

MARCH 1955

Fast pipe-laying means a machine for every step

SOME KIND OF A construction record has been set by the Milosevich and Zarubica Construction Co. when they trenched and installed 1,256 ft. of sewer pipe in one 8-hr. working day. What makes this so outstanding is the water or gas underground obstructions occurring about every 50 ft., and that the average depth of cut was 11½ ft.

The contract under way by this firm is for the installation of 48,000 lin. ft. of 6- to 15-in. diameter sewer pipe for a Los Angeles County Sewer District. This is a county improvement project being financed by a bond issue to the tune of \$208,000. Work began November 1954 and is due to be finished in March, this year. At present, work is well over the 75% mark.

Both R. V. "Ronnie" Milosevich and B. J. "Brownie" Zarubica, both of the firm of their names, keep close touch with their work. On this particular project the job foreman is Jim Muir. One man to whom much credit is due for keeping this impressive array of highspeed equipment moving is Melan "Miggs" Marinovich, master mechanic. For the Los Angeles County Sewer District, Joe Obrian and L. Riavic are the inspectors.

Here is the line-up and sequence of equipment that allowed this contractor to have completed over 1,000 ft. of sewer pipe on several successive days. This project, incidentally, took place in an area where traffic problems were a major consideration.

2 NEXT IN LINE was a Gar Wood Buckeye 160 trencher. The cut depth handled by this machine varied from 7 to 14 ft. with an average of about 11½ ft. The soil was generally an adobe with intermittent layers of sand. In some cases along busy streets where it was impossible to leave the excavated material, a Hough Payloader was used to load International trucks. This material was then stockpiled until ready for the backfill operation. Not far behind the trencher came one of the two Austin-Western Badger cranes being used (not shown). This small, crawler-mounted crane (used here in a ¾-yd. capacity) was equipped with a clamshell for excavating around obstructions that the trencher had by-passed. This operation is normally done with pick and shovel but in this case was rapid! done by the small crane. Trenching crews followed immediately with planking and trench jacks to shore the trench at appropriate intervals depending upon the depth of cut.

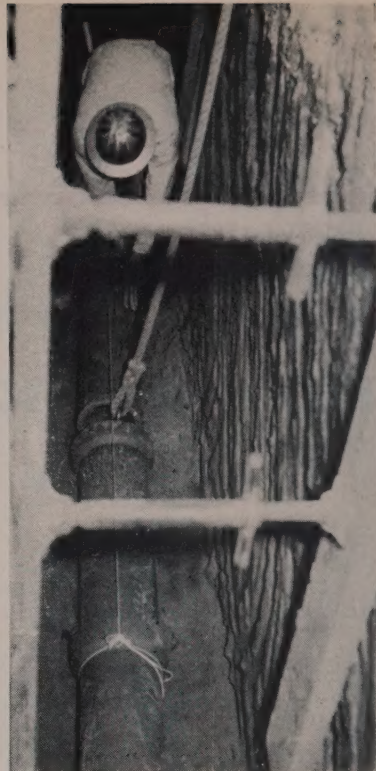


1 WHERE BLACKTOP pavement is encountered on the center line of the trenching operation, the lead-off piece of equipment was an Ottawa Hydra-Hammer. This wheel-mounted, versatile piece of equipment has a 4-in. chisel point that very neatly broke up to 4 in. of asphaltic concrete pavement. The chisel operated much as a pile-driving hammer, being successively raised and released.





3 LINE AND GRADE down the center of the trench was rapidly established with the use of a Gradeline. This time-saver framework is set upon one of the offset grade stakes and extends over to the trench. A plumb bob and ordinary measuring tape are connected to the framework in such a manner that a simple leveling and grade stake reading allows the plumb bob tip to establish both line and grade in the trench bottom. Conventional stakes and string lining are then used.



4 SINCE THE SEWER PIPE had been distributed along the trench line in advance, the crews proceeded immediately to lower 3-ft. sections of vitrified clay pipe into position.

7 IF TRAFFIC THROWS more dirt on the pavement adjacent to the trench section, another pickup truck straddles the trench and pulls a Littleford rotary broom that again cleans away all loose material.



8 FROM A NEARBY hot-mix plant the trucks bring material as in a conventional large hot-mix operation. In this case the trucks straddle the 2-ft. wide ditch and dump material over a 5- or 6-ft. wide area.





5 NOT FAR BEHIND the pipe-laying crew came the second Austin-Western Badger crane. This one was equipped with a wide steel blade and operated as a dragline crane. Backfill material was easily brought to the trench whether the material lay in a ditch or on level ground. Following the trenching, installation of the pipe, and the loose backfill operation, water jetting of the material provided initial compaction. Specifications required that paving over an average of 2-ft. wide trench should not be done before 14 days had elapsed.



6 HIGHBALL OPERATION on the paving is equally as interesting as the trenching operation. The first step is to take one of the dump trucks, load it with 10 tons of material and have it run up and down the backfilled and consolidated trench. This provides a high degree of surface compaction. Just prior to laying the hot-mix asphalt, this is the sequence of events. A Ford pickup truck is used to pull a Chicago Pneumatic compressor, alongside which a man operates an air jet to blow all loose material from the 4-in. deep by 2-ft. wide section in the pavement to be surfaced.

9 THAT NOT ALL the hot-mix asphalt is dumped into the narrow trench section is no problem. A Ford tractor equipped with a rear spreader, which can be hydraulically raised and lowered, is used to spread the material evenly to surrounding pavement elevation and drag the excess forward. Very few passes with this piece of equipment are needed before the next operation.



10 FINAL GRADING of the hot-mix asphalt and compaction is obtained with the use of a Cat 12 grader. The blade of the grader and one outside set of wheels are alternately used to grade the hot-mix and to compact it. The rate of progress on such work as this equals that of the trenching operation.





1 SHALE and sandstone deposit near road was ripped up and then hauled to nearby road and dumped in windrow.



2 CAT 12 motor grader spreads part of windrow over road for next step which is size reduction by grid roller.

Grid roller cuts resurfacing cost for a Montana county road

RESURFACING 550 mi. of county road with native gravel would have been a costly operation for Stillwater County, Montana, as the gravel pits were located as far as 60 mi. from the sections to be surfaced. Estimates indicated the cost would be about \$2,500 per mile of road.

This problem was solved by utilizing the sandstone and shale material, which exists in abundance throughout the area. To make use of this material required an inexpensive method of crushing the pit-run material on the existing surface. This was accomplished by the rolling of

the shale material with a grid roller.

A shale and sandstone deposit was located 1 mi. from the first section to be resurfaced. This material was ripped up and hauled to the road where it was dumped on the shoulder at the rate of 2,000 cu. yd. per mile. Part of the windrow was then pulled and spread onto the road by a Cat 12 grader.

Pulled by a Cat D6 tractor, the Hyster grid roller made five passes over the material which reduced it to 2¼-in. oversize. The crushed material was then bladed to the opposite shoulder and the crushing process

continued until the entire windrow of pit-run material was crushed and moved to the opposite shoulder. It was then spread over the road surface and compacted to the finished surface with the grid roller.

This method of resurfacing cost the county \$0.38 per cu. yd. or \$760 per mi. This cost included ripping the shale and sandstone in the deposit, hauling, crushing, and compacting to a finish. To resurface a section 0.8 mi. in length, 18 ft. wide, required 8 hr. The grid roller was equipped with 18,000 lb. of concrete ballast and was towed at a speed of 3 mph.

3 HYSTER grid roller with 18,000 lb. of concrete ballast is towed by Cat D6 tractor operating in third gear.



4 REDUCED MATERIAL is shoved to opposite shoulder and process repeated. Final result is maximum 2½-in. oversize.



The 25-story building that "couldn't be built" nears completion

THREE FLOORS AT A TIME is the way this steel went up. And over 5,300 tons were involved in the new Equitable Life Assurance building in the heart of San Francisco. Foundation problems and methods of construction were given in *Western Construction*, Feb. 1954, p. 59.

The structural erection and design problems go back to 1948 when the city adopted a new building code, considered to be the most stringent in the country. Its regulations relating to earthquake forces were such that many doubted that another tall building would be erected here. The unique construction design that was worked out by architects Loubet & Glynn, the late W. D. Peugh, Irwin Clavan (consultant), and structural engineers F. W. Kellberg & Assoc., places it well within the code.

Building plan size is 122x168 ft., rising 15 stories (about 209 ft.) over this area. It then reduces to a 10-story tower section that rises another 122 ft. with plan dimensions of 65x168 ft. Total floor area is 458,000 sq. ft., costing about \$19.00 per sq. ft., excluding interior partitions and finish.

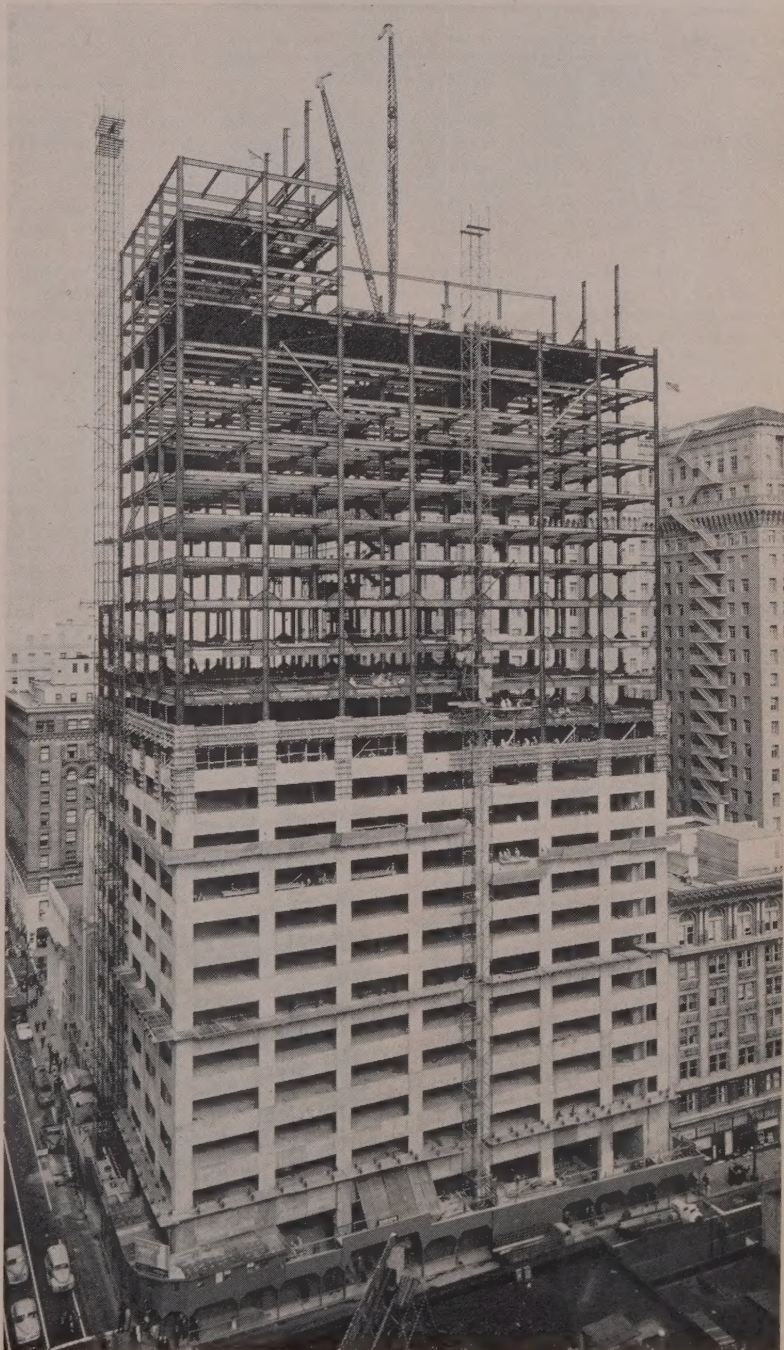
Here's the how and why of the steel design and erection

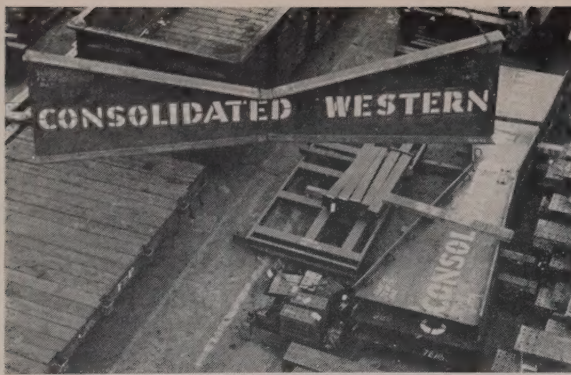
TO KEEP floor-to-floor dimensions to a minimum, the exterior walls of the building were designed to take all lateral earthquake forces. This allowed a typical floor-to-floor height of 12 ft. 2 in.—with exception of the first story which is 23 ft.—with floor beam depths of 18 in. This still allowed 12 in. for duct space between beam fireproofing and the ceiling construction.

After thorough study of the exterior wall design problems, the structural engineers decided on a design for tapering the columns uniformly from the base plates to the 14th story. Columns started with 42x1½-in. webs and 18x3-in. flanges at the base and tapered to 12-in. webs and 16-in. flanges at the 14th story—taper was 3/32 in. per ft. Use of this design solved the problem of column splices where heavy flanges are involved as compared to the offsets of straight column sections reducing in size with height.

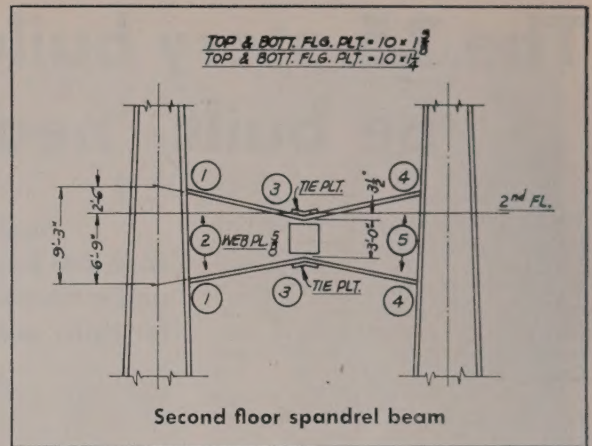
From the 2nd to the 11th floor, spandrel beams that are "butterfly" in shape were used to restrain the columns. These have great depth at the column connection, tapering to a lesser section at the midpoint where the top flange is at floor level. Large size of the spandrel sections can be seen illustrated on these pages. Tie-in of the spandrel flange at midpoint

Such features as tapered columns—"butterfly" spandrel beams—combination of rivets, bolts, welding—and a concrete pouring schedule that never missed except for rainy weather make this structure a standout.





BUTTERFLY-SHAPED spandrel beams are used on first 14 floors of building. Diagram at right shows (1) butt-welded top and bottom flange plates, (2) web welded to column, (3) burn-through plates.



to the floor system helped resist the displacement of the column flanges.

With the four exterior walls taking all of the lateral forces for the lower 15-story portion, interior beams and columns were designed for vertical loads only. The upper 10-story section was more like a typical steel structure and designed with the entire frame providing the bracing. The changeover in bracing systems necessitated complicated horizontal bracing at the 15th and 16th floors.

Erection problems

Steel for the project was fabricated at U. S. Steel's Consolidated Western Steel Division plant at Maywood, Calif., and shipped 400 mi. by railroad to San Francisco. The tapered steel columns and spandrels were made from three plates by the automatic hidden arc welding process.

Erection began on a 3-story lift basis, this being the column length fabricated. Steel was delivered by truck to the busy downtown site, one truck at a time at intervals of 30 min. Each truck driver telephoned the job site office from an intermediate point to clear his arrival at the unloading site. Such "front-line" communications helped keep the job on schedule.

As each 3-story tier was completed, the two derricks used for all erection were jumped to the new work level. The complete lack of storage space available made it doubly important that each arriving shipment have the proper units ready to go into place.

Field connections of the structural frame required no riveting at all—either welding or high strength bolts being used. Only shop connections were riveted. Most interesting were the provisions made for spandrel beam to column connection.

Each spandrel was fabricated in two parts with two flange tie plates welded to the midpoint section to hold them together. When erected to position between columns and seated on angles sloped to fit the tapered spandrel flange, a full butt weld was used on the flange to column connection and double fillet

welds on the web to column connection. Then, to relieve any possible locked-up stresses resulting from this heavy welding, the tie plates top and bottom at spandrel midpoint were burned through. Splice plates were then used on the web section of the spandrel beam and high strength bolted to complete the erection.

Welding was done with Lincoln Fleetweld 5, and E-6010 electrodes. If cracking occurred in the root passes of joints where heavy sections were encountered, a pass was made with LH-70, an E-7016 electrode.

The remainder of the field connections were high strength bolted. Clip angles were added to the tops and bottoms of all beams framing to columns. This added to the rigidity of the building until the floor slabs were in place. In the upper stories, brackets were used on all beams framing to columns. Beam butts were fastened to columns and brackets with high strength bolts here also.

Four sets of forms for the perfect concreting schedule

ONE OF THE BIGGEST items in the pouring of concrete on any job is proper scheduling. It is true that actual materials used are a sizeable proportion of any building cost, but the labor cost for placing those mate-

rials—in this case concrete and embedded items—can skyrocket without careful scheduling to keep all trades busy. Scheduling of the subcontractors and general contractor's own men plus the delivery of materials on time was nearly perfect on the Equitable Building. How was this done and what were the physical factors involved?

Physical quantities involved were the placing of 22,000 cu. yd. of concrete. This required two different types of mixes. Foundation grade beams on the steel piling and concrete up to the second floor was a structural grade required to meet a strength of 3,300 psi. on the 28-day test. From the second floor on up to the roof or 26th floor, all concrete was light weight. The aggregate used was Haydite, which provided a final unit weight of only 100 lb. per cu. ft. as against 150 lb. per cu. ft. on the structural. Light concrete was required to test 2,750 psi. on the 28-day test.

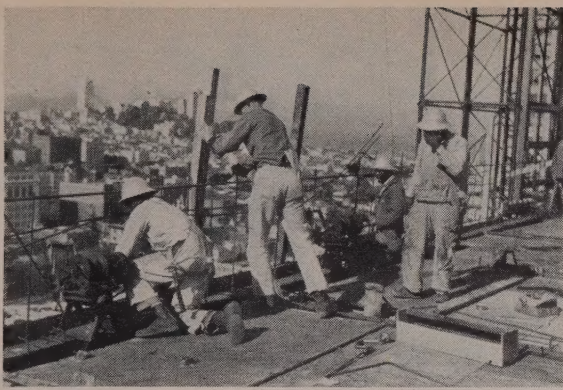
Beginning on the second floor, pours were typical from floor to floor up to the 15th and 16th where the extensive steel bracing in those floors posed a special forming problem. From the 17th to the 26th floor in the tower, pours were again typical. Window openings, mainly concentrated on the two street sides of the building, required pouring a spandrel beam extending about 2 ft. above floor level and about 4 ft. below. Floor thickness is 6 in., while wall thickness was 1 ft. for the first story, 8 in. for the 2nd to 4th story, and 6 in. from the 5th on up. Interior fireproofing concrete over beams and columns was 2 in. thick.

Stepped-up pouring rate

Planning the formwork at first was based on three complete floors of formwork. It had been planned to have two pours per floor per calendar week. Very shortly after actual concreting was started late in August last year, it was found possible to pour every other work day. The stepped-up pace also made four complete floors of formwork necessary if the sequence of curing period, strip-

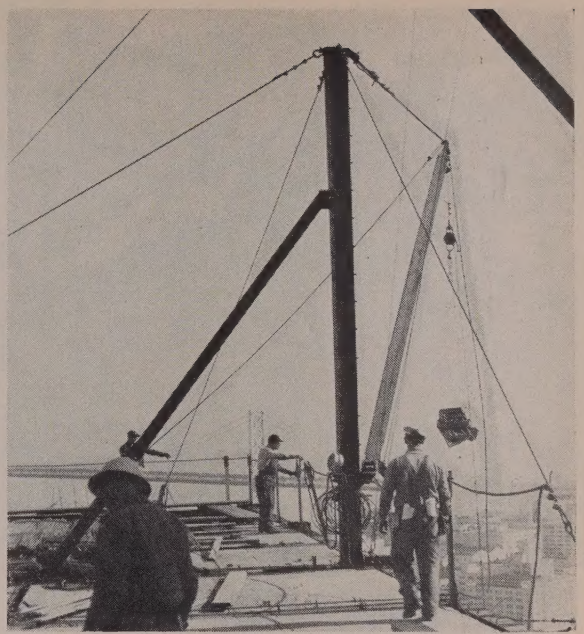


BOOM-UP signal for first steel column was given last June by Vernon Rutledge, foreman.



▲ **OUTSIDE WALL FORMS** have had a long trip and are being hand winched here for the last time to the 25th story. Formwork for deck in foreground is all loose lumber.

REINFORCING STEEL for 26th floor is brought up from street by stiff-leg derrick. Hoist is located on 1st floor. Careful scheduling was necessary for material arrival.



ping, and new erection was to keep up with pouring. Except for rain, the every other day pour schedule was maintained.

Since nearly all wall, column, and floor concrete surfaces will be covered by other materials in the finished structure, no special care was required in providing smooth formwork surfaces. Plywood panels have been used for columns and walls, while loose plywood sheet and joist construction has been used on most deck framing. Beam fireproofing soffit forms, which in turn support the floor decking, were suspended by rods that were crimped around the beam flanges. Female cones extended from beneath the soffits—through the forms to be threaded to the male end of the rods. Stripping of the entire deck and beam formwork was quick and easy with removal of the female cones. Exterior wall forms were raised by hand winches.

Rapid concrete hoisting

Concrete was delivered by transit-mix truck by Pacific Coast Aggregates, Inc. Provision had been made for two trucks to park side by side within the building for discharge. Concrete from the trucks went down a chute to a storage hopper which in turn delivered it to the hoist. Two hoisting towers were erected on two sides of the building, one of which was used for concrete. A 100-hp. American Hoist was used to lift a 1½-cu. yd. bucket. Although perhaps oversize, this hoist had been used by the general contractor on another large project. It has served them well in both cases.

Initial pouring was at the rate of 70 cu. yd. per hour on the lower floors but this decreased to about 45 cu. yd. per hour as the haul distance of the

hoist increased. At the 25th floor, for instance, one round trip of the bucket took 1 min. 25 sec., giving a theoretical maximum rate of pour of 60 cu. yd. per hour. Pour quantities varied from 350 to 400 cu. yd. per day on the lower floors, to 200 to 250 cu. yd. per day on the smaller tower pours. In all cases the standard two pours per floor were made.

One good trick was used for pouring the spandrel wall sections that had their top about 2 ft. above each floor. These were poured the same day as the adjacent floor by having a special ramp at top of wall height. Maximum concrete slump of 5½ in. was sufficiently stiff so that concrete poured first in the walls would remain there without sliding out on the floor. Ramps were then removed and the floor pour completed.

Both Viber and Dreyer concrete vibrators were used during floor placement. A special wall form vibrator, a Syntrol external wall vibrator was used since there was not suffi-

cient room to slip in the conventional vibrators.

After screeding and floating, the floors received a metal trowel finish. Curing was accomplished with Techkote Sealtex XX clear curing compound, a non-wax compound that deteriorated in about two months time so that asphalt tile floors could be laid. Exterior walls on two sides of the building were left rough since they would be covered with special aluminum, stainless steel, and marble facing. Two other exterior walls were patched and sacked to receive paint.

Delivery of reinforcing steel, mechanical and electrical supplies, followed the same close scheduling as was done for the earlier structural steel erection. Delivery trucks would call in from a point several blocks distant from the job site where they could park for up to 1 hr. until cleared to drive to the unloading point. In addition, all deliveries were scheduled as closely as possible 24 hr. ahead of time. Materials were taken to proper floor height by any of the following means: Reinforcing steel by use of two stiff leg booms located at the floor being formed; miscellaneous mechanical and electrical by use of a double cage hoist and a Chicago boom. Inside the building, there are 10 elevator shafts. Two of these were in use, both for men mainly, and at slack periods for small materials handling.

General contractor is Dinwiddie Construction Co., Inc. For this firm, Grant Beery is general superintendent; John Entwistle is assistant superintendent on the overall building; Al Hook is assistant superintendent on carpentry and formwork; Jack Meehan is engineer; Floyd Agee is general labor foreman; Ben Shaver is concrete foreman.



RAMP enabled contractor to pour spandrel beams same day that floor was poured.



MOIST BLACK LOAM curls off the moldboards and spoil wings of the latest thing for heavy-duty canal excavation. In this test last year the

machine peeled 6 in. off a bottom width of 8 ft. and carried material up the moldboards a vertical distance of more than 5 ft.

It rips and blades to dig a ditch

POWER IS THE KEY to this new piece of equipment. Fancy-Dan techniques are one thing in earth-moving, but if power is available, there is a tendency to do the job by brute force.

Briscoe's new Model 68 ditcher works on the brute-force principle. It rips and blades lifts of dirt 6 in. thick, and rolls the material out and up on moldboards and spoil wings that can be set to handle a variety of ditch sections.

And the Model 68 makes frank use of power in doing the job. Four Caterpillar D7's did most of the pulling on the tests reviewed here. How they performed shows up in the accompanying table. And here's Briscoe's story too:

"This particular ditch was to be 8 ft. deep, 1½:1 slopes, with a 3-ft. bottom width. Their original plans were to dig the ditch with a dragline. But they decided to use a Model 68 to dig to a depth of 5 ft. (with ap-

CUT (in.)	CU. YD. REMOVED		POWER
	per pass	per hr.	
12	2,809	1,874	3-D7, 1-D6
6	1,753	1,169	3-D7
9	3,049	2,033	4-D7
9	3,567	2,379	4-D7
6	2,719	1,814	4-D7
6	2,962	1,976	4-D7
6	3,096	2,065	4-D7, 1-D8
6	3,316	2,212	4-D7, 1-D8

proximately an 8-ft. bottom), and then take the dragline and dig on down the other 3 ft.

"This machine will dig a 2:1 slope ditch at a depth of 5 ft. and having a 6-ft. flat bottom. On our previous models it has always been our experience that dirt would not travel up a blade economically higher than 5 ft. This machine seems to be changing our opinion on that.

"The performance data show that the machine made 8 passes. The 8th pass obtained an average depth be-

tween 5 and 5½ ft. Another pass, the 9th, was the last one and the maximum depth was over 6 ft."

The ditch involved on this work was 1½ mi. long. Soil was described as moderately moist black loam, and some sand. Material removed on 8 "official" passes came to 23,271 cu. yd. The machine was in operation for a total of 12 hr., giving an average production rate of 1,940 cu. yd. per hr. (Actual movement of the spread was at about one mile an hour, with the tractors in first gear.)

This isn't the first ditcher produced by Briscoe Manufacturers of California. The firm's previous headliner was the Model 46, equipped with 12-ft. moldboards and capable of cutting a maximum bottom width of 6 ft. For comparison, the Model 68 moldboards are 20 ft. long, and the maximum cut width is 8 ft. (bottom.)

The new machine weighs a little over 12 tons. It has a 27½-ft. wheelbase, plus 9 ft. more length of towing tongue.

A two-cycle, air-cooled Wisconsin engine provides 13 hp. for the hydraulic control system. And there are no functional adjustments that can't be made by hydraulic control while the machine is on the job. Bottom-width setting can be changed, moldboard angles adjusted, and depth of cut varied. Positioning of spoil wings is also by hydraulic control. And the operator can even steer the front wheels as an assist in maneuvering in and out of a ditch.

OPERATOR IS KING—of full hydraulic controls, and the work of another half-dozen machines. Four D7's did the pulling, with spoil spread by another D7 and two graders.





THE ALCANGO PIPELINE: PART 2 OF 2

Constructing 620 miles of trouble

Winter temperatures of 72 deg. below—boggy summer tundra—yet the pipeline installation was on schedule. Here are the methods that brought success.

WILLIAMS BROS., the world-wide pipeliners from Tulsa, Oklahoma, have done it again. This time they tackled a military pipeline project in Alaska and northern Canada and completed the main pipeline early this winter. Obstacles as numerous as spawning salmon in the whitewater streams of the Alaskan tidewater had to be conquered to keep this high priority pipeline for the U. S. Armed Forces pushing forward on schedule. The construction problems ran the gamut from ground that never thaws out to dangerous bears in the Kluane Lake Game Refuge.

What to do first

The great variety of the headaches that tried to hinder highball operations was endless. Detailed logistics as all the material needs had to be pin-pointed and shipped from the States before the start of construction. Paperwork problems of supply and transportation. Canadian Customs perplexities as a section of the

pipeline ran across Canada. Great lack of qualified welders. Terrific turnover of personnel. The hard-to-dig permafrost country with its all year around frozen ground. Destructive flash floods. Muskeg quagmires. The extremely wet season of the Alaskan coastal area. Frigid 72 deg. below zero weather in the Interior. The threat of wild animals along the rough wilderness right-of-way. Tough terrain which contained some sections that could not be penetrated by the nearly unstoppable bulldozers. Sunstroke, heat exhaustion, and snakes were about the only construction problems not encountered by the pipeline spreads.

In the fall of 1953, a joint venture of Williams Bros. of Tulsa, Oklahoma, Marwell Construction Company of Vancouver, British Columbia, and McLaughlin, Inc. of Great Falls, Montana, was awarded the low-bid \$29,000,000 contract by the Corps of Engineers for the construction of this Alcango petroleum pipe-

line from Haines, Alaska, across northern Canada, and then north along the Alaskan Highway to Fairbanks, Alaska. The 8-in., 621-mi. long installation is needed to supply the U. S. defense bases in the Alaskan Interior—Big Delta, Eielson and Ladd Air Force Bases, just south of the Arctic Circle.

T-i-m-b-e-r-r-r!

The job got under way in December 1953, after the prime contractors had let subcontracts to Oaks Construction of Anchorage for right-of-way clearing and grading in Alaska and to Omac Company of Canada for dozer work in the Canadian section. The tree-dozing operations started all along the staked location with one outfit working south from Fairbanks, the second cutting a swath through the timber both ways from Tok, and the third crew proceeding south from the Alaska-Canada border. The plans called for a 30-ft. working right-of-way, with fire lanes and windrows increasing the necessary width to 50 ft. of clearing. The dozers roared throughout the winter,

(Continued on page 32)

DO YOU WANT



Blaw-Knox Bituminous Paver laying base course on the Garden State Parkway in New Jersey.



The State of Pennsylvania has always been very particular about its asphalt roads. The Blaw-Knox has been approved by the Highway Department of the Commonwealth of Pennsylvania.



Outer Drive Extension in Chicago—a county job—Here the Blaw-Knox Paver helped to complete the job before the deadline.

BLAW-KNOX Bituminous Paver Check List

If you don't have these Bituminous Paver advantages you are losing money!

- Wheel Steering with long wheel base eliminates the over-steering of crawlers and assures greater accuracy, a smoother course and better joints.
- Wheel mounting eliminates the 600 to 700 parts characteristic of crawlers.
- Wheel mounting absorbs vibration, reduces chatter in screed and wear and tear on machine.
- Dual Controls—handle machine from either side.
- Handles boxcar trucks with ease.
- Compacts to uniform density and automatically measures and levels.
- Long wheel base and leveling principle equalizes ordinary subgrade irregularities.
- Simpler, more easily adjusted crowning device.
- Easily tows to new location and gets back to lay parallel course in a quarter of the time required for crawlers.
- Easy conversion for increased width.
- Outproduces any other asphalt spreader on the market today.

ADNUN JR.

For those driveway and parking lot jobs the Adnun Jr. will make money. Power saves truck time. Continuous Course Correction gives a smoother surface—and it tows to the job—no trailer is required. Ask for a Catalog.

