 East Main Street, Missoula, Montana; Evans Engine & Equipment Company, 1230 Westlake North, Seattle, Washington; Reno Equipment Sales Company, 1700 West Street, Reno, Nevada



LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS
BALDWIN - LIMA - HAMILTON
 Construction Equipment Division—LIMA WORKS

folder published by the Tubular Products Division of the **Babcock & Wilson Co.** The folder is a ready cross reference between the steel, the application and the specification covering the product. Reference specifications are those of the ASTM, AAR and a number of special B&W specifications covering the products mentioned. Copies of Bulletin TDC-186 may be obtained from the division's offices at Beaver Falls, Pa.

Leaded steel rings

Publication of an eight-page bulletin describing the company's production of seamless forged and rolled rings from its new Hi-Qua-Lead leaded steel is announced by **Alco Products, Inc.**, P. O. Box 1065, Schenectady, N. Y. The illustrated booklet points up advantages of using the leaded steel developed by Alco, and contains test data and microstructures showing the even lead distribution and machining characteristics of the product.

Dust collection in overhead drilling

A new device for easy, inexpensive dust collection in overhead drilling operations is described in a bulletin just published by **Mine Safety Appliances Co.**, 201 North Braddock Ave., Pittsburgh 8, Pa. The M-S-A Drildust bucket is designed to provide a portable method of dust collection for overhead rotary drilling operations where fluted augers are used. The bulletin, No. 1504-3, pictures the M-S-A bucket and fully describes its design and operation.

Automatic torque control for electric power tool

A four-page, illustrated folder describes Ingersoll-Rand's latest model electric power tool which has automatic torque control. Job photographs illustrate the application of the new torsion bars which provide

torque control from 20 to 90 ft.-lb. **Ingersoll-Rand Co.**, 11 Broadway, New York 4, N. Y.

Hot pipe insulation

Gilsulate insulation for hot underground pipes is described in a new four-page, two-color brochure just published by **American Gilsonite Co.**, Salt Lake City, Utah. The brochure discusses the problems of underground pipe insulation and explains how Gilsulate's special properties overcome them. On-the-job photographs illustrate ease of application; brief technical data are also included.

Roll-Bond brochure

Roll Bond, a patterned metal used where high efficiency heat and cold transfer is needed, is described in an illustrated booklet published by the Metals Division, **Olin Mathieson Chemical Corp.**, East Alton, Ill. The six-page booklet describes how Roll-Bond is made and lists some of its uses.

Equipment selector

A slide rule type equipment selector which shows the productivity per man hour and the cost per yd. of placing concrete for various distances of pours and labor rates with the use of wheelbarrows, hand carts, and model 15A prime-movers is offered by the **Prime-Mover Co.** of Muscatine, Iowa. The information presented is based on average job conditions and is especially useful to superintendents and construction cost estimators.

Tygon paint manual

Publication of a new paint manual, Tygon Protective Coatings Bulletin No. 760, is announced by the U. S. Stoneware Co. This new manual is

designed for use as a practical work book, presenting useful painting data in the form of charts, tables, diagrams and illustrations. The complete line of Tygon protective coatings and related primers are presented along with surface preparation, priming, application methods and maintenance instructions. **Plastics & Synthetics Division, U. S. Stoneware Co.**, Akron 9, Ohio.

Worthington motor pulleys

A new bulletin on variable speed motor pulleys has been issued by **Worthington Corp.**, Harrison, N. J. Featured in the bulletin are motor pulleys ($\frac{1}{8}$ through $\frac{3}{4}$ hp.) available with adjustable and tilting motor bases, companion sheaves, motor bases and V-belts. Bulletin 1630-B1 P is illustrated by numerous charts that list complete ratings, dimensions and selection data for the various Worthington variable speed motor pulleys; the 24 QD sheave stock sizes; and Worthington-Goodyear V-belts.

Euclid twin-power scraper

A new catalog explaining the twin-power principle of separate engines fore and aft on the Euclid TS-18 scraper is now available from **Euclid Division, General Motors Corp.**, Cleveland 17, Ohio. Condensed specifications and a performance graph are included to provide data on engines, transmissions, tires, scraper controls, weights and dimensions, speeds and grade ability. Ask for Form 552.

Drain or sampling valve in sizes to 2 in.

A two-page data sheet, No. 294, gives details and features of the new Jerguson drain or sampling valve in sizes from $\frac{3}{4}$ in. up to 2 in. featuring a valve stem seating outside the valve body and OS&Y construction to

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PERFORMANCE DEPENDABILITY

HUBER-WARCO 7-D Motor Grader



torque converter • power-shift transmission

Tough grading assignments are met quickly and efficiently with the 140 h.p. Huber-Warco 7-D motor grader. The perfect balance of weight and power, plus torque converter and power-shift transmission, handles a larger volume of work with fewer passes.

A tail-shaft governor automatically adjusts engine RPM to meet load conditions, at any ground speed set by the operator. Other performance features include: completely hydraulic cab-controlled blade

movement; power sliding moldboard; elimination of a foot clutch and many more.

Other Huber-Warco torque converter graders are: 6-D (100 h.p.), 6-D2 (125 h.p.), 7-D2 (150 h.p.) and 5D-190 (195 h.p.). Models with standard transmission include: 4D-75 (75 h.p.), 4D-85 (85 or 93 h.p.) and 4D-115 (115 or 123 h.p.). This complete grader line offers a size for every job.

A Product of Huber-Warco Company • Marion, Ohio, U.S.A.

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Here's the business end of a heater

When you buy a heater, don't stand in front of it; stand behind it. All heaters are hot in front, but their value to you depends on the rear end.

If you want *circulated warm air* indoors, *powerful spot heating* outside, if you want *dry plaster*, pour and *cure concrete* and *keep the job rolling* in any weather, you need a Master heater.

It's a compact furnace-on-wheels, with starter, fan, thermostat, filter, pressure atomizing burner, insulated fire chamber and all. It rolls into place, starts at the flip of a switch, needs no vent and burns low cost kerosene or fuel oil.

We think it gives you more good heating for your money than any other type heater. Write for the free folder "Summer Warmth in Winter" or call your Master Distributor and see if you don't agree.

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meet high temperature and corrosive conditions. Detailed specifications and engineering drawings are included. Write **Jerguson Gage & Valve Co.**, 80 Fellsway, Somerville 45, Mass.

Lidseen pipe benders

A new folder just published by **Gustave Lidseen, Inc.**, 1000 First St., Hayesville, N. C. It illustrates the complete line of Lidseen "Chicago" pipe benders featuring a calibrated degree scale for making accurate repeat bends with ease. Each model is fully described showing their capacities, performance data and bending circles for rigid or thinwall conduit. The folder includes complete operating instructions, prices of units, parts, and features, and exploded views with parts numbered for identification purposes. Bulletin No. 556.

Liquid bonding agent for concrete

A new liquid bonding agent for improving adhesion between old and new concrete, plaster, and many other materials, is described in an eight-page folder published by **Standard Dry Wall Products, Inc.**, New Eagle, Pa. Circular No. 48 describes Thorobond, its characteristics, methods of application, coverage. Typical uses are illustrated. Also available is a 160-page catalog depicting the Thoro system for sealing of interior and exterior masonry surfaces.

Reprint of Hyster booklet

Hyster Co.'s booklet, "9 Profitable Minutes For Contractors," is again available for distribution. The brochure outlines methods of increasing productivity through the use of Hyster job attachments on either new or used tractors. Information is given on the economies of using tractor attachments for profitable fill compacting, trenching, shoveling, pile-driving, winching, yarding, bituminous salvage and other construction tasks. Copies available from Caterpillar-Hyster dealers or by writing **Hyster Co.**, 2902 N.E. Clackamas St., Portland 8, Ore. Request Form No. 1305.

New rock-drill bulletin from Le Roi-Cleveland

A new 12-page bulletin describing Le Roi-Cleveland rock drills has been issued by the **Le Roi Division** Westinghouse Brake Co., Milwaukee, 1, Wis. The three-color bulletin, AT111B, describes and illustrates the company's line of construction tools—breakers, sinkers, clay spades, tampers, and wagon drills. Individual pages are devoted to tool design and construction, operator handling and care, and maintenance features leading to longer tool life. The lubrication system, drill and blow actions, and valve and piston design are also discussed.

The "EXTRAS" are STANDARD on Bucyrus-Erie Transit Cranes

Any two carrier-mounted cranes look very much alike. You can tell the difference only by an extensive comparison of features. When such a comparison is made, Bucyrus-Erie Transit Cranes top the field because so many features that are "extras" at additional cost on other cranes are furnished as standard equipment on Bucyrus-Erie machines. Here's a rundown of such features and what they can mean to you on your lifting crane jobs:

Power controlled lowering for main hoist line on lifting crane permits delicate positioning of loads.

Friction swing brake, in addition to regular swing lock, permits more accurate spotting and holding of boom point over desired position.

Power controlled boom hoist, fully independent of all other functions, provides high accuracy boom control in crane work.

Safety boom stops, designed to prevent boom from accidentally snapping over center and striking cab, are furnished on all machines equipped for lifting crane service.

Pendant-type boom suspension with 8 parts of operating line between bridle and boom point is ideal for changing boom lengths conveniently.



Driving piling for a new interstate bridge near Portland, Ore., is this Bucyrus-Erie 22-B Transit Crane. Consolidated Freightways of Portland owns the machine.

Open-throat boom design permits easy rigging of multi-part lines.

Extendible outriggers, two on each side of carrier chassis, provide added stability for swinging capacity loads.

Transit Cranes are offered in two sizes—the 15-ton Model 15-B and 25-ton Model 22-B, readily convertible to 1/2- and 3/4-yd. excavators respectively. See your nearby Bucyrus-Erie distributor for full information on the size machine you need. Bucyrus-Erie Co., South Milwaukee, Wis.

223E56-1

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The Colorado Builders' Supply Company.....
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Crook Company.....Los Angeles & Bakersfield, California
Great Northern Tool & Supply Company....Billings, Montana
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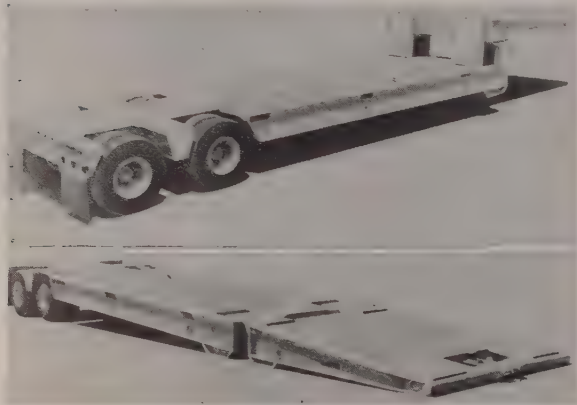
to Men Who Shape the Earth

NEW EQUIPMENT

For your convenience in obtaining more information quickly, the manufacturer's address is provided with each review.

Gooseneck trailer features level deck

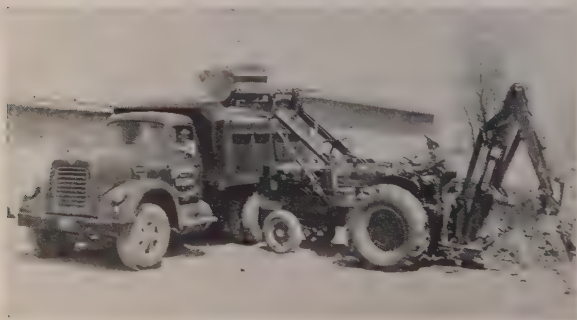
A front and rear loading folding gooseneck trailer with a level deck has been included as a standard model in the heavy duty trailer line manufactured by **Martin Machine Co.**, Kewanee, Ill. The level deck permits more usable



platform area, shorter overall length and reduces weight approximately 800 lb. as compared to the drop deck model. Designated as the RFTL series, this trailer is available in four models with capacities of 20, 27, 32 and 40 tons. With the folding gooseneck lowered, equipment is driven directly on to the platform, eliminating the need for ramps or blocking. The winch equipped truck tractor lifts the folding gooseneck into towing position. Complete details available from the company or from Caterpillar dealers.

Ottawa backhoe and loader for IH tractors

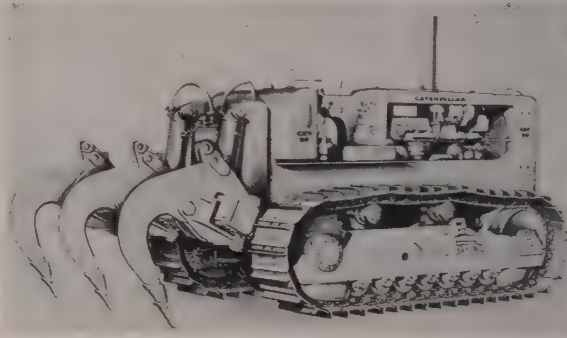
The Ottawa backhoe and loader shown here on the new International Harvester W-400, but also available for the W-600 and Utility 300 tractors, are mounted on a common frame designed to eliminate stresses and



strains on the tractor main frame. Incorporated into both the loader and the backhoe hydraulic systems is a patented single operating lever. Two double acting cylinders are used to actuate the loader bucket, to provide powerful balanced breakout and double down pressure. Manufactured by **Ottawa Steel Division, L. A. Young Spring & Wire Corp.**, Ottawa, Kansas, these attachments are available through International Harvester dealers.

Cat ripper for D9 tractor

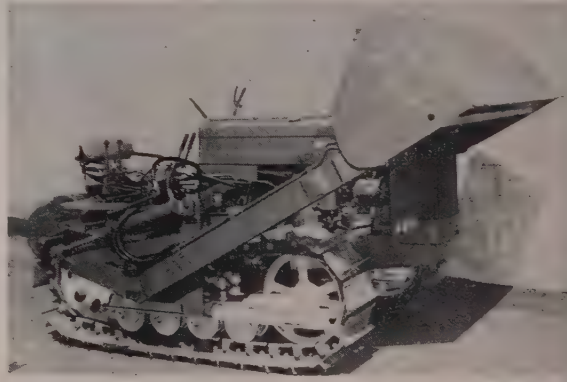
A new tractor-mounted ripper designed for use with the Caterpillar D9 tractor has been announced by **Caterpillar Tractor Co.**, Peoria, Ill. The complete ripper consists of two mounting brackets, two hydraulic cylinders, one beam assembly, and three teeth. It weighs 10,830 lb. The No. 9 ripper mounts on the bevel gear case through a special drawbar bracket group which



replaces the standard drawbar brackets, and is operated hydraulically by two hydraulic cylinders working in conjunction with the Caterpillar No. 50 Hydraulic Control. Power is provided by a hydraulic pump which permits the ripper to be raised and lowered independently of the flywheel clutch. A convenient control feature is the automatic kickout which throws the hydraulic control lever back to "hold" position at the end of the "raise" stroke.

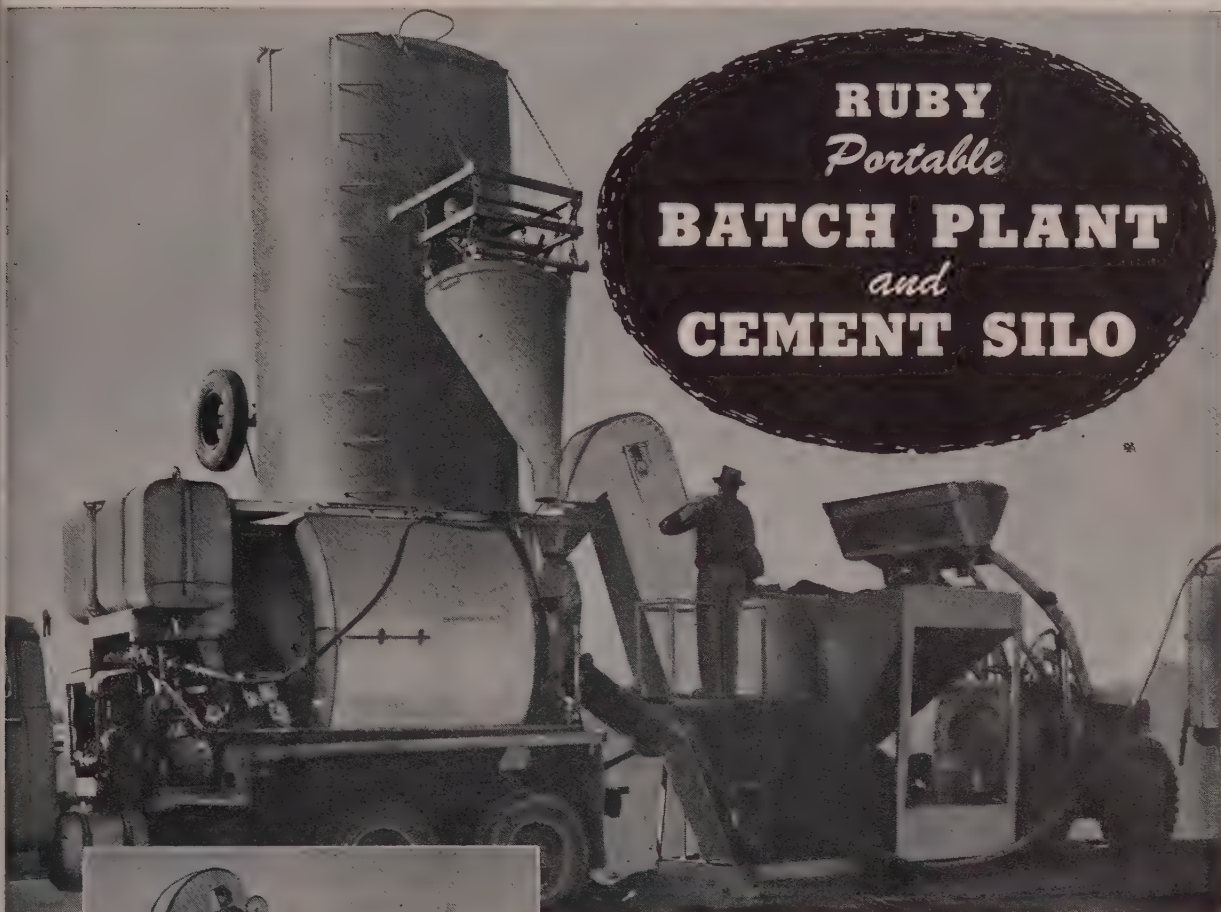
Heavy-duty dozers for John Deere 420 crawlers

Contractors may now equip their John Deere 420 crawlers with a new heavy duty bulldozer manufactured especially for use with this equipment by the **Holt Manufacturing Co.**, Independence, Ore. The new dozers which include straight, angle and straight hydraulic tilt models



have been cleared by John Deere for their "Allied Equipment" program. The heavy-duty models utilize the Holt cantilever side-arm construction principle which gives them high lift and clean design. The Holt angle dozer may be angled or tilted by manual adjustment while the straight hydraulic tilt uses hydraulic controls for blade tilting.

