WESTERN CONSTRUCTION

OCTOBER 1955

PIPELINING across the West

Construction is well under way on the 1,466-mi. natural gas line that runs from New Mexico all the way to Washington. Here is an account of the methods being used by the first contractor to have pipe underground in rugged Colorado.

ONE OF THE "BIGGEST EVER" pipeline projects in the West, 1,466 mi. of it, is well under way now after many years of planning. All the facts about it are big: The cost will be approximately $160,000,000, about 20 contractors will be involved, between 3,000 and 4,000 men will be employed, and the time to put it all in will only be about one year to target completion date in 1956. It's a big pipe with the diameter up to 26 in. and with 15 major compressor stations to be located along the route.

About 1,000 mi. of the line are under construction this year—the remainder next year. This pipeline will carry natural gas from large reserves available in the San Juan Basin of northwestern New Mexico all the way to Bellingham in northwestern Washington. Traversing this distance involves 6 of the 11 Western states. Starting at Ignacio, Colo., it takes the following route: Moab, Utah—Loma, Colo.—Jensen, Utah—southwest of Green River, Wyo.—Sage, Wyo.—Lava Hot Springs, Idaho—south of Boise, Idaho—Pendleton and Baker, Ore.—over the Columbia River near Umatilla, Ore.—west on the north side of the Columbia River to Vancouver, Wash.—north to Bellingham past Seattle, Wash.

Owner of the project is Pacific Northwest Pipeline Co. All engineering plans and specifications are being prepared by Fish Northwest Constructors, Inc. Both of these firms are in Houston, Texas, with temporary headquarters in Salt Lake City. Contracts for pipeline installation in 60- to 100-mi. sections are being awarded to subcontractors on an open bidding basis by Fish Northwest.

Of the first eight sections of the pipeline awarded last May and covering a total distance of 655 mi. on the southern end, the first contractor to have a spread putting pipe underground was R. H. Fulton & Co. of Lubbock, Texas. This firm's two contracts totaled 160 mi. of 26-in. diameter line running between Moab and Jensen, Utah. Between these two points the line goes over into western Colorado, crossing Douglas Pass at an elevation of 8,000 ft. Fulton has been working six 10-hr. days to provide a scheduled 3,000 ft. a day.

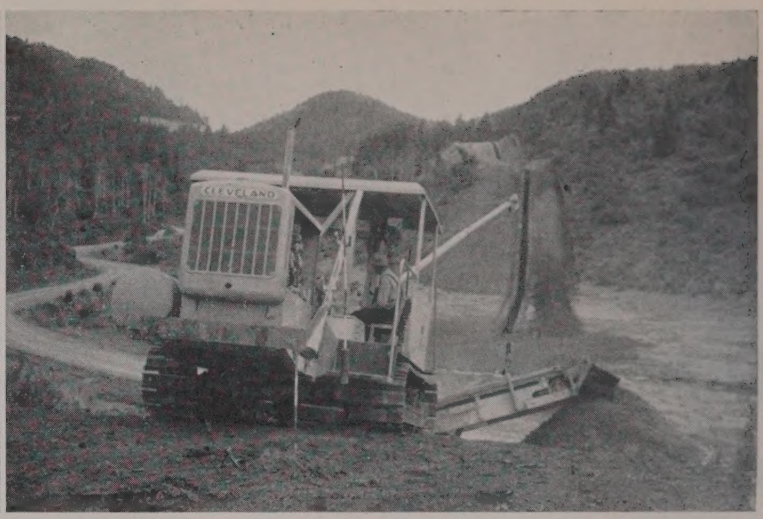
Operations by Fulton over his section include terrain varying from flat desert to steep rocky mountain slopes to crossing and recrossing small river channels. The pictures on these pages show the various stages of work on the spread at the time it was crossing Douglas Pass.

Aerial maps had been taken of the general route last April by Fish Northwest. This was followed in May by a survey crew accompanied by experienced pipeliners to further stake and flag the route and use on-the-spot judgment for the best route location. That brings us up to the present typical operation by Fulton.

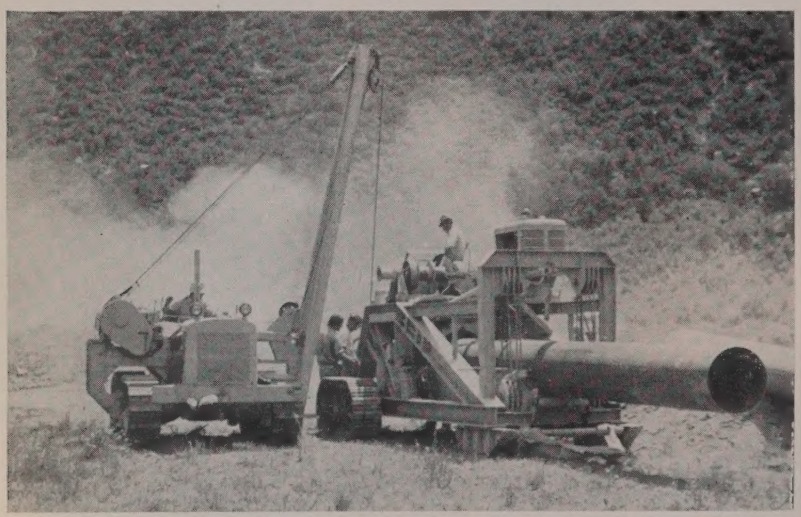
Leading off the parade is a ground-leveling crew of eight bulldozers. Providing a level, cleared right-of-way 50 to 75 ft. wide is their problem. All are Cat D8's with several having rippers to loosen up tough rock. Major fill or excavation sections on the line are rare since the pipe can be bent to follow the rise and fall of the ground. Slopes of 20 to 30% can be handled by most of the equipment.

Providing enough trench for the daily average distance of 4,000 ft. is no problem. Two Cleveland 320 ditchers chugging up and down hill provide at least this much ditch per 10-hr. day—and often nearly twice

LEVELING the way goes a pioneer team of Cat D8's, some equipped with rippers.



DITCHING uphill and downhill, two Cleveland 320 trenchers have handled well over 4,000 ft. of 42-in. wide ditch, 5 ft. deep, in a single 10-hr. shift. Soil runs from dirt to rock.



BIG CRC pipe bending machine can put up to a 20-deg. bend in each 40-ft. length of pipe. Sideboom Cat brings about 10 sections to the machine before towing on to new location.

WELDING the sections together is a fast moving operation. For the stringer pass and the hot pass, welders are located on both sides of the pipe. Lincoln welding machines furnish 300 amp.

that amount. Depth of cut is close to 5 ft. (to provide 30 in. of cover over the pipe) and trench width is 42 in. A pipeframe to which is attached curved blades straddles the trench—towed about 10 ft. behind the ditcher. This framework serves to turn back loose dirt near the trench edge on both sides that could possibly fall in during the one to two weeks that it is open before pipelaying.

In rockier ground and at the gaps left by trenchers where the line crosses highways or rocky ground, backhoes and clamshells follow up. Climbing up the steep south slope of Douglas Pass it was often necessary to hold a backhoe (such as the Bucyrus 22-B's or Northwest 25's) in place with cables leading to two uphill Cats. Light drilling and shooting is called for in rock that is too much for the backhoes.

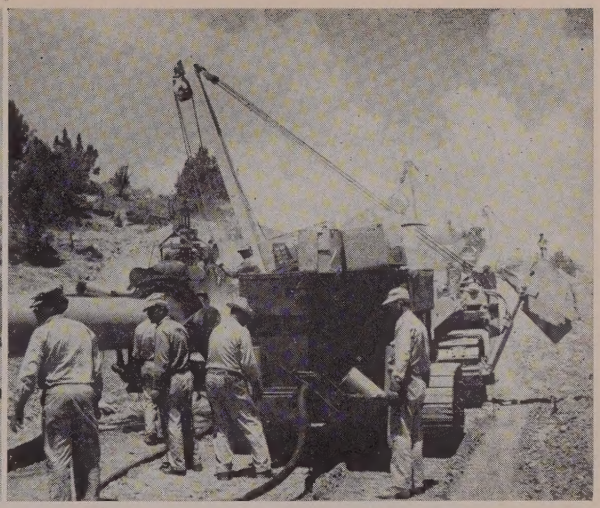
Hauling and spotting pipe along the trench involves some fairly long hauls from rail terminals over dusty, rough roads. Each truck and pole trailer carries seven 40-ft. lengths of pipe and is unloaded at the site by sideboom tractors.

Determining the amount of bend to put into each pipe section is the exacting work of a survey crew as the next major step. Stakes are set opposite each pipe joint giving the amount of sag, overbend, or left or right sidebend required.

Following closely behind the survey crew comes the bending machine, a CRC upright smooth type. Spotted in one location, about 10 lengths of pipe are brought to it by a sideboom Cat before moving further to handle another 10 sections. Maximum bend for the 26 x .281-in. shell thickness pipe is 20 deg. in a 40-ft. length.

The biggest collection of manpower and trade skill comes next in the welding together of the sections. The train consists of two lead-off sideboom tractors that alternate in picking up and holding a pipe section in position until the initial stringer

CLEANING the pipe with wire brushes and applying a prime coat—it's all done in one package with this Crose priming machine. Rolling sling held by sideboom keeps pipe off ground.



REVOLVING spindles of Crose doping machine are best seen from the rear. They're putting on paper and fiberglass. Dope kettle in foreground holds 1,000 gal. at 500 deg.

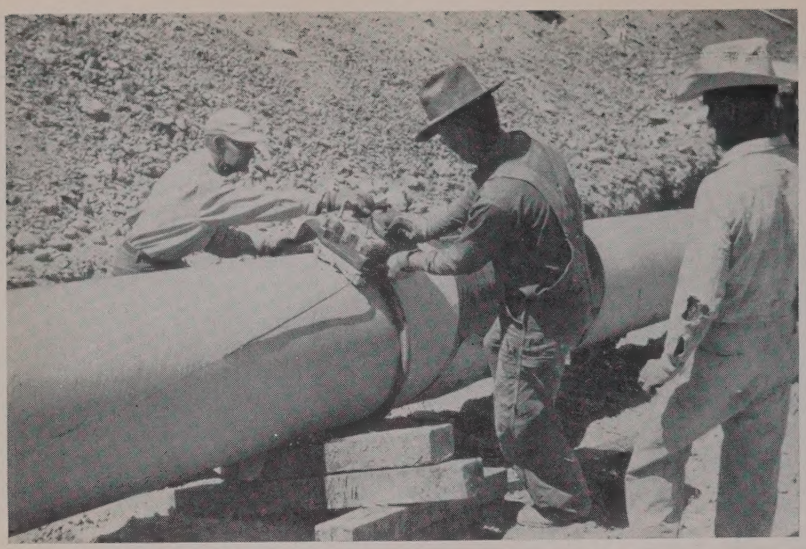
welding pass can be made. Joint alignment for the first weld is made by a line-up clamp located inside the pipe. It is then retracted and pulled through the pipe for the next joint.

Four welding operations are required at each joint. The first, the stringer pass mentioned earlier, is made by two welders working on opposite sides of the pipe. They use a 5/32-in. Fleetweld No. 5 rod with current from a 300-amp. Lincoln welding machine. Two other welders follow one joint behind to make the hot pass, using a 5/32-in. Shield-Arc No. 85 rod with current supplied at 250 amp. Strung out behind these lead-off welders are nine other welders on the "firing line" who each work on a single joint apiece. They make two more complete welds around the circumference of the joint and are designated the filler weld and the finish or cap weld. For these last two a 3/16-in. Shield-Arc No. 85 rod is used with current at 250 amp.

Mobility of equipment and men is a necessity on the welding. To handle the first two sets of welders, who work closely together, the welding machines are mounted on trailers pulled by a tractor. For the welders strung out along the firing line each has his own welding machine mounted on a pipeframe skid. One tractor has a fulltime job pulling the farthest removed welder and his machine up to the front end of the line in a continuous process. At this stage of work also, the pipe is wood blocked up off the ground for the succeeding operations.

Next comes a Crose priming machine with its rotary wire brushes that clean the pipe surface. The same machine then applies a prime coating evenly spread by revolving fiber brushes. Blocking holding up the pipe is removed just as the sideboom tractor and its priming machine approach and is then replaced as it

DOWN THE HILL comes the doping operation, the pipe receiving a 3/32-in. protective layer of dope, fiberglass, and paper. Blocking is replaced under the pipe after machine passes.



DEFECTS in the pipe covering are located by this battery-charged device that rolls a coiled spring surrounding the pipe. Flaws are marked and patching crew follows up.

BACKFILLING with fine material in rocky stretches is a job for this front-end loader. He makes his haul with material from the foreground.

passes on. This type of machine usually needs a complete overhaul after priming some 100 pipe-miles.

Only a few hundred feet further back comes the Crose doping machine that applies a 3/32-in. covering composed of asphalt enamel, fiberglass, and a paper covering. One sideboom tractor picks up and cradles the pipe while another follows holding the doping machine and towing a dope kettle.

Four or five of the Littleford 1,000-gal. dope kettles are used each day. Keeping a supply on hand at the right temperature is handled by filling each of the kettles at night, firing them up, and by the next morning they are ready to go.

Inspection of the pipe covering before it can be lowered into the trench comes next. A battery-operated device, put out by Pipeline Inspection, Inc., has a coiled spring attached that passes entirely around the pipe and is easily rolled along the pipe lengthwise. At points where the covering is defective a noisy spark within the coiled spring is emitted. The spot is marked for a patching crew.

The pipe is now ready for lowering into the trench and backfilling. More sideboom Cats handle this stage of the work in a continuous operation—lifting it from the blocking and threading it into the trench. Backfilling by dozers or backfill machines is typical for most of the work. On the rocky portions front-end loaders place select backfill material first.

At many locations, such as for road crossings, a field closure or tie-in section is required, with the road relocated over the finished pipe section and the former road trenched across. The closure section is carefuly measured, flame cut to a beveled edge to match the normal pipe end bevel, locked into position, and welds made —similar in all respects to the regular process.

There are some important hand labor jobs not mentioned earlier. One of these is finegrading the trench in rocky areas to provide a smooth bed for the pipe. Another is that of removing fences along the right-of-way and then putting them up again after completion of the work.

Prime suppliers of steel pipe for the line are the Consolidated Western Steel Division, United States Steel Corp. with its new plant at Geneva, Utah, and Kaiser Steel Corp. to supply pipe from its Fontana, Calif., plant. Almost 5 mi. of pipe a day is being produced by Consolidated Western.

Key personnel for Fish Northwest Constructors, Inc., include R. D. Ricketts, president; J. W. Hall, project manager; A. B. Allyno, project engineer; K. C. Biedermann, superintendent of construction, and Lloyd Harleston, pipeline superintendent.

For R. H. Fulton & Co., A. A. Carrigan is superintendent; Sam Tune, dope foreman; James Zucco, pipelaying; Peter Hines, right-of-way.

PIT PROBLEMS including plastic clay, deficient fines, and PI specs, solved by—

Plant flexibility on Colorado highway job

A DIFFICULT ROCK PIT, dirty with clay and yet deficient in natural fines, has just been handled successfully by a completely new crushing and screening setup working on Route 160 near Mancos, Colo. Harrison & Atchison Co., Denver contractors, showed how Mother Nature could be outwitted by bringing full plant flexibility to bear when conditions turned bad. The job on which the heads-up demonstration was made was a 4.8-mi., $396,000 grading-gravel-paving contract with the Colorado State Highway Department.

"I've worked over here on the west slope for three years running, and I haven't found an easy pit yet," explained R. H. Atchison, a partner in the contracting firm. "Nothing but the best equipment will work here," he added ruefully.

What Atchison was referring to was a dirty trick the geological past has played on roadbuilders throughout the southwestern Colorado area in the general vicinity of "Four Corners," where the fabulous uranium rush is on. While the area is one of lofty mountains, high elevations, and steep terrain, very little really good roadbuilding material exists. This is an area of Mancos shales, sedimentary sandstones, and similar rock. Gravel pits are few and far between, and what few there are seem shot through with plastic clay which washed down from the mountains in ages past. Aside from this material, there are few natural fines.

This general condition was found to an exaggerated degree at the pit near the foot of Mancos Hill, where about 80,000 tons of Colorado's Class 1 base course material is being crushed for the new 2-lane and 3-lane highway. In addition to this tonnage, about 20,000 tons of ¾-in. minus mineral aggregate will be produced from a second pit to make the necessary filler for a 2-in. plant-mix riding surface. The paving surface is to be 34 ft. wide through the 3-lane truck climbing sections; 22 ft. wide on the 2-lane highway.

Colorado's specifications for Class 1 material are an indication of what the contractor was up against. They called for 100% of material passing the 2-in. mesh, from 40 to 70% passing the No. 4 and from 5 to 15% passing the No. 200 screen. With a PI reading of 9 in the natural fine fraction inherent in the pit, the job was to produce a crushed material having a zero PI, at a rate sufficient to make money at 84 cents per ton—Harrison & Atchison's bid figure.

To meet such typically tough conditions, Harrison & Atchison in March purchased from Colorado Builders' Supply Co. in Denver a completely new rock plant. It consisted of a Pioneer 46VE Duplex portable as the basic unit, along with a Pioneer 150 PRS primary unit, which could be set in the production line to handle unfavorable pit conditions. This primary unit is equipped with a husky 20x36 jaw crusher and a 4x6-ft. 2-deck Pioneer Mesabi-type vibrating screen. In a pinch, this screen on the primary unit can reject objectionable fines and route good rock through the jaw crusher and on to the 46VE plant for further reduction.

There is enough flexibility in the 46VE plant, however, so that most of this marginal fraction can be saved. Atchison estimated he was crushing at least 70% of his pit to get that result. But even in 70% crushing, the setup turned out a consistent average of 200 tons per hr., and the high crushed portion of the mix effectively soaked up the marginal fines with their appreciable PI reading. Material going out to the highway checked out with a successful zero PI because of the crushed fraction.

Raw pit-run material was dug against a tough 12-ft. bank by a 1½-yd. shovel, and hauled to the Pioneer

trap and feeder by two end-dump Eucs. The primary jaw unit was set to break everything over 4 in. Atchison rigged a by-pass arrangement to route a sizable portion of these throughs directly to the 40x22 roll crusher on the 46VE Pioneer plant. The 10x36 jaw on the 46VE, however, was set at close enough clearance so it did a fair share of the work. The roll crusher worked 2½-in. rock, while set for a clearance of about 1¼ in., through most of the pit. But the setting could be changed quickly enough if pit conditions suddenly changed.

The screen decks start off with a 1¾-in. mesh on top. Atchison used 2-in., 2-in. slotted, and 1-in. mesh. The material was highly abrasive—the power shovel working in the raw pit used a set of teeth every 10-hr. shift. About 5,000 tons of crushed material will wear a screen deck to the point where screens must be replaced.

A feature of the entire production setup was that crushed and natural material moved out of the plant toward the surge bin at any point in the system where it became acceptable. Material meeting specifications at the roll crusher, for example, wasn't routed needlessly through other parts of the plant. The jaw crushers worked only on coarse rock which needed crushing.

Another item of importance, particularly on the Mancos job where the elevation was over 7,000 ft. above sea level, is the method by which the Pioneer plant components are powered. There is no single diesel engine which pulls the plant from one end of a shaft and an electric generator from the other. On this setup, a General Motors Series 6-71 diesel generating set operates independently to generate electricity for many of the small motors which power conveyors and screens. A Caterpillar D17000 diesel engine drives the 46VE plant's jaw and roll crushers independently with a flat belt drive. The Pioneer 150PRS primary has a D13000 driving engine, which also operates its vibrating screen.

PRIMARY UNIT to cope with unfavorable pit conditions consisted of a 20 x 36 jaw crusher and a 4 x 6-ft. two-deck Pioneer vibrating screen. If necessary this screen can reject objectionable fines.

According to Atchison, who acted as general manager of the job, the plant has sufficient latitude to work such an unfavorable pit as this and meet even tougher specifications. It would cost more than 84 cents a ton, of course, but even if the state asked for the total removal of the minus ½-in. fraction, it could be done without slowing the plant down too much. The trend in Colorado, as it is in other forward-looking highway departments, is toward more and more precise control over the subbase portion of the roads. Sub-bases made with a high percentage of sound crushed particles, without anything plastic in between to distort under heavy traffic loads, simply hold up much longer under the transportation which uses today's highways.

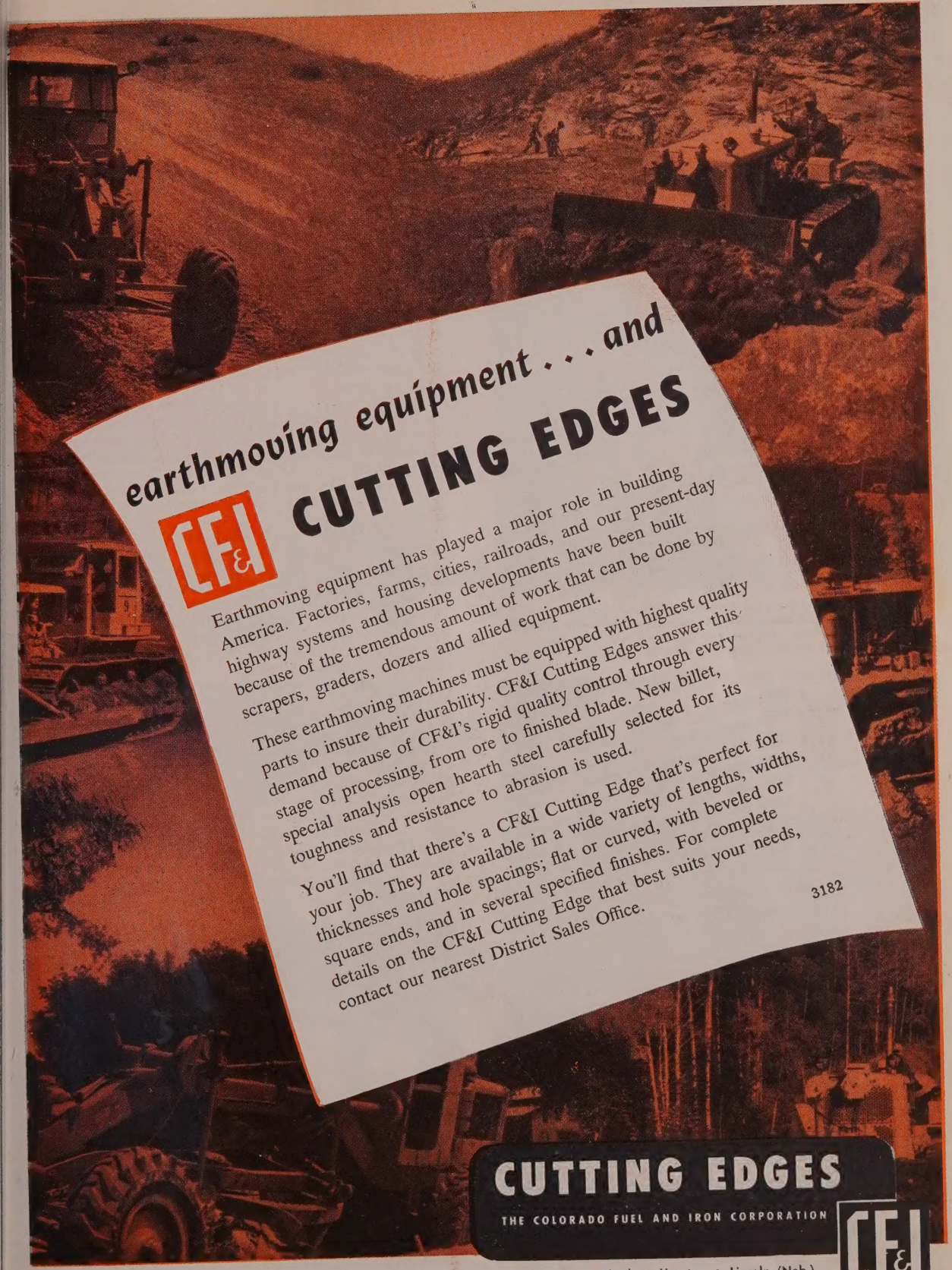
Production of the 20,000-ton mineral aggregate item for hot mix was expected to be an even higher percentage crushing assignment. But Atchison didn't particularly worry about it, because he could reject what wasn't good and still have power to spare to crush good rock down to exact size.

Nightly maintenance of the roll crusher unit by a welder was being followed religiously. Welding with Resisto-Loy 5/16 welding rod kept the roll surfaces built up with hard-facing to their new dimension. When roll crushers wear down until they cup in the center, production suffers. And there is too much highway con-

(Continued on page 84)

SURGE BIN of 45-yd. capacity loaded the Eucs as the plant turned out its 200 tons per hr.

ON THE GRADE the material was spread and rolled in 6-in. lifts to make up the 11 to 19-in. thickness of base.



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Stud welding helps install aluminum face on building

WITH STUD WELDING, installation of aluminum window wall panels on San Francisco's newest skyscraper was a comparatively easy task instead of a tough one, and simpler architectural design was permitted at the same time. This split-second fastening technique enabled architects of the new Equitable Life Assurance Building to utilize specially-designed, preassembled, aluminum window-and-facing units.

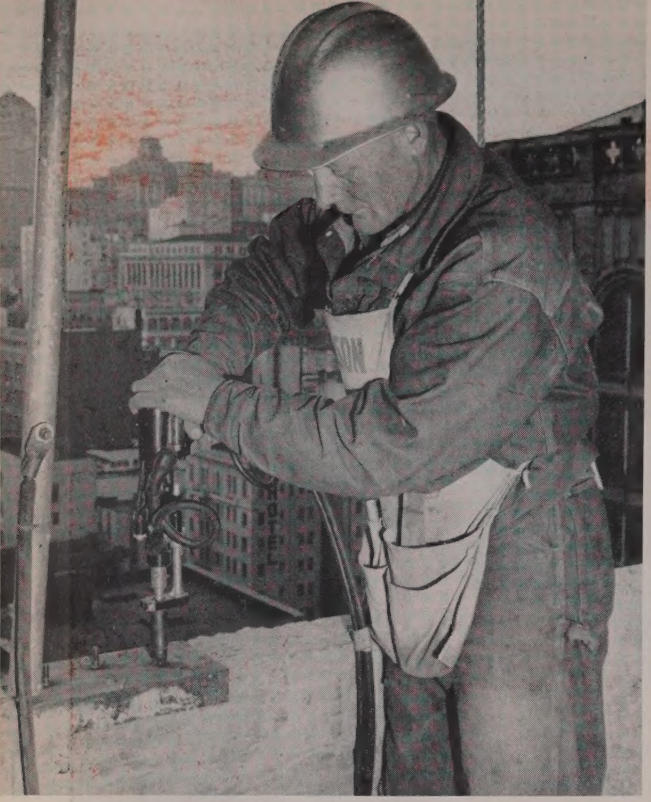
During construction of the building, steel inserts were cast in the top and bottom of the concrete poured around the structural spandrels and standard threaded Nelson MG studs, ⅜ x 1¼ in., were end welded to these inserts. A total of 7,500 studs, installed in this way with the Nelson stud welding gun, were used to fasten angle clips to which the window units were then bolted. The aluminum facing covering all horizontal concrete members of the building below the windows was an integral part of these window units.

According to Berkeley, Calif. officials of the Kawneer Co., which fabricated and installed the window wall panels, stud welding permitted a rapid, accurate, and economical fastening job which would have been much more difficult and costly with other fastening methods. The steel inserts could not have been drilled and tapped before the concrete was poured because there was no way of maintaining absolute alignment or of positioning the inserts accurately in relation to the window panels.

This factor was highly important because the window panels had to be secured very precisely in respect to the face of the building and the units above and below. Drilling and tapping on the job would have been slow and tedious compared to split-second stud welding. Another possibility, tack welding the angle clips to the inserts, was ruled out because the clips must be removable for future maintenance work.

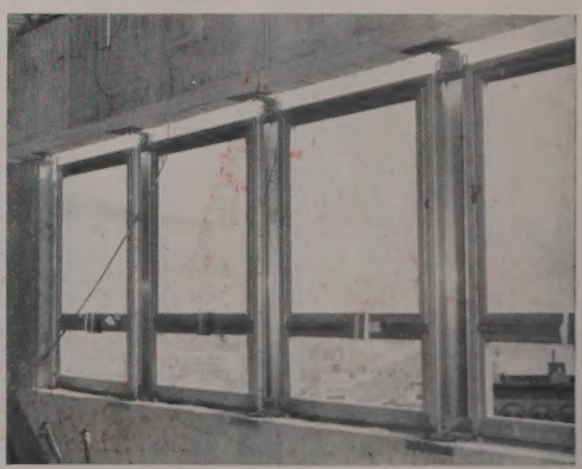
For maximum mobility during stud welding, a Nelson battery unit was used to furnish power, with an ingenious ground arrangement. A large steel tube, nicknamed the "pogo stick," was fastened to the ground cable of the welder and placed against the metal inserts in the concrete. Studs were located with an accurate template, with positions positively indicated by drill marks.

Architects for the Equitable Building are Loubet and Glynn, San Francisco, successors to W. D. Peugh (deceased) and Irwin Clavin, New York Associate Architect. The Kawneer Co. was in charge of the stud welding and all other phases of the fabrication and installation of the window wall panels. The Dinwiddie Construction Co., San Francisco, is general contractor.



Nelson MG threaded studs are here end welded to steel inserts cast in the concrete. Using a battery unit for power gave operators maximum freedom of movement. Template was used to locate studs first.

Two sides of the Equitable Life Assurance Building had the aluminum preassembled window wall panel installed, and to lesser extent on another side. A total of 23 floors was involved.



Over 7,500 studs were installed to secure the clip angles that in turn hold the panel units. First panels were given extensive testing to determine vibration and waterproof characteristics.

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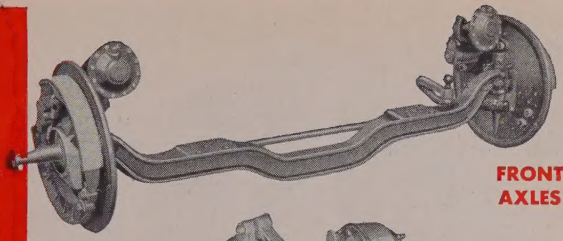
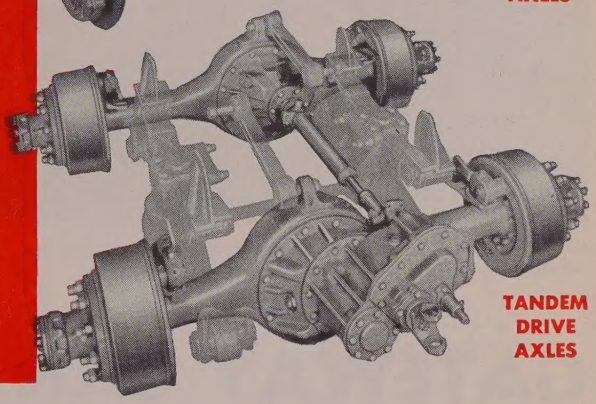
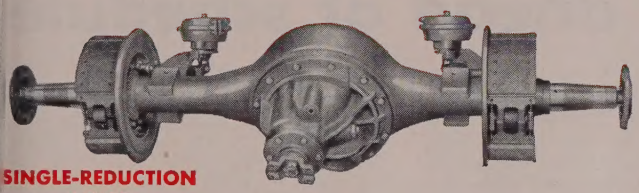


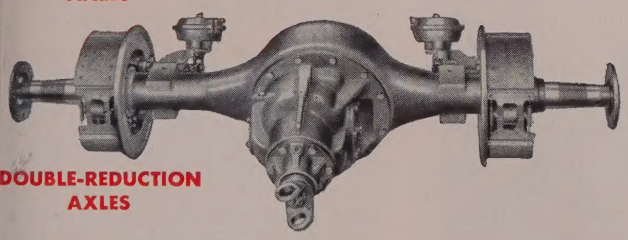
FRONT AXLES



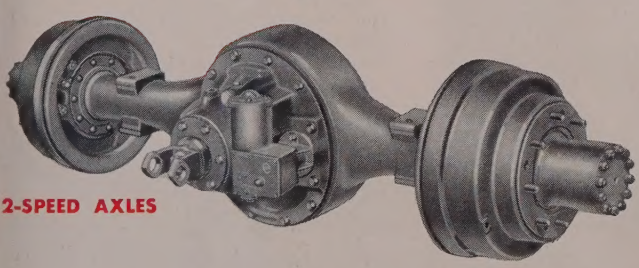
TANDEM DRIVE AXLES



SINGLE-REDUCTION AXLES



DOUBLE-REDUCTION AXLES



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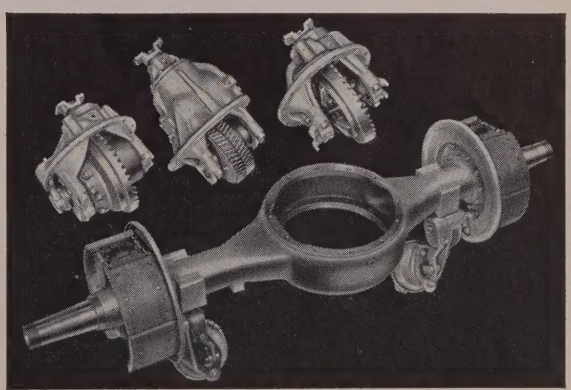

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CANAL SECTION is developed by a series of steps shown on this page. Leading off is a grader to define the 4-ft. wide berms.

SCRAPERS MOVE in to rough excavate for the 9-ft. depth and 1½ to 1 side slopes. Roadways are built up on each side.

GATEWAY CANAL: Seven miles of ditch is one year ahead of schedule

SCHEDULES ARE BEING BROKEN on many projects being constructed as part of the Bureau of Reclamation's $70,000,000 Weber Basin Project in Utah. One of these is the contract held by Morrison-Knudsen Co., Inc., for the $1,948,812 Gateway Canal. Called for here was the construction of 7.6 mi. of 10-ft. bottom width open canal, 6 mi. of concrete lining, and the placing of 1,800 ft. of 11-ft. inside diameter precast concrete pipe siphons. With work started in September 1954 and with 1,000 calendar days allowed for completion, this project may be finished late this year—one year ahead of schedule.

The Gateway Canal at its upper end will take water from the Weber River about 35 mi. below the storage reservoir at Wanship Dam, also under construction. The lower end is the beginning of the 3.3-mi. long Gateway Tunnel of 9-ft. horseshoe bore and finished last year under another contract. At the lower end of the tunnel the water supply splits, part going north toward Ogden through the Weber Aqueduct and part going south toward Salt Lake City through the Davis Aqueduct. The two latter projects are also under construction.

The canal section is such that it lent itself to a scraper earthmoving type of construction. With a bottom width of 10 ft., the canal's sides rise on a slope of 1½ horizontal to 1 vertical.

Depth of the concrete-lined section is 8 ft. 4 in. Allowing for a 4-in. thick concrete lining and 4 in. of pervious material to be placed under the concrete, the excavated depth of canal is 9 ft. Setting back about 4 ft. on each side of the canal are the paralleling roadways with widths varying from 7 to 12 ft. depending upon canal location.

Leading off the earthmoving operation, about 1,000,000 cu. yd. involved, was the pioneering work done by two of the new Cat D9s. Morrison-Knudsen has acquired six of them total, but only two were used on this job. It was their big job to clear the ground and then to cut a side hill bench along the center line of the canal down to the elevation of the top of the canal.

After the pioneering work, the 4-ft. shoulder or berm outside the top of

BOTTOM 10-ft. width is reached and the smaller Cat DW 10s are used rather than the bigger Wooldridge scrapers used at first.

TRIMMING THE SLOPES and the bottom to accurate line and grade is the next important step prior to using slip form paver.

the canal lining was staked out by the surveying crew and brought to an accurate grade by Cat 12 graders. This shoulder, known as the hobo path because of its similarity to that found along railroad tracks, also serves later on as the location for the rails to carry the slip form paver for concrete lining.