MULTI-FOOTE

The MultiFoote Concrete Paver has long been a standard for highway paving. Shovel-type crawlers with self-cleaning action, fast charging and discharging, and better vision, mean greater output on the job.



TO MAKE MORE MONEY ON BLACK TOP PAVING?



A TRUE SURFACE

● If you are planning new equipment for your black top paving jobs this spring you will be making a serious mistake if you do not get full details on the Blaw-Knox Bituminous Paver.

There has never been anything like it for speed of spreading and for smoothness of surface. Wheel design at once improves control and eliminates some 600 to 700 parts present in crawler units making upkeep easier and less costly.

Wheel design simplifies transportation and reduces truck standing time by easier, faster relocation on the job. With the Blaw-Knox you pave profitably with *any* mix, hot or cold. You pave with automatic leveling and compact to uniform density. You pave with a permanent bond between strips and you pave with the only paver that gives you positive traction at *all times*.

Even if you feel your present equipment is adequate you may cut your costs and increase your profit by replacing it with a Blaw-Knox. You owe it to yourself to get all the details.

On wheels
it will pave
for less

**BLAW-KNOX
COMPANY**
CONSTRUCTION
EQUIPMENT DIVISION
1940 State Street
Nunda, New York

BLAW-KNOX



TWIN CATS bucked mountainous snows and drifts to get work started on the 50-ft. wide right-of-way in early January 1954. Oaks Construction Co. handled cold northern end in Alaska.



PIPE STRINGING crew out in front of spread near Fairbanks. Two spreads laid pipe — one out of Fairbanks working southeast to Canadian border, one from there on along the Alcan highway.



MODIFIED Cleveland 320 trenching machine was used by Williams Bros. on 122 mi. of buried pipeline. Smaller diameter digging wheel and more buckets provided shaving action on permafrost soil.



CAT HT 4 SHOVEL was used for picking up pipe for buffing on pipeline construction near Dot Lake, Alaska. Portable power units and special pipe pickup were necessary job innovations.

running 24 hr. a day, even when not working, as it is nearly impossible to start equipment in the extreme winter cold without heated storage.

In spite of the frigid weather, which included a February low of 72 deg. below zero at Tok, good progress was accomplished. Winter timber operations in Alaska have their advantages—the trees are very much dormant, the boggy muskeg swamps are frozen as hard as rock, the rivers and lakes are paved highways of thick ice to carry the equipment safely, and there are no mosquitos and stinging gnats to plague the catskinners. In the summer, the insects swarm out of the swamps and try to carry off the equipment operators. Alaskan trees have no taproots as the feeders spread out close to the surface to be as near the sun as possible and away from the cold permafrost underneath the shallow sub-soil. Of course, breakdowns were frequent — the 24-hr. running took its toll, and the tough terrain and extreme cold weather is hard on equipment. Some areas were too inaccessible and too difficult for the D8s and TD24s; so some hand clearing was necessary. Seventy-five difficult locations were relocated to facilitate construction.

Most of these changes were in rock slide areas. Spring brought warm weather and the thawing, heaving breakup. Cats mired down and nearly disappeared from sight in the muskeg. By main strength, lots of "cussing," filling bad spots with corduroy and firm fill the dozers bulled through and stayed ahead of the pipelining.

Organization and supply

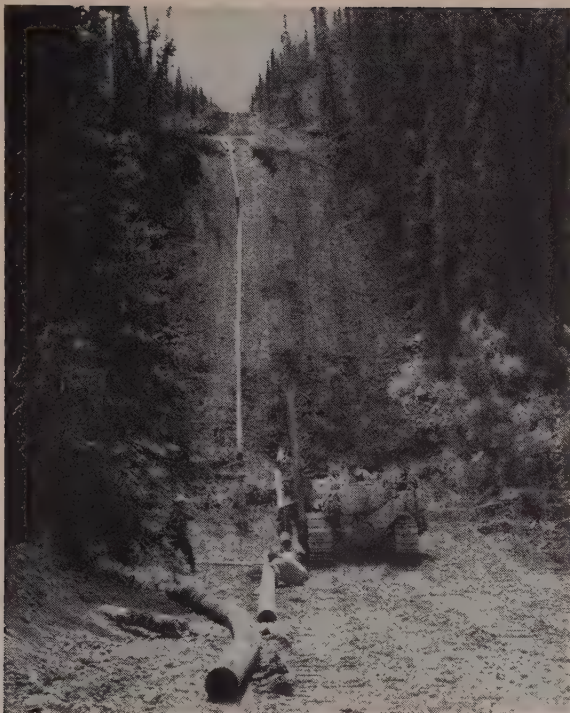
The prime co-venturers divided up the work, with Williams Bros. concentrating on the pipeline and Marwell constructing the tank farms and pumping stations. The pipelining was separated into two spreads—the Alaskan outfit and the Canadian crew. Using mobile trailers for housing, camps were moved and set up at 75-mi. intervals. United of Calgary 5-bed trailers and Spartanetts were utilized as traveling bunk-houses on wheels. Trailer kitchens and mess-halls were included in the camp cavalcade. Canus Service, a commissary company, provided the housing and food services under contract.

The Alaskan sections used American pipe, manufactured by Jones and Laughlin at their Aliquippa, Pa., plant 9,500 long miles away from the Alcanco location. Barges were uti-

lized to ship 8,300 tons of pipe 2,000 mi. down the Ohio and the Mississippi to New Orleans with each barge carrying 500 tons. Freighters loaded the pipe at this Louisiana port, and it started its long 7,500-mile sea journey across the Gulf of Mexico, through the hurricane-infested Caribbean Sea and the Panama Canal, and then north up the Pacific Coast to the far-away Alaskan ports of Valdez and Haines where the pipe was stockpiled. The trip took about eight weeks. Stewart's of London furnished the English pipe for the Canadian spread, and it was shipped from England, via the Panama Canal.

In April, pipe stringing operations began using Ford F-8 tandem trucks and pole trailers to haul the pipe from the ports to right-of-way stockpiles. Cat D6s with side-booms strung out the pipe along the center-line. The roads and ground were still frozen and snow-covered. But it was not long until the thermometer began to climb, and the spring breakup began. The thaw was on. The frost went out of the gravel roads and the right-of-way. The bottom dropped out. Tow cats had to be used to bull the loaded trucks to the pipeline location, down

(Continued on page 35)



PIPEBENDING was an ever recurring event as the pipeline followed mountainous route. Here a Cat D6 tractor equipped with a pipe-layer sideboom is working on bending operations. Photograph was taken in August during better part of construction weather.



TWO LINCOLN welders were mounted on D6 tractor. Welding team consisted of three stringer bead welders followed by three filler welders. Three more cover men completed the welds. Other tractors with sidebooms prepared pipe for welding.

construction access roads built ahead of time by the clearing and grading crews. The muskeg became a quagmire, especially after the hummocks were dozed down. The mechanical monsters bogged and sank nearly out of sight. Cables had to be run out to snake them back to firm ground. Then the Cats had to be taken apart and cleaned.

Corduroy and temporary bridges were utilized to keep the pipe stringing moving forward. At one location in Canada, Koidern No. 1 and South Fork, a temporary bridge was built to reach the Island between the two streams. Dick Woodring, stringing superintendent, tried out the trestle with a Cat. The west side of the structure gave way, dunking the super and the skinner into 9 ft. of icy water. Luckily, no one was injured, and the drowned Cat was rescued by cables run from several pull Cats on the shore.

Cleveland "milling machine"

Plans called for about 122 mi. of the 621-mi. pipeline to be buried, with most of the trenching being in permafrost. Williams Bros. had anticipated hard digging in this permanently frozen ground. A Model 320 Cleveland trenching machine had been shipped up from their Louisiana shop with alterations made to facilitate excavation in the hard ice conglomerate of the permafrost. The diameter of digging wheel had been shortened, and more excavating buckets had

been added. The idea was to dig with a shaving-milling action instead of a scooping set-up. Jiffy points, hardened and heat-treated with special S4 rock weld, were used on the 14 buckets. The grinding action worked on the frozen ground, but one complete set of bucket points had to be replaced with new ones after each working shift. A backhoe was used to clean out the ditch behind the trencher.

G. R. "Dick" Hamilton, Humble, Texas, veteran of 14 yr. pipelining with Williams Bros., was in charge of the ditching operations, which ran 24 hr. a day and 6 days a week. Routine repairs were made on Sundays by the trencher crew. Hamilton said that the Alcango job was the toughest pipeline that he had worked on, due to the permanently frozen ground and the muskeg mud.

A clean-up crew headed the welding operations. Then came the spacer gang, lining up and clamping the pipe into place for the welders. A 1/16-in. gap was left between the lengths of pipe.

Welding work was started April 19, 1954, by the Alaskan spread near Fairbanks. The first arc was struck by the Canadian crew on April 26. The welding teams were organized with three stringer bead welders and one spell-off man spearheading the push. They were followed by three filler welders. Three cover men completed the welds. Each welder had a helper to wirebrush the welds and

handle the lines. There was a constant flow and turnover of welders, especially at the start of operations. The soft pipe, specified to offset the country's great temperature differential of 174 deg., was difficult to weld. Many applicants failed the tests necessary for qualification. Welding personnel became a major problem. Canadians were given employment preference on the Canadian Sector. Americans were hired by securing work permits from A.C.L. Adams, Canadian Special Commissioner, who processed all employment in Canada.

Weld inspection

The radiographic inspection of the first welds disclosed many failures. The government specifications called for visual and X-ray inspection of the welds, and the Corps of Engineers let a contract to the Isotope Products of Texas and Edmonton, Alberta, Canada, to carry out this technical work. Gamma graphs were taken of the welds, using the radioactive pill method. It required many conferences to iron out the difficulties of getting satisfactory visual and gamma graph inspections within the rigid requirements of the specifications. A. G. Barkow, a welding authority, and a Lincoln Welding Co. consultant were called in to help solve the welding problems. The telegraph wires hummed with frantic calls to Oklahoma and Texas to recruit qualified welders. Eventually, experienced

(Continued on page 38)



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Remember, lift capacity is *work capacity*. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength, extra speed and stability to handle bigger loads faster with every excavator attachment.

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205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
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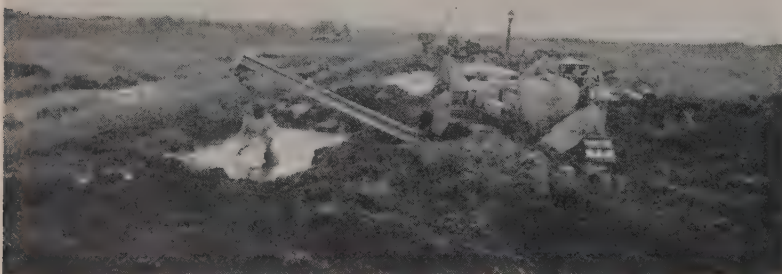
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SPACER GANG preceded welders, clamping pipe sections together and allowing 1/16-in. gap. Pictured here are two stringer bead welders and helpers. Scene is in heavily forested Northwestern Canada.



FINISHED PIPELINE lies unrestrained and in the open for 500 mi. of its total length. Only 120 mi. is buried. Rugged scene here is near shoreline of Klwane Lake in Canada.



BLOCKS OF CONCRETE weighing 480 lb. were necessary to weigh down the pipe and keep it from floating in many swampy locations and also at river crossings. Equipment was often bogged down in such areas. Scene is south of Shaw Creek, Alaska.



GAMMA GRAPHS were taken of the welds, using the radioactive pill method. Many flaws were discovered in first welds that had appeared satisfactory to the eye.

welders were secured, and the production was stepped up. The Canadian record was 426 completed welds in a 12-hr. shift.

After 100 mi. of the main pipeline had been layed, the tie-in crews began installing road and bridge stream crossings, tie-in lines, stream burials, and speciality items by-passed on purpose by the fast-moving main line spreads.

How to jump a river

The stream crossings had been simplified as the pipeline was carried over the large, deep rivers and streams on the existing highway bridges. The streams crossed with underground burials were small and shallow. Backhoes dug the trench across the stream bed; a section of pipe long enough to reach across was welded on the shore's firm ground; and Cats carried the pipe across the stream. Other methods were also used—the pipe section was shoved across by a Cat with another machine pulling and anchoring the operation on the other side; two Cats, by-passing each other out in the stream, alternated in carrying the pipe and holding it up. These pipeline know-hows were also used in crossing the muskeg quagmires and the boggy swamps. Bulldozers were utilized to backfill the buried pipeline sections and the stream burials.

A summer flash flood washed out bridges and section of the Alaskan Highway along the pipeline location for 100 mi. from Mile 1,060 to Mile 1,160. Crews were stranded without food and supplies. Equipment was marooned and could not be reached until the raging floodwaters subsided. Pandemonium reigned, and production dropped off. Soon detours and temporary bridges were built hastily to keep the pipeline operations rolling. The job settled back to normal, and the pipeline surged forward again.

The northern end of the pipeline was completed from Fairbanks south to the Canadian border September 15. The American spread was shifted then to the Haines sector.

On October 1, the spreads reached the British Columbia-Alaskan Panhandle border, out from Haines, the tidewater terminal. Success was in sight, but the crews were fighting time as winter with its delaying cold and snow was just around the corner and over the mountains.

The wind-up

All forces were concentrated on the by-passed Canadian tie-in items. The snow held off. Storms ripping across the Gulf of Alaska turned south before reaching the vulnerable pipeline operations. In two weeks, the tie-ins were completed to the bor-

der by October 15, beating the snow blizzard by 12 hours. All hands hurried back to the Alaskan Highway to complete the loose ends from Mile 1,016 to Mile 1,097. Except for the Slim's River bridge crossing, the pipeline was completed November 15. Shut-down wintery weather had held off.

Ready for the final estimate

The Williams Bros. construction men have left the Far North. Red Davis, the Alaskan spread superintendent, had pushed through the final operations as Canadian super, replacing Ed Hubach who was called back to Tulsa to prepare for the spreads to ship south for a Bolivian job, jumping from the North Star's permafrost to the tropical jungles of the Southern Cross. The tall tales of the Alcampo will liven up many a bunkhouse bull-session in South America.

As their part of the co-venture with Williams Bros. and McLaughlin Inc., Marwell Construction Company started the construction of the tank farms and pumping stations in the spring of 1954. This phase of the contract is still under way and is scheduled for completion in September, 1955.

See the "Supervising" section of this issue for the names of key personnel on the project.

Look under the hood!

*On now—Truck
Event of the Year—*

HOODS UP SHOWDOWN!

A new type short-stroke engine design is revolutionizing truck performance. Ford, and only Ford has it in every model!

It's the automotive news of the year! First the car industry goes short-stroke V-8. Now the truck industry begins to follow suit. Small wonder! This new engine design increases piston ring life up to 53% . . . saves up to 1 gallon of gas in 7

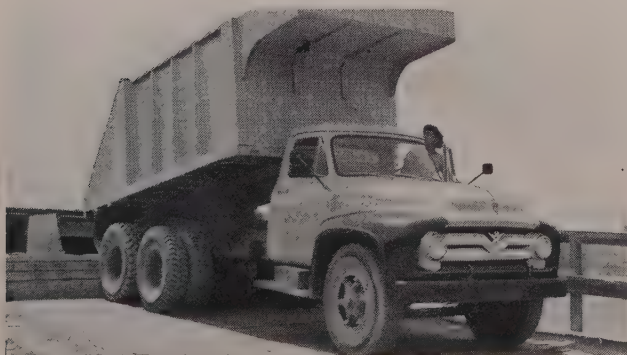
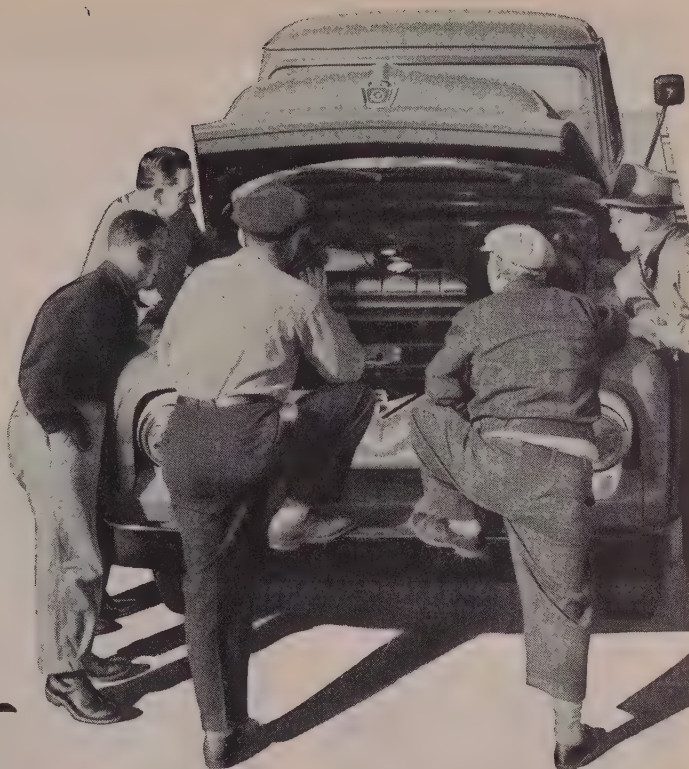
. . . reduces engine friction as much as 33% for more usable power . . . gives longer engine life.

Ford—pioneer in V-8 truck power—has had Short Stroke V-8's on the road for three years.

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Look under the hood! Be sure your next truck doesn't have an old-type, *long-stroke* engine that may be outdated before it earns its keep. Get the facts at your Ford Dealer's Hoods Up Showdown . . . now!

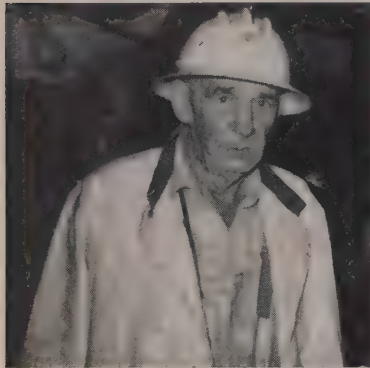
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Triple Economy
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Short Stroke power to roll the heaviest loads on long or short hauls with amazing speed and economy. New Ford T-800 Tandem Axle Big Job with 170-h.p. Short Stroke V-8. Power Steering standard. New 11,000-lb. front axle at extra cost. 40,000 lbs. GVW, 60,000 lbs. GCW.



RADIO AND TV catch E. R. Crocker, USBR project manager, and Al Coker as they measure the job with Joe Pasinato, born the day first shot was fired in Tecolote, March 3, 1950.



UNDERGROUND for last round is Charlie Conrad, superintendent on final driving. He goes to New Haven, Connecticut, for new job.



NOON HOUR looks the same as usual. After lunch, with cameramen gone, they'll muck out final round, set last steel ribs and lagging.

Tecolote holes through:

STREAMERS that had fluttered in the outlet portal of Tecolote Tunnel now hung limp. The blowers had been shut down so that 100 guests could hear a few speeches and watch the ceremony at the shooting switch. Noiselessly for them, the last shot had just been fired in the West's toughest tunnel.

Now, slowly, the streamers swung inward. Soon they were standing almost horizontal, caught in the rush of air being sucked into the bore by

blowers at the inlet end, 6.4 mi. away.

A nervous cheer, laughter, and scattered applause signified success. The driving of Tecolote Tunnel was done. After January 15 there was just the humdrum prospect of concrete lining in the 3.5-mi. outlet leg.

This was the first blast of the day. Most of the guests went home, but a few, led by L. N. McClellan, chief engineer of the Bureau of Reclamation, went underground to measure and photograph the historic scene.



SCENE OF VICTORY shows good alignment for line and grade, and good breakage. Heat and water left behind, this work was done in the dry, with daily progress of 40 ft. toward end.

One tunnel—two blasts!

The second blast came in the form of a party that night, when 400-odd employees, their wives, and guests gathered for a holing-through party at Santa Barbara's Mar Monte Hotel. Cocktails, dinner, liqueurs, two bars, dancing, and a floor show. And Coker and Kiewit picked up the tab as the crowd stayed on and on—officially until 3:00 a.m.

For old hands and new ones both, this was a great occasion. Some of the miners had sweated it out in

Tecolote Tunnel since the early days of the job—and it began in March 1950. Others had come down with Al Coker only a year or so ago, from the Eklutna Tunnel job near Anchorage, Alaska. For them Santa Barbara was quite a change, enough to provide the best joke of the day:

Coker's stiffs were frozen so solid on their northern work that they didn't know Tecolote was a hot tunnel until they'd been on the job for 6 months!



DINNER is hot, prompt, and well-attended, but with no formal speeches. Just a chance for engineers, contractors, and suppliers to hold an informal "post mortem" on the project.



DANCING shows that mining a mountain in a steam bath hasn't sapped anyone's strength. Two free bars enjoy good trade too, but no fights, as Tecolote Tunnel is preserved in alcohol.



SUCCESS for contractor brings smile, fellowship with men, and probably some money to Al Coker, project manager of victorious Coker-Kiewit venture.



SUCCESS for USBR is seen in story and smile of Grant Bloodgood, chief construction engineer. He flew in from Denver to be at party.



SUCCESS for superintendent Ray Blasongame is a dance now, a start on concrete lining in Tecolote, then another tunnel in West Virginia.



NEW YORK THRUWAY—more than 500 "Eucs" of all types—Rear-Dumps, Scrapers, Bottom-Dumps and Loaders helped rush many sections of this 427 mile road to completion.

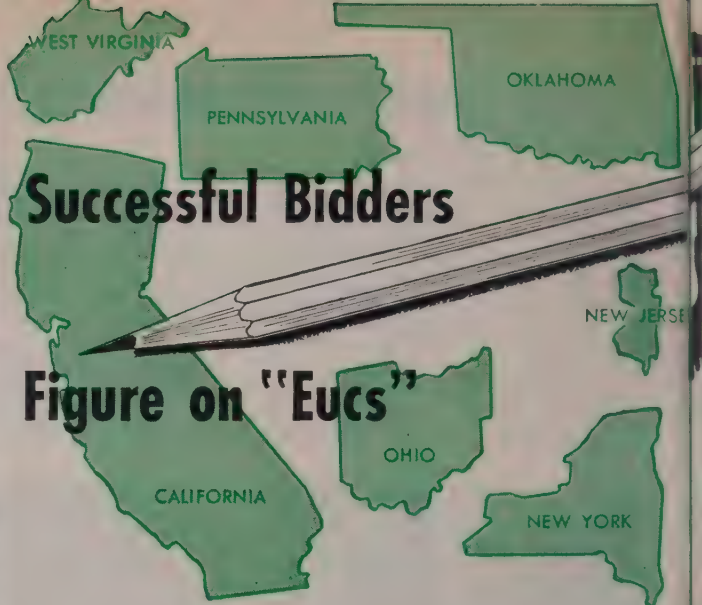


WEST VIRGINIA TURNPIKE—probably the most rugged test of equipment on all turnpikes to date because of the rocky, mountainous country. Of 275 off-highway rear-dump trucks used on the job, 260 of them were "Eucs".

CALIFORNIA—Euclid equipment has played an important part in building many of the modern super highways in the West. The "Euc" Scraper shown here is working on the Los Angeles Golden State Freeway.



OHIO—Bottom-Dumps and Euclid Loaders dominated the construction scene on the Ohio Turnpike. "Eucs" outnumbered all competitive rubber tired earth moving equipment by better than 4 to 1.



Successful Bidders

Figure on "Eucs"

On almost every section of every turnpike project there's been mighty keen competition for the jobs—usually 10 or more bidders. When your competitors are using "Eucs" to move dirt or rock faster and cheaper, you just can't afford to pass up the cost-cutting advantages of Euclid equipment. That's why successful bidders on hundreds of earth moving projects base their estimates on the production performance of Euclids.

Money-making performance on all types of work is proved by the fact that over 60% of all Euclid equipment sold is repeat business from satisfied users.

FOR TOUGH ROCK JOBS...

and other heavy excavation, Rear-Dump "Eucs" are the logical choice as they were on the West Virginia Turnpike by more than 9 to 1. Capacities range from 10 to 50 tons with engines of 125 to 600 h.p., with some models equipped with Torqmatic Drive.

FOR BIG YARDAGE PRODUCTION...

the Loader and Bottom-Dump combination has no equal for high speed loading and hauling of earth and free flowing material. Bottom-Dumps have truck capacities of 13, 17 and 25 cu. yds. with loaded top speeds up to 35 m.p.h.

FOR SCRAPER JOBS...

big or small, there's a complete line with truck capacities of 7, 12, 15.5 and 18 cu. yds. High production and dependable job availability of "Euc" Scrapers has made them the fastest growing line in the industry. The "Twin Power" Scraper shown at the left has exceptional versatility—it's been a one-man earth moving spread on lots of jobs!

There are lots of reasons why the men who know equipment use "Eucs" but they all add up to this simple fact:

**EUCS MOVE MORE LOADS PER HOUR
AT THE LOWEST COST PER TON OF WORK**

It's "Eucs" on the Indiana Turnpike now

INDIANA



First contract on the Indiana Turnpike covering a 7.4 mile section was awarded to Rieth-Riley Construction Co. Grading is being done by Chapin & Chapin of Norwalk, Ohio—over a million cubic yards are to be moved. In the photograph, one of a fleet of 8 Euclid 15.5 cu. yd. Scrapers is shown working on an overpass northwest of South Bend.

Euclid equipment was used by most of the contractors who built our first super road — the Pennsylvania Turnpike — more than 15 years ago. Since that time "Eucs" have been the choice of contractors for grading work on just about every super-highway project from Maine to California.

The new Indiana Turnpike is no exception—Euclids will be used on nearly all of the grading contracts awarded to date. In fact, "Eucs" already outnumber competitive rubber tired equipment by a wide margin and many more will go to work when the job moves into high gear.

Men who bid these big jobs can't gamble on the selection of equipment—they have to play it safe with machines they can depend on to do the most work at the lowest overall cost. Even if you don't bid on these big projects, the same dependable low cost performance of "Eucs" can mean more profits — and more jobs — for you. Call your nearby Euclid dealer for help with any earth moving problems — he's at your service to help you make more money on every job.

EUCLID DIVISION

GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

"Eucs" paid off in performance on
all of these toll road projects:

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PENNSYLVANIA TURNPIKE
NEW JERSEY TURNPIKE
MAINE TURNPIKE
OKLAHOMA (TURNER) TURNPIKE
WEST VIRGINIA TURNPIKE
OHIO TURNPIKE

and on other highway jobs all
over the world.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





MIXING GROUT for grouting of the foundation rock of Mormon Island auxiliary dam. Ray Heffington (center) is checking the mixing time of the Colcrete Mark III double drum mixer.

High speed grout mixer on Folsom Dam foundation

AFTER EXTENSIVE tests in its Sausalito laboratory, the Corps of Engineers is further testing the advantages of high speed grout mixers on the Folsom Dam Project. Folsom Dam is under construction on the American River 24 miles northeast of Sacramento. See article in *Western Construction*, Dec. 1954, p. 44.

The Sacramento District of the Corps of Engineers recently purchased two Mark III Double Drum Colcrete Mixers from Colcrete, Inc. of Los Altos, California. One mixer is now in use on the grouting of the foundation rock of the Mormon Island Auxiliary Dam, an earthfill structure 4,820 ft. long and 110 ft. high. The other mixer is being used in the grouting of foundation rock at the main dam, a concrete gravity structure 1,400 ft. long and 340 ft. high. Both jobs are being grouted with neat cement grout. Ray H. Heffington is supervising this work for the Sacramento District.

The Colcrete mixer is a high speed grout mixer which utilizes the prin-

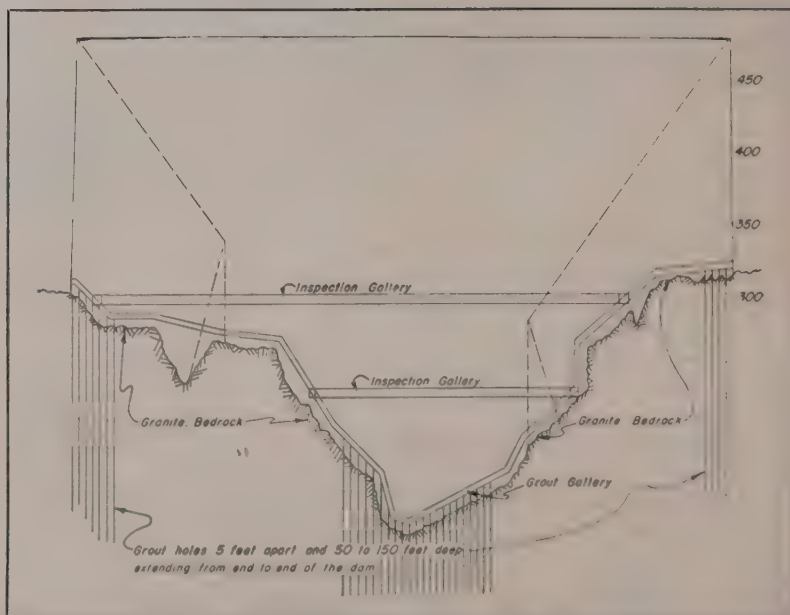
ciples of the colloidal mill to mix sand, cement, and water in such a manner that the resulting grout is stable and the sand will not segregate during handling. Grout from the mixers has been used successfully for foundation grouting, grouting of preplaced aggregate to form concrete, the grouting of channels in prestressed construction, and similar uses. The Mark III Double Drum Mixers have a capacity of 240 cu. ft. per hr. for sanded grout. With a few modifications they are capable of mixing up to 300 sacks per hr. of neat cement for foundation grouting.

Job production figures

Selby Drilling Corp. has the contract for grouting through the fill at Mormon Island Dam. Near the first of the year the following facts had been established. Maximum depth of holes was 60 ft. in rock. A maximum pressure of 60 psi. had been used to inject 17,113 bags of cement. Total footage drilled in rock amounted to over 39,000 lin. ft.

Continental Drilling Co., doing the main dam grouting, had encountered the following items. Maximum depth of holes was 150 ft. in rock. A maximum pressure of 375 psi. had been used to inject 6,734 bags of cement. Total footage drilled in rock amounted to over 33,500 lin. ft.

GROUTING of the main concrete gravity portion of Folsom Dam is shown below. This part of the dam is 1,400 ft. long, has a maximum base thickness of 270 ft., and rises 350 ft. above the river channel. It is flanked by earth-fill wing walls. From the grout gallery 1 1/2-in. diameter grout holes were drilled at a 12-deg. slope downstream measured from a vertical line.



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Trouble with fractions? Try modular measure

MODULAR MEASURE, the new and efficient system for dimensioning buildings and building materials, got another boost recently. A get-together of general contractors, manufacturers and architects praised the system during a conference at the National Academy of Sciences in Washington, D. C.

If you haven't run into the system on a job yet, you probably will soon—modular measure has been the coming thing since World War II, stimulated by reports from contractors all over the country that it appreciably cuts construction costs.

"Modular measure" simply means the use of a 4-inch unit of measurement in planning buildings (traditional dimensioning uses 1/16th of an inch as the smallest unit.) A dimension of 24 ft. 9 3/16 in. on a plan done the old way would instead become 24 ft. 8 in. done by modular measure.

Advantages of the system are cited as: less time wasted cutting and fitting materials at the construction site; fewer pieces of material cut off and thrown away; quicker drafting of blueprints; not so many building product sizes to be carried in stock, etc. A basic significance of the sys-

tem is that it's part of the present trend toward industrialization of the U.S. construction industry. Industrialization calls for factory fabrication of building parts, which are then distributed and stocked until ordered, and finally delivered to the building site and assembled there. The 4-inch module is claimed to be small enough to give the designer adequate flexibility.