The Ruby "Team" that saves batching Dollars!



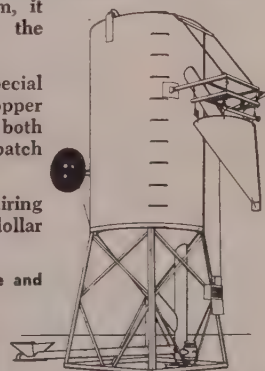
When you find complete portability of both Batch Plant and Silo . . . "one-man" economy of operation . . . and quick, efficient production, all combined in one LOW COST team, it's NEWS! . . . REAL NEWS for the transit mix operator, AND his pocketbook!

The Ruby Portable Batch Plant, in either 3 or 5 yard capacity, is designed for completely portable highway transport and quick, easy installation. Used with the Ruby Portable Cement Silo (170 barrel capacity), as a one-man operated . . . one location . . . batch-on-the-job team, it means lower operation costs from the first day!

The Ruby Portable Cement Silo, also designed for easy highway transport without special permits, is engineered for "team" operation with the Ruby Batch Plant. The Silo scale hopper accurately measures the bulk cement needed for controlled batching. One man operates both units from the Batch Plant platform. Lost time and added labor costs of separate silo and batch plant locations are eliminated.

The Ruby Portable Cement Silo makes bulk cement use a "profit-maker" on jobs requiring even small amounts of transit mix concrete. Complete portability of both units means dollar savings on every yard of concrete handled.

Write to Clark's Welding Works, Dept. 5, Perkins, California, for complete information or the name and address of the dealer nearest you.



Sketch of Ruby Cement Silo showing loading hopper

CLARK'S WELDING WORKS

PERKINS, CALIFORNIA (EAST OF SACRAMENTO)

Q. Say, Frank, what do you know about HyPOWER cylinders?



A. PLENTY...

We're using 'em for two good reasons...

First of all, Tom, HyPOWER'S are made for our kind of equipment. You know, rugged for tougher western conditions.

Secondly, HyPOWER cylinders are production made --- in eleven types and over 300 diameters and strokes. That means a big saving to us over custom made cylinders.

And believe me we've made plenty of comparisons. These cylinders are tough---tougher than any cylinder we've ever used!

We like the fine points, too. Points like HyPOWER'S heavy-ier cylinder walls and shafts ... simple but accurate stroke controls ... all-welded construction without staybolts.

But if you really want to know all about HyPOWER cylinders I suggest you write to the HyPOWER folks for their catalog. Would give you mine but engineering uses it constantly.

**TURLOCK IRON
& MACHINE WORKS**
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HyPOWER
HYDRAULIC CYLINDERS

FACTORY REPRESENTATIVES: GREYER & GREYER
P. O. BOX 47 • STOCKTON, CALIFORNIA

Overland scraper for IH 300 tractor

The Overland scraper, made by Western Equipment Mfg. Co., 105 S. Kenwood St., Glendale, Calif., has been approved for use with the International 300 Utility tractor.



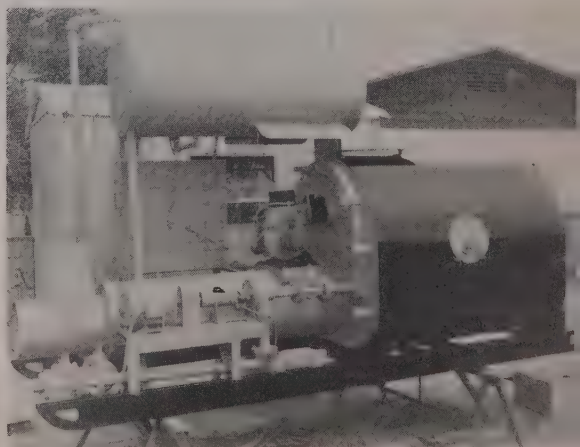
This high speed scraper attaches to the quick hitch of the IH 300 Utility and is controlled by the hydraulic system of the tractor. Four ripper teeth are located in front of the scraper blade, and the rear wheels are set inside the scraper frame to cut close to banks and allow continuous cuts for excavating. Load carrying capacity is increased 50% by the automatic apron which allows the scraper to be lifted free of the ground for quick transport of the load.

Highway maintenance trucks

A new, heavy-duty all-wheel drive truck series, engineered and built especially for gravel hauling and highway maintenance, is now available from the Oshkosh Motor Truck, Inc., Oshkosh, Wis. The trucks in this new series are designed for year 'round use. They are powered by either a Continental 427-cu. in. gasoline engine or a Cummins JT-600 diesel engine; have an 8½-cu. yd. gravel dump body; carry a payload of 18,000 lb. on the front axle to conform with maximum load limits in most states; built for mounting an underbody blade for road grading work, or a large sander body in conjunction with the underbody blade for winter road maintenance and ice control.

Childers announces new line of oil heaters

Childers Manufacturing Co., Inc., Albuquerque, N. Mex. announces the availability of their new D Model



line of circulating hot oil heaters. The present line of C models will be discontinued. The new D models incor

The Problem:

To get water for irrigation from one side of the Rio Grande to the other

The Solution:

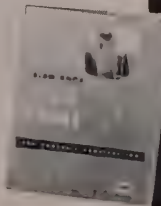
D. D. Skousen & Son, Albuquerque contractor, builds 1200-ft. siphon under the river with

BLAW-KNOX STEEL FORMS

• One of the most unusual projects in which Blaw-Knox Steel Forms have played an important part is the construction of a siphon under the Rio Grande near Albuquerque, New Mexico. The siphon is necessary to divert water from one side of the river to the other during the low water season, so that irrigation can be maintained on either side of the river. The 84" diameter concrete conduit, with 15" thick walls reinforced with steel, dips 40 ft. below the river bed at one point.

One of the most important aspects of this job was the time-pressure under which contractor D.D. Skousen & Son worked. The entire job had to be completed between November 15 and the annual Spring high water period. By the use of specially built Blaw-Knox Forms, Skousen was able to set and pour two 25-ft. sections of conduit per day. Working seven days a week, the project was completed without delay.

Siphons, Sewers, Big Dams, Bridges—whatever your concreting problem—solve it the low-cost way by taking advantage of Blaw-Knox forming experience. Bulletin 2430 contains special design suggestions and complete details about the Blaw-Knox Steel Form Consultation Service. Send for it today, while your next job is in the preliminary planning stage.



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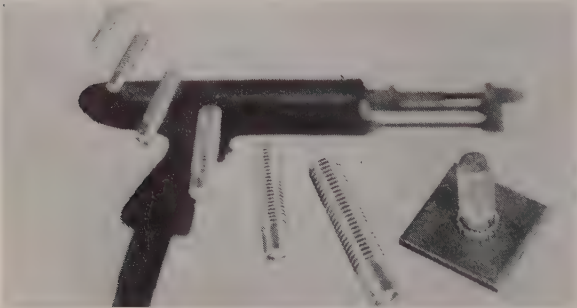
BLAW-KNOX STEEL FORMS
CONSULTATION SERVICE



porate the Childers circular radiating fins which guide the oil through the heater and eliminate the possibility of dead spots and resultant oil deterioration. The jacketed heat tube and combustion chamber of the C model heaters are again used in the new models, but they are now insulated. Greater economy results from the use of these hidden fins as additional radiating surfaces and the down-draft principle of firing which utilizes every bit of burnt fuel for heating purposes. The four new models, D-50, D-100, D-150 and D-250 replace the old C models, C-50, C-100, C-75 and C-200.

New type welding stud for construction

A new type threaded end welding stud offering important design improvements and costing less than the standard product it will largely replace is announced by the Nelson Stud Welding Division, Gregory Industries,



Inc., Lorain, Ohio. Designated type CP, the new granular-fluxed studs have tensile strength as much as 13% greater than the former standard MG studs and provide improved welding qualities. The same templates now being used with Nelson MG studs can be used with CP's up to and including 1/2-in. diam., as the ceramic ferrules

used in welding have identical outside dimensions. Among the newest applications of end-welded studs are their use as shear connectors in composite steel-and-concrete bridges and building construction, and as fasteners in field-assembled insulated aluminum "sandwich" walls.

Railroad Gradall takes to the highway

Self-compensating flange guide wheels have been introduced as an optional feature for one-man operation of the Railroad Gradall by the **Gradall Division, Warner & Swasey Co.**, 5701 Carnegie Ave., Cleveland 3, Ohio. These



guide wheels are quickly and easily lowered in place on the rails or retracted for driving on the right-of-way, highway or cross country. Air cylinders keep them on the rails and compensate automatically as the rubber tires ride up over crossings, frogs, and switches. The front guide wheels carry 100% of the front axle weight lifting the front rubber tires clear off the ground. The rear guide wheels carry 40% of the weight, allowing the rear rubber tires to bear 60% of the weight for traction and driving power. Positioning of the guide wheels can be controlled from either the upperstructure operator's cab or from the carrier's driving cab.

Pole trailers from Talbert

Latest design feature on the complete line of Talbert pole trailers is a fabricated box-type pole trailer reach. This extra-rugged box frame construction assures maximum strength required for specialized hauling of pipes



poles, conduits, etc. Talbert pole trailers may be designed with either single axle or the Hendrickson tandem suspension and may be equipped with 20-in. or larger tire. Talbert pole trailers are available in 15, 20, and 25-ton full-rated capacities. Complete information available from Talbert Trailers, Inc., 7950 West 47th St., Lyons, I

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HEAVY DUTY MOTOR OIL

Restores Horse-power. This top quality motor oil is ideal for the construction industry. Keeps rings, pistons, valves and bearings clean and efficient.

Performance is improved even while equipment is in use. These are real money saving factors as tests made under all operating conditions show.

Protection for equipment is more important than ever as operating costs go up. ZOILDEEZ is the answer. *Get ZOILDEEZ, Pennzoil's heavy duty motor oil.*

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Write or phone to have an American sales engineer help you plan your next job.



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Tamprite Tips



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**DRIVE OFF WORN TIPS
DRIVE ON NEW TIPS**

PREVENT COSTLY DELAYS by equipping your sheep foot rollers with Tamprite Tips and Shanks. Simple to replace on the job. Available for immediate delivery. Write for information.

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2737041



**LOS ANGELES
STEEL CASTING CO.**
6100 So. Boyle Avenue, Los Angeles 58, California

Mower cuts 15-ft. swaths

A new Double V type knifehead has been developed by **Triumph Machinery Co.** of Hackettstown, N. J., for use with **Triumph Hydro-Clipper** mowers. The new head, combined with Triumph's low-temperature hy-



draulic governor, makes it possible to simultaneously operate a sickle-bar and rotary mower that will cut 10 to 15-ft. swaths at 3 to 6 mph. depending on the size and power of the tractor. The new knifehead has long V type guides and can be adjusted by simply moving the rear guide forward.

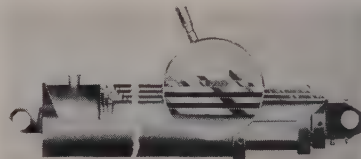
Portable signal horn powered by CO₂

A portable, self-powered signal horn that can be heard more than half a mile is being produced by **Falcon Alarm Co., Inc.**, Summit, N. J. Called the **Big Bertha**, it is powered by carbon dioxide and pro-

vides a warning signal comparable to that of a diesel engine horn. Sound output of the 40-lb. **Big Bertha** is rated at from 116 to 122 decibels at a distance of 25 ft. The standard model of the **Big Bertha** consists of a 15-lb. steel cylinder of CO₂, a 13-in. horn, special diaphragm and valve assemblies and a pressure gage. Overall height is 31 inches.

New line of telescopic cylinders

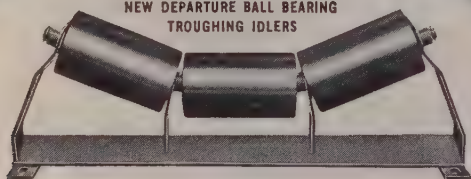
A new line of telescopic hoist cylinders, for use in **Galion's Uni-scope** and **Duo-scope** hoists, is announced by **Galion Allsteel Body Co.**, Galion, Ohio. Seamless alloy steel sleeves with ground and polished surfaces are designed to provide leak-free op-



eration and long seal life, and molded wiper rings are located above each seal assembly to protect the self-adjusting chevron seals from damage. Available with lifting capacities from 20,000 to 68,000 lb., **Galion** telescopic cylinders are offered in a variety of sizes to suit individual application requirements. Cylinder diameter ranges from 5 to 8 in.

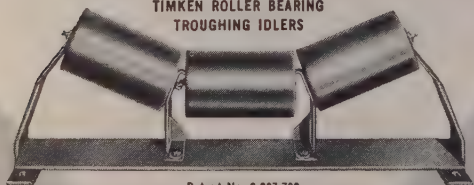
CONVEYCO

NEW DEPARTURE BALL BEARING
TROUGHING IDLERS



CONVEYCO

TIMKEN ROLLER BEARING
TROUGHING IDLERS



Patent No. 2,687,799

THERE'S A SECRET TO LONGER IDLER LIFE!

It's U.S. Patent No. 2,687,799

Whatever your job conditions may be, **Conveyco** Idlers with sealed-for-life New Departure Bearings or **Conveyco** Timken Bearing Idlers will give you better performance over a longer period. The secret is in the patented construction... let a **Conveyco** engineer show you how to reduce idler maintenance.

Note: **Conveyco** is a convenient source for repair or replacement parts on conveying equipment. Bearings, pulleys, etc.

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Special 4 x 6 Steam Fixed
Drum Winch. Duty single line
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Now 2 Kolman Conveyor-Screen Plants Fit All Jobs



Kolman has the combination for low-cost, high-production screening and loading! That extra heavy construction throughout the Model 101 permits handling heavy loads at constant rates without fear of excessive expense or breakdown time loss! It's a brute for production—capable of loading over 800 tons per hour.

Kolman Model 101 is available in belt widths from 18" to 42" and up to 60-ft. length on portable plants. It's capable of carrying either a single, double or triple-deck vibrating screen without additional support, and can be equipped with a gravity-feed loading trap or feeder-trap combination. The complete plant is portable with

no disassembly whatever, as pictured at left. The vibrating screen folds easily into towing position. Adaptable to any type of feeding—dozer, dragline, shovel, front-end loading and others. Best of all, you'll find the Kolman 101 costs less than comparable heavy-duty conveyors. Write for literature.



The Kolman "Junior" Conveyor, Model 202, is designed to meet the demand for a LOW COST portable conveyor rugged enough to support a Loading Trap and large Vibrating Screen. It will take the kind of punishment that is dished out to a portable outfit—and will cost you less money to own and operate!



The rugged "box-type" construction of the "Junior" gives you great strength and rigidity at unusually low prices. The sides are of fabricated 3/16" steel plate formed into a channel 16" deep with 2" legs. A steel belt cover completely covers the top, giving additional rigidity and completely encasing the return belt

to prevent material from working in to cause belt damage. The under-slung power unit provides easy access for operation and servicing. The "Junior" is available with a gravity feed loading trap to make a complete, low cost portable screening plant. Lengths up to 50' with 18" or 24" belts. Write for literature.

SEND for FREE literature

KOLMAN Manufacturing Co.