Wooldridge scrapers and Cat D8s

The major excavation could then begin on the canal section. In all, eight Wooldridge scrapers and Cat D8s performed this work. Relatively short haul distances were set up, about 1,000 ft. maximum, since the only way out of the canal section as it was cut lower and lower was at the uncut sections at each end. This was true where no gullies crossed the section. Quite frequently, however, there were fill sections where box culverts or concrete pipe crossed beneath the canal and as a result shortened somewhat the haul distance of the scrapers.

Other than the fill that was needed to build up the 3-ft. high roadways paralleling the canal—the remainder of the excavation was wasted. Embankment sections were constructed by having the material placed in about 6-in. layers (maximum of 5-in. rock allowed). Impervious material was moistened and compacted to 95% of the Bureau's test for maximum dry density. Free draining soils could be placed in 12-in. lifts if compacted by coverage of tractor treads (6-in. lifts if sheepsfoot compacted) and required a 70% relative compaction.

Getting the final 10-ft. wide canal bottom was just the right work for Cat DW10s—they were of the right size to back into a section, then be push loaded, and make their way back out.

Homemade attachment saves time

Trimming the slopes of the canal to the final proper slope and leaving a smooth surface for lining was the work for graders. Dean Straw, a grade foreman who had previously had some railroad grading experience, came up with the idea of adding a wing attachment onto the end of the grader blade that cleaned off the hobo path at the same time the slope was being trimmed. About 4 ft. in length, the attachment bolted on at an angle to the main blade and performed the operation quite successfully.

Siphons became a major construction consideration on this contract because of the size and weight involved. There are seven of them varying in length from 80 ft. to 600 ft. for a total length of about 1,800 ft. Under an alternate, Morrison-Knudsen chose to use precast concrete pipe sections rather than monolithically placed concrete. The centrifugally formed pipe sections are being furnished by United Concrete Pipe Corp. from their Pleasant Grove, Utah, plant. Inside diameter of the pipe is 11 ft. with an 11-in. shell thickness. Each section is 8 ft. long and weighs 21 tons.

Special construction was required for the elbow sections of the siphons. These were fabricated of plate steel with rib stiffeners around the outside circumference and then given a gunite cover 1½ in. thick on the inside and 2 in. thick on the outside. These sections weighed about 15 tons. There are several large cranes on the job for handling the heavy sections such as a Bucyrus 54-B, Northwest 6, and a Northwest 95. They sometimes team up for the lifts. These same cranes were used as draglines for excavating the trenches for the siphons and for some of the drainage structures passing beneath the canal.

Culverts for drainage

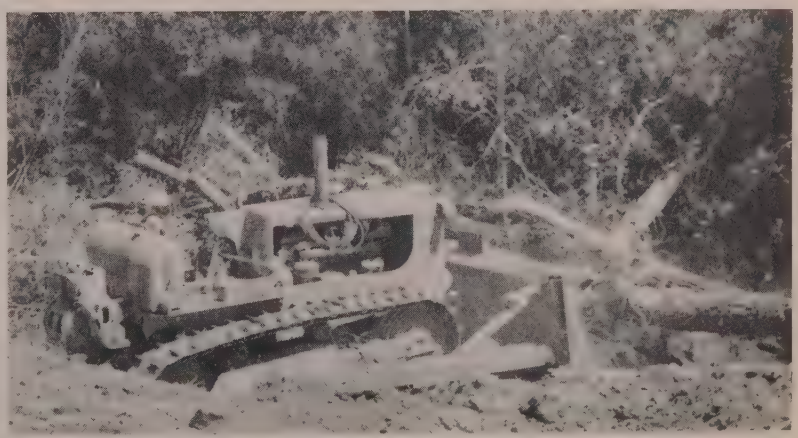
The many structures required on this contract are very similar to those required on a highway contract. Subcontractor on all this work was A. S. Horner Construction Co. who recently received a contract award for construction of the Stoddard Diversion Dam that will divert the Weber River into the canal. Since the canal meanders along a hillside for most of its length, provision for uphill water drainage runoff takes the form of some 30 culverts passing beneath the canal. Four of these are box culverts ranging in size from 7 x 6 ft. to 8 x 7 ft. The others are precast concrete pipe from 24 in. to 60 in. in size. Transition wingwalls on the uphill and downhill ends are typical for both kinds as well as two intermediate concrete cutoff walls in each length of culvert.

Other structures include 10 farm irrigation turnout structures, 11 check structures, siphon inlet and outlet transitions, minor bridges, cattle crossings, and irrigation crossings. The major one of the entire project is at the lower end of the

EQUIPMENT LIST

- 12—Caterpillar D8s
- 3—Caterpillar D6s
- 2—Caterpillar D9s
- 2—Ateco rippers
- 3—Caterpillar 12 graders
- 3—Caterpillar DW10 scrapers
- 4—Wooldridge TC 170 scrapers
- 3—Wooldridge TCN scrapers
- 1—Northwest 95 dragline
- 1—Northwest 6 dragline
- 1—Bucyrus-Erie 54 B dragline
- 1—Lorain Moto-crane
- 1—Koehring 304 crane
- 1—Hyster grid roller
- 1—McCoy sheepsfoot roller
- 1—LeTourneau sheepsfoot roller
- 1—Southwest sheepsfoot roller
- 1—Fleco 10 tooth rock rake
- 1—Ingersoll-Rand 210 compressor
- 1—Ingersoll-Rand 500 compressor
- 1—Ingersoll-Rand 124 compressor
- 1—Universal 880 portable crushing plant
- 1—Rex 105 concrete mixer
- 1—Guntert & Zimmerman slipform paver
- 1—Batch plant

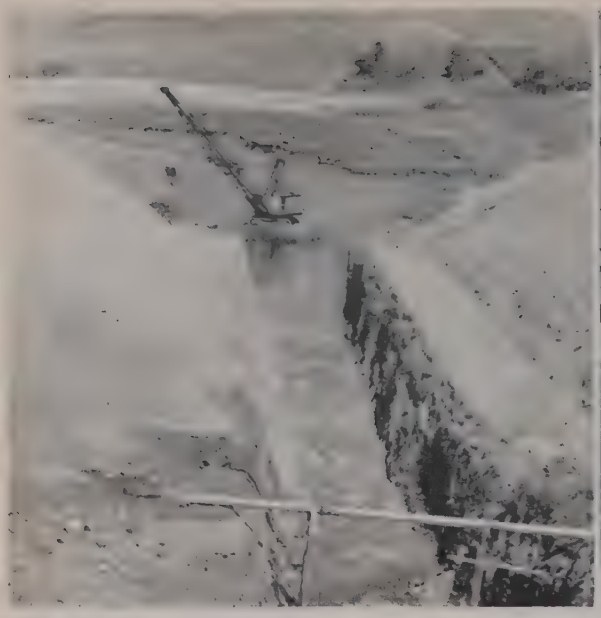
The Cat D9: One man's opinion



STEVE HANCOCK is a catskinner for Morrison-Knudsen and one of the few men who have had a chance to operate a new Caterpillar D9 tractor. Here are some of his observations on how it feels to be in the operator's seat when doing pioneer clearing and grading work along the route of the Gateway Canal

The tractor's 230-hp. drawbar pull was more than enough to spin the 24-in. wide tracks that this one was equipped with even in the best of ground. The 27-in. or 30-in. wide tracks which are available would have increased its traction and performance. Even at that he was able to push over 3-ft. diameter cottonwood trees that had been too much to handle for two Cat D8s pushing at the same time. The only trouble encountered to date was the failure of the oil booster pump to the brakes.

As a measure of the size of this tractor compared to others he claims that it is the equivalent of climbing a long stairway to get from the ground all the way up to the driver's seat. Another thing that he has had to get used to is the quieter engine.



SEVEN SIPHONS were required of which the excavation above by a Bucyrus 54 B dragline on an 800-ft. section was the longest.

IT'S A HEAVY LIFT as the first elbow section of 11-ft. inside diameter siphon pipe is taken off the lowboy by a Northwest.

canal where it enters the tunnel. Here is a combined powerplant headworks, tunnel intake, and wasteway structure. The formwork for this structure was intricate indeed. The wasteway has a vertical descent of about 150 ft., in a distance of 750 ft. down to the river, and is a concrete lined chute.

Concrete for the structures that Horner has constructed is dry batched in Ogden, about 15 mi. away, delivered to the job, and transferred to transit-mix trucks by a Travel-Batcher. Then the water is added, and the concrete is ready for placement by concrete bucket and crane.

Slip form paver

The concrete lining for the canal is the remaining big item for consideration. For most of the canal's length it passes through impervious ground that requires that a 4-in. layer of pervious rock be placed on the bottom and slopes before the concrete lining. A special slip form paver was ordered from Guntert & Zimmerman of Stockton, Calif., that will place this pervious sand and gravel lining as well as the 4-in. thick concrete lining. The pervious lining for a given section of the canal will be placed first and then the paver will backtrack and place the concrete.

Crusher near jobsite

Rock aggregate for both the linings is being produced near the jobsite. A portable Universal 880 crushing plant has been set up to produce 2½-in. minus material from pit run gravel. This plant has a jaw crusher that will handle rock up to 10 in. in size and this is followed by secondary crushing with roll crushers. In the past, the plant has turned out up to 2,000 tons of 1-in. minus rock in a 9-hr. shift. About 6,000 cu. yd. of concrete are needed for the lining. Type I low-alkali cement is being used.

Personnel for Morrison-Knudsen include I. D. Robbins, project manager; Russ Healey, general superintendent; George Skelton, master mechanic; Tom Randel, project engineer; J. B. McClelland, office manager. For subcontractor A. S. Horner key men are Havins Cook, superintendent, and W. I. Olkjer, assistant superintendent.

The Bureau of Reclamation's Weber Basin Project is represented by Clinton D. Woods, project manager; L. R. Dunkley, construction engineer; Rex Greenhalgh, office engineer, and Ross D. Billings, resident engineer in charge of Gateway Canal, assisted by engineers Ray Hardy, Reed Gunderson, and Forest Coulter.

INTRICATE powerplant headworks, tunnel intake, and wasteway structure is constructed at canal's lower end at Gateway Tunnel.

BOX CULVERTS pass beneath the canal section to carry hillside water drainage. Universal Uni-Forms were used extensively.

CONTRACTOR'S ENGINEER

By J. DONOVAN JACOBS
Chief Engineer
Kaiser-Walsh-Perini-Raymond
Snowy Mountains Project
Cooma, New South Wales

Trained as a technician, he must learn to think in terms of dollars. Construction is a team operation and the engineer must fit into the team.

CONTRACTING, the business of construction, is not in itself an engineering function. The contractor is an entrepreneur who purchases labor and materials and by the application of skill and knowledge combines the ingredients into a saleable product. Since the required skill and knowledge are often technical in nature, the engineer is an important member of the contractor's staff. He is not necessarily the most important—though this fact is contrary to the belief of many engineers.

The man in command of a construction contract is frequently confronted with choices of alternative methods and equipment. Since his motive is to earn a profit, the choice between alternatives must be resolved in the direction of greater financial gain. The young engineer must learn this from the first. He must acquire the knack of analyzing unit costs of work and must train himself continually to search for means of lowering those costs.

Cost records are only the means

Too often it happens that the only costing work done by the engineer is the reporting of work quantities to the accounting department. These figures are processed by accountants into a periodic cost report for the guidance of those who manage the job. This recording of money costs of construction is the task of accountants. Usable cost information for the engineer, on the other hand, consists of more than a tabulation of dollars or cents per unit of measure.

The accounting department's record of the cost of Job 222 will reveal that concrete formwork of a certain description cost $0.83 per sq. ft. But does it give the breakdown between labor and materials? Does it show the average man-hour cost for employees building those forms, from which can be obtained the man-hours required to build, set, and strip those forms? Is there a brief description, so that some future estimator can set up a comparison with a job for which he is preparing a bid?

In short, it behooves both engineer and manager to see that the alleged analytical traits resulting from a technical education be put to better use than that of mechanical harvesting of data. The reasons are twofold: costs are a financial check of job health, enabling the diagnosis of economic ills, and they establish dependable measures of value to use in bidding future work.

Cost keeping and estimating are supplementary operations. Each thrives on the other. An engineer who is concerned with costs should be impressed that, for the purpose of making future cost estimates, unit costs in money mean little. Wage rates vary greatly with time and locality. There is considerably less variation in the productivity of men. Cost records expressed in man-hours per unit of work are little affected by the passage of time.

Estimating knowledge is essential

Knowledge and experience in estimating are essential for one who aspires to higher places in the contracting world. The engineer who has sufficient imagination to perform a job "on paper" and who has the knowledge of the factors that influence costs will usually devote a part of his construction career to the estimating department.

The estimator's task is not always an enviable one. Credit for a winning job usually goes to supervision, while blame for an unprofitable contract is passed to none other than the culprit who estimated the costs too low!

An estimating engineer must know construction methods. He must possess the ability to plan. Knowledge acquired from books and publications, while valuable, is not a substitute for "having done it."

An estimater must not only know operational details but must be gifted with imagination and inventiveness. This quality is most essential in heavy construction, where a method of accomplishment must be designed before a cost estimate can even be started. A successfully low bid is often attributable to the development by the estimator of a unique construction method.

On all jobs, large and small, design skill and resourcefulness pay dividends, but it is likely that such dividends are higher, percentage-wise, on the smaller contracts. The most obvious simplification in the method of doing a job is often hidden by prejudice or by shadows of previous habits. An engineer learns to observe and study the operations around him and frequently asks himself, "What change in this operation will make it less expensive?"

Engineering is a broad term

The engineer who is imaginative and mechanically minded may find his niche to be in the field of construction plant design. Anyone who has spent much time in plant work finds that he has to draw on knowledge in all branches of engineering: mechanical, electrical, civil, and mining. For that reason a young man in college who hopes one day to tackle construction work should give thought to diversity in his elective courses.

Most of the designing done in a contractor's office is of plant items. A differentiation should be made between "plant" and "equipment." Plant is chargeable to the particular job only and includes roads, water supply, electrical power distribution, transportation and installation of construction equipment and buildings, etc. Equipment includes any machine that can be moved to another job and reused there: trucks, power shovels, concrete mixers, pavers, etc.

One of the few times that equipment designing is performed on the job is in the improvement of existing machines or in development of new devices. But it's a rare case where a piece of equipment is required which some manufacturer does not produce. On the plant end, however, nearly every job requires some planning and layout work from the drafting department.

Drafting must be fast and clear

The young man who is "on his way up" in construction engineering is well advised to serve time rubbing his middle anatomy against a drafting table. He should become proficient in making clear, readable, and neat pencil

tracings. He must learn to draw rapidly, without embellishment but with just the right amount of detail that his ideas are conveyed plainly to others who must put them into operation. Along with this skill goes the ability to write a specification that tells everything necessary with a minimum of words. Design engineers of experience outside construction are frequently surprised to find how much more simple and direct are the drafting room procedures in a contractor's engineering office. Rapid results are demanded. Economy and efficiency are substituted for "spit and polish."

Field work most important

Now, all the preceding has been about the office duties of a contractor's engineer. Any outside man, on the other hand, will insist that the job's profit or loss is incurred in the field, and that all office-employed personnel are sedentary, non-producing creators of overhead. And it is true that the field engineer lives his work day with the men who are actually performing the work, and that he thereby has the best possible vantage point from which to learn all practical phases of construction. His duties include surveying, record keeping, and coordination between owner and contractor.

The surveyor role of the contractor's engineer has increased in scope in recent years. Construction agencies and owners are passing on to the contractor the responsibility for both location and quantity determination surveys. The contractor's engineer is seldom called upon to do precise surveying, but he must be skilled in the techniques of fast and accurate structural layout, leveling, route surveying, and topographical surveys by the stadia method. And he must work with a minimum of assistance. A party usually consists of two chainmen or rodmen, with the engineer as instrument man and chief of party.

One of the more humdrum chores in the life of a construction engineer is the taking off of quantities. And when a contract provides for the owner to perform all quantity surveys, it's important that a careful check be made of his quantity determinations. This obvious precaution, rather surprisingly, is often neglected. A manager who wouldn't think of receiving a truck load of materials without checking the waybill often accepts without question the owner's statement of quantities of work performed. Especially on jobs where excavation quantities are the means of computing the principal monthly income to the contractor, ordinary business common sense calls for an independent survey and computation. This precaution protects against the ever-present hazard of personal error.

A one-man field force

On projects of limited size the field engineering is frequently a one-man department. The engineer's workday begins before start of the workmen's shift and seldom is completed till long after the quitting whistle has blown.

The engineer must work closely with the superintendent in matters of planning and scheduling of operations so that he knows well in advance where and when his surveying assistance will be required. Then, whenever possible, the setting out of the required work points should be the first business of the day in order to assure that no delay in operations will result from a lack thereof.

The last portion of the workday should be the time for reports and paper work. And in between, the alert field engineer makes it a point to tour and inspect all the work under his assignment, as completely as time will permit, in order to familiarize himself with all details.

Before leaving the job at shift's end the field engineer makes sure that his diary or job log book contains a complete and concise recording of pertinent occurrences during the period he was on duty. How important such a record can be is often learned in an unhappy way when some unforeseen circumstance makes it imperative that events be recollected—and it is then discovered that no record is available.

In cases of legal actions and claims, diaries are invaluable. For this reason it is advisable that the daily entries be made in ink. Pencil records are often suspect in court because of the possibility of erasure and alterations. It's better to be too verbose than to be too concise. The fact recorded in a brief sentence may some day develop into great importance.

Accumulating daily reports

Using properly designed printed forms, it is the field engineer's daily assignment to report quantities of income-producing work accomplished. On jobs large enough to warrant an office engineer, he will receive the daily reports from the field and accumulate and record the daily and to-date accomplishments for management. On smaller jobs, the field engineer will do his own accumulating and pass the information to the proper people.

In cases such as excavation, where accurate measure of pay quantities can be made only from surveys, sufficiently accurate daily approximations can be obtained by means of truck counts or other estimating devices. These are expedient methods only, and should always be checked later by more accurate determination.

Working in harmony with the team

Personality characteristics are as important to the success of a young engineer as his technical background. Ability to perform his daily tasks in complete harmony and cooperation with co-workers, superiors, and subordinates is a trait that an employer must insist upon. Teamwork is essential. Many a technically sound man has failed to make the grade because he lacked tact and diplomacy. An attribute which occasionally must be acquired somewhat painfully by new employees is the quality of humility.

In recent years many engineering schools have recognized that construction is here to stay, and they are offering undergraduate courses intended to make men more useful in the construction industry. Courses such as Estimating and Construction Equipment are reputedly popular with students, but their actual value depends entirely upon the practical knowledge and experience of the instructor. In addition to these specialized electives, the aspirant to a career in contracting shouldn't overlook the benefits to be received from such courses as Accounting, Contract Law, and Geology.

Most civil engineers are given a cursory course in electric power which is taken with as much enthusiasm as a dose of castor oil. In the designing of modern construction plants knowledge of electrical distribution and power becomes appreciated by the discovery of its lack. The same applies to training in machine design and kinematics, usually the domain of the mechanical engineer.

Many a young engineer has plunged into a career in construction, only to suffer acutely from disillusionment upon failing to find the glamor that had been conjured up in his imagination. Indeed, construction life may be lacking in certain luxuries. But it has recompenses. The newcomer may forsake sartorical elegance for a khaki twill uniform, and a fixed habitat for a nomadic existence. But if he possesses the necessary combination of interest, fortitude, ability, and enthusiasm to hold him in the chosen endeavor, the chances are good that he will progress and prosper with never a regret for having chosen that path.

PRESTRESSED GIRDERS 136 ft. long will be formed and poured in a yard at the left edge of the picture. They then will be rolled on rail-mounted dollies to the end of the building. Here four cranes will lift the 80-ton members to rails on the columns for rolling to position.

FOUNDATION TO ROOF: A building that's unusual all the way up

A REALLY UNUSUAL building is going up at Hill Air Force Base near Ogden, Utah, both from the structural design and construction methods viewpoint. The compacted earth foundation, the formwork and shoring system for the concrete work, the method being worked out for the erection of the longest prestressed concrete girders in the West yet to be poured in one place and then moved to another, and the system for handling precast roof slabs—all these make for a very interesting reinforced concrete building project.

Contractor doing this work is Jacobsen Construction Co. of Salt Lake City on a contract of $2,360,000. The structure involved is a spark-proof cleaning and painting hangar. Outside dimensions are 274 ft. long by 260 ft. wide. It is actually two structures having the same length but composed of one section having a 130-ft. clear span and the other being a two-story building. Column spacing lengthwise of the structure is 31 ft. 4 in., with three lines of columns in the two-story section and only two lines in the large clear-span section.

Foundation problems

With a heavy unit column loading in this structure, foundation conditions posed a problem. Alternative footing designs were considered for a soil that varies from sand to silt and was originally deposited by both wind and water. A pile foundation or concrete piles formed by the Franki ramming method were both considered. The method finally chosen was to excavate below finish grade to a 12-ft. depth and then replace the same material in compacted form. This was done under the entire building area except under the clear span area. Replacing the ground in 6-in. layers with scrapers and compacting with sheepsfoot rollers to a high relative density did the trick to get increased bearing values for the ground. Gravel 6 in. thick will be placed beneath all ground slabs and followed at a later date with concrete from 6 to 14 in. thick in various sectors of the ground floor.

Pan-type second floor

Upper floor construction in the two-story section is of the pan type. Large reinforced concrete girders span between columns width-wise of the building. Spanning between the girders are pan-formed joists on 2-ft. 3-in. centers. Joist depth is 14 in., width is 7 in. Sheet metal pans are 1 ft. 8 in. wide and leave a 3-in. slab between joists.

With the first story height of about 20 ft., a shoring system to hold up the pans could have been a problem. This was solved in good style by using pipeframe shoring about 13 ft. high that was cross-braced in two directions to form a stable first height. On top of this was built the normal wood

PAN-TYPE JOIST construction with 2-ft. 3-in. spacing was used to span the 31-ft. distance between girders on the two-story section of the building. These sheet metal pans are 1 ft. 8 in. wide and leave a 3-in. thickness of slab between joists. Rapid erection of formwork was typical of this system and procedure.

SHORING SYSTEM for the 20-ft. height of the first story was a combination of pipeframe and timber. The first 13 ft. was of pipeframe on which rested a 7-ft. height of normal wood shoring to support the pans and joists. The pipeframe shoring was cross-braced in two directions.

shoring system to support the joists and pans. A convenient working height platform for workmen on top of the pipe shores was also provided by this system.

In the large clear span section of the building, columns 40 ft. high and measuring 4 ft. by 3 ft. 6 in. will be formed and poured in 12-ft. lifts. New columns will be formed almost butting columns of the two-story section that will have been already poured. For this situation some of the largest column clamps in the United States were assembled to tie the new column forms to the already poured columns. These are Roos column clamps that measure 9 ft. on each leg and took two months of good expediting to get.

The prestressed girders to rest on the columns are 136 ft. long with 130-ft. clear span. These are 6 ft. 4 in. deep at the ends and 7 ft. 6 in. deep at the center to provide a pitch for the roof. Bottom flange is 1 ft. 8 in. wide, top flange 3 ft. 6 in. wide, and web thickness 7 in. Each girder will be post tensioned using the Stressteel method. This requires that 18 bars of about 1⅛-in. diameter be looped through the girder and each one of them tightened to an effective stressing force of 77,000 lb.

Rolled and lifted and rolled

From the casting yard at one end of the building and 100 ft. away, the girders will be rolled on rail-mounted dollies to the end of the building. Here they will be picked up by two cranes at each end with the aid of lifting beams (the girders weigh 80 tons apiece) and set on trolleys at the top of the end columns. The reinforced concrete girt beams connecting the tops of the columns will support the rail for the trolleys that will enable the girders to be rolled to position further on down the building.

TWO CASTING PADS for the 100 precast roof slabs 28 ft. 8 in. long feature steel headers for accuracy of length, steam curing pipes on top and bottom and a compressed air system for blowing the slabs loose from its forms. Sequence calls for pouring at noon one day and removal the following morning.

TWO-TYPE SHORING is shown in this general view, with the 13-ft. pipeframe topped with the wooden supporting system for the concrete girders. Concrete pouring will be in 40-ft. sections to provide contraction joints at that spacing.

On top of the girders are to be placed precast roof slabs of pan-type construction. These measure 10 ft. 10 in. wide, 28 ft. 8 in. long, 12 in. deep at the ribs, and have a 1½-in. crown thickness. These slabs, 100 total required, are being formed and poured on the jobsite.

Two very accurately leveled concrete casting pads were formed and poured for this operation. On these pads are placed the pans and steel side forms. The intended fast moving pouring and stripping operation will be aided by steam curing. Slabs will be poured at noon one day and stripped and removed the following morning. A Clayton oil-fired steam cleaner has piping leading from it to the underside of the pans—the steam will also be fed under tarps covering the tops of the slabs. When it comes to lifting the slabs free from the pans, (after the side forms have been removed) provision has been made to attach an air hose to another piping system that will force air beneath the slab and the pans to break the bond there. This is a well thought out system for rapid precasting work.

An interesting ground-level concrete plant was set up here. Its unique feature was that from the aggregate stockpiles to the placing of concrete in foundation portions of the structure, a crane was not needed at all. Cranes did come into the picture for placing concrete by bucket at later stages. A Wagnermobile front-end loader delivered aggregate to the two-bin Winslow batch plant and scaler. Then the Wagnermobile took the dry-batched material and delivered it to the 1-cu. yd. Ransome mixer. Sacked cement was added at this stage. On the discharge end of the mixer a Buggymobile with its 1-cu. yd. hopper picked up the concrete for delivery to the pouring area.

Directing the job

Running this job for Jacobsen Construction Co. is P. A. Maxwell, superintendent, with Jack Wheatly as engineer. For the Corps of Engineers, Lawrence Fine is resident engineer for all projects at Hill AFB and J. W. Ferrell is job inspector. Col. J. A. Graf, San Francisco district engineer, is in over-all charge.

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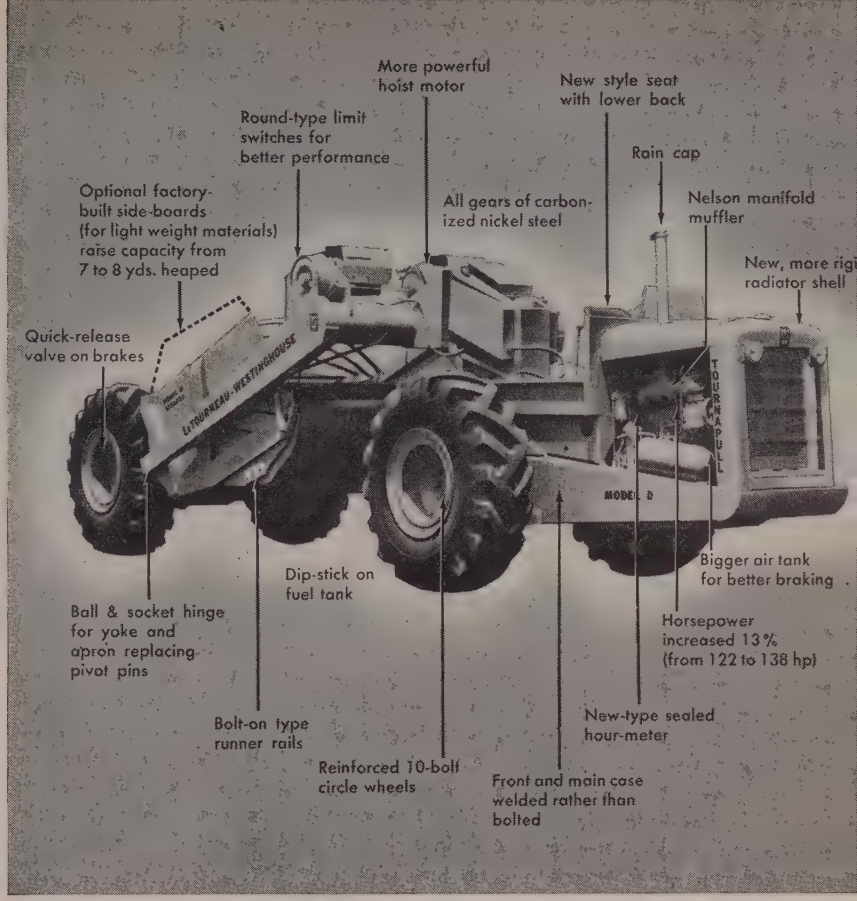

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NATIVE SOIL breaks out easily for Morrison-Knudsen and Westbrook at March Air Force Base. The big thing is putting it back, 6 in. at a time, with other materials totaling 60 in. thick. Contractor and Corps have a tough job meeting the specifications.

Earth compaction on B-47 runways

BRUTE FORCE and soils technology—they're working together to build Air Force runways and taxiways husky enough to stand up under today's B-47 wheel loads. The brute force is a 100-ton pneumatic-tired proof roller, with tire pressures up to 150 psi. The soils technology is the CBR test, performed repeatedly on successive lifts of subgrade, sub-base and base materials.

The result is a bearing structure 60 in. thick. It will handle the B-47 design wheel load—100,000 lb. on duals 37½ in. apart, having 267 sq. in. of contact area.

Design standards and depths

This kind of construction means a lot of earthmoving at March Air Force Base, for example, where Morrison-Knudsen and R. A. Westbrook have to excavate and backfill all along the line, as well as import material from two outside pits. Their $4,811,000 contract covers two main items, a runway extension 200 ft. wide and 3,300 ft. long, and a taxiway 75 ft. wide and 4,075 ft. long. In addition there are parking aprons, drainage ditches and structures, and utilities.

Design standards for this type of work have evolved with increases both in loads of operational air traffic and in knowledge of soils. And the process is a continuing one, marked lately by greater requirements for depth of compaction and imposition of proof rolling.

Depth of compacted materials in taxiways, for instance, has moved up from 37 in. to 60 in. And from the airport contractor's viewpoint the work is spelled out letter-by-letter. Corps of Engineers specifications set forth the maximum compacted lift thickness as 6 in. The required degree of compaction is stated in terms of modified AASHO density. And, "compaction shall be accomplished by sheepsfoot rollers, heavy pneumatic rollers, power rollers, or other equipment approved by the contracting officer."

BRUTE FORCE reserved for special occasions of proof rolling is this 100-ton rig. Not an ordinary piece of equipment (it was built by Porter), it is hauled on this job by a Euclid rubber-tired tractor.

In-place densities are checked to insure that requirements are being met. The frequency of testing is best illustrated by the number of density tests taken in some of the constructed materials in the runway and taxiway extensions: 185 tests in subgrade materials (90% required), 90 tests in subgrade materials (93% required), 75 tests in disintegrated granite (98% required).

Proof rolling required

Along with the greater depth of compaction, proof rolling is called for. The rolling is applied on the top of each zone as the work progresses, but not to individual lifts. The idea is literally to prove the adequacy of routine compaction; the proof work also achieves some added compaction on its own if moisture conditions remain near optimum. After all, the machine has 25-ton wheel loads, and tire pressures of 140-150 psi.

Twenty passes of the proof roller are applied on the following surfaces: (1) the excavation payline, 54 in. below final grade; (2) top of 18 in. of native soil; (3) top of 12 in. of native soil; (4) top of disintegrated granite; and (5) top of pit-run sand and gravel. Here is the applicable portion of current specifications for Morrison-Westbrook's work at March:

"The test rolling for each layer shall consist of the number of passes directed by the Contracting Officer and shall be accomplished after the layer has been brought to the specified density and final grade. Each pass shall consist of the entire coverage of the area with one trip of the roller. If, in the opinion of the Contracting Officer, the test rolling indicates unsatisfactory materials or compaction, the Contractor will be required to correct the deficiencies in the following manner. In general, the

Blythe Brothers, Morrison-Knudsen

cut maintenance with tractors-on-rubber

n ideal answer to the problem f excessive track maintenance is eported by officials of Blythe Bros. ompany, Charlotte, North Caro- na, and Morrison-Knudsen Com- any, Inc., Boise, Idaho.

hese two nationally-known firms, n their million-yard joint venture t Alvin Callender Air Base near ew Orleans, have replaced 148 hp rawler-type tractors with two 208 p rubber-tired Tournatractors.

his job, with its continuous work n Mississippi River-bottom sand, proved a nightmare for the crawlers. Most of the time, it was necessary to replace pins and bushings and build up rails and rollers about every 900 operating hours. Each time the repair job was done, it cost about $2,000 per tractor.

Tires cut track rebuilding costs

Tournatractor tires have practically eliminated these troubles. These big single tires roll easily over the abrasive sand. In months of double-shifting, they have required no maintenance other than inflation.

Sand dumped by Tournapulls is dozed out over swampy ground. This is method contractors are using, together with dragline-stripping and side-casting of 7′ of top muck, to fill an age-old cypress swamp. Sand — over 1,000,000 yards of it — is dredged from the Mississippi River and hauled in. It is so abrasive that crawler tracks require rebuilding every 900 hours.

High output is reported for Tournatractors, too. Pushing sand dumped by Tournapulls to fill over a swamp, they average a 300′ dozing cycle every 32 seconds. Push forward is made in third gear (8 mph) . . . return in second (also 8 mph). The 150′ dozing distance takes an average of 19 seconds . . . the 150′ return, 13 seconds. Loads vary from 2 to 2½ cubic yards . . . output per 55-minute hour, from 200 to 250 cubic yards.

Travel 19 mph job to job

In spare time, Tournatractors make good use of their 19 mph mobility to handle odd jobs around the 4.7 square mile construction area. Units "run" everywhere . . . cross pavements, tracks without planking . . . travel up to 1,670 ft. per minute to do such odd-job assignments as cleaning the haul route. At times, units have also been used to pull 50-ton rubber-tired compactors.

Let us show you what speed, plus elimination of track problems, can do for you. In sand, reduced maintenance alone can quickly pay for your Tournatractor. In less abrasive materials, you'll find one or two of these versatile tractors ideal for fast work all over the job site. Write today for new bulletin and specifications.

Tournapull, Tournatractor— Trademark Reg. U.S. Pat. Off. T-813-A-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

corrective action will consist of adding material and compacting it to the required density for that portion of the layer under consideration. However, when directed, unsatisfactory portions of the layers shall be removed and reconstructed with satisfactory materials. After completion of the corrective measures, the area affected shall again be test-rolled and if deficiencies still exist, corrective action shall again be undertaken."

Test rolling is measured by the square, defined on this work as 100 sq. ft. Payment is for the number of squares acceptably rolled with one pass of the proof roller, with one exception: no measurement of or payment for test rolling required due to reconstruction of a layer located above the pay line in cut, or above the natural ground surface in fill.

PROCESSING material on the fill includes disc and drag that leaves uniform moisture content and a fairly easy chore for the blade operator. Most of the time, compactors can follow up directly.

WATER is supplied in 5,800-gal. loads from this odd rig, converted by Lefever from a bottom-dump Euclid. Big capacity means more time on the fill, keeps work going smoothly.

COMPACTION of lifts is handled by Fergison and Southwest 50-tonners. First pass is the toughest, and wheels slip if already loose material is a little too wet.

CBR test of performance

The overall gauge of performance in the field is the CBR method of testing. Its importance is such that the foundation and materials engineers of the Corps don't talk of gravelly sand or of disintegrated granite, but instead of "CBR 40" or "CBR 25." These are the minimum required test values for two materials in the runway and taxiway profiles.

The CBR, or California Bearing Ratio, is a modulus of shearing resistance determined by a penetration test. The ratio is expressed as a percentage of the standard stability for crushed stone, taken as 100. Empirical design curves equate CBR values to strength properties for a given material, and the thicknesses of material are determined from these curves.

CBR testing itself is fairly fast. It consists of applying a progressive load to the base course, noting the stress required to get certain standard penetrations. The result is a curve of penetrations plotted against unit pressures. A straight line is faired through the lower portion of the curve to intercept the horizontal axis, and the origin of the coordinates is then offset to match the new intercept. Penetration values are then measured from this new origin, and unit pressures picked from intersections on the curve. The ratio of pressures for a given penetration, as between the runway material and a standard crushed stone sample, is the CBR value.