Thus far, since the first American standards on modular measure were published in 1946, the most extensive conversion of building materials to modular sizes has been with concrete blocks, wood and metal windows, brick, wallboards and insulation, flue linings, glass block, certain finish materials and related products.

The Federal housing agency booklet, "Building Better from Modular Drawings" is a simple explanation of modular measure, available for 20c from the Superintendent of Documents, G.P.O., Washington 25, D. C.

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- **YOU WANT** either lever or air operated gates which are self-closing and safe!
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- **YOU WANT** center vertical discharge to prevent segregation of high specification concrete.
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CAPACITY | ½ to 8 cubic yards

CONTRACTORS PREFER Gar-Bro Concrete Buckets because they have so many extra advantages and plus values which pay off on concrete handling jobs.

With all the types, models and capacities of Gar-Bro Buckets, your Gar-Bro dealer can match the capacity of your mixers and answer the dimensional problems of your construction project. He can show you how to save money on concrete placing jobs. See him, consult with him about your next job.

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for the GAR-BRO
Manual . . .

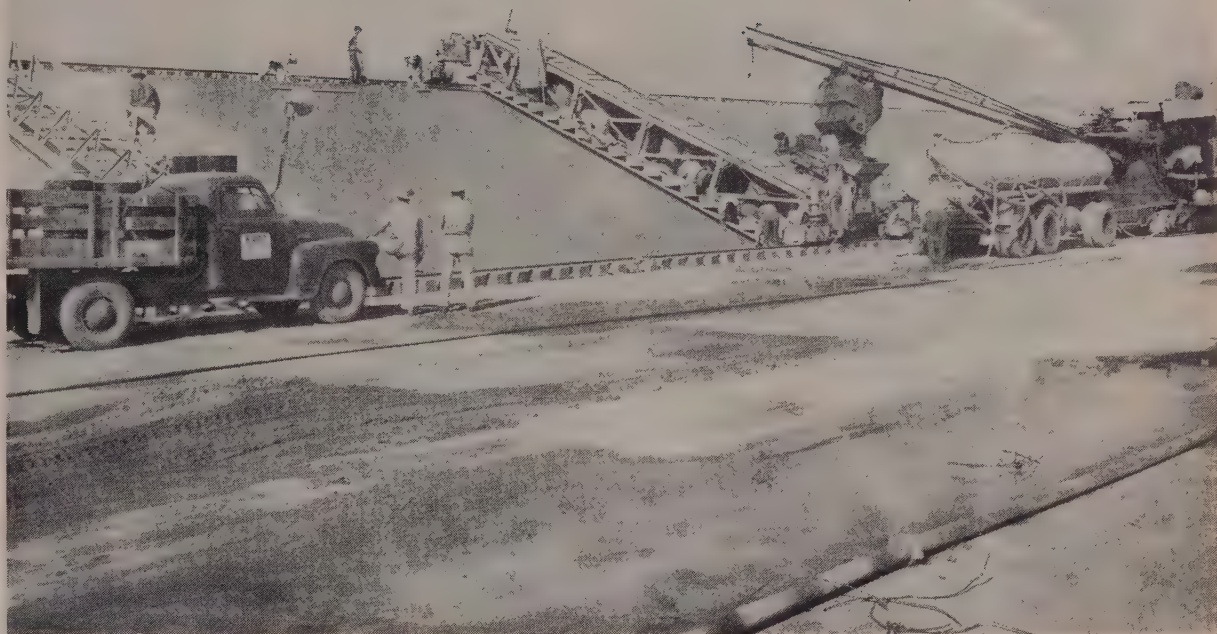


River is piped over the top, and— Trench crosses channel

STEEL SHEET PILING proved to be the practical answer in permitting safe construction of a sewer siphon 14 ft. below the bed of the Los Angeles River.

Total job, constructed under a \$233,000 contract by Vido Artukovich & Son of El Monte, Calif., included: 5,100-ft. length overall, with dry land portions consisting of 30- and 27-in. clay pipe; structures on both banks of the Los Angeles River; the 330-ft. siphon under the river, made up of 20- and 10-in. concrete-encased cast iron pipe; and 38 pilings to support the siphon.

Water and safety were problems in placing the 330-ft. siphon portion of the job. First, the contractor threw up an earth dike, with two large diameter steel pipes carrying river flow downstream over the right-of-way. Then, the 14-ft. trench was excavated, with trench walls shored up by steel sheet piling supplied by L. B. Foster Company. Pumps discharged seepage water downstream while placement of piling, concrete and pipes proceeded with little difficulty.



PAVER was converted from earlier horizontal paving to handle maximum 44-ft. slope distance. Rex 34E paver discharges stiff mix to

traveling hopper mounted on slope paver. Slab has 8-in. thickness, averages 1 cu. yd. per lin. ft. Hunt Process follows.

Slip-form paver on slope helps beat winter rains on Rio Hondo

CONCRETE SLOPE PAVING of a flood control channel marks another Western first for the firm of A. Teichert & Son, Inc., and M. J. Bevanda, joint venturers on one phase of the Whittier Narrows Flood Control Basin project. Time was of the essence in completing the channel work before winter rains began and the fact that this project was completed in time is a feather in the cap for this highball organization.

Involved in this project were 3,740 ft. of channel, 150 ft. wide at the bottom. Side slopes of the channel were $2\frac{1}{4}$ horizontal to 1 vertical with a varying slope distance of 36 to 44 ft. Original plans called for a 300-ft. soft bottom channel with grouted cobblestone side slopes. However, when the Corps of Engi-

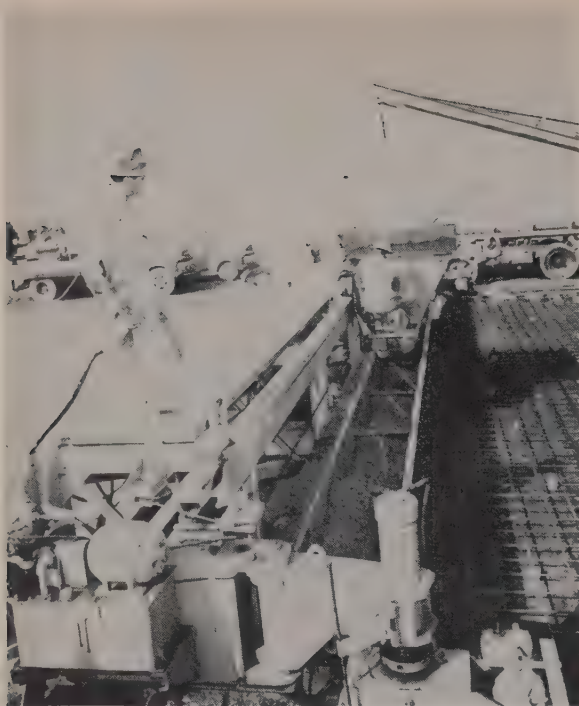
neers decided to change the design, it was determined by Teichert and Bevanda that their paving machine could be adapted to slope paving and could perform this work at a cost competitive with that of placing cobblestone rock. It was also felt that slope paving could be done more rapidly too. The channel was completed on the basis of 150-ft. paved invert and paved side slopes.

In the sequence of events for the slope paving, one of the important things was to place the reinforcing curtain of steel without disturbing the sandy slopes. This was capably done by hanging a large mat of the steel from a square pipe frame. Varying lengths of light cable held the mat at an angle below the level pipe frame and enabled the crane to place it with no difficulty. There was a

minimum of ironworker's foot traffic over the sandy slopes. Light steel rails laid at the top and toe of the channel slopes provided the roadway for the paving machine.

Invert paving was accomplished first and then the slope paving followed. This same machine was adapted to the slope paving and consisted essentially of the following component parts. The truss work spanning between rails was supported on two sets of flanged wheels. In the wheel housings there are electric propulsion units operating on 440 volts. Automatic cut-off devices keep the wheels at each end of the paver in constant alignment with each other. Power is furnished from a diesel-generator set mounted on a truck.

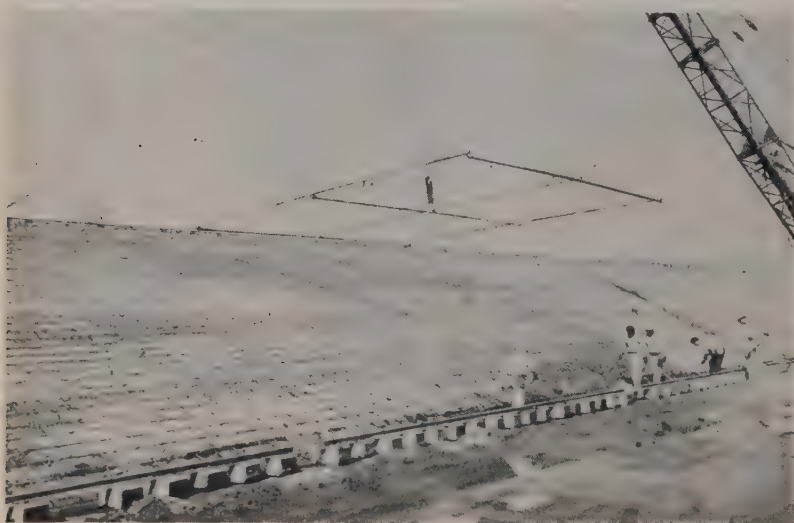
The truss could be raised and



CLOSEUP view on horizontal paving shows 10 compartments that take discharge from traveling hopper. Diesel-electric generator on truck provides power for moving. Hydraulic jacks on wheels give proper screed height.



ONE-HALF of slope paving had been completed by early December before rains began. Crane in background is placing cobbles in normal flood control bank protection. New method is almost as cheap and may be used again in future work.



PLACING of reinforcing steel grid on sandy slopes was handled by pipe framework that supported steel. Conventional placing of steel by ironworkers handling a bar at a time would have ruined slopes, since sand would have been easily displaced or gouged.

lowered to establish screed height by electrically operated hydraulic jacks, individually mounted on each set of wheels. On the leading edge of the truss were 10 compartments to hold fresh concrete that were filled by a hopper that traveled back and forth the full length of the truss. A vibrating screed traversed the length of the 10 compartments and there was no difficulty in keeping the very stiff concrete flowing. Con-

crete slump was only $1\frac{1}{2}$ in.

About 600 cu. yd. of concrete were handled per 8-hr. day with approximately 1 cu. yd. being required per lineal foot of distance along the slope. Thickness of the concrete here was 8 in. as against 10 in. on the invert.

Not far behind the paver (about 50 ft.) came another track-mounted truss used to apply Hunt Process curing compound to the fresh con-

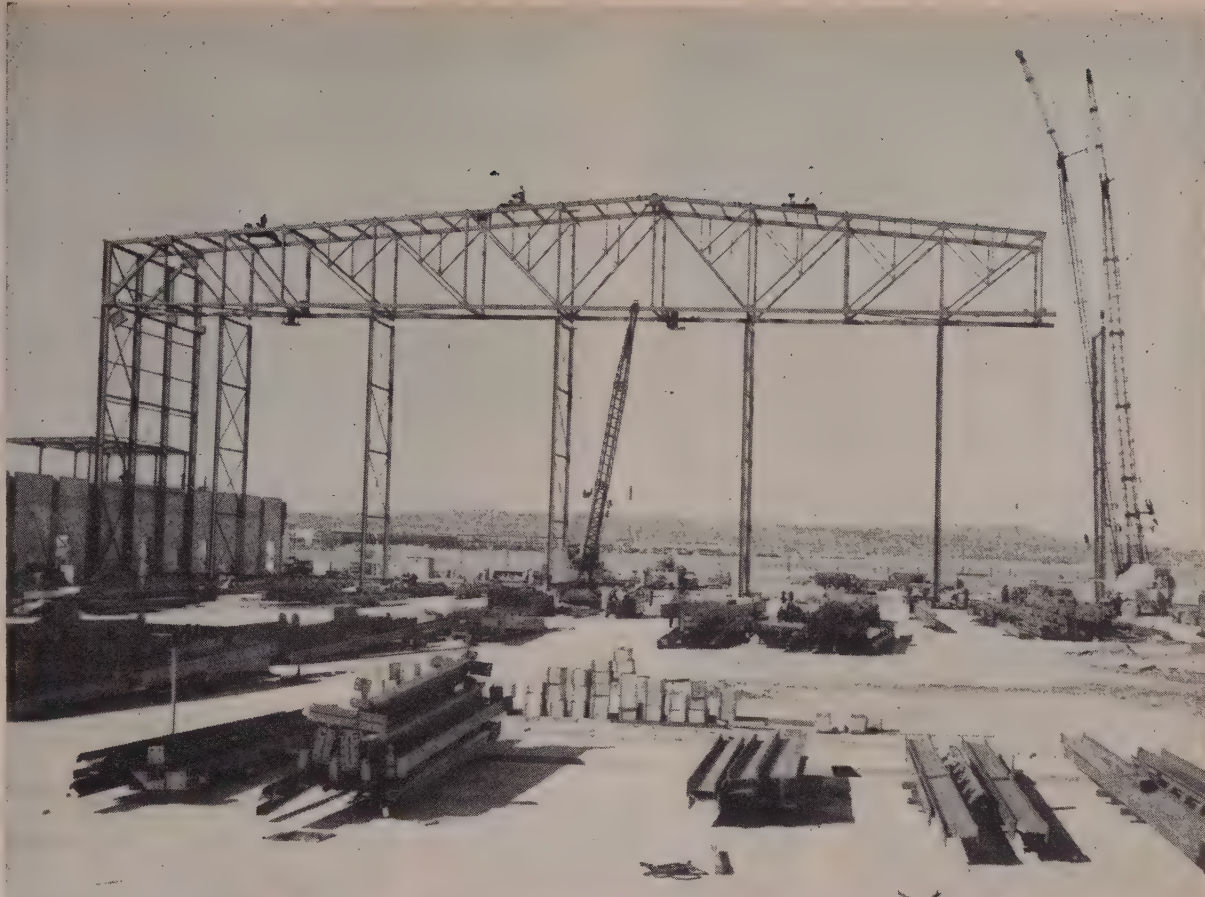
crete. Concrete was prepared and delivered to the paving machine by a Rex 34E dual drum paver. The hopper rolling back and forth on the paver would come to the toe of the slope to pick up each batch as it was ready. Another feature of the paving machine, manufactured by Guntert & Zimmerman of Stockton, Calif., was the working platform on the paver for cement finishers to float off the slope behind the screed.

The paving machine was easily adapted to the 3 horizontal passes required for the invert. In this case the frame was lengthened to provide 3 even 48-ft. wide passes.

The operations just described are one phase of a \$3,087,946 contract held by Teichert and Bevanda for construction of the west embankment and outlet works of the Rio Hondo at Whittier Narrows. The channel section concreted (and described above) is located above the headwaters where flood water will back up from the dam below.

For Teichert and Bevanda, J. P. Cagle is superintendent, B. E. Grounds is assistant superintendent, A. V. Towler is concrete foreman, J. C. Lawrence is structures superintendent, M. P. Brotherton is master mechanic, L. J. Wright is job engineer, and M. F. Lund is office manager.

Colonel Arthur H. Frye is District Engineer for the Los Angeles District, Corps of Engineers. Gordon Lilley is project engineer.



CLEAR SPAN of 300 ft. is erected piecemeal with aid of falsework bents and 140-ft. booms of truck cranes. Expense of hauling larger

crawler-mounted cranes to site to handle complete trusses was thus eliminated. First two of 29 trusses lack about 50 ft. to be completed.

World's largest hangar erected entirely with truck cranes

WITH A CLEAR FLOOR AREA of $4\frac{1}{2}$ acres, the world's largest hangar is rapidly going up at the Air Force Flight Test Center at Edwards Air Force Base, 90 mi. north of Los Angeles. The problems being faced by the Vinnell Steel Division of Vinnell Co., Inc. in the erection of 300-ft. clear span trusses entirely with truck cranes are believed to be unique in the history of structural steel erection.

A \$4,125,288.05 price tag has been hung on this project. Due to the urgency of the Air Force Flight Test program, only one year's time was allowed for completion of this structure. Work started July 1 last year and is scheduled to be finished by June 30, this year.

Main features of the project are a building area 605 x 605 ft. sq. divided roughly into two equal portions. One half of this area is taken up by the hangar and the other half by a main-

tenance shop. Total area covered is over 9 acres. The hangar will have three doors capable of allowing the largest planes we have to enter. Two of these doors, located at opposite ends of the hangar, will have a 300-ft. clear opening. A third door in the middle of the long 605-ft. side will have a 250-ft. opening. Clear ceiling height inside will be 75 ft. Accordion doors sliding horizontally with push button controls will cover the large openings into the hangar.

Truss erection

To give this hangar its clear inside area, there are 29 trusses spanning the 300-ft. wide dimension spaced at 25 ft. centers. At their mid point these trusses have a depth of 30 ft. Trusses bear on columns in all cases except over the 250-ft. wide side opening where a carrying truss will be used to span this opening. The height of the trusses above the floor,

75 ft., and the 78-ton weight of each of the 29 trusses is what led the contractor to his unique erection method. Truck cranes with 140-ft. booms and falsework bents are the show here.

Erection begins with putting up a 96-ft. column weighing 10 tons and guying it temporarily. Two such columns erected allow the beginning of truss erection. Falsework bents were located at the panel points of the lower chord of the trusses, the bents being put up in succession as truss erection proceeded.

At the top of each falsework bent are located two screw-type jacks. These are used to provide the necessary elevation and erection camber for the lower chords of the two trusses being carried forward at the same time. After the lateral bracing and roof purlins have been temporarily bolted in place, wire rope is used as an X-brace between the two



P & H TRUCK CRANE is shown carrying 75-ft. high falsework bent to position at end of trusses. An American truck crane could alternate on this work. Maximum height of lift was 115 ft. to top of trusses.



RAPID SORTING of structural steel was aided by Ross carrier. Versatility is shown here by its handling a 100-ft. long column weighing 10 tons. Sorting of steel required about 6 acres.

trusses for additional rigidity. Wire rope X-bracing is also used between the falsework bents for increased erection rigidity.

To take care of the riveting gangs which follow closely behind the erection, a truly novel arrangement has been made. Four platforms equipped with flanged wheels ride on top of the roof purlins. These are spaced at roughly equal intervals of 75 ft. over the 300-ft. truss length. Rivet tossing distance will be held to a minimum. Also, as the work progresses, the four riveting gangs will be hard pressed to keep up with the erection. There are a total of 96,000, 1-in. diameter rivets required in all. After the sixth and last falsework bent has been erected under two trusses, the end bearing columns are erected. Thus the cycle is ended for the complete erection of two trusses.

Shop fabrication of truss

Here are some interesting sidelights not mentioned so far. The first truss was shop fabricated to allow for a 4-in. camber. Templates were then made for all field connections. After a truss has been erected in the field and the false work bents removed, the dead weight of the truss will reduce the camber to only 1½ in.

Control of the lower chord panel points in the field erection is handled by surveying from the ground level. A measuring tape is held on top of the screw jacks and extends to the ground level where elevation readings are taken.

In the early stages of construction,

the first steel was being erected before much of the remaining truss work had even been fabricated at the Los Angeles fabrication plant. This is one reason why erection began as it did about 200 ft. from one end of the building—the 250-ft. carrying truss not being fabricated yet. The erection method for handling two trusses at a time will generally be used for all steel erection. An exception takes place where the 250-ft. carrying truss is necessary over the side opening. In this case columns will be set beneath the panel points of the carrying truss until it, too, will have been completed similar to the smaller trusses it carries.

Unusual steel sorting

One factor greatly aiding the contractor in his erection has been a large sorting yard area. Steel is trucked from Los Angeles to Edwards Air Force Base where it is unloaded by a Brownie truck crane. With 4,200 tons in all to arrive, and rapid erection a must, a new trick is being used for much of the sorting. Nearly all of the steel has been blocked up so that a Ross carrier can straddle the pile, pick it up and deliver it to a pick-up point for the larger erection truck cranes. Balancing a 100-ft. long, 10-ton column and then running with it is a neat trick for this carrier and its operator.

The two truck cranes doing the erection must reach a high point at the middle of the trusses of 115 ft. For this purpose a P & H truck crane has been equipped with 110-ft. boom and a 30-ft. jib and an

American truck crane equipped with 105-ft. boom and a 30-ft. jib. The two cranes working in coordination can ably handle any erection problem faced here.

Another interesting feature concerning the requirement for so much wire rope cross bracing being required on the falsework bents is the high wind velocity to be encountered in this desert area. Afternoon winds up to 50 mph. are not uncommon.

Key personnel

Key personnel on this project for Vinnell Company, Inc., include Schyler Walker as general superintendent for all Vinnell's Edwards Air Force Base operations. This includes three projects at the present time. For the Vinnell Steel Division, which is acting as a subcontractor for the steel erection on the hangar, Neal Lange is general superintendent and Robert Walling is job superintendent on the hangar. George Davis is project engineer representing the Los Angeles District, U. S. Army Corps of Engineers. Col. A. H. Frye, Jr. is Los Angeles District Engineer.

The Air Force Flight Test Center, commanded by Brigadier General J. S. Holtner, is one of 10 centers of the Air Research and Development Command, charged with the responsibility of keeping our nation's aircraft and related materiel qualitatively superior to all other nations. The AFFTC is mainly concerned with the actual flight testing of aircraft, power plants, components and allied equipment.



HEAVY EQUIPMENT—1929. Reconstruction of a portion of the Richardson Highway by government forces. Since then this section has been reconstructed to Alaska Road Commission "Through Road Standards."



HEAVY EQUIPMENT—1955. Reconstruction of another section of the Richardson Highway by Morrison-Knudsen Co., Inc. Modern equipment such as Cat D8 bulldozer and DW20 make possible today's roads.

What's the Alaska road situation?

From the staff of the Alaska Road Commission comes this factual account of the unusual major problems that they have met and overcome in the design and building of modern roads—this happening in a fast growing area unlike any other to be found in the U. S.

THE ALASKA ROAD COMMISSION had, during its long experience, developed location and construction criteria which permitted the economical construction of comparatively low-standard roads in permafrost areas. Silty, water-susceptible materials which lost stability and were subject to extreme change in volume were carefully avoided—frequently at the expense of more desirable alignment and grade—whereas porous, granular soils which permitted adequate drainage and developed relatively satisfactory stability were sought.

Experience dictated that if at all possible, the protective cover on frozen ground must not be disturbed, since once disturbed the surface thawed unevenly each summer, providing a continuous surplus of water. The moss and grass retarded drainage, and the frozen subsurface prevented vertical run-off. It was found that thawed soil, practically suspended in water, could not be economically handled by regular earth-moving equipment in the usual manner. Moreover, since ice and frozen ground could not be graded until thawed, it was determined that completion of a grading project in a single operation was not economically feasible.

Thus, the Commission developed "stage" construction techniques, whereby excavation was slowly and progressively accomplished as natural or artificially-controlled thawing progressed. Subsequent re-shaping of the grade over a period of several years, as differential settlement occurred, was continued until a new equilibrium between the several factors inherent in the permafrost province had been established.

Location of new routes is of prime importance, since construction problems can be minimized by observance of simple location criteria. Locations are developed on the southerly exposure of hills whenever possible, to utilize the sun's heat to the greatest extent and thus take advantage of any permafrost-free areas. This will also help reduce subsequent maintenance problems by reason of lighter snowfall, later freeze-up, lighter icing formations and earlier thaw. Wet slopes indicating effluent-type seepage are carefully avoided, since spalling of slopes, major slides, and subsequent ground icing generally result. Too, locations must be higher than stream and river icing elevations, either marginal or crossing the line. Finally, in Alaska even pioneer location parties are required to travel

off the final line in order to avoid any disturbance of the ground cover!

Bridge design involved the additional consideration of permafrost foundation, winter icing, stream break-up flow termed "debacle" and major channel changes common to glacial streams. Too, glacial rivers are subject to extreme flash floods, caused by the bursting of glacier dammed lakes, streams, and rivers. It is not uncommon for such floods, which may occur in either summer or winter, to raise rivers and streams as much as twenty feet. In addition to the usual trees, stumps, and other debris, these flash floods carry tremendous quantities of lake and river ice.

Bridges to prevent "debacles"

Clear span bridges are therefore more satisfactory than trestle-type structures, and mid-channel piers are most undesirable since they must usually be protected by costly ice breakers. On wide, flat streams, most subject to icing but carrying little damaging "debacle," the use of clear spans is frequently uneconomical or

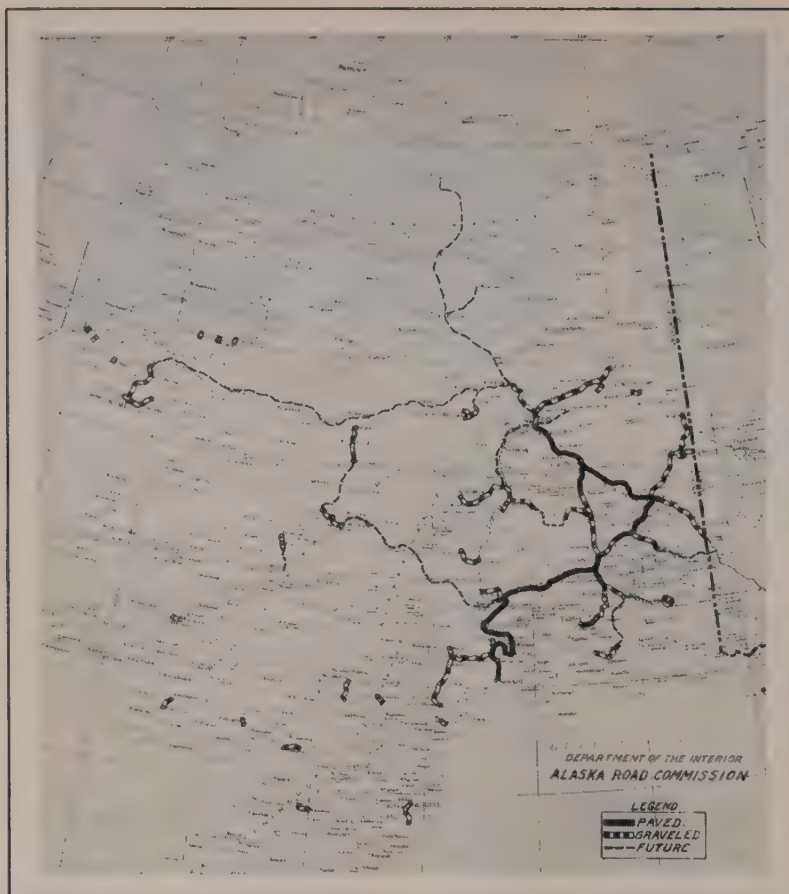
Expansion started with a boom in 1948—

It was not until 1948, when the world political situation had produced acute unrest in the Nation, that Alaska overnight became an important bastion of defense of the continental United States. Again, military necessity gave Alaska's lagging highway program a boost. From a previous average of less than a \$1,000,000 a year, the Congress made available an additional \$4,000,000 for road work during fiscal year 1948. These funds were ear-marked for initiating construction of a new highway, eventually to cost \$28,000,000, to connect Anchorage, Alaska's largest city, and the adjacent major military installations, with Seward, Alaska's principal seaport. In addition, the Congress au-

thorized a 6-yr. road program to cost in excess of \$100,000,000 and appropriated \$24,000,000 for initiation of the program in fiscal year 1949. The program for connecting, improving, and paving the primary highways developed suddenly, with little advance notice.

Although obviously essential, adequate funds in themselves could not accomplish the program. Numerous problems were immediately apparent. The Commission as then constituted was a small, efficient organization, geared to a modest program of comparatively low standard road construction.

Around a small core of experienced Alaska road builders was built a modern highway organization.



impractical. In such instances the use of steel piling bents, designed without bracing to avoid hanging ice, have proved practical. Although many feet of ice may build up and adhere to the steel piling, no actual load results. Thawing temperatures must prevail before the stream undercuts the ice, and during such temperatures the heat conducting quality of the steel piles releases the ice mass and permits gradual settling.

"H" piling piers

Piers for Alaska's bridges are predominantly of the steel "H" piling bent type, first developed by the Commission in the early 1930's. Performance equals that of concrete piers and the comparative simplicity of materials handling and erection is of major importance in isolated areas. Since they require none of the costly excavation, form work, cofferdam, caisson, or other underwater work common to concrete piers, the cost of steel "H" piling piers is comparatively low. Of equal importance is the fact that they are well adapted to use in frozen ground and can be placed as easily in mid-winter as in summer—an additional economy over concrete and the costly heating measures incident to winter pouring.

A recent modification of the steel "H" piling bent, utilizing salvaged 70-lb. railroad rail, has recently been

adopted by the Commission. Piling, fabricated by welding three rails together, bell to bell, provide a section easier to drive and structurally better than the 10-in. "H" piling.

In addition to constructing and maintaining roads and bridges, the Commission had built and maintained numerous isolated airfields, an 80-mi. section of narrow-gauge railroad tram, several ferries, and a seaplane canal.

To write the experience gained over many years into plans, specifications, and contract documents presented a major problem to the Commission. Although location and design criteria were equally applicable to work accomplished by either force account or contract, the principal feature of "stage" construction techniques—the element of time—was inconsistent with the theme of the new contract construction program—speed.

The accelerated program, therefore, included no pioneer construction. Rather, it was limited to the reconstruction and paving of existing primary routes; the Glenn, Alaska, and Richardson Highways; and relocation of the Alaska Railroad's Anchorage to Seward track, in order that the old grade could be utilized for construction of the Seward-Anchorage Highway.

Construction standards designed

to provide soundly-engineered highways without the costly refinements of alignment, grade, and roadside development common to Stateside highway standards, were adopted.

Bridges on through highways are designed for H-20 loading and have a roadway width of 24 ft. Bridges on secondary roads are designed for H-15 loading with 20-ft. roadway widths.

Why asphaltic pavements?

Continual movement of the surface resulting from changes in seasonal frost or deformation of underlying permafrost dictates flexible mat-type paved surfaces. Asphaltic pavements of either road-mix penetration or hot plant-mix are completely satisfactory. A 2-in. mat of rapid-curing cutback asphalt plant-mix, laid over a 4-in. crushed rock base primed with medium-curing cutback asphalt, placed over a minimum of 15-in. granular sub-base, is standard for primary roads.

The problems of staffing, climate, terrain, and construction, while formidable, did not delay inauguration of the accelerated program schedule. Although contractors' forces frequently kept pace with the Commission's survey parties, the program gained momentum. Today, 6 yr. and \$135,000,000 later, the original program nears completion.

The present highway system consists of a network of all-weather paved routes connecting the ice-free ports of Valdez, Seward, and Haines with Interior Alaska's principal cities and military installations, and with the continental United States via the Alaska Highway through Canada; and a secondary system connecting farming, mining, and industrial areas to the primary network. The most northerly point on the 2,912-mi. connected system at Circle is the northern terminus of the hemispheric highway presently being constructed through North, Central, and South America. In addition to the connected network, the system includes 570 mi. of isolated local roads connecting inhabited areas with air, rail, or water transportation facilities.

Severe maintenance problems

Today, the entire primary system and much of the secondary network is maintained open the year round. The Commission is organized and equipped to cope with all routine and emergency maintenance problems. Methods developed in the continental United States have been utilized in their most modern concept for routine summer maintenance; and modified to meet the problems imposed by arctic conditions for winter maintenance.

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below zero and light snowfall of Interior Alaska, requires special methods and equipment. Every type of modern snow-fighting equipment, supplemented by specially - designed heavy rotary plows, believed to be the world's largest, are utilized to combat the 80-ft. annual snowfalls and 100-mph. gales of the pass areas.