5670 West 12th St., Sioux Falls, S. D.

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☐ 202 Junior Conveyor

☐ Screens ☐ Feeders

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- | | |
|--|---|
| <p>ALASKA</p> <p>FAIRBANKS, ANCHORAGE—The Carrington Company</p> <p>CALIFORNIA</p> <p>FRESNO—Allied Equipment Company, P. O. Box 871</p> <p>LOS ANGELES—Brown-Bevis Industrial Equipment Co., 6550 E. Washington Street</p> <p>MARYSVILLE—Valley Truck & Tractor Co., 100 D Street</p> <p>OAKLAND—Spears-Wells Machinery Company, 1823 West 9th Street</p> <p>SACRAMENTO—Sacramento Valley Tractor Co., Broadway & 19th Streets</p> <p>IDAHO</p> <p>BOISE—The Sawtooth Company, 1115 Grove Street</p> | <p>MONTANA</p> <p>BILLINGS—Hall-Perry Machinery Co., P. O. Box 1975</p> <p>BUTTE—Hall-Perry Machinery Co., P. O. Box 1367</p> <p>GREAT FALLS—Hall-Perry Machinery Co., P. O. Box 1869</p> <p>MISSOULA—Hall-Perry Machinery Co., P. O. Box 1063</p> <p>NEVADA</p> <p>ELKO—A-D Machinery Company, P. O. Box 231</p> <p>OREGON</p> <p>PORTLAND—Contractors Equipment Corporation, P. O. Box 2191</p> <p>WASHINGTON</p> <p>SEATTLE—Air-Mac, Inc., 3838 4th Avenue South</p> |
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Curb and gutter forms

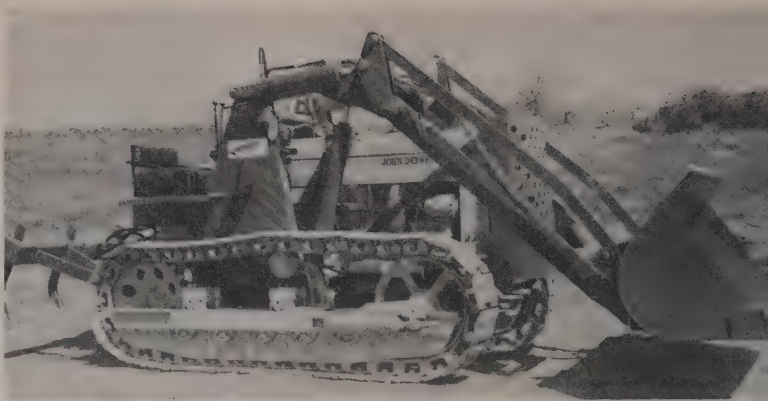
A complete line of combination curb and gutter forms is announced by **General Road Machines, Inc.**, Niles, Ohio. Supplied in 10-ft. sections, the new forms are made of electro-welded 10-gage special alloy steel. Back and front gutter forms are slotted every foot in length for division plates. Forms have close-fitting sleeve joint connections for quick, easy alignment. Detailed information available from the manufacturer.

Heavy-duty power take-offs

The **Twin Disc Clutch Co.**, Racine, Wis., announces the addition of a new model to its SP line of heavy-duty friction power take-offs—the SP-321. This new power take-off can handle up to 6,730 lb.-ft. of torque and transmit up to 602 hp. at 1,550 rpm. It is available with a standard SAE No. 00 flywheel housing adapter to meet the widest range of industrial power units in its horsepower and rpm. ratings. Literature available.

Self-leveler rig for ladders

A new self-leveling ladder attachment has been announced by **Eden Enterprises, Inc.**, 2000 East Eden Place, Milwaukee 7, Wis. The unit, called the Safety-Level, adjusts itself to any terrain hydraulically.



Henry shovel for John Deere tractors

The Henry TS-40F industrial tractor shovel has been tested and cleared by John Deere for use on their 420 and 40 crawler tractors. Special features of the shovel include a self-leveling bucket; double acting lift cylinders— $3\frac{1}{2}$ in. in diam.; solid

steel lift arms— $1\frac{1}{2}$ -in. thick; large parallel circuit valves, and full flow oil filters. The large steel main frame serves as oil reservoir. Lifting capacity to full height is 3,000 lb., breakaway, 5,000 lb. **Henry Manufacturing Co.**, 1700 North Clay, Topeka, Kan.

When the valve under the bottom rung is open, the ladder levels itself and upon closing the valve the ladder is locked in position. The unit comes equipped with safety grip feet which can be used on rubber pads for hard surfaces, or can be set with the safety spike protruding for use on loose ground.

Aluminum dump body

An all-welded, aluminum dump body is being produced by the **Perfection Steel Body Co.** of Galion, Ohio. Of 20-cu. yd. capacity, the body weighs 2,300 lb. in contrast with 4,300 lb., the weight of a steel body of the same capacity. The use of Perfection's new front-lift telescopic



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Pacific Telephone



Ask the man who moves mountains

Without him no structure, no road, no dam or development could happen. He whittles the earth into usable shapes with a fine steel blade. He smooths a way for progress.

NEW OILS FOR POWER

All these works are done with power, which we mostly take for granted. But there is nothing *indestructible* about it. On the contrary: the life of your modern diesel engine depends, literally, on very special lubrication! That's why Caterpillar Tractor Company has announced the need for a *new class* of oils—Superior Lubricants, Series 3, for diesel engines. They show

many advantages over the older Series 2 oils which some people still use.

One of the *first* to meet these stiff specifications is Richfield's SUPER Circle C brand of motor oil. It is now recommended for use in a score of Caterpillar engines and noticeably improves the operation of many other makes. It reduces wear, lessens maintenance and parts replacement, keeps the engine cleaner and counteracts the effects of high sulfur fuels found here in the West.

PICK UP YOUR TELEPHONE

Arrange for a trial of Richfield SUPER Circle C Motor Oil. As any man who moves mountains will tell you, it gives *new life* to diesel engines!

FREE!

Send for your copy of our new illustrated Diesel Lubricating Guide. Address Richfield, Lubricants Dept., 555 So. Flower St. Los Angeles 17, California

SUPER CIRCLE C ©

THE ADVANCED MOTOR OIL

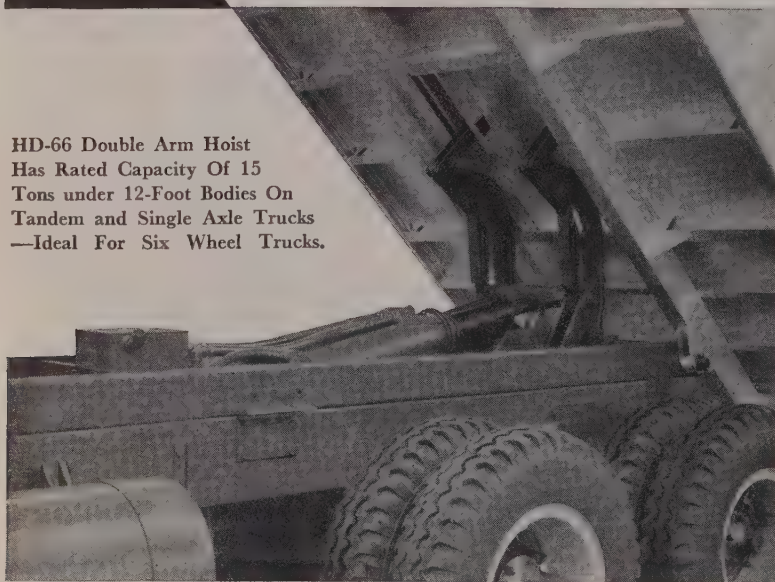
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Now!

Handle Extra Heavy Payloads with the MARION TWIN 66 HOIST

HD-66 Double Arm Hoist
Has Rated Capacity Of 15
Tons under 12-Foot Bodies On
Tandem and Single Axle Trucks
—Ideal For Six Wheel Trucks.



Extra Profit Features *that Count*

- Low oil pressure operation for smooth lifts without pressure surges.
- Exclusive equalizing double-arm lift hoist provides outstanding performance.
- Rugged, heavy duty pump provides faster dumping cycle.
- Class 12 HABMA rating.
- Economical to operate . . . compact . . . dependable for long life operation.



"Designed on the Job"

MARION

BODIES AND HOISTS

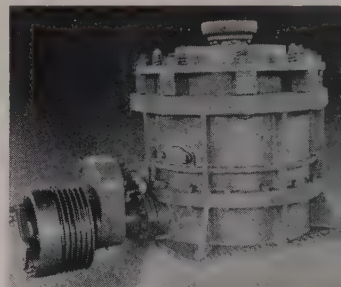
MARION METAL PRODUCTS CO., MARION, OHIO, U. S. A.

A complete line of standard and special hydraulic hoists and dump bodies to fit every need.

hoist also results in an additional weight saving of 1,000 lb. increase the legal payload of tractor and body to 3,000 lb.

Gyratory crusher has 10 to 75-ton capacity

Straub Manufacturing Co., 18383 Baldwin St., Oakland 21, Cal., announces production of a 28-in. diameter fine reduction crusher with



capacity of 10 to 75 tons per hour. It is available with fine, medium or coarse bowl liners to suit different feed sizes and products. Receiving openings range from 1 3/4 to 3 3/4 in. Discharge settings range from 1/4 in.

Crawler attachments

Now available for use with John Deere 420 Crawler is a Shawnee Loadmaster front-end loader. Produced by Shawnee Manufacturing Co., Topeka, Kansas, the Load-



master has a lifting capacity of 3,000 lb. to a 9-ft. dumping height. The loader has large twin bucket cylinders and can be mounted on the tool bar of the tractor. The Scout D70HL backhoe has individual hydraulic powered leveling feet, hydraulic loader and operates on a drag principle which provides additional digging power. It digs 12 ft. deep, reaches 14 ft. and loads to 9-ft. dumping height.

Torque converters for large equipment

Heavy-duty, single-stage hydraulic torque converters for transmission use, 100 to 1000 hp. to excavating, earth handling, and construction machinery are described in Bulletin 468 newly issued by the National Supply Co., Two Gateway Center, Pittsburgh 19, Pa. Features and specifications of 17 sizes and capacities of National torque converters are given.

Portable Heltzel Batching Plant

*... combined with **Dual Drum***

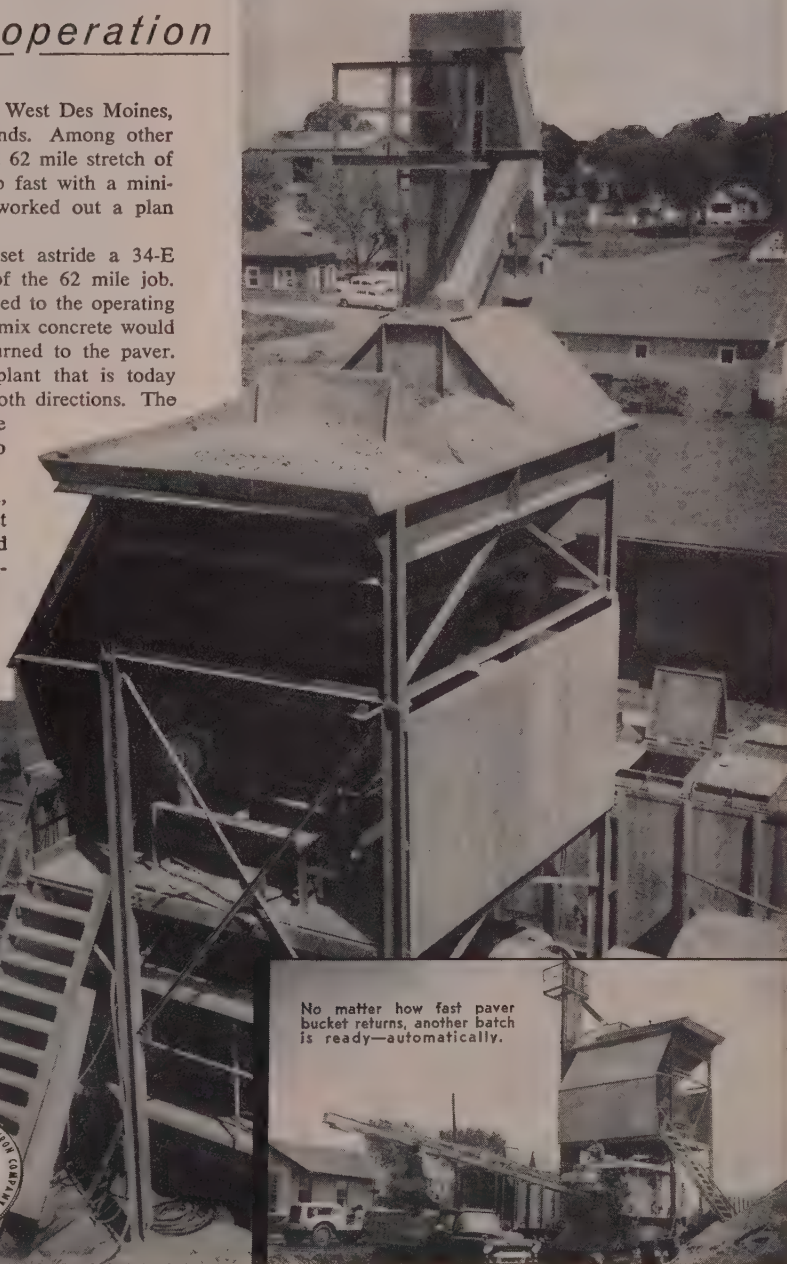
***Paver** gives midwest contractor unusually
flexible pre-mix operation*

Ronald Kenyon Construction Company, West Des Moines, Iowa, had an idea that's paying dividends. Among other jobs, they had a contract for widening a 62 mile stretch of highway. They wanted to work this job fast with a minimum of equipment. To do this, they worked out a plan and came to Heltzel.

A small 50-ton batching plant would set astride a 34-E Dual Drum Paver right in the center of the 62 mile job. The plant batching cycle would be indexed to the operating cycle of the paver so that a batch of premix concrete would be available every time the bucket returned to the paver. Heltzel engineers worked out such a plant that is today keeping a fleet of trucks operating in both directions. The job is ahead of schedule, and concrete production costs have been reduced to an absolute minimum.

If you have a concrete batching problem, why not bring it to Heltzel—for almost 50 years the nation's most experienced manufacturer of concrete handling, forming and spread equipment.

The compact operation requires no plant operator. Paver operator is all that is needed. Cement is drawn directly from car on siding.



No matter how fast paver bucket returns, another batch is ready—automatically.



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| ILLINOIS | NEW MEXICO |
| Chicago.....Columbia Equipment Co. | Albuquerque.....Contractors' Equipment & Supply Co. |
| St. Louis.....Columbia Equipment Co. | El Paso, Tex.....Francis Wagner Co. |
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| | Missoula.....Hall-Perry Machinery Co. |

**THE HLTZEL STEEL FORM
AND IRON COMPANY
WARREN, OHIO**

Davey line of mobile machine shops

A new line of Mobile Machine Shops is announced by Davey Compressor Co., Kent, Ohio. Shop assemblies vary from relatively simple



items of power equipment to vast collections of tools and accessories. Basic units are Davey air compressors and power and welding generators. These are driven direct from truck engine through a Davey heavy-duty power take-off. Shops can be mounted on practically every make and model of truck.

Two reinforced blades added to clipper series

Clipper Manufacturing Co. announces two additional specifications have been added to its "Polk-A-Dot" series of triple reinforced Break-Resistant Abrasive Blades. The CBR-914 is recommended for saw cutting on extremely hard ma-

terials such as hard glazed tile and brick, as well as other products of comparable density. The CBR-922 offers low cost cutting on lightweight type materials such as cinder block, pumice block, and certain refractories including insulating brick. The two new Clipper break-resistant abrasive blades are triple reinforced with extra reinforcing on both sides of the hub where the strain is greatest. For complete information, write to Clipper Manufacturing Co., 2800 Warwick, Suite 696, Kansas City, Mo.

Diagrams show use of Ramset tool

The first group in a series of diagrams showing different ways in which the Ramset tool can be used are being made available from Ramset Fastening System, 12117 Berea Road, Cleveland, Ohio. In this series such applications as the fastening of steel roof decking, steel deck plates, duct straps and others are discussed. Other ways of using the tool will be shown in the future. The pages are designed for easy loose-leaf filing.

New lift truck series by Hyster

An entirely new series of lift trucks of 3,000, 4,000 and 5,000-lb. capacity models has been introduced by Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore. All "styled by

Dreyfuss," the gasoline-powered Hyster 30, 40 and 50 feature compact, close-to-the-ground silhouette, increased safety, automobile-



controls, greater operator comfort and faster speed of operation. Traction steer wheels, short overall length and a short turning radius provided for high maneuverability. The Hyster 50 has a load lifting speed of 48 fpm. and 50 fpm. for the Hyster 30 and 40. Fast forward travel speed of 13.8 mph. is featured in all models of the series. Literature available.

Dragline buckets from Bucyrus-Erie

A line of completely new dragline buckets, offered with either solid or perforated baskets, has been announced by Bucyrus-Erie Co., So-



Here's why it pays to buy PAVING BREAKER ACCESSORIES BY PAVING BREAKER SPECIALIST

It's the breaker that supplies the power, but it's the *tool* that does the *work*! That's why I-R paving breaker steels and accessories are made to the most exacting specifications by the most advanced production methods. Far more than just a piece of steel, each I-R tool is engineered and produced to stand up longer on the job. Precision metallurgy and heat treating assure the right combination of hardness and toughness in the finished product—extra care and precision that pays off in longer tool life and lower replacement costs. Send for Bulletin 4126 on the complete I-R line.

Ingersoll-Rand
5-437
11 Broadway, New York 4, N. Y.

Look at the evidence of **MURPHY** **"TRUE DIESEL"** **OPERATION**



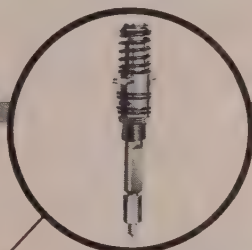
Look inside a Murphy Diesel for the reasons why Murphy engines are noted for economy, dependability and long life. You'll find design features ordinarily found only in large diesel engines... the "true diesel" features offered by no other engine in Murphy's size and power range.

Look for these features in your next diesel engine. Ask your Murphy Diesel Dealer to explain the advantages of "true diesel" operation for your power requirements.