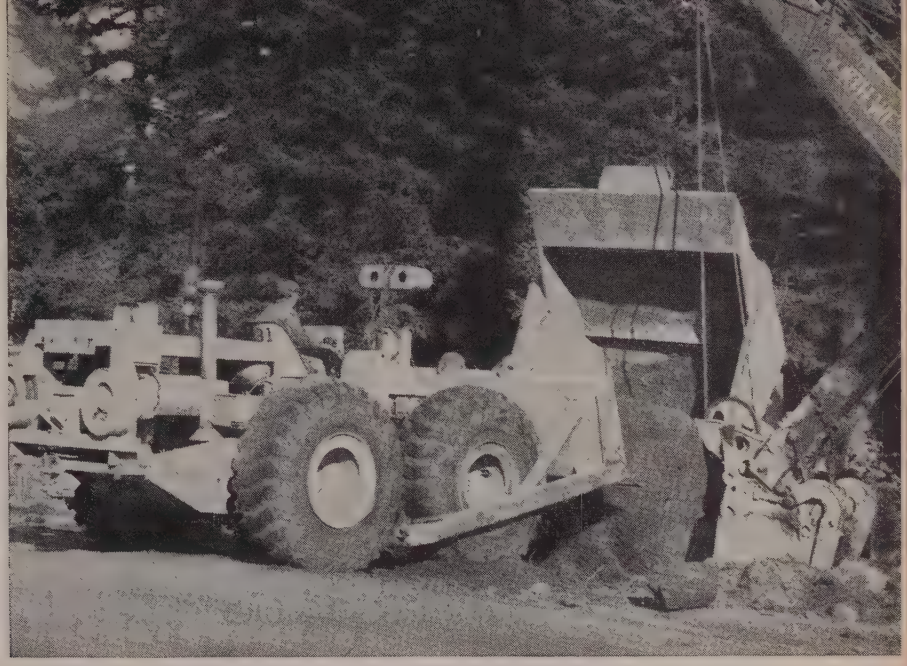
Soils compacted in the laboratory may have different characteristics from those compacted in the field. For example, the standard lab procedure involves a 4-day soaking period. Therefore, as construction progresses duplicate samples are tested by field and lab methods, and correction factors are determined for applying to field results. The ratio of soaked and unsoaked CBR values leads to a "corrected field value" that is similar to the "adjusted moisture value" determinable only in the lab.

Instruments are simple

Instrumentation for the test is equally simple. A calibrated proving ring is the heart of the equipment. A dial gauge registers its deformation, which is proportional to the load. And a second dial gauge registers piston penetration into the base course. These provide the needed stress and deformation readings. Other equipment includes only surcharge weights approximating the weight of base course materials that would normally overlie the tested layer.

Three or four test pits are adequate

tractor and shovel position and hold boulder while electric hoist brings back ump body to haul position. Big low-e tires of tractor do no damage to g pavement. Dozer's high blade lift (54") ist positioning help speed loading.



How ontractor Heintz beat the boulder problem...

On toughest section of Portland-Salem Expressway, extensive beds of 3 to 6-yd. boulders removed by combination of tractor, rear-dumps, and shovel

You have the toughest section of ..."

A. Heintz Construction Company, rtland, Oregon, heard that phrase en during their work on 6.9 miles the Portland-Salem Expressway be-een Boone's Ferry Road and the illamette River.

ot that the grading in their $663,-0 contract for turning 2 lanes of isting highway into 4 lanes of pressway involved much dirt. It dn't. Only 200,000 yards, with most ts less than 5 ft. deep.

ut in many places extensive beds of oulders had to be moved. These eraged 3 cubic yards to 6 cubic rds and 12,000 lbs. to 24,000 lbs. each. The "awkward" size. Too big for most shovels to handle alone. Too small to blast economically.

A real problem!

How would you lick it?

Contractor Heintz's solution was to team his two 16-ton LeTourneau-Westinghouse Rear-Dumps with a rubber-tired Tournatractor and a 2½-yd. shovel. As each of the many big boulders was reached, tractor and shovel lifted together, the tractor bracing the rock tightly against the shovel bucket. Meanwhile, one of the Rear-Dumps backed as close to the boulder as possible, its bowl in dump position to minimize lift required. Shovel and tractor teamed up to place and hold each boulder against the Rear-Dump bed. Rear-Dump operator then lowered bowl while shovel and dozer operators followed lift of rear-end to keep load from rolling out. As soon as body reached haul position, Rear-Dump drove away either to waste dump or deep fill where its electric-controlled dump and great strength of the 3 layer, all-steel body made it easy to roll the big boulders out of the bowl and safely over the edge of the fill.

Despite difficult loading, output averaged remarkably high. On one 4000' cycle, where haulers dumped on approach to the Willamette River bridge, each Rear-Dump delivered a load every 10 minutes. Production per unit per 50-minute hour averaged 5 loads (60 to 80 tons).

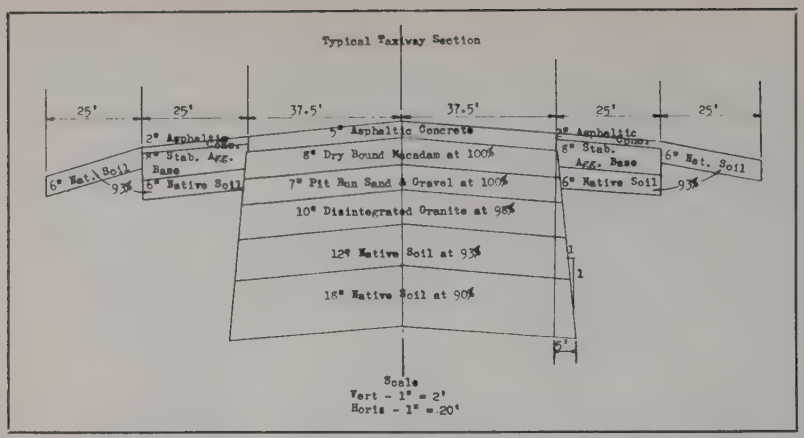
LeTourneau-Westinghouse equipment can pay off on your tough jobs, too. Let us prove it to you by showing you the machine in action.

Tournatractor—Trademark RT-619-Hb

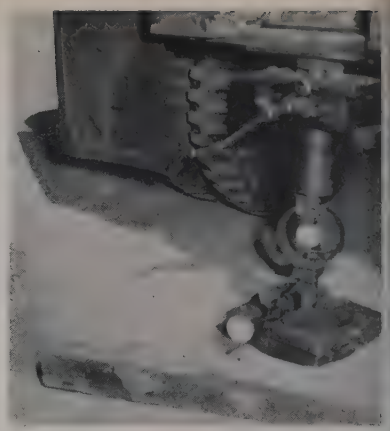
LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



DEPTH OF COMPACTION is illustrated by typical section of taxiway at March. Asphaltic concrete runway profile looks the same except for top 20 in. Runways have 4 in. of A.C., 7 in. of dry-bound macadam, and 9 in. of pit-run sand and gravel.



CBR TEST GEAR is this compact set-up below tailgate of truck used to supply reaction. Here are piston, proving ring, and gauges.

for a job the magnitude of March. More might be desirable, but the number is limited in order not to interfere with construction progress. Tests are made at five depths as the profile is built up. First, the subsoil 60 in. down. Then compacted native soil at depths of 42 and 30 in. Then the top of the two following select layers, disintegrated granite at 20 in. and gravelly sand at 13 in.

To assure that typical results are obtained, from 3 to 5 tests are made on each surface, with the penetration points about 1 ft. apart. The testing is done while construction progresses elsewhere. And when the contractor is ready to return, control tests are available to guide his next operation.

Hauling length varied

For Morrison-Westbrook this system of construction control is easily worked in with their construction schedule because of several conditions that govern their earthmoving. First, their sources of material are at various distances from the site. Native materials, obviously, are only a matter of stripping, stockpiling, processing, and returning to the work. But the next higher course, disintegrated granite, comes from a borrow area 2 mi. to the southwest. And sand and gravel come from a long-established location, the Weaver pit, 9 mi. away. By properly scheduling operations, Morrison-Westbrook can almost always have a spot ready to receive these materials, or the hauling equipment can be shifted from one source to the other.

This suggests the second reason for the practicality of the CBR system of construction control. The contractor doesn't have a spread of equipment big enough to handle everything at once. It would not be economical for him to do so, and the job does not require it. Instead, he shuffles his hauling and processing equipment as the weather and soils and other factors require.

For example, one day in July the job was "caught up" on disintegrated granite embankment, and a fleet of 25-yd. belly-dump trailer combinations was apparently idle. So the contractor rented a Sierra Loader, tied it to a Cat, and put it to work breaking out native soil from the runway extension alignment and loading trailers for a short haul over to some taxiway that was ready for it. The loader worked at about 500 yd. per hr. with one tractor. It didn't quite keep up with the truck-trailer combinations, but for the most part it kept them profitably occupied.

Morrison-Knudsen and Westbrook have carefully picked the operations for sub-contracting on this project. Hauling is one, subbed to Miles & Sons of Merced, to take advantage of big hauling equipment that is their specialty. Another operation is watering the embankment. Lefever of Sacramento has this item, and again they have special equipment to handle it. The principal rig is a 5,800-gal. tank made by converting a belly-dump Euclid wagon.

Other subs are pretty much on separate phases of the work, apart from runway and taxiway construction itself. There is ABC of Norwalk, on drainage—quite a stint in itself, involving four 72-in. concrete pipes side by side as a storm drain.

Finally, E. L. Yeager of Riverside has subbed asphaltic concrete surfacing, while the prime contractor will do his own concrete paving—about 220,000 sq. yd. On the 3,300-ft. runway extension, 2,300 ft. is asphaltic, and the last 1,000 ft. is concrete, 17 in. thick. Taxiway surfacing is asphaltic concrete, while parking aprons are paved with concrete. Principal quantities are as follows:

ITEM	RUNWAY & TAXIWAY (cu.yd.)	APRON (cu.yd.)
Excav. and grade	415,000	196,500
Disintegrated granite	31,100	59,000
Sand and gravel	21,000	
Dry-bound macadam	16,700	
Cement concrete	10,630	209,380
Asphaltic concrete	24,152 tons	

Running the project for Morrison-Knudsen Co., Inc., and R. A. Westbrook is O. P. Pope, project manager, with Don J. Westbrook as his general superintendent. Del Hoyt is excavation superintendent, Don Jensen is batch plant superintendent, and Bill Southworth is concrete superintendent. Dallas Matthews is master mechanic. The project engineer is Frank Scully, with John West assisting in the office.

For the Los Angeles District, this and other work at March Air Force Base is under the jurisdiction of William Smiddy, project engineer. John Fallon is the office engineer. Walter A. Talley is construction coordinator.

Construction control testing is under the direction of Frank Mills, Investigation Section, Foundation & Materials Branch. Design and liaison is being done by Joseph Sciandrone. Actual CBR testing is being conducted by Tom Watson. Responsibility for this part of the construction program lies with the project engineer. The investigation section functions in a service capacity, providing specialized knowledge and obtaining data for study and application to future design.

A NEW TREATISE on clays and clay technology has recently been published by the **Division of Mines,** California Department of Natural Resources. Issued as Bulletin 169, it is entitled "Clays and Clay Technology." Divided into 7 parts, including sections on geology and mineralogy, properties, methods of identification, technology in relation to soil science, to soil mechanics, to ceramics, and to the petroleum industry, the book presents the latest information in the field of clay science. Bound in cloth, the 326-page, 8½x11 book is amply illustrated. Priced at $4.50, plus 3% sales tax for California residents, the book may be ordered from the Division of Mines, Ferry Building, San Francisco 11.

arly 200 "EUCS" already at work on the

St. Lawrence Seaway

Model 63TD "Euc" getting a heaped load of 20 cu. yds. at site of Long Sault Dam near Massena, N. Y.

Although work on the St. Lawrence Seaway and related New York Power Authority projects is just getting under way, close to 200 Euclids are already "digging in". They're helping build cofferdams, making diversion cuts, relocating highways and railroads, and preparing power house sites. Other "Eucs" are doing similar jobs on the Canadian side of the river.

One of the key projects in the whole Seaway program is construction of Long Sault Dam near Massena, N. Y., a joint venture sponsored by Walsh Construction Co. Others who have pooled their men and machines on this 7 million yard job are B. Perini & Sons Co., Morrison-Knudsen Co., Peter Kiewit Sons Co. and Utah Construction Co. . . . some of America's leading contractors. At present 50 "Eucs" are working on this one contract and others will be added as work progresses.

Eight of the Euclids are 22-ton Rear-Dumps with 300 h.p. engines and Torqmatic Drives. They were selected for this job because of their ability to haul big loads at fast travel speeds day in and day out . . . with less down time for servicing and repairs. That's the kind of performance that has made "Eucs" the preferred equipment for hauling heavy excavation on the toughest jobs everywhere . . . it's one of the important reasons why ***EUCLIDS are your best investment.***

Torqmatic Drive and 300 h.p. make this "Euc" a top performer. Torque Converter and semi-automatic transmission eliminate manual shifting—utilize full engine power at all times.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

EUCLID

GM GENERAL MOTORS

POWDER DON'TS— Best to play it safe

THIS SERIES of don'ts adopted by the Institute of Makers of Explosives should be of value to all. In the following: "explosives" include dynamite, black blasting powder, pellet powder, blasting caps, and electric blasting caps. The term "electric blasting cap" means instantaneous electric blasting caps, delay electric blasting caps, and delay electric igniters with blasting caps attached.

Don't purchase, possess, store, transport, handle, or use explosives except in strict accordance with organizational, local, state, and federal regulations.

Don't use permissible explosives except in the manner specified by the United States Bureau of Mines.

Don't store explosives anywhere except in a magazine which is clean, dry, well ventilated, properly located, substantially constructed, and securely locked.

Don't permit explosives to be handled or used except by or under the direction of a person who is competent and experienced in their handling and use. Under no circumstances should persons under 18 years of age be permitted to handle or use explosives.

Don't allow any persons not essential to the blasting operations in or near the danger area of a blast.

Don't leave explosives lying around where children can get them.

Don't leave any explosives or the empty paper shells or bags therefrom in any place where livestock can reach them.

Don't allow leaves, grass, brush, or debris to accumulate within 25 ft. of an explosives magazine.

Don't smoke or have matches, open lights, or other fire or flame, either inside or within 25 ft. of an explosives magazine, or have them nearby while handling or using explosives.

Don't shoot into explosives with any firearm, or allow shooting in the vicinity of an explosives magazine.

Don't store any metallic tools or implements in an explosives magazine.

Don't open kegs or cases of explosives in a magazine.

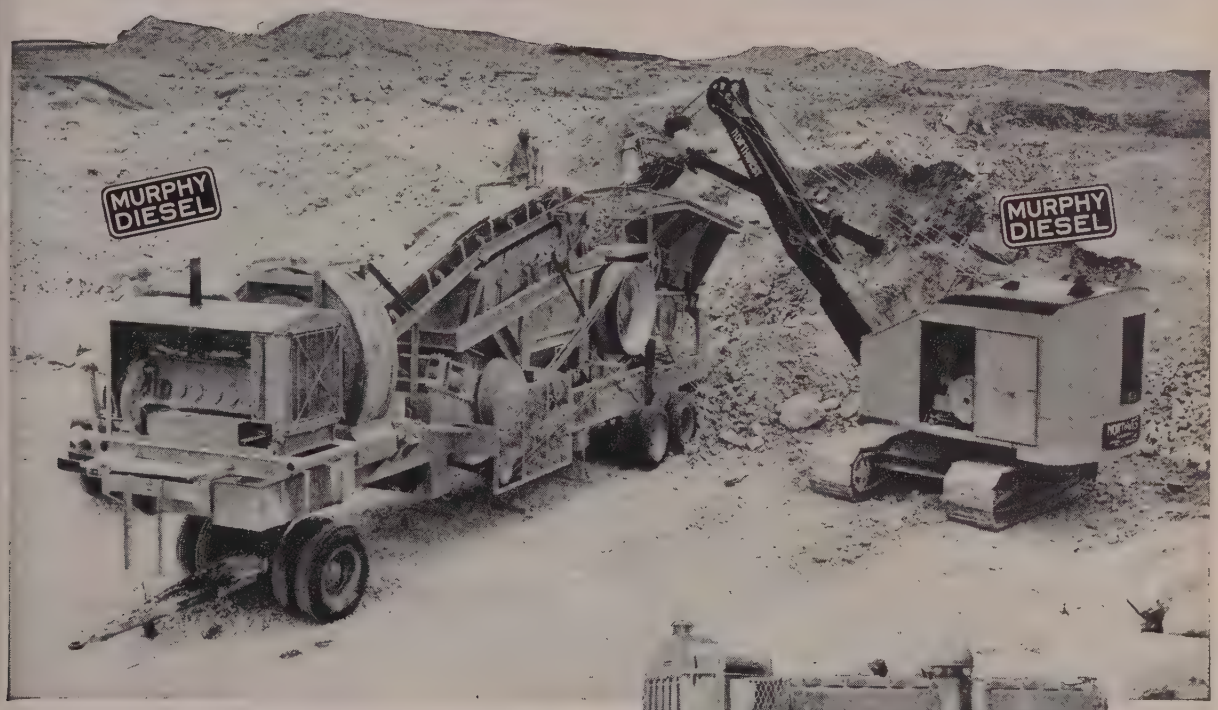
Don't use metallic tools to open kegs or wooden cases of explosives. Use a wooden wedge and wooden, rubber, or fiber mallet. Metallic slitters may be used for opening fiberboard cases, provided that the metallic slitter does not come in contact with the metallic fasteners of the case.

Don't store or leave packages of explosives which have been opened without replacing the cover.

Don't try to light fuse with burning paper, other inflammable refuse.

MURPHY DIESEL POWER

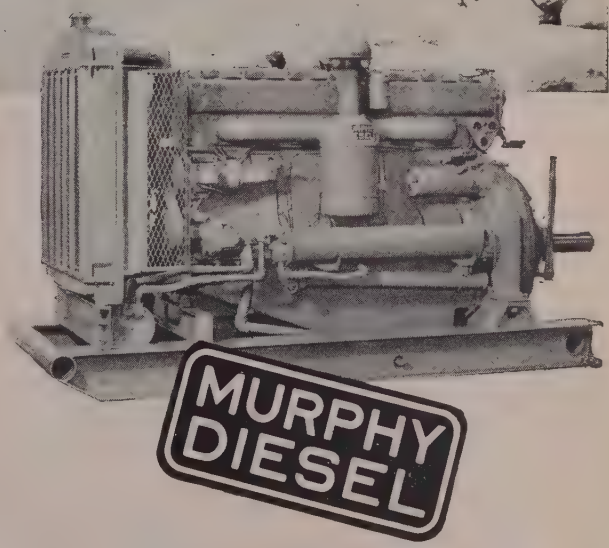
all the way on this job . . .



. . . turns out over 100 tons of limestone and flint rock per hour

● From this Kansas pit, W. O. Homer of Junction City, Kansas, is turning out 100 tons of limestone and flint per hour, with flint accounting for about 20% of the total. Mr. Homer is doing this job with a Murphy Diesel powered Northwest shovel and a Murphy Diesel powered Universal portable crushing plant. So it's Murphy Diesel all the way on this job.

If you're looking for dependable output at maximum operating economy, profit by the experience of pit and quarry operators everywhere, and put Murphy Diesel power to work for you. It's your best bet for getting the most rock per gallon of fuel and you'll particularly like the trouble-free service and freedom from costly downtime.



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Murphy Diesel Engines and Power Units are available in sizes from 96 to 248 H.P. "Packaged" generating units are available with capacities ranging from 60 to 155 K. W.

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Engineering Sales Service, Inc., P. O. Box 851, Boise, Idaho
Industrial Engine Service, 5315 Valley Boulevard, Los Angeles, California
Lively Equipment Co., 2601 Fourth St. N. W., Albuquerque, New Mexico
Oswald Machine Works, 2936 Hyde Street, San Francisco 9, California
Glenn Rose Engine Service, 502 South Real Road, Bakersfield, California
General Machinery Company, E. Station B, Spokane 31, Washington
Hall-Perry Mach. Co., 812 East Iron St., Butte, Montana

WESTERN CONSTRUCTION NEWS

ARIZONA

HOUSE BUILDING faces a much slower second half of 1955 than it enjoyed the first six months. Because of the sand and gravel strike-lockout, high inventories of many builders, and lack of mortgage money for speculative building, home construction is at a virtual standstill.

PLANS for 21 mi. of sewers have been adopted by the Phoenix city council. Estimated cost of the sewer project is $426,090, with the city to pay $9,227 and the balance to be assessed against the property owners involved. The entire project is expected to be completed in about four months from the time work starts but portions will be put in service before that time.

AN APPORTIONMENT of $10,628,652 in federal aid highway funds for the year beginning next July 1 has been announced. Arizona received a similar apportionment for fiscal 1956, the current year, which touched off the biggest road-building program in state history.

CLOUDBURSTS in August caused about $426,650 damage to highways. Washouts, bankfull arroyos, and water-filled dips kept highway crews busy trying to keep roads open to traffic. Major damage was reported on Highway 66 as high water swept over a 6-mi. stretch southwest of Kingman, washing away 500 ft. of pavement and two bridge approaches, with an estimated damage of $100,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Arizona include an award of $183,833 to **Fisher Contracting Co.** of Phoenix for grading and surfacing 7 mi. of Route 80 southwest of Buckeye. **Flickinger Bros. Contracting Co.** of Phoenix submitted a low bid of $409,014 for 7.6 mi. of grading and surfacing on Route 80, 1 mi. east of Gila Bend. **Dale F. Payne, Contractor** of Phoenix, submitted a low bid of $250,842 for 3.8 mi. of grading and surfacing on the Ehrenberg-Wickenburg highway beginning at the town of Hope. **Phoenix-Tempe Stone Co.** received a $303,849 award for 3 mi. of grading and surfacing on the Prescott-Phoenix highway northeast of Congress.

Record attendance for WASHO conference

With a record attendance of 537 registrants the Western Association of State Highway Officials held its 34th Annual Conference Sept. 8-10.

Officers elected for the following year are: president, J. R. Bromley of Wyoming; vice president, D. C. Greer of Texas; secretary-treasurer, H. B. Glaisyer of Oregon; members of the Executive Committee, H. D. Mills of Nevada, Wm. E. Willey of Arizona, and Earle V. Miller of Idaho. The 1956 conference will be held in Phoenix, Ariz.

Winner of the annual "Dr. L. I. Hewes Award," sponsored by Western Construction, was J. Al Head, assistant traffic engineer in the Oregon State Highway Department, for his outstanding work in the field of traffic engineering, particularly in the analysis of urban highway problems and long range planning of highway development for these areas.

A summary of the conference papers which have particular significance to construction engineers and contractors will appear in the next issue.

CALIFORNIA

CONSTRUCTION OF A TEMPORARY rock weir on the Colorado River near Blythe will begin as soon as possible, according to the U. S. Interior Department. Money to begin work on the Palo Verde project has been set aside. The dam will have a total estimated cost of $6,599,000 and $1,985,000 has been set aside for work on it this year.

THE FIRST CONCRETE for the $7,600,000 Monticello Dam has been poured. The concrete was poured from a 12-ton bucket suspended from a crane standing 200 ft. above the bed. Two trains traveling across a 900-ft. trestle will carry concrete from the mixing plant. The pouring schedule calls for 800 cu. yd. per day on a 16-hr. shift until 345,000 cu. yd. are placed. The dam is being built by a joint venture of Peter Kiewit Sons' Co. and the Parish Bros. Construction Co. on a contract awarded by the Bureau of Reclamation.

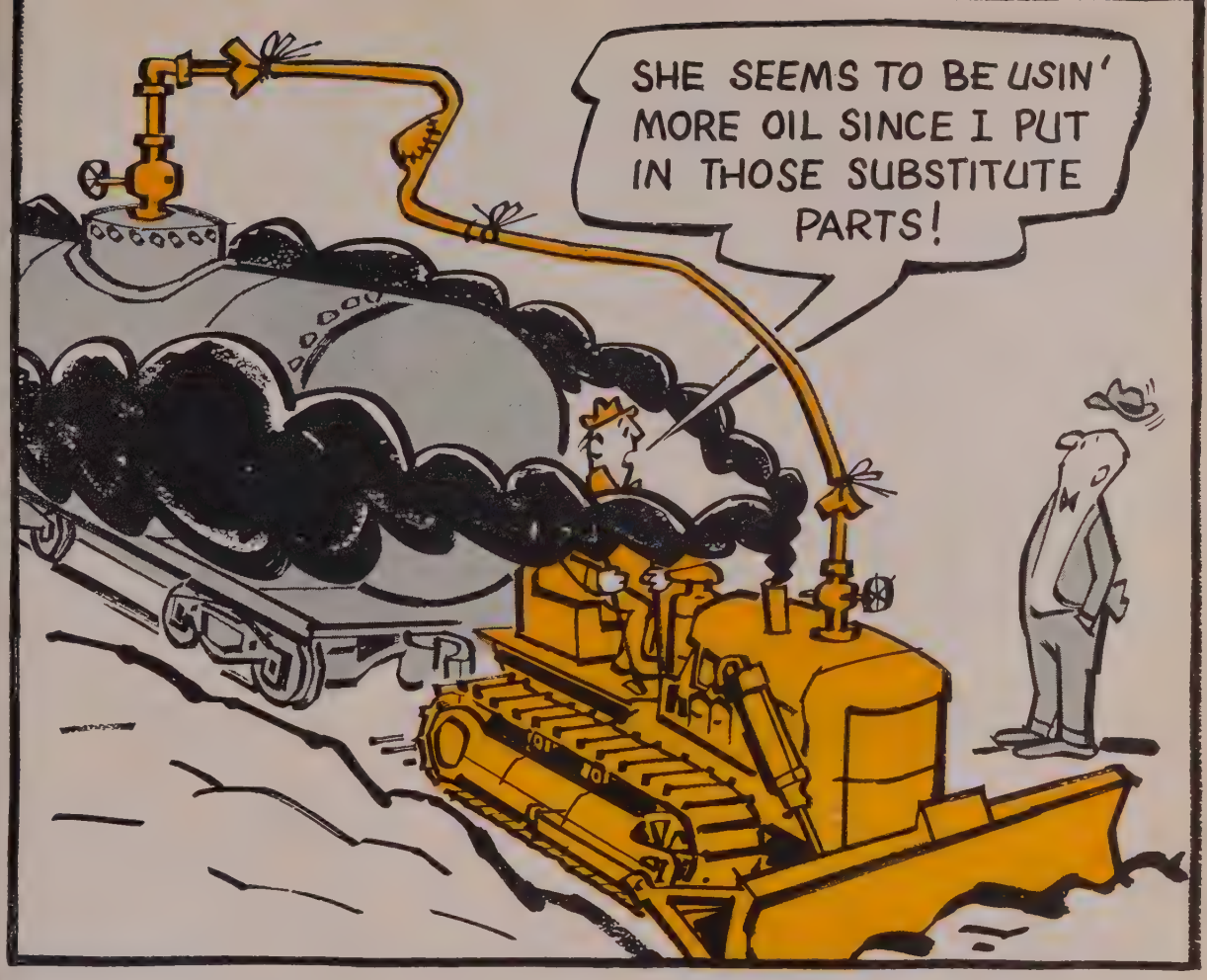
ROGERS CONSTRUCTION CO. is installing 1½ mi. of 48- to 69-in. concrete pipe to increase the pressure on the San Diego water system. At present the water drops 100 ft. from the aqueduct's terminus to the pumping station. By connecting directly with the aqueduct this 100 ft. of head will be added to the system. The grade is so steep that crawlers will be used to hold the draglines in place as they dig the ditch.

THE COMMERCE DEPARTMENT in Washington announced that California will get $47,000,000 in federal highway funds during the current fiscal year. The Division of Highways said some of the federal money will be used in the current $233,000,000 highway budget, although the state will have until June 30, 1957, to use the total.

RECENT MAJOR CONTRACT AWARDS and low bids in California include a low bid of $19,647,000 for construction of Superior Courts building in Los Angeles. **Charles L. Harney, Inc.**, of San Francisco submitted a $1,744,213 low bid for improvement of Bay Bridge Toll Plaza and the Port of Oakland overcrossing in Alameda County. **F. E. Young Construction Co.** of San Diego submitted a $1,540,000 low bid for Sycamore Canyon facilities at Camp Elliott. **Oberg Bros. Construction Co.** of Inglewood was awarded a $797,763 contract for roadwork and a bridge in Los Angeles County.

Vinnell Co., Inc. of Alhambra received a $683,568 award for roadwork and construction of two concrete bridges in Los Angeles County. **F. A. Parish Co.** submitted a low bid of $600,819 for earthwork, structures, and surfacing of State Highway 102 near Rutherford. **Granite Construction Co.** of Watsonville submitted a low bid of $447,722 for grading and surfacing 1.2 mi. in Monterey County. **Huntington Bros.** of Napa, submitted a low bid of $279,554 for 3.3 mi. of grading and surfacing on Brunswick Road in Nevada County.

A. S. Hubbs of Colton was awarded a $244,315 contract for 3.2 mi. of grading and surfacing in San Bernardino County. **W. H. Darrough & Sons** of Yuba City received a $209,457 award for 5.3 mi. of grading and surfacing and construction of drainage facilities in Mendocino County. **I. L. Croft & Son, Inc.**, of Saugus submitted a low bid of $195,-



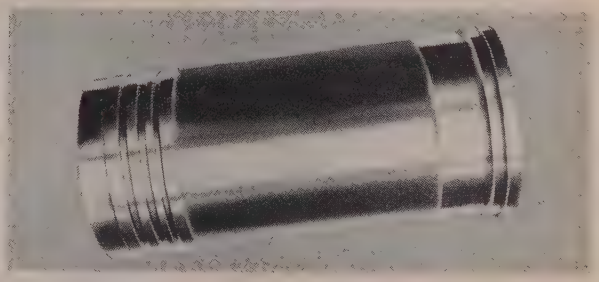
Chances are you'll never need to hook on a tank car to avoid down time. Chances are you *will* have to do something about cylinder liners at one time or other, though.

If you replace with a Caterpillar-built liner, you're sure of a liner made of a special nickel-molybdenum-chrome alloy that's tougher and stronger than steel, more resistant to heat and abrasion. You're sure of controlled induction hardening that makes bare surfaces highly resistant to wear, and of bores chemically treated for easier break-in —better seating of rings. You're sure of precision machining for smoothness, roundness and straightness the full length of the liner.

If you replace with a non-genuine liner, can you be sure of anything?

Better get Caterpillar parts every time.

Caterpillar Tractor Co., San Leandro, Cal.; Peoria, Ill., U. S. A.



This is a genuine CAT cylinder liner. As many as 14 different inspections guarantee its composition, strength and hardness.*

CATERPILLAR*

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740 for 4.2 mi. of grading and surfacing in Inyo County. **Clements Construction Co. & Ronald D. Coats** of Centerville received a $178,491 award for 2 mi. of grading and surfacing in Alameda County.

COLORADO

REPRESENTATIVES of the Murchison Brothers of Dallas, Tex., signed a 99-yr., $5,000,000 lease on a downtown Denver site and announced a ,new skyscraper will be completed by April 1957. The structure will be a 25-story office building at the north corner of 17th and Welton. Signing of the lease ended a year of negotiations. Construction cost for the building, which will be the biggest ever erected in Denver, will be about $8,000,000. Valuation of the ground alone was set at more than $1,000,000.

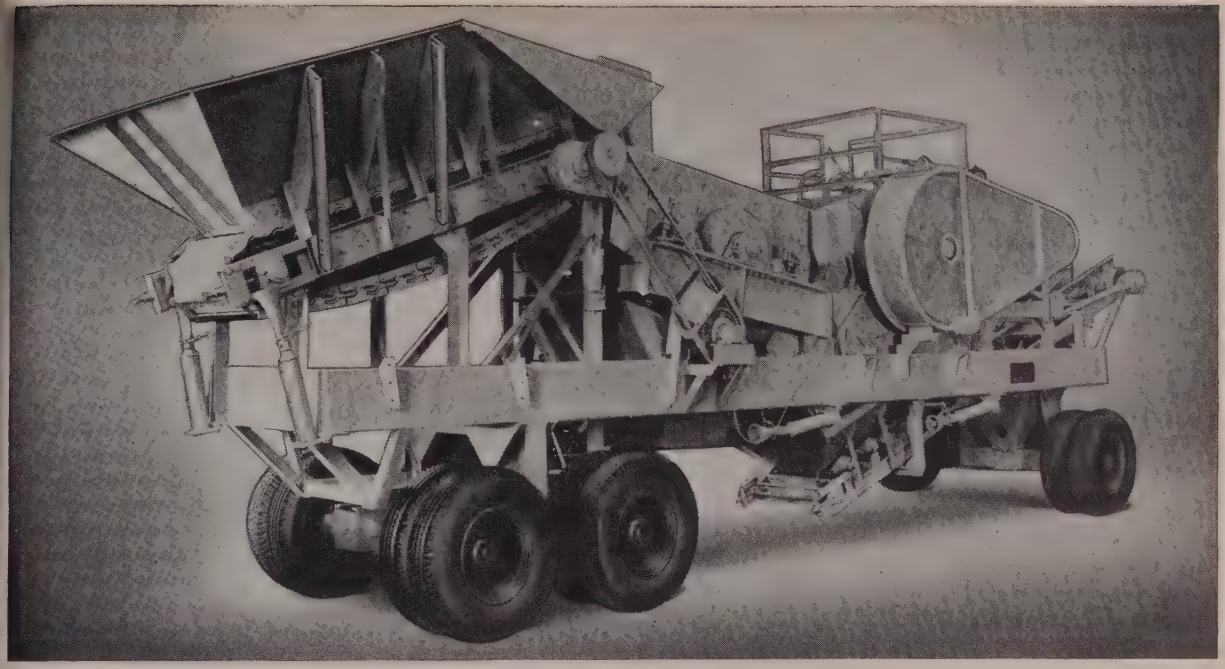
THE FEDERAL GOVERNMENT allocated $13,500,000 to Colorado to build roads and airports. The funds must be matched dollar for dollar. Nearly $13,300,000 of the total will go for highways. The remaining $300,000 was budgeted for airport work in Denver, Pueblo, and Cortez.

BOULDER'S BUILDING BOOM is well on the way toward shattering all previous records. During the first seven months of 1955 building permits for construction valued at $5,133,910 were issued. This figure is $2,000,000 more than at the same time last year, a record year for private construction. Construction activity in areas expected to be annexed soon would more than double the total. Colorado University is setting the pace, with 14 buildings completed since 1947.

RECENT MAJOR CONTRACT AWARDS in Colorado include an award of $399,235 to **Wade Lahar Construction Co.** of Mountain Home, Arkansas for construction of water system on the U. S. Air Force Academy Site.

IDAHO

THE IDAHO POWER CO. won the public-private power dispute when the Federal Power Commission authorized it to build three dams in the Hells Canyon area. The public power advocates favored federal construction of a single high dam. The Commission said. ". . . the ratio of power benefits to power costs of the three-dam plan is greater than that for the one-dam plan." It is likely that proponents of the single dam will take the matter to the U.S. Court of Appeals. (**Western Construction**—Aug. 1953, p. 94.)



Why this new primary rock buster breaks production records

● You've demanded it so here it is . . . PIONEER's new 150 PRS Primary Crushing Plant. This record breaker is completely portable and is designed either to work with a secondary plant or to be used alone for producing ballast.

Why Production Is High

The two-deck Mesabi screen, *located between the apron feeder and the jaw crusher,* is one reason why the 150 PRS is breaking production records. This screen removes and by-passes smaller sized material to the output conveyor so the jaw crusher receives only oversize for reduction. This feature increases efficiency of the jaw crusher and thus boosts output of entire plant, because both jaw and screen are utilized to full advantage.