Drainage problems during the winter have led to development of unusual expedients such as the ice fence to force land ice to build up vertically, frequently many feet high, instead of spreading over the roadway; and the use of specially designed heating units to keep water flowing through drainage structures rather than freezing solidly and forming impassable ice formations over the road.

Thus, the Commission has grown, in a few short years, from a small, highly-efficient force account operation into a modern highway organization. Much still remains to be accomplished before Alaska has a completely adequate highway system. During the past few years of accelerated activity, the Commission has not neglected its planning for the future.

Should Alaska's highway program receive another unexpected boost, the Commission will be ready with another "impossible" program. To date, road construction of any consequence has been confined to the Pacific mountain and central plateau regions. However, the great mineral and petroleum potential of the Arctic slope may very well justify the northward extension of the highway system in the very near future.

Valuable new book by ACI on concreting

CONCRETE design and construction are covered in detail in the new American Concrete Institute 270-page "ACI Book of Standards." The book is a compilation of current ACI standards, recommended construction methods, and specifications. It is available at \$3.50 per copy, from ACI headquarters at 18263 W. McNichols Road., Detroit 19, Mich.

The book contains recommended practices for: winter concreting methods; selecting proportions for concrete; application of paint to concrete surfaces; measuring, mixing, and placing of concrete; construction of concrete farm silos; application of mortar by pneumatic pressure; and use of metal supports for reinforcement. Specifications are discussed for: concrete pavements and bases, cast stone, and reinforced concrete chimneys. Building code requirements for reinforced concrete are listed, and minimum standard requirements for precast concrete floor units are presented.

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FOUR SPECIAL REQUIREMENTS provided the answer to a big problem on recent freeway grading in California. The problem was standard state specifications for base material vs. the spotty character of the contractor's borrow pit. At stake was no small item: 2,000,000 tons of imported material.

Piombo Construction Co. has been working on 5 mi. of the Bayshore Freeway south of San Francisco, providing three new lanes and four overcrossings on a bid of about \$3,700,000. All the grading was on unstable flats laced by tidal sloughs and underlain by soft bay mud. Settlement of the new work was a foregone conclusion, but it didn't lessen the need for control of the embankment.

Specs for the job

The critical item was the top one foot of imported material, specified for placement in lifts of 3 or 4 in. This was the material for which specs had to be changed a bit. Here's what was finally required.

(1) No more than 15% passing the No. 200 sieve. (Standard spec names 9% as the figure here.)

(2) Plasticity index not to exceed 15. (PI is a measure of clay content.)

(3) The product of the first two items not to exceed 75.

(4) At least 30%, but not more than 60%, of material to pass the No. 4 sieve.

This set of requirements was realistic. It gave the needed measure of control, but was flexible enough to meet almost any pit condition that Piombo might uncover. For instance, if Item 3 were high, but Item 4 were low, the answer would be to add sand up to as much as 60% passing No. 4. This added material would not pass the No. 200 sieve, so the percentage defined in Item 1 would go down. The sand would also reduce the PI (Item 2), so the product would also fall in line.

Handling cement-treated base

According to Joe Stockton, superintendent, this system for embankment material control did the trick. All trucks rolled without trouble. And this was important. Truck haul ranged from 3 to 8 mi. to cover the 5-mi. job, and turning back a 20-yd. semi, or wasting its load, would have been costly.

Stockton's problems didn't end with the imported base material. He had to plan and execute a lot of cement-treated base work. Some of this was on long tangents, but a considerable volume was on the cloverleaf ramps for the four interchanges.

The choice for any given stretch of



JOE STOCKTON, superintendent, found two answers to a question of equipment.

work was between a Wood Road-mixer and a Seaman Pulvi-Mixer. To pick one or the other, it was necessary to study their characteristics for handling the material. Here is the way Stockton saw it:

The Wood mixer works on a windrow. It mixes and wets the material uniformly, and turns out another windrow behind. (Cement is added by means of a spreader box hauled down the original windrow.)

After mixing, a V-plow spreads the mix between headers and is followed by a 3-legged roller. A blade comes next, trimming the base course at high spots—"sweeping" it clear. The base is sealed by a wobble-wheel roller. (Piombo had a new rig on this job: a 9-wheel, 12-ton Tampo. It worked well, having better speed and maneuverability and more weight than other machines that have been used on cement-treated work.) Now the base course is ready for a bitumul seal cure.

The Seaman mixer works best on a "blanket" of material, although it can handle a windrow. In turn it produces a blanket of mixed base in place. (And it, too, is preceded by a cement spreader.) The succession of operations that follow are essentially the same as with the Wood, in Stockton's opinion, except that you can get along without a separate spreading operation, and sometimes without the trimming. What you have is a lift of base course anywhere from 2 in. to 7 in. deep, ready for the pneumatic roller.

On the tangents, where there was room for equipment to move and

where the width was consistent, Stockton picked the Wood mixer. Production was a steady matter, and the Wood performed well in both dependability and yardage. A key point here was no human error in the matter of moisture. Water was introduced automatically to the entire charge of material.

On the interchange ramps it was another story. The Wood mixer was clumsy in close quarters. And its operation was inflexible; the feature that was advantageous on the straight run worked against the machine here. Stockton needed a machine that was adaptable to varying road widths.

He found his answer in the Seaman machine. It could handle odd widths effectively by means of metering the water added to the mix. Stockton's operator could cut out jets on the mist bar to fit the particular pass coming up next. Not a good feature for the long haul, perhaps, but handy for this work.

Traffic safety at 50 mph.

With the cement-treated base work figured out this way, the rest of the work is structures and plant-mix. These items present their own problems, especially with respect to handling traffic.

The most care is directed to brief detours required for steel erection at overcrossing, and to longer, semi-permanent detours where the alignment is cut for drainage facilities. (The Piombo contract includes replacing culverts under the old road.)

The Division of Highways designed these detours, and provide "banner" signs and blinking yellow signals directly above detour entrances. The contractor added other large, well-lit signs for more advance warning. And all barriers are fitted with battery-powered blinkers.

After this it has been a matter of careful patrol. Shift superintendents check all safety and warning devices regularly, and are required to file reports of their inspections. Also, every foreman passing down the road in the course of his work must note the time and the condition of all signs and lights.

Personnel

The contractor's organization on this work, in addition to Stockton, includes F. E. Kerr, assistant superintendent, and Paul Fry, master mechanic. Foremen are: Carl Frandsen, structures; George Lunning, carpenter; Willie Hathaway, concrete; Jim Hawkins, labor; William Kinney, grade; Melvin Shelton and R. G. Piombo, dirt; and Clarence Yturriga, pit.

For the Division of Highways, W. G. Remington is resident engineer, assisted by Ray Shour and Robert Keller. Bob Blake was bridge department representative on structures during the course of their construction.

Hydraulic drive of the Case "VAIH" mower brings new freedom from the hazards and delays of mowing in public places. Stones or other objects caught in the sickle merely stall the hydraulic motor at relief-valve pressure; reversing this motor usually releases the obstacle. Mowing is resumed instantly as the sickle cuts equally well with either direction of rotation. Hydraulic drive is a complete system of itself, separate from the hydraulic control system which lifts and lowers the cutter bar and also raises the inner shoe for mowing over curbs.

The same two-cylinder control of cutter bar is used on the standard Case Highway Mower. Both models work at any position of cutter bar from 45 degrees down-slope to straight up. Both permit use, without interference, of front or rear-mounted equipment as well as doing draw-bar jobs with the Case "VAI" Tractor.

NEW hydraulic- driven MOWER



NEW...CASE ROTARY MOWER

mounted on 3-point Eagle Hitch

Goes anywhere that tractor will go. Mows anything from low-lying grass to light brush; chops and spreads as a protective mulch. Cutting width 60 inches. Cutting height from 1½ to 6 inches, gauged by runners, and up to 15 inches with hydraulic control. Safety features include hinged knife arms and jump clutch on drive shaft. Fits Case tractors with Eagle Hitch, other tractors with 3-point hook-up. Also available as trailer unit.



New Case "50" Powerloader brings new capacity with one-yard bucket . . . new power with Case Diesel 65 horsepower engine . . . new ease of handling with power steering. Fast, too—lifts 10½ feet in 10 seconds, dumps in 3½, lowers in 4. Toggle action and power down-crowd give real digging ability. Shares features of Case "30" and "40" Powerloaders, Case "520" Diesel 6-cylinder tractor. See or call Case industrial dealer for full story. Write J. I. Case Co., Racine, Wis.

CASE



Superior Equipment Co., Phoenix, Ariz.; Hassard Equipment Co., Chula Vista, Calif.; Reynolds Equipment Co., Fresno, Calif.; Island Equipment Co., Sacramento, Calif.; Contractors Machinery Co., San Francisco, Calif.; Electric Tool & Supply Co., Los Angeles and San Bernardino, Calif.; Equipment Sales & Service, Stockton, Calif.; Liberty Truck & Parts Co., Denver, Colo.; Starline Equipment Co., Boise, Idaho; Jenkins and Albright, Reno, Nevada; Montana Powder & Equipment Co., Helena and Billings, Mont.; Columbia Equipment Co., Portland, Ore.; Star Machinery Co., Seattle and Spokane, Wash.; Wortham Machinery Co., Cheyenne, Casper, Rock Springs and Sheridan, Wyo.; Oley's Sierra Machine Shop, Bishop, Calif.; Orange County Tractor Co., Anaheim, Calif.; Heinrich's Equipment, Santa Maria, Calif.; Farmer's Hardware & Equipment, San Luis Obispo, Calif.



Less field labor with welded station design

EXPERIENCE GAINED in the fabrication and installation of the semi-rigid box-type structure first used in Arizona Public Service Company's new 50,000-kva. 161/69/12.5-kv. substation has amply demonstrated its superiority over the conventional lattice-type structure.

As this is the first such 161-kv station on the system, several substation structures were considered and the semi-rigid box-type structure was selected as the type with the most desirable features; namely, simplicity, ease of erection, and pleasing appearance, along with economy. This type of structure was designed to fit into several possible schemes of equipment location and flexibility for expansion of this type of station. It is felt that the structure is of more compact design than any of the other designs studied, without sacrificing any electrical clearances.

Tapered columns

In order to obtain a structure that would pass all the rigid needs, a closed box-type section was developed. This section is composed of structural rolled shapes continuously and automatically welded into a composite rectangular box. The columns are of tapered box section to the height of 40 ft., from which point a pyramidal mast spires an additional height for static-wire protection. Thus, the largest cross dimension of this column tapers from 2 ft., at the rigid built-up and skirted base, to 1½ in. at the top of the mast.

In order to overcome the heavy dead-end loading on the super-structure, large reinforced concrete spread footings were designed with reinforced concrete pedestals carrying load from structure to ground. These footings were carried to virgin soil of a caliche material underlaid with sand and rock.

An efficient means of fabrication of all steel parts was instituted by a lo-

cal steel fabricator—Allison Steel Manufacturing Co. It was there that all steel was laid out, cut, and systematically distributed to a production line. Tolerances were held to a minimum by special jigs prepared to assure proper fabrication. A submerged-arc automatic welding machine was used in the assembly line to provide high-quality continuous long welds throughout the length of beams and columns.

It was in the final assembly area that all structural members received a shop coat of zinc-chromate paint before the last plate was welded into place. All members were then forwarded to a shot-blasting machine for complete cleaning prior to the final stage of exterior preparation. The hot-zinc spray was then applied by the Metco System to a thickness of 0.0003 inches. All threads of nuts, which were welded to the back side of the surface at required drillings, were wiped with waterproofing compound and the steel was ready for shipment to the job site.

Erection in 10 days

While the steel was being fabricated, the substation site was leveled and the foundations for all structures and equipment were installed. The anchor bolts for the towers were set in the tower foundations at this time. All of the structure was set by use of a mobile crane with a 100-ft. boom, and the average time to set a tower or beam was 25 minutes. Approximately ten erection days were needed to erect the complete structure. The crane also facilitated the installation of the disconnect switches on the structure.

Through the experience and planning of the first of this type of substation at Buckeye, Arizona, it was found that such a structure was readily adaptable to enlarging and changing to accommodate many installations.

Tests check durability of paving asphalts under new California spec

A NEW SPECIFICATION for asphalts of paving grade has been developed by the California Division of Highways. A series of test sections are being placed on a major construction project, and no marked differences in construction procedures have been noted to date under the new specs, either in spreading or rolling.

The improved specifications are now being used in the "Special Provisions" on all state projects. They will remain on a tentative basis to allow for any future modification or development of new test methods.

Were asphalts better before?

The adoption of the new specification has required changes in some refinery production methods. The questions arose as to actual service behavior of the new product when compared to asphalts previously used, and the relative durability of the various asphalts placed under identical construction conditions and using a common aggregate source. From a construction standpoint close observations were desirable to detect any differences which might be evident in spreading and rolling characteristics of the various mixtures.

Therefore, the proposal was made to place a series of test sections on a major construction project in which a number of asphalts complying with the requirements of the new specifications would be compared with asphalts meeting previous standard specifications under identical construction conditions.

Scope of tests

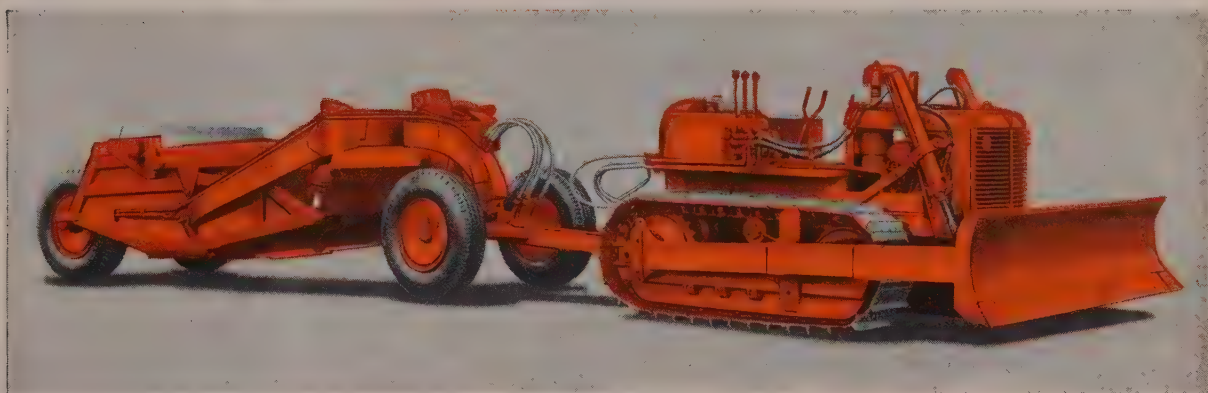
The project on which the experimental sections are being placed involves the construction of 6 mi. of 4-lane divided highway on U. S. 101 about midway between Santa Barbara and Santa Maria. The work consists of grading and paving two lanes of entirely new construction, and the rebuilding of the presently used roadway. The geometrical section consists of two 12-ft. lanes with 8-ft. shoulders on the travel lane and 2-ft. shoulders on the passing lane.

The structural section on the new construction consists of 1 ft. of imported subbase material, 8 in. of cement-treated base (Class B) and 4 in. of plant-mixed surfacing (Type B). The structural section over the present traveled way will be strengthened along the present shoulder area by 1 ft. of imported base material to bring it to modern standards. Then at least 6 in. of cement-treated base will be laid over the entire section, followed by 4 in. of plant-mixed surfacing.

The necessity of carrying traffic through the project has required that construction proceed in two steps,

Allis-Chalmers HD-5 Tractor with dozer blade . . . plus 4-yd AC-44 Scraper—

RIGHT COMBINATION FOR VERSATILITY, LOW-COST DIRT MOVING



THE AC-44 SCRAPER

has plenty of features which contribute to low-cost dirt moving — wide-cutting edge and “center-boiling” action that loads quickly on short runs and with less tractor effort — high-flotation tires and ample ground clearance for easy travel with ground-hugging ability — high apron lift and forced ejection that takes less horsepower, dumps quicker and cleaner — full hydraulic control to speed production, simplify the operator’s job.

Capacity: 4 cu yd struck; 4.7 cu yd heaped; weight, 6,595 lb

THE HD-5 CRAWLER TRACTOR

has *earned* its popularity, with tens of thousands of satisfied users. It has such modern tractor features as all-steel, box A-frame for long, productive life . . . unit construction that cuts service down time to a minimum . . . 1,000-hour lubrication intervals for truck wheels, idlers and support rollers that save up to 30 minutes’ service time each day . . . extra large idlers and sprockets add traction.

Full 40 drawbar hp; 5 speeds forward to 5.5 mph; reverse 2.0 mph; weight (bare tractor) 11,250 lb

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

NEVADA
A-D Machinery Company, Inc.—Elko
Moore Equipment Company—Reno

OREGON
Pape Brothers—Eugene, Roseburg and North Bend

OREGON
Dielschneider Tractor Company—The Dalles
Haupt Tractor Company—Medford
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Cate Equipment Company, Inc.—Salt Lake City

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American Machine Company—Spokane
Mid-State Equipment Company—Wenatchee, Wash.

WYOMING
Studer Tractor & Equipment Company—Casper

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**bring the
mountain
to Mohammed!**



**The moving
of a mountain...**

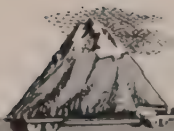
is no longer impossible with the present day earth-moving and excavating equipment in the construction field.

However, with equipment of this size, especially engineered trailers must be used to move them from job to job.

Utility is proud of their record with progressive operators all over the West who depend upon them to build equipment for this difficult task — men who know from experience that Utility Trailers will operate year after year with greater dependability and lower maintenance cost.

If your hauling requirements need especially designed equipment, or a standard trailer, **UTILITY** is your best buy.

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and the first phase of the project involving the new construction has been completed recently.

Careful attention was given to selection of the test sections and the source of the asphalts. The length of each test section was established at about 2,500 ft., and each asphalt will be used on both the new and old traveled ways. The sections were also laid out in such a way that each asphalt will be subjected to approximately the same type of up-grade and down-grade traffic.

Eight different asphalts, including the contractor's supply, of 200-300 penetration were incorporated in the test sections just completed and these same asphalts will be used in the second phase of the construction program. Six of the asphalts comply with the new specifications, and two with standard specifications. The asphalts were selected so that the principle California crude sources were represented and include different methods of production from the same crude source.

Normal paving operation

The recently completed pavement on the new construction lanes was produced in a modern 5,000-lb. batch plant erected near a gravel deposit in the Santa Ynez River. Five tanks, each holding approximately 39 tons of asphalt and heated by hot oil circulation, were used for storage of the various asphalts. The level course was laid with spreader box and blade and the surface with a standard Barber-Greene paver.

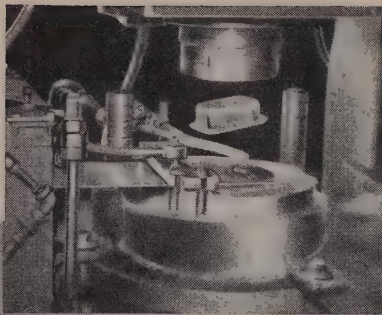
All plant and street operations were identical for each asphalt. Plant temperatures were excellent with clear warm weather being encountered during the entire 2½ weeks of paving. Extensive sampling was performed during paving operations.

Personnel

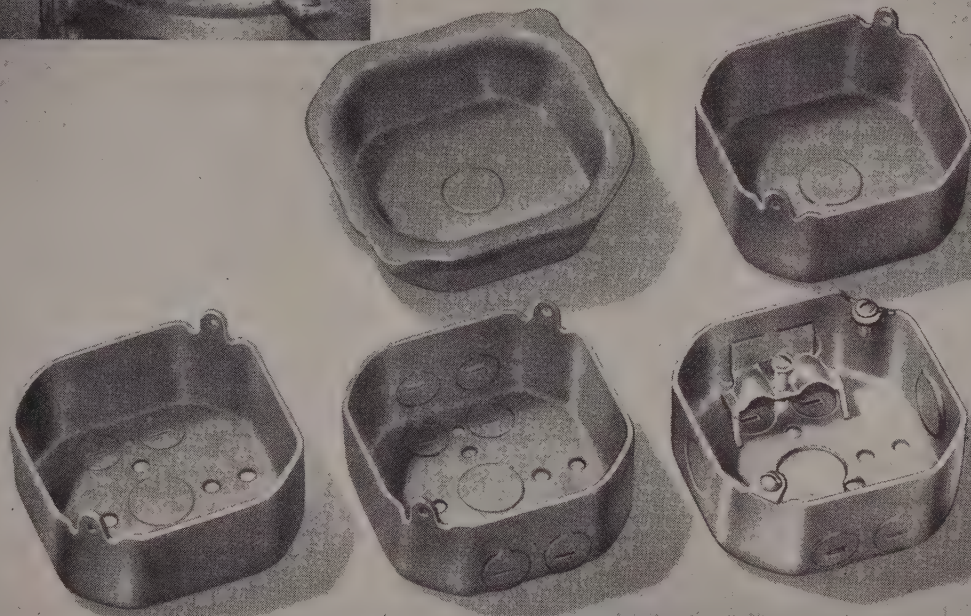
The contractor on this job is the Madonna Construction Co. of San Luis Obispo. R. Osborne is general superintendent and O. T. Luster is plant superintendent. The Sunray Oil Corp. and the Hitchcock Transportation Co. arranged for and transported all of the asphalts used on the job.

The project is being built by the California Division of Highways, George T. McCoy, State Highway Engineer. Direct supervision of the project is being handled by District V of the Division, E. J. L. Peterson, district engineer. C. I. Brown is assistant district engineer for operations and Lee Bunce is resident engineer.

The placing of the experimental asphalts was conducted under the supervision of the Materials and Research Department with F. N. Hveem, Materials and Research Engineer. E. Zube, supervising materials and research engineer, and head of the pavement section, is in direct charge of all laboratory investigations connected with the project.



This 80-ton punch press makes the first medium draw in producing electrical outlet boxes; turns out approximately 12,000 units per day.



Whether or not you make electrical outlet boxes—

You can save money with the one right steel!

Using 14-gauge, hot-rolled coils from United States Steel, Bowers Manufacturing Company, Los Angeles, produces a wide variety of electrical outlet boxes. The photo above shows five steps in the fabrication of a box. After the initial draw, trim, and re-draw, the knockouts are formed and clamps and screws are installed. Finally, the outlet box receives an electro-galvanized plating. Using the one right steel enables this company to get more efficient production, fewer rejects, and results in money saved.

For every job, there is one particular steel that best suits the need. Evaluating your requirements and translating them into steel is our business. Isn't there some place in your plant where the one right steel could be saving you money today? One call to a Columbia-Geneva Technical Field Representative could be the answer to your problems.

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WIRE ROPE TIPS—1

... A series of good ideas as laid out by L. C. Torrell, wire rope engineer for Bethlehem Steel Company.

FOR THE IMPORTANT LIFT it is well to consider the use of a new wire rope. While many tests have shown that used ropes near the end of their useful life or even after discard have lost very little strength, they still may not be safe. It is not too generally understood that in the normal duty of a hoisting rope, bending, alternate loading and unloading, and repeated subjection to sheave and drum pressures constitute cold working of the steel wires. The original strength and toughness of a new rope is the result, in substantial part, of the cold work done in drawing the wire. Steel has just so much capacity for absorbing cold work before it becomes embrittled, and the unit tensile strength tends to rise with the work. In good rope-wire drawing practice care is taken to see that an ample reserve of this work-hardening capacity is left in the wire for normal usage of the rope. However, it cannot last forever, so it is not a safe practice to rely too much on the

apparently high strength of a well worn rope, for the wires may be near to a fully-embrittled state and may break from this cause when a heavy load is applied and bending occurs.

Making heavy lifts

This explains why it is entirely practical and quite safe to take certain liberties with generally accepted standards of minimum sheave and drum diameters for just a few heavy lifts, provided a new rope is used. So long as this is not carried to the

ridiculous extreme where the rope is crushed or pinched out of shape on the sheaves or drums, or outside wires are displaced, practically the full new strength remains effective. It won't remain effective for very long, and the rope will wear out in a hurry, but this is usually a minor problem in the preparations for handling a few important lifts. The cost of a few feet of expendable wire rope may well be much less than that of providing ideal wire rope operating conditions.

Largest sale of surplus equipment now underway

\$24,000,000 WORTH of construction equipment used on the Alcan Project in British Columbia is going on the block. The Aluminum Co. of Canada has selected S & S Machinery Co., 140 53rd St., Brooklyn, New York, to manage the sale.

This is the largest single disposal of surplus equipment ever undertaken by private industry. It follows completion of the first phase of the project, which included construction of a network of roads, dams, powerlines and tunnels in mountainous territory. More than 50,000 different items purchased expressly for the project—equipment parts, supplies, materials, both used and unused—are being made available at a fraction of original costs.

An unusual aspect of the sales program is a rental plan that makes most of the heavy equipment available to firms under a leasing arrangement.

Included in the equipment waiting for buyers are: shovels, tractors, cranes, and dump trucks by the hundreds; generators, motors, compressors, and engines in the thousands; mining and tunnel equipment used in blasting the project's 10-mi. tunnel—locomotives, flatcars, and drills of all types; an entire air transport fleet of helicopters and other aircraft; a fleet of boats ranging from a 103-passenger ship and self-propelled barges to outboard motor boats; crusher plants, cement batch plants, and extensive logging equipment and camp facilities.

WHAT DOES IT TAKE TO LAND A BID LIKE THIS?

Skill, integrity and responsibility, to be sure. But often a *low* bond rate can be the *final* factor that tilts the bid in your favor.

So ask your Indemnity Agent to establish your credit line now with Indemnity Insurance Company of North America. This independent company offers the *lowest* bond rates* to contractors of *skill, integrity and responsibility*.

Indemnity's low bond rates save you money. An established credit line assures you of getting bonds on future jobs without delay. See your Indemnity Agent now.

*Sorry, Indemnity's low rates are not available in Louisiana and Texas.

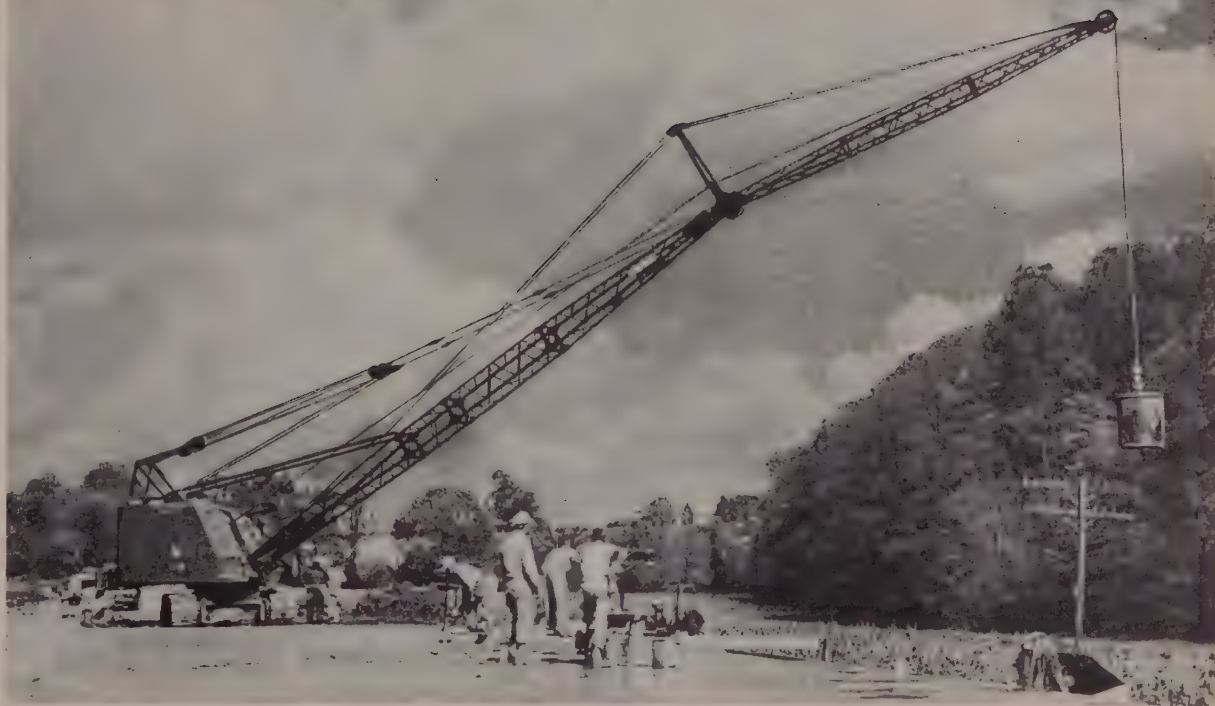
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FAR REACHING, NEW LS-88 uses jib to spot concrete bucket on road job. Patented high gantry is raised and lowered under power, one of many optional extras.

Long, wide and exceptionally stable crawler mountings and shoe widths are available to suit any heavy-duty, ¾-yard job. All clutches are interchangeable.



UP TO 25% MORE OUTPUT — Speed-o-Matic power hydraulic controls cut fatigue. No lag, jerk or strain.



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UP TO 99 NET HP FOR 1-YARD PROFITS — New heavy-duty LS-98. First time Speed-o-Matic in this class.

How to be **AHEAD** on every job

...use a Link-Belt Speeder!
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TTEAM up with the shovel-crane line that gives you the most productive capacity. It's the only line that offers you true power hydraulic Speed-o-Matic control, *and it's on every model.* Choose from many new models—with pace-setting improvements—in the ½ to 3-yard, 10 to 60-ton range. Equip for extra speed, power and work range—to bid successfully on more jobs—*and earn more on all of them.* See your Link-Belt Speeder distributor for complete facts, or write: Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

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Builders of a complete line of crawler and rubber-tired shovel cranes

REPORTS from the COURTS

By HOWARD S. BURNSIDE, Attorney and Registered Engineer

Los Angeles County zoning ordinance upheld

A decision by the Supreme Court of California in 1954 is apt to have far reaching effect in the field of zoning regulation. It concerns the problem of objectionable types of industries operating in areas zoned for other things. The tremendous expansion of Western cities finds many plants, once beyond the city limits, now in zoned areas where the particular operation is prohibited.

For many years existing plants in newly zoned areas had a limited sort of immunity based on constitutional rights. Local government could not re-zone an area and require an existing plant to stop operations, although it could prevent further expansion. In recent years there seems to be a shifting of opinion which works against industry and favors the administrative acts of civil government. This case involves a concrete batching plant in Los Angeles County.

Bodies such as county boards of supervisors can exercise what is called the "police power," and enact reasonable zoning regulations. In addition, if an activity involves public health, safety or morals to a dangerous degree it may be declared a nuisance and stopped by civil authorities without regard to any zoning regulations. The power to zone and the power to terminate a nuisance are distinct and different and the two powers are usually exercised in different manners.

In 1930 the Supreme Court of California quoted approvingly from an earlier case: "public officials . . . cannot . . . change the zoning law and cancel a permit previously issued under the original zoning act . . . It would be nothing short of confiscation, and a complete disregard of constitutional rights, if a municipality could revoke a building permit issued under the conditions as presented in this case." In concluding the 1930 case the court said: "Where . . . a retroactive ordinance causes substantial injury and the prohibited business is not a nuisance, the ordinance is to that extent an unreasonable and unjustifiable exercise of the police power."¹

Early in 1950 the Livingston Rock and Gravel Co. leased land in Los Angeles County, built a batching plant and bought a fleet of mixer

trucks. They complied with all existing ordinances and secured all necessary permits. Soon thereafter the county re-zoned the area and this operation became a prohibited activity. However, the drafters of this new ordinance provided an "automatic exception." That is, such existing structures might be used for another 20 years unless the automatic exception were to be revoked.