Plain, Open Combustion Chamber

The Murphy Diesel's plain, open combustion chamber, like that of time-tested larger engines, assures complete combustion. Murphy owners get maximum power from each drop of fuel with less engine wear.



Precisely Controlled Fuel Injection

In the Murphy Diesel, fuel injection for each cylinder is accurately controlled by a simple injector unit which serves as both pump and nozzle. High pressure fuel lines are eliminated. There is no erratic, irregular injection, no after-dribbling or air binding.



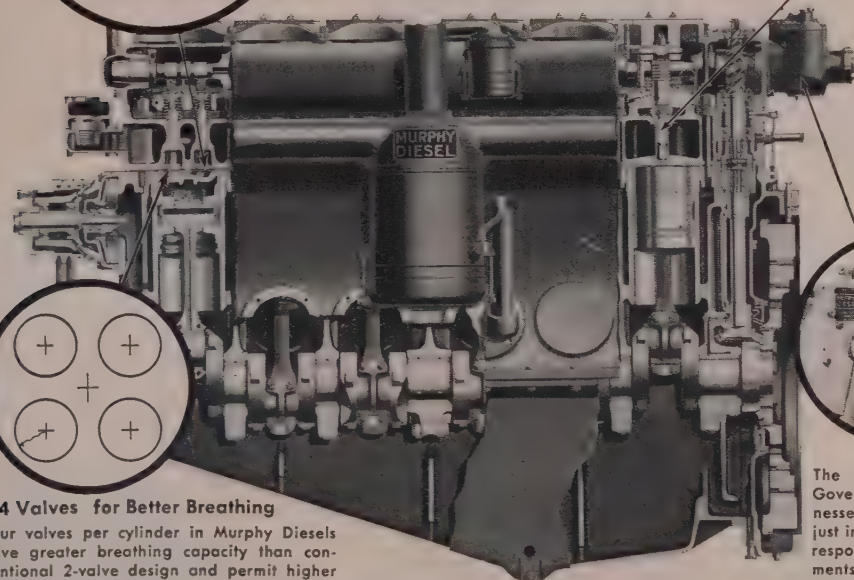
4 Valves for Better Breathing

Four valves per cylinder in Murphy Diesels have greater breathing capacity than conventional 2-valve design and permit higher power output. Because they run cooler, they rarely have to be ground. Valve troubles are virtually unknown.



Instant Response to Load Change

The exclusive Hydraulic Servo-Type Governor on a Murphy Diesel harnesses lubricating oil pressure to adjust injector controls for instantaneous response to changing power requirements. If lube oil pressure should drop below a safe level, the governor automatically shuts off the engine.



MURPHY DIESEL

350N

MURPHY DIESEL COMPANY

5325 W. Burnham St., Milwaukee, Wisconsin

SALES... PARTS... SERVICE

Throughout the Nation

Heavy-Duty Power for Construction

Murphy Diesel marine propulsion engines and auxiliaries are made in sizes from 96 to 243 H.P.; marine type generator sets from 64 to 165 K.W.



In Pasco, Washington, too—Clevelands® do the digging



DISTRIBUTION SYSTEMS in Pasco and Kenewick, Washington, are being constructed for Cascade Natural Gas Company by A. J. Curtis Construction Company of Casper, Wyoming. Even in alleys and similar narrow rights of way, such as the 4-inch main installation shown, Curtis, cashing in on the compactness and maneuverability of his Cleveland trenchers, is averaging 1,650 feet of trench per 6-hour day.

Crowded cramped quarters or open fields, rocky soils or easy digging—Cleveland's original compactness, maneuverability, exclusive wide range of power and speed combinations and recognized quality construction are the reasons they dig *more trench . . . in more places . . . at less cost.* That's why you'll find Clevelands leading the way on gas work in the Pacific Northwest—as they have *everywhere* for over 30 years.

THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



Milwaukee, Wis. Three types available in a wide range of sizes—BL for light-duty digging, the 1 for medium-duty digging and the 2 for heavy-duty digging conditions. The buckets and their parts are made of Becoloy, a steel alloy developed by the company for dragline bucket service. Full details available.

Swivel wheel on spreader prevents tipping

An aggregate spreader with swivel wheel arrangement on front which prevents the unit from tipping when unhooked from truck has been developed by Highway Equipment Co., Inc., 616 D A Northwest, Cedar Rapids, Iowa.



According to the manufacturer, this is the first major change in design of this type spreader in the last 10 years. A larger diameter feed roller with deep cut right and left spirals to grip material makes it possible to spread from fine sand to 2-in. diameter crushed rock. Full information available from manufacturer.

4-blade power trowel

A medium-size 4-blade cement finishing machine with crank adjustment to switch blade pitch while unit is in operation is announced by Superior Cement Tool Corp., 111 Wright Road, Lynwood, California. The new power trowel, called the prior Junior, weighs only 134



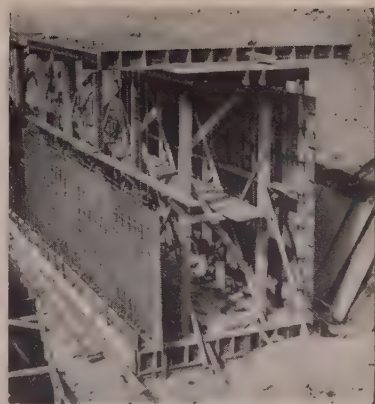
and is powered by a 2.5 hp. Briggs & Stratton gasoline engine and has a blade sweep diameter of 33 in.



SIDENCE FOUNDATION—Erects fast . . . two
ers only on inside; no liners on outs'de.



LARGE THEATRE in Alaska—Note minimum
alignment and bracing.



CONCRETE CULVERT—All Ply panels used 11
times in covering the 336 ft. length.



USH DESIGN—Simplifies stacking the forms at
s site. All Ply's weigh less than 5 psf.



OVING—Absence of wooden or metal frames
mits stacking up to 7500 sq. ft. of panels on
e truck.

SUPERIOR ALL-PLY FRAMELESS PANELS CUT FORMING TIME

Unique Combination Clamp and One Blow of a Hammer Does Three Separate Jobs

In all types of concrete form work, from residential to large industrial projects, contractors have reported the versatility and substantial labor saving of Superior All-Ply panels.

The panels are of 1 1/8" plywood, without a metal or wooden frame, yet providing great strength and rigidity.

A unique 3-way Combination Clamp (*the only working part*) is the secret of All-Ply's superiority . . . It does 3 separate jobs with one blow of a hammer: (1) Locks the panels; (2) Secures snap tie head, which acts as both spreader and tie; (3) Secures and draws up liners, which generally are required on one side only.

Weighing less than 5 lbs. per sq. ft., standard ALL-PLY panels come ready for use with Superior Snap Ties.

Panels come in standard sizes of 2 x 4, 2 x 6, and 2 x 8 ft. . . Also special corners and fillers as required. You can assemble your own panels using 1 1/8" plywood and hardware furnished with a jig by Superior.

On your next forming job, discover the convenience and labor saving of All-Ply panels . . . *for complete details request a copy of our 12-page catalog.*

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Million ELEMENTARY SCHOOL—Plywood face and rigid locking of forms by Combina-
on Clamp insure clean, true surfaces.

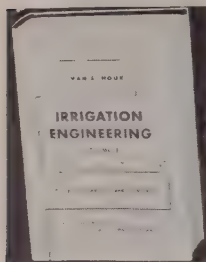


ONE BLOW of hammer
locks panel, secures snap
tie, holds liner.



ALL PLY PANELS come in
3 standard sizes: 2 x 4,
2 x 6 and 2 x 8 ft.

Ready Now!



A thorough,
up-to-date
survey of
planning,
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Projects, Conduits, and Structures

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An outstanding authority with years of experience in irrigation engineering presents complete information on all phases of projects, conduits and structures. Besides a thorough coverage of principles, the book stresses the practical requirements to be fulfilled in promoting, planning, constructing, and settling irrigation projects. It contains a comprehensive treatment of large gravity irrigation projects and their storage systems. Much of the information is unavailable elsewhere.

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Pick-up truck does fire fighting

H. S. Watson Co., Emeryville 6, Calif., announces production of a fire fighting kit for pick-up trucks. The



pump for the kit, takes its motive power from a power take-off shaft coming out of the rear end of the truck just under the body. The pump develops up to 350-lb. pressure to make a penetrating fog spray. For additional information, write the manufacturer.

Yumbo hydraulic shovel with ball bearing turntable

Now in production by Geco, Inc., is the Yumbo hydraulic shovel with ball bearing turntable which was developed in Italy seven years ago. The Yumbo is an all-purpose tool with the following attachments: 1/4-yd. backhoe, 3/8-yd. front dump bucket,

3/8-yd. rock bucket, 3/8-yd. gravel bucket, 1/2-yd. clamshell, 6,500-lb. crane hook. The backhoe has a digging depth of 10 ft. and a dumping height of 10 ft. The shovel has a dumping height of 10 ft. Geco Inc. P. O. Box 177, Denver, Colo.

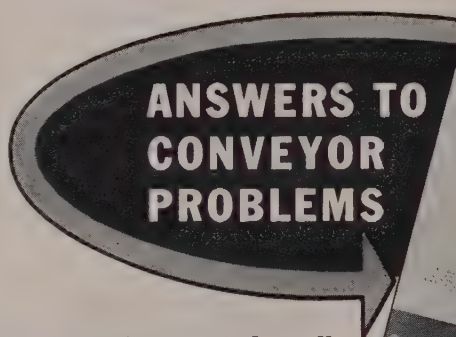
Special diaphragm pump for tough work

The Gen-A-Matic Corp. of 1474 Bessemer St., Van Nuys, Calif., is introducing a new diaphragm pump designed specifically for water laden with mud, sludge, sewage, pebbles and other foreign bodies that clog the action of ordinary centrifugal pumps. Special features of the pump include the long-life diaphragm, non-clogging valves, and the use of anti-friction bearings in the pump rod and in the main transmission. Pump is powered by a one-cylinder 4-cycle air-cooled gasoline engine with high tension magneto and impulse coupling, oil bath air cleaner, fuel tank and hand crank. Capacity is 6,000 gal. per hr.

Portable roller features power steering

A new 3-5 ton portable roller, said to be the first with complete power steering, has been announced by Littleford Bros., Inc., Cincinnati, Ohio. Power steering in the Model 160 is in operation at all times and is done with a steering wheel, not a

Yours for the asking...

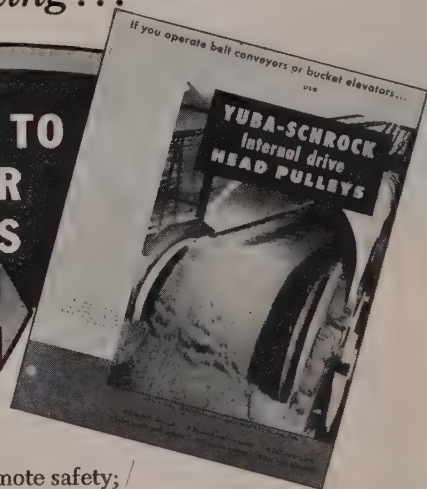


NEW, 4-page catalog tells
and shows how Yuba-Schrock
internal drive head pulleys

save space, cut downtime, promote safety;

liberally illustrated with photos of Western applications. Diagrams and charts give dimensions and speeds for sizes from 1 to 125 hp.

See for yourself how "the head pulley with the motor inside" solves conveyor problems. Write for your FREE copy of this Yuba-Schrock folder now.



YUBA MANUFACTURING CO.

701 East H Street • Benicia, California

107

STANG SETS A WELLPOINT RECORD

Note shovel marks next to concrete weight in foreground of photo. This clearly indicates how well the earth is stabilized—no sloughing—no extra hand work required.



2300 FEET OF 30 - INCH PIPELINE *laid in one day!*

Visualize more than a mile of header pipe with sufficient Stang Wellpoints to lower ground water level from 6 to 15 feet below subgrade in 2000 foot sections. That approximates the amount of dewatering equipment that Stang utilized in order to maintain a 1650 foot daily average (with a single-day high of 2300 feet) for the first two weeks on the job—amidst almost constant rainfall.

This 150 miles of 30-inch natural gas pipeline through southern British Columbia is

being laid for the Pacific Northwest Pipeline Corporation by Sparling-Davis Co., Ltd. of Canada. In order to complete the 24 miles of dewatering required on the job within approximately 60 working days Stang field engineers contemplate stepping up the working schedule sufficiently to end up with a 2000 foot daily pipeline installation average for the entire job. Don't slow down your production because of groundwater—use Stang Wellpoints and engineering services to protect your job profits!

Putting water
in its place



WRITE FOR BULLETIN 103-D,

JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems
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2339 Lincoln Avenue
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TULSA, OKLAHOMA
4026 South Urbana Street
Telephone: RIVERSide 2-6929

564

steering lever. Trailing to rolling positions are changed by means of a hydraulic lift. Trailing wheels are removable but need not be removed except when necessary since in the rolling position the trailing wheels are 5 in. above the rolling surface. Model 160 is powered by a 19.5 air-cooled engine, and has two forward, two reverse speeds. Descriptive bulletins available.

Arps half-track for Ferguson 40 tractor

The Arps Corp. of New Holstein, Wis., has recently announced that Arps steel and rubber-belted half-tracks are now available for the new Ferguson 40 tractor. Arps half-tracks are reputed to give the tractor as much as 440% added drawbar power when working under poor traction conditions. Lower cost and greater maneuverability are among the features of the half-tracks. Travel speed is 7 to 8 mi. per hr. faster than crawler tractors. Full information available.

Diesel generator plant

A new type of diesel generator plant has been developed by Lynn Engineering Co., Russ Bldg., San Francisco 4, Calif. Power-Lite model DG-2500 packs 2,500 watts of 115 volts, 60-cycle power in a package weighing only 315 lb. The plant

delivers electrical and mechanical power simultaneously through extra power take-off sheave for driving water pump or other vee belt driven equipment. The generator operates at 1,800 rpm., is glass insulated and completely moisture and fungus



proofed. The engines are rated 6 hp., 4 stroke cycle, with novel flywheel condenser and built-in water tank. No water pump, fan, or radiator is required as flywheel serves all these functions.

Material handling bucket for H-5 Hydrocrane

A new ¾-yd. clamshell-type material handling bucket, for use with the truck-mounted, all-hydraulic H-5 Hydrocrane, has been developed by Bucyrus-Erie Co., South Milwaukee, Wis. Designed for handling bulk materials, it features foot-controlled selector valves which enable the operator to channel all of the machine's available horsepower into the digging action. With two double acting hydraulic rams forcing the bucket bowls closed, no digging effort is lost through the hoisting action required to close cable-operated buckets. Bowls of this bucket are interchangeable with those of the ½-yd. digging bucket. To speed bucket changes, the tagline hose connection is equipped with a quick-disconnect coupling.

Improvements on Cleveland Formgrader

Power steering, a hydraulically operated cutter lift bar, and an improved self starter are now included as standard equipment on the Cleveland Formgrader. According to the manufacturer, Cleveland Formgrader Co., Mills Road, Avon, Ohio, the machine will cut 6,840 lin. ft. of form trench in six hours. The Formgrader uses a heavily weighted drive wheel which follows in the path of

Interested in bidding on

GOVERNMENT PROJECTS?



The Washington Service Bureau of National Surety Corporation issues Bulletins on U.S. Government projects. They tell who is issuing the invitations, where bids are being received and when they are being opened. To receive these bulletins, without obligation, write to either of the Central Bonding Offices listed below or to any of our Branch or Service Offices.



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VICTOR

Automatic Rods

Victor automatic hardfacing alloys go on 3 to 4 times faster than manually-applied hardfacing, enable you to make big savings in labor costs. And if you're repairing equipment, cutting down time by $\frac{2}{3}$ or $\frac{3}{4}$ likewise is a terrific saving. You get a more uniform deposit, too, from Victor automatic hardfacing alloys, resulting in longer, more even wear. Check this chart — you'll find there's a Victor type for every hardfacing need.

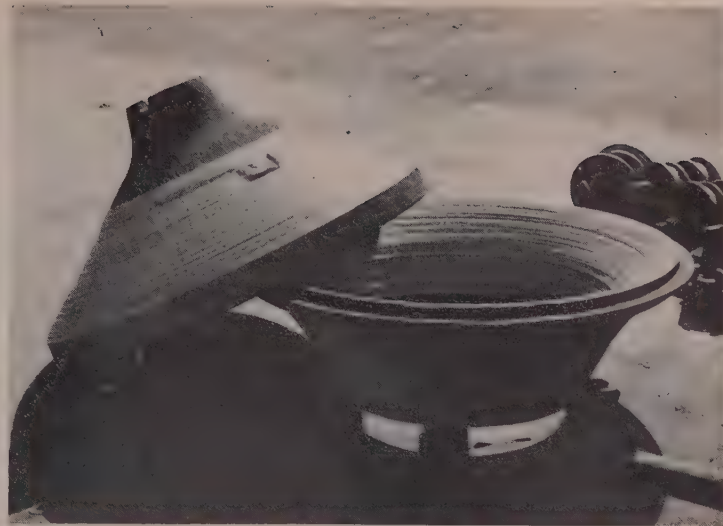
Learn for yourself how hardfacing with Victor automatic rod reduces labor and repair down time. Ask your Victor dealer for Bulletin 358—or better yet, order a coil of rod NOW and try it on your job.