The high capacity of this plant's big 2036 *overhead eccentric* jaw crusher is another reason why production runs so high. It works on the forced-feed principle, made possible only with overhead eccentric crushing action. With each crushing stroke, the pitman crowds material down and through the crushing chamber . . . crushing at a rate of 250 strokes per minute. With this action you can take on even the toughest kind of crushing with assurance of high output.

Weighs Only 56,000 Pounds

The 150 PRS consists of a 36″ x 10′ apron feeder, 4′ x 6′ Mesabi screen, 2036 jaw crusher, and conveyor, all mounted on a rubber tired chassis.

Yet, despite big units, it weighs only 56,000 lbs. less power. It's compact, too . . . only 38′5″ long, 13′8″ high and 8′6″ wide when set up for operation!

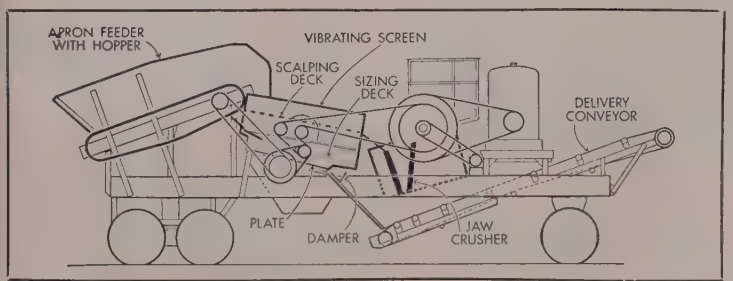
For further information on the 150 PRS or other PIONEER Portable or Stationary Crushing and Screening Plants, write Pioneer Engineering Works, Inc., Minneapolis (Subsidiary of Poor and Company, Chicago).

SPECIFICATIONS

Apron Feeder	36″x10″ with forged steel pans
Mesabi Screen	2-deck, 4′ x 6′
Jaw Crusher	20″ x 36″
Jaw Crusher capacity	95-190 tph*
Delivery Conveyor	30″ x 18′
Hp required	110 continuous at 1200 RPM
Weight, less power	56,000 lbs.
Travel height	12′7″

*3″-6″ setting. Varies ± 25% according to material. To compute total plant output, add by-passed material.

Pioneer Continuflo EQUIPMENT



Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago
Please send information on equipment checked.

☐ GRAVEL PLANTS	☐ WASHING PLANTS	☐ MECHANICAL FEEDERS
☐ ROCK PLANTS	☐ BITUMINOUS PLANTS	☐ VIBRATING SCREENS
☐ JAW CRUSHERS	☐ APRON FEEDERS	☐ BUZZER SCREENS (LIGHT DUTY)
☐ ROLL CRUSHERS	☐ ORO FEEDERS	☐ CONTINUFLO CONVEYORS

*Name*_____
*Company*_____
*Address*_____
*City*_____ *Zone*___ *State*_____

THE FEDERAL GOVERNMENT has granted Idaho $8,720,047 in federal-aid highway money for the fiscal year beginning next July 1. The money will be apportioned as follows: $3,902,559 for primary; $2,744,957 for secondary; $333,787 for urban, and $1,738,744 for interstate.

THE ATOMIC ENERGY COMMISSION has approved construction of a test reactor to provide radiation facilities needed by early 1957. Construction employment is expected to peak at about 800 during the summer of 1956. Kaiser Engineers, Inc., Oakland, Calif., is the architect-engineer; a construction contractor has not been selected.

RECENT MAJOR CONTRACT AWARDS and low bids in Idaho include a low bid of $884,093 submitted by **W. W. Clyde & Co.**, Springville, Utah, for roadwork and construction of concrete bridges in Bear Lake County. **Bickford Construction Co.** of Portland, Oregon, submitted a low bid of $657,500 for construction of facilities at the National Reactor Testing Station in Idaho Falls. **Holmes Construction Co.** submitted a low bid of $442,392 for surfacing and structures on State Highways 26 and 89 and Indian Creek Detour Road. **Eagle Construction Co.**, Boise, Idaho, received a $313,092 award for roadway and bridge in Ada County.

MONTANA

START OF CONSTRUCTION on the proposed Noxon Rapids power project near Thompson Falls may be postponed one year. The Washington Water Power Co., has not been able to acquire the needed land. This will postpone the awarding of the contract for clearing timber along the reservoir. The estimated cost of the complete project is $85,000,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include an award of $251,841 to **Stanley H. Arkwright, Inc.**, of Billings, for 5.5 mi. of grading and surfacing in Golden Valley County. **N. A. Nelson Construction Co.**, Sheridan, Wyoming received a $599,788 award for construction of a steel and concrete bridge in Fergus and Phillips County. **C. H. Elle Construction Co.** of Pocatello, Idaho, received a $522,096 award for 11.2 mi. of grading and surfacing in Gallatin County.

Stanley H. Arkwright, Inc. of Billings received a $489,362 award for 12.3 mi. of grading and surfacing in Big Horn County. **Peter Kiewit Sons' Co.** of Billings received a $459,395 award for 12.9 mi. of grading and surfacing in Carbon County. **McLaughlin, Inc.**, of Great Falls, received a $388,674 award for grading and surfacing 12 mi. in Chouteau County. **Peter Kiewit Sons' Co.**, of Billings received a $371,229 award for construction of 4.3 mi. of road in Gallatin County. **Norgaard & Hilling** of Williston, North Dakota received a $260,289 award for grading, draining and surfacing in construction of a bridge in Roosevelt County. **Northwestern Engr. Co.** of Rapid City, South Dakota received a $102,853 award for construction of two steel and concrete bridges in Valley County.

TWIN STACKS AT PIT 4 POWERHOUSE

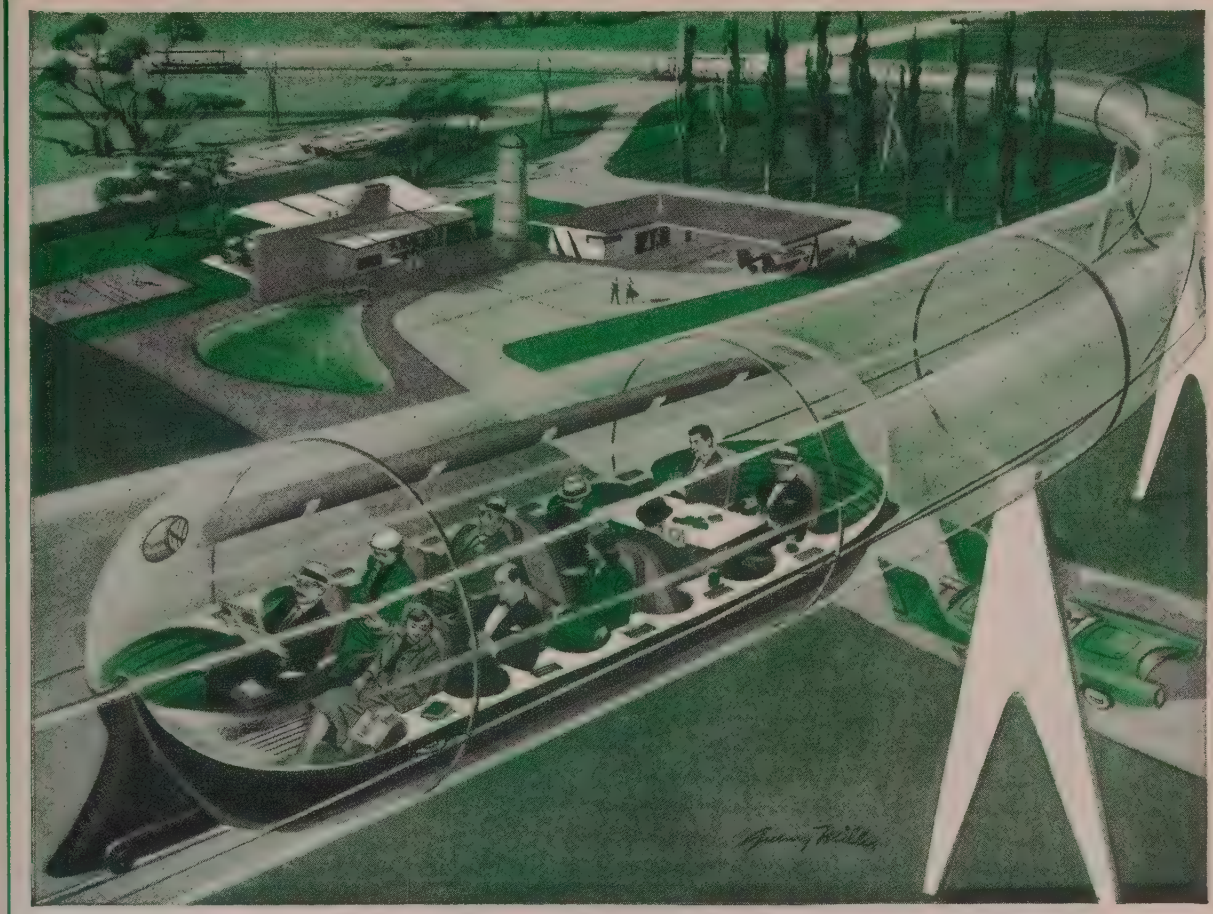
These 160-ft. standpipes mark the end of a 4-mi. tunnel at Pacific Gas and Electric's Pit 4 hydro project in Shasta County, Calif. Note the men working at the top. The powerhouse is down the slope at the river's edge. The $25,000,000 project was dedicated in August after three years under construction (Western Construction—Sept. 1954, p. 64).

NEVADA

CONSTRUCTION IS DUE to start early in 1956 on the boring of a second tunnel through Cave Rock at Lake Tahoe, on U. S. Highway 50 in Douglas County. Estimated cost of the project, which will include a roadside park, is $885,000, to be provided by the federal government through forest highway funds.

NEVADA has been allotted $8,720,047 in federal aid highway funds for fiscal 1956. This is roughly the same amount the state received for fiscal 1955 but more than $3,000,000 more than Nevada was granted in 1954. The federal government provides 84 per cent of the funds needed for road construction and the state puts up 16 per cent. The current highway program is on schedule despite a shortage of engineering and design personnel.

PLANS have been announced for the construction of a five-story hotel-motel and a commercial building to house the J. C. Penney Co. in downtown Reno. The Penney structure will cost $1,000,000. A Reno construction firm will be awarded the



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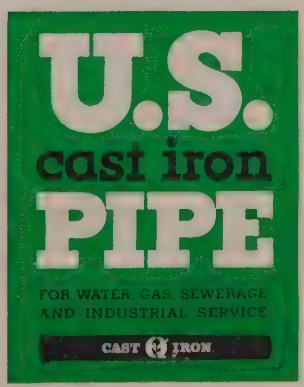
WE MAY TRAVEL BY VACUUM TUBE!

Many fantastic developments...today only dreams and lines on an engineer's blueprint...may become the commonplace of the future.

But in that world to come, one highly useful servant will continue its public service much as it does today. Cast iron pipe laid today will still carry our gas and water.

Records show that over sixty American cities are served by cast iron gas and water mains laid in the ground over a hundred years ago! And today, U. S. Pipe, centrifugally cast and quality-controlled, is even 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, Alabama

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

bid. Construction will start about Jan. 1, 1956.

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include an award of $464,920 to **Hoops Construction Co.** of Twin Falls, Idaho, for construction of 13.2 mi. of highway in Eureka County.

NEW MEXICO

VALUE OF CONSTRUCTION in Albuquerque appears headed for a record. Construction for the first seven months of the year totaled $26,549,621. In 1953 the all-time high of $37,365,229 was reached. If the remaining months are average the total valuation would be over $45,000,000.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include a low bid of $111,935 submitted by **D. D. Skousen & Son** of Albuquerque for earthwork, clearing and structures on the Middle Rio Grande Project.

OREGON

AN ARMY ENGINEERS' crew has begun the staking out of the dam site area for Hills Creek Dam on the Middle Fork Williamette River 40 mi. southeast of Eugene. The Portland District has $310,000 with which to continue planning and start construction of the $33,000,000 unit. It also has $500,000 with which to continue planning and start construction of Cougar Dam on the South Fork McKenzie River and $100,000 with which to plan Green Peter Dam on the Middle Santiam River. The Hills Creek project will cost $33,000,000 and the Cougar project $37,000,000. Planning on the Green Peter Dam is pending the final selection of a site.

WITH AUTHORIZATION by the State Highway Commission the way was cleared for construction of a $300,000 project on Highway 99 through Ashland. Completion should be not later than summer of 1956. Tentative plans show construction to begin not later than the first of next year.

THE MORRISON ST. BRIDGE over the Willamette in Portland will begin to take shape in Jan. 1956. Four main piers will be built first at a cost of $2,250,000. Superstructure is due to start in June or July along with work on the approaches. Engineers and designers of the span, Sverdrup & Parcel, Inc., and Moffatt, Nichol & Taylor, say the bridge will open to river traffic by the tilting up of each half of the middle span. Total cost of the structure is $12,000,000.

A NAVAL $12,000,000 reserve training station at Hillsborough, just east of Portland, is scheduled to get under way with the acquisition of 801 acres of land for the airport. Construction bids will probably be called within the next six months.

THE BUREAU OF RECLAMATION has received $274,000 for the next fiscal year to start construction on the Haystack regulating reservoir, part of the Deschutes north unit.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include an award of $4,234,828 to **Oscar R. Wayman** of Portland for construction of a 75-room high school in Portland. **General Construction Co.** of Portland received an $881,706 award for construction of interchange structures and paving in Multnomah County. **Rogers Construction Co., Inc.,** of Portland received an $844,000 award for 2.6 mi. of grading and 2 mi. of paving in Clatsop County. **Hamilton & Thomas** of Eugene received a $406,161 award for construction of a 565-ft. bridge and 120-ft. overcrossing in Douglas County. **Rogers Construction Co.** of Portland received a $237,504 award for grading and surfacing 2.4 mi. in Washington County.

FINISHING UP AT DEXTER DAM

A 22½-ton Lorain crane is silhouetted against the spillway of the recently completed Dexter Dam in Dexter, Ore., as it uses a dragline bucket to slope the shoulder of an adjacent road. Rubber-tired cranes of this type are particularly adaptable to large projects spread over a considerable area.

UTAH

HEAVY CONSTRUCTION is expected to start on the anhydrous ammonia plant this fall at the Geneva Works of U. S. Steel near Provo. Engineering work is in progress and the task of procuring materials is under way. Ground has been cleared, foundation tests for footings have been completed, and the site is being prepared for the start of construction. Blaw-Knox Co. is designing and building the plant.

RECENT MAJOR CONTRACT AWARDS and low bids in Utah include a $1,372,172 award to **Utah Construction Co.** of Ogden for work on the Weber Basin Project. **A. S. Horner Construction Co.** of Denver received a $495,197 award for construction of dam and canal on the Weber Basin Project. **Whiting & Haymond** of Springville received a $258,735 award for 5.3 mi. of grading and surfacing in Summit County. **D. W. Brimhall** of Murray received a $132,000 award for 31.4 mi. of grading and surfacing in San Juan County. **D. W. Brimhall** of Salt Lake City submitted a low bid of $103,070 for surfacing of access roads in Grand & San Juan Counties.

WASHINGTON

FIRST WORK has started on the $135,000,000 Ice Harbor dam on the Snake River near Pasco. Exploratory drilling crews and surveying parties are on the site. Rights of entry to private land are being obtained and bids for access roads may be called in September. Congress recently appropriated $1,000,000 for the start of the project, the farthest downstream of four dams to be built on the Snake River. The dam will include a navigation lock 100 ft. high, 10 ft. higher than the McNary lock which is now the highest single lift lock in the world. The project will be under the direction of the Walla Walla District of the Corps of Engineers.

TWO GOVERNMENT structures, one in Seattle and one in Olympia, are moving toward completion with the last of 2,300 tons of steel in place and covered with concrete. The $4,000,000 office building and the $4,500,000 post office are scheduled for completion late this fall. Interior finishing is now under way. John Graham Co. is the architect and Howard S. Wright Co., the general contractor.

BIDS FOR CONSTRUCTING Bremerton's concrete dam across the Union River were scheduled to be opened Sept. 12. Cost of the structure is $1,000,000. The arch dam will stand about 130 ft. above the stream bed. The two largest estimated quantities are 35,200 cu. yd. of common and solid rock excavation and 42,620 cu. yd. of concrete.

RECENT MAJOR CONTRACT AWARDS and low bids in Washington include a $3,375,000 award to **H. Valle Co., Inc.,** of Seattle for construction of a department store in Bellevue. **Donald M. Drake Co. and George A. Fuller Co.** of Portland submitted a low bid of $1,218,000 for construction of a ramp at Larson Air Force Base. **R. A. Heintz Construction Co.** of Portland received a $923,063 award for 3.3 mi. of grading and surfacing in Clark County.

Washington Asphalt Co. of Seattle received a $299,723 award for 12.4 mi. of grading and surfacing in King County. **Sound Construction & Engineering Co.** of Seattle received a $248,294 award for construction of a 500-ft. tunnel in the Hanford plant area. **J. N. Conley** of Portland received a $217,875 award for 1.9 mi. of grading and surfacing in Cowlitz County. **Columbia Asphalt Paving Co.** of Yakima received a $134,257 award for 5.1 mi. of grading and surfacing in Kittitas County. **N. Fiorito Co., Inc.,** of Seattle received a $133,450 award for construction of State Highway No. 2 in Kittitas County. **Kontich, Juran & Stovich** of Seattle received a $124,444 award for 1.3 mi. of grading and surfacing in Chelan County. **Frank G. Bauline, Inc.,** of Yardley received a $110,566 award for 2.5 mi. of grading and surfacing in Whitman County.

WYOMING

WYOMING WILL RECEIVE $959,531 for national forest highways and $8,520,155 in federal aid highway funds for fiscal 1957. Primary highways will get $3,925,992, $2,660,899 will go to secondary or feeder roads, $188,578 for urban highways, and $1,744,646 for the interstate system.

A BILL SIGNED in August by President Eisenhower assures Wyoming federal funds totaling $700,000 for airport improvements over the next two years. Local and state funds will provide another $300,000. Improvements tentatively are scheduled at Torrington, Lusk, Newcastle, Wheatland, Gillette, Sheridan, Greybull, Powell, Worland, Casper, Shoshone, Rawlins, and Cheyenne.

MONTANA - DAKOTA UTILITIES Co. has been granted a certificate by the Federal Power Commission authorizing it to construct a total of 44 mi. of pipeline on its system in South Dakota and Wyoming. Estimated cost of the facilities is $1,500,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Wyoming include a low bid of $424,640 submitted by **Woodward Construction Co.** of Rock Springs for 14.7 mi. of grading, draining and surfacing in Sweetwater County. **Big Horn Construction Co.** of Sheridan submitted a low bid of $234,797 for grading, surfacing and miscellaneous work on 6.6 mi. in Johnson County. **A. E. & W. R. Schmidt** of Arvada, Colorado submitted a low bid of $223,529 for 5 mi. of grading, draining and surfacing in Sublette County. **C. A. Reeves** of Sheridan submitted a low bid of $172,118 for 7.6 mi. of grading, draining and surfacing in Big Horn County. **Asbell Bros. Construction Co.** of Riverton submitted a low bid of $147,712 for 7.4 mi. of grading, draining and surfacing in Sweetwater County.

ALASKA

CONSTRUCTION on a $3,500,000 power development to serve the Seward and Moose Pass areas should begin this year. The project is now awaiting approval of a permit for distribution of the power. The city of Seward has hired H. T. Harstad & Associates of Seattle, Wash., as consulting engineers and they are now engaged in seismic work.

RECENT MAJOR CONTRACT AWARDS and low bids in Alaska include a $22,000,000 award to **Morrison-Knudsen Co.** of Boise, Idaho for construction connected with the "Dew Line" radar defenses in the northern section of the continent. **Green Construction Co., & S. Birch & Sons Construction Co.** of Seattle received a $2,872,615 award for construction of additional storage facilities at Eielson Air Force Base. **Gaasland Co., Inc.,** of Bellingham, Washington, received a $1,408,000 award for construction of an Air Force Station near Indian Mountain.

Misco-West Coast, Inc., of Seattle submitted a low bid of $591,030 for construction of powerhouses, penstock and sub-station for the Purple Lake hydro project at Metlakatla.

Here and There

AN APPORTIONMENT of $875,000,000 has been made for federal aid to states for highways. This is the last appportionment under the provisions of the Federal-aid Highway Act of 1954. The Act authorized a total of $1,932,000,000 for grants to highway projects for the fiscal years beginning July 1, 1955 and 1956. It is the largest two-year sum ever provided for the federal highway program. The 11 Western states will get about $160,000,000.

THE FEDERAL BUDGET bureau approved $900,000 for the Owl Creek project in Hot Springs County, Wyo., and $4,000,000 for the Yellowtail dam in Montana. Other projects cleared by the bureau that had been passed by Congress but not included in the regular budget were Deer Creek in Utah, Roza in Washington, and Trinity in California.

PRIVATE CONTRACTORS did almost 99 per cent of all Bureau of Reclamation construction during fiscal year 1955. The agency spent $1,284,506 out of a total construction cost of $117,977,905 for work performed by its own forces. The 99 per cent figure is the largest for any year on record.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

SEPTEMBER SONG—Alaska this September is in a transition stage construction-wise. The transition is from high volume of earth-moving and building to wintertime dormancy; from high employment to final checks for thousands. The September song for thousands of construction workers is a blues number; despite the giant strides made by builders in improving construction methods, they still haven't licked the problems created by Alaska's winter weather. Some construction stiffs think maybe this is a good thing. During the long, night-less Alaskan summer they work hard; most jobs are three-shift and progress during one summer of Alaska work often rivals all-year-around achievement Outside. In the bush country, the tempo of construction is slowing. Bearded bulldozer-operators are arriving back in Anchorage and Fairbanks for the homeward trek. Construction hasn't come to a halt by any means. There's 30 or 40 days more in high gear, 60 if the weather's kind. But whether you care to admit it or not, in Alaska the curtain is ringing down on another construction season.

SOUR NOTE in this September's "song" here in Alaska is the extended plumbers' strike. For more than a month, Anchorage area plumbers have been jobless as a result of a wage dispute. The union has demanded a 20 cent wage increase for each of two years. Contractors are willing to pay 10 cents more for the first contract year and 12½ cents additional the second. This is no go as far as union is concerned. Construction men in Anchorage, regardless of their sympathies in this dispute, see the walkout as a monkeywrench that's crippling the construction machinery in the heart of the territory while the precious days of the 1955 season draw to a close.

HOME, SWEET HOME—Because of the plumbers' walkout, the approaching end to the construction season, and the steady decline in available jobs (and upsurge in layoffs) don't come north seeking work in the construction trades. Stay home—regardless of what you may have heard about job opportunities in Alaska—and if you insist on coming, check with your union local or employment service office first.

BIG LAWSUIT—Plumbing contractors of Alaska have filed a $2,500,000 breach of contract suit against the Plumbing and Pipe Fitting Union, charging contract violation. The action seeks $100,000 a day in additional damages as long as the plumbers' work stoppage continues. A similar lawsuit was won last year by a Juneau lumber firm which sued a union for damages.

EMPLOYMENT PICTURE—In Anchorage job-seekers include carpenters, truck drivers, office clerks, heavy duty mechanics, heavy equipment operators, and welders. The only shortages here at this time are for well-qualified stenographers and experienced graduate engineers. A total of 1,299 persons are seeking work at this time, in the Anchorage area. Unemployment in Fairbanks is 1,102; in Juneau, 142; in Ketchikan, 108 and in Petersburg, 41. In Fairbanks, the only job openings are in the categories of electricians, operating engineers, electrical linemen, water plant operators, and plumbers.

TERMINATION DUST—Alaska's first snowfall near populated areas—known in construction jargon as "termination dust"—coated the Fairbanks area on Aug. 29. A few days later, the Chugach mountains in the Anchorage area got a liberal sprinkling of the "dust" which signals the approaching end of construction. Each day the snowline on the Chugach range descends lower; one Anchorage newspaper called the attention of striking plumbers to this snowline and to the significance of the "termination dust," asking them not to waste the precious time still available to them for active construction.

A LOOK AT TOMORROW—What's in tomorrow's Alaska construction picture? A survey of contractors, the district engineers, and the military provides a few interesting straws-in-the-wind for 1956 and later. Defense construcion in Alaska will continue at a high rate but not quite up to 1955 volume. Emphasis will be on Arctic construction and on radar and other defense projects. Military has already announced program for construction of Nike rocket sites in both Anchorage and Fairbanks area. If Congress pays attention to Henry M. Jackson (D. Wash.) there will probably be a stepped-up airfield construction program. During recent visit to Alaska, Jackson declared one of the prime needs of the territory was more airfields to bolster defenses . . . Commercial construction within major cities of Anchorage and Fairbanks will continue high. Building permits in Anchorage alone now average more than $15,000 a week. All in all, tomorrow's construction outlook in Alaska is fairly optimistic.

MEMO TO CONTRACTORS—Of interest to contractors are announcements of planned work by Alaskan agencies. Alaska Railroad, for example, plans a $2,000,000 improvement program for coming year in addition to $4,500,000 Seward dock replacement. Greatest slice of cash will go for track improvement, new equipment, and new rolling stock. Alaska Road Commission plans to let a contract in April 1956 for construction of 38 mi. of highway in McKinley park. Prospective bidders can get details from ARC main office in Juneau.

POSSIBLE PROJECTS—Not certain, but in the "possible" stage, are several major Alaskan projects. Alaskans see some significance in the recent five-day tour of civil works activities, Corps of Engineers, in Alaska by Col. H. S. Miller, resident member of the board of engineers for rivers and harbors. Miller visited Juneau, Fairbanks, Anchorage, and Ketchikan—gave particular emphasis to a study of many sites in Alaska recommended by the Corps for possible water use development, including rivers and harbors, flood control, navigation, and hydro-electric power . . . Installation of an instrument landing system and a flight information center at Cold Bay airport has been recommended by the International Air Transport Association . . . In past month, several federal officials connected with waterpower and reclamation have visited the site of the proposed Yukon river dam at Rampart. If constructed, Rampart would rival Grand Coulee, would make a lake out of a large part of interior Alaska and would undoubtedly have far-reaching effect on both the climate and economy of the territory.

CONSTRUCTION NEWS NUGGETS . . . District Engineer will advertise bids early this winter for construction of additions to Harbor of Refuge at Seward . . . 3-ft. concrete wall must be constructed atop 900-ft. long breakwater and piling must be driven to narrow harbor's mouth from 400 to 75 ft.—all this to minimize damage to dock by high tide and storms . . . Check for $1,302,485.56 has been turned over by the Alaska District Corps of Engineers to Birch-Lytle-Green of Anchorage and Seattle as partial payment on contract for construction of fuel system at Elmendorf . . . Territorial police plan to build radio stations at Ketchikan, Port Chilkott, and Haines . . . School tax collections thus far this year indicate there are 3,000 fewer employees on payrolls in Alaska this year than last . . . Anchorage Oxygen Company won front-page publicity from an Anchorage newspaper for carrying out an outstanding clean-up and beautification program at its plant near city's outskirts.

ENGINEERS on the move

C. A. Bedford, an executive with various Kaiser affiliated companies for the past 23 years, recently joined Kaiser Engineers Division as vice president. He returns to the Oakland headquarters from Michigan after ten years' absence. Bedford joined the Kaiser organization in 1932 during construction of Hoover Dam, and subsequently participated in the building of Grand Coulee Dam.

* * *

Six U. S. A. officers recently arrived in Anchorage on their new assignments to the Alaska District, Corps of Engineers. They replace personnel who have been reassigned to the states. The new officers and their assignments are: **Col. Leonard L. Haseman,** assistant district engineer; **Maj. Robert E. Burt,** project engineer at Ladd AFB; **Capt. Virgil S. Adkins, Jr.,** assistant to Alaska district engineer; **Capt. John H. Mason,** special assistant on Army military construction; **Capt. Norman R. Rosen,** construction inspection engineer at Fort Richardson; **Capt. Edwin S. Walters,** construction inspector engineer at Elmendorf AFB.

Ben S. Morrow, chief engineer and general manager of the Bureau of Water Works of the City of Portland, Ore., for the past 30 years, recently retired after 46 years with the Bureau. He directed construction of Bull Run Dam, and during his career with the city has seen the water system grow from a top capacity of 22,500,000 gal. per day to a peak daily supply of 225,000,000.

* * *

John A. Lambie was recently appointed to the post of county engineer of Los Angeles County to replace **William J. Fox,** retired.

* * *

Brig. Gen. Theron D. Weaver has been recalled to active duty and named president of the Beach Erosion Board of the Corps of Engineers. Since his retirement two years ago he has served as a consultant to **Lieut. Gen. S. D. Sturgis, Jr.,** Chief of Army Engineers, on special civil works problems.

* * *

A. D. Edmonston, State Engineer of the State of California, recently announced his intention to retire from government service Nov. 1. An employee of the state since 1924, Edmonston rose to the position of assistant state engineer in 1945 and on the death of **Edward Hyatt** in 1950 he was appointed state engineer.

Also retiring on Nov. 1 is another top executive. He is **Gerald H. Jones,** Assistant State Engineer, who leaves after over thirty years spent in state service. Jones is a past president of Sacramento Section, American Society of Civil Engineers.

A. D. Edmonston

* * *

Albert S. D'Alessandro has been appointed acting project construction engineer for the Bureau of Reclamation of the Palo Verde Diversion Project on the Colorado River near Blythe, Calif. D'Alessandro's engineering staff at Blythe will consist of **Howard Burr,** office engineer, and **William Gage,** field engineer, both transferees from the Bureau's Parker-Davis Project headquarters in Phoenix, Ariz. Since last June D'Alessandro has been doing preconstruction work on the diversion project, operating out of the office of **J. P. Jones,** director of Region 3, Boulder City.

* * *

John J. Hammond, chief of the Bureau of Reclamation's dams branch at Denver, recently retired, completing a 39-year career of Government service. He plans to remain in Denver, opening offices as an engineering consultant on the design of dams in this country and abroad.

* * *

Roscoe C. Hildebrand was recently appointed to the position of structural field engineer for the Seattle, Wash., office of the Portland Cement Association. A graduate civil engineer, Hildebrand comes to PCA from the Seattle City engineering department where he was employed for over four years.

* * *

Simultaneously with the announcement from the Chicago headquarters of Harza Engineering Co. of the appointment of **Arthur P. Geuss** as vice president and chief engineer, word was received that **C. Keith Willey,** who has been Western manager of the firm since June of last year, also was named vice president. Willey joined the Harza organization in 1947 and was placed in charge of the project planning and power studies section. In 1952 he was assigned as resident engineer on the Box Canyon hydroelectric project in Pend Oreille County, Wash.

STUDENT ENGINEERS from the nation's colleges have summertime jobs with the Alaska District, Corps of Engineers, on defense construction jobs throughout the Territory. Here, one of them, *Ted Spitler* (on the transit) signals his directions to the chainman, as *Burt Rochefort* of the Corps stands by to record the readings.

At the Denver water dam one hose takes the place of many...

The immense water-supply dam just completed for the city of Denver, Colorado, required over 8,000 feet of air hose in its construction.

The experienced contractor who handled the job picked U. S. Royal Cord Air Hose for several hard-boiled reasons:

(1) U. S. Royal Cord Air Hose not only handles air—but also *water—and water under the extreme pressures required in washdown.* He used the hose on vibrators to consolidate the concrete—he used it as part of cooling lines on face of dam—on pneumatic tools, on sump pumps and sludge pumps, rock drills, chipping hammers, air wrenches.

(2) The contractor found there was no need to go easy on U. S. Royal Cord. *No* need for cribbing, no time wasted by workers in selecting or storing away special hose for special jobs. *No money tied up in stocking specialized hose.*

(3) Valuable pay hours saved—hour after hour, week after week. U. S. Royal Cord is *built like a tire*—that's why it can be kicked around and abused and made to do jobs you don't expect from an air hose.

You can save yourself plenty of worry by standardizing on "U. S." Hose. Performance after performance demonstrates the folly of wasting money on short-lived, cheap hose. You can get "U. S." Hose at any of the 27 "U. S." District Sales Offices.

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Rufus Jackson, resident engineer for the Corps of Engineers at Chief Joseph Dam, recently retired. He had been in government service since 1911 when he joined the Bureau of Reclamation on the Boise-Payette project in Idaho. **Byno Jeter**, chief of the installation section, will be in charge of the remaining construction at Chief Joseph.

* * *

George R. Putnam, recently retired vice president of Utah Construction Co., was honored at a banquet held in Salt Lake City, Utah, attended by leaders in the engineering, contracting and construction industry in the West. Putnam joined the Utah contracting firm in 1934 at Ogden as project manager. The nationally known construction engineer is a past president of Intermountain Branch of Associated General Contractors.

* * *

Col. Daniel A. Richards in mid-August moved up from executive officer of the Omaha District, Corps of Engineers to executive officer for the Missouri River Division, where he is second in command to **Brig. Gen. W. E. Potter**, division engineer.

* * *

Merrill Ely recently returned from French Morocco to his former position as chief of the North Pacific Division's safety branch, Portland, Ore. **Bernard Sheridan** who held the post while Ely was on overseas assignment will remain as assistant branch head.

* * *

Lt. Col. Richard G. Graeser, Air Force Installations representative for Alaska, is leaving the Territory for a new assignment. Replacing Colonel Graeser as AFIR to the C. of E. is **Lt. Col. Gregory J. Hobbs.**

* * *

Newly appointed to serve as officers until July 1, 1956, of the San Diego, Calif., Section, American Society of Civil Engineers are: **Jean L. Vincenz**, president; **George R. Saunders**, first vice president; **Charles A. Smith, Jr.**, second vice president; **Lloyd G. Jefferies**, treasurer; **Robert K. Fogg**, immediate past president. **William D. Myers** is secretary of the Section.

* * *

Rear Admiral Edward V. Dockweiler, USN (ret.) was recently appointed as chief harbor engineer by the Los Angeles Board of Harbor Commissioners.

* * *

John A. Shackleton has been named manager of pressure vessel engineering for Kaiser Steel Corp.'s Napa, Calif., fabricating division plant. For the past three and a half years he has been project engineer and project manager for Union Oil Co.'s refinery at Oleum.

* * *

Jacob Dekema of San Bernardino has been appointed as district engineer of District 11, California State Division of Highways, succeeding **E. E. Wallace** who retired Aug. 31.

Jacob Dekema

For the past three years Dekema has been assistant district engineer of District 8 at San Bernardino. His new headquarters are in San Diego.

* * *

Lt. Col. R. Duncan Brown, Jr., was recently named executive officer of Omaha District, Corps of Engineers. Colonel Brown filled an assignment in Alaska from 1947 to 1949 where he was project engineer and assistant chief of the construction division for that district.

* * *

Richard C. Mielenz, head of the petrographic laboratory of the Bureau of Reclamation, Denver, for the third time received the Sanford E.