All this simply means that an existing business can continue to operate unless its right to operate is revoked. The inference is that the existing business does not have an unqualified constitutional right to operate an investment made in good faith before adoption of the ordinance. In view of the court's words in the Jones case in 1930 one might guess that this ordinance would be disposed of in short order. Unfortunately not, because this new ordinance had some added frills.

The right to continued use of the property can be revoked, under the ordinance, if the Regional Planning Commission finds that there is no impairment of any person's constitutional rights in requiring him to use the property only as allowed by the zoning ordinance. Another section authorizes the planning commission to revoke a permit where the use of the property is exercised so as to be a nuisance. It would seem that the nuisance provision is mere surplusage because this power existed before; but somehow it gives added strength.

In December 1950 the planning commission, after a hearing, notified the Livingston Company that its operation was a nuisance and its right to operate was revoked. An appeal to the County Board of Supervisors was unavailing and Livingston went to the courts for relief. The county admitted that its proceedings were taken under the authority of the ordinance and not under pre-existing statutory authority to act against a nuisance. The trial court held the ordinance to be unconstitutional but the Supreme Court of California reversed the decision, finding that it did meet constitutional requirements.²

The Supreme Court majority opinion placed much importance on the fact that the ordinance used words which said existing businesses were automatically excepted from the prohibitions of the ordinance. But this

same opinion spent little time considering the manner in which the ordinance was actually used to compel Livingston to shut down. The county's action in this case was based on the finding that the plant was a nuisance. And the power to determine this had been placed with the planning commission by the terms of the new ordinance. Now that the ordinance as a whole has passed the constitutional test before the Supreme Court, future actions by future planning commissions may be based on things unpredictable at this time.

A strange statement is made in the opinion. "Manifestly, care has been taken in such rezoning regulations to refrain from the interference with constitutional guarantees, and in the light of such express language it would be a contradiction in terms to hold that the regulations are nevertheless unconstitutional." This is equivalent to saying that the ordinance must be all right because the ordinance says so. This is a dangerous principle. The requirement of constitutionality is implied for every law and it applies without saying so. Likewise, it must apply even when the ordinance avows its own constitutionality. Constitutional rights of the people have been protected by impartial courts of law and not by planning commissions.

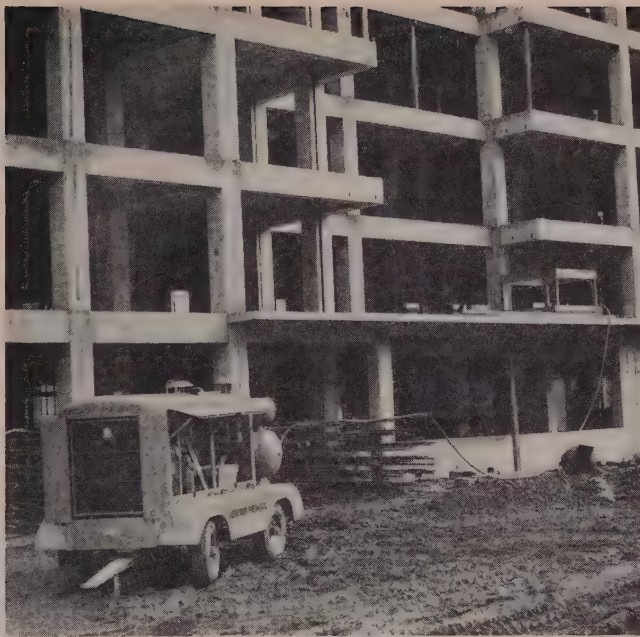
The Court continues, "Likewise, there can be no constitutional objection . . . where . . . it is found that the nonconforming use is so exercised as to be detrimental to the public health or safety, or so as to be a nuisance." Heretofore this was the only valid ground on which the existing operation could have been stopped and the county admitted it was not proceeding under the nuisance statutes.

The following rule is then announced by the Supreme Court and is the law in California today: " . . . rezoning regulations authorizing the revocation of automatic exceptions are constitutionally valid as a whole and come within the prescribed objectives of the police power."

Thus, in 1930 it was wrong directly to prohibit the operation of an existing plant through a zoning ordinance. But in 1954 a similar result may be achieved by automatically excepting the plant from the operation of the ordinance, and then making provision to revoke the exception after certain findings by an administrative body which is fundamentally dedicated to making zoning regulations operate. The plaintiff company felt this was one and the same and an unconstitutional exercise of power. Three judges dissented from the majority opinion.

1. *Jones v. City of Los Angeles* 311 Cal. 304, 312.

2. *Livingston Rock & Gravel Co. v. County of Los Angeles* 272 P. 2d 4.



◀ This other CP Rotary compressor answers air demands for vibrators placing concrete atop a building structure in a Newark, N. J. housing project.

◀ Here a CP Rotary Compressor easily keeps up with the exhausting air demands of pile-driving on a building project in the heart of New York City.

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Whether you're digging a two-acre hole, forty-two feet deep or placing concrete six stories up, you can depend on CP Rotary Compressors to fill the job's air demands to a "tee." CP Rotaries' tried and proved design features afford thousands of hours of operation without downtime for repairs. Compact, lightweight and free from vibration, their oil injection system provides full lubrication . . . yet oil consumption is remarkably low. CP Rotaries are available with Hercules gasoline engines in capacities of 125 and 210 cfm.; and General Motor diesel engines in capacities of 210, 365, 600, and 900 cfm. For more details write for Bulletin 734. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*



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ARIZONA

THE CONSTRUCTION BUDGET for Arizona Public Service Co. as recently announced will amount to \$16,100,000 for 1955. This is part of the \$44,000,000 expansion program announced last year. Of the amount to be spent in 1955, \$11,400,000 will be spent on the electric system, \$2,700,000 for gas facilities, \$800,000 for water properties, and \$1,200,000 for general property improvements and additions.

Completion is not far off for the company's new Saguaro Power Plant, first 100,000-kw. unit of the two units having been placed in service the middle of last year.

"YOU COULDN'T GET any more people in here unless you hung them on hooks" was one comment concerning the crowded conditions now existing in the Arizona Highway Department building. Problems connected with providing a new building for the Department were recently

discussed at a meeting of the Highway Commission. It is hoped that the State Legislature meeting this year will be able to provide funds to alleviate the present situation.

BILLS TO authorize a \$12,937,740 expenditure were introduced in the Arizona State Senate for a building program at the University of Arizona and the two state colleges. Construction of new buildings and remodeling of existing structures would account for the major portion of this amount.

CONSTRUCTION IS WELL UNDER WAY on the \$1,000,000, 148-house addition to Avondale near Phoenix. The development is being constructed by Modern Builders, subsidiary of Del Monte Construction Co., and is designed to provide much needed housing for personnel working at Goodyear Aircraft, Naval Air Facility, and Luke Air Force Base.

ANOTHER LARGE \$2,250,000 subdivision development is going up in Phoenix that will embrace 74 acres

and have 300 homes. H. C. Crittenden, heading the construction company bearing his name, is undertaking this venture.

RECENT MAJOR CONTRACT AWARDS and low bids in Arizona include a low bid of \$118,493 submitted by **Arizona Sand & Rock Co.** of Phoenix for 2.7 mi. grading and paving on Route 90 on the Ft. Huachuca-Bisbee highway. **W. J. Henson** of Prescott submitted a low bid of \$64,504 for 0.5 mi. grading, draining, and seal coating on U.S. 89 on the Wickenburg-Prescott highway.

Isbell Construction Co. of Phoenix submitted a low bid of \$315,955 for 4 mi. grading and draining on Route 77 beginning 16 mi. north of Winkelman. **Phoenix-Tempe Stone Co.** of Phoenix submitted a low bid of \$319,022 for 17.7 mi. surfacing on Route 79 beginning 6 1/2 mi. north of Phoenix. **Royden Construction Co.** of Phoenix submitted a low bid of \$222,679 for 2 1/3 mi. grading and paving in the city of Miami and the construction of two 3-span bridges on U.S. 60-70.



ONLY ONE COLUMN IN THE CENTER OF THE BUILDING

Clean in design, a new Safeway store with a structural steel roof framework was finished in Burlingame, Calif. This type of framework offers a column-free floor area, with the exception of one column in the center of the building. This supports a 160-ft. long master truss running the full length of the structure. Fourteen transverse trusses, each 108 ft. long and supported on steel columns imbedded in the concrete masonry of the walls, are framed into the master truss. Extremely fast erection was a keynote. All of the structural steel was fabricated at Bethlehem Pacific's Alameda Works and erected on time by the company's erection division. **Donald L. Hardison** of Richmond is the architect, and **Elmer F. Steigelman** is the engineer. **MacDonald, Young & Nelson**, San Francisco, is the general contractor.

CALIFORNIA

COAST PACIFIC LUMBER CO. began construction of an additional 500-ft. dock on Humboldt Bay. The cost is estimated to exceed \$250,000.

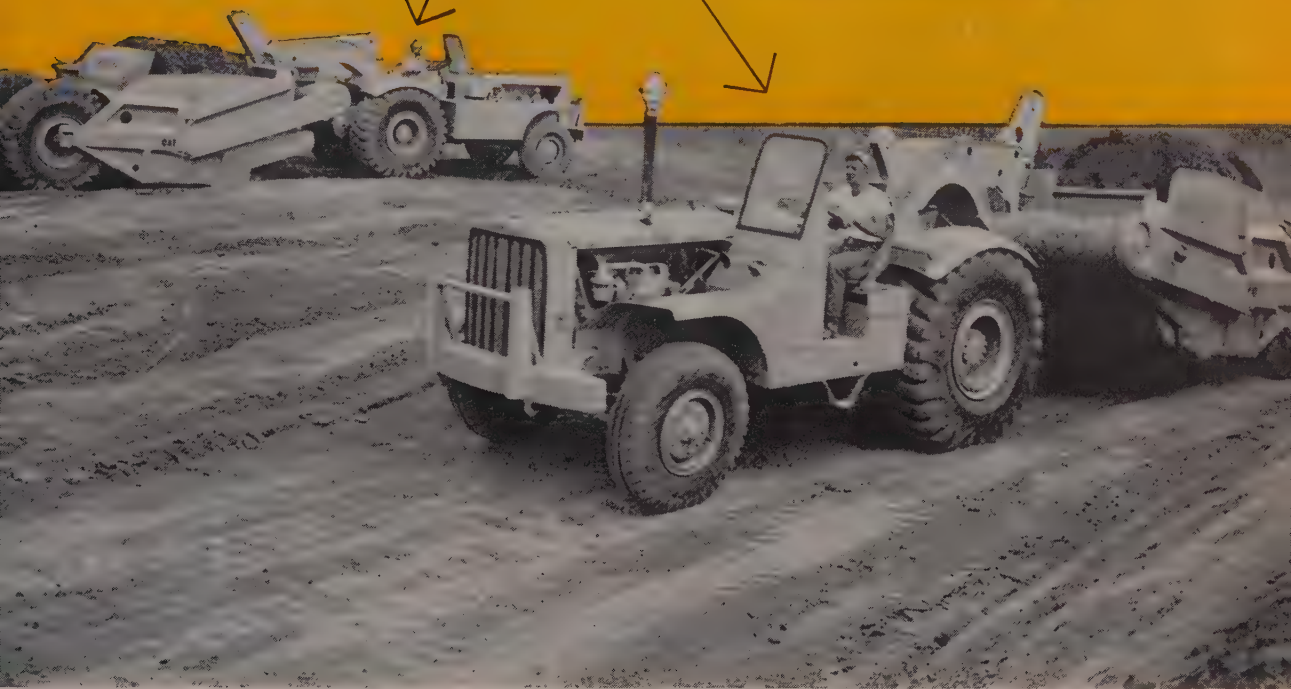
Large ships can now enter the Bay since the U.S. Army Corps of Engineers spent \$500,000 over the last 2 yr. in dredging the bar entrance. Vessels can now be loaded to full capacity and Humboldt Bay may soon become a principal lumber port on the Pacific Coast. Another dock is being planned by the **Oliver F. Olson Steamship Co.** about 7 mi. south of Eureka.

BID CALLS WERE EXPECTED on a 3-mi. freeway extension of U. S. 101 near Santa Barbara. Estimated cost is placed at \$2,200,000, making it the largest of the \$11,592,000 worth of highway projects in Santa Barbara County either under way or scheduled for an early start.

THE FEATHER RIVER PROJECT feasibility report was to be submitted to the California State Legislature this last month. The project, estimated to cost \$1,500,000,000, is designed to provide water for Southern California via a California Central Valley foothill canal and then a series

"They move plenty of dirt

...and they have
that **CAT***
dependability"



A county road south of Bloomington, Kansas, had to be straightened. Fill for the job—some 70,000 yards of clay and loam—were to come from changing Kill Creek's channel . . . a big assignment that called for fast-stepping heavy-duty machines. G. W. Christolear, of Heide & Christolear Construction Co., Smith Center, Kansas, says, "We looked the earthmoving equipment field over, watched all makes of rubber-tired machines, talked to the owners, and settled on Caterpillar DW15s. The fact that they move plenty of dirt and have that Cat dependability convinced us."

The DW15s on this job haul heaped loads in their No. 15 Scrapers, making an 800-yard round trip in just over four minutes. They go ten hours a day on only 35 gallons of fuel.

These 150-HP four-wheeled workhorses are designed and built for tough, fast, economical work. They offer ten forward speeds to 24 m.p.h.—to 31.3 m.p.h. with optional gears. They perform especially well in narrow, confined

areas. And they work smoothly with a complete line of matched units—with scrapers, and with bottom dump and side dump wagons.

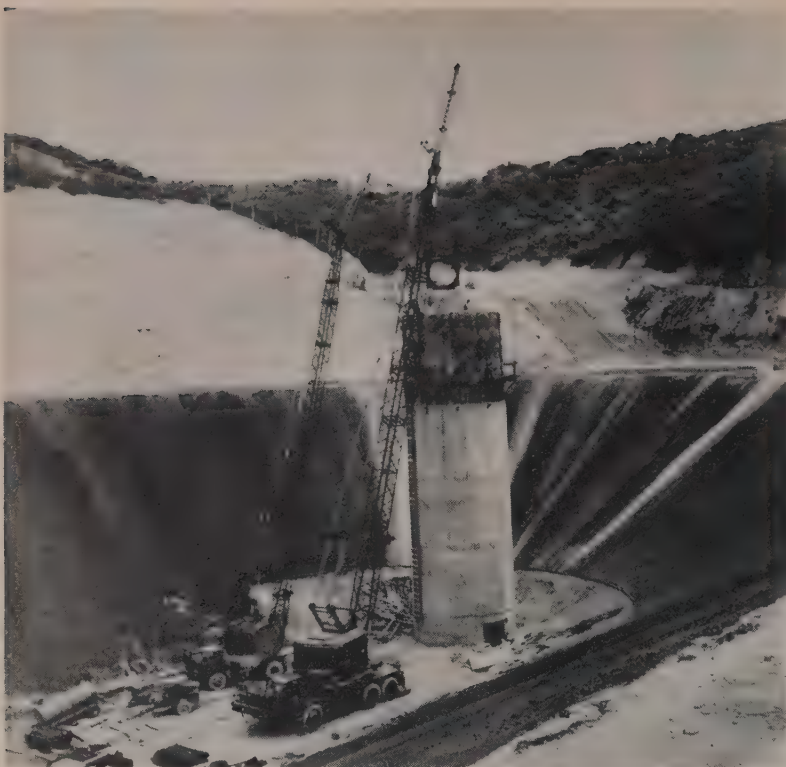
But only a real demonstration can show you the DW15's advantages. Call your Caterpillar Dealer today. And remember, he's always handy with competent service and genuine factory parts—parts you can trust.

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BIG GATES FOR EAGLE ROCK RESERVOIR

Frame and slide are handled separately for 60-in. Rodney Hunt sluice gates to be used in the water outlet tower at this Los Angeles water supply reservoir. To handle the frame and slide separately is unorthodox but the expedient was dictated by weight and height as affecting the capacity of the crane. Other gates, making a total shipment of 28,000 lb. lie on the bottom of the reservoir ready to be emplaced at different levels on the opposite side of the tower. Multi-level gating permits different strata of water to be drawn and aids in keeping water from stagnation. All of the frames, gates, and hoists had to be lifted above the 60-ft. tower and lowered to position. All are cast-iron, bronze-mounted, and built to take seating and unseating pressures of 60 ft.

of pump-lift operations over the Tehachapi Mountains.

DREDGING OF THE MISSION BAY entrance channel near San Diego is under way. Standard Dredging Co. of San Francisco was awarded the work under a \$750,000 federal appropriation being supervised by the U. S. Army Corps of Engineers.

The San Diego City Council ordered the Mission Bay entrance channel closed more than 3 yr. ago when six persons lost their lives in the shallow waters. Widening and deepening of the channel to a 20-ft. depth will make it safe for small boats.

LOTS OF MONEY is being spent and will be spent by the Los Angeles Department of Water and Power to keep up with the future needs of water supply in their area. An \$80,-238,000 construction program is now under way just to provide for people and industries coming in this year, and it is estimated an investment of \$335,000,000 will be spent for improvements and expansions during the next 5 yr.

Important projects included in the program are a 10-mi. pipeline linking Eagle Rock and Hollywood reservoirs to be completed this year. It provides the city's most important connection to the Colorado River supply and is costing \$6,400,000.

Scattergood Steam Plant, located at the El Segundo-Los Angeles boundary near the International Airport, which will cost \$50,000,000 for the first two generating units of 156,000 kw., will be started within the next few months.

Pleasant Valley Dam and power plant, located 290 mi. north of Los Angeles on the Owens River, is being built at a cost of \$2,341,000.

Improvement and enlargement of Lower Stone Canyon Reservoir in West Los Angeles is under way at a cost of \$4,000,000. This dam is being reconstructed and new inlet and outlet lines also being built.

Installation of a trunk line in Van Ness Avenue, that will have a capacity of 171,000,000 gal. per day is costing \$1,365,000.

Eleven power stations within Los Angeles will call for an investment of \$16,833,000. Pumping plants and res-

ervoirs at eight locations within the city will cost \$1,075,000. The Department's 5-yr. program is certainly a big one of interest to most contractors.

SANTA FELICIA DAM and Reservoir has been authorized for the United Water Conservation District of Santa Paula, Calif. The Federal Power Commission has issued a 50-yr. license for this project to be located on Piru Creek in Ventura and Los Angeles counties.

The project will be developed in two stages. The first part, Santa Felicia Dam, is estimated to cost \$8,-000,000. The dam will be about 270 ft. high and provide a reservoir with an estimated storage capacity of 100,000 acre-feet. Powerhouse construction will come at a later date.

OVER 9 MI. OF WATER transmission main is under construction by the East Bay Municipal Utility District with headquarters in Oakland. United Concrete Pipe Corp. has contracts totaling \$390,000 for installation of 7,500 lin. ft. of 24-in., concrete-lined, steel pipe leading from Bryant reservoir near Orinda and another 10,800 lin. ft. of 30- and 36-in. welded-steel, concrete-lined pipe leading from the new 19,000,000-gal. Leland reservoir.

Another large contract of \$476,000 held by McGuire & Hester covers the installation of 29,000 lin. ft. of 42-in. steel, reinforced-concrete lined pipe that leads from the new 50,000,000-gal. South reservoir, now under construction. More than \$7,000,000 is invested each year by EBMUD for improvement and expansion of the publicly owned water service.

A HEAVY, JACKING operation was completed for Southern California Edison Co. when the first 227-ton stator for the first turbine generator was cribbed into place at the company's El Segundo steam station. This operation is similar to that described (*Western Construction*, August 1954, page 84) when two stators were similarly cribbed and jacked up 26 ft. at the Etiwanda steam station of the same company.

EIGHT FEDERAL AID secondary county highway roads were recently authorized by the California Highway Commission that totaled \$1,500,-000. Two of the larger projects were as follows: \$500,000 in San Diego County for 2 mi. of grading and servicing a 4-lane divided road on Alvarado Canyon Extension; \$245,000 in San Joaquin County for 2.6 mi. of grading and surfacing on Tracy Road and construction of a 340-ft. bridge and approaches across Old River.

UNDER A UNIFORMLY applied load of 12,480 lb., prestressed concrete purlins were recently tested for the new California State Printing Warehouse, now under construction at Sacramento. The job requires 180

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Joining the big output of a Symons Cone Crusher with the high screening capacity of a Horizontal Vibrating Screen in this new Cedarapids Portable Plant gives you the best production features of a permanent installation, adds extremely low operating and maintenance costs... and puts it on wheels!

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QUICK! Send me full information about the new Cedarapids-Symons Cone Crusher Plant.

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of these purlins. The test took place at the point of manufacture, the Basalt Rock Company's plant at Napa, Calif., and was observed by State officials as well as representatives of general contractors of the project. The warehouse is being built by Continental Construction Co. and Lawrence Construction Co.

The applied load was the equivalent of $1\frac{1}{2}$ times the live load plus the dead load and results were reported highly successful with observed deflection being less than $1/800$ of the entire span. The prestressed purlins are 10 in. wide, 16 in. high, 34 ft. 4 in. long and weigh

4,800 lb. each. They were prestressed by the Freyssinet method, using 18 wires of 0.196-in. diameter.

In addition to the purlins, Basalt Rock Co. has also manufactured 21 precast I-Beam girders for the job. These beams are 20 in. wide, 3 ft. 6 in. high, 47 ft. 2 in. long and weigh 28,500 lb. each. They were similarly prestressed using 5 cables of 18 wires each.

Precast beams will be shipped to the jobsite via rail and purlins via truck. Precast columns and wall sections were cast at the jobsite by the general contractors.

RECENT MAJOR CONTRACT AWARDS and low bids in California include a low bid of \$1,565,103 submitted by **Guy F. Atkinson Co.** of South San Francisco for 2.4 mi. grading and paving and construction of six bridges and one pedestrian undercrossing to provide a 4-lane divided freeway near Santa Barbara. **B. & R. Construction Co.** of San Francisco submitted a low bid of \$259,488 for construction of roads, buildings, and utilities at Clear Creek, Siskiyou County. **Daley Corp.** of San Diego submitted a low bid of \$609,849 for 3.5 mi. grading and surfacing in San Diego County. **John Delphia** of Patterson submitted a low bid of \$476,821 for 2.9 mi. grading and surfacing and construction of a welded-steel girder bridge located at the Estrella River in San Luis Obispo County.

Griffith Co. of Los Angeles submitted a low bid of \$2,817,519 for 2.7 mi. grading and paving and construction of bridges on the Santa Ana Freeway between Lewis Street and Broadway in Orange County. **Madonna Construction Co.** of San Luis Obispo submitted a low bid of \$2,964,679 for 9.3 mi. grading and paving and construction of six bridges in San Luis Obispo County. **M. J. B. Construction Co.** and **Lord & Bishop, Inc.** of Stockton submitted a low bid of \$1,036,230 for 3.4 mi. grading and paving and construction of four bridges in San Joaquin and Sacramento counties.

Piombo Construction Co. of San Carlos submitted a low bid of \$2,314,554 for 4 mi. grading and surfacing north of La Moine and construction of a steel, plate-girder bridge in Shasta County. **Silberberger Constructors, Inc.**, and **J. B. Stringfellow Co.** of Riverside submitted a low bid of \$386,886 for 0.8 mi. grading and surfacing and construction of a welded, plate-girder bridge in Imperial County.

Charles J. Rounds Co. of Los Angeles received a \$1,143,101 award for construction of the Alhambra-Monterey Park storm drain for Los Angeles County. **Transocean Engineering Corp.** of Hayward submitted a low bid of \$547,525 for 4.4 mi. grading and surfacing on the Clayton road near Concord, Contra Costa County. **Wattson-Kier Co.** of No. Hollywood received a \$305,000 award for construction of the Second St. storm drain in Alhambra. **Claude C. Wood Co.** of Lodi submitted a low bid of \$359,825 for 6.2 mi. grading and surfacing and construction of a welded, plate-girder bridge in Shasta County.

THIS FIELD OFFICE TRAVELS BY TRUCK



This 175-square foot Armco Steel Building serves as a "portable" field office for the Perry McGlone Construction Company, Kansas City, Missouri.

Light weight and a simple foundation make it easy to move this contractor's field office from job to job. It's a Type 1 Armco Steel Building, mounted on skids. When relocation is necessary, the office is simply loaded onto a truck and taken to the next job site.

Interlocking Armco STEELOX Panels provide both structural support and exterior finish in a single unit. This saves framework, rafters and sheathing. Panel joints can't open up or pull apart; they keep the building strong and weather-tight.

Larger Armco Steel Buildings of almost unlimited width and length are also available to meet your big space needs—such as repair shops, garages, warehouses and similar uses on permanent sites. Write for complete data.

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Clear-span widths up to 12 feet.



Clear-span widths up to 40 feet.



Clear-span bays combined for almost unlimited width.



Armco Steel Buildings

COLORADO

CONSTRUCTION of the 14-story Petroleum Club building in Denver was well under way in February. Contractor for the \$4,400,000 building is N. G. Petry Construction Co. An

*Handle with care! 200-ton load
being lifted into place by MOFFETT
gantry crane, built and erected for the
new Valley Steam Plant of Los Angeles
Department of Water and Power.
Capacity of main hoist, 225 tons;
auxiliary hoist, 15 tons. Main span,
45 feet; outrigger, 65 feet.*

For overhead cranes that "baby" big loads and meet construction schedules, see MOFFETT

SIZES: ¼ to 650 TONS



This 408,600-pound generator, which with its turbine cost \$2,000,000, is definitely a "handle-with-care" load. MOFFETT "plant individualized" cranes for public utilities are specially engineered to "baby" such loads... working with safety and efficiency both at the time power plant equipment is installed and for years to come.

MOFFETT cranes are built for quick, easy installation, too. Each crane is completely and carefully assembled in our shop, then match marked... and delivered when you're ready for it. Result: MOFFETT crane parts fit into place accurately and quickly at the job... and on schedule.

When you order a MOFFETT-designed crane, you can be sure it will meet your exact requirements. Our

engineers work directly with you, giving fast personal service, designing special features where needed, such as the 65-foot outrigger shown above.

And in most cases,

MOFFETT "plant individualized"
cranes cost no more than standard designs.

Phone, write or wire NOW for consultation and quotations. No obligation

For sure, safe materials handling, specify MOFFETT
"plant individualized" traveling cranes. Types include:

- continuous duty • heavy industrial duty • intermittent duty
- powerhouse • standby • steel mill • gantry • special purpose

13



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10,000 Tons of Proof... in the last three years alone, we have built cranes with an aggregate capacity of 10,000 tons for such leaders as:

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H. K. Ferguson Co.

Pacific Gas & Electric Co.
Swinerton & Walberg Co.
Robt. Simmons Construction Co.
Stone & Webster
Tennessee Valley Authority
U.S. Army, Corps of Engineers
U.S. Navy
U.S. Maritime Commission
Texas Construction Co.
Foley Bros. Construction Co.



MASSIVE TAINTER GATES AT LOOKOUT POINT DAM

One of the final but important tasks undertaken by Bigge Crane & Rigging Co. at Lookout Point Dam was the installation of seals at the sides of the tainter gates. This large dam on the Middle Fork Willamette River, 23 mi. from Eugene, is now producing power. Shown working above are M. A. "Whitey" White and D. W. Bahr.

1,800-ft. deep well to provide an independent water supply is already down past the 600-ft. depth. Excavation to a 25-ft. depth below street level will be carried on even though the well is not completed.

Because of the building's design, the lower floors will be occupied as completed which may come late this autumn. Final completion of the building should be early in 1956.

A WELDING CONFERENCE on structural welding for bridges was held by the University of Colorado in conjunction with the Colorado State Department of Highways in February. To date, the Highway Department has not designed or constructed welded bridges. The conference was organized in order for bridge designers, engineers and others to better learn the economics of welded bridges of the conventional types, and to learn more about problems involved in design, fabrication, and erection. Steel fabricators and construction companies of the area were invited.

CONSTRUCTION OF A PLUSH, ranch-type, luxury hotel is under way on 9 acres of ground within the Denver City limits. The \$1,000,000, 253-room structure is being built by Hampden Development Co. and is to be completed by this fall.

THE SAN JUAN BASIN will have a new \$9,000,000 R.E.A. electric generating and transmission system under construction before the end of 1955. No site has yet been picked. The project was originated by the Colorado Ute Electric Association, made up of four local R.E.A. co-ops, but

Western Colorado Power Co. will operate the 25,300-kw. plant.

THE NEW \$100,000,000 suburban city to be located a few miles north of Denver and to have been built by Del Webb has been cancelled. The proposed subdivision involving 2,000 acres was dropped when the backers of the project could not get water from Denver and decided it would have cost too much to develop water at the site.

WALKER-LYBARGER Construction Co. of Grand Junction will continue for two more years performing the work that it has for the last six for the A.E.C. compound. Under a cost-plus-fixed-fee contract, the company has about 400 persons engaged in the work which includes furnishing necessary personnel, repairing and maintaining equipment, buildings, housing facilities and other government property, and preparing construction designs and cost estimates among many other things.

SCHEDULED to get under way about May 1 is a 20,000-person city to be located off the Denver-Boulder turnpike. The project, estimated to cost \$100,000,000, will include a total of 6,000 new brick homes, plus other community buildings. The total development will cover 2,200 acres.

IDAHO

MORE THAN 6,000,000 of the 13,500,000 cu. yd. of earthfill which are to go into the Palisades Dam in eastern Idaho has been completed. That

was the situation before winter weather caused a shutdown in dirt hauling and concrete pouring. Present activity is confined to grouting in the main tunnels, installation of penstocks and butterfly valves at the power plant, and excavating some rock in the spillway tunnel. U.S. 26 relocation around the reservoir will be completed this year. A final contract for 4 mi. of road in Wyoming is to be let this month. Total mileage involved in the relocation is about 20½ miles. Reservoir clearing will come up for bidding this month also.

The completed dam, which is scheduled to go into use some time in 1957, is about 50% complete. About 1,000 workers are on the job during the summer construction season.

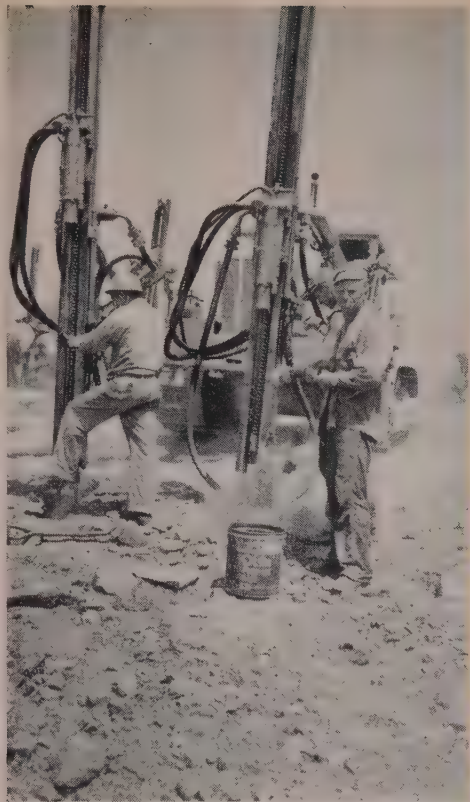
ONE MACHINE to do the same work of a bulldozer, dump truck, motor grader or prime mover has been invented by I. J. Wardle of Boise. The all-purpose machine has all-wheel drive, and rubber tired wheels. In operation the new machine will move against a pile of dirt and load a 6- to 8-cu. yd. capacity box by means of a claw-loading scraper apron. The apron will scrape the dirt to the rear of the box. The machine can then carry the dirt away as a dump truck for distances of 50 to 500 ft. Two-way transmission control is such that the machine doesn't have to turn around at any time for loading or dumping. Once the load has been dumped it can then be spread uniformly without the need of a grader. The operator will sit almost in the middle where he can see what is going on.