**PROFITABLE
DEALERSHIPS OPEN;
INQUIRE NOW!**

VICTOR EQUIPMENT COMPANY

ALLOY ROD AND METAL DIVISION

Los Angeles 59, California • Wakita, Oklahoma



Note even deposit of Victor VA#3 automatic rod on gyratory crusher cones.

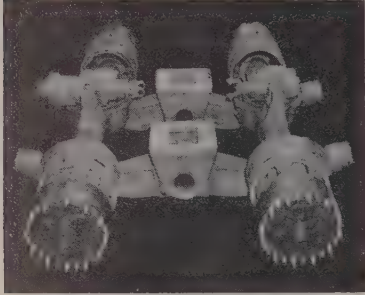
TYPE	USES	PROPERTIES AND APPLICATION
VA #1	Crusher Rolls Gyratory Crushers Crusher Mantels Scraper Blades	Rockwell 'C' 54-57 Impact Resistance—good Abrasion Resistance—high AC-DC submerged arc or DC open arc
VA #2	Pinch Rolls Tractor Idlers Tool Joints Coiler Rolls	Rockwell 'C' 50-52 Impact Resistance—good Abrasion Resistance—good Submerged arc only Suitable for multiple passes
VA #3	Roll Crushers Gyratory Crushers Impellers Mill Guides	Rockwell 'C' 54-57 Impact Resistance—good Abrasion Resistance—high For use where abrasion is severe Submerged arc only
VA #4	Tractor Rollers Sheave Wheels Tractor Idlers	Rockwell 'C' 25-28 Impact Resistance—excellent Abrasion Resistance—good Submerged arc only Suitable for multiple passes Machineable
VA #5	Tractor Rollers Sheave Wheels Tractor Idlers Grader Blades	Rockwell 'C' 34-38 Impact Resistance—high Abrasion Resistance—good Suitable for multiple passes Submerged arc only
VA #6	Crane Wheels Roll Necks Pump Sleeves	Rockwell 'C' 38-41 Impact Resistance—high Abrasion Resistance—fair Suitable for multiple passes Deposit machineable Submerged arc only
VA #7	Excellent base for high alloy application. Mine Car Wheels	Rockwell 'C' 36-42 Impact Resistance—excellent Abrasion Resistance—good Suitable for multiple passes Deposit machineable Submerged arc only
VA #8	Tool Joints Grader Blades Scraper Blades Roll Crushers	Rockwell 'C' 51-54 Impact Resistance—high Abrasion Resistance—high Submerged arc only
VT #60	Tool Joints Grader Blades Scraper Blades	Automatic Tungsten carbide wire Abrasion Resistance—excellent (maximum) Deposits are heterogeneous Open arc—DC reverse only

Rod diameters 1/8", 5/32" and 3/16". Standard coil size, 22-1/2" inside diameter, 4" wide, approximate weight 100 lbs.

the cutter blade and simultaneously compacts and rolls the trench ready for instant setting of forms. It is also available with a crawler track drive.

30-ton axle assemblies

The first of a line of special purpose tandem rear axles for rubber-tired cranes is now being offered by the **Industrial Brownhoist Corp.**, Bay City, Mich. The new axle assemblies



are intended primarily for use with crane carriers rated at 30 tons or more lifting capacity. Now in production is the Model 440 which is designed for cranes of 30 to 50-ton rating. It employs a conventional differential center unit combined with a planetary wheel for final reduction to produce overall axle ratios of 17 to 42.

Mobile generators

A mobile generating set, permanently housed in a tractor-trailer unit, has been developed for use as



highly maneuverable, trouble shooting electric power by White Diesel Engine Division of the **White Motor Co.**, Springfield, Ohio. The units, available in 350- and 500-kw. sizes, are built into Fruehauf trailers and are hauled wherever needed by gasoline-powered White 3000 series tilt-a-cab tractors. White Mustang engines power the tractors which have 145-in. wheel bases. The heart of the system is a model 40 Superior diesel engine fed fuel from a tank on the trailer's belly. One tank of fuel can drive the generators at capacity for 12 hr.

44-in. sickle bar mower

A new sickle bar mower, Model H Champion, is being made by **Jari Products, Inc.**, 2990 Pillsbury Ave. S., Minneapolis 8, Minn. A lightweight aluminum engine reduces the overall weight of the machine by 12 lb. and delivers 2.75 hp. Greater power permits the use of a 44-in. sickle bar which is 8 in. longer than standard sickle bars. The self-propelled mower



is recommended where large areas must be cut in the least possible time. Cutting height is 1½ in.

Three prong stumper

A new stumper, the Ransome model R100, has been introduced by **The Ransome Corporation**, 2729 Hunting Park Ave., Philadelphia 29, Pa. The new three prong stumper can be attached to any bulldozer blade from 35 to 51 in. in height. The model R100 features a positive clamping device which permits its



being mounted or dismounted in a matter of minutes, freeing the bulldozer for gathering stumps. No alterations to the bulldozer blade are required. The Ransome stumper has replaceable manganese teeth.

Hoist cylinders protected by steel check bars

A new type of check bar, now standard equipment on all Galion trailer dumps with under body hoists, is announced by **Galion Allsteel Body Co.**, Galion, Ohio. The new check bars, fabricated of 1¼-in. alloy steel, are designed to protect the hoist

Advertisement



Symons Forms on 2½ Million Gal. Reservoir Tank

Cahill-Mooney Construction Co., Butte, Montana, general contractor, used approximately 5,000 square feet of 2' x 6' Symons Concrete Forms to build this reservoir tank which is 130 feet in diameter and 25 feet high. The tank will hold 2½ million gallons of water, and was constructed for the Butte, Montana, water department.

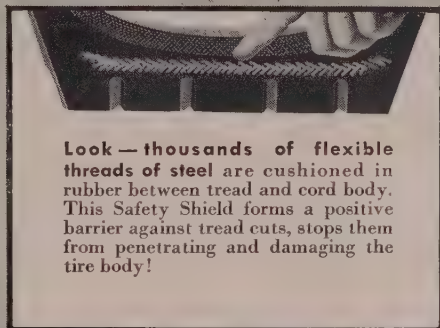
Symons experienced engineers' ability to tackle and analyze any job, no matter how large or small, is your assurance of efficient, money saving form erection. With your plans, our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient and cost saving method of forming.

Symons Forms, Shores, and Column lamps may be rented with purchase option. Our general catalog is available FREE upon request. Symons Clamp & Mfg. Co., 683 Thornton Street, San Leandro, California.

Tread Cuts Are Stopped

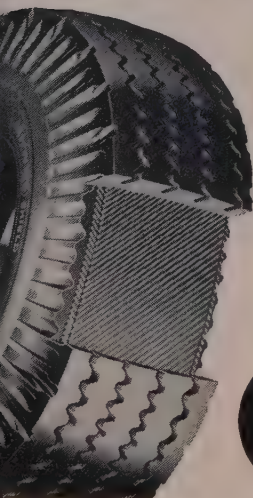
by new
exclusive

SAFETY **STEEL** SHIELD



Look — thousands of flexible threads of steel are cushioned in rubber between tread and cord body. This Safety Shield forms a positive barrier against tread cuts, stops them from penetrating and damaging the tire body!

U.S. ROYAL Truck Tires



You are looking at an entirely new kind of truck tire. It combines the strength of *steel* with full flexibility, light weight and soft ride—without increased inflation.

Because this new U. S. Royal is *invulnerable* to cuts and ruptures in the tread area, it gives you the longest, most trouble-free service in truck tire history. Because steel cord shields its carcass, it remains undamaged for more safe recapping, making it

the most economical of truck tires.

On new U. S. Royals like this, your trucks ride secure from sudden tire failure. Your loads are protected from damage due to accident, from spoilage due to road delays.

You'll find that these new U. S. Royals cost *surprisingly little*. Ask your U. S. Royal Dealer now! And remember you can specify them on any new equipment you buy!



United States Rubber

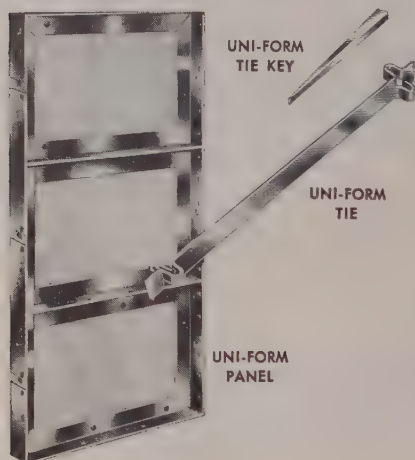
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SIMPLE . . . FAST . . . FLEXIBLE

**3 BASIC ELEMENTS mean
Faster, Easier, More Accurate Forming**



Simple mechanical assembly of UNI-FORM Concrete Forms provides faster forming . . . easier stripping and lowest all around costs. Ready to use when they reach the job, UNI-FORMS guarantee time, material and labor savings on any forming job. Let us prove UNI-FORM advantages . . . send us a set of prints for free recommendation and proposal on your next job. There's no obligation.

FORM CIRCULAR WALLS AT LOWEST COST

- No alignment or bracing on outside.
- Free working area.
- Minimum excavation required.
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UNI-FORMING Circular walls costs less per square ft. of contact area . . . provides unhampered steel setting . . . greater control of concrete placement. Write for details on UNI-FORMING circular walls.

PREFABRICATED CIRCULAR WALL FILLER

Used on outside form only . . . assures true form curvature with standard UNI-FORM Panels.



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McCRACKEN RIPLEY CO.	Portland 12, Oregon

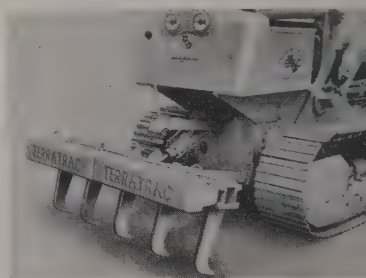
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cylinders by preventing over-travel of the body when dumping stick loads. Hinged to the longitudinal and sliding on 2¼-in. pins welded to the chassis, the bars are at a 90-deg. angle to the body understructure at a maximum dump angle. They swing up parallel to the chassis frame when the body is down. Provision is made for pressure lubrication.

Hook gives positive lift to scarifier

A new manually-operated carry-over hook is now furnished on all current model TerraTrac crawler-tractors equipped with hydraulic scarifiers, according to American Tractor Corp., Churubusco, Ind. The carry-



hook, designed to take weight off the hydraulic cylinder when scarifier is not in use, is engaged or released by a lever from operator's seat. Used for ripping hard ground, black-top, etc., they are available with four or five removable teeth on all eight TerraTrac diesel and gasoline-powered loader and dozer models, from 2 to 62 hp.

Portable drill weighs 53 lb.

A completely self-contained drill which has a total weight of only 53 lb. is now available from Atlas Copco Pacific, Inc., 930 Brittan Ave., San



Carlos, Calif. The Cobra will drill up to 26 ft. an hr., and to depths of 13 ft. Operational average is 100 drilling ft. per gal. of gas. The one-cylinder double-stroke, free-wheeling motor has a pull type starter, and a floatless carburetor that permits inclining drilling positions up to 45 deg. Steep changes or conversion of the drill to a rock-pavement breaker is rapidly accomplished.



Macks are popular on the St. Lawrence Seaway... and for good reasons—their bonus capacities, sure-footed traction, and dependable power pay off. (Right) A Mack lineup ready for work on...

The St. Lawrence Seaway... a big job for big trucks...

...a job for a lot of heavy-duty Macks—that's the conclusion of Miron & Freres, Limited, the contractor working on the Cote St. Catherine section of the St. Lawrence Seaway. They are using Mack off-highway dumpers exclusively, over 30 of them, for their big earth-moving job. And their big Macks are paying off for them in real hauling efficiency—plenty of power for big payloads with

minimum maintenance costs... even during winter operations.

Like these big dumpers, all of Mack's heavy-duty construction chassis for concrete mixers, tractors, and flat bed trucks can be relied upon for outstanding performance. Rugged construction, dependable power, low maintenance, as well as such features as Mack's Balanced Bogie and ex-

clusive Power Divider—the four-wheel tandem drive that delivers power only to the wheels with traction—make Macks the logical choice for getting jobs done on schedule, and at a profit.

For full details, see your Mack Branch or Distributor. Mack Trucks — Los Angeles • Denver • Portland • Seattle • San Francisco • Salt Lake City • Albuquerque.

MACK
first name for
TRUCKS

High boom crane for Gradall

A new high boom crane that provides a reaching height of 25 ft. is now available as optional feature on all models of the multi-purpose Gradall manufactured by Gradall Division, Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio. The high boom retains all the operat-



ing features of the standard boom—telescoping action, tilt action, attachment wrist action, 360-deg. swing, and up and down movement. Available also is a grapple with four tines, each individually controlled with hydraulics. The tines can be operated independently, in pairs, or all at the same time.

International heavy-duty trucks with V-8 engines

A new V-Line of International heavy-duty trucks, featuring three new V-8 engines, is now in production by International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill. Nine series of trucks in conventional and cab-over-engine, four and six-wheel design, comprise the V-Line. Models are available with gross vehicle weight ratings of 24,000 lb. and up, and gross combination weights of 50,000 lb. and up. Power is supplied by new International V-8 engines of 401, 461, and 549-cu. in. displacement with hp. ratings of 206, 226, and 257 respectively.

Excavator adapted as truck crane

Production of a truck crane version of the recently improved model 305 excavator has been announced by Koehring Co., Milwaukee 16, Wis. As a crane, it will lift loads up to 25 tons and its road travel speed is listed at 30.2 mph. The upper machinery arrangement has been simplified to contain only two major horizontal shafts, and the all-welded turntable is equipped with integral sidestands on which the main cross shafts revolve in antifriction bearings. The truck crane turntable swings on six adjustable hook rollers that resist



tipping in any direction. The unit can be adapted for any type of crane operation, including lift, clamshell, dragline, grapple, magnet and pile driving work.

Swinging drawbar for traxcavators

A new swinging drawbar attachment for No. 955 traxcavators has been announced by Caterpillar Tractor Co., Peoria, Ill. Designed to give the No. 955 all the drawbar versatility of the D4 tractor, it can be used to pull the No. 40 scraper or any other piece of towed equipment. The center of the new drawbar's clevis is 15½ in. above ground. The drawbar has a lateral movement of 21½ in., and can be locked in any of several positions.

Power steering for tractor

Latest addition to the tractor accessory line of Sherman Products Inc., Royal Oak, Mich., is a new hydraulic power steering unit for attachment to the Fordson-Major diesel tractor. A combination hydraulic servo valve and cylinder actuated by the pitman arm of the tractor steering column. Hydraulic power is supplied by a self-contained pump and reservoir unit, driven by a V-belt from the generator pulley on the tractor. The Sherman unit eliminates side thrusts and shocks which normally tug at the steering wheel and makes steering easier when the front of the tractor is weighted down by a heavy attachment.

½-yd. yard crane

A ½-yd. self-propelled yard crane is being produced by Little Giant Crane & Shovel, Inc., East Sixteenth and Howard Drive, Des Moines 1, Iowa. According to the manufacturer, a patented ball bearing turntable provides a lower center of gravity, greater stability and easier swinging. The unit is equipped with hydraulic servo steering, hydraulic power braking, accompanied with spring loaded parking brakes. Designed for crane or shovel work in



cramped quarters, the unit will turn in less than a 60-ft. circle, with a 360 deg. vision cab for the operator. Priced at \$14,900.

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Ray Wayne.....1869 Hedges St., Fresno, Calif.

Capitol Scaffolding & Equipment Co....North Sacramento, Calif.

Borchers Brothers.....342 North Second St., San Jose, Calif.

The United Materials.....814 West 14th Ave., Denver, Colo.



the INSLEY type WB

full heavy duty 1 yd. Rock Shovel

- Deck and machinery side stands constructed as a one piece weldment.
- Heavy gauge, all steel cab, $\frac{3}{8}$ " protective rear plates.
- Hook and load roller construction.
- Internal expanding mechanical clutches with booster operated drum clutches.
- Independent boom hoist.
- Gasoline, diesel or electric power.
- Crawler, self-propelled Maxi or Lorry (truck) mounting.
- Fully convertible to all front end attachments.

With optional features for any excavator-crane job:

Power Load Lowering ● Independent Travel ● Third Drum ● Fluid Coupling or Torque Converter

INSLEY MANUFACTURING CORP. • INDIANAPOLIS, IND.
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News of DISTRIBUTORS



SCENE at J. I. Case Co.'s recent Allied Equipment Dealer Meeting held at Stockton, Calif., Aug. 24. Approximately 125 men attended from the Case dealer organization in Northern California and Nevada. At a corresponding meeting held at Riverside on Aug. 31, there were in attendance approximately a hundred representatives from the dealer organization in Southern California and Nevada.

Manitou's new Seattle branch

Manitou Equipment Co. of Portland, Ore., announces the addition of P. C. "Phil" Royer and R. C. "Breezy" Johnston to its personnel. The former is vice president and branch manager, and the latter assistant at the new Seattle branch which Manitou opened in July to serve western Washington with sales, parts, and service facilities for Unit Crane & Shovel Corp. products. The new branch address is 5602 First Ave. So., Seattle 8.

Andrews employs man for new lines

Andrews Equipment Service of Washington, Spokane, recently acquired the Pettibone-Mulliken line of Cary-Lifts and Speedall loaders; Wagner prime mover tractors complete with Be-Ge scrapers and Vibro-Plus vibrating rollers. They have employed Roy Shuler for the Basin territory, specializing in road machinery, to handle the recently acquired lines. Ray Leighton moved from the Basin to take care of Spokane County.