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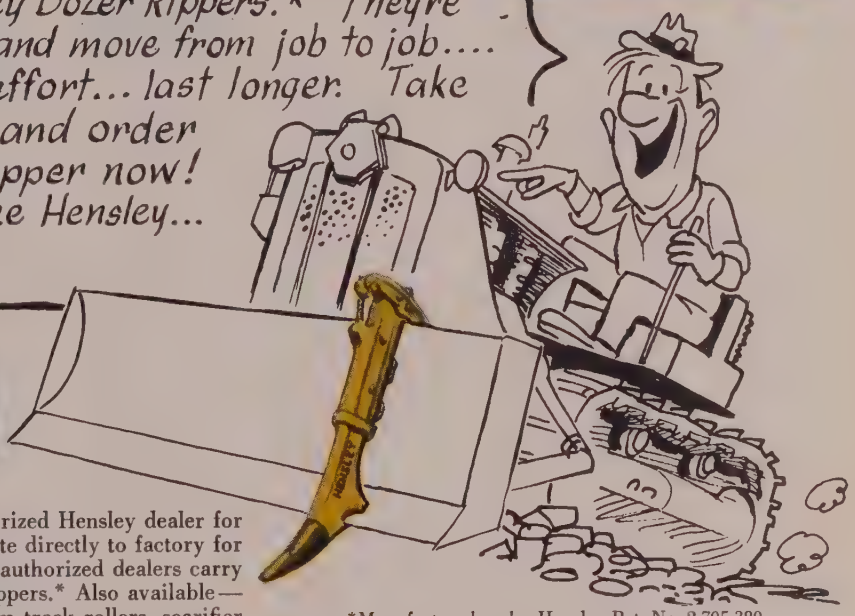

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Westate Machinery, Billings

NEVADA:
Elko Blacksmith Shop, Elko
Pioneer Equipment Co., Reno

NEW MEXICO:
Lively Equipment Co., Albuquerque

OKLAHOMA:
Crose-Curran Equipment Center, Tulsa

OREGON:
Cal.-Ore. Machinery, Medford
Western Equipment Co., Eugene and Portland

TEXAS:
Caprock Machinery, Amarillo
Deal's Machine Shop, Lubbock
Hi-Way Machinery, Dallas and San Antonio
W. L Johnson Machinery Co., Midland
Lively Equipment Co., El Paso

UTAH:
J. T. Holland Co., Salt Lake City

WASHINGTON:
Pacific Hoist & Derrick Co., Puyallup and Seattle
Western Machinery Co., Spokane

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Thompson Award established by the American Society for Testing Materials on concrete and concrete aggregates. The paper which won him the award was entitled "Petrographic Examination of Concrete Aggregates."

* * *

H. G. Mason and **J. A. Bishop** of the U. S. Naval Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif., in conjunction with **P. E. Brown** and **L. A. Palmer,** also civilian Navy engineers, were honored by receiving the C. A. Hogentogler Award for their paper "Piles Subject to Lateral Thrust." Awards were made at the ASTM 38th Annual Meeting in Atlantic City.

* * *

John Kardell, city and county engineer at Alturas, Calif., recently resigned to take a position with a construction company on Okinawa.

* * *

Phil G. Holgren was recently appointed as city engineer at Spokane, Wash., to succeed **B. J. Garnett** who retired after 46 years' service.

* * *

Forest Roff, formerly associated with the Walla Walla, Wash., engineering department, recently returned to become assistant to City Engineer **Cline Cote.** He succeeds **W. E. Cameron** who becomes city engineer and director of public works at Sanger, Calif.

Col. Myron E. Page, Jr., recently replaced **Col. Alexander H. Miller** as district engineer at Walla Walla, Wash. Colonel Miller resigned from the U. S. Engineers to enter private industry. Joining the Corps in 1938

Col. Myron E. Page, Jr.

as a 2nd lieutenant, Colonel Page advanced through all grades to full colonel. His most recent assignment prior to this present appointment was on the staff of the Engineer School at Fort Belvoir, Va.

* * *

Reuben H. Owens took over the office of city engineer for the city of San Francisco on Oct. 1. For eleven years chief designer in the city engineering bureau, he was appointed to the top position following the retirement of **Ralph Wadsworth.** Owens entered city service in 1926. In recent years, as design chief he was in general charge of an extensive sewerage construction program. He also supervised such projects as the Broadway Tunnel, new municipal as phalt plant, Bryant St. viaduct, a well as various overpasses and via ducts. Owens is a member of the Sa Francisco Section of the America Society of Civil Engineers.

* * *

Clarence L. Leavitt as of Septem ber 1 was appointed county enginee of Pinal County, Arizona. For th past twelve years he had been asso ciated with the State Highway De partment and was senior field eng neer when he left.

DEATHS

Gerald F. Alcon, 47, a constructio engineer for Weyerhaeuser Timbe Co., died at Tacoma, Wash., recentl

* * *

Emmett J. Anderson, 77, retire building contractor of Portland, Ore died at his home here recently.

* * *

Harmon S. Meissner, 55, widel recognized authority on cement an concrete with the Bureau of Recla mation at Denver, Colo., died re cently after an illness of severa months.

* * *

Allan H. Toole, Sr., 67, well know civil engineer and a resident of Spo kane, Wash., for 18 yrs., died recentl At one time he was part owner of th firm of Clifton Applegate and Tool

SUPERVISING the jobs

Gordon A. Withrow, project manager, and **Horace Jones,** superintendent, are top men for Newstrom-Davis & Co. on remodeling of the City and County Building at Denver, Colo., a $767,000 undertaking. Contractor started working June 20 and expects to finish in 390 days. **Clayton C. Musick** is representing the architect, G. Meredith Musick.

* * *

W. J. Parson, superintendent; **Grant Collett,** grade superintendent; **Paul Garner,** asphalt paving foreman, and **Sid Hendricks,** grade foreman, are top personnel on two contracts recently awarded to Jack B. Parsons Construction Co. Both are in Tooele County, Utah. One, a $484,721 award, is for grading and surfacing 13.8 mi. of the Timpie Point-Grantsville road. The other, costing $270,801, is for 10.6 mi. of grading and surfacing on the Grantsville-Mills Junction road. Both jobs are being done by the same equipment since they join one another. There are 3 gravel plants, one 4,000-lb. Standard hot plant, 6 Heiliner scrapers, 7 D8 Cats; 5 No. 12 Cat graders; 1 80D Northwest shovel; 2 Euclid end dumps; 500-ft. compressor; 2 wagon drills, and a new Blaw-Knox PF90 finishing machine.

* * *

Ross W. Gibson is superintendent for Badger Lynch, contractor who recently received an award from the Office of Indian Affairs for grade and drainage of 2.6 mi. of Window Rock-Tuba City highway in Arizona. Approximate cost is $40,000.

* * *

Harry B. Palmer, project manager, and **Don B. Ferguson,** superintendent, are head men for J. S. Ramstad Construction Co. which currently has under construction a frame addition to operations building and miscellaneous work, including installation of electrical feeders and road construction at Tatalina, Alaska. Estimated to cost $96,526, the job is expected to take 180 days. Work started June 27.

* * *

M. G. Lubanko, superintendent, **H. Van Deren,** master mechanic, and **A. G. Crosby,** field office manager, are working for N. L. Basich on a $279,700 contract near Coyote Wells underpass and 2 mi. west of Mount Signal, Imperial County, Calif. Work consists of 22.6 mi. of grading and surfacing and two concrete bridges. Started July 11, about 100 working days are required for the job.

* * *

Walter Gott is superintending a $184,857 job for O. D. Coward in Mora County, New Mex. This 100-day job started July 15 and consists of 31.2 mi. to be graded and surfaced on the Ojo Feliz-LaCueva road. **Fred Roeder** is managing the office.

* * *

R. L. Dever, superintendent, with the aid of **T. C. Carr,** bridge foreman, and **Paul Taylor,** crusher foreman, is handling a $148,686 contract recently awarded to Armstrong & Armstrong for 3.8 mi. of grading and surfacing on U. S. Highway 66, Santa Rosa-West Road in Guadalupe County, New Mex. Work started July 20 and is expected to be finished before the end of the year.

* * *

Lee E. Woods is head man for H. S. Leigland & Sons which is putting up two dormitory structures at the AFB at Great Falls for the Corps of Engineers. Among the other key men working on these 3-story reinforced concrete buildings are **Torlav Olson,** carpenter foreman; **Paul Jenetski,** labor foreman, and **Harold Wright,** equipment foreman. **Arnold Bleken** is in charge of the office. Construction of this $587,000 project started in June, and completion date is set for May next year.

* * *

Harold Leigland of the Leigland Co. is general superintendent for the company on erection of the Airmens Club at the Great Falls AFB, a $216,000 contract which got under way in June and will be finished about the end of the year. Superintending the job is **S. V. Nickey. Cecil Remington** is carpenter foreman, and **Bob Hamers** is labor foreman.

* * *

Bernard Liebelt is superintending the construction of a cold storage building at the AFB at Great Falls for Sletten Construction Co., a $190,000 award. Carpenter foremen are **Ralph Bleecker, Mondo Lencioni,** and **Hollis McBee.** Started in June, the building will probably be completed by July 1956.

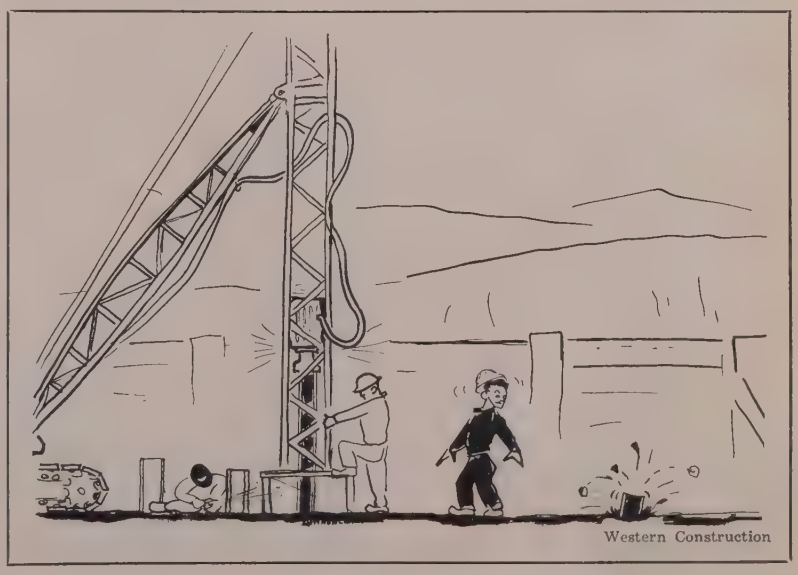
* * *

W. H. McNeal, project manager, and **L. J. "Rance" Hinnewinkel,** superintendent, head a grading and draining job being done by Peter Kiewit Sons' Co. for the Bureau of Public Roads. Job covers a 4.5 mi. stretch between Victor and Swan Valley, Idaho. Others working on this nearly completed $199,059 contract are **Ray Seeley,** office manager; **Willie Sawyer,** grade foreman, and **K. W. "Shorty" Klein,** master mechanic.

* * *

W. H. McNeal heads another highway job of Peter Kiewit Sons' Co. This is a $439,621 contract for grading and draining in the vicinity of Ashton, Idaho. **Jess "Sully" Willis** is superintending the work, assisted by **Duane "Buck" Homewood.** Grade foreman is **Alex Karst. Robert Johnson** of the sub-district office at Idaho

Down-time . . . . . By Domagalski



Western Construction

Larson *Ferguson*

Schaefer

Waslaski *Johnston* *Vice* *Lacey* *Johnson* *Fisk*

Peter Kiewit men at Billings Airport

Leo F. Larson is Peter Kiewit Sons' Co.'s general superintendent in charge of construction of an 8,600x150-ft. runway at the Municipal Airport at Billings, Mont. This $543,826 project is now nearing completion. **Frank Ferguson** is project engineer, and **"Johnny" Siebert** is office manager. Other key contractor men are **Otto Schaefer,** superintendent; **Clifford E. Johnson,** plant foreman; **Leonard "Pete" Schaefer,** asphalt foreman; **Jack Ratchye,** gravel foreman; **Dave Barker,** crusher foreman. Also **Phil Waslaski, Dan Johnston, Albert Vice, Earl Lacey,** and **George Fisk** on the Billings project.

Falls is estimator for this project, which got under way in July 1954 and is almost finished.

* * *

Steve Smith, general superintendent for Fife Construction Co., heads an Idaho State Highway job located at Leadore to Lemhi and covering a 19-mi. stretch of grading and 4 bridges. Grade foremen are **L. P. Adams** and **Wendell Fife. Walt Jenkins** is master mechanic. **Gordon Reese** is shovel runner, and **Lanny Fife,** "general helper." Work at the site has been going on since October last year and is about finished now. Working two shifts, there have been 7 DW15 Cat scrapers and 4 D8 Cats on the job.

One culvert and the four bridges were subcontracted to Wangsgaard Construction Co. at an approximate cost of $80,000. **Bob Crookston** is general superintendent and **Glen Jardine,** general foreman on this phase of the work.

* * *

John E. Hightower and **Lester Hightower** are acting as project manager and general superintendent respectively for Hightower & Luprecht Construction Co. which is putting up the $2,400,000 high school at Missoula, Mont. Assisting the Hightowers are **John Schultz, Jack Dazell** and **Bud Price,** carpenter foremen; and **Charles Badgely,** labor foreman. Work started in April 1955 and is expected to be finished about September of next year.

* * *

A. C. Nesbitt is project manager for Nilson-Smith Construction Co. and Northwestern Engineering Co. on this joint firm's $4,800,000 contract for alert hangar and airfield paving at the Great Falls AFB in Montana being constructed for the Corps of Engineers. Project engineer is **Clarence Decker. Clifford Craig** is executive representative. **Paul Howard** is office manager, and **Lois Foster** is serving as secretary. Others among the key men are: Superintendents—**James Jones,** grade; **Bob Phillips,** paving (PCC); **Bill Radovich,** bituminous concrete; **Norm Moe,** crusher. **Ted Jacobs** is master mechanic. **R. A. Morris** is grading foreman, and **John Paul** is finish grade foreman. **Lyle Shroll** is field clerk.

D. A. Whitley Co. is doing the hauling under a subcontract. **Lee Jabbora** of the firm is acting as general superintendent. **Jake Jabbora** is supervising the work; **"Mickey" Collins** is master mechanic, and **A. D. "Bud" Coleman** is shop foreman.

Nilson - Smith — Northwestern commenced work on this project the first of March and have set the completion date for late 1956.

* * *

Elmer Nelson, project superintendent, along with **Robert Hansen,** job engineer, are in charge of work on the theater and hospital structures going up at the AFB at Great Falls, Mont. Hagstrom Construction Co. is erecting both the hospital ($1,500,000) and the theater ($226,000), having started last April and will probably finish the work next January. Other key men are **Al Anderson** and **Ed Becker,** carpenter foremen, and **Ned Sunchild,** labor.

* * *

Tiber Dam is now well nigh completed, with December 1955 set as the date. This $12,800,000 USBR project near Chester, Mont., is being constructed by Guy H. James Construction Co. and Wunderlich Contracting Co., prime contractor. In October 1954 **Western Construction** presented some of the James-Wunderlich personnel and now brings its readers up to date on more of the key men currently handling the work: **F. A. Bleecker,** project manager; **J. M. New,** general superintendent; **G. P. Stewart,** night grading superintendent. Grading foremen—**P. "Red" Bott, M. S. Buno, S. W. Crawford, M. B. Parsons, G. D. Phillips, F. B. Turnham;** and **J. E. Guilford** and **S. M. Van Hise,** general grade foremen (nights). Shop—**W. P. Akes,** day shop foreman; **E. A. Kueny,** night shop foreman; **W. S. Hunt,** parts manager and **B. A. Hull,** welder foreman. **M. L. Morelock** is grease foreman; **D. E. Robinson,** trailer camp manager; **S. L. Weaver,** tire supervisor, and **E. G. Niles,** first aid. Office—**Nick Latsko,** manager; **F. E. Conroy,** engineer, office and safety, and the following clerks—**L. E. Whelchel, L. C. Loser, M. M McGuire** and **H. E. Matson.**

Contractor has a total of 45 Euc on the job: 39 bottom-dump, 35 yd. and 6 end-dump, 15 yd. Max Morelock's crew of 6 men greases and services 35 of these units in 45 min.

* * *

R. E. "Buck" Buckingham is superintending about $189,000 worth of relocation work in the Tiber Dam area for E. C. Powell. This contractor started grading and gravel surfacing on relocation of county roads for the USBR in mid-April and ex

Multiple-part Red-Strand Slings are always trusted to handle heavy loads. They are easy to apply to both the load and the crane hook. User tests in Detroit proved Red-Strand slings withstood unusual abuse, yet maintained higher-than-rated strength.

A Gary plant uses Red-Strand single-part slings for many lifting jobs like this. These slings are available with various combinations of end fittings for attaching the sling to rings or lugs. Single-part slings frequently are the most economical to use.

How to Select the Correct Sling for Your Job

A heavy cylindrical load like this usually calls for the use of multiple-part Red-Strand Flat-Laced slings. They are strong, flexible and do not slip or abrade on smooth round surfaces.

Start your sling selection by analyzing five factors:

1. The load—its size, weight, shape, finish.
2. Working area, amount of head room.
3. Size and type of crane hook.
4. Angle of sling legs.
5. Location and type of lugs or rings, if any.

This is basic information. From it, your supplier can recommend the sling by type, size and length that is safest, longest lasting and most economical for your job.

Types of Slings

Multiple-part slings are always recommended for heavy duty service, because for equal strength they are far more flexible than single-part slings. They hug the shape of the load easily, present a greater bearing surface to the load, and reduce the possibility of marring finely finished surfaces.

Where these factors are not so important, either Red-Strand *single-part slings* or *grommet slings* may be used for economy. Single-part Red-Strand slings are often recommended for lifting lighter weight objects, or those that have fixed attaching rings or lugs. Grommet, or continuous strand Red-Strand slings are ideal for forming hitches of various types without fittings.

How to Gain Extra Savings

Two suggestions will help you save money on slings.

Re-useable Pin-Lock thimbles reduce sling costs by 21%

The first is to re-use Pin-Lock thimbles on multiple part slings. They increase sling life by protecting loops from abuse or damage. Besides, these exclusive Leschen Pin-Lock thimbles cut sling costs on an average of 21% because they may be used again and again. They lock into sling loops with pins instead of permanent clamps, permitting re-use, and eliminating constant expense of thimble replacements.

The second suggestion is to use Red-Strand slings—for a very simple but good reason: Red-Strand slings are made of *higher-than-rated* quality Leschen wire rope that delivers *longer-than-expected* service.

Get a copy of Leschen's *Sling Handbook* for complete information. Ask your Leschen man for one, or write.

Depend on Leschen's higher-than-rated quality for longer-than-expected service.

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pects to see the work finished by early October. Assisting in supervising the work are the following foremen: **Hans Martinson** and **Al Schmidt**, grade; and **Don Buckingham**, crusher.

* * *

Jack Devlin is Allison Honer Co.'s job superintendent on the general contract recently awarded this firm by the California Division of Architecture for a hospital annex and alterations to the Pacific State Hospital at Spadra. Other key men on this $1,400,000 job are **Gene Harris**, assistant superintendent; **Lucien Escalle**, engineer, and **Walt Crockett**, labor foreman. **H. B. Meyer** is office manager.

Contract for the mechanical work went to Kenneth Fraser Co. at about $360,000. Galland Electric Co. got the contract for the electric work on a bid of about $170,000.

"Chuck" Fields represents the Division of Architecture as construction supervisor.

Completion date is scheduled for December 1956.

* * *

Larry Grossnickle, formerly a key man with Guy F. Atkinson Co., is now superintendent for Millie & Severson on a bridge on Spring St. over Cayote Creek in Los Angeles County, Calif.

G. O. Millie is project manager on all work for the company.

* * *

John West, office engineer, and **Don Jensen**, foreman on the batch plant, are two key men whose names we missed in listing the job personnel working on the runway extension job at March AFB, California, for Morrison-Knudsen and R. A. Westbrook, joint venturers.

* * *

Louis Schmidt is superintending construction of the new Osteopathic Hospital at Long Beach, Calif. Job foreman is **Adlow Thomas**. Work is being done by Stanton Reed Co. at a cost of about $1,300,000. Job has been under way since July.

* * *

Frank Moore is general superintendent for Steed Bros., contractor on the new steel frame addition to the Pacific Tel. & Tel. Co. building going up at San Bernardino, Calif. Moore has the assistance of **Maurice McCoy**, assistant superintendent, and **Paul Kay**, general carpenter foreman. Completion date is set for April of next year.

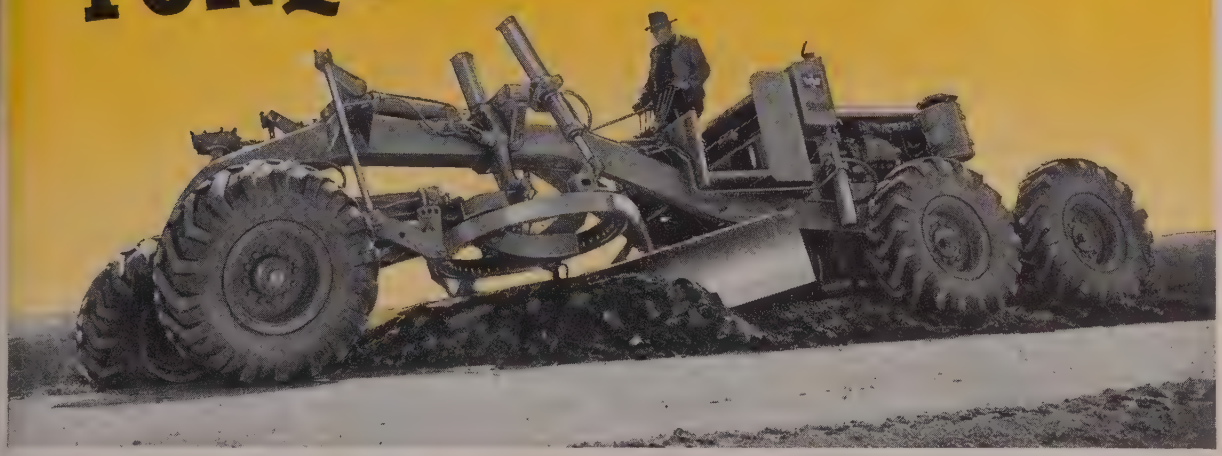
* * *

Pete Bernhard is superintending a job for the Empire Steel Building Co., a tilt-up construction costing about $400,000. Located in Los Angeles, the building is being erected for Canvas Specialties Co.

* * *

Two foremen whose names were inadvertently omitted last month in describing Lindgren & Swinerton's job at Norton AFB, Calif., are **Clifford Langley** and **Kenney Langley**.

POWER SHIFT NO CLUTCH TORQUE CONVERTER



HUBER-WARCO 5D-190 (195 H.P.)

POWER!

Tough grading jobs are handled easily and quickly by this 31,450 pound motor grader, powered by a 195 h.p. General Motors diesel engine.

PERFORMANCE!

An Allison Torque Converter protects the unit from shock loads while a full power-shift transmission — WITHOUT CLUTCH — permits quick shifts under full load without interrupting power flow from engine to load. A tail shaft governor automatically adjusts engine RPM to meet any load condition, at any speed set by the operator. Power sliding moldboard is standard equipment.

PROFIT!

These power and performance features have been combined to increase the working capacity of the 5D-190 and reduce costly down-time. With this motor grader it is possible to move more material, with fewer passes. This increased working capacity will add more profit to every job.

For more information write for Huber-Warco 5D-190 literature — Bulletin HWG-508 and Bulletin HWG-510.

For More Details — See Your Huber-Warco Distributor

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Bossing the job at Glendo Dam

J. E. Dunn is general superintendent on Lytle and Green's over-$6,000,000 contract for construction of Glendo Dam, about 4½ mi. from Glendo, Wyo. Project engineer is **James Brodt. Roy H. Thies** is in charge of the office, and **George Eells** is paymaster. Others in the office are **Roy Knutson,** bookkeeper, and **Peggy Collins,** secretary. Important construction personnel are **John Ellison,** equipment superintendent; **Guy Strother,** concrete superintendent; **Eugene D. Ledwell,** carpenter superintendent; and the following foremen: **Newt Schoonover,** shop; **Charles Regeleski,** chief partsman; **Clay Tucker** and **Don Larimer,** excavation; **Edward Troupe,** powderman; **Robert L. Peterson,** clean-up; and **B. W. Woods, Clyde Foster,** and **R. C. Lane,** carpenter. **Jack Florence** is plant operator.

Cement trucking is in the hands of Vernon Miller Trucking Co. **Vernon Miller,** head of the firm, is superintending the work, with **George Perry** handling the office detail.

Lytle-Green started work on this contract the end of November last year, and has it scheduled for completion about March 1958.

* * *

W. S. Dunbaugh is superintending the $500,000 contract of Pittsburgh-Des Moines Steel Co. for penstock, surge tank, and manifolds at the USBR Glendo Dam Project in Wyoming. **R. A. Bogue** is project engineer and **Dave Lutz** is foreman. **G. L. Yetter** is inspector for the Bureau. Under way since May 16, this work will probably be completed by early October.

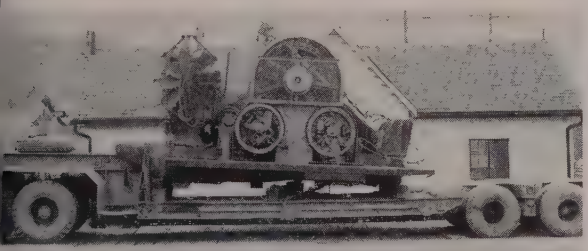
* * *

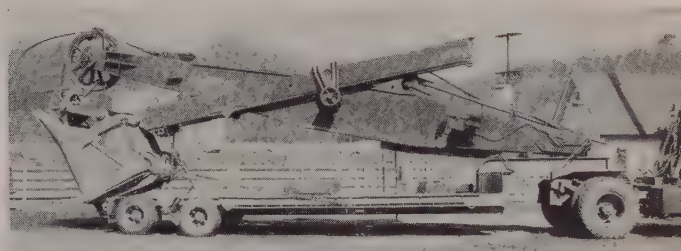
Kirk H. Fox of Gates & Fox Co., has been acting as project manager on the firm's $700,000 award for the tunnel and shaft at Glendo Dam. They started work March 1 and are now finishing up the job. Tunnel superintendents (walker bosses) are **Ed Hill** and **George Boone.** Tunnel foremen (shift bosses) are **Jack Sweeney** and **Tom McClanahan. Roy Shoemaker** is master mechanic, assisted by **Carroll Necaise.** The office is in charge of **James Clarke.**

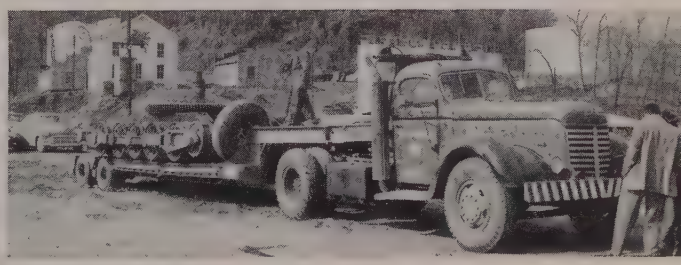
C. F. Replogle Co. reports:

"4 yd. LIMA 1601 knocked down, ked 125 miles and reassembled in 3 days"

C. F. Replogle of C. F. Replogle Co., Circleville, Ohio, writes: "We really benefit from the fact that our new 4-yard Lima 1601 shovel knocks down for over-the-road transfer from job to job. We've knocked it down, moved it 125 miles and reassembled it in three days' time. During the eight months we've had it, the 1601 finished shovel work on three jobs and started a fourth.







"The Lima 1601's 400 hp diesel with torque converter 'toys' with a 4-yard rock bucket. It eliminates the necessity to 'clutch' the hoist, and multiplies hoist line pull under load to maintain hoist speed. Cable, gear and shaft breakage due to shock loads are eliminated. The machine consistently loads one E-18 Tournarocker (10 plus pay yards) per minute.

"The new 1601 even digs laminated rock that would usually require drilling and shooting. And its rugged construction cuts maintenance costs. To date, our 1601 has loaded out over 800,000 yards of rock without a single mechanical failure. We got all this for an original capital investment considerably less than we'd spend for other like capacity machines."

You can get all these benefits with the new Lima Type 1601! Send today for our new booklet containing detailed specifications. Write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio . . . or see your nearby Lima distributor.

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Cascade Industrial Supply, Highway 99, So., Redding, California
Modern Machinery Company, 4412 Trent Avenue, Spokane 2, Washington
Faris-Moritz Equipment Company, 1095 South Jason Street, Denver, Colorado
McGaraghan Supply Company, 529 Broadway, Eureka, California

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Construction Equipment Division • LIMA • OHIO • U. S. A.

J. C. Hubbard as general superintendent, with the help of **Clayton Peterson,** foreman on bridge work, and **G. A. Martinez,** foreman-miscellaneous, is directing Etlin E. Peterson's $367,879 award for road work in Campbell County, Wyo. Job consists of grading, draining, surfacing, overhead crossings, and miscellaneous work on 3.3 mi. of the Gillette-Moorcroft road. Dirt work on this project is subcontracted to Rissler-McMurray, and the gravel and oiling is being done by Leonard Matheson. Completion date is set for some time next February.

* * *

E. L. McColl, superintendent; **W. L. Stephenson,** foreman, and **R. W. Rivemping,** engineer and office manager, are key men employed by Inland Construction Co. on a $330,465 award for grading, draining, surfacing, and construction of a bridge and miscellaneous work on 4.9 mi. of the Worland-Thermopolis road in Washakie County, Wyo. A 100-day job, pipe laying and grading operations were under way in mid-August.

* * *

Merle Nanamore is superintending for Jones-Hinckley & Jones, Inc., which recently received a $351,779 award for grading and surfacing and 3 concrete slab spans over Alkali Draw and 3 continuous girder spans over Potato Draw, with miscellaneous work on 6.7 mi. of road in Big Horn County, Wyo. Foremen are **Wallace Jackson,** grade, and **Oscar Gard,** culvert. Charles M. Smith Constructors has the bridge construction under a subcontract. Starting date was Aug. 8, with 150 days estimated for completion.

* * *

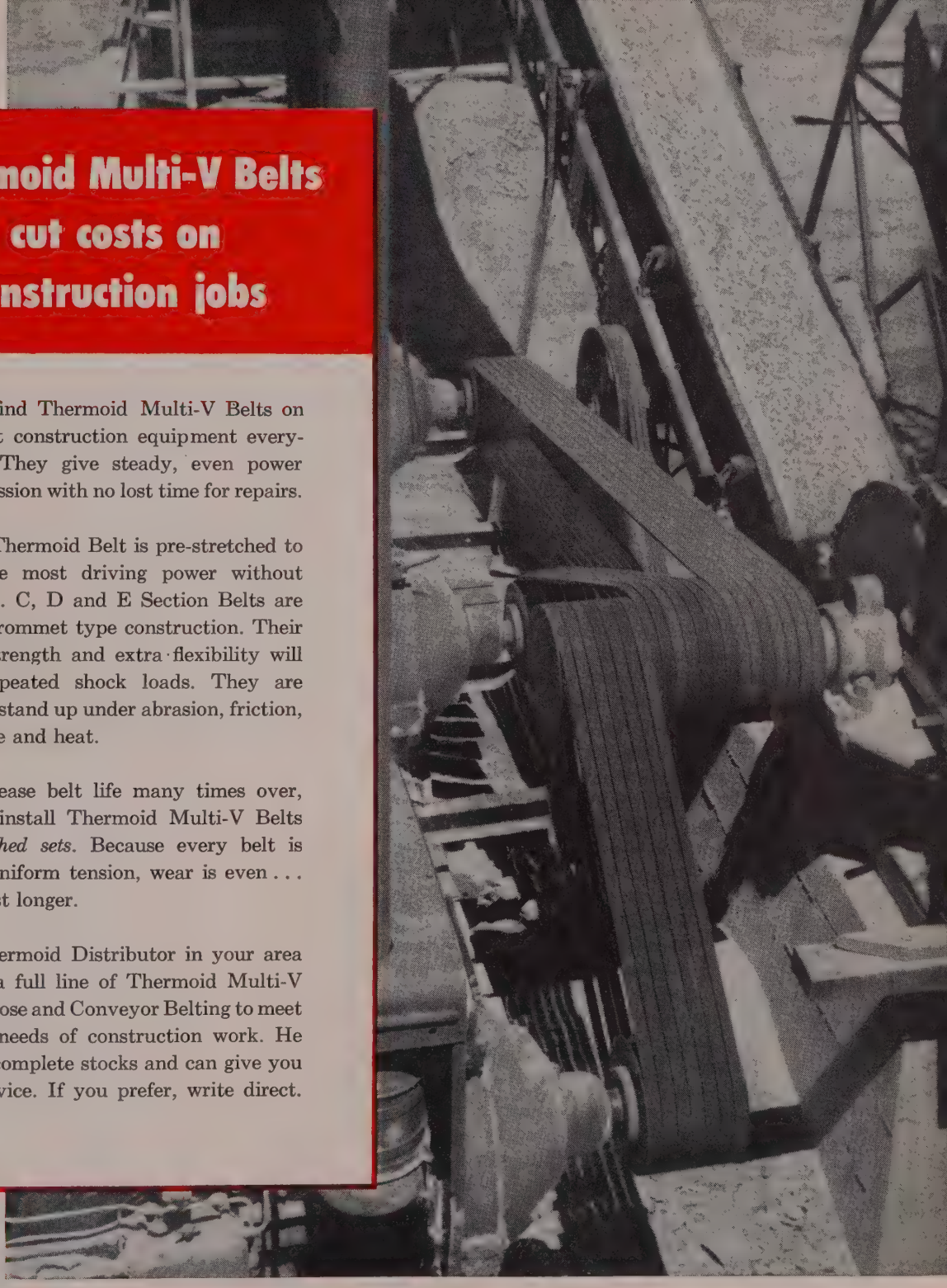
Loyd Herren and **Curtis Strong,** partners in the contracting firm of Herren & Strong, are directing the recent award to the company for grading, draining, and miscellaneous work on 4.1 mi. and surfacing and other work on 9.3 mi. of the Chugwater-east road in Platte County, Wyo. This $124,865 contract will soon be completed.

* * *

Richard A. Jackson is acting as asphaltic concrete superintendent on a recent contract awarded to Wilder Construction Co. for 3 mi. of grading and surfacing on Highway No. 1 at Bellingham, Wash. Assisting on the 120-day job which started Aug. 10 are foremen **Orville Fish,** asphalt plant; **Carl Andreas,** street, and **William Baldwin,** grade.

* * *

W. N. Evans is in charge of the $10,863,140 recent award which went to The Arundel Co. and L. E. Dixon Co. for construction of Mayfield Dam, powerhouse, and appurtenances on the Cowlitz River for the city of Tacoma, Wash. Evans is vice president of L. E. Dixon Co., the sponsoring firm. Superintendent of construction is T. E. Curtis. S. D.



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You'll find Thermoid Multi-V Belts on the best construction equipment everywhere. They give steady, even power transmission with no lost time for repairs.

Every Thermoid Belt is pre-stretched to give the most driving power without slippage. C, D and E Section Belts are rayon-grommet type construction. Their brute strength and extra flexibility will take repeated shock loads. They are built to stand up under abrasion, friction, moisture and heat.

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Unique Prefab Form System Speeds Sewage Plant "Y" Wall Construction

MECHANIZED FORMING with new "Y" wall trusses and UNI-FORM Panels speeds construction, saves labor and material

Field reports on a new system for forming "Y" walls in aeration tanks and settling basins indicate very satisfactory operation and important labor and material saving advantages for the system.

Developed by the Universal Form Clamp Co., Chicago, the new system is said to completely eliminate the many problems and difficulties encountered by contractors in forming this special type of wall in sewage disposal plant construction.

Specially designed trusses, which can be made to handle any type, height, shape or wall thickness, are used in conjunction with standard UNI-FORM Concrete Forms to form the "Y" wall. Assembly of the truss and UNI-FORM Panels into a complete form, ready to receive concrete is a fast, mechanical operation. Positive internal spreading and accurate wall thicknesses are assured by the use of Universal Spiroloc Cone Nut Assemblies.

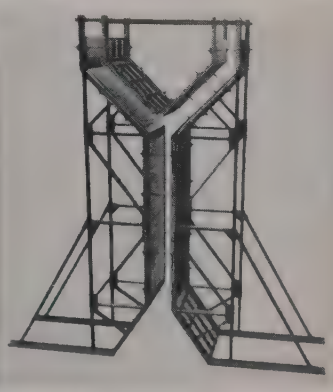
Features incorporated in the design and operation of the Universal "Y" wall forming system eliminate the necessity of additional lumber or tying devices for the alignment and bracing of the unit.

STRIPPED WALLS are clean and accurate

Erection, stripping and movement of the form can be handled either as individual pieces or as a large unit. Both methods have been very successfully used on recent projects.

Because standard UNI-FORM panels are used to form a large percentage of the "Y" wall contact area, it is possible to strip all UNI-FORM panels within a very short time after the actual pouring of concrete, leaving the trusses in place to provide the necessary support for the required period of time.