RECENT MAJOR CONTRACT AWARDS and low bids in Idaho include a low bid of \$700,757 submitted by **Peter Kiewit Sons' Co.** of Idaho Falls for 12 mi. of road construction on the Banks-Lowman road in Boise National Forest. **Duffy Reed Construction Co.** of Twin Falls submitted a low bid of \$979,907 for construction of 13.7 mi. of highway and widening two bridges on Route 15 in Valley County. **Twin Falls Construction Co.** submitted a low bid of \$239,668 for 2.3 mi. of grading and surfacing Route 51, and surfacing on 14.2 mi. of the Grandview-Bruneau road in Owyhee County.

MONTANA

POWER OUTPUT at Hungry Horse Dam has finally reached its full capacity. With a full reservoir of 3,468,000 acre-feet and operating on a 475-ft. head, the four generators can put out 285,000 kw.

The first generator went into operation in October 1952 although the project was not completed in 1953. Maximum water storage at Hungry Horse in the winter of 1953-54 did not allow for full power development.



Making Time on the N.Y. Thruway!

Le Roi 600 cfm compressor and Cleveland T-286 drill rig speed drilling operation

Motorists aren't the only ones who travel fast on the N. Y. Thruway. Contractors had to make plenty of time, too.

That's why this contractor made a mobile drilling unit out of his D-8 Cat. He used as components a Le Roi 600 CTM compressor and the Cleveland T-286 drill rig.

The compressor is designed especially for use with D-8 or TD-24 tractors. It is the only unit that attaches directly to the PTO and has a clutch as well. Capacity of the unit is 600 cfm.

The T-286 drill rig consists of two Cleveland patented air feeds, and Cleveland 4" drifters with air-motor booms. Here, it is mounted on the front of the tractor and has a spread of 220 degrees suitable for any variable drill pattern. Ten-foot steel changes, faster set-ups, better hole spacing, greater footage, better fragmentation—mean faster drilling and lower costs.

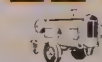
If you want to make time and cut costs on your rock jobs—just put an old tractor to work this way. Write us for literature that tells how.

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COLORADO

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Grand Junction

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Wallace

Equipment Sales Co.
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Crook Company
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Denver Machine Shop
S & M Supply Co., Inc.
Engineering Sales Services, Inc.
Southern Idaho Equip. Co.
Southern Idaho Equip. Co.
Bres Mining Equip. Co.

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Lively Equipment Co.
Industrial Equip. Co.
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Treasure State Equip. Co.
P. L. Crooks & Co., Inc.
Robert Taylor & Sons
Totem Equipment Co.
Blackwell-Coleman Equip. Co.
Gehring Equipment Co.



BIG STEEL PIPE MILL IN UTAH

Steel pipe—the kind that carries natural gas or oil or water—will be rolling from this site in a few months. Engineers of U. S. Steel's Consolidated Western Steel Division are busily engaged in the erection of this mill located adjacent to the Geneva Works, source of the steel plate the new installation will use. Railroad tracks are in and the first building which will house the expanding equipment for the gas and oil pipe in sizes from 20 to 36 in. in diameter can be seen in the center. Foundation footings for the remainder of one of the 980-ft. work bays can also be seen. The new mill is scheduled to start production late this spring.

ONE OF THE LARGER CONTRACTS of 1955 was awarded to Nilson-Smith Construction Co. of Great Falls and Northwestern Engineering Co. when they received a \$4,784,819 contract award for airfield paving and construction of an alert hangar at Great Falls Air Force Base.

The airfield pavement work will involve construction of a 1,000-ft. extension at each end of the existing runway. This will call for 45,000 sq. yd. of concrete 15 in. thick. Also included in the project are placing 30,000 sq. yd. of asphaltic concrete taxiway, placing a 15-in. thick concrete apron totaling 150,000 sq. yd., and removal of about 140,000 sq. yd. of 8-in. thick concrete apron. The structural steel alert hangar will cover 3,600 sq. ft. and provide four hangar pockets.

AT THE 28TH ANNUAL meeting of the Northwest Scientific Association in Missoula the Northwest Power Pool was cited as an effective pooling of federal and public utilities power production facilities. The pool is made up of 11 principal utilities and their generating facilities with the combined capacity of over 7,000,000 kw. and over 17,000 mi. of transmission lines. It was created during World War II on a voluntary basis and has continued since because it saved up to 695,000 kw.—the equivalent to another Bonneville Dam.

The pool spreads over about 700,000 sq. mi. in Montana, Idaho, Utah, Washington, and British Columbia.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include a \$218,864 award to Francis H. Holland of Bozeman for 4.4 mi.

grading and gravel surfacing in Lake County. **Naranche & Konda** of Missoula submitted a low bid of \$401,432 for 10.9 mi. grading, surfacing, and draining on the Whitefish-Stryker road in Flathead County.

NEVADA

CONSTRUCTION OF A 114-MI. pipeline is scheduled this year for the Southern Nevada Power Company's steam plant. The pipeline which will run north from Topock, Ariz., near Needles, Calif., will supply natural gas from the San Juan fields in New Mexico. Cost of the new line is estimated at \$2,500,000.

CONSTRUCTION OF A \$6,000,000 resort type, hotel-casino is scheduled to be built two miles south of Reno. If present plans materialize, the hotel will be ready for operation in 1956. Financing is in the final stages and a general contract should be awarded soon. A second tunnel at Douglas County's Cave Rock on U.S. 50 on Lake Tahoe will probably be built this year. Estimated cost of the new tunnel would be about \$500,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include a \$689,857 award to Wells Cargo, Inc., of Las Vegas for construction of a portion of the state highway system in that city. **Silver State Construction Co.** of Fallon received a \$329,988 award for 11 mi. of roadwork north of Pioche, Lincoln County.

NEW MEXICO

CONSTRUCTION of a 300-acre-foot flash flood retarding dam near Bernalillo is expected to start this month. The dam will be of earthfill construction and involve placing about 100,000 cu. yd. An outlet pipe imbedded in the base will allow impounded flood waters to run up slowly.

Financing is on a cost sharing basis by the Soil Conservation Service and the Santa Fe-Sandoval Soil Conservation District. Flash floods in the area have caused severe damage to Santa Fe Railway tracks and to property in the northern outskirts of Bernalillo.

A CONTRACT was awarded in late January for the construction of a new building to house all administration divisions of the New Mexico State Highway Department. The new building will cost about \$1,100,000. The go-ahead signal has been given the chief highway engineer to enter into the next phase—that is—shops, garages, and landscaping.

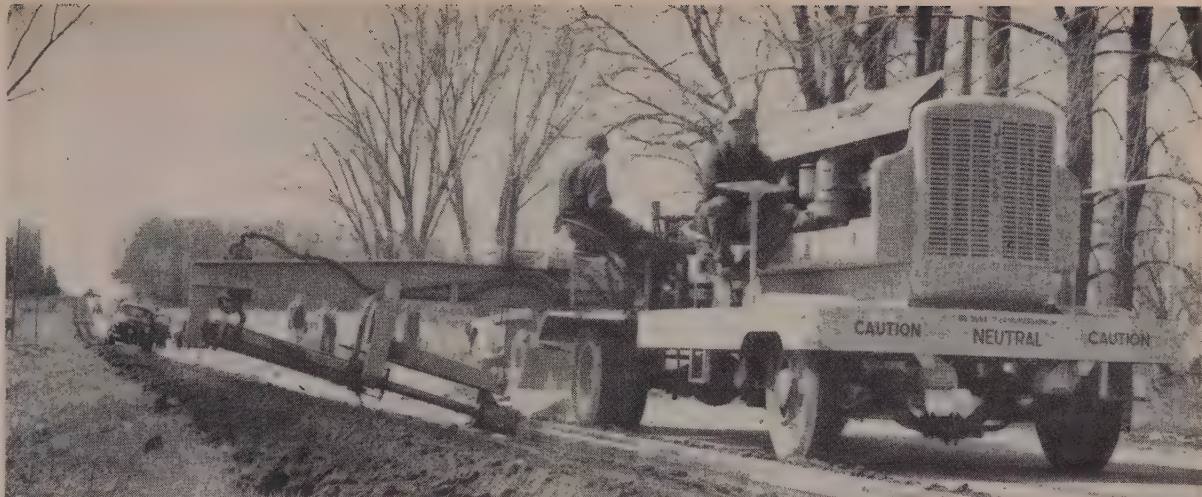
THE COST OF BRIDGE construction in 1955 as compared to 1910 is well demonstrated by the new concrete bridge to cross the Rio Grande at Alameda. The new structure is costing the State Highway Department almost seventeen times the cost of the steel bridge it is replacing. The old bridge was built for \$19,077 and consisted of five steel spans, each 110 ft. long plus 150 ft. of steel approach.

The new bridge on which construction recently got under way is to cost \$316,000 and is to be of pre-stressed block construction, and 961 ft. long—261 ft. longer than the old.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include a low bid of \$117,745 submitted by **C. of C. Contractors** of Albuquerque for construction of the West Albuquerque storm sewer. **Floyd Haake** of Santa Fe submitted a low bid of \$239,000 for 4.8 mi. of grading on the Pleasanton southerly route in Gila National Forest, Catron County. **C. H. Leavell** of El Paso submitted a low bid of \$1,093,077 for construction of the new state highway building in Santa Fe.

OREGON

TELEVISION EQUIPMENT is being used again to observe underwater problems. In this case the Portland District, Corps of Engineers, is using a closed television circuit to inspect the bottom of the Columbia River in the closure area of The Dalles Dam. Observations are being made of the general relief of the river



C. L. Gleason, Chief Construction Engineer, Iowa State Highway Commission, designer; J. D. Armstrong Co., Ames, Iowa, builder.



Machine is run entirely by air—even pneumatically-propelled. Shoulder is first sloped to facilitate its operation.

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Breaking 600 ft. of concrete curbing per hr., at a cost of only 10c a ft. compared to over 35c by other methods, was achieved by Hallet Construction Co. on the widening of 70,000 ft. of Highway 150 between Independence and Walker, Iowa. This low cost and high production was obtained by means of a specially-designed curb breaker powered by a Jaeger "Air Plus" compressor. The

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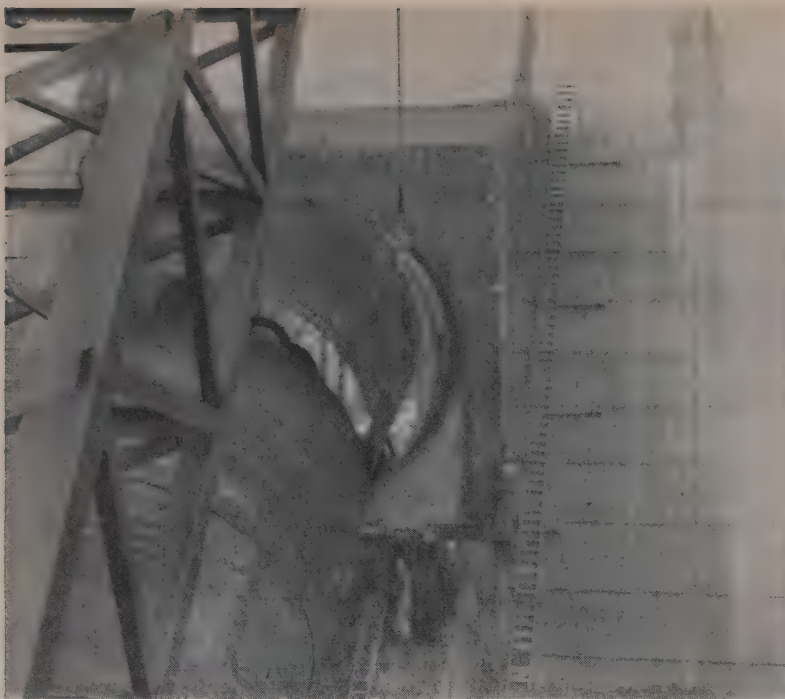
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LAST SECTION OF PENSTOCK GOES INTO CHIEF JOSEPH POWERHOUSE
A 23-ton penstock section was lowered into place late last year that marked the completion of this phase of work by American Pipe & Construction Co. The 16 penstocks, each of which was 25 ft. in diameter and 234 ft. long, required placing 6,015 tons of steel. Each penstock was fabricated in 13 sections and the 12 field joints were welded. For the contractor: *J. S. Volpe, Jr.* was project manager; *Ted Sherwood* was project superintendent; *Lloyd Walters* was project engineer.

bed and to determine whether there is any gravel or rock deposit which would underlay the zone where engineers intend to place impervious material to close the river.

The camera is the same one which was used late last year at Grand Coulee Dam to examine erosion damage at the base of the project's spillway. At Grand Coulee a diver was used to move the camera about on the area to be pictured on the screen above water, while at The Dalles the camera is moved about in a frame developed jointly by the Portland District and by Francis J. Maiken, Commercial Divers, Inc., Linn Moorage, Portland, owner of the camera.

AN EXCELLENT SAFETY PROGRAM placed in operation at The Dalles Dam by H. B. Elder, resident engineer, during 1954 reduced the project accident frequency from 26½ per million man hours worked in 1953 to 9½ in 1954, according to Col. Moorhead, Portland District Engineer. The safety program has been so effective that copies of the program are being sent to other district engineers as an example of a fine safety effort. Accident reduction at The Dalles Dam Project is equivalent to having prevented 70 disabling injuries during 1954.

THE LEGISLATIVE Highway Interim Committee stated in its report to the Governor that it was in no

position to recommend an additional \$0.02 a gallon tax or other methods of increasing highway revenues because of the proposed Federal Highway program and the lack of information regarding the program at this time. Oregon, which originated the gasoline tax, now levies \$0.06 a gallon. The State has also been the leader in the weight-mile tax.

PRELIMINARY INVESTIGATION of the upper Lewis River in Washington is being carried ahead by Pacific Power and Light Co. The work has been under way for several months and is being done in the Swift Creek area upstream from the Yale Dam.

For Pacific Power, Bechtel Corp. is helping with the investigation. Core drilling for samples of the underlying formations is being done by Lynch Bros. Test pits for suitable fill material are also being obtained. Soil studies are being made by Haden Drilling Co., with surveys being run by Pettijohn Engineering Co.

EXPLORATION of two new dam sites deep in the lower reaches of the Snake River canyon, which are expected to add 850,000 kw. to the regional power supply, was being readied today by Pacific Northwest Power Co. as advance crews moved camp supplies and drilling equipment over rugged mountain trails.

Immediate objective of the pioneer

parties was to establish access roads and set up field camps in the canyon before mid-winter snows handicapped travel through the adjacent high country.

To be investigated are the Mountain Sheep and Pleasant Valley dam sites, on which Pacific Northwest Power has filed application for preliminary permits with the Federal Power Commission. The development company's sponsors are Pacific Power & Light, Portland General Electric, Washington Water Power and Montana Power companies, which together serve 800,000 of the region's electric customers.

A 233-ft. dam at Mountain Sheep and a 492-ft. dam at Pleasant Valley would drop water a total of 530 ft. through generators to harness the 850,000-kw. potential of a 55-mi. stretch of the Snake river downstream from Hells Canyon and above the Salmon and Imnaha rivers.

Engineering studies of the site will be carried on jointly by the Bechtel Corp. and Ebasco Services, Inc., with construction cost estimates to be developed by Morrison-Knudsen.

Work parties are being moved in to the camp sites from both the Oregon and Idaho sides of the river. Because of the rugged nature of the country, supplies are also expected to be moved in by boat from Lewiston.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include a \$140,187 award to Allum Bros. Construction Co. of Eugene for 3.1 mi. of grading and surfacing on the Eugene-Marcola road about 2 mi. northeast of Springfield. Columbia Empire Construction, Inc., and P. S. Lord of Portland submitted a low bid of \$159,590 for construction of four bridges on the Pacific highway in Douglas County. Halverson Construction Co. of Burley, Idaho, received a \$124,074 award for grading and bridge construction on the South Fork Windberry road, Willamette project 190-A. Intercity Sand & Gravel Co. and John Kevynovich of Eugene submitted a low bid of \$190,050 for construction of Crescent Lake dam project.

Peter Kiewit Sons' Co. of Longview received a \$152,792 award for 3.5 mi. grading and paving near Klamath Falls. Tom Lillebo of Reedsport received a \$149,014 award for construction of two bridges on the Oregon Coast highway south of Port Orford, Curry County. C. C. Meisel of McMinnville received a \$146,040 award for 3.2 mi. grading and paving on the Yamhill-Newberg highway west of Newberg. Milwaukee Crane & Service Co. of Wisconsin submitted a low bid of \$693,119 for the intake trash racks and lifting beams for The Dalles Dam powerhouse. L. B. Read of Portland submitted a low bid of \$123,775 for construction of the Blodgett Overcrossing on the Corvallis-Newport highway in Benton County.

HOW TO DO 4 JOBS WITH 1 MACHINE



Here's a borrow pit a half-mile from the water works in Kansas City, Missouri. 80,000 yards of fill are being hauled from it, to be placed around the water works' settling tanks. A housing project will go onto the leveled area.

Doing four jobs at once in this pit is a CAT* Diesel No. 112 Motor Grader.

It scarifies constantly—since the dirt in the pit is hard clay. It push-loads a No. 15 Scraper. It keeps the borrow pit clean. And it grades the area as the job moves along.

Working with the No. 112 for Miller Brothers Construction Co., Kansas City, are two DW10 Tractors with No. 15 Scrapers, and a D7 Tractor with bulldozer.

"In the eight years we've been operating," W. F. Miller says, "we've found our Cats to be our most durable and rugged machines."

One reason—in the case of the No. 112—is this: built and serviced *entirely* by one organization, the Cat Motor Grader is carefully balanced, *power* with *weight*

with *speed*. Its engine, controls, and frame and circle assembly are all designed specifically to work with one another. This integral engineering—with matched components—helps give you that durability and ruggedness Mr. Miller is talking about.

There are other reasons, of course, and your Caterpillar Dealer will be glad to discuss them with you. Better still, ask him to demonstrate. That's really the best way to size up this big yellow machine.

And remember, your Caterpillar Dealer is always ready with prompt, genuine parts service, too.

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UTAH

OVERLOADING of Utah highways continued in 1954, with nearly one-fourth of the heavier vehicles being in violation of the State's recommended weights. This is according to a report of the State Road Commission's Highway Planning Department issued in cooperation with the U.S. Bureau of Public Roads.

A test was conducted during the last week of July and the first week of August last year. Most flagrant violations were in the class of vehicle having a two-axle tractor truck and one-axle semi-trailer.

BRIGHAM YOUNG University at Provo has announced a \$5,000,000 building program for additional housing facilities. To be constructed soon will be eight structures to house women students. Estimated cost is \$1,500,000. Also to be built is a men's dormitory—a 4-wing structure providing eating and sleeping facilities for 800 students.

RECENT MAJOR CONTRACT AWARD and low bids in Utah include a low bid of \$325,815 submitted by **Legrand Johnson** of Logan for 5.6 mi. grading and surfacing and construction of a concrete bridge on U.S. 30 from Tremonton westerly in Box Elder County. **Olaf Nelson Construction Co.** of Logan submitted a low bid of \$226,640 for 8.7 mi. grading and surfacing on the Whit Rocks-Lapoint Junction road in Uintah County. **Strong Co.** of Springville submitted a low bid of \$296,451 for 5.6 mi. grading and surfacing on Route 24 and construction of two concrete bridges in Wayne County.

Wheelwright Construction Co. of Ogden submitted a low bid of \$819,610 for earthwork, structures, equalizing and wasteway reservoir, and the Beber Aqueduct on the Weber Basin Project. **Whiting & Haymond** of Springville submitted a low bid of \$146,993 for 6.4 mi. grading and surfacing on Route 54, Garfield County. **L. A. Young Construction Co.** of Richfield submitted a low bid of \$213,464 for 12.8 mi. grading and surfacing on the Oak City-Leamington highway, Millard County.

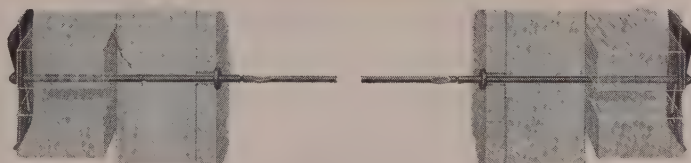
WASHINGTON

ONLY ONE 489 ft. long tunnel remains to be drilled through on the Heart O' The Hills National Park Highway. **Northwood Construction Co.** finished tunnel No. 2,335 ft. long, in January and is due to finish tunnel No. 3 this month.

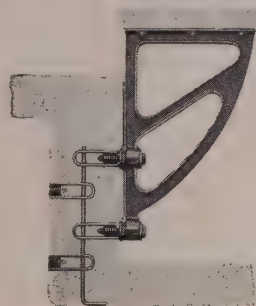
Hugh Govan of Port Angeles has a \$893,180 contract to construct 7 mi. of the Heart O' The Hills National Park Highway starting at the south

SUPERIOR

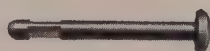
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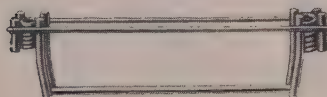
PANEL LOCK BOLTS



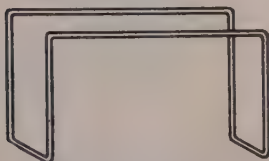
ROD CLAMPS



STANDARD HANGER FRAMES

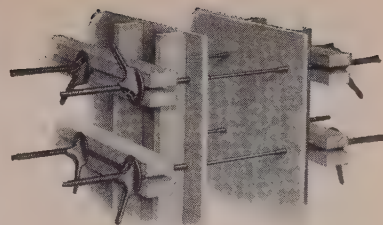


SPECIAL HANGER FRAMES

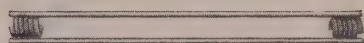


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portal of No. 3. The contract completes the clearing and grading of the 13-mi. highway to Big Meadow on Hurricane Bridge.

PREPARATION for the arrival of natural gas is under way with a \$1,200,000 gas distribution system expansion approved by the Seattle Gas Co. New 12- and 16-in. mains are to be laid immediately through Seattle's industrial area. As the natural gas pipeline schedule becomes more definite, extension of the transmission mains to other areas and to various greater Seattle new residential communities will take place this year. Natural gas may be flowing in the mains by late spring of next year.

ANOTHER LARGE SUBDIVISION is to be constructed by Western Builders Co. in Spokane this year. Nearly \$3,000,000 worth of houses and a shopping center will be constructed there involving at least 200 homes. Work should be under way about April 1.

THE PROPOSED ROCKY REACH hydroelectric dam and power plant on the Columbia River north of Wenatchee came a step closer to construction with the Chelan County Public Utility District No. 1 retaining the firm of Stone and Webster Engineering Corp. of Boston to carry out preliminary engi-

neering studies. The Puget Sound Utilities Council would like to contract for some of the Rocky Reach power; also, President Eisenhower has asked Congress for \$2,000,000 for federal work on the project.

ONE OF THE LARGER contract awards in Washington this year was a \$4,797,801 contract awarded to Morrison-Knudsen Co. Inc. of Seattle for extensive airfield paving and lighting at Fairchild Air Force Base near Spokane. Involved are 3,320 ft. in lengthening a runway, widening the runway 50 ft. on each side for a total runway distance of 10,800 ft., construction of a taxiway, shoulder stabilization with 2-in. asphaltic concrete between all parking stubs and adjacent to taxiways, and construction of a concrete maintenance apron. Some of the larger items involved are 808,000 cu yd. of common excavation, 116,000 tons of asphaltic concrete, and 129,000 cu. yd. of concrete. Completion time allowed is nearly two years.

A 14,000-SQ. FT. building is slated for the Mountain Pacific Chapter of the Associated General Contractors in Seattle. Bid calls were received last month for the 60x120-ft., 2-story reinforced concrete building. Completion is scheduled in September. Incidentally, bidding was limited to

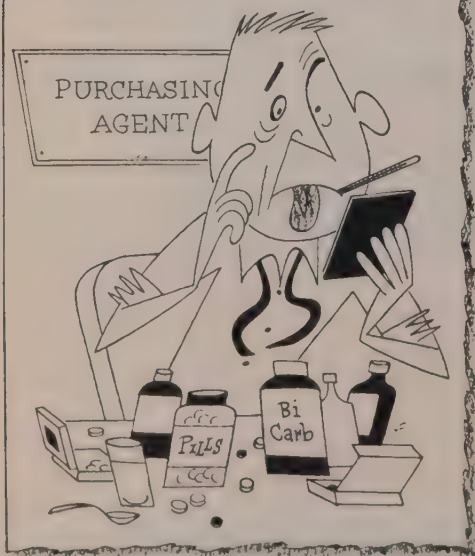
members of the AGC without limitation as to chapter.

THE FIRST CONTRACT has been awarded for construction work on the Cowlitz River Power Dam Project. The award was made by Tacoma Public Utilities Board to Helmer Gustafson of Randall for construction of an access road to the Mayfield site. The entire development of the dams at Mayfield and Mossy Rock is expected to cost about \$146,000,000. Work on the access road was to start about the 1st of March pending right-of-way negotiations that were to have been cleared up about the end of February.

RECENT MAJOR CONTRACT AWARDS and low bids in Washington include a \$164,469 award to Carbon Bros. of Spokane for 4.4 mi. grading and surfacing on Routes 3 and 3-E in Walla Walla and Dumas counties. C. and E. Construction Co., Inc., of Yakima submitted a low bid of \$117,891 for 4.8 mi. grading, draining, ballasting, and surfacing in Yakima County. Curtis Construction Co. of Spokane received a \$192,161 award for 7.2 mi. grading and surfacing on Route 11-G in Grant County. Columbia Asphalt Co. of Yakima received a \$116,524 award for repairing roadway surfaces at Fairchild AFB.

Grant Construction Co. of Coeur d'Alene received a \$142,418 award for

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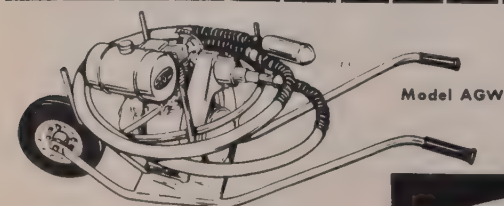
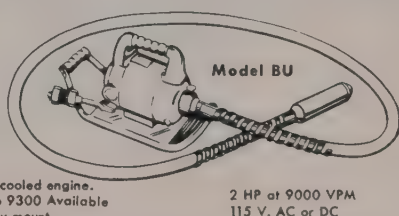
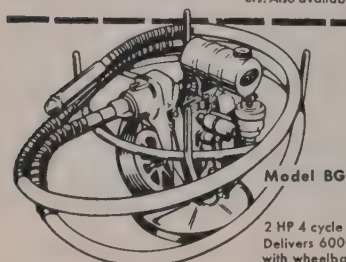
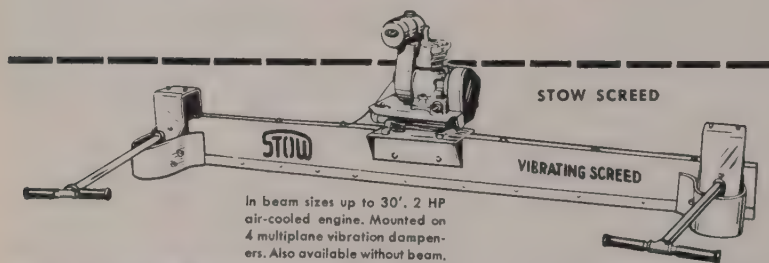
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56 Shear Street Binghamton, New York

31.1 mi. of Franklin County road-work. The Harrison Bros. Co. of Tacoma received a \$265,812 award for 1.9 mi. grading and surfacing on Route 1 in Thurston County. E. R. Haynes of Spokane submitted a low bid of \$553,760 for construction of the Whitman County courthouse building at Colfax.

Lewis Hopkins Co. of Pasco submitted a low bid of \$773,312 for construction work on the Chandler Main Canal, Kennewick. Peter Kiewit Sons' Co. of Longview received a \$694,914 award for construction of The South Bay Bridge of Route 13-A in Grays Harbor County. Larsen Construction Co. of Seattle received a \$1,000,000 award for construction of a new wharf at Standard Oil Co.'s terminal at Point Wells, north of Seattle. Morrison-Knudsen Co., Inc., submitted a low bid of \$2,407,076 for relocation of 14 mi. of the S. P. & S. railroad line on the Washington shore of The Dalles Dam Project. George Pfeiffer & Arnold Pontius of Othello submitted a low bid of \$200,093 for earthwork and structures for laterals, sublaterals, and wasteways on the Columbia River Basin Project.

WYOMING

PRELIMINARY SURVEY and pipe commitments have been made for a 22-in., 365-mi. natural gas line that would link Denver to Rock Springs, Wyoming. This was announced by the Colorado Interstate Gas Co. recently.

The line will connect Rock Springs with the proposed line from the San Juan Basin to the Pacific Northwest. The new line will also be capable of increasing by 100,000,000 cu. ft. the daily gas supply of the expanding Denver market.

SLATED FOR CONSTRUCTION this spring is a new 16-in. diameter crude oil pipeline, 450 mi. long, connecting the eastern Montana area with other lines now operating from eastern Wyoming. The proposed line would be operated by a new company jointly owned by Shell Oil Co. and by the Murphy Corp.

A NEW BILL in the Wyoming house of representatives proposes to increase the legal limit of vehicles on Wyoming highways to a height of 13 1/2 ft. and to allow 3-unit vehicles on public roads. Such vehicles were allowed in Wyoming during World War II, and at that time were deemed safe. Currently Wyoming is a bottleneck to this type of traffic. The legal limits on the size of vehicles would be 8 ft. wide, 13 1/2 ft. high, 40 ft. long for single units, and a combination of single units of more than 3, a 60-ft. total length.



P&H Truck Cranes — two of many that gave a cost-cutting assist on the New York Thruway.

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P&H 255-A dragline cuts clean-up costs in Georgia.

P&H shows how on road jobs . . . everywhere

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ESCONDIDO, California.....Southern Equipment & Supply Co., 301 W. Grand
EUREKA, California.....Riley Logging Supply Co., 1034 Broadway Street
LOS ANGELES 22, California.....Shaw Sales & Service Co., 5100 Telegraph Rd.
OAKLAND, California.....Cook Bros. Equipment Co., 416 E. Eighth Street
SACRAMENTO, California.....Sacramento Valley Tractor Co., 1901 Broadway
SALINAS, California.....Farmers Mercantile Company, 15 W. Alisal Street
SAN DIEGO 13, Calif.....Southern Equipment & Supply Co., 2025 East Harbor Drive
FRESNO, Calif.....Allied Equipment Co., 1824 Santa Clara St.

SANTA MARIA, Calif.....Hanson Equipment Company, Main St. at Blosser Road
DENVER, Colorado.....Liberty Trucks & Parts Co., 690 Lincoln Street
BOISE, Idaho.....Starline Equipment Co., 503 South 16th St.
ALBUQUERQUE, New Mexico.....Leonard Motor Company, 1211 North 4th Street
RENO, Nevada.....Jenkins & Albright, 100 Giroux St.
EUGENE, Oregon.....Loggers & Contractors Machinery Co., 540 Filmore Street
PORTLAND 14, Oregon.....Loggers & Contractors Mach. Co., 240 S.E. Clay Street
SALT LAKE CITY, Utah.....Western Machinery Company, 2300 South Main Street
SEATTLE 8, Washington.....Bow Lake Equipment Co., Inc., 300 Michigan Avenue
SEATTLE 4, Washington.....Glenn Carrington & Co., 91 Columbia Street
SPOKANE 1, Wash.....Construction Equipment Company, E. 3823 Trent Ave.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

BIG DOCK PROJECT—One of the more important new projects for which Uncle Sam has given the green light is the \$4,400,000 dock which will be constructed at the seaport of Seaward. At the peak of construction, hundreds of workers will be utilized, taking the pinch off the dwindling employment in the Seaport city. The dock will replace an old installation labeled unsatisfactory and decrepit. Included in the project are two 500-ft. piers and a large concrete and steel warehouse.