The location at 126 S. Walnut where Andrews has been for fourteen years is being purchased by the City of Spokane for right-of-way for the new Maple Street bridge and has to be vacated by January 1. A new building on the site of Andrews' present yard at 4620 East Trent Ave. will be ready for occupancy by that time.

Heil distributes Talbert trailers

Heil Equipment Co., San Francisco distributor, has been appointed exclusive dealer for Talbert removable gooseneck machinery trailers. This

equipment is manufactured by Talbert Trailers, Inc., at Lyons (Chicago suburb) Ill.

News of Continental Sales

Ben F. Tobin, III, sales engineer for Continental Sales & Service Co., was recently appointed to the position of assistant sales manager. After an absence of two years W. E. "Bill" Maine returned to the company as sales engineer. The Hallett diesel engine line was recently taken on by this Los Angeles distributor.

New salesman; new outlet

Added to the Portland office of Cramer Machinery Co. is Bill Kempthorn, who becomes city salesman. A new branch in Eugene, stocking smaller accounts, is under the direction of George Groom, manager.

Cummins parts store opens in Reno

Watson & Meehan announces the opening of a Cummins parts store in Reno, Nev., located at 1126 East Fourth St. The store will carry a complete line of Cummins parts, including cylinder blocks, crankshafts, camshafts, heads, pistons, liners, etc. K. M. "Ken" Mirch is in charge. He will also continue to cover the Nevada, as well as the Feather River and Truckee areas in California, as in the past.

Advancement by Peterson Tractor

Formation of an engine sales department with Glenn W. Peterson as engine sales manager is announced by Frank Castellucci, general sales manager, Peterson Tractor & Equipment Co., Caterpillar—John Deere

dealer, San Leandro, Calif. Fred H. Stevens, formerly chief design engineer of the special equipment department, has been transferred to assist on engine sales and layouts.

Peterson also announces through Elmer Miller, service manager, the promotion of Ray Giezl from service representative to the new post of assistant service manager; John Strange from service shop manager to service representative, and Arthur Crow to service shop manager. New offices, control center and a complete reference library have been added to this department. Also recently put into effect is an apprentice training program for new mechanics, with James Brownson as instructor.

California distributors appointed

The Prime-Mover Co., Muscatine, Iowa, announces the appointment of two new distributors for California. Essick Machinery Co. is exclusive distributor for Southern California, with headquarters at 1950 Santa Fe Ave., Los Angeles. The authorized distributor for Northern California is Ricker Machinery Co., 302 Fourth St., Oakland. Prime-Mover manufactures powered carts for placing concrete and hauling other building materials.

Euclid Div. names dealer

J. W. Bloomquist, domestic sales manager of Euclid Division of General Motors Corp., announces the appointment of a new authorized dealer for the full line of Euclid scrapers, rear-dumps, bottom-dumps and crawler tractors. Archer Tractor & Machinery Co., 1118 S. Main St. in Salt Lake City, will represent Euclid in Utah, southwestern Wyoming and Elko and White Pine counties in Nevada.

Hatten named Wooldridge rep

Appointment of Hatten Machinery Co. as exclusive distributor for the Wooldridge complete scraper line in western Washington has been confirmed jointly by the Seattle distributor organization and Wooldridge Manufacturing Division, Continental Cooper & Steel Industries, Inc. Complete parts, sales, shop and field service facilities are offered by the Hatten company, which is headed by J. T. Hatten, president, and C. C. Pecnik, sales and service manager. The sales organization includes E. L. Wellington, Ray Larson, E. J. Brower, and R. P. Markle. Frank Longhi is parts manager.

Parts and service on 24-hr. basis

Hamilton Engine Sales, Inc., Portland, Ore., has the Buda Division, Allis-Chalmers' franchise for Oregon and the river counties of Washington, for all A-C marine engines from 10 to 516-hp., with parts and service on a 24-hr. basis. Hamilton is also equipped for service on Twin Disc, Capitol, and Torcon marine gears, convertors and clutches.



NEW SUPER MILEAGE LUG TIRE CUTS YOUR HAULING COSTS

PULLS BETTER OFF ROAD, TOO!

Here is a new Firestone tire that will cut your operating costs to the barest minimum.

On hard paving, its deep-ribbed, wide center treads move along smoothly without the tire-wearing, equipment-killing vibrations so often set up by ordinary type heavy-duty tires. As a result, you get more original tread miles. And, heavy lug bars give you all the pulling power you need for off-the-road duty.

Firestone Super Mileage Lug tires have 60% deeper tread to give you more low-cost miles. More than that—they are built with husky, Safety-Tensioned *Gum-Dipped*[®] cord bodies. This exclusive Firestone process gives a stronger tire body and makes it possible to get more retreads on every tire.

Any way you look at it, you'll save money with Firestone Super Mileage Lug tires! If you operate dump trucks, cement mixers, logging, mining or any other heavy-duty trucks, it will pay you to contact your Firestone Dealer or your Firestone Store now for the best deal you ever got on the longest wearing, most dependable tire ever built for on- and off-the-road performance!

Test after test proves you get extra original tread miles and more retread miles at lower cost with Firestone Super Mileage Lug Tires.

**DEEPER
TREADS
LAST
LONGER!**



**WHEN YOU BUY NEW EQUIPMENT
OR REPLACEMENT TIRES SPECIFY**

Firestone

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC.

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When welded
structural designs

Have simpler
details . . . more
usable room

Yet require
less steel . . . fewer
hours to erect

WHY
shouldn't all
your designs
be welded



Ask
**THE
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COMPANY**

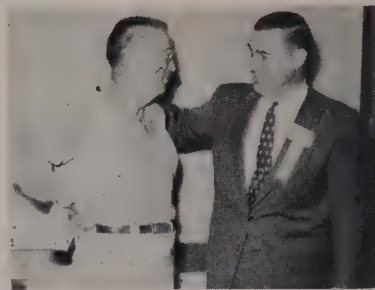
Cleveland 17, Ohio

*The World's Largest Manufacturer of
Arc Welding Equipment*

ATTENDING THE A.E.D. CONFERENCE

Region 12 of the Associated Equipment Distributors held its annual conference Sept. 6-8 at Shore Lodge near McCall, Idaho. Phil Dufford, Director of Region 12, and general manager of Intermountain Equipment Co., Boise, presided at the general sessions. Peter H. Cohn, president of Starline Equipment Co., Boise, was general chairman of the conference.

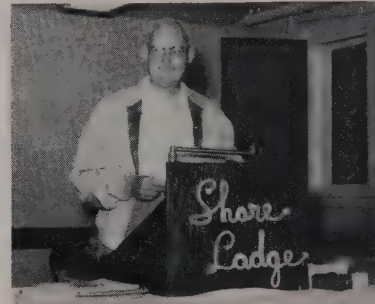
Stan Laskey, international president of A.E.D., spoke on "Are You Ready for the Highway Bill." L. Miner Doolen, executive vice president of A.E.D., and Frank Skidmore, director of industrial relations of national headquarters staff, also attended.



Director Phil Dufford thanks Gov. Robert E. Smylie of Idaho for speaking at the opening session, Sept. 6. Fifty-one member companies were represented at the conference.



Stan Laskey, International President of A.E.D., lines up a shot during the golf tournament which followed the meetings on Sept. 7.



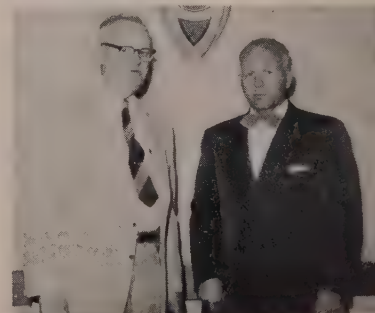
Freeman Sersanous, Loggers & Contractors Machinery Co., Portland, presents resolutions during the closing session of the three-day conference.



Idaho foursome wins perpetual golf trophy held by Peter H. Cohn, president, Southern Idaho Equipment Distributors. Members of the winning team are (left to right) Phil Dufford, S. T. Collins, Jr., S. L. Cate, Jr., and M. G. Gooch.



Frank Skidmore, (left) Director, Industrial Relations of A.E.D., and L. Miner Doolen, (right) Executive Vice President, A.E.D.



H. W. Hurd, Engineering Sales Service, Inc., Boise, and H. H. Ellsworth, Secretary, Emergency Committee on Intermountain Freight Rates.

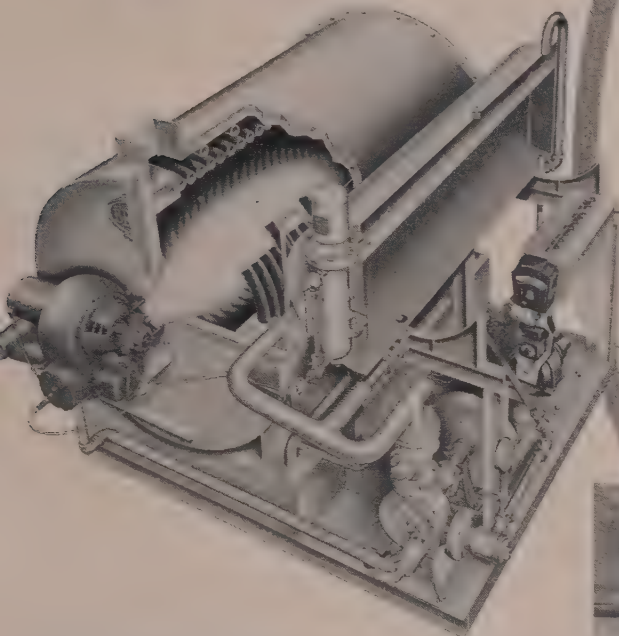
ASPHALT PLANT OPERATORS

Increase Heat
Transfer

60%

..with the **BROS**

Hi-Heat Oil Heater



Fast, automatic operation of the Bros Hi-Heat Oil Heater provides heat transfer 60% faster than steam. Temperatures up to 500° F. are quickly reached and maintained.

Design and construction are backed by 75 years of experience in heat transfer equipment. The Hi-Heat unit eliminates the need for licensed standby engineer. Low pressure operation naturally reduces your insurance requirements. And electronic controls provide the ultimate margin of safety under all conditions. Readily portable.

HI-HEAT DESIGN FEATURES

Coil Furnace Efficiency. No other furnace design provides such controlled flow of the oil volume through its heating chamber. This flow eliminates any "breakdown" or carbon separation of the high temperature oil. Assures longer furnace life.

"Cold Oil" Seal Protects Oil. Oil expansion tank is separated from the through-flow of the high temperature oil circulating system, providing a "cold oil" seal. This seal keeps the oil in the expansion tank relatively cool . . . and prevents oxidation of the high temperature oil.

Completely Automatic Operation. The Bros Hi-Heat Oil Heater is equipped with the finest automatic performance

BROS

DISTRIBUTORS

ARIZONA EQUIPMENT SALES

Phoenix, Arizona

WESTERN EQUIPMENT CO.

Boise and Idaho Falls, Idaho

PIONEER EQUIPMENT CO.

Reno, Nevada

THE HARRY CORNELIUS COMPANY

Albuquerque, New Mexico

CROOK COMPANY

Los Angeles, California

McCOY MANUFACTURING COMPANY

Denver, Colorado

LOGGERS & CONTRACTORS MACHINERY

Portland, Eugene, Oregon

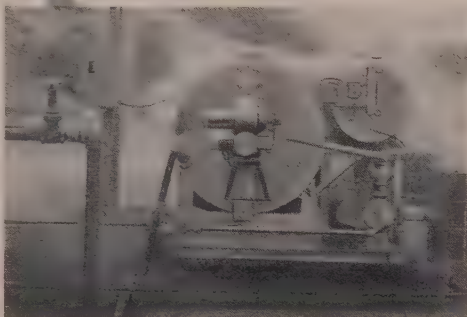
COAST EQUIPMENT COMPANY

San Francisco, California

KEREMI TRACTOR AND EQUIPMENT CO.

Casper & Cheyenne, Wyoming

SALES & SERVICE



BROS Hi-Heat Oil Heater hookup on a typical asphalt plant showing the piping connections to the heater.

and safety controls available. A temperature control indicator regulates actual temperature of the heat transfer oil. Burner is either "full on" or "full off" in response to the demands of the oil temperature indicator, and also automatically recycles. Oil level in the system is automatically maintained.

Safety controls include flame failure control, low oil level control and extreme temperature control.

Weatherproof Electric System. The Bros Hi-Heat Oil Heater is completely electrically operated, providing a smooth, constant flow of power. Completely weatherproofed with all controls centralized.

3 Sizes — Oil or Gas Firing. Bros Hi-Heat Oil Heaters are available for oil and gas firing; capacities range from 1,400,000 to 2,800,000 hourly BTU input.

Get all the Hi-Heat facts and features from your nearest Bros equipment distributor, listed above.

BUY THE COMPLETE BROS TEAM FOR LOW COST ROAD BUILDING



Self-Propelled Roller



Roto-Mixer



Preparator

BROS

Road Equipment Division
WM. BROS BOILER & MFG. CO.
Minneapolis, Minnesota

MANUFACTURERS

Pioneer elects two vice-presidents

W. A. Rundquist has been elected vice president, sales promotion, and A. J. Belanger, vice president, sales, according to announcement by O. J. Ellertson, president of Pioneer Engineering Works, Inc., Minneapolis.



Rundquist



Belanger

Rundquist is also director of advertising and public relations for Poor & Company, the parent company. Belanger joined Pioneer's engineering department in 1940, where his activities were devoted principally to the design and development of the firm's continuous process bituminous plants. In 1951 he was appointed assistant sales manager, and in 1953 was named sales manager.

New West Coast sales manager

Barber-Greene Co., Aurora, Ill., manufacturer of asphalt mixing and paving equipment, belt conveyors, loaders and other construction equipment, recently announced the appointment of Marshall C. Ham as sales manager for the area encompassing the states of Arizona, California, Oregon, Washington, Utah, Nevada and Idaho. Ham succeeds



Marshall C. Ham

E. L. (Shean) Benson who has been the company's sales manager in this territory (Area VIII) since 1946. Benson has been appointed to the new post of district manager, conveyor sales, and will concentrate on promotion of the company's line of belt conveyors in California and Nevada. Both Benson and Ham will operate out of B-G's West Coast headquarters in San Mateo, Calif

Harry C. Boardman dies

Harry C. Boardman, 69, director of research, Chicago Bridge & Iron Co., Chicago, Ill., died on Aug. 6 in Chicago.

E. K. Kelly succeeds Truxell

Appointment of Eugene K. Kelly as works manager of the Detroit Diesel Engine Division of General Motors is announced by Clyde W. Truxell, general manager. In his new post Kelly succeeds Truxell whose appointment as general manager was also recently announced.

R. H. Gillespie promoted

Appointment of R. H. Gillespie as fleet sales manager for GMC Truck & Coach Division of General Motors is announced by R. C. Woodhouse, general truck sales manager. Under the general supervision of J. M. Gilroy, assistant general truck sales manager, Gillespie directs an expanded fleet sales activity from the GMC home office at Pontiac, Mich. He succeeds A. S. McEvoy who will handle special assignments for the general manager. Gillespie served as national fleet sales representative in San Francisco from 1936 until 1952 when he moved to New York.

Hendren named v.p. of CB&I

R. F. Hendren, manager of plants of the Chicago Bridge & Iron Co., Chicago, has been elected a vice president of the firm. Joining CB&I in 1923, Hendren has been a director of the company since 1946 and manager of plants since 1947.

American Hoist names Gough

Appointment of Percy S. Gough as sales manager of the Crosby-Laughlin Division is announced by John E. Carroll, president of American Hoist & Derrick Co., St. Paul, Minn. Gough joined the sales department of American Hoist in 1937. In recent years he has been manager of distribution, handling distributor relations. Gough will move from St. Paul and make his headquarters in Fort Wayne, Ind.

Marion department changes

Marion Power Shovel Co., Marion, Ohio, announces a reorganization of the firm's service department and personnel changes within the department. R. P. Sullivan is promoted to the new position of manager of service and erection. C. S. Jarvis assumes Sullivan's previous duties of service manager, and will be assisted by L. D. May and James S. Hotz. A veteran of more than 41 years' service with the company, Sullivan had been service manager since 1942.

New Los Angeles district sales mgr.

Donald L. Reid has been appointed Los Angeles district sales manager, mechanical goods division, United States Rubber Co., according to announcement by Purdy Miller, manager, branch sales, for the division. He succeeds D. H. Meissner, who is transferred to the company's Passaic plant.

New Permanente division

A new contractor sales division has been established by Permanente

Cement Co. Offices for the new division have been opened at 235 Montgomery St., San Francisco. C. C. "Cless" Moore, a veteran of eleven years sales experience with Permanente, has been appointed sales manager. In addition to Moore the staff will include Harold H. Ashton, C. H. "Hank" Schneider, and B. F. "Tommy" Thompson.

Gebhard heads Western subsidiary

The appointment of Irvin L. Gebhard as general manager of Koehring Company of California was recently announced. Gebhard succeeds Harry



Irvin L. Gebhard

R. Powers who earlier this year was named district representative of the company's Northwest territory. Gebhard will be in charge of all operations of this West Coast subsidiary of the Koehring Company, Milwaukee, manufacturer of heavy duty construction equipment. Under his management will be the servicing of Koehring equipment for users in the eleven Western states as well as the manufacturer by the West Coast firm of some parts and other equipment.