In this way, faster forming cycles, using minimum UNI-FORM equipment are possible, resulting in lower labor and material costs. UNI-FORM Panels are rented or sold, or rented with an option to purchase.



ASSEMBLED SECTION of "Y" wall truss with UNI-FORM Panels

For complete details on Universal "Y" wall forms and UNI-FORM Panels, Write:

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1238 N. Kostner • Chicago 51, Illinois

Fraser is superintendent of dam, and **E. Jacobsen** superintendent of excavation. Two more key men are **J. Gossett**, master mechanic, and **William Hughes**, chief electrician. **A. R. Linden** is chief engineer. **A. D. Haile** manages the office, and **George Henningsgaard** is purchasing agent. This is an 800-day project which got started early in July.

* * *

Jim Goodfellow, Jr., superintendent for Goodfellow Brothers, Inc., is in charge of grading and surfacing 1.5 mi. of State Highway No. 10 in the vicinity of Lakeside, Wash., a $111,183, 90-day job started the first of August. Grading foreman is **Bill Wells**; labor foreman, **Chalmers Corle.**

* * *

Fred Pankratz is superintending the utilidor construction and rehabilitation at Eielson AFB, Alaska, for B-E-C-K Constructors, Inc., which recently was awarded the contract for the 400-day project at a figure of $1,346,602. Other key men on the job, which got under way July 1, are **H. Brenden** and **B. King**, foremen, and **L. Cleveland** who is in charge of the office.

* * *

D. A. Flickinger is acting as general superintendent for Flickinger Brothers Contracting Co.'s recent award at $409,014 covering grading and surfacing of the Phoenix-Yuma highway in Arizona. Superintending the grading is **E. M. Tidmore**, and the concrete, **Ed McGalliard.** Master mechanic is **Glen Wells.** August 1 was the starting date and the job is expected to take 120 days.

* * *

Dick Dickerson is superintending the construction of a 1-story, 45,000-ft. plant and office facility near Denver, Colo. Berglund-Cherne Co., the contractor, got started June 1 and estimates 200 working days to complete the project.

* * *

William T. Spencer is general superintendent; **Fred Straub**, superintendent, and **Wayne Hapaala**, bridge superintendent working for Gordon H. Ball, contractor employed in Tulare County, Calif., on a $1,521,670 project involving 5.8 mi. of grading and paving and 5 reinforced concrete bridges between Pixley and Earlimart. Started in July, the work will probably be completed about October 1956.

* * *

Andrew Cathey, superintendent; **Mike Shipley** and **Joe Kiely**, grade foremen, and **E. R. MacIntosh**, mechanic foreman, comprise the top personnel for Eaton & Smith which on May 16 started a 3.7-mi. grading and surfacing job located between Montgomery Creek and east of Hillcrest in Shasta County, Calif. Work on this $601,031 construction will shut down for winter season, re-open in spring of 1956, and will probably be finished about June.

Why 4 Reverse Speeds in a motor grader?

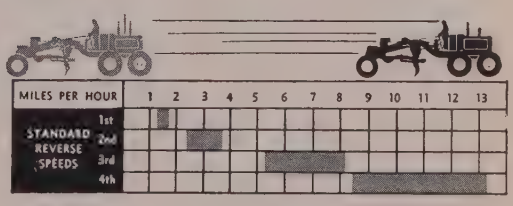
Try an ADAMS and see!

● Adams 4 reverse speeds (instead of the usual 2) give you a more flexible speed range for back-up operations—up to 13 mph. This pays big dividends when shuttling back and forth on short stretches, working between forms, etc. Your Adams backs up to starting points quickly, economically—saves production time.

This is only one of the many *plus* advantages that make Adams Motor Graders the most advanced and finest-performing on the market. Others include: 8 Forward Speeds (up to 26 mph.)—Optional Creeper Speeds (low as ¼ mph.)—Easy-Shifting, Constant-Mesh Transmission—Rubber-Mounted Engines—Dual-Braking System.

Adams Motor Graders are available in four popular models, 75 to 140 hp. Ask your nearby Adams dealer to show you the size best adapted to your needs—show you how it can do better work, faster, at lower cost than any grader you've ever owned.

Only ADAMS has 4 Reverse Speeds



Adams 4 reverse speeds range from 1.2 to 13.2 mph.—save you valuable time in shuttling back and forth on short stretches, backing to buck snow drifts, etc.

A Product of Adams Division • LeTourneau-WESTINGHOUSE Company • Peoria, Illinois

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Make your next motor grader an ADAMS

C. H. Elle is in over-all charge of a contract for 11.2 mi. of grading, surfacing, and draining the Gallatin Gateway—South Highway in Gallatin County, Mont., a $522,096 award which recently was won by C. H. Elle Construction Co. Superintending the excavating is **Glenn Terry,** while **Forrest Pumnea** is supervising the grading-pipe laying.

* * *

Guy Haney, superintendent, **Al Miller,** crusher foreman, and **Bill Ille,** paving foreman, are three key men on a recent award to S. Birch & Sons Construction Co. for 3.9 mi. of grading and gravel surfacing on the Tenth Ave. south by-pass highway, in Cascade County, Mont.

* * *

W. J. Shirley, superintendent, with the assistance of **Charles Kernan,** is supervising the construction of a junior high school project at Wilmington, Calif. Expected to take 365 days, work on this plant started Aug. 8.

Colorado highway

(Continued from Page 26)

struction work needed in Colorado now and in the future to keep this equipment in anything but new condition, according to Atchison.

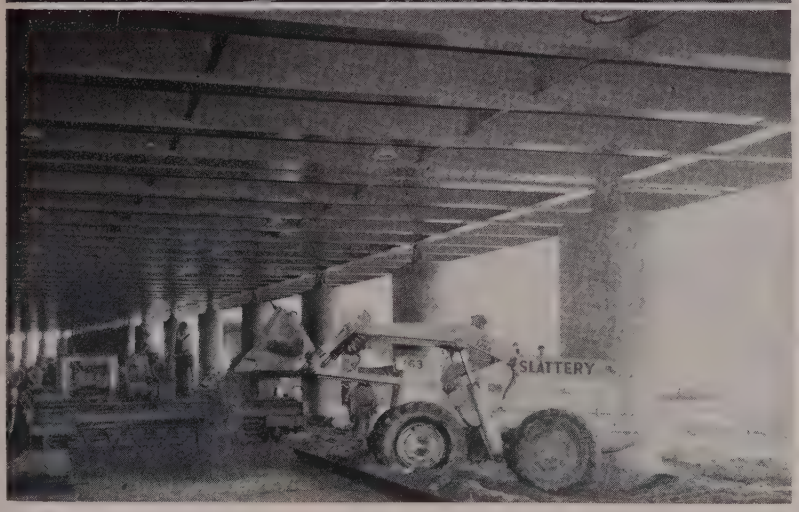
The Pioneer crusher's output made an excellent granular base 11 to 19 in. thick, depending on soil conditions in the subgrade underneath. The material was stacked by the plant to a 45-yd. Pioneer surge bin, where four bottom-dump Eucs could move underneath to pick up their loads.

Out on the grade, the crushed rock was dumped to make 6-in. lifts or less. If moisture were needed, tank trucks added it. A bulldozer and a motor grader were available for leveling and blade mixing, if that were necessary. Steel-wheel rolling by a 10-12-ton roller gave specified compaction results. On the top lift, pneumatic rolling undoubtedly will be necessary to bed everything down tight ahead of paving.

Ironically, considering the difficult crushing condition, grading was relatively easy. Most excavation cut through Mancos shale, a soft slate-gray material which responded to ripping. No shooting was necessary, and a modest fleet of tractor equipment, assisted by the same 80J Lorain shovel and Euclid trucks, which later served the rock plant, moved the muck easily. Deepest cut was 56 ft.; highest fill was 120 ft.

Started in September 1954, the Mancos Hill section was slated for completion by August 1, 1955. The job relieves a serious traffic bottleneck on the important southwestern route by creating a new section with safe right-side truck climbing lanes. Automobiles can now use the hill for 2-way traffic, unhampered by trucks as they labor slowly uphill.

TRICKS of the TRADES



Need buggies? Improvise

USING TWO TRACTOR SHOVELS as concrete buggies was the solution Slattery Rock Corporation, Bronx, N. Y., devised for the tricky problem of pouring under a viaduct with underclearance too low to allow use of paving machines.

Slattery has a paving contract for a portion of New York City's six-lane Major Deegan Expressway, which will connect with the southern end of the New York State Thruway. Work progressed without interruption until paving crews reached a viaduct which stretched for 800 ft. over four of the six 12-ft. wide lanes. Clearance under the viaduct was 14 ft., too low to permit raising of the pavers' skips to feed batch into the mixing drum. But work had to continue without delay because of a rigid time schedule.

Four-wheel drive Michigan tractor shovels provided the answer. The paving machines were moved to the fifth lane, not covered by the viaduct. Mixed concrete was discharged directly into the tractor shovels' buckets, filling them slightly less than the 1⅝-yd. capacity to avoid spillage.

Equipped with automatic shift and power steering, the tractor shovels scooted back and forth between the pavers and the four overhung lanes, maneuvering handily between supporting columns. They pushed directly up to footings before making a pour. From 200 to 250 passes of the tractor shovels were made to pour each 800-ft. lane in four hours.

Special ditcher digs at edge of drop-off

EXCAVATING TRENCH for lighting cable on the Ohio Turnpike turned out to be a tricky job for Henkels & McCoy, Philadelphia contractors.

Although trench for the lighting cable averages only 30 in. deep and 15 in. wide, a trenching problem existed because specifications required that the trench be excavated 13 ft., 6 in. from the edge of the pavement. This placed the trench only a few inches away from the edge of the interchange grade drop-offs—which drop up to 22 ft. from the grades. Ordinary ditchers with centered digging wheels couldn't excavate as close to the edge of the grade drop-offs as required because they would have no support for one of their crawlers.

Two Model 306 Gar Wood-Buckeye ditchers solved the problem for the contractors. The ditchers were equipped with special off-set digging wheel frames which allow the digging wheel to trench in line with the outside edge of either crawler so that trench can be excavated right on the edge of the drop-offs.

Said Milton G. Peck, Gar Wood vice president and director of sales: "These ditchers have enabled the contractor to average 3,000 ft. a day of trenching, cable laying and backfilling on the job, except when digging very rocky fill, which drops production to 2,000 to 2,500 ft. a day."

Proper tightening will give bolts more strength

THINK A BOLT'S greatest load-holding power stems from its size?

Not so, say Russell, Burdsall & Ward, fastener manufacturer. Preload, or residual tension, in a tightened bolt means more to assembly strength than the actual strength of the bolt itself.

In a joint, a bolt torqued to its proper load level resists a maximum amount of external load without loosening, according to R B & W engineers. Designers can take advantage of this fact and assure better results.

For example, one designer calculated high strength bolts at least ½ in. in diameter were needed for truck frames. So he used ⅝-in. to assure a safety factor. But on the assembly line these bolts were torqued to 100 ft. lb., whereas they needed at least 200 ft. lb. for proper residual tension. The ½-in. bolt at 100 ft. lb. would actually have produced a stronger assembly and at less cost.

In another case, a manufacturer of construction equipment found the

Here's the answer

to a lot of tank problems

American has been building tanks of many types, pressure vessels and storage reservoirs for a third of a century. This great store of experience in the design, fabrication and field erection of these products has resulted in carefully engineered custom fabricated units at the lowest possible cost. Facilities, experience and personnel have made American outstanding in the field. Job-timed delivery eliminates costly construction delay.

You'll find it easy, profitable and pleasant to do business with American.

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

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bucket on its earth-moving equipment was continually working loose. Designers kept increasing the size of the bolt—up to 1¼ in.—but to no avail. The impact wrench used was supplying far too little torque for this size bolt. By setting up the wrench to 350-lb. torque, a return to the original ¾-in. size bolt was possible.

A water gate valve designed to withstand 160 psi. used 48 bolts of 1-in. diameter in a gasket joint holding the bonnet to the valve. The joint leaked badly in testing, and the cause was found on the assembly floor. The operator was using an impact wrench built to tighten 2-in. bolts because it took less time than the smaller wrench. As a result the bolts were stretched ½ in. The solution, naturally, was to tighten the bolts just enough to keep the valve from leaking.

As a rule of thumb, R B & W technicians conclude the more you stress a bolt within its elastic limit, the greater its ability to stay tight and make a strong assembly.

Squat, don't lean—

BAD BACKS are second only to headache as a source of bodily misery. Back troubles originating from disease are comparatively rare with the difficulties almost always brought about by the misuse of the body.

Nationally analyzed records of back injuries indicate that injuries caused by lifting are three times as numerous as any other kind. Almost any type of lifting can result in injury. Other actions that oftimes result in injury include unaccustomed heavy work, the lift-twist-and-heave of shoveling, carrying too heavy a weight too far, the act of jumping from one level to another, pushing, pulling and all forms of stooping.

Recognizing the fact that most bad backs are preventable, if you want to avoid getting one, acute or chronic, the following precautions are recommended:

1. Have good posture; stand right, sit right and sleep right.
2. Don't make your back do strenuous things that it is not accustomed to.
3. Don't subject it to sudden, erratic motions—especially if you are not "warmed up."
4. If you must lift something heavy, lift it right. Don't lean over from the waist. Squat down, back straight, lift with your legs.
5. Don't habitually work at anything in an awkward, cramped or stooped position.
6. Never try to lift, push or pull anything difficult or heavy when off balance or when you have to put in a turning or twisting motion at the same time.
7. Keep your back muscles in good condition by adequate and sensible exercise.

TOOLS of the TRADES

Use the addresses listed for further information on any of these items

A TWIST of the fingers is all that is required to securely lock any broken drill into a one-piece miniature chuck. The chuck provides a positive lock without the need for tools of any kind. Available in a wide range of sizes and

threads to fit any standard angle or snake drilling unit, the design facilitates drilling in extremely tight spots. Size range: 1/16 to 3/16 in. by 64ths. Thread sizes: 10-32; ¼-28; 5/16-24; 9/32-40. Complete information is available from the manufacturer; **Drilex Tools, Inc.,** 622 East Jericho Turnpike, Huntington Station, L. I., N. Y.

CUTTING WIRE ROPE without first seizing it securely can throw it out of fabricated position and result in kinks or doglegs. A better seize for cutting wire rope can be obtained using hose clamps manufactured by **Punch-Lok Co.,** 321 N. Justine St., Chicago 7, Ill. Seizing with hose clamps prevents any movement of the strands during cutting operation. On stress-free preformed rope only one clamp is needed on each side of the cut. Clamps can then be removed or left as a permanent seize if needed.

A HOSE CLAMP has been developed that can be fixed in place in 3 sec. with ordinary pincers. The clamp is round with U-shaped folds or lugs. The device is merely slipped on the hose or part and crimped in place by squeezing the parallel sides of the lugs together with pincers. To remove the clamp the lugs are snipped off with the pincers They are available in 20 sizes ranging from ¼-in. inside diam. to 2⅝-in. inside diam. **Circle Clamp Corp.,** 39 Broadway, N. Y. 6, N. Y.

A TWO-WHEEL DOLLY has been introduced by **Multi-Matic Corp.,** 14741 Bessemer St., Van Nuys, Calif., for use with its line of portable electric plants. The dolly weighs 15 lb. and can be carried in the trunk of a car. The price is $42.50.

SAFETY — A paving breaker handle has been designed to cut down injuries when operators work near walls or projecting masonry. The device weighs 2 lb., and is available on the Ingersoll-Rand PB8A paving breaker. It can also be purchased separately for attaching to existing PB8A models or earlier PB8's. Write to **Ingersoll-Rand Co.,** 11 Broadway. New York 4, N. Y. for further information.

DRIVE SCREW NAILS and fetter ring shank nails are now available from **Frank L. Robinson Co.,** Fastener Division, Latham Square Bldg., Oakland 12, Calif. The nails can be used for anchor plate, boxes, crates, dry-wall, pallets, and siding. Samples, bulletins, and price lists are available on request.

ROCKING FULCRUM action on a new wrench allows a number of pipe fits with only one adjustment. A setting for a 1½-in. pipe will also accommodate 1¾- or 1-in. sizes. This fulcrum action results in a snap-on effect. Once the jaws are placed on a pipe the spring loaded hook jaw exerts a constant pressure and will hold the wrench in place; thus requiring only one hand for any operation. Models of 12, 14, and 18 in. are now in production. **Stilsomatic Sales Corp.,** 1100 20th St., N.W., Washington 6, D.C.

A NEW PIPE HOOK, with a safety handle, can be used manually when placing pipe in position for welding or connecting. A cluster of two to four

hooks may be used on a spreader for loading or unloading pipe with a 2½-in. throat opening. **Newman Mfg. and Sales Co.,** P.O. Box 5939, Kansas City 11, Mo.

THE CON-FLEX blade for cutting green concrete is being manufactured by **Champion Mfg. Co.,** 2028 Washington Ave., St. Louis, Mo. It can be used for cutting green concrete (6 to 12 hr. old) with slag, limestone, or dolomite aggregates.

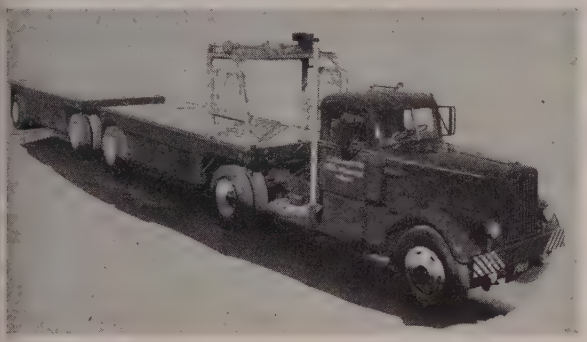
A NEW TYPE of hacksaw and coping saw blade has been developed by **Tyler Mfg. Co., Inc.,** 516 5th Ave., New York 26. N. Y. The blade has a spiral, continuous cutting edge that allows cutting in any direction without turning the work piece. It is especially good for intricate pattern cutting. It comes in standard sizes for use without adapters.

NEW EQUIPMENT

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

Trailer unit has traveling elevator

This combination set of trailers delivers bulk cinders, sand, or gravel and cinder or cement blocks. Loading and unloading of the finished blocks is achieved by a gasoline motorized traveling elevator. A pallet load of blocks can be handled without pallets; being raised from ground level and carried forward by the traveling elevator to be placed wherever desired on the trailer. The design permits double-stacking. Gondola bottoms are utilized by simply lifting the trailer floor, which then forms gondola sides, ready for filling with bulk cinders, sand or gravel. The trailer makes it possible to deliver the raw materials in bulk to the block plant and use the same equipment to deliver the finished blocks to the job. **Utility Trailer Manufacturing Co.,** 3600 Medford Street, Los Angeles 54, Calif.



Concrete plant produces 110 cu. yd. of mix per hr.

A portable high speed concrete batching plant has been completed and tested by **Standard Steel Corp.,** 5001 South Boyle Ave., Los Angeles 58, Calif. The plant is the first of a complete line of concrete construction equipment planned by the company.

Portability was one of the first considerations in the design of the plant. It can be knocked down into four component sections and transported on three low bed trucks. Its top and center sections and cement silo are within all state highway-prescribed maximum truck hauling dimensions. The cement elevator, completely assembled and ready for operation, also is within these limits. Less than 2 days time is required to erect it after it reaches its operational site, provided of course that its base has been prepared previously. It can be disassembled in less time for removal to a new location.

The batch plant is able to produce 160 cu. yd. of dry mix, or 110 cu. yd. of transit mix per hour. The aggregates are weighed to meet all specifications. There are separate weigh batchers for both cement and aggregates, plus large-size, positive-acting double clamshell gates throughout and a high-speed cement batcher feed screw equipped with accurate cut-off. All dials and controls are in full view of the operator, who can control gates to any position with a valve arrangement.

The unit has a vertical 550-bbl. cement batching and storage silo, which is filled with a vertical bucket elevator. Either an electric motor or gasoline engine can be used to run both the elevator and the screw-type feeder, operated off a chain drive. All electrical, air and water systems are factory-installed. Motors are designed to start instantly on full load. This insures that operations may begin immediately once the unit is erected, reducing field installation costs. The center section contains the scales, controls and panel board, with twist-lock connectors to motors, water and air systems. This also assists in decreasing erection costs. The silo is so designed that once the batching silo is filled, cement will overflow into the storage area.

There is easy access to all valves, controls, drives, bearings and gates. The cement batcher gate seal is simple to replace, as are the bolted clam gate leaves and end castings. Two large inspection doors are located on the elevator casing.

The entire plant is designed for 13.3% seismic loading. The top section, or aggregate storage bin, is fabricated from 3/16-in. plate steel and is braced to prevent distortion. Replaceable liner plates are installed in the aggregate hopper. Substructure under which trucks drive is designed to clear 6½-yd. transit mixers.

The plant is complete with no additions required. However, cement bins can be furnished up to 1,200-bbl. capacity. Ten foot sections can be added to the elevator as the bin height requires.

Off-highway dump truck weighs in at 40 tons

A new 40-ton spring-mounted dump truck is now being produced by **Kenworth Motor Truck Corp.**, 8801 E. Marginal Way, Seattle, Wash. The machine was engineered for off-highway hauling jobs in open pit mining and earth

or rock moving. Body capacity struck is 24 cu. yd. Heaped load is 28 cu. yd. With a gross vehicle weight rating of 150,000 lb., the chassis weight of the Kenworth 803 with body is 68,000 lb. The vehicle measures 12 ft. across the front hubs, and is 14 ft. off the ground over the one-man cab shield. The single diesel engine supplies power varying between 300 and 500 hp., depending on the grades of the loaded haul. Indicative of the general bigness of the Kenworth 803 is the radiator capacity of 2,800 sq. in. Tire are 18:00 by 33, about 6 ft. in diameter.

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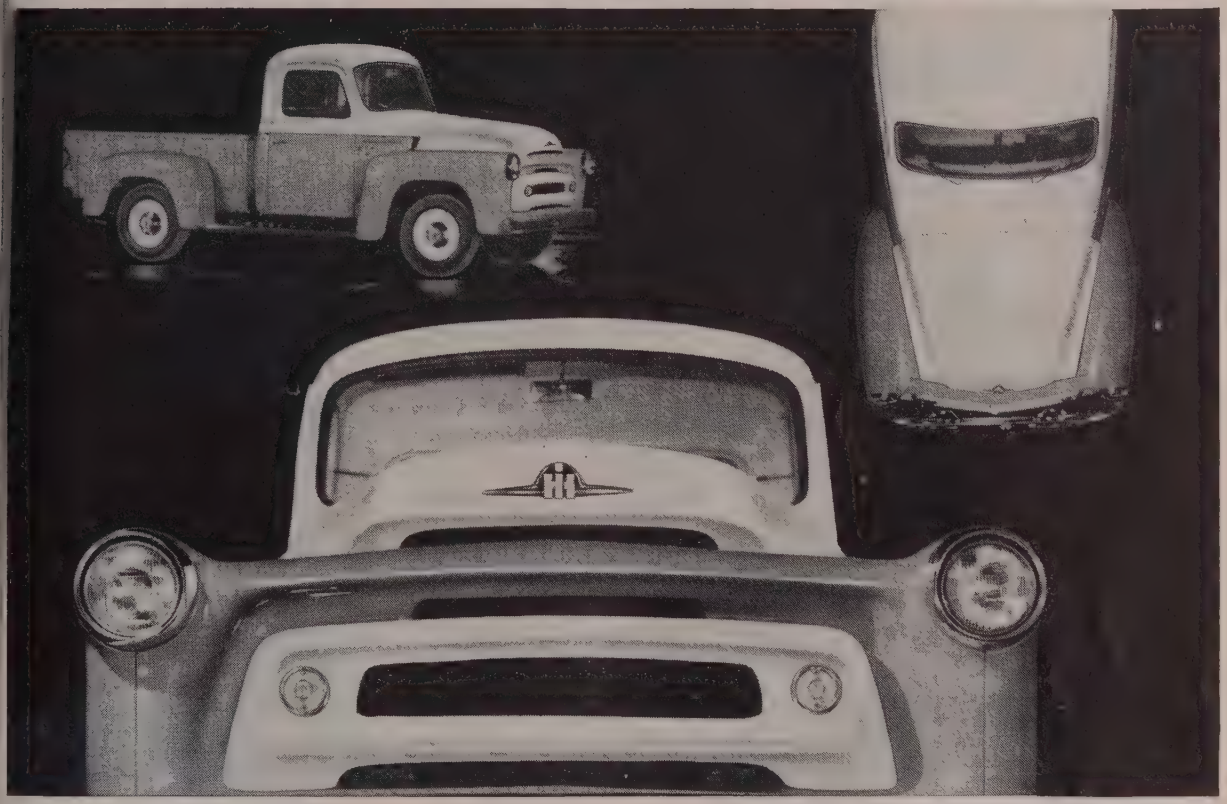

New INTERNATIONAL "S-line" includes light, medium and heavy-duty models from 4,200 to 33,000 lbs. GVW, with 10 gasoline and LPG engines, every modern truck feature.

Functionally styled for practical good looks!

Here are the new INTERNATIONALS . . . a great new truck line from *any* point of view! Their clean-lined styling is trim and functional — designed to take the rough going of truck work without excessive repair costs.

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They give you real comfort, too! They're driver-designed to let you work longer without fatigue. Loaded with performance and handling features that make hauling jobs easier.

More usable horsepower for BIG money savings!

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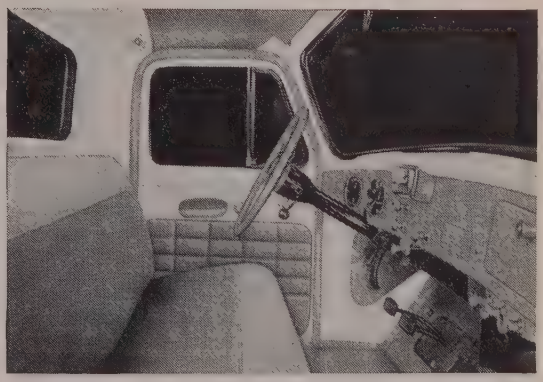

You relax in REAL comfort in Comfo-Vision cabs. Comfort-angled steering wheel. Low hood for closer view ahead. "Quiet-ride" roof lining, draft-free doors. Choice of 24 solid and optional two-tone exteriors. Optional deluxe cabs have color-keyed interior, chrome trim.

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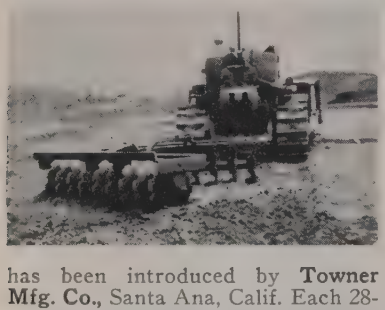
Plastic coated wire rope

A plastic coated cable called Plastic-Stainless has been announced by **Macwhyte Company,** Kenosha, Wisconsin. It is available in sizes 1/16 x ⅛ in. to ¼ x ⅜ in. inclusive in transparent green or opaque white. Strengths are from 480 lb. to 7,000 lb. The flexibility of the rope is not adversely affected by the plastic coating. It resists sunlight, oxidation, and provides color stability. It is resistant to most acids, bases, salts, oils and greases. Circular and prices are available.

Disc blade scarifier

The "Scari-Plow" designed for cutting fill on dams, levees and roads and for loosening dirt in borrow pits



has been introduced by **Towner Mfg. Co.,** Santa Ana, Calif. Each 28-in. diameter blade has 10 notches. Soil is cut so finely that no matter how small the fill the dirt can be spread evenly. The mixing action of the disc blades eliminates air pockets. It can also be used for mixing water into the lower layers of soil.

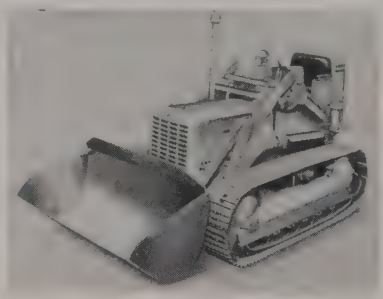
Portable materials hoist

The Tusky is a portable construction elevator which can be towed to the job by car or pick-up, put in place by one man and be ready to use in two or three minutes. In its basic erected position, the platform hoist will handle two wheelbarrows or 1,200 lb. unloading at over 20 ft.

Extra sections can be added permitting the hoist to unload at height up to 100 ft. Power is furnished by an air cooled gasoline engine coupled to a hydraulically driven winch. The hoist has a governing feature which automatically prevents overloads, and an alternate stand-by system that permits manual control at any time either from ground or platform. The hoist weighs 2,650 lb. **Tubular Structures Corp. of America,** 2960 Marsh St., Los Angeles 39, Calif.

Tractor-shovel by Caterpillar

The advantages of integral tractor and shovel design have been incorporated in a Traxcavator completed by **Caterpillar Tractor Co.,** Peoria 8, Ill. The bucket is 1½ cu. yd. in capa-



city and can be tilted when it is in any position. Diesel engine and gasoline starting engine are started from the operator's seat with all controls readily accessible. Length of the machine is 15 ft. 1¼ in., width is 80 in., and height is 82 ft. ⅛ in. Weight is 21,480 lb. Two reverse speeds up to 264 ft. per min. and four forward speeds up to 607 ft. per min. are available.

Rollers added to line

Three 2-axle tandem rollers have been added to the line of **Buffalo-Springfield Roller Co.,** Springfield, Ohio. The rollers are in the 5-8-,

6-9-, and 8-10-ton class. In all models a single-stage torque converter matches power and speed to load. Full information is available.

Wire tie has re-usable ends

A wedge-type 5,000-lb. wire tie, internally spaced, is now on the market. The outer rod units are re-usable. The inside rods have double lead thread for quick assembling and disassemblying and are designed to insure exact wall spacing. Ask for Bulletin No. T.W. 2-55. **Williams Form gineering Corp.,** 1501 Madison Avenue, S. E., Grand Rapids 7, Mich.

Water-cooled pumper

Model 40M, a 4-in. water-cooled pumper, has been announced by **Construction Machinery Co.,** Waterloo, Iowa. Powered by a Continental F-140 engine which develops 30 hp. the unit has electric starter, battery

and generator as standard equipment. It can pump up to 40,000 gal. per hr. Write for Bulletin CP-40M.

Sleeve is wax impregnated

A fibre tube, wax impregnated to eliminate greasing, for use as a pipe sleeve is on the market. Called Sono-

pipe Sleeve, it can be used in any concrete member in which cores are required for heating, plumbing, and conduit lines. The sleeves are available with inside diameters ranging from 2 in. to 8½ in. The 4-in. size is 18 cents per ft. **Sonoco Products Co.,** Hartsville, S. C.

3 tractors by Ford

Ford Motor Co., Birmingham Mich., announces it has added three models in two power series to its tractor line. All are 4-wheel types. The "600" delivers 26.8 hp. at the drawbar; the "800" delivers 35 hp. The machines are designed for towing and mountain loaders and backhoes.

Line of engine generators

A new line of diesel (5-kw. to 200 kw.) and gas-gasoline (10-kw. to 150 kw.) engine generators for both con

Tilt-up and lift-slab construction becomes even more practical with clean-breaking, nonstaining

HORN PARTING COMPOUND

Horn Parting Compound is a special product specifically formulated for use with this economical method of concrete construction. Unlike other curing compounds, it leaves no oily residue to interfere with paint or asphalt tile adhesives. Nor does it prevent proper penetration of chemical hardeners. Contains no wax, fat or paraffin, and is stable in the container. Keeps discoloration to a minimum. Residue will disintegrate, or can be easily removed, leaving a surface suitable for chemical hardening, installation of asphalt tile, or painting with oil base, resin emulsion or latex base paints.

For complete specifications and prices, write A. C. Horn Company, Inc., 252 Townsend St., San Francisco, Dept. HPI-1029.

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tinuous and standby duty has been announced by **U. S. Motors Corp.**, Oshkosh, Wis. The line includes portable, mobile, and stationary units with adaptations available for individual installations. The line is described in two folders which will be sent on request.

Portable heater

An indirect fired air heater is now on the market, selling for $300. The heater is fired with ordinary fuel oil but will burn gasoline when outdoor temperatures fall below the "firing range" of fuel oils. Heating capacity is manually controllable from 50,000 to 170,000 BTU per hr. Heated ventilation air is discharged under pressure by means of an electric motor driven blower. **American Air Filter Co., Inc.**, Louisville 8, Ky.

Tarpaulins in all sizes

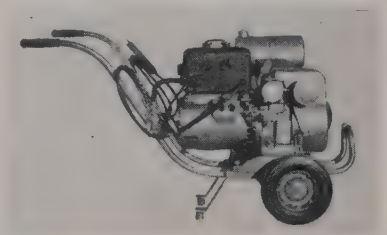
A line of tarpaulins and coverings of all shapes and sizes is in production by **Strength Incorporated**, James St., Somerville, N. J. The material uses nylon and vinyl plastic. It is water-proof, rot- and mildew-proof, with sun-fast colors. Tarpaulins are available as large as 100x100 ft.

Engine gives 2.3 to 5.6 hp.

The Model ACN is the smallest engine in a series of 12 models being made by **Wisconsin Motor Corp.**, Milwaukee 3, Wis. It is rated from 2.3 to 5.6 hp. The engine can be supplied with various gear reduction, clutch assembly, or with electric starter alone. It can be equipped to operate on gasoline, kerosene, butane, propane, or natural gas.

Portable AC generator-welder

A portable AC generator-welder combination weighing 250 lb. has been announced by **Royal Arc Industries, Inc.**, Chillicothe, Ill. The



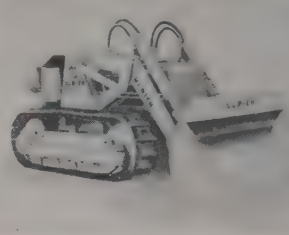
unit combines an Onan 2,500-watt electric plant with a Royal Arc transformer-type welder. The components can be easily separated for individual use. The combination is available mounted on a two-wheeled dolly or on a tubular steel carrying frame.

Diamond core drillers

Two diamond core drilling machines, Model 30 and L-2, powered by either a diesel or a gasoline motor, an air motor or an electric motor, are on the market. Normally skid-mounted, they are available also with a trailer mounting. A third option provides a complete self-contained core-drilling rig mounted on a 4-wheel drive truck. Further information is available. **Sprague & Henwood, Inc.**, Scranton 2, Pa.

Loader for Cat D4

A new hydraulic loader for Caterpillar D4 tractors with non-oscillat-



ing tracks is on the market. The loader was designed to replace cable-operated loaders. Complete information is available. **Ulrich Products Corp.**, Roanoke, Ill.

The answer to loader shock

Bucket loader shock and vibration can be lessened in the shock-absorber action of the Greer Accumulator. This hydraulic component smooths bucket loader operation, reduces structural strain, and lessens

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Streamlined as a luxury cruiser, the "Evergreen State" ferry boat hurries sightseers and Seattle commuters back and forth from Bainbridge Island. Even when loaded with 100 autos and 1200 people, the steel hull can knife through the water at sixteen knots. 1250 tons of steel were needed to build the Evergreen State... and the greatest share came from the mills of *United States Steel.*

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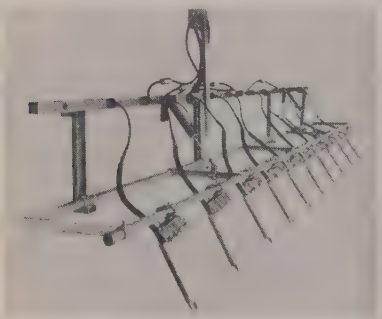
operator fatigue. The unit connects to main pressure lines between lift cylinders and control valve. Literature is available. **Greer Hydraulics, Inc.**, N. Y. International Airport, Jamaica 30, N.Y. Request Bulletin 1200.

Full slab paving vibrator

A full slab paving vibrator attachment, suitable for mounting on any concrete spreader or finisher, has been announced by **Maginniss Power Tool Co.**, Mansfield, Ohio.