WORK AT GALENA—A major construction project on which bids will have been opened by the time this is in print, is the \$5,000,000 air force job at the tiny village of Galena. This project is notable because, for the first time in Alaska, tar-rubber paving for airfield runways and aprons will be used. The project also calls for extensive buildings and utilities, fuel installations and road construction.

BOTTLENECK REMOVED—Delays in shipping of construction material to Alaska job sites often were caused in the past by a shortage of rolling stock on the Alaska Railroad. Such delays will soon be a thing of the past in Alaska. The railroad's general manager, F. E. Kalbaugh says nearly a million dollars worth of new rolling equipment will be added to the railroad this year. One hundred multi-service cars will begin to roll on the railroad before the end of the year, and this should shatter completely a major bottleneck.

IMPORTANT DATE—A red letter day on the Alaska construction calendar is April 1. That's the date tentatively set for wage talks between carpenters and contractors in the territory. Preliminary talks ended without tangible results the third week of January. At the April meeting, it's expected that important decisions will be made affecting the whole rate structure of wages for the 1955 construction season. Other construction crafts usually have a look-see at the kind of a deal negotiated by carpenters before they advance their own demands. That's why April is a red letter day on the Alaska construction calendar.

UNDER THE AURORA—One of Northland's biggest overland transportation movements is now in progress for construction sites situated north of the Arctic Circle. Sleds loaded with supplies are scheduled to be hauled across the frozen tundra—not by the dog teams used in Alaska's

rip-roaring days—but by mechanized snowmobiles. For publication, the destination of these 'cat trains' is officially 'unknown'—all that has been released so far is that they're headed for radar sites located in the trackless North. Fairbanks employment officials are beginning to hire a few men for the far northern project. As the days lengthen to permit construction for a longer period of time, more will be hired and several hundred will eventually make the trek far north. Right now, beyond the Arctic Circle, Alaska is barely in the middle of its six-months long night, unrelieved even by a glimmer of daylight.

TERRORS OF THE TRAIL—Rigors of cat-train crews hauling materials to jobsites in the remote interior are in the tradition of the rugged frontier North. Crews must steer the trains across trackless terrain, treacherous lakes where sometimes the ice is deceptive. Many sled-loads have been lost when they plunged through soft spots in the ice of lakes and rivers. A few lives have been lost. Worst of all is the numbing northern cold that hovers between 30 and 50 below. A classic story is told of the cat-train man who brought along a bottle of bourbon to "keep him warm" on the trail. He made a mistake of taking a healthy snort of the liquid, which had a temperature almost equal to that outside—40 below. This sub-zero liquid was worse than liquid fire, and killed the unfortunate man almost instantly. This, incidentally, is a good thing to remember if you ever come north.

GOING . . . GOING—Things, engineering-wise, aren't so good at Nome. Circumstances unforeseen when the Bering Sea town's court house and post office building was being constructed back in the Thirties are now making themselves manifest. The modern-appearing building, one of the finest in that historic gold-rush town, has decided to go underground, and is sinking at the alarming rate of more than 3 inches a month. The structure is situated on a gooey, seemingly-bottomless ooze that was frozen when the building was constructed. Apparently it is now thawing and the building's weight will eventually change the first floor to a cellar. Uncle Sam has taken notice of all these goings-on at Nome and the president has recommended that \$1,200,000 be appropriated to build a new post office and courthouse there.

SUPPLY STRATEGY—Military troops north of Anchorage late in January succeeded in constructing an

airfield out of the wilderness in less than 62 hours. The field, constructed through a process involving compaction of snow through pressure and moisture, provided a workable field on which the largest military planes were able to make a landing. Similar techniques can of course be developed for air supply of remote construction projects where speed is of the essence, and where the cost factor is important. It's understood that the military will provide data on airfield construction to contractors interested.

ALASKA'S MOVING MOUNTAIN—A mountain on the Alaska Railroad is giving railway officials no end of trouble. The mountain, located near Healy, north of Anchorage, is pierced by a railroad tunnel. Because the entire mountain, consisting of millions of cubic yards of almost solid rock, rests on an inclined base of permafrost, it is in a constant state of slight but perceptible motion. As the permafrost thaws, the entire mountain begins a slow descent toward a narrow gorge hundreds of feet away. This is just about the number one headache on the Alaska Railroad line. Railway men put their heads together to find a solution to the vexing problem—meanwhile the mountain continued to move.

BAZOOKAS, BLASTING POWDER—It was decided to call the Army in. Soldiers advanced on the mountain and began firing at it point-blank on the theory that the huge mountain would crumble away into the gorge and the movement would stop because most of the weight of the mountain would be blasted away. The mountain continued to hold like the Rock of Gibraltar—and continued to move. But the cannonading, it is reported, scared away all the moose and mountain sheep within a 20-mi. radius. It was the only defeat ever suffered in Alaska by Uncle Sam's finest. This year, the engineers are changing their tactics. Instead of frontal assault, they are attacking from within. A crew of "powder monkeys" has been methodically drilling holes in the side of the mountain and blasting. Each blast sends 5,000 cubic yards of rock roaring into the river below. Railway men are afraid now that with the mountain honeycombed by blasts, it will disintegrate all at once, taking with it a tunnel, a couple of miles of roadbed and commensurate trackage. Newsletter readers will be kept informed as to the outcome of this project.

CONSTRUCTION NEWS CAPSULES—A proposal, still in the talking stage, would tie in the current Alaska highway system with the town of Whittier, now served only by the railroad. No action has been taken on this as yet, but most road officials feel such a road is a necessity and will be built sooner or later.

ENGINEERS on the move

Milo S. Farwell, sales engineer in Bethlehem Pacific's San Francisco district sales office, recently retired after 26 years of service with the company. During this period he



**Milo S.
Farwell**

played an active role in developing the use of steel H-piling on Western construction jobs. Now he plans to engage in consulting engineering practice, specializing in building plastic models as an aid in the design of building structures.

* * *

Robert L. Hahn of Spokane, Wash., is now engaged in private practice as consulting engineer. He was formerly chief engineer with E. R. Haynes, general contractor of that city.

* * *

In recent news from the Corps of Engineers, Portland District, are the following personnel items: Assistant resident engineer at Lookout Point Dam, **Tom Waring**, has been transferred to The Dalles Dam, where he is assistant resident engineer in charge of relocation of the S.P.&S. Railroad. **Thurston B. Wheeler**, formerly employed at McNary Dam, has returned to the U.S.A. after two years in Saudi Arabia with The Fluor Corporation.

* * *

At the annual meeting of The Asphalt Institute recently the following officers were elected: **H. B. Pullar**, chairman of the executive committee; **J. E. Buchanan**, president (re-elected); **Arvin S. Wellborn**, secretary; **George R. Christie**, treasurer; and **John N. Smith**, assistant treasurer. **Raymond Harsch** of Shell Oil Co., San Francisco, as retiring chairman of the Institute will serve ex officio as a member of the executive committee. **N. H. Angell**, American Bitumuls & Asphalt Co., was named vice president, representing the Pacific Coast Division as a member of the executive committee.

* * *

The Asphalt Institute during January moved its executive offices and

laboratories from New York City to the campus of the University of Maryland, in order to expand its research and engineering operations and to take advantage of more modern and greatly enlarged facilities. Located at College Park, near the outskirts of Washington, D. C., the Institute will be more convenient also to government agencies and other interested groups in the capital.

* * *

John H. McVey, district manager of The Austin Company, engineers and builders of Los Angeles, Calif., was recently made vice president of



**John H.
McVey**

the firm. **R. E. Ward**, who has headed the company's Southern California operations since 1925, continues as vice president in an advisory capacity.

* * *

At the annual meeting of the Santa Barbara-Ventura Counties Branch of the Los Angeles Section of American Society of Civil Engineers the following new officers were elected: president, **Richard E. Burnett**, con-

struction engineer of the USBR, Santa Barbara; vice president, **Vernon F. Freeman**, engineer, manager of Santa Paula Water Works, Ltd., Santa Paula; and secretary-treasurer, **George Conahey**, engineer on staff of U. S. Navy School for CEC officers.

* * *

Earl V. Grover, president of Apex Steel Corp., Ltd., Los Angeles, was recently elected president of the American Institute of Steel Construction, Inc. He is the first West Coast man to be elected to this office, according to announcement by the Association's executive headquarters.

* * *

D. M. Forester is the newly chosen supervising engineer of the Yellowstone-Bighorn Projects Office of Re-



**D. M.
Forester**

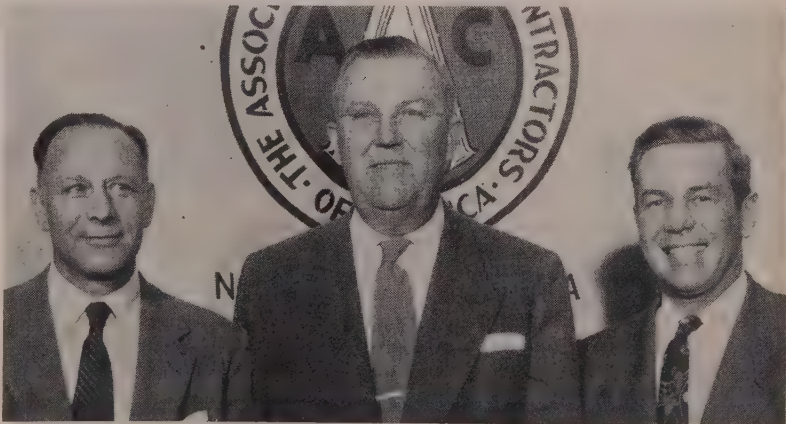
gion 6, Bureau of Reclamation. Located at Cody, Wyoming, Forester has been a member of the American Society of Civil Engineers since 1926.

* * *

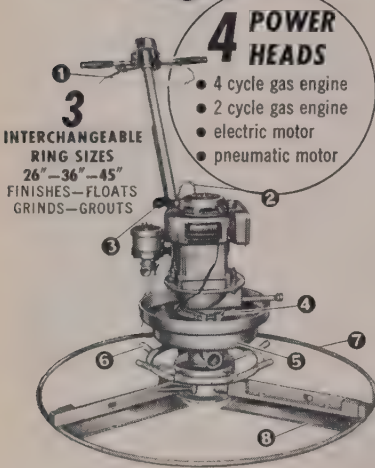
Harry M. Koons was recently appointed to the position of chief construction engineer of the Pipe Line Division of Bechtel Corporation, working out of the San Francisco headquarters office.

* * *

As of Jan. 1, **Warren Hunter** became construction division manager of Fisher Contracting Co., Phoenix, Ariz., and **Carleton Robb** assumed Hunter's previous duties as chief engineer. Hunter has been chief engineer for the past five years. His new



NEW OFFICERS of Northern California Chapter of Associated General Contractors: (l. to r.) **Felix Siri**, treasurer; **Ernest L. Clements**, president; and **Gordon Pollock**, vice president. President Clements is senior partner in the firm of Clements & Co., Pollock is general manager of George Pollock Co., and Siri is president of the Pombo Construction Co. **Frank W. Callahan** is Chapter manager.



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position is one previously held by Del Fisher, who will continue as president and general manager of the firm.

John N. Robertson was recently elected 1955 president of the American Road Builders' Association, succeeding Robert M. Reindollar.

Herbert V. Strandberg, chief electrical engineer with Seattle City Light, has been named to fill the position of chief engineer, in charge of all design and construction engineering. Dwight D. DeNise, principal engineer in charge of inside construction, has been appointed director of operations.

Joseph E. Spink, Engineer, and Associates of Sacramento, Calif., recently announced the formation of their organization into a partnership. Members of the firm are Joseph E. Spink, Donal H. Dean, Enoch E. Stewart, Robert S. Stinchfield, and Melvin R. Stover.

Robert E. Kane recently started a general civil engineering practice of his own at 4 Harte Ave., San Rafael, Calif. He was formerly connected with Western-Knapp Engineering Co., in the Chicago office.

L. E. Wiscombe, engineer-manager at Nephi City, Utah, recently transferred to Murray, Utah, as city engineer, succeeding Davis R. Woods, who has accepted a position in New Zealand for two years.

Herbert E. Prater, regional engineer with the Bureau of Reclamation, Denver, Colo., was recently elected president of the Colorado Section of the American Society of Civil Engineers to serve for 1955. Francis E. Bell of the U. S. Geological Survey was chosen vice president. Dewey S. Wright, city engineer of Denver, was elected secretary-treasurer.

J. B. Barber has been elected 1955 president of Spokane Section, American Society of Civil Engineers. Others elected are: C. A. Moore, 1st vice president; W. W. Wilson, 2nd vice president; J. F. Mangan, secretary-treasurer. Life memberships in the Section were presented at the annual meeting to Thomas H. Judd of Spokane and Lewis M. Norelius, Wenatchee, Wash.

Fred Clayton, a member of the Nevada Public Service Commission at Carson City, has been elected president of the Nevada Subsection of the American Society of Civil Engineers to serve during 1955. Named to serve with him were Ernest W. McKenzie of the McKenzie Construction Co., vice president; and E. J. DeRicco, deputy state engineer, secretary-treasurer.

Embree Reynolds of Marysville, Calif., was recently named 1955 presi-

dent of the Marysville Subsection of the American Society of Civil Engineers, succeeding Charles E. Paulsen. Other officers chosen are B. T. Berndtson, vice president; R. G. Jacobs, secretary, and A. L. Morford, treasurer.

Axel Osberg, president; F. M. Brennan, vice president; and M. P. Butler, treasurer, were elected to lead



Axel Osberg

the Mountain Pacific Chapter, Associated General Contractors in 1955. Osberg, president of Osberg Construction Co., succeeds V. R. Scheumann.

Jose L. Aramayo, project engineer with the California State Division of Highways in Redding, was recently chosen 1955 president of the Shasta Subsection of the American Society of Civil Engineers to succeed Robert Putnam. Other officers elected are George Bralye, vice president; Frank Noel, treasurer, and Robert Reiser, secretary.

H. A. Schirmer, contracting manager for Bethlehem Pacific's San Francisco sales district, was recently elected president of the Structural Engineers Association of Northern California to serve during 1955. Other new officers are Walter L. Dickey, vice president; Harry B. Corlett, secretary; Cecil H. Wells, Jr., assistant secretary; and William K. Cloud, treasurer.

DEATHS

Everett S. Huntington, 61, engineer with the Bureau of Reclamation at Denver, Colo., died Jan. 22 following a two-year illness.

Albert M. Berlander, 69, Bechtel Corporation veteran pipeline field official, died of a heart attack at Port Arthur, Ontario, where he was a consultant on construction of the Trans-Canada Pipe Lines system.

W. H. O'Hair, 65, president of W. H. O'Hair & Sons, contractor of Colusa, Calif., died recently.

William R. Ellis, 68, retired Hercules Powder Co. executive, died recently at San Francisco. Ellis was credited with development of blast-

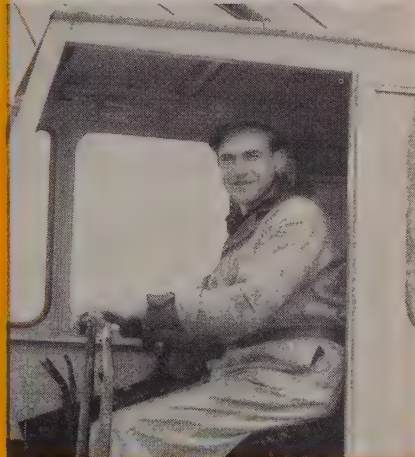
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"Hell, I wouldn't kid you . . . this 'TL' is a sweet running machine."
Operator Del Marous, Trebec Excavating Co., Euclid, Ohio

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8. Jaw Clutches for selection of Swing or Travel.
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LEE REDMAN EQUIPMENT CO.
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ing practices used in building Hoover Dam, and during World War II was in charge of manufacture of all bazooka and other rocket propellant powder used by the armed forces.

* * *

Fred D. Derrick, 48, construction superintendent for Morrison-Knudsen Co., Inc., was killed recently when his car went out of control at Ontario, Ore.

* * *

Frank M. Brennan, Sr., 73, of the construction firm of Goetz & Brennan, died at Seattle, Wash., after a long illness.

* * *

Carl R. Skooglund, 46, city engineer of Vancouver, Wash., died recently of a heart attack.

* * *

Alfred Melander, 85, an estimator for F. J. Kirchhof Construction Co., Denver, Colo., until his retirement in 1951, died recently.

* * *

Robert E. Bell, 32, a civil engineer for Bechtel Corporation at Salt Lake City, died recently of a coronary thrombosis.

* * *

Henry W. Tabor, 61, a civil engineer with the Bureau of Reclamation for the past 28 years, died recently at Denver, Colo.

* * *

Lloyd A. Scanlan, road commissioner of Sierra County, Calif., was killed recently when his jeep veered off the highway.

* * *

Ralph E. Ferguson, died recently at his home in Fontana, Calif. Since 1938 he was attached to the Los Angeles District, Corps of Engineers, serving mostly as project engineer, and at the time of his death held this position at San Antonio Dam.

* * *

Arthur F. Hewitt, 71, structural designer with the Colorado State Highway Department, died recently. He had been an engineer with the Department for 25 years.

* * *

Arthur J. Davidson, 54, for 18 years an employee of the Colorado State Highway Department, died recently. At the time of his death he was superintendent of the recently completed Denver-Boulder turnpike.

* * *

George J. Johnson, 73, a partner in the Western Construction Co., Seattle, died recently following a heart attack.

CALENDAR

Mar. 9-12—American Concrete Pipe Association, annual meeting at Sheraton-Plaza Hotel, Boston.

April 18-19—American Institute of Steel Construction, national engineering conference, Hotel Muehlebach, Kansas City, Mo.

SUPERVISING the jobs

November and will run 1,200 days.

* * *

W. R. Bauske, general superintendent, and K. Kitchens, job superintendent, are chief supervisors on the \$1,200,000 construction of a high school project at Eunice, N. M. Work started November 1 and is progressing satisfactorily, with completion date estimated at 360 days.

* * *

Don Westbrook was job superintendent on a contract held by Morrison-Knudsen Co., Inc., and R. A. Westbrook for 8 mi. of new railroad at Mojave, Calif., for the Southern Pacific. Westbrook was assisted by Del Hoyt, excavation and grade; Ken McKinney, master mechanic; and Pete Bassette, pile driving. The job was on schedule and finished on time.

* * *

Arnold Anderson is superintendent for Gust K. Newberg Construction Co. which has a \$1,887,000 contract for constructing a medical unit at the Metropolitan State Hospital, Norwalk, Calif. Job got under way in mid-December and is scheduled for completion in about 400 days.

* * *

A. D. (Ace) Miller has been named to superintend the construction of the Colorado River Bridge, a 300-day job which recently was awarded to Fred J. Early, Jr., Co., Inc., on a bid of \$1,236,765. Work consists of a steel girder span and an approach embankment at Yuma, Ariz.

* * *

K. Poss, superintendent; Grant Brown, assistant superintendent; Tom Brooks, office manager; and Bill Bishop, master mechanic, comprise the top men on the \$5,107,822 contract being executed by Fredrickson & Watson Construction Co. for 4.8 mi. of grading and paving, including nine concrete bridges, in Contra Costa County, Calif.

* * *

Arnold Dehn, with the assistance of L. L. McNeil and W. R. Grinnell, is superintending the construction contract of Sharp & Fellows Contracting Co. for grading and surfacing 0.4 mi. of road in San Bernalillo County, N. M. This 250-day job was awarded on a bid of \$316,559. W. A. Dodson is in charge of the office.

* * *

W. O. (Ole) Orrestad is general superintendent; M. W. (Mac) McKown, job superintendent; Earl King, job engineer, and Bernard Moen, job clerk, on construction of a high school project in Seattle, Wash., by H. Halvorson, Inc., which won the contract on a bid of \$1,928,047.

* * *

Kenneth DeWitt, superintendent, is in charge of grading and draining work on US Route 70 crossing Salt Creek, 30 mi. southeast of Globe,

Ariz., a \$141,678 job currently under way by Dale F. Payne Construction Co.

* * *

Terry N. Buchanan, project manager; Carol L. Nelson and Arnold Sather, project supervisors; and L. Wayne Moses, project engineer, are key contractor men for Buchanan, Sather & De Rycke which is handling the \$167,777 construction of Mesa pumping plant and canal lateral, Block 14, Columbia Basin Project, Wash. Work has just started and is scheduled for completion in 645 days.

* * *

N. E. Parson, general superintendent, and William Phillips, project superintendent, are top men on the construction of 1.2 mi. of roadway with railroad underpass on Price road from US 91-191 to US 30, Bannock County, Ida. Arnold Draper is grade foreman. C. H. Elle is handling structures under a subcontract. None but preliminary work will be done before spring, but the job is expected to be completed by mid-August.

* * *

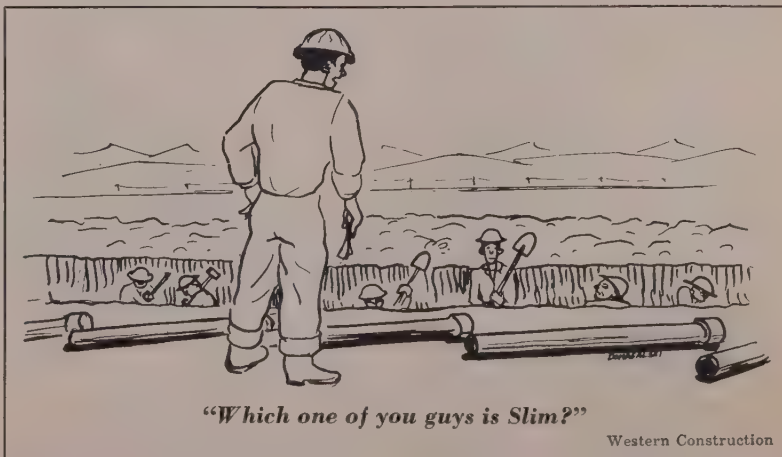
James E. Dunn, superintendent; James Brodt, project engineer, and Roy L. Thies, office manager, are top personnel employed by Lytle & Green Construction Co. which was recently granted contract on a low bid of \$6,270,790 for power plant foundations and roads on the Glendo Dam Project, Oregon Trail Division, in Wyoming. Job started the end of



KEY MEN for Vinnell at Edwards Air Force Base near Los Angeles: (l. to r.) Schyler Walker, general superintendent for all operations; Neal Lange, general superintendent in charge of steel erection; and Robert Walling, job superintendent on erection of the hangar. (For description of job, see page 53.)

Ernie Gound and Don Chapel are superintending for Ernest C. Mohamed who recently won a \$356,839 award for grading and draining and base surfacing a 2-mi. stretch at Phoenix, Ariz. Work started in mid-December and completion date is set for June 30.

Down-time By Domagalski



Western Construction



ON THE JOB at Alcango (l. to r.): **Edward Huback**, spread superintendent for Williams Bros.; **William Lennon**, area engineer for Army Corps of Engineers; and **B. E. "Barney" Barnes**, vice-president of Williams Bros.



REPRESENTING the U. S. Army Corps of Engineers and its Alaska District in the administration and supervision of the Alcango Project: **Lt. Col. John E. England** (left) as resident engineer, and his assistant, **James Biddison**.



H. L. (RED) DAVIS (right), general superintendent of Alaska Division of Williams Bros., chats with **Dick Hamilton**, trenching superintendent.

Here are people who helped on the Alcango pipeline

Some of the key personnel who pushed through the Alcango pipeline (see page 29 of this issue) in Alaska and northern Canada are **A. M. Garber**—resident manager for the joint-venturers (William Bros., McLaughlin, Inc., and Marwell Construction Co.); **R. H. Kerr**—assistant secretary; **B. E. (Barney) Barnes**—vice president; **Ben Hasha**—project engineer; **Paul Cote**—technical engineer; **"Red" Davis**—Alaskan spread superintendent; **Ed Huback**—Canadian spread superintendent; **G. R. (Dick) Hamilton**—trenching. Superintendents included **Clyde Gregory**, **Jack Engleking**, **"Red" Smith**, **Harold Brady**, **Ray Crane**.

Engineers included **"Red" William**, **"Southern" Comfort**, **Al Ross**, **Larry Parker**, **Roy Bartlett**, **Ray McGuire**. Foremen were **Dick Woodring**,

Spence Lambert, **"Red" Stoakes**. Welders were **Chambers**, **Jensen**, **Burgess**, **Swift**, **Beale**, **Sydowski**, **Hamlin**, **Barber**, **R. McDougall**, **Belmar**, **Smith**, **Lambert**, **Dunham**, **Hill**, **Peasley**, **Lyster**, **Roberts**, and **Eby**. Safety engineers were **Don Edwards**, **L. White**, **"Doc" Kellam**, **Don Bacce**. Cat skimmers were **Mike**, **Kasloski**, **George**, and others.

Canus Service, commissary company, had **Fred Thomlinson**, **Jack Brownlie**. **Oaks Construction Co.** on Alaskan clearing had **Carl Oaks**, **W. Butcher**, **R. Crawford**, **Tope**, **Smith**, **McMann**, **J. Beale**. **Omack Co.** on Canadian clearing had **Charles Ash**, **H. Balfour**, **Cliff Thompson**. **General Enterprise of Whitehorse** on hand clearing had **Harry Frome**, **"Smokey" Stoot**, **McIssac**.

Corps of Engineers' personnel in-

cluded **Col. Carl Y. Farrell**—district engineer; **Alaska General Projects Branch** included **Capt. James Trimble**, **Bob Prescott**, **Charles Campbell**, **Gus Steinwandell**, **Dick Huston**, **Leo Kelly**; resident engineer—**Lt. Col. John England**; assistant resident engineer—**James Biddison**.

In the resident engineer's office: **Foster Harrington**—structural; **Capt. Bill Martin**, **C. B. Russell**—mechanical; **Herb Dodderage**—electrical; **Hugh Tyler**—civil; **H. A. Sherman**, **Dedes**—office engineers; **Joe Dukes**—welding; **Alice Burnson**—drafting; **Dick Moore**; **W. Hickinson**, **J. Von Gillern**—surveyors; **Mel Blevins**, **R. Fischer**—engineering aides; **Ethel Smock**—administration; **Jay Scherer**—property; **Doris Johnson**—mail and records; **"Binks" Sieffert**—automotive maintenance.

Area engineers—**J. L. McNamara**, **William Lennon**, **Jack Spangler**; assistant area engineers—**Dave Nease**, **C. B. Russell**, **Jack Stegge**; inspectors—**G. T. White**, **G. F. Flinn**, **Harry Knutson**, **L. J. Drake**, **Fred Burns**, **James Wilson**, **George (Beau Brummel) Kraft**, **Bob Rushing**, **Dick Shock**, **T. Rockwell**, **L. A. Roby**, **Charles Bicknell**, **Weaver Rushing**, **Mel Blevins**, **Dick Campbell**.

Isotope Co. (radiographic welding inspection): **Al Moft**—president, **Texas Corp.**; **M. Duncan**—Canadian Corp. **Elmer Smith**, **Woody Nolen**—superintendents; **Ashby and Staggs**—foremen; **Bud Abbot**, **Jack Robinson**, **F. Stovall**, **E. Adamson**, **J. Willett**, **J. Rieley**, **B. White**, **Appleton**, **Mobley** (visual inspectors), **Ken Vallens**, **F. Carlson**, **D. Nieken**, **A. Worfold**, **S. Kasco**, **J. McPherson**, **N. Lamarre**, **Don Eldes**, **B. Lenard**.

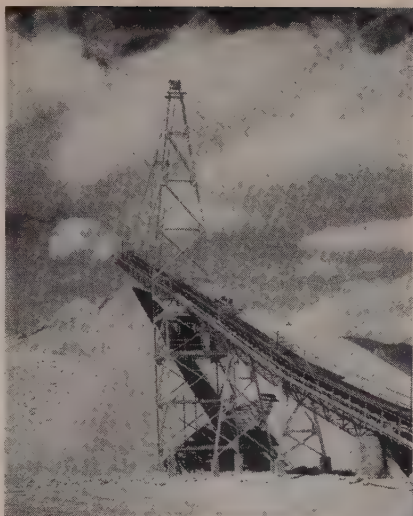
McLaughlin, Inc., of Great Falls, Mont.: **J. L. McLaughlin**—president; **O. W. McIntyre**—secretary.

Marwell Construction Co., Ltd., of Vancouver, B. C.: **B. Chaslesworth**—vice president; **C. E. Barker**—secretary; **H. A. Martin**—vice president; **Erric Hagberg**, **B. Ruffel**—superintendents; **"Reg Ward"**—**R. Stewart**, **E. Jones**.

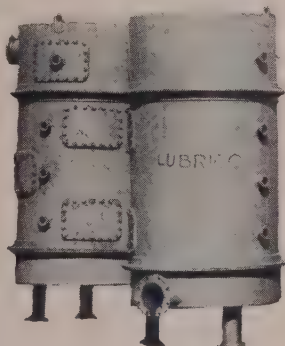


AT THE HAINES END of the Alcango Project (l. to r.): **B. D. Edwards**, representing the prime contracting combine; **D. S. Nease** and **G. T. White**, Corps of Engineers, inspectors; **E. A. Groves** and **A. E. Johns**, clearing sub-contractors, and **J. L. McNamara**, Corps of Engineers, project engineer at Haines.

DOES YOUR JOB CALL FOR SPECIAL EQUIPMENT OR COMPONENTS



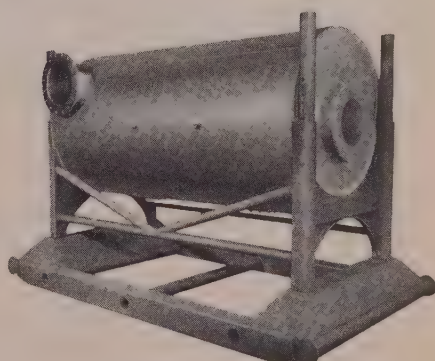
Conveyor stacker at end of mile-long conveying system for carrying crushed rock (minus 8").



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1000-ton, double-drum hoist, designed to handle a 194-foot digging ladder on large dredge.



Diesel engine exhaust silencer, skid mounted for portability. Built for export.

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Fast penetration in hardest materials

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Really shatters rock for easy loading

Curved standards provide natural draft to keep points down, produce underground quivering action that seeks out cracks and weak spots. Shatters rock and hard materials to easy-loading condition...you get bigger loads faster, with less scraper wear and damage.

8,800 lbs.* of rugged strength

Takes full power of largest track-type tractors and either rips rock or stalls tractor. ATECO drawbar takes the pull—no strain on tractor case.
*with three standards; 7,500 lbs. with two.

Available for Caterpillar D7 and D8, Allis-Chalmers HD20, and International TD24 tractors. Sold exclusively through your Caterpillar distributor. See for yourself how an ATECO ripper boosts yardage and saves equipment. Call your "Cat" dealer for a demonstration NOW.

#27

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R. B. Kurtz is project superintendent and H. M. Haish is superintendent for Fredrickson & Watson Construction Co. on a low bid award of \$785,555 to this firm for 2.9 mi. of grading and cement treated base surfacing in Shasta County, Calif. On this 400-day job, which got started November 1, Tom Brooks is timekeeper, and Bill Bishop is master mechanic.