Heads new sales reorganization

Reorganization of Gar Wood Industries construction machinery sales department is announced by Milton G. Peck, vice president and director of sales. David J. Davis steps into the newly created position of general manager, construction machinery. Davis, formerly sales manager for



David J. Davis

Gar Wood tractor equipment sales, will direct construction machinery sales activities from new headquarters in Findlay, Ohio.

New Martin district rep

Martin Machine Co., Kewanee, Ill., announces the appointment of Don Hartzell as district representative. Hartzell's territory will include Montana, Wyoming, North Dakota, South Dakota, Minnesota, Colorado, and a portion of Nebraska. Before joining Martin, he accumulated more than eight years experience in the equipment field while employed by a machinery company in Omaha. Martin Machine Co. manufactures a

WIRE ROPE TALKS

SUBJECT:

STORING WIRE ROPE OUTDOORS

Practical hints on the use and care of wire rope by
Robert M. Kilian, Chief Engineer of Leschen Wire Rope
Division, H. K. Porter Company, Inc.

QUESTION:

What is the best method of storing wire rope outdoors?

ANSWER:

If you think of wire rope as a machine of many parts built to close tolerances, you quickly understand why it should be protected from outside exposure, particularly from weather that involves dampness or humidity. Extended exposure under severe conditions will impair wire rope to the point of substantially reducing its effectiveness. After idleness and lack of care it may be of little use.

For example, rust tends to bind wires together so they are not free to move back and forth. Then they fail to adjust themselves when lifting or pulling a load. They do not move properly in operation around sheaves.

Lubrication and Cleaning

The outer layer of new wire rope to be stored on its shipping reel should be covered with a heavy protective lubricant. A generous application will tend to protect the entire length. "LePro" Wire Rope Protector, a Leschen product, is especially formulated for this purpose. You apply it cold, and it goes on quickly with a brush or by pouring slowly from a can.

Wire rope removed from service, to be stored for future use, should be cleaned thoroughly with a wire brush, compressed air, or superheated steam. Then lubricate it first with a penetrating lubricant that will coat all strand wires, internally as well as externally. Next coat the rope with "LePro" to seal in the other lubricant and repel penetration of moisture and fumes. Finally, wind the used rope on a reel, rather than let it lie loosely on the floor or ground.

Following lubrication with "LePro" it is advisable to cover the rope on the reel with waterproof or tar paper. Seal the paper at the flange with "LePro". If a number of reels are stored at one spot, cover the entire group with a tarpaulin.

Taking proper care of high-quality products like HERCULES Red-Strand wire rope is as important as selecting them in the beginning. You are money ahead on both counts.

Storing and Re-Use

Select a storage area that is clean and dry, and as well protected from the weather as possible. Avoid nearby acid fumes or other corrosive agents. They can cause embrittlement of the surface of the wires. Reels should not rest directly on the ground. Place them on wood or metal supports.

When rope is returned to service, excess lubricant can be wiped off as the equipment is run slowly. Lubricants may pick up some dirt later, but this will cause far less damage than would the leaching effect resulting from the use of a solvent for cleaning.

The higher-than-rated quality built into Leschen wire rope is well worth preserving by proper storage methods. To obtain this quality in the first place remember to specify the rope with a RED STRAND—the symbol of highest quality wire rope for seventy-five years.

A Leschen district warehouse or distributor is nearby. See them for other rope-saving suggestions—and for HERCULES Red-Strand Wire Rope.

Reprints of this "Wire Rope Talks" are available on request



LESCHEN WIRE ROPE DIVISION

H. K. PORTER COMPANY, INC.

St. Louis 12, Missouri



GEARED to SERVE the whole dern WEST!



with the BEST in ...

NEW, USED and REBUILT Contractors Equipment

Hoists • Pumps • Light Plants
• Gas and Diesel Engines •
Electric Motors • Compressors •
Transmission Equipment, etc.

NEW and NEW SURPLUS Industrial Piping

"COMPLETE Industrial
Piping"

INQUIRIES INVITED
QUOTATIONS GLADLY!

ZIDELL

Machinery & Supply Co.



3121 S. W. Moody Street
PORTLAND 1, ORE. CA 8-8691

complete line of heavy equipment trailers including folding gooseneck, tilt-tops, rear loaders and tow types. These products are distributed through Martin-Caterpillar dealers throughout the United States.

H. H. Hance named advertising mgr.

Harrison H. Hance has been named advertising manager for Kaiser Steel Corp. He will also be in

H. H.
Hance



charge of publications issued from the company's home offices in Oakland, including Kaiser Steel's award-winning "Westward" magazine.

LeT-W \$9,000,000 expansion

A \$9,000,000 building and tooling program for LeTourneau-Westinghouse Co., earthmoving and material handling equipment manufacturer with headquarters at Peoria, Ill., is announced by Merle R. Yontz, president. Major aspect of the program is the new \$6,000,000 factory building and tooling at Peoria. At the same time the company is expanding its plant operations at Toccoa, Ga., and at Indianapolis, Ind. At the latter plant are manufactured the Adams motor graders, Traveloaders and related equipment.

Kolman Mfg. names new reps

Announcement is made by Sam Madrid, Western representative of the Kolman Manufacturing Co., of the appointment of the following distributors: Brown-Bevis Industrial Equipment Co., Los Angeles, who will cover the southern section of California; Contractors Equipment Corp., Portland, the entire state of Oregon; Air-Mac, Inc., Seattle, all of Washington state; and The Carington Co., Seattle, all of Alaska Territory.

Better service established

H. W. Saunders of Air Reduction Pacific Co., Emeryville, Calif., reports the establishment of retail stores at important Western points where door-to-door trucks are able to supply the full company line of welding supplies to the local buying areas. These outlets are located at Stockton, Fresno, Bakersfield, Burbank, Inglewood and San Diego in California; at Portland, Ore., and Tacoma, Wash.

Top executive changes

The Oliver Corporation Board of Directors in Chicago on Aug. 28 elected A. W. Phelps president, replacing A. King McCord, who recently resigned to accept the presidency of Westinghouse Air Brake Co., Pittsburgh, Pa. Phelps had been serving as chairman of the board and chief executive officer. At the same time Oliver's first vice president, C. L. Hecker was elevated to executive vice president.

Change in district managers

E. S. Morgan is no longer with the U. S. Rubber Co. in Portland, Ore. He recently became a partner in Keller's Tire Shop, Inc., U. S. Rubber distributor in Kelso, Wash. W. D. Ralston is now U. S. district manager at Portland.

Pioneer names sales promotion mgr.

Fred W. Hartlage was recently appointed sales promotion manager for Pioneer Engineering Works, Inc., Minneapolis, Minn. Hartlage was



Fred W.
Hartlage

formerly an account executive with Alfred Colle Advertising Agency and advertising and sales promotion manager with Baker-Lull Corp.

PREFERRED by CONTRACTORS

Less initial cost—Lower upkeep

1 1/2 HP to
5 HP

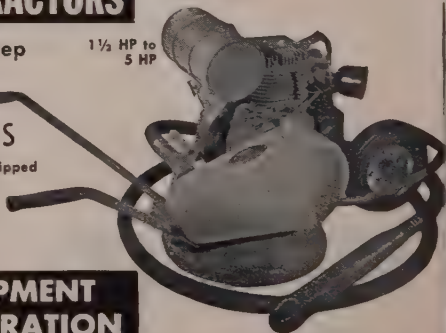
MARVEL CONCRETE VIBRATORS

GV-1, GV-2 & GV-3 Models Now Equipped
with Automatic Centrifugal Clutch as
Standard Equipment.
Interchangeable Flexible Shafts.

Write for full information

MARVEL

EQUIPMENT
CORPORATION
215-217 EAGLE ST. • B'KLYN 22, N. Y.



UNIT PRICES

Selected abstracts for Western projects

HIGHWAY—Road construction in Washington

Washington—Thurston County—State. Fiorito Bros. submitted a low bid of \$926,659 for construction of 0.440 mi. of highway in Washington.

(1) Fiorito Bros.	\$ 926,659
(2) N. Fiorito Co.	955,002
J. N. Conley	1,005,357
Erickson Paving Co.	1,016,512

	(1)	(2)
47 ac. Clearing	\$ 375.00	\$295.00
47 ac. Grubbing	375.00	295.00
Lump Sum Clearing and grubbing		
102,270 cu. yd. Common excav. incl. haul of 600 ft.	.27	.28
300 cu. yd. Solid rock excav. incl. haul of 600 ft.	2.50	3.00
350 cu. yd. Common trench excav. incl. haul of 600 ft.	1.85	2.25
711,780 cu. yd. Common borrow incl. haul of 600 ft.	.27	.26
2,000 cu. yd. Strip, bor. & surf. pits incl. haul of 600 ft.	.30	.30
156,480 unit Overhaul	.35	.40
250,500 cu. yd. Special borrow including haul	.60	.50
183,000 cu. yd. Excav. of unstable material incl. haul	.56	.61
8,375 cu. yd. Structure excavation	2.00	2.50
1 unit Furn. jetting equipment	1,500.00	3,500.00
5 unit Furn. tamping roller	500.00	200.00
2 unit Furn. pneumatic tired roller	500.00	200.00
1 unit Furn. variable load compactor	250.00	500.00
80 day Operating jetting equipment	75.00	50.00
545 day Operating tamping roller	52.00	50.00
180 day Operating pneumatic tired roller	50.00	50.00
55 day Operating variable load compactor	90.00	50.00
330 day Mechanical tamper	45.00	45.00
7,835 lin. ft. Slope treatment, Class "A"	.12	.15
11 sta. Finishing roadway	20.00	20.00
600 M gal. Water	2.00	2.50
20 cu. yd. Gravel backfill for foundations	6.00	6.00
1,175 cu. yd. Gravel backfill for drains	6.00	6.00
1,290 ton Selected roadway borrow	1.50	2.50
610 ton Crushed stone surf. top course	3.50	4.50
4,165 sq. yd. Cem. conc. pavt. std. 14 day 5 sack mix 8 in. sec.	5.0	5.00
100 sq. yd. Cem. conc. driveway std. 14 day 5 sack mix 6 in. sec.	5.00	5.00
40 ea. Dowel bars with rubber caps	.50	.60
93 lin. ft. Pavement headers	2.00	2.75
1,955 lin. ft. Integral cem. conc. curb	1.25	1.00
780 cu. yd. Concrete Class "B"	47.50	60.00
26 cu. yd. Concrete Class "B"	75.00	75.00
7 cu. yd. Concrete Class "C"	100.00	75.00
58,690 lb. Steel reinforcing bars	.125	.15
936 lin. ft. Plain conc. culv. pipe 12 in. diam.	2.10	2.10
414 lin. ft. Plain conc. culv. pipe 18 in. diam.	3.10	3.10
663 lin. ft. Std. reinf. conc. culv. pipe 12 in. diam.	2.90	2.90
852 lin. ft. Std. reinf. conc. culv. pipe 18 in. diam.	4.00	4.00
24 lin. ft. Std. reinf. conc. culv. pipe 24 in. diam.	6.00	6.00
597 lin. ft. Std. reinf. conc. culv. pipe 30 in. diam.	7.85	7.85
300 lin. ft. Bit. coated perf. corr. metal drain pipe 4 in. diam.	1.40	1.40
3,545 lin. ft. Bit. coated perf. corr. metal drain pipe 8 in. diam.	1.95	1.95
1,213 lin. ft. Bit. coated corr. metal pipe ty. #2 #16 gage 8 in. dia.	2.40	2.40
409 lin. ft. Bit. coated corr. metal pipe ty. #2 #16 gage 12 in. dia.	3.05	3.05
799 lin. ft. Bit. coated corr. metal pipe ty. #2 #16 gage 18 in. dia.	4.25	4.25
340 lin. ft. Bit. coated corr. metal pipe ty. #1 #16 gage 18 in. dia.	4.95	4.95
10 lin. ft. Galv. wrought iron water pipe 4 in. dia.	8.00	8.00
13 ea. Manholes	225.00	225.00
1 ea. Special manhole	435.00	435.00
1 ea. Special precast conc. drop manhole	950.00	950.00
8 ea. Catch basins	95.00	95.00
45 ea. Special catch basins	80.00	80.00
84 lin. ft. Std. beam guard rail	5.00	4.00
67 ea. Reinforced concrete roadway markers	7.00	7.00
6 ea. Guide posts	12.00	5.00
440 sq. yd. One course portland cem. conc. sidewalk	4.00	4.00
15,890 ton Loose riprap Class "A"	1.50	2.35
20,340 ton Loose riprap Class "B"	2.50	2.50
6 cu. yd. Hand placed riprap	25.00	25.00
265 lin. ft. Remov. cem. conc. curb & gutter	.50	1.00
2,235 sq. yd. Remov. cem. conc. pavt.	.50	1.00
348 sq. yd. Remov. cem. conc. sidewalk	.50	.50
640 lin. ft. Remov. galv. iron water pipe 2 in. dia.	.50	.50
480 lin. ft. Remov. cast iron water pipe 4 in. dia.	.95	.95
100 lin. ft. Remov. cast iron water pipe 6 in. dia.	1.25	1.25
140 lin. ft. Remov. & relay cast iron water pipe 6 in. diameter	6.00	6.00
Lump Sum Construct & maintain haul road	11.50	8.50
848 lin. ft. Aluminum bridge railing		
est. Flagging est. \$5,000.00		
Lump Sum Illumination system		
5,000 cu. yd. Furn. & placing top soil	1.75	2.00
2,500 cu. yd. Stockpiling topsoil	.40	.30
810 sq. yd. Precast conc. slope protection	9.00	4.00
Bridge		
280 cu. yd. Structure excavation	2.50	3.50
385 cu. yd. Concrete Class "A"	57.00	70.00
30 cu. yd. Concrete Class "B"	40.00	50.00
102,000 lb. Steel reinforcing bars	.125	.02
2 ea. Bridge drains	75.00	75.00
48 lin. ft. Downspouts	7.00	7.50

HIGHWAY—Roadway construction in Colorado

Colorado—Custer County—Bureau of Public Roads. J. P. Elliott & Co. was low bidder at \$365,386 for construction of 3.314 mi. of highway in San Isabel National Forest, Colorado.

(1) J. P. Elliott & Co.	\$365,386
(2) Hinman Bros. Construction Co.	396,414
Z. H. Lowdermilk, Inc.	428,477
Colorado Constructors, Inc.	435,490

	(1)	(2)
Lump sum Clearing and grubbing	\$6,000.00	\$13,000.00
3,000 cu. yd. Stripping and storing topsoil	.30	.43
385,000 cu. yd. Unclassified excavation	.63	.64
820 cu. yd. Unclassified excavation for structures	3.00	3.00
9,000 cu. yd. Unclassified excavation for borrow, case 1	.25	.33
300,000 sta. yd. Overhaul (1,000 ft. free haul)	.02	.02
1,000 cu. yd. Spec. overhaul of borrow (1,000 ft. free haul)	.30	.36
2,000 cu. yd. Replacing topsoil	.30	.74
Contingent sum Obliteration of old roadways to be paid for as earned	1,000.00	1,000.00
3,750 unit Watering of embankment	1.00	1.00
Lump sum Providing & maint. water plant or plants	500.00	3,532.50
19,500 ton Rolling of embankment	7.00	10.00
284 cu. yd. Subbase material	1.30	1.15
35,200 lb. Conc. Class "A" (air-entrained concrete, low-alkali cement)	60.00	80.00
60 cu. yd. Reinforcing steel	.13	.15
1,656 lin. ft. 24-inch C.G.S.M. culvert pipe	80.00	80.00
264 lin. ft. 30-inch C.G.S.M. culvert pipe	5.60	6.74
374 lin. ft. 36-inch C.G.S.M. culvert pipe (12-gage)	7.80	8.14
270 lin. ft. 36-inch C.G.S.M. culvert pipe (8-gage)	11.00	12.90
56 lin. ft. 48-inch C.G.S.M. culvert pipe	16.00	18.94
300 lin. ft. 6-inch perf. C.G.S.M. pipe underdrain	14.00	18.24
18 ea. Concrete maintenance marker posts	5.00	3.85
1 ea. Cattle guard	30.00	17.53
32,000 lin. ft. Barbed wire fence, Type 2	1,900.00	2,250.00
4 ea. Gates, 12 ft.	.30	.38
	50.00	49.10

HIGHWAY—5 mi. grading and paving in Washington

Washington—Benton County—State. A \$229,229 contract was awarded C. E. Oneal for construction of 5 mi. of highway near Patterson, Wash.