The unit can vibrate slabs up to 25 ft. wide and 19 in. deep. No auxiliary carriage is required. The frame is positioned by hydraulic cylinders mounted on adjustable brackets. The control switch is within easy reach of the operator. Further information is available.

Two new 18-yd. Eucs

Two overhung engine scrapers, each with a struck capacity of 18 cu. yd., have been announced by **Euclid Division**, General Motors Corp., Cleveland 17, Ohio. Torqmatic drive

eliminates clutching and permits the operator to change speed ranges under full power. The model S-18 is powered by a 300-hp. engine. The TS-18 has two 194-hp. engines—one driving the tractor wheels and the other the rear wheels. The TS-18 is pictured.

Torqmatic transmission

A torqmatic transmission designed for vehicles requiring forward and reverse operations in all speeds was announced by Allison Division, **General Motors Corp.**, Indianapolis 6, Ind. Known as the CRT-3330, the device will be used with gasoline or diesel engines in the 70- to 130-hp. class. It has three speeds forward and three in reverse, with a wide range of application in loaders, graders, and fork-lift trucks.

Fabric conveyor belts

Conveyor belts constructed with synthetic fabrics have been announced by **Boston Woven Hose & Rubber Co.**, Box 1071, Boston 3, Mass. The belts have working tension ratings up to 110 lb. per in. per ply. A four-page folder outlining the advantages of this product is available.

Slide Gate by Rodney Hunt

An alumnium slide gate has been announced by **Rodney Hunt Machine Co.**, Orange, Mass. The gate is made of sheet aluminum reinforced with extruded aluminum angles, can be used as a stop-gate in by-pass channels. Only a simple frame is required for installation. In normal flow, it is corrosion resistant.

Three new I-H trucks

Three cab-over-engine truck models have been introduced by **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill. They are the CO-180, with gross vehicle weight rating of 17,000 lb.; the CO-181, with GVW 19,000 lb.; and the CO-182, with GVW 21,000 lb. The are available in 99, 111, 123, 135, or 135-in. wheelbase. Literature is available.

NOW! DOUBLE AND TRIPLE-DECK VIBRATING SCREENS

are available on the

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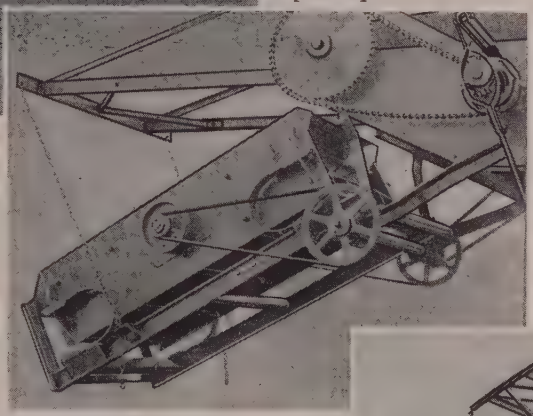
COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR • SCREEN • TRAP • FEEDER

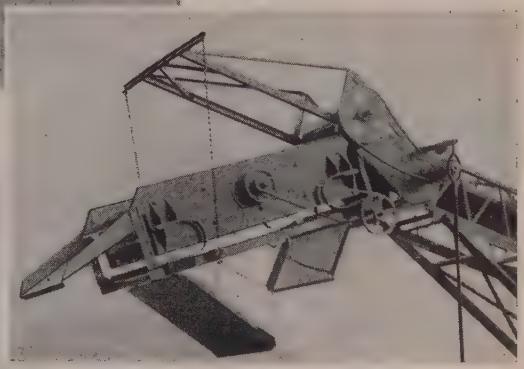
Multiple separation with a Portable Conveyor-Screen Plant? Yes, that's just what the owners of the KOLMAN plants pictured here have got! Two and three-deck Vibrating Screens are now available on the KOLMAN Model 101 Portable Field Conveyor.

KOLMAN Screens, designed to eliminate all possible excess weight, are ideally adapted to conveyor installations. Their "floating action" avoids transmission of vibrations to the conveyor. And see how easily the KOLMAN Heavy Duty Conveyor supports these multiple-deck screens without extra bracing.

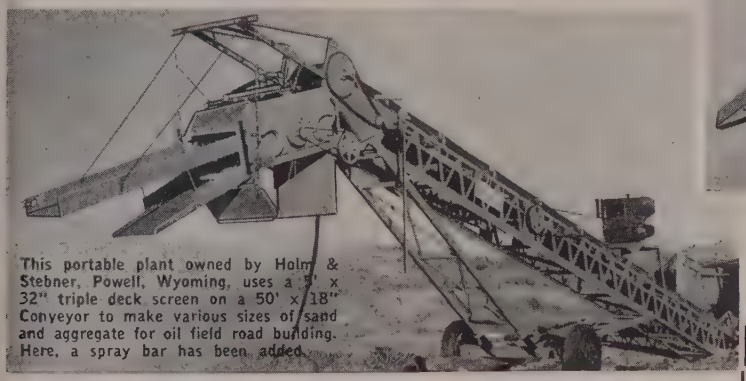
With either a double or triple deck screen on a KOLMAN Portable Conveyor-Screen Plant it is possible to accurately make several sizes of material at one time. The plant has also proved ideal for scalping out oversize and rejecting fines in a single operation. With the top deck removing oversize, the capacity of lower decks for screening fine material is increased. All this on a **portable** outfit!



The two pictures above show a Type DC 6'x36" double-deck KOLMAN Vibrating Screen installed on a 50'x30" Model 101 KOLMAN Conveyor used for loading and sizing coal in one operation by Rasmussen Bros., Sheridan, Wyo.



Above is a 7'x42" double-deck screen on a 50'x24" Model 101 Conveyor. The owners, Claude C. Wood Co., Lodi, Calif., report excellent results loading and screening aggregate on a central California dam project.



This portable plant owned by Holm & Stebner, Powell, Wyoming, uses a 5' x 32" triple deck screen on a 50' x 18" Conveyor to make various sizes of sand and aggregate for oil field road building. Here, a spray bar has been added.

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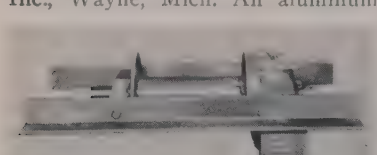
6- and 10-ton winches

New 12,000- and 20,000-lb. winches, featuring shrouded drum flanges and rope clamps, are now being manufactured by **Gar Wood Industries, Inc.**, Wayne, Mich. An aluminum



gear case housing permits faster heat dissipation, lessening the danger of damage by overheating. Both winches have a safety brake which holds a full load up to specified rating; it is an air cooled unit, and is easily adjustable.

Electric Impactool

A new size 4U-SD electric impactool has been placed on the market. The tool is readily adjustable to drilling, reaming, tapping, screw driving, and wire brushing. For further information write: **Ingersoll-Rand Co.**, 11 Broadway, New York 4, N. Y.

The 1956 Econmobile

The 1956 Econmobile, a hydraulic loader made by **American Road Equipment Co.**, 4302 N. 28th St., Omaha, Neb., has a hoisting height of 18 ft. (22 ft. with auxiliary tower),

but has an 8-ft. clearance. Attachments for the machine include a pallet fork, 4-ft. tower, ½-yd. hopper with hydraulically controlled gate, 15 cu. ft. bucket, 78-in. dozer blade, work platform, and chain boom. Details will be sent on request.

Angle head for wet rubbing

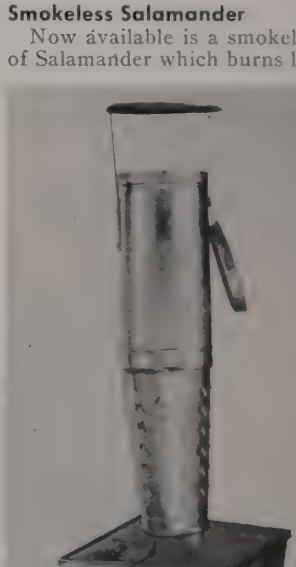
Now on the market is an angle head, Model RW, for wet rubbing concrete. The angle head makes the grinding attachment easier maneuver than when it is connect directly to the flexible shaft. It h an attachment for a water hose that water can run through the ce ter of the grinding wheel on to t concrete. A button enables the o erator to control the water. T angle head can be connected to Sto gasoline vibrators, or Stow electr concrete grinders. **Stow Mfg. Co.**, Shear St., Binghampton, N. Y.

Front-loading trailer

A front-loading, low-bed traile designed for transportation of bla top pavers, rollers, etc., has been a nounced by **LaCrosse Trailer Cor** LaCrosse, Wis. Employing a sel contained power system with sheave-type hitch and cable lift a rangement, the trailer can be ope ated behind any standard truck, r gardless of whether or not the tru has a hoist. A motor-driven h draulic pump and ram actuates t cable which lowers the platform a 7-in. height. The trailer is availab in two models, 8 and 14 ton. Bo have a platform height of 20 in.

Smokeless Salamander

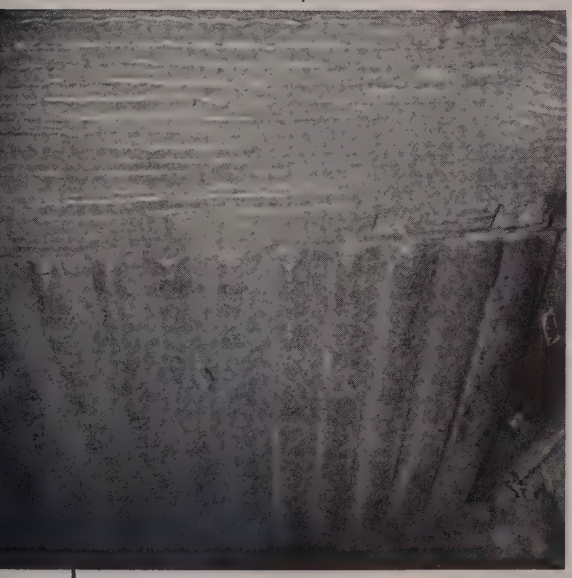
Now available is a smokeless ty of Salamander which burns less tha



a gal. of fuel per hr., and will pr duce 175,000 BTU's. Unburned ma terials are continuously recirculate through the flame. For further info mation and literature write: **C. F Daniels, Inc.**, Daniels, Md.

Generator for welding

A 2,500-watt generating plant wit external modifications to operat any transformer type AC welder u to 150-amp. rating has been an nounced by **D. W. Onan & Sons, Inc** Minneapolis, Minn. With this port



how to EXTEND working life of jaw crushers

apply VICTOR HARDFACING

No Disassembly This jaw crusher was hardfaced with jaws bolted in place, using 3/16″ coated Tube Victorite. Despite cramped working area only 12″ deep and 36″ wide, high deposition rate and low spatter loss enabled welder to get uniform, non-sagging, long-wearing bead without distorting jaw.

Downtime Saver Because it goes on fast, without flux interference, and sets up quickly, coated Tube Victorite is wonderful for hardfacing on the job without disassembly of equipment.

Where To Use Coated Tube Victorite is a high alloy content rod with Rockwell C hardness of 55-58. It was developed specifically for tools subject to severe abrasion and impact, such as:

- Ripper Teeth
- Pug Mill Augers
- Jaw Crushers
- Roll Crushers
- Die Rings
- Tool Joints
- Scraper Blades
- Asphalt Mixer Paddle Shanks
- Mill Hammers
- Bucket Lips

It welds easily to carbon alloy and manganese steels—the latter frequently is used for buildup before applying coated Tube Victorite. It can be used for position welding. Deposit is smooth, even, free of pin holes. Made for AC and DC (reverse polarity) application.

Free Help—Victor hardfacing manual shows you the right rod to use and how to apply it. Ask your Victor dealer for manual and descriptive leaflets on Tube Victorite and other Victor rods . . . or write us.

Profitable dealerships open; inquire now!

VICTOR for hardfacing

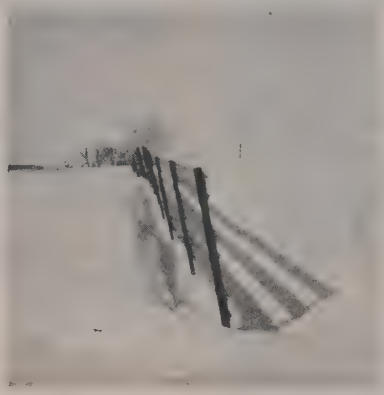
VICTOR EQUIPMENT COMPANY
ALLOY ROD & METAL DIVISION
Los Angeles 59, California • Wakita, Oklahoma

28

able source of power an operator may weld anywhere, operate tools or lights and at the same time have available a supply of power if commercial power is interrupted. The unit weighs 152 lb.

Fence for sand, dust, snow

A steel snow fence that offers sand and dust control as well has been marketed by **Northfield Iron Co.**, Northfield, Minn. Called the Blizzard-buster, the fence will pile snow



twice the height of the fence itself, yet remain clear without burying. There is no maintenance, and reasonable care will give it three times the service life of lath fence.

Aluminum pumps

A line of aluminum, centrifugal, self-priming pumps has been marketed by **Multi-Matic Corp.**, 14741 Bessemer St., Van Nuys, Calif. Four

models are being offered, a 1½-in. model that pumps 6,000 gph.; a 2-in. pump that delivers 8,000 gph., and a 2-in. pump with a larger impeller that has a capacity of 12,000 gph.; and a 3-in. pump with 22,000 gph. The pumps are mounted on Neoprene pads.

Clemco Venturi Nozzles

New Clemco Venturi Nozzles will fit all sandblast units now in use. The Venturi design improves cleaning characteristics by creating a uniform impact without large fringe areas. The nozzles are available in a variety of lengths and orifice sizes. **Clementina Ltd.**, 2277 Jerrold Ave., San Francisco, Calif.

Chain saw weighs 22 lb.

A chain saw, the Super 33, made by **McCulloch Motors Corp.**, 6101 W. Century Blvd., Los Angeles 45, Calif., weighs 22 lb. Features include a wrap-around handle and a sawdust and sprocket guard. The saw is easy to handle and has low maintenance.

Tractor-shovel is largest of line

A tractor-shovel now available features power-shift transmission, torque convertor, and 4-wheel drive

planetary axles. The line includes a 2½-cu. yd. unit which is the largest ever produced. In addition, 1¼- and 3¾-yd. models are available. The bucket is designed for a 30-deg. tilt-up from ground position. Each model is offered with either a gasoline or diesel engine. **Pettibone Mulliken Corp.**, 4700 West Division St., Chicago, Ill.

Addition to Triplex tamper line

An addition has been made to the line of Triplex compaction equipment. It is the GT-5 D Triplex ditch

tamper. The tamper has handle bars which adjust both vertically and horizontally allowing the operator freedom to work efficiently in trenches as narrow as 10 in. and as deep as 5 ft. Areas which formerly were considered difficult no longer pose a problem. **Gunderson-Taylor Machinery Co.**, 1237 Shoshone St., Denver, Colo.

LA FERA LAYS IT ON THE LINE!

—tells how P&H 955-A trench hoe (2½ yd.) uts costs on 8-mile trench job in New Jersey

espite water fill conditions our 955-A digs a trench 20′ le and 22′ deep at a sustained rate of 80′ per day. That's .5 cu. yd. per operating hour. We believe we can out-duce other 2½-yard machines year after year with less ustment, replacement and lay-up costs."

says Joseph LaFera, President of the LaFera Contracting mpany of Newark. And he makes no secret of his costs l operating data, now available in a Gould Report just the press. Why not get the facts? See how P&H all-welded construction, greater stability, Magnetorque swi and other advanced features can help you get your cos to rock bottom. There's new profit here for you!

Ask for Gould Report #5505. Your P&H dealer can gi you a copy, or write — P&H Pacific Division: Harnischfeg Corporation, 2400 East Imperial Highway, Los Angeles 5 100 Bush St., San Francisco; 2909 First Ave., South, Seatt 1108-15th St., Denver.

HARNISCHFEGER

See your P&H dealer

ESNO, Calif. . . . . . Allied Equipment Co., 1824 Santa Clara St.
NVER, Colo. . . . . . Liberty Trucks & Parts Co., 690 Lincoln St.
OISE, Idaho . . . . . Starline Equipment Co., 503 South 16th St.
BUQUERQUE, N. M. . . . . . Leonard Motor Company, 1211 North 4th St.
NO, Nev. . . . . . Pioneer Equipment of Nevada, 525 Kietzke Lane
GENE, Ore. . . . . . Loggers & Contractors Machinery Co., 540 Filmore St.
ORTLAND 14, Ore. . . Loggers & Contractors Machinery Co., 240 S.E. Clay St.
ALT LAKE CITY, Utah . . . Western Machinery Company, 2300 South Main St.
EATTLE 8, Wash. . . . . . Bow Lake Equipment Co., Inc., 300 Michigan Ave.
ATTLE 4, Wash. . . . . . Glenn Carrington & Co., 91 Columbia St.
OKANE 1, Wash. . . . . . Construction Equipment Company, E. 3823 Trent Ave.
PHOENIX, Ariz. . . . . . Arizona Equipment Sales, Inc., 2812 Grand
CRESCENT CITY, Calif. . . . . . Riley Logging Supply Co., Highway
EL CENTRO, Calif. . . . . . Purdy-Holmquist Co., 1275 Mai
ESCONDIDO, Calif. . . . . . Southern Equipment & Supply Co., 301 W. G
EUREKA, Calif. . . . . . Riley Logging Supply Co., 1034 Broadway S
LOS ANGELES, Calif. . . . . Shaw Sales & Service Company, 5100 Telegraph
OAKLAND, Calif. . . . . . Cook Bros. Equipment Co., 416 East Eight
SACRAMENTO, Calif. . . . . . Sacramento Valley Tractor Co., 1901 Broa
SALINAS, Calif. . . . . . Farmers Mercantile Company, 15 W. Alisal S
SAN DIEGO 13, Calif. . . Southern Equipment & Supply Co., 2025 E. Harb
SANTA MARIA, Calif. . . . . . Hanson Equipment Co., Main St. at Blosse

Attachments for International tractor

An excavator and angling bulldozer for mounting on the International 300 tractor have been announced by **Pippin Construction Co., Inc.**, White River Junction, Vermont. The excavator digs to a

depth of over 10 ft. and loads a truck to a height of 9 ft. with backhoe bucket and 12 ft. with shovel bucket. The front drive pump can be used for operation on both the excavator and front end attachments. The bulldozer has a tubular push arm accompanied with a low pivot point for effective dozing operation. The blade is available with angling bracket for angling 12½ or 25 deg. left or right.

Portable electric hack saw

Now available is a self-powered portable electric hack saw designed for making straight, circular and random cuts in wood, masonite, metal sheeting, reinforcing materials, or metal decking. It can be operated from utility lines or 2-kw. portable generating outfits. The unit weighs 6¾ lb. and measures 16½ in. overall. **Key-Hak Division**, Producers and Distributors, Inc., 1321 Hanover Ave., Allentown, Pa.

Wagner adds scarifier to line

An hydraulically controlled scarifier that operates independently of the loader has been introduced by

Wagner Iron Works, 1905 South First St., Milwaukee 1, Wisc. The hydraulic control allows the operator to set the scarifier down to a depth of 7 in. and hold it there. Designed for use with a loader equipped John Deere 40C tractor, the attachment rips and loosens packed surfaces, worn and broken down hard top.

Front end loader by Napco

The Napco loader has front wheel drive and rear wheel steering. A turning radius of 7 ft. 4 in. and a low center of gravity gives the loader good maneuverability. The 15-cu. ft. bucket can be lifted 7 ft. 6 in. The lift capacity is 1,250 lb. Literature is available. **Napco Construction Equipment, Inc.**, 834 North 7th St., Minneapolis, Minn.

Movall wagon for Cat DW15 tractors

A new Movall wagon for use with Caterpillar DW15 tractors has been announced by **C & D Manufacturing Co.**, Perkins, California. The Movall has a heaped capacity of 16 cu. yd.

and 12 cu. yd. struck, and a carrying capacity of 44,000 lb. It is intended for use with DW16 tractors now in the field or with new prime mover units. Under favorable job conditions it can be used with Cat DW10 tractors. The machine has positive cable-controlled ejection, a turning width of 27 ft., a loading target area of 10 x 16 ft., and a dumping time of 11 sec.

Two Mack B42's . . . part of the sixteen-unit fleet of the Allen's Ready Mix Concrete Company, Memphis, Tenn.

Macks cut maintenance costs 90%

Take it from Mr. S. G. Allen of the Allen's Ready Mix Concrete Co., Memphis, Tenn., when he says Macks really save him money.

Before he put Macks on his jobs, his monthly maintenance costs averaged more than $1,000. Since switching to an all-Mack operation of sixteen mixers and dumpers, he finds these average monthly costs for his entire fleet have been cut to less than $100!

As Mr. Allen puts it, "Macks have made an important contribution to the success of my business. In my opinion, Macks are the finest equipment ever built. They have no equals for long life, dependable service, minimum down time and low-cost operation."

High praise for Mack performance? You bet! But ask other owners and operators of Macks throughout the country and see how they agree with Mr. Allen. It's no wonder that in the construction industry the "word" is—it pays to standardize on Macks.

MACK TRUCKS Los Angeles • Denver • San Francisco • Seattle • Portland • Salt Lake City

Heller adds to trencher line

A trencher for mounting on John Deere 48 crawler tractors is under production at **Heller Manufacturing Co.**, 1849 East Slauson Ave., Los Angeles 58, Calif. The trencher has

a digging depth of 4 ft. and trenches 14-in., 16-in., and 18-in. widths. The machine switches dirt to either side and has a back filler blade to replace dirt. Literature and specifications are available.

Bottom-seating sluice gate

The HY-Q flush bottom closure sluice gate is being manufactured by **Rodney Hunt Machine Co.**, Orange, Mass. In the HY-Q gate the frame has been lowered so that the opening is flush with adjacent chamber floors or with the natural bottom floor line. The gate seats flush with the invert. The gate is of cast iron bronze-mounted construction. It is secured in its closed position by bronze wedges on top and sides only which hold it tight against the frame. With closure at the bottom there is less turbulence and no barrier to accumulate silt or trash.

Engine delivers from 2.3 to 5.6 hp.

An engine now available has a piston displacement of 14.88 cu. in. and is designed to operate within a speed range of 1,600 to 3,600 rpm. delivering from 2.3 to 5.6-hp. Called the Model ACN, it can be equipped to operate on gasoline, kerosene, butane, protane or natural gas with minimum carburetion change-over. **Wisconsin Motor Corp.**, 1910 South 53rd St., Milwaukee 46, Wisconsin.

Push button lifting hook

A new lifting hook is pneumatically operated and electrically controlled. It can be operated by button

from the cab of the crane. Made in two sizes, 6 ton and 12 ton, it is positive in action and cannot open under any load within its capacity. Jaws open wide for easy pick-up and overlap in closing. Further details are available. **Gar-Bro Manufacturing Co.**, 2415 East Washington Blvd., Los Angeles, Calif.

Take this heater with you

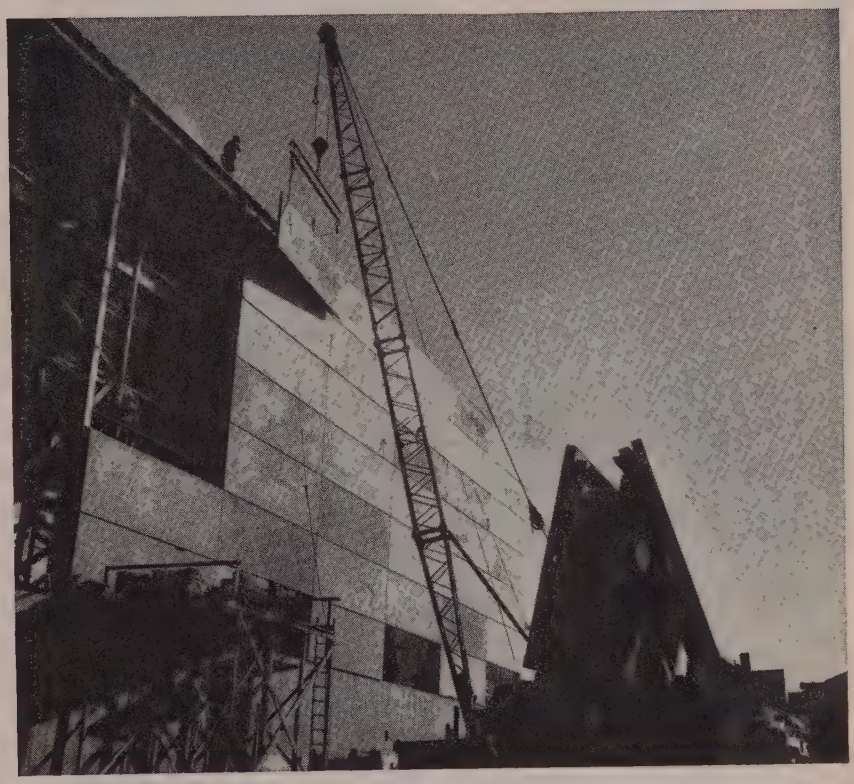
The B-100 portable heater weighs 78 lb. without fuel and can be lifted or wheeled easily by one man to wherever it's needed. Workmen can

use it high on scaffolds or carry it through places too small for conventional sized heaters. It has 100,000 btu. per hour capacity with ¼-hp. combined fan and pump motor that blows 500 cu. ft. of warm air per min. It has a 12-hr. fuel capacity to run all night. It runs from 110-115-volt, 60-cycle AC current and burns kerosene or No. 1 or No. 2 fuel oil. Literature is available. **Master Vibrator Co.**, 362 Stanley Ave., Dayton 1, Ohio.

THROUGHOUT THE WEST . . .

it's Permanente Cement

ST. HELENS, OREGON
The $15,000,000 expansion of Crown Zellerbach paper mill and converting plant. Permanente Type I, Standard Portland cement was used.



*On the job—On time**

STANDARD PORTLAND
MODIFIED PORTLAND
HIGH EARLY STRENGTH
LOW HEAT
SULPHATE RESISTANT
PRONTO (Pipe Cement)
PORTLAND POZZOLAN
BRICK MIX
PLASTIC CEMENT
OIL WELL CEMENTS

*SERVICE MARK

A unique and speedy method of using pre-cast slabs for concrete construction is shown in photo of exterior wall assembly at the St. Helens, Oregon, paper mill of Crown Zellerbach Corporation. The slabs are cast with protruding steel studs, raised into position, and bolted to the steel frame of the building.

PERMANENTE TYPE I, STANDARD PORTLAND CEMENT is the preferred brand wherever good concrete is being placed throughout the West — either for pre-cast slabs, or in regular form type construction. Permanente specifications insure the production of sound, strong and durable concrete when properly used in general-purpose construction.

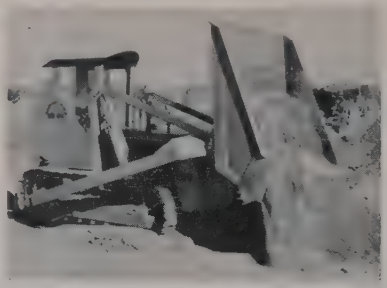
PERMANENTE
CEMENT COMPANY

PERMANENTE, SANTA CLARA, YOSEMITE AND KAISER BRANDS OF PORTLAND CEMENT AND PERMANENTE LIME PRODUCTS

OAKLAND • PORTLAND • SEATTLE • EAST PASCO
ANCHORAGE • FAIRBANKS • HONOLULU

Front-dump buckets for Austin loaders

Live front-dump buckets are being offered as extra equipment on



Models 2-C, 4-C, 6-C, 7-C, and 8-C Austin Overshot loaders. Interchangeable with bulldozer and front-end loading attachments, the live bucket is removed or installed in 15 minutes. Hydraulic bucket positioning is controlled from the cab. Bucket tilt is 45 deg. Austin Division, **Central Ohio Steel Products Co.,** 2 Santa Fe Drive, Denver, Colo.

Bulldozer attachment

A bulldozer attachment, suitable for mounting on Model 2-C, 4-C, 6-C, 7-C, and 8-C Austin Overshot loaders has been announced by Austin Division, **Central Ohio Steel Products Co.,** Galion, Ohio. With the attachment the machine can be used for grading, back-filling and other dozing jobs as well as for digging, loading, screening and stockpiling material. The blade is interchangeable with Austin standard or front-dump buckets. The attachment can be installed in 15 min. and blade tilt adjustment in 15 deg. on loaders equipped with standard buckets and 45 deg. on front dump bucket-equipped machines. Blade and end bits are replaceable.

Bucyrus-Erie offers hydrocrane

An all-hydraulic truck crane, the H-5 Hydrocrane, is available from **Bucyrus-Erie Co.,** South Milwaukee, Wisc. It is available as ½-cu. yd. excavator and as a 9-ton lifting crane. It is designed for mounting on a new or used conventional motor truck, eliminating any need for a crane carrier. The H-5 has an 18,000-

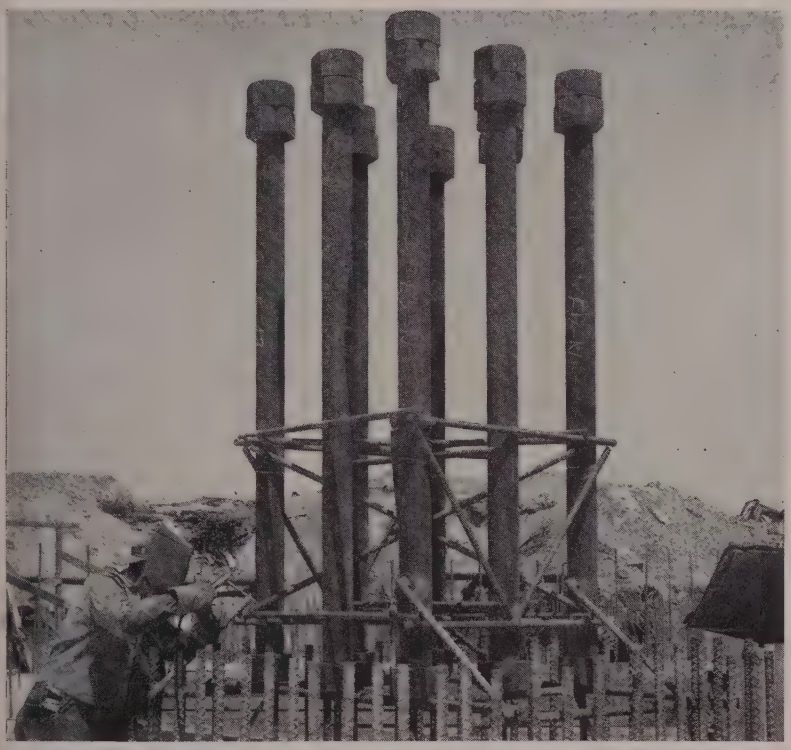
lb. maximum lift. It can be equipped with a standard 2-piece boom, telescoping from 24 ft. to 36 ft., or with an optional high lift, 3-piece boom extendible from 38 ft. to 50 ft. It can travel at speeds up to 50 mph on the highway. A jib is available for standard or high-lift boom and provides a maximum clear lift under the hook of 72½ ft. at minimum radius

Starting system for diesels

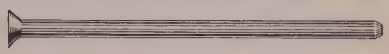
A hydraulic starting system for diesel engines has been announced by Allison Division, **General Motors Corp.,** Indianapolis 6, Indiana. Called the Hydrostarter, the starting system consists of a hydraulic motor, piston type accumulator, an engine driven pump, a reservoir and a manual pump. No outside source of energy is needed. The motor extends slightly more than 9 in. from the engine fly wheel housing. It can be coupled to practically all diesel engines up to 300 hp. in the same way as a conventional electric starter.

BETHLEHEM PACIFIC

Your Headquarters for Fasteners

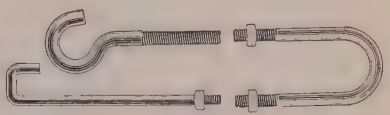


These 4¾-in. diam anchor bolts were made in our South San Francisco Plant. These assemblies were placed within concrete pedestals to anchor the massive steel structure supporting the boilers at the P. G. & E. power plant in Pittsburg. Bechtel Corporation was the general contractor.



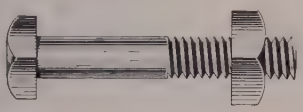
DRIFT BOLTS. Heads are button, square, and countersunk. Points are wedge, semi-cone, and full-cone. Also supplied without head or point. Round or square shank. Plain or galvanized.

SPIKES. Heads are diamond, button, nail, hook and countersunk. All have wedge points and square shank. Plain or galvanized.



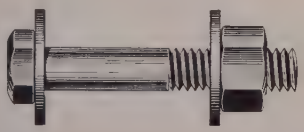
HOOK-, U-, EYE- AND J-BOLTS. All sizes. Furnished with round, square and right-angle bends. Also special bends. Plain or galvanized.

TURNBUCKLES. Diameters from ⅜ to 2⅝ in., with 6-in. openings between heads. Right- or left-hand threads, with or without stub ends.

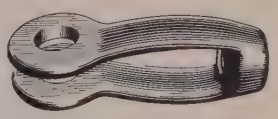


MACHINE BOLTS. Made to ASTM Specification A-7. Also in standard grades of carbon or alloy steel. Heads are square, hex, tee, button or countersunk. Cut or rolled threads.

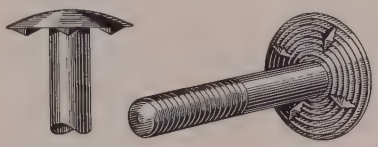
TIE RODS. Round or square rods in lengths up to 65 ft. Standard or special threads, cut or rolled. Single or multiple units. Galvanized, painted or asphaltum-dipped.



HIGH-STRENGTH STRUCTURAL BOLTS. Heat-treated to meet ASTM Specification A-325. All sizes from ½ to 1¼ in. in varying lengths. Usually supplied with hexagon head, two hardened washers, and heavy hexagon nut.



CLEVISES. Drop-forged. Usually tapped to Coarse Thread Series, Class 2. Right- or left-hand threads, with or without pin and cotter.



TIMBER BOLTS. Tight grip assured by four diamond-shaped lugs under head. Requires no washer, will not turn in timber. Eliminates counter-boring and retards dry rot. Square-head bridge bolt, with integral forged washer under the head, also available in varying lengths.

BOLT SPECIALS. You name it, and we'll make it at one of our three modern bolt and nut plants on the West Coast. Whether it's a ladder rung, a hanger pin or a special bolt — we can make a wide variety of specialties to your specifications.

SLEEVE NUTS. Top diameters from ⅜ to 4 in. Usually tapped right-hand at one end, left-hand at other. Also furnished with right-hand threads throughout.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: Los Angeles, Phoenix, San Francisco, Portland, Seattle, Spokane

BETHLEHEM STEEL

News of DISTRIBUTORS

Allis-Chalmers transfers

Sherman O. Anderson is appointed Pacific Coast territory manager, Tractor Group, and George E. Hall is named Pacific Coast territory manager for the Construction Machinery Division, Tractor Group, of Allis-Chalmers Manufacturing Co. L. W. Davis was formerly in charge of this territory. Anderson comes from Portland where he was branch manager, and Hall from Los Angeles, where he was assistant manager.

Kaiser Steel appoints engineer

Kenneth V. Dawson has been named sales engineer for Kaiser Steel Corp.'s Napa (Calif.) fabricating division plant. He will represent Kaiser Steel in contacts with engineers and designers on general fabricating work. Dawson retired recently from the U. S. Navy as a rear admiral.

Western sales rep

Paul T. Liefeld was recently appointed sales representative for Rheem-Beam guard rail, according to William M. Carson, sales manager, U. S. Spring & Bumper Co., Automotive Division, Rheem Manufacturing Co. Liefeld's territory covers the eleven Western states.

New Western sales manager

The Construction Machinery Division of Chain Belt Co. announces the appointment of Charles R. Angell, Jr., as Western district sales manager with offices in San Francisco. Angell has a varied background in the construction machinery field. Prior to joining Chain Belt he was San Francisco regional supervisor for a leading manufacturer and had also spent some time selling equipment for a West Coast distributorship.