* * *

Jack Adams, superintendent, with the assistance of John Leverton, concrete foreman, and John Lee and C. Luttrell, grade foremen, is supervising Jack Adams' contract for 14.9 mi. of grading and surfacing in Sandoval and Santa Fe counties. N. M. A \$722,719 award, the job is expected to take 275 days. Hazel Dodson is field clerk.

* * *

I. H. Poston, superintendent, and C. J. Belton, master mechanic, were among the top men for Stock & Grove, Inc., on the recently finished storm sewer job at Anchorage, Alaska, a \$419,032 contract.

* * *

Jess (Sully) Willis, job superintendent, assisted by Duane (Buck) Homewood, is supervising a highway job in Targhee National Forest in Idaho for Peter Kiewit Sons' Co. which was granted the contract on a low bid of \$199,059. Jim Rosson is also assisting as master mechanic.

* * *

Cliff Campbell, superintendent, with the assistance of Adlie Hunt, supervised the construction of the recently completed expansion to a lumber mill in Flagstaff, Ariz. This was a \$1,500,000 contract executed by Dickmann - Pickens - Bond Construction Co. Ralph Shelby handled the office work.

* * *

H. H. Stewart, general superintendent; J. L. Cain, assistant superintendent; A. W. Zegeer, job engineer; and W. B. Hugo, office manager, are key men on the construction of an oil refinery plant at Salt Lake City, Utah. The Fluor Corporation, Ltd., has the \$2,500,000 contract which is scheduled for completion in May.

* * *

Carrol January is superintending a grading and draining job 16 mi. south of Ash Fork junction near Chino, Ariz., for Lyle Price. Two other important men on this \$484,889 project are Bill West, drilling and powder foreman, and Glen Lambson, timekeeper. Job is scheduled for completion the middle of May.

* * *

Ernest Kisse is general superintendent and N. V. Raney is utility superintendent for Lease & Leigland and M-B Contracting Co., Inc., which is constructing a warehouse and appurtenances at Anchorage, Alaska, at a cost of \$266,910. Other important personnel on this work are Fred Holm and Harold Rhett, carpenter

Guy F. Atkinson reaches 80th birthday

About 350 celebrants from across the nation gathered in San Francisco on Jan. 15 to honor Guy F. Atkinson, internationally-known construction pioneer and chairman of the Guy F. Atkinson Co., at a testimonial dinner held in the Sheraton-Palace Hotel. The event marked Mr. Atkinson's 80th birthday and his 64th year in the construction engineering field.

High point of the occasion was the unveiling of a massive portrait of the octogenarian painted by the Hillsborough (Calif.) artist, William Holt, a grand-nephew. Tributes were paid Mr. Atkinson by old friends and business associates from numerous fields. Speaking on his philanthropic activities, M. D. L. Fuller, a San Francisco attorney, told the part Mr. Atkinson

plays as director of two foundations bearing his name. The foundations are dedicated to the support of hospitals, churches and schools—providing funds for both scholarships and maintenance.

Speaking as both friend and long-time employee was Atkinson vice-president, David Root. His son and business partner, George H. Atkinson, told of the warm and energetic qualities which are so strongly identified with his father and to which his success and high esteem are attributed.

Under Atkinson's direction, the company which he founded and is now chairman of, grew to international importance, with projects underway here and in the Far East.

foremen; **Harold Leader**, office manager; **William Neve**, timekeeper, and **W. H. Bookwalter**, master mechanic. Completion date, July 31, 1955.

Don Mahoney, area superintendent; **Bill House**, project superintendent; and **Ivan Goodwin**, carpenter superintendent, are among the key personnel of **Stolte, Inc.**, employed on the \$1,346,221 construction of a 4-story courthouse in Sacramento, Calif. Work has been under way since the middle of last September and is scheduled for completion this coming September.

Jack W. Baker, partner in the joint firm of **George W. Peterson & Jack W. Baker**, heads up the construction of 4 concrete box girder bridges, approaches, etc., between **Kiel St.** and **Odava Place** in Los Angeles. Superintending this \$722,658 contract is **Fred Falk**. **C. C. Perkins** is office manager. The work will probably end in August.

Elmer V. Moss is superintending his own contract for construction of 65 houses in **Mercer Island, Wash.**, a \$1,200,000, day-labor job. **Erling Bergslien** is general foreman of the work and **Gus Swanson** is buyer and office manager. Going since June 1954, the building project will probably be finished the end of this year.

Rudy Buhlman, general superintendent; **Walter Small**, superintendent; **Marvin Lokkesmoe**, job engineer, and **R. B. Lane**, timekeeper, comprise the leading personnel on construction of a 3-story factory addition to the **American Can Co.** plant in San Francisco. **J. H. Pomeroy & Co., Inc.**, started work on this \$2,500,000 undertaking in September last year and expect to finish in June.

Paul A. Thorn, president and manager; and **Francis Bradley**, vice president and project superintendent, are supervising their own contract re-

cently awarded **Thorn Construction Co., Inc.**, at a cost of \$1,242,539 for construction of a portion of state highway in **Clark County, Nev.** Master mechanic on this job, scheduled for completion in July, is **Arch Cameron**.

J. C. Colhouer is superintending the construction of the **Youngs Lake** guided missile launcher and control areas, **Seattle** and **Tacoma** section, in Washington. This is a \$394,152 contract by **Cisco Construction Co.**

F. E. Stearman, project manager for **Seth W. Henderson**, was recently on a \$211,000 state highway job near **Superior, Ariz.**, for this contractor.

Hal McGregor is job superintendent for **Griffith Company** on a \$3,400,000 contract for 3.3 mi. of highway and 6 structures on the **Ramona Freeway**, east of **El Monte, Calif.** Engineer on the project is **Dave Stratton**. **Ralph Preston** is in charge of the office. Bridge superintendent is **C. E. McCracken**, and working under him as foremen are: **Dan Carroll**, **Gus Bjornson**, **Mel Kruse**, **Sam Hurley**, **Forest Grounds**, and **Artie McCracken**. Grading foreman on the highway are **Caesar Stringer**, **Ernie Arant**, **Bill Cox**, and **Harry Scott**.

Ralph Tice is superintendent on the **Garvey bridge** and **Harry Voeke** is superintending construction of the **Durfee bridge**, two structures on the **Ramona Freeway** in Los Angeles County. **Peter Kiewit Sons' Co.** has this contract.

Working under the superintendency of **W. F. Mello** on construction of two buildings at the **University of California, Goleta**, are **Cullen Burke**, carpenter foreman; **Richard Nardeau**, labor foreman; **F. Adams**, crane operator, and **C. A. Sellentine**, oiler. **Pat Vernon** is in charge of the office. Other personnel working on this joint venture of **Williams & Bur-**

rows, Inc. and **Carl N. Swenson Co., Inc.**, were listed in the November 1954 issue.

Ray Andicochea, general superintendent, assisted by **Jim Ferrara**, foreman, is directing the work of **Gilbert J. Martin Construction Co.** which is erecting 49 dwellings in the **Freeway Manor Tract, Los Angeles**.

George Ainsworth is supervising construction of 34 homes in **Gilroy, Calif.**, for **W. O. Logan** of **San Jose**, the contractor.

Harold E. Weaver, general superintendent, and his assistant **L. B. Westfall**, are top supervisors for **James I. Barnes Construction Co.** on a \$4,000,000 contract for the erection of 23 Class A buildings at **Reseda High School, Reseda, Calif.** **Dick Finan** is field engineer, and **Williard Flinders** is chief clerk. Carpenter foremen are: **J. F. Rogers, Jr.**, **C. J. Laurutis**, **J. L. Marbale**, **J. C. Van Dine**, and **L. E. Elliott**. General labor foreman is **H. J. Pitcher**, being assisted by **F. H. Bierle** and **Robert Huitron**, foremen.

Joe Collins, general superintendent, is directing construction of the **May Company** store at **North Hollywood, Calif.**, for the contractor, **T-S Construction Engineers, Inc.**, which expects to have the job completed this coming September. Chief Engineer is **A. Bean**. General carpenter foreman **Otis Holt** has the assistance of **Fischer**, **Prasch**, **Allen**, **Howarth**, **Stonke**, **Dashiell**, and **Widsen**, foremen. General concrete foreman is **J. Johnson** and labor foreman is **Oliver Starr**. **R. I. Widdis** is job coordinator.

George Young is doing the electric work, with **Fred Williams** superintending. **Johnson-Washer** has the plumbing contract, with **Bob Smith** superintending and **J. J. Weeks** as lay-out man. Other subcontractors are: Air conditioning—**Western Air & Refrigeration, Inc.**; **Bob Bird**, superintendent. Reinforcing steel—**Blue Diamond Corp.**; **J. Crain**, superintendent. Plastering—**Carroll Duncan**; **Bob Hallet**, superintendent. Structural—**Bethlehem Pacific**; **Jack Hamilton**, superintending. Sprinkler—**Automatic Fire Protection**; **Georg Gierloff**, foreman. **O. K. Forshee** represents **A. C. Martin**, architect.

Jim Berry, superintendent for **Raymond Concrete Pile Co.**, is in charge of building four overpasses at **Firestone Blvd.** and **Valley View St.**, **Los Angeles**. Foremen are **Jeff Townsend**, pile driver; and **Bob Davis**, concrete.

Charles V. Anderson is located at **Peterson, Utah**, where he is employed as engineer for **Morrison-Knudsen Co., Inc.**, on canal construction for the **Bureau of Reclamation**. For-



Nelson McMahon Baum Gamble Maris Barela



Trimmers Cox Richardson McCauslin Kokinchak Chabot Siegel

Charles C. McMahon is project superintendent for Louis C. Dunn, Inc., general contractor for the \$5,000,000 construction of the Broadway Valley Department Store in Panorama City (Los Angeles).

Other key men on the job for the contractor are: Al Nelson—general foreman; A. J. Baum—chief of party; John J. Farrell—office manager; Harry L. Killian—detailer; R. E. Crump—timekeeper; R. D. Maris—instrumentman; William Trimmers, James L. Cox and Charles Richard-

son—carpenter foreman; Phillip Lawrence—labor foreman; Clemente Barela—concrete foreman; John Puskar—materials expeditor. Representing subcontractors on the job are: "Mac" McCauslin, steel foreman for Soule Steel; John Kokinchak and "Frenchy" Cabot, electrical foremen for Newbery Electric; Wayne Shultz, steel forms foreman for Steelform; William Siegel, masonry foreman for E. A. Wikholm; and Bill Gamble, inspector for Smith Emory.

merly he was cost engineer at Sparks, Nev., surveying for fall program of construction at Gateway Canal.

George C. Carlson, president, and Russell H. McClelland, vice president and purchasing agent of Carlson-McClelland Realty Co., are in overall charge of their company's \$1,500,000, 200-unit building program in Denver, Colo. D. C. McClelland, secretary of the firm, is supervising the job. Russell Theurer is designer and William B. Craig is assistant secretary and office manager.

Read Powell, general superintendent; Ed Howsman, paving superintendent; and Joe Crandall, paving foreman, are the top personnel who handled the \$249,312 paving job in northwest Albuquerque, New Mex., for Allison & Hanev.

Sig Anderson, general supervisor, with the help of Dalton Pinion, pile driver superintendent, and Edgar Gibson, carpenter superintendent, is directing the construction of a 525-ft. pile trestle and appurtenant

work over Isthmus slough on the Coos City-Summer road, Coos County, Ore. for Tom Lillebo, contractor. This \$174,000 job is scheduled for completion in July.

L. (Red) Darr, job superintendent, and Bill Stephenson, job engineer, head the construction crew working for Macco and Pacific Dredging, joint venture building a retaining wall and fill at Rainbow pier, for the city of Long Beach, Calif., a \$1,000,000 job. "Pinkey" Zufelt is carpenter foreman, and Ellis Daniels is labor foreman. Bill Rich is dredge superintendent.

H. A. White, construction superintendent; S. M. Porter, project manager; and J. H. Carr, purchasing agent, for Stearns-Roger Mfg. Co., are top personnel working on a \$3,500,000 power plant under construction at Canon City, Colo. Job started Oct. 1 and will probably end Aug. 1.

Sid Romine, superintendent for Stanley H. Arkwright, Inc., is supervising a 7.5-mi. road job in Park and

Sweet counties, Mont. Other key personnel on this \$218,969 contract are Tommy Martin, Bud Armstrong, Richard Redding, foremen; and Rollin C. Adams, culvert and structure foreman.

I. D. Robbins is project manager for Morrison-Knudsen Co., Inc., on this contractor's \$1,948,822 job on the Weber Basin Project, for earthwork, etc. on Gateway Canal, which is just about completed. Russell Healey is excavation superintendent; George Skelton, master mechanic; Jim McGinnis, structure foreman; and Tom Randal, field engineer.

O'Neil Jones, project manager, with Andy Stolzenburg, excavating superintendent, and Carl Lowrey, gravel superintendent, is handling a \$516,351 contract recently awarded to Albert Lalonde Co. for 0.4 mi. and 13.7 mi. of grading, gravel surfacing, etc. on two stretches of highway in Teton County, Mont. Job is scheduled for completion by September.

Roy L. Houck, Sr., of the firm of Roy L. Houck & Son, is acting as project manager for his company on a grading and paving job on a section of Pacific Highway south of Salem, Ore. Supervising the \$341,441 award are Roy L. Houck, Jr., grading superintendent, and Carlos T. Houck, paving superintendent. Scheduled completion date is Oct. 31.

O. Q. Robinson is supervising a \$431,264 contract for L. M. White for widening and surfacing existing roadway, for a distance of about 12.7 mi. on U. S. Route 60-70, Ariz. Edward Matz, timekeeper, and S. H. Stoddard, foreman, are two other key contractor men.

Louie Bodeen, general superintendent, and Arnold Olson, superintendent, are top supervisors on construction of ten barracks buildings and utilities at Fort Lewis, Wash., a \$3,983,010 contract which was awarded to Wick Construction Co. and Dahlgren Construction Co. and got under way in mid-November. Work is scheduled for completion by Dec. 1.

Robert R. Helen, project manager; Richard H. Smith, engineer; and Norman Jennings, superintendent, comprise the top supervisors of Healy Tibbetts Construction Co. which is doing an over-\$1,000,000 out-fall sewer installation for the Los Angeles County Sanitation District near San Pedro, Calif. Job is scheduled for completion in late 1955.

Richard L. Stenshoel, president; Howard R. Watchie, vice president; and Tim Ryan, overall coordinator, are directing a \$1,700,000 project for Trail Construction Co. consisting of 160 houses in Bridle Trails Park Ad-



Mack Model LRSW working under a 4-yard shovel on the tough Ardsley-Tarrytown section of New York Thruway.

big shovels call for big trucks

Today's big-yardage jobs demand maximum loads per haul and faster time cycles from shovel to dumping point and return. Increasing use of big 4- and 5-yard shovels points to the Mack Model LRSW six-wheel dump truck as the answer to these stepped-up requirements.

Here's a truck that's built to keep big shovels on the go . . . to give contractors increased production per driver and per truck dollar invested.

Rated at 30 tons payload capacity, it will move 25

heaped yards with unfaltering ease over the toughest terrain. No miring in with Model LRSW—it has the advantage of Mack's Balanced Bogie with exclusive Power Divider, enabling it to pull through where other trucks bog down. In actual service Model LRSW has demonstrated its ability to maintain the time schedule of smaller-capacity dumpers.

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For accurate estimation of construction costs—

Here is a revolutionary new method of calculating construction costs—a method so simple you wonder why no one thought of it before. Entitled "Estimating Production and Construction Costs" and written by Louis Dallavia, construction estimator, the new system presented has been developed and perfected in 22 years of actual estimating practice by the few contractors, architects, and construction engineers who know about it. Now, for the first time, this application is available in book form.

With it you can estimate more accurately than ever before your local production and construction costs. The new technique shows you how to figure costs for any general construction in any place at any time. The method never goes out of date.

Following a brief introduction that explains the system carefully, the book tells how to apply it specifically to the major divisions of any building construction. The 160 tables give such local cost data as: (1) Earth-

work production costs of power shovels, draglines, tractors, scrapers, wagons, shovels, rollers, dozers, trucking; (2) Concrete production costs of fabricating, erecting, stripping wood and metal forms, reinforcing, concrete placing and finishing; (3) Structural steel production costs of erection, riveting, welding; (4) Masonry production costs of laying brick, tile, blocks, stone; (5) Rough and finish carpentry costs of framing, finishing; (6) Production and material costs of concrete, steel and masonry design.

With the same tables the architect or engineer can easily calculate square foot design costs of concrete, steel and masonry for cost comparison of alternate design schemes.

The full appendix provides a welter of useful construction data, and the complete index gives you quick reference to any particular construction detail. Cost of the book is \$15.00 and can be obtained by writing to The Dallavia Company, 2110 Elmen, Houston 19, Texas.

dition at Bellevue, Wash. This construction started last November, and is expected to be finished next January.

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Earl C. Henderson is project superintendent for C. H. Leavell & Co., which is building an instrumentation and standards laboratory at White Sands Proving Grounds, Las Cruces, New Mex.; a \$574,748 undertaking. Contract is scheduled for completion the middle of November, this year.

* * *

Don Montgomery is superintendent ing 3.8 mi. of road work 20 mi. north of McCall, Idaho, for Miller & Strong, Inc., contractor who received the award on a \$236,241 bid.

* * *

Paul Cross is superintending for Henry Thygesen & Co. a \$342,967 contract for 2.7 mi. of grading and paving on U. S. 64-84 and 285, in Santa Fe County, New Mex. Job started the middle of October last year, ceased for the winter, and is expected to close about mid-June.

* * *

Larry W. Kuckenberg, project manager, and **Dick Mortensen**, general superintendent, head up the supervisory personnel of Kuckenberg Construction Co. which is executing a \$520,567 grading and oiling and mat-surfacing job on Pacific Highway in Douglas County, Ore. **William McFall** is equipment superintendent, and other important personnel are **Frank A. Lindgren** and **Jack Griffina**, foremen; and **Ethel Park**, timekeeper and clerk.

* * *

Sam Gillette is superintending the construction of a road job, including 3 concrete bridges, on Sawtooth Park highway in Jerome County, Idaho,

for Carl E. Nelson Construction Co. Foremen on this \$237,075 contract are **M. G. Cole**, grade, and **LaVon Chattenton**, crusher.

* * *

Ray Strohm, superintendent, assisted by **H. C. Strohm** as foreman, is supervising a \$279,095 contract recently awarded to Platte Valley Construction Co. for earthwork construction on the Middle Loup Division of the Missouri River Basin Project, Neb.

* * *

Hyrum H. Plewe of Plewe Construction Co., directed the company's recent contract for construction of a high school at Provo, Utah. Superintending this \$3,877,500 project was **Roy Stanley**, assisted by **Don Warner**.

* * *

Raymond Dahl, general superintendent; **Earl Brusberg**, superintendent;



THE \$1,532,000 construction of two wharfs for the city of Long Beach, started in May 1954, is being wound up this month by Guy F. Atkinson Co. In at the finish are (l. to r.): Lee Cox, visiting general superintendent; Joe Mayberry, assistant superintendent; and C. T. Glenn, district marine superintendent.

ent; and **Wayne Gardner**, foreman, are top men supervising the \$1,000,000, 8-story, 87,500-sq. ft. office building going up at Boulder, Colo., a job just started by Jack H. Cys Construction Co., and expected to take two years for completion.

* * *

W. W. (Bill) Scott is superintending a \$219,632 job for Peter Kiewit Sons' Co. consisting of grading and surfacing Route 6, Tonto National Forest in Maricopa County, Ariz. Others on this job, which is scheduled for completion this coming May, are **Dick Knox**, general foreman; **Lee Whitehead**, powder foreman; and **Leo Foster**, grading foreman.

* * *

Charles W. Evans is superintending a \$1,376,755 earthwork and pipeline contract on Friant-Kern Canal, part of the Central Valley Project of California, for Cen-Vi-Ro Corp. Others among the key personnel are **George Carlin**, project engineer, and **Richard T. Vogel**, office manager; as well as **Bill J. Woolery**, foreman, and **David L. Harrison** and **A. R. Parker**, mechanics. Started Sept. 1, 1954, the work will probably end in September this year.

* * *

J. H. Match, project manager; **Ed Morris**, project superintendent; and **C. Harpe**, concrete foreman, are top supervisors on the grading and surfacing of 1.6 mi. between Route 207 and Baseline Ave., 2 mi. north of Redlands, Calif. This \$183,894 contract was awarded Match Brothers, who started work on Nov. 15 and expect to finish in May.

* * *

I. H. Poston, superintendent for Stock & Grove, Inc., is supervising 2.4 mi. of construction on Mitkof Highway in Alaska, a \$244,680 award. Master mechanic on this job, which started in September, is **C. J. Belton**. Completion date is set at Sept. 1 this year.

* * *

W. B. Mackey, superintendent of grading and **Bert Crisp**, surfacing superintendent, are directing work on the \$207,471 contract recently awarded to Mullinax Engineering Co., consisting of grading, draining, surfacing, and miscellaneous work on 9 mi. of the South Fork Road in Park County, Wyoming. Completion date, June 1955.

* * *

R. B. Murray, superintendent; **Jack Corbett**, foreman; and **Fred Williamson** and **Charley Noel**, master mechanics, comprise C. V. Kenworthy's top personnel on a 7.6 mi. grading and surfacing road job in Inyo County, between Cottonwood Creek and Diaz Lake, Calif. Bid price, \$237,958.

* * *

Harold R. Brown and **Richard C. Brown** of the contracting firm of Hallett Construction Co. will administer their recent award for stringing conductors and overhead ground

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wires on transmission division of the Missouri River Basin Project, No. Dak. Supervisory personnel chosen for this \$720,428 job, which is scheduled to start June 1, are A. F. Leidman, general superintendent; D. W. Runde, job superintendent; and Hank Jandl, general foreman. Duration of job, about 150 days.



A. B. (AL) SCOTT (left) is senior field engineer and N. L. (Buzz) Barron is general superintendent for Bechtel Corporation on the big Standard Oil refinery going up at El Segundo, Calif. (See item.)

N. L. (Buzz) Barron is the general superintendent for Bechtel Corporation on construction of a refinery for the Standard Oil Co. of California at El Segundo, Calif. A. B. (Al) Scott is senior field engineer, and other engineers on the job are Jack Payton, Mike Uiteri, Art Kerns, Alan Paul and Gordon Fickema. Vince Johnson is office manager. Bill Franklin is warehouseman. Jerry Despain is general ironworker foreman, and W. G. Burch is reinforcing steel foreman. J. J. Coatney is cement foreman, and Ed Daugherty is boilermaker foreman. Harry Sammons and Pete Brogna are pipefitter foremen, and Walt Buehring is pipefitter welding foreman. Ed Ireland and C. T. Grigsby are labor foremen, Joe Jenkins is carpenter foreman, and C. T. Russell is electrical foreman. Ted Climmons is millwright foreman. L. P. Kvilvang is layout foreman. Work will be finished this April.

* * *

G. C. Weeshoff is project manager; Jim Hall, engineer; and R. Moroney, office manager, for joint venture firm of Irish, Johnson and Wood, which has a \$3,269,745 contract for Project No. 1, East Compton Creek storm drain of the Los Angeles County Flood Control District. Other top supervisors are Roy Thomas, pipe; M. E. Noble, reinforced concrete box culverts; and Matt Stanich, sewer. This is a year-long job scheduled for completion in November.

* * *

Ray W. Revell is project manager for Morrison-Knudsen Co., Inc., on a \$199,518 contract for concrete work, excavation, etc. for underground utilities, culvert, and drainage structures, at Eielson AFB,

Soil Cement Is Low Cost for Road Base Course

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Base materials native to the job can be used in many states. Even with imported materials, soil cement base course costs are lower in the long run. In the last 13 years soil cement paving awards increased from 9 million to 140 million square yards... that's a 1,555% increase!

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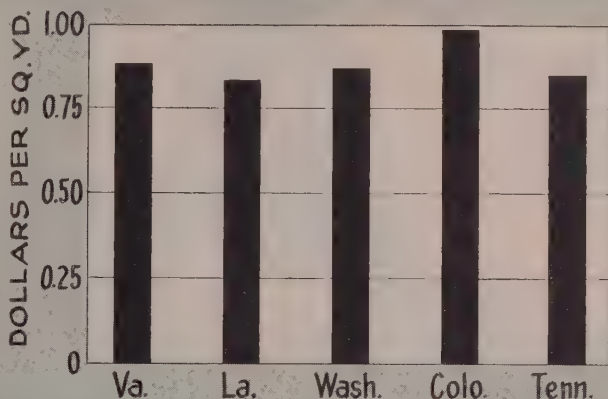
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AVERAGE SOIL CEMENT BID PRICES ROAD BASE COURSE—1953



AIRPORT LOAD-BEARING DATA WITH SOIL CEMENT BASE COURSE

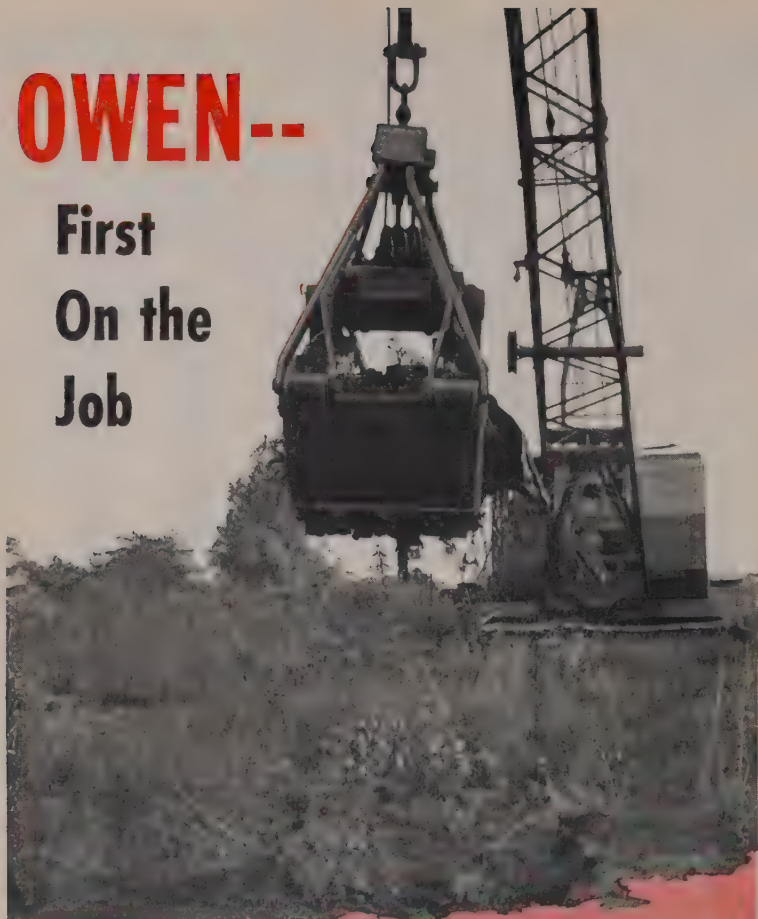
BASE COURSE TYPE		BEARING VALUE K
6"	Soil Cement	535
8"	Compacted Gravel	355
6"	Soil Cement	1012
5½"	Macadam + 2" Bituminous Surface	626
6"	Soil Cement + 2" Bituminous Surface	475
6"	Emul. Stab. + 2" Bituminous seal	240
6"	Soil Cement	735
6"	Sand-Clay + Bituminous seal	520
6"	Soil Cement	940
8"	Sand-Clay + Bituminous seal	520
6"	Soil Cement + Bituminous seal	424
8"	Bituminous Stab. + 2" Bituminous Surface	255

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Alaska. Al Spornak is project engineer, and W. W. Sabin is in charge of the office. This job is being administered in conjunction with other M-K work at Eielson.

* * *

J. E. Ricker, project manager for Morrison-Knudsen Co., Inc., is directing a contract for earthwork and structures, Unit 4, Welton-Mohawk Division of the Gila Project, Ariz., a \$634,476 job. Other key personnel are N. Spencer, project engineer; G. VanLandingham, master mechanic; Bud Snowball, excavation superintendent; W. Burns, structure superintendent. C. D. Johnson is office manager.

* * *

W. C. Hurdle in the superintending spot, assisted by Tom O'Brien, foreman, is directing a 200-day job being executed by F. L. Flynn & Co. for construction of one 374-ft. steel and concrete bridge and one 38-ft. timber bridge on Three-mile Creek at Florence, Mont., a \$147,510 award.

* * *

Elof Gustafson, project manager; R. W. B. Saunders, project engineer; Arthur L. Perez, office engineer; Paul Gatschet, carpenter superintendent; and George Trivitt, field superintendent, make up the top men supervising the \$2,040,720 contract awarded to Stolte, Inc., and Gallagher & Burk, Inc., for work in Alameda County, Calif., consisting of about 19 mi. of grading and paving, a reinforced concrete overcrossing and an undercrossing. A 450-day job, work started the first of January. L. A. Anderson, resident engineer, and Guy Mancardi, bridge engineer, represent the State.

* * *

V. L. Walker, area manager for Carson Construction Co., headquartered in the Times Square Bldg., Seattle, Wash., is in charge of administering Carson's recent award covering construction of 5 buildings and utilities at the Haines terminal of the Haines-to-Fairbanks pipeline, Alaska.

* * *

T. G. Moore, superintendent for Armstrong & Armstrong, is directing work on a 0.9-mi. grading and surfacing job on U. S. 70 in Roswell, Chaves County, New Mex. Assisting Moore on this \$107,979 contract are Clyde Rossow, grading-surfacing foreman; Paul Taylor, hot plant foreman, and L. D. Arnold, concrete foreman.

On Armstrong's \$163,422 contract for 1.7 mi. of grading and surfacing in Dona Ana County, New Mex., (Las Cruces-west), Bob Dever is in the superintendent spot; T. C. Carr is bridge and concrete foreman; and again Taylor is in charge of crusher and hot plant.

* * *

C. W. Holford, superintendent, and his assistant Earl Shannon, are supervising Henry Thygesen & Co.'s



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Stimulated by the President's "grand plan" for the nation's highways... contractors and engineers are setting their sights on a tremendous highway construction program for the years ahead. As a result, there has been an increasing upsurge in the sales of MADSEN Asphalt Plants and asphalt plant equipment. During recent months more MADSEN Asphalt Plants have been sold than during any similar period. MADSEN has always built superior engineering and plus values into its asphalt plants to give the industry the greatest possible hourly production. This same superior engineering together with the best of workmanship has always meant lower maintenance costs with MADSEN!

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\$716,351, 5.8-mi. grading and paving job on U. S. 54-70, at Alamogordo, Otero County, New Mex., a 250-day job which got under way the middle of January.

* * *

Al Regalia, project manager, and A. J. Vercuysen, superintendent, head the job personnel working for Baldwin Contracting Co., Inc., on a highway job in Sacramento and Placer counties, Calif. Work lies between Ben Ali and 5 mi. east of Roseville, and consists of about 13.1 mi. to be surfaced with plant-mix on cement treated base and untreated base. Others on this 120-day contract are George Logan, equipment superintendent; Herman Bertolini, master mechanic; and Johnny Zerkervich, plant superintendent. Baldwin won the award on a low bid of \$1,576,913.

* * *

Tom Schlott is Peter Kiewit & Son's Co.'s job superintendent on a 2.4-mi. long grading and surfacing job on state highway between Birchfield and Moxee City, Yakima County, Wash.

* * *

Frank Muren, project manager; and Bill Loy, general superintendent, head the list of personnel working for the combination firm of Peter Kiewit Sons' Co