(1) C. E. Oneal	\$229,229
(2) J. W. Hardison	243,021
Sather & Sons	253,592
Parker-Schram Co.	284,803

	(1)	(2)
Lump sum Clearing & grubbing	\$2,000.00	\$4,000.00
133,155 cu. yd. Com. excav. incl. haul of 600 ft.	.29	.26
36,890 cu. yd. Solid rock excav. incl. haul of 600 ft.	1.35	1.44
25 cu. yd. Com. trench excav. incl. haul of 600 ft.	3.00	2.00
17,310 unit Overhaul	.40	.55
190 cu. yd. Structure excav.	3.00	2.00
1 unit Furn. smooth wheeled power roller	50.00	100.00
2 unit Furn. pneumatic tired roller	50.00	100.00
2 unit Furn. variable load compactor	200.00	500.00
45 day Operating smooth wheeled power roller	40.00	50.00
72 day Operating pneumatic tired roller	40.00	50.00
48 day Operating variable load compactor	85.00	130.00
13 day Mechanical tamper	35.00	40.00
4,125 lin. ft. Slope treatment Class "B"	.12	.10
3,230 cu. yd. Slope protection material	1.20	1.50
268 sta. Finishing roadway	10.00	10.00
4,390 M gal. Water	2.50	3.50
19,480 ton Selected roadway borrow	.85	.80
9,270 ton Crushed stone surf. top course	1.45	1.40
15,180 ton Crushed stone surf. base course	1.35	1.35
2,000 ton Main. rock ½ in. minus in stockpile	1.90	2.00
5 mi. Light bit. surf. treat.—method A		
169 ton Prep., constr., finish	300.00	300.00
2,045 ton Asphalt cement MC-3	45.00	45.00
1,460 cu. yd. Crushed cover stone in stockpile	.90	.90
Placing crushed cover stone from stockpile	1.50	2.00
Mfn. agr. for non-skid single seal tret.—schedule B		
1,360 ton Coarse crushed screen. ½ in.—#4 sieve in stockpile	1.40	1.50
360 ton Fine crushed screen. #4 sieve—0 in stpkple.	1.40	1.50
Other items		
48 lin. ft. Plain conc. culv. pipe 12 in. dia.	2.50	2.00
30 lin. ft. Std. reinf. conc. culv. pipe 12 in. dia.	2.75	2.50
639 lin. ft. Std. reinf. conc. culv. pipe 18 in. dia.	3.75	4.00
75 lin. ft. Std. reinf. conc. culv. pipe 24 in. dia.	5.00	6.00
150 lin. ft. Plain corr. metal pipe 84 in. dia. #8 ga.	45.00	50.00
13 ea. Mon. cases & covers	30.00	35.00
52,128 lin. ft. Wire fence type #1	.40	.40
18 ea. Single 14 ft. metal gates	55.00	50.00
39 ea. Guide posts	5.00	5.00
est. Flagging est. \$1,500.00	1,500.00	1,500.00

Space is sold as advertisers' inches. All advertisements in this section are 1/2 in. short of contracted space to allow for borders and composition.

CLASSIFIED

Rates are \$8.50 a column inch. Copy should be sent in by the 15th of month preceding publication.

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CONTRACTOR'S EQUIPMENT

FOR SALE RENT RENTAL PURCHASE

2 CALIFORNIA DIRT SPREADS

AT BEVERLY HILLS
431 Doheny Road

1 HD-21 w/ripper
6 HD-20's
2 DW-21's
5 AC TS-300's
2 15-20 CY Scrapers
No. 12 Motor Grader
Tamping Roller
Euclid Water Wagons
D-337 Engine
Pickups & Misc.
Shop Trucks & Equip.

Other equipment located in Texas, Kansas, New York and Oklahoma. Tractors, Euclids, Paving Equipment, Drills, Air Compressors, Buckets, Pumps, etc.

AT MILLBRAE
Millwood Estates

8 HD-21's w/rippers & dozers
6 HD-16's
3 D-8's
2 DW 21's
5 DW 20's
4 AC TS-300's
4 15-20 CY Scrapers
1 12-15 CY Scraper
No. 12 Motor Graders
No. 28 Ripper
Tamping Rollers
Grid Roller
Euclid Water Wagons
Shop Trucks, Pickups

Call or Write — W. P. BREWER

VALLEY VIEW EQUIPMENT COMPANY

Route 7, Box 497-E
Office: ADams 5-7134

Dallas, Texas
Residence: DAVIS 7-5719

LOW COST INSTALLATION AND OPERATION



CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY: 3 to 20 TONS
SELL, RENT or BUY
FOR DAMS, BRIDGES, BREAKWATERS, FILTRATION AND SEWAGE PLANTS
FOR SPEED, ECONOMY, EFFICIENCY, FLOOD SAFETY, LABOR REDUCTION
AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

RENT STEEL PILING



Get the exact lengths and sections you need of all standard sections, delivered on time—and at Foster's usual low rental rates

LE FOSTER CO.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

BRIDGES FOR RENT

Bailey Steel Truss Type
Portable & Fully Prefabricated
Variable Span & Capacity
Cantilever Erection

Excellent For
Construction detours—Contractors' access.
Emergency detours—Temporary overcrossings—Traffic separation

BAILEY BRIDGE EQUIPMENT CO.
1767 Conejo Ave., San Luis Obispo, Calif.

FOR SALE

SURPLUS EQUIPMENT FOR SALE

In order to balance our equipment inventory, we are disposing of over 150 units including:

**SHOVELS (1 1/2 to 5 yd.) • DRAGLINES • COMPRESSORS • BULLDOZERS
LOADERS • TRUCKS • CONCRETE & PAVING EQUIPMENT
ROAD BUILDING, EARTHMOVING, SCREENING EQUIPMENT, ETC.**

*Located in Phoenix, Arizona, and Fairplay, Colorado.
Many items purchased new for the Montgomery Dam job*

NO JUNK—All equipment was purchased for our own use and operated and maintained by our skilled personnel. Many units actually in like-new condition.

CALL, WIRE OR WRITE FOR A COMPLETE DESCRIPTIVE LIST

FISHER CONTRACTING CO.

ATTN: JACK E. BROWN, SURPLUS EQUIPMENT SALES

P. O. Box 6306

PHOENIX, ARIZONA

Phone ALpine 8-7741

NOTE:

We will maintain a temporary sales office in the Fairplay Hotel at Fairplay, Colorado, until approximately October 1st. Please DIRECT ALL INQUIRIES TO:

FISHER CONTRACTING CO.

Attn: Jack E. Brown

P. O. Box 177

Phone Fairplay 21

Fairplay, Colorado

FOR SALE

STEEL SHEET PILING

125 Tons Beth AP3, 20, 25 & 30'
276 Tons Carnegie M116—20, 30, 39 & 60'
160 Tons Beth SP4—12 ft. to 28 ft.

PILE EXTRACTOR

2 McKiernan Terry E

5 PILE HAMMERS

Vulcan No. 1—2 new, 3 used

2 YD. P & H DIESEL SHOVEL

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HIGHWAY—Construction of 5.1 mi. highway and five concrete bridges

California—Sonoma County—State. Guy F. Atkinson Co. received an award of \$2,818,146 for grading and paving of 5.1 mi. of freeway, frontage roads, ramps and interchanges and the construction of five reinforced concrete bridges near Santa Rosa, Calif.

Guy F. Atkinson Co.	\$2,818,146
Chas. L. Harney, Inc.	2,826,082
Parish Brothers, Inc., & Carl N. Swenson Co.	3,078,327

	(1)	(2)
60 ea. Portable timber barricades.....	\$ 45.00	\$ 48.00
4,000 sq. yd. Obliterating existing road.....	.05	.11
0,000 sq. yd. Removing concrete pavement.....	1.00	.70
Clearing and grubbing.....	30,600.00	70,000.00
Dev. wat. sup. & furn. wat. equip.....	60,000.00	43,000.00
Applying water.....	.50	1.00
Compacting original ground.....	.05	.06
0,000 M gal. Roadway excavation.....	.50	.55
3,000 sq. yd. Structure excavation.....	3.50	4.00
5,490 cu. yd. Structure backfill.....	5.50	5.30
0,000 cu. yd. Ditch and channel excavation.....	1.10	1.30
0,000 ton Imported borrow, Type "A".....	1.40	1.05
0,000 ton Imported borrow, Type "B".....	.72	.81
3,000 ton Untreated base.....	3.00	2.30
0,000 sq. yd. Mix, spr., & comp. cem. fr. subgr.....	.22	.30
3,900 bbl. Portland cement.....	4.50	5.50
350 ton Mineral aggregate (C.T.B.).....	3.90	4.50
180 ton Asph. emul. (curing sl. pt. bdr. & sl. cf.).....	40.00	34.00
110 ton Liquid asphalt, MC-2 (curing seal).....	50.00	39.00
120 ton Liquid asphalt, SC-1 and SC-2 (pr. ct. & pen. tr.).....	36.00	33.00

1,075 ton Paving asphalt (plant-mixed surfacing)	32.00	7.20
1,500 ton Mineral aggregate (P.M.S.)	5.20	7.20
1,300 sq. yd. Placing P.M.S. gutters & downdrains	1.50	1.20
1,148 lin. ft. Placing P.M.S. dikes	.23	.23
375 ton Screenings (medium seal coat)	6.00	6.50
0,100 cu. yd. Class "B" concrete (pavement)	16.50	17.00
0,000 ea. Pavement tie assemblies	.52	.50
20 ton Air-refined asphalt (subsealing)	65.00	70.00
2,200 cu. yd. Class "A" concrete (structures)	75.00	57.00
1,796 lin. ft. Class "A" conc. (bridges) (4,410 C.Y.)	275,000.00	255,000.00
144 lin. ft. Concrete railing	6.50	7.00
5,000 lb. Rubber waterstops	2.25	2.00
48 ea. Bar reinforcing steel	12	13
48 ea. Bar reinf. steel (bridges) (881,000 lb.)	107,000.00	100,000.00
6,780 lin. ft. Furn. precast prestressed conc. girders	2,500.00	2,500.00
407 ea. Erect. precast prestressed conc. girders	250.00	230.00
300 lb. Furnishing concrete piling	3.50	3.30
2,000 cu. yd. Driving concrete piles	80.00	80.00
41 ea. Miscellaneous iron and steel	.40	.55
24 ea. Class "B" concrete (curbs & gutters)	32.00	42.00
75 cu. yd. Right-of-way monuments	9.00	7.00
1,300 lin. ft. Survey monuments	20.00	24.00
54 lin. ft. Broken concrete riprap	035.00	30.00
1,518 lin. ft. Metal plate guard railing	4.50	4.40
270 ea. Steel railing	8.75	9.00
8,000 lin. ft. Gde. posts, miks. & horiz. refl. units	6.25	7.00
3,000 lin. ft. New property fence	.50	.49
2,700 lin. ft. 72 in. chain link fence	2.35	1.80
700 lin. ft. Salvaging 48 in. chain link fence	.45	.80
1,100 lin. ft. Reconst. salv. 48 in. chain link fence	.75	.40
300 lin. ft. 12 in. R.C.P. (std. str.)	2.60	2.70
500 lin. ft. 15 in. R.C.P. (std. str.)	3.25	3.50
300 lin. ft. 18 in. R.C.P. (std. str.)	4.00	4.50
500 lin. ft. 24 in. R.C.P. (std. str.)	6.00	6.20
500 lin. ft. 30 in. R.C.P. (std. str.)	8.25	9.00

60 lin. ft. 33 in. R.C.P. (std. str.).....	9.50	11.00
50 lin. ft. 54 in. R.C.P. (std. str.).....	20.00	24.00
210 lin. ft. 12 in. C.M.P. (16 gage).....	3.50	3.40
Finishing roadway.....	5,000.00	6,000.00
Highway lighting systems.....	38,000.00	37,000.00
460 lin. ft. 6 in. asbestos-cement sewer pipe.....	3.50	2.90
640 lin. ft. 15 in. reinforced concrete sewer pipe.....	6.25	6.00
3 ea. Adjusting manholes to grade.....	60.00	50.00
4 ea. Abandoning manholes.....	60.00	50.00
3 ea. Manholes.....	375.00	350.00

HIGHWAY—Grading and paving roadway south of Manville, Wyoming

Wyoming—Niobrara County—State. A \$148,547 contract was awarded N. V. Lamb, Lamb Construction Co. for grading, draining and paving 5.014 mi. of road.

(1) N. V. Lamb, Lamb Construction Co.	\$148,547
(2) Wilson Bros.	160,005
Siegrist Construction Co.	162,052
Summit Construction Co.	166,761

	(1)	(2)
166,000 cu. yd. Excavation.....	\$.25	\$.22
19,300 cu. yd. mi. Cubic yard mile haul.....	.20	.18
4,500 M gal. Watering.....	3.00	2.00
180 hr. Sheep's foot roller operation.....	11.00	11.00
110 hr. Pneumatic tired roller operation.....	6.00	7.00
15 hr. Smooth steel roller operation.....	9.00	12.00
375 hr. Mechanical tamping.....	6.00	6.00
241,800 T. mi. Haul of surfacing material.....	.12	.11
30 cu. yd. Structure excavation.....	2.50	3.00
270 cu. yd. Excavation for pipe culverts.....	2.00	3.00
50 cu. yd. Subexcavation.....	3.00	5.00
20,000 ton Selected material surfacing, Type 1.....	.65	.50
10,600 ton Crushed gravel base course (1 in. max.).....	.85	.70
125 ton Asphaltic material MC-prime.....	32.00	33.00
65 ton Asphaltic material RC-seal.....	36.00	33.50
600 ton Crushed sand-gravel.....	4.50	3.00
10.2 cu. yd. Class "C" concrete.....	85.00	43.00
8,540 lb. Structural steel.....	.50	.25
560 lb. Reinforcing steel.....	.25	.20
1,045 lin. ft. 18 in. std. R.C.P.....	4.50	3.80
142 lin. ft. 24 in. std. R.C.P.....	6.50	5.50
58 lin. ft. 36 in. C.M.P.....	12.00	10.50
72 lin. ft. 42 in. C.M.P.....	14.00	12.00
54 lin. ft. 48 in. C.M.P.....	17.00	14.28
60 lin. ft. 60 in. C.M.P.....	25.00	26.00
102 lin. ft. 72 in. C.M.P.....	40.00	33.00
194 lin. ft. 84 in. C.M.P.....	50.00	47.00
54 lin. ft. 22 in. x 13 in. C.M.P. arch culverts.....	5.00	4.00
164 lin. ft. 132 in. struct. plate pipe (710-18).....	75.00	78.00
55 cu. yd. Class I riprap.....	20.00	12.00
25 cu. yd. Grouted riprap.....	30.00	18.00
44,100 lin. ft. Barbed wire fence (4 wire).....	.17	.20
760 lin. ft. Barbed wire fence (5 wire).....	.18	.21
4,150 lin. ft. Barbed wire fence (6 Wire).....	.19	.22
3,040 lin. ft. 32 in. woven & 3 barbed wire fence.....	.22	.32
35 ea. Brace panels.....	12.00	15.50
50 ea. End panels.....	15.00	15.50
1 ea. Galvanized steel gates (16 ft.).....	80.00	75.00
2 ea. Cattleguards (7 ft.-9 in. x 10 ft-0 in.) H.D.....	500.00	380.00
30 ea. Right-of-way markers.....	12.00	10.00
2 ea. Reinforced concrete project markers.....	25.00	25.00
150 sq. yd. Concrete sidewalk.....	3.50	5.00

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Engineers precede construction

The West now has 25% of the members of the American Society of Civil Engineers residing in this country. Any forward-looking appraisal of the construction industry would include this factor in predicting the outlook for activity during coming years. This heavy proportion of civil engineers busy on preparing plans and specifications is proper assurance that construction will follow at a rate that parallels the accelerating growth of the region.

A few comparisons: California has about as many Society members as the states of New York and Illinois combined, or 2.7 times as many members as all six of the New England states put together. Washington has as many as Massachusetts, and Oregon has almost as many as Wisconsin. Even one of our less populated but booming Western states—Arizona—has more than Delaware.

Such an engineering force represents the advance guard of construction, which in turn leads the way in providing the facilities and services that meet the needs of our population increase. Only as this design group functions are the job opportunities opened for contractors and the suppliers of construction equipment and materials.

Possibly this is rather intangible evidence upon which to build a case for continuing construction activity in the West for the years ahead, but look at the picture in reverse. If this engineering force were **not** here at work in the West the future of construction activity would present a much different view.

Public pressure must build up

With so much at stake for the construction industry in getting the highway program off to a fast start, delays are not only disturbing at this time, but could also prove to have damaging consequences. The highway program resulted from Congressional action brought about by the demands of the public and highway users. Congress expected, very naturally, that these crying needs would produce fast action in getting the appropriated funds put to use. The whims and peculiarities of Congressional action are difficult to fathom or predict. It is just possible that delays or sluggish action could create a feeling in Congress that perhaps the needs were not as great as represented, and that funds ought to be curtailed for the next few years to coincide with the actual volume of work put under contract.

This is not just idle speculation, but a serious possibility causing concern among those who are in a position to see the broad picture. What is the key to the problem, and what can be done to solve it?

Hard work on the part of state highway departments and other road planning engineers is of no avail if the general public fails to take action. The same public that clamored so loudly for the Federal highway program now sits on its hands when it is called upon to voice approval or revise promptly the recommendations of the engineers. The strategic network, where Federal funds represent 90% of the financing, involves relocations around or through many cities of the West. Public hearings are part of the legal procedure required to approve or change the plans of the engineers. However, a typical hearing consists of the department engineers making the presentation, followed by violent objections of vociferous minority groups, while the vast majority of the public and the highway users take no part. As a result, the public officials of the municipality feel called upon to support those citizens who put in an appearance. This would appear to leave the engineers on one side, and the public on the other. That is not true, but the impression is bad. The majority of the public has not spoken, and needs to be heard.

No improvement plan can be made to please everyone, and planning engineers are the first to admit this. However, if a location, or a re-location is an advantage to, say, 80% of the highway users in a municipality, they should come forward and say so for the sake of the record. Civic groups are the organizations that must take the initiative, even if they do not appear at the hearings, so that the term "public" is not just an idle billing.

Somehow, engineers and other interested elements of the construction industry must see that public acceptance of plans becomes prompt and active rather than passive.

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