Koehring representative

William B. Thompson was recently appointed district representative by the Koehring Company. Working out of San Francisco, Thompson will cover the territory of California, Arizona, Utah, and Nevada for all Koehring equipment, as well as that of its subsidiaries: Parsons Company and the Kwik-Mix Co.

New Sacramento branch

Central Equipment Co.'s new branch at Blumenfeld Ave. and Arden Way in Sacramento, Calif., is under the managership of Al Hewett and is well equipped for the selling, servicing, and rental of contractor equipment, such as air, sandblast, pump, etc.

News from Cook Bros.

John E. Quartarolo has replaced Art Bouterious as assistant branch manager at the Oakland office of Cook Bros. Equipment Co. Bouterious had to leave because of ill health. The Oakland branch was recently appointed dealer for the American Hoist & Derrick Co. for the Northern California territory, covering the complete line of hoists, derricks, crawler cranes, rubber cranes, and locomotive type cranes. Sales, parts, and service are now available at the Oakland location.

Don Paxton joins Andrews

Andrews Machinery Co. of Washington, Inc., has added to its staff as a salesman, Don Paxton. Paxton was for 15 years with Guy F. Atkinson Co. and was known to many as the purchasing agent for that company on the Ross Powerhouse construction job. Before joining Andrews he had been selling equipment in the Seattle area.

Four new N.W. dealers; 1 Alaska

Four new dealers in the West have been appointed by the Construction Machinery Division of Clark Equipment Co. In Montana, Western Construction Equipment Co., Billings, will handle only Michigan tractor shovels in counties east of and including Glacier, Pondera, Teton, Lewis and Clark, Jefferson, Silver Bow, and Madison. Miller Machinery Co., Missoula, will handle only tractor shovels in 11 counties, and will handle the company's excavator cranes in the entire state. In Wyoming, Moss Equipment & Supply Co., Casper, will handle the entire line in all of the state except the counties of Lincoln, Sublette, Uinta and Sweetwater. In Washington and Oregon, Columbia Equipment Co., Portland, will handle the line in all counties of Oregon except four, and in the five southernmost counties of Washington and the southern part of Pacific County. Besides these four new Western dealers, Clark has named Evans Engine & Equipment Co. of Seattle to represent them in the entire Territory of Alaska.

Alcoa names Faisst in Northwest

J. Colin Smith of Seattle, Pacific Northwest district sales manager for Aluminum Company of America, has been appointed manager of the company's New York district sales office. Smith will be succeeded by Harold A. Faisst, who has been manager of Alcoa's Richmond, Va., branch sales district.

Superior Scaffolds signs T.H. dealer

Edward R. Bacon Co. of Hawaii has been appointed the first dealer located outside continental U. S. for the sale of products of Superior Scaffold Co. of Culver City, Calif. "Bob" Squire, Superior's president, on returning from a recent cross-country trip, indicated that selling through building material dealers has proved its value and the company intends to move their entire output through their dealers.

New Raymond sales engineer

Raymond Concrete Pile Co. announces the appointment of Howell T. Hunt as sales engineer in the Los Angeles district, making his headquarters at 816 West 5th St.

Cleaver-Brooks makes appointment

Cleaver-Brooks Co. announces the appointment of Barrett & Yost Co. of Seattle, Wash., as manufacturer's representative for its equipment.

Standard Products Div. activity

Standard Products Division of Stephens-Adamson Mfg. Co. announces the appointment of two authorized stocking distributors in the

Anderson *Hall* *Dawson* *Liefeld* *Angell* *Thompson*

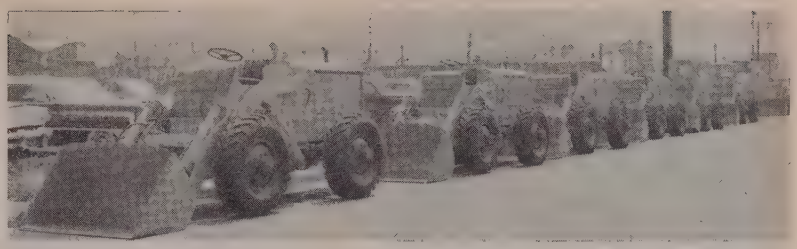
West: Harshberger Equipment Co. of Portland, Ore., and in Los Angeles, Calif., the Stephens-Adamson Mfg. Co. These organizations will handle the company's complete line of belt conveyor idlers and rollers, centrifugal loaders and pilers, car pullers, winches, and allied machinery.

New N.W. branch manager

Announcement was recently made of the appointment of Bill Hackett as branch manager of Columbia Equipment Co.'s new offices and warehouse at N. 1007 Freya St., Spokane, Wash. A veteran of 25 years with Columbia, Hackett has been territory salesman in the Spokane area for about 20 years. Taking over Hackett's former sales territory is D. W. Myers who has been machinery demonstrator-salesman for the firm. He has had extensive on-the-job experience with several contracting firms in the Northwest and has been with the company a total of about 10 years.

Ace King moves to Portland

Ace King has joined the staff of Lincoln Electric Co., Portland district office, as welding engineer. He has been with Lincoln since 1937 serving in the Cleveland plant as research engineer and production specialist. King has become active in the American Welding Society and will devote his time to welding engineering problems in the Portland area.



FLEET of Pettibone-Mulliken 1-yd. loaders with torque converters recently displayed at the open house party of the Calavar Corporation of Los Angeles, dealer who made the sale of the six units to the County of Los Angeles, augmenting their other 1½-yd. Pettibone loaders. Representing Pettibone-Mulliken Corp. is *Claude W. Cadarette*, district manager.

New distributor chosen

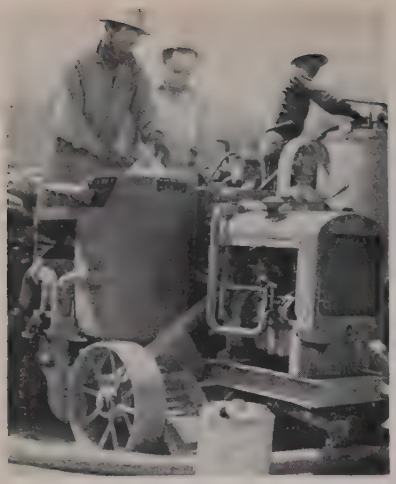
T. G. Weir, district manager of Joy Manufacturing Co., Los Angeles, Calif., recently announced the appointment of San Joaquin Tractor Co., Bakersfield, for five counties in California: San Luis Obispo, Kings, Tulare, Kern and Inyo; and for Clark County, Nev.

Faster customer service

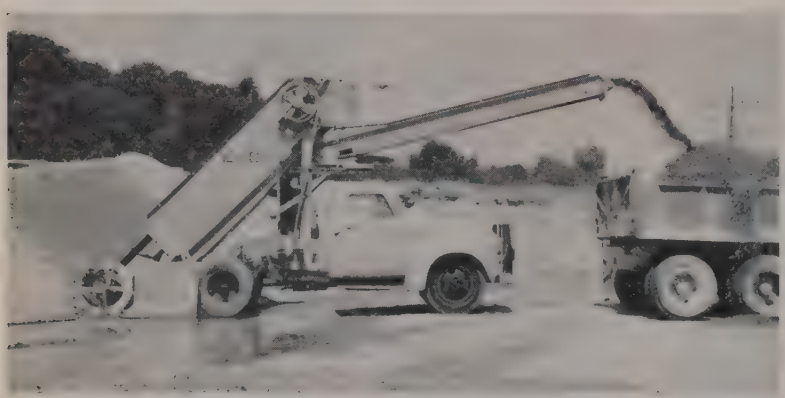
A new use for radio has been found by several dealers of construction and earthmoving machinery. It is being used in their parts departments to give customers better and faster service. Weaver Tractor Co., Caterpillar dealer in Sacramento, Calif., has installed radio equipment in its main store where its principal parts stock is kept, and in its three branches located from 30 to 60 mi. from Sacramento. This instant communication now available between the four departments in effect puts the entire parts inventories of all stores at the customer's disposal should an item not be on hand at the particular store when the customer calls for it.

Cummins in Alaska

Appointment of a distributor for the entire Territory of Alaska has been announced by Cummins Engine Co., Inc. President of this new distributorship, Cummins Diesel Sales of Alaska, is R. B. Newell, former vice president, Cummins Diesel Sales of Washington at Seattle. Headquarters of the new organization will be on East Fifth St. in Anchorage. Newell has named Dale Ungerecht as



COLCRETE MARK III mixer in use on Morman Island auxiliary dam, Folsom Dam Project. One mixer handled up to 300 sacks per hour of neat cement COLGROUT with water cement ratios of 0.6 and 0.5. Average mixing time was 15 seconds.



manager. A branch at Ketchikan will be managed by Don Nafziger. Complete stocks of parts and factory-type maintenance service will be available at both Alaskan points.

New branch manager

A new manager of the Los Angeles branch of The White Motor Co. has been named. Wyman L. Henry has

Wyman L. Henry

been transferred from Kansas City to head up sales and service operations. He replaces L. A. Fleener, recently resigned.

Dean Holman appointment

Dean Holman has been appointed assistant district manager of Chicago Pneumatic Tool Co.'s San Francisco office. He has been associated with the company for many years and has many acquaintances in construction, and also in the mining and industrial industries.

New Bay Area distributorship

Western Traction Co., San Francisco, was recently named distributor for Gradall Division—Warner & Swasey Co., as reported by Robert Bechtel, company sales representative at Los Angeles.

Wooldridge names rep

Frank L. Johnson has been appointed district representative for Wooldridge earthmoving equipment

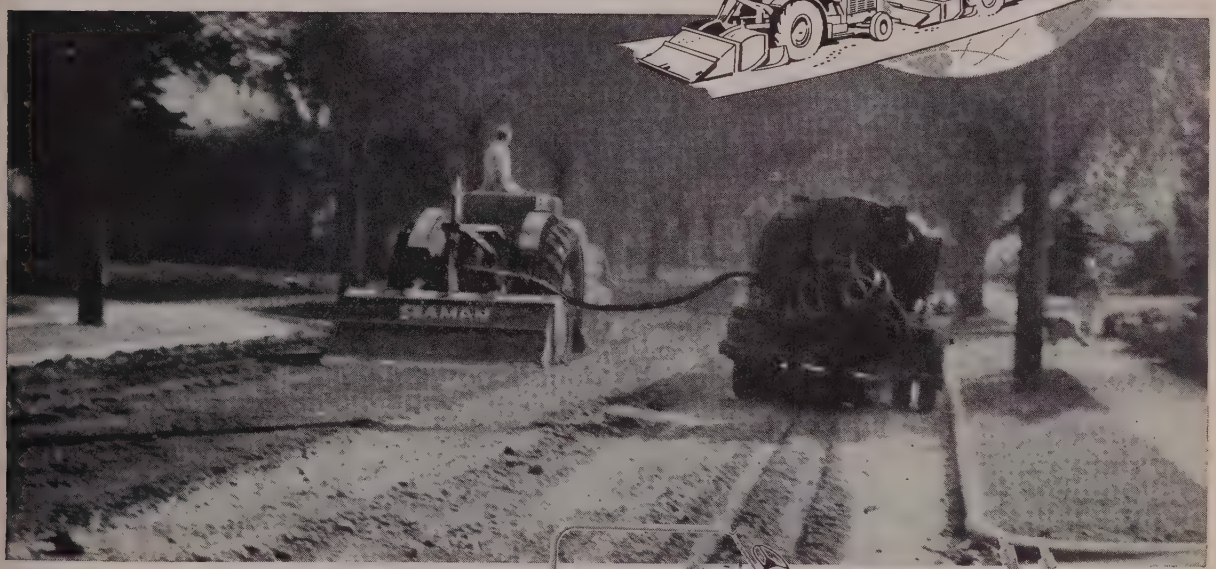
Frank L. Johnson

in California, Nevada, Arizona, New Mexico, Utah and Colorado, according to announcement by Wooldridge Manufacturing Division, Continental Copper & Steel Industries, Inc., Sunnyvale, Calif.

Stewart joins Calavar sales

Calavar Corporation announces the addition of Charles O. Stewart to its sales staff. Having spent the last 15 years with Universal Engineering Corp. of Cedar Rapids, Iowa, he gained an excellent background in construction machinery sales, valuable for any jobs pertaining to the handling of rock and sand. Stewart

On YOUR Streets and Highways . . . And all Around the World



The SEAMAN PULVI-MIXER Builds Better Bases at Lower Cost

Towns as small as 600 population — and of course cities with several millions of people, find the SEAMAN Mixer builds better bases for a lot less money. Townships with relatively few miles of road, counties and states with big highway programs depend upon the PULVI-MIXER as primary equipment.

And that's true in virtually all the free countries throughout the world. Why?

- The PULVI-MIXER mixes any suitable native material with any binder.
- It mixes in-place to cut material handling cost.
- It *assembles* the materials properly so that coarse aggregates and fines are perfectly blended. Segregation is eliminated. Voids are filled with fines to securely mortar-in the larger aggregates.
- It provides higher densities, higher load-bearing values — and cuts maintenance to a fraction.
- And it operates at the lowest cost per square yard in *any* stabilized construction.

You'll find many more good reasons when you put a PULVI-MIXER to work in your street and highway projects. Call your SEAMAN distributor today.

The story of SEAMAN-mixing is told in detail with many job photos and diagrams. Just jot "Bulletin TPS" on a postcard and mail it — today.

SEAMAN-ANDWALL CORPORATION

285 NORTH 25th ST. MILWAUKEE, WISCONSIN

A NEW COPPER MINE near Kimberly, Nev., is being created by Consolidated Coppermines Corp. Pictured here are 4 of fourteen 22-ton rear dump Euclid trucks purchased from Foulger Equipment Co., Salt Lake City, and one of three P&H shovels that have enabled Consolidated to start mining and hauling its own ore from the pits to the railroad terminal.

will be located in Santa Barbara and will handle the territory of Santa Barbara, Ventura and Bakersfield, as well as being available for rock and sand problems in the rest of Southern California.

LOOKING ON as *Ben Krider*, former LeTourneau-Westinghouse district representative, signs the sales and service agreement for the newly formed Krider Equipment Co., Inc., Fargo, No. Dak., are (left) *F. W. Duke*, Western sales manager, and (right) *Arthur Krueger*. Krueger is a newly-appointed district sales representative for the area formerly covered by Krider: Montana, North Dakota and northern Wyoming.

Byrne now full owner

E. E. Byrne, president of Byrne-Ferris Machinery Co., Spokane, Wash., has purchased the Ferris family interest in the firm. No organizational changes or changes in company policies are contemplated. The company distributes diesel engines, tractors, motor graders and earth-moving equipment for Caterpillar Tractor Co., and products of Athey Corporation, Hyster Company, Fleco Corporation, Martin Machine Co., Ulrich Corporation, Broderick & Bascom Rope Co., and Young Iron Works.

MANUFACTURERS

Production zooms at young firm

The brand new company known as General Road Machines, Inc., Niles, Ohio, administered by three seasoned equipment builders, Don Heltzel, Jack Marcello, and Michael Hudis, which started manufacturing operations on April 1, reports it has been able to live up to product demand, and actually has exceeded production schedules by a 75% margin. Included in the company's present lines are subgraders, automatic curing machines, mechanical curb builders, compacting screed finishers, road and airport forms, and final finishers. Planned for the coming months is the introduction of a subgrade testing machine, concrete spreaders, joint machines, cap strips, and rolling and

23 MOVALLS ON SEAWAY! (as of Sept. 1). Dutcher now has 12, Pitts Constr. 8, Atlas Constr. 3—total 23.

MOVALL'S POSITIVE EJECTION SCRAPES OUT GLUE-LIKE CLAY ON SEAWAY JOB

MORE LIKE GLUE THAN CLAY—that's how observers described the sticky, blue marine clay on Dutcher Construction Company's Grasse River Locks project near Massena, N. Y. Gravity alone couldn't discharge this sticky clay from bottom-dump and tilting end-dump wagons. It came out of scrapers in big lumps which blocked the scraper wheels.

After considering all types and makes of hauling units, Don Dutcher put nine C & D Movalls, powered by Caterpillar DW21's on the job. Here's what he says of his choice:

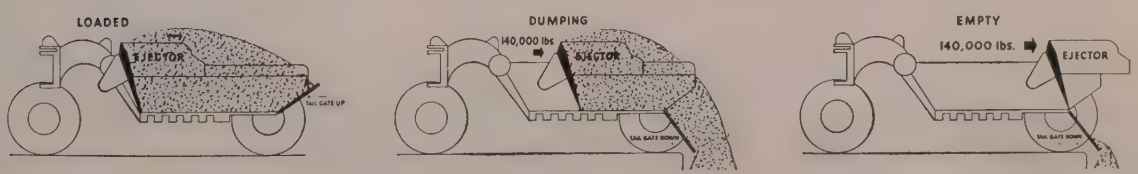
"I selected Movalls for my job on the St. Lawrence Seaway because I figured the positive ejection features would handle the sticky material here better than any other hauling unit. The MOVALLS will also handle rock and any other type of material I'll have to haul. I like the easy interchangeability from Movall to scraper use. The Movalls are doing a wonderful job, and I am very happy with them."

DOZER-LIKE EJECTOR with 140,000-lb. push wipes the Movall body clean every trip (no build up as with gravity dump); handles any material you can top load, enables you to control dump and spread, when needed.

BUY AND TRY FROM CATERPILLAR DISTRIBUTORS—C & D Movalls of 31 tons, 25 heaped yards capacity are available NOW for DW20's, DW21's; also 22 tons, 16 heaped yard Movalls for DW15's. Ask your reliable Caterpillar-C & D dealer to demonstrate on your job, or write direct to C & D Manufacturing Company, Perkins (suburb of Sacramento), California. Phone HIllcrest 5-8592.

6

HOW IT WORKS—Movall uses standard cable scraper power control. To dump, operator releases backhaul drum to drop tailgate, engages ejector drum. Eight-part ejector line gives 140,000 lb. push to boost load out fast and clean. Operator has complete control of discharge, controls spread depth by varying travel speed. After dumping, backhaul line closes tailgate and rolls ejector to loading position.



power bridges. By early 1956, a full line of bins and batching plants will be available.

J. J. Jenkins named sales manager

Joseph J. Jenkins has been appointed sales manager of the Industrial Division at Lincoln Engineering Co. Jenkins has been with this lubrication equipment manufacturer for 15 years, serving first in the plant service department, then as national service manager, followed by sales work as assistant to the industrial sales manager.

White Motor names Tobin sales mgr.

P. E. Tobin has been appointed general sales manager of the Truck Division of The White Motor Co., with headquarters in Cleveland. He succeeds J. N. Bauman as top sales executive, the latter having just recently been elevated to the executive vice presidency of the company.

L. A. Young buys Ottawa Steel

Purchase of Ottawa Steel Co., Inc., of Ottawa, Kans., manufacturer of roadbuilding and industrial construction machinery, has been announced by L. A. Young Spring & Wire Corp., Detroit. Ottawa Steel produces a line of hydraulically-operated implements for use on tractors in breaking concrete, cutting blacktop, back-filling, tamping, digging holes and trenches, loading trucks, bulldozing and angle-dozing, and removing snow.

NEW $300.000 PLANT of Air Reduction Pacific Co. at 2861 Leonis Blvd., Vernon, Calif. The company is a division of Air Reduction Co., Inc., New York, producer of oxygen, nitrogen, helium, argon and calcium carbide. The firm also manufactures a complete line of gas welding and cutting apparatus and electric welders and arc welding electrodes. Heading up the new 15,000-sq. ft. office and warehouse building is *E. W. MacCorkle, Jr.*, vice president in charge of operations in Southern California, Arizona and southern Nevada.

New cement plant

Permanente Cement Co. will expand its operations into Southern California with the construction of a new $12,000,000 cement plant near Victorville, Calif. The plant, which will have an initial capacity of 2,000,000 bbl. of Portland cement annually, is scheduled to begin production in the early fall of 1956.

Kaiser Steel buys coal lands

Kaiser Steel Corp. has purchased all the real estate and mining properties of the St. Louis, Rocky Mountain & Pacific Co. in Raton, New Mex. The coal reserves thus acquired are estimated to be sufficient to supply Kaiser Steel's requirements at the present rate of steel consumption for many hundreds of years.

Gar Wood appoints sales manager

Appointment of Harold H. Hippler as general sales manager of Gar Wood Industries, Inc., is announced. He has been associated with Gar Wood since 1924 and has filled many important positions in the company's sales activity.

Cleveland Trencher promotes three

Cleveland Trencher Co. announces the promotion of E. B. Volmar to vice president in charge of manufacturing and the appointments of Clifford P. Morgan as sales manager and David L. Raymond as chief engineer.

Hercules expands Utah plant

Plans for a $2,000,000 expansion and modernization of its Bacchus, Utah, dynamite plant are under way by Hercules Powder Co., as part of a project which will terminate dynamite production at Hercules, Calif., which latter plant will be devoted to the manufacture of nitrogen products and other chemicals. Additional storage magazines will be constructed in strategic West Coast areas to service explosives customers now served by the California plant.

Troyer joins Galion

Galion Iron Works & Mfg. Co. announces the appointment of William R. Troyer as supervisor of sales and service training for motor graders and rollers. Troyer was formerly Eastern division manager for J. D. Adams Mfg. Co., having been with that company for 16 years.

Geo. Dixon becomes president

Two important changes in top-level management are announced by

HERE'S A MANEUVERABLE COMBINATION that underground utility construction men can depend on for fast repair operations. It's the portable Chicago Pneumatic "Power Vane" Rotary Compressor teamed up with two hard-hitting CP Demolition Tools!

CP WHEELS INTO ACTION... WHEN AN EMERGENCY STRIKES

Efficient CP Rotaries afford thousands of hours of trouble-free operation with minimum attention. Compact and light in weight, these easy-to-tow compressors are available in capacities of 125, 210, 365, 600 and 900 cfm. CP Demolition Tools afford maximum penetration... their responsive throttling action and easy handling qualities are ideal for emergency work. Capacities range from the CP-111 (25 lb. class) to the CP-117 (80 lb. class). For more information call your nearby CP dealer or write to Chicago Pneumatic Construction Equipment headquarters today! *Chicago Pneumatic Tool Co., 8 East 44th St., N.Y. 17.*

Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Space is sold as advertisers' inches. All advertisements in this section are ½ 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 preceding month if proofs are required; by the 20th if no proofs are required.

FOR SALE

FOR SALE

440—14"x14"x10' Steel Concrete Paving forms manufactured by Blaw-Knox Co. These forms were used on one job and are in good condition.

CHERF BROS. & SANDKAY, INC.
Box 938, Ephrata, Wash., Phone SKyline 4-3571

FOR SALE
USED CRUSHING PLANT

Cedar Rapids Master Tandem, S/N 4281 with Caterpillar D-17000 Power Unit S/N 5E9318, completely portable with towing dollie. Tires in good condition. 40"x20" Rolls; 1036 Jaws; 12'x4' Double Deck Screen; 24"x36' Return Conveyor; 24"x22' Return Conveyor; 30"x40' Feed Conveyor; 24"x46' Delivery Conveyor; 18"x30' Fines Conveyor; 24"x48" Reciprocating Feeder; Air Brakes. Plant and Power Unit recently reconditioned. All new manganese; all Drives and Conveyor Rolls in good condition—ready to go to work. See it and buy it.

KEREMI TRACTOR AND EQUIPMENT CO.

Box 908 Phone 8-8922
Cheyenne, Wyo.

FOR SALE OR RENT

Lorain MC824 Moto-Crane 45 ton lifting capacity. Also equipped for Clamshell Bucket—6x4 carrier — 100 ft. boom — 125 ft. boom with jib. Like new condition. Write or wire for complete information,

JOHN FABICK TRACTOR CO.
3100 Gravois Avenue
St. Louis 18, Missouri

WANTED

WANTED: One used 36" Gyrasphere Telsmith Crusher. Must be in good condition and priced right. G. E. Oaks, Redding, Calif.

FOR RENT

RENT STEEL SHEET PILING

Get the exact lengths and sections you need of all standard sections, delivered *on time*—and at Foster's usual low rental rates

H-BEARING PILE
PIPE FOR PILING
LIGHT-WEIGHT STEEL PILING
PILE HAMMERS & EXTRACTORS

L. B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

SOLD RENTED REPAIRED
Transits • Levels
Steel Tapes • Compasses
Portland Instrument Co.
334 S.W. 5th nr. Stark
PORTLAND 4, ORE., AT 3598

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 SEWERAGE PLANTS

FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION

AMBURSEN DAM CO INC
295 MADISON AVE NEW YORK

JOBS

The Washington State Highway Commission announces immediate openings for civil engineering graduates for permanent Merit System bridge design work in Olympia, C. E. degree, $380-451; two yrs. exp., $414-492; three yrs. exp., $432-514. Liberal vacation, sick leave, 40-hr. week. Retirement system. Write Personnel Officer, Washington State Highway Commission, 220 Transportation Bldg., Olympia, Wash.

Engineers — Foremen — Office Men

Learn latest methods to organize and run work. Prepare for the top jobs. Send post card for details.

Geo. E. Deatherage & Son
CONSTRUCTION CONSULTANTS
P. O. Box 921 Lake Worth, Florida

MANUFACTURERS ... *CONTD.*

Dart Truck Co., manufacturer of heavy duty, off-highway trucks. George F. Dixon, Jr., is the newly elected president, succeeding Furber Marshall, who becomes chairman of the board. For the past year and a half Dixon has served as vice president of the Carlisle Corporation, parent company of Dart.

Two new v.p.'s

Butler Bin Co. recently announced the election of Kenneth P. Kerr to the position of vice president in charge of sales, and Morgan R. Butler, Jr., as vice president in charge of production. Kerr, who has been with Butler Bin since 1929, has served as sales manager for the past 12 years. Morgan Butler, Jr., has been associated with the company's research and manufacturing activities since 1938.

Manofsky heads engineering staff

Appointment of Albert E. Manofsky as chief engineer of Sherman Products, Inc., is announced. Manofsky, whose appointment as head of the engineering staff of this manufacturer and distributor of tractor-mounted industrial devices became effective June 15, has a long record in machine and tool designing.

Wausau takes over Willett Mfg. Co.

Wausau Iron Works, pioneer snow plow builder, announces its purchase of the Willett Manufacturing Co., Grand Rapids, Mich. In the future the Willett graders and truck-patrols will be completely manufactured at the Wausau plant at Wausau, Wis.

K. O. Williamson joins Quick-way

Appointment of Kenneth O. Williamson as assistant general manager of Quick-way Truck Shovel Co. was recently announced. He brings a wealth of experience in the shovel industry to his new position, having had an extensive background at the Osgood (Marion-Osgood-General) Company since 1941.

E. B. Hill joins Koehring

Appointment of R. E. Burton as assistant general sales manager of the Koehring Company, heavy-duty construction equipment firm, was recently announced. He succeeds M. O. Messenger. Also made known was the addition of E. B. Hill to the executive staff. He fills the newly created position of assistant to the president. Prior to coming to Koehring, Hill was with Gar Wood Industries, Inc.

Allen Dennison succeeds Miles

E. Allen Dennison is appointed a manager for sales engineering o the Johns-Manville Corp., Building Products Division, succeeding W Stanley Miles, who is retiring after career of more than 41 years with th company.

ADVERTISERS in this issue

BACKFILL, uncompacted

Help for the flagman (and the motorist)

Last year we were a little rough in our comments on some highway project flagman we had run across. Matter of fact, the memory still makes us mighty critical of every job we see that has flagmen involved.

Being critical is okay. What's bad is to assume that every flagman is asleep, inconsiderate, or stupid. What's worse is to barrel right through the work on your own, without any knowledge or guidance about what's around the next curve.

Idaho has come up with a bit of paperwork that keeps the flagman on his toes (he has to hand it to each driver), educates the motorist (tells him what's ahead and what to watch for), and does an all-around goodwill job for the contractor and the highway department (includes a landmark map of the state and a plug for its roads and tourist attractions).

The leaflet ought to do some good. It's bound to protect the contractor's men and machines on the job where it's handed out. And it's pretty sure to remind each driver that not all flagmen are useless. That means protection for the next contractor on down the road, maybe in the next state. The motorist won't be so likely to jump to dangerous conclusions about flagmen. (Of course, he still has the right to be critical!)

Head loss? It looks like it!

The nasty old business of "feather-bedding" in federal agency engineering came to mind again recently. This time it happened when we watched a man follow the letter of the specification on a culvert headwall. Right at that moment he was stoning the concrete surface. (He wouldn't get around to the neat cement coating until later!)

Now, what goes on here? Just when it seems that a little hard-headed realism has shouldered in among the concrete theoreticians, this kind of thing turns up.

And all because some slide rule and handbook artist back in the office has got a paper clip on the pages that give head losses. He should look in the mirror. Then he'd see where the head had been lost . . .

A wire under the wire

Back in our school days we learned that contractual negotiations by mail are effective when the letter goes into the mail box. Modern times have seen the reasoning extended to cover telegrams too. The filing time is the crucial thing.

And Donald M. Drake Co. of Portland knows it well. They bid on some Oregon air base work a couple of months ago. The bid opening found E. H. Moore & Son of San Francisco low at $422,834. Then along came a telegram knocking Drake's bid down from $443,900 to $414,622.

Too late? No, it was decided. Drake's wire was under the wire by a good hour at the filing office. It had been delayed in transmission.

But what about his sales pitch?

Someone must have us confused with **Sports Illustrated.** But no—the letter really did come from a Western manufacturer serving the construction industry.

They have a new man in their sales organization, and this letter was an announcement of the fact. Presumably, we should have written up a news item. But we lost interest, except as a matter of curiosity, when we came to the part about the fellow's training and experience:

(1) He went to college. (2) He was a varsity pitcher. (3) He did two years of post-graduate work combined with a teaching fellowship. (4) He coached the frosh team to a season's record of 13 wins, 2 losses, and 1 tie.

Now, there's a chance he'll want to use the ol' bean ball on some tough customers once in a while. But, what about the rest of the time? Somehow, we think those six years of education will be the biggest asset. Even though no one has told us what he studied.

An engineer on the move

There's an item this month that could as easily go in our "Engineers" section as on this page. But we choose this spot, because the individual is one you know well.

He's Ken Greene, and for the past year and a half he's been assistant editor of **Western Construction.**

You don't know him? Yes, you do. He's the man whose sure eye observed the Fish Northwest pipeline work in Colorado this summer. And his equally sure judgment and skillful typing hand resulted in the timely and preceptive lead article this month. Ken did things like that the whole time he was with us. You've gotten authentic, authoritative reviews of work all over the West from him.

In short, he knows how. He knows how mostly because he's done a good share of it himself. He came to us after four years with contractors, largely in Alaska, working all the way from instrumentman through estimator to project engineer on a variety of structural work.

Now, after lookin' 'em over editorially, he's found that being in the field all the time is his first love. So, publication of this issue finds him a reader again, instead of an editor. Ken has moved across the bay from these San Francisco offices. He's assistant project engineer for Grove, Shepherd, Wilson & Kruge on their freeway contract in Oakland.

He's an engineer on the move, and we wish him well.

Signs of the times

The Southern California Chapter of AGC calls our attention to an amendment in the California Administrative Code. Here it is: "Class C-53 — Swimming Pool Contractors. A swimming pool contractor is a specialty contractor whose contracting business is the execution of contracts requiring that specific art, ability, experience, knowledge, science and skill in connection with the use of those building or construction industry trades, crafts, or skills as are necessary to the construction of a swimming pool."

There's more, but we won't quote it. It doesn't say one word about knowing how to swim. And yet you can't exactly ask a man to stand on his work in this business.

Twenty-five years ago in *Western Construction*

"Record production of portland cement concrete paving was attained by **Basich Bros. Construction Co.** of Los Angeles on the San Francisco Bayshore Highway when their two Ransome pavers and Lakewood finisher put down an average of 840 cu. yd. per 8 hr. for ten days."

* * *

"The plans for the **Colorado River Aqueduct** to Southern California, including a comparison for four routes under intensive study, were reviewed in an article by F. E. Weymouth, chief engineer of the Metropolitan Water District."

* * *

"Gordon Construction Co. of Denver was low bidder at $469,505 for the Eleven Mile Canon dam for the City of Denver."

. . . The Editors

Editorials

Concrete units "off-the-shelf"

No longer is structural concrete a construction material made on the job. It is rapidly becoming a manufactured article produced in commercial plants that provide careful control over raw materials and casting conditions, with exacting inspection. Developments in the science and skills of prestressing during the past few years have accelerated this forward step. As a result there are locations in the West where these structural units can be specified by the designer, ordered by the contractor, and delivered to the site just the same as a stick of structural timber or a steel beam.

Costs of these prefabricated units have been coming down as mass production methods have been introduced to Americanize this European process. The growing record of successful projects and the increase in casting and stressing experience have also extended engineering confidence.

The most serious remaining problem retarding the expansion of the method has been the weight of the finished product and resulting transportation costs. With the long distances characteristic of the West, the few commercial plants pioneering this newest construction advance have been restricted in the area that could be served.

Now, the logical answer to the last problem appears to be around the corner. Lightweight aggregates that are capable of cutting almost one-third off the weight of concrete have been known and accepted by designers for years. Characteristics of the resulting product under the forces of prestressing and the subsequent readjustments in the concrete-steel relationship have recently begun to receive closer study. Initial efforts to use such aggregate will expand as economic pressure builds up demanding the resulting weight reduction.

The way is opening up to the time—not too far distant—when prestressed structural units will be available in standard sizes and lengths for selection out of a handbook for off-the-shelf delivery. Structural concrete is rapidly moving out of the "made on the job" class.

The article starting on page 25 is an outstanding example of this development.

Does the West need Eastern experts?

The "wise men" have been coming from the East for 1955 years. People in the West seemed resigned to this. When a problem is big or complex the cry is for the medical, legal, or financial genius from the East. In engineering it is the same. However, a correct answer based on Eastern engineering may not solve problems with Western angles, because the West is different.

One problem having such expert study recently is the urban traffic snarl. In the two major population centers of the West—Los Angeles and San Francisco Bay—groups of Eastern experts found the answer to the mounting traffic headache in mass transportation facilities. They can prove, and correctly, that more people can be moved faster and cheaper. Monorail is envisioned as well as more conventional means. In this case the right answer is wrong. The solution suited to the East cannot be adapted to meet the needs acceptable to the West.

In New York, Boston, and Chicago the bulk of the people who use mass transportation ride compactly, silently and docilely as they have for generations, and always will. The method is never questioned. Usual human gripes are aired and compared, but in no case does the complainer decide to drive his car to work next morning. So the subway straps are hung with executives, clerks, and artisans swaying together as their fathers did, and will their children.

Not so in the West. These same types and classes of people have never traveled that way, are not interested and cannot be pressured into it. Today, this has been proved in the two major Western centers, where mass transportation is dying. It will be demonstrated in other Western cities as their size and traffic problems grow big together.

The West has grown up on rubber tires. Like the fictional cowboy, the young Westerner would walk three blocks to get his car to drive one. Waiting ten minutes for a morning bus with two cars in the family garage is unthinkable. Even if facts prove public conveyance cheaper and faster, and even if there are deep seats and indirect lights, the average Westerner will turn away from the curb to get into his own car.

So freeways and express routes are the Western answer to the mass transportation problem. Right-of-way costs may seem prohibitive, the four-lane route may be running bumper-to-bumper and parking may be terrible, but the private car appears to be answering the mass transportation problem in the West. Perhaps it is the last flicker of the pioneer spirit of independence.

In this same spirit the West should work out its own problem without the cry for help to the Eastern wise men.

It Takes These TWO

FOR TOP PERFORMANCE

All-Wheel Drive for 30% more Power-at-the-Blade when the going is tough... All-Wheel Steer for 100% greater maneuverability. Working together, these exclusive Austin-Western features form an unbeatable team, capable of handling the widest variety of jobs... straight through the year... with speed and efficiency which the ordinary rear-drive, front-steer motor grader can't hope to equal. Why be satisfied with less in your next grader?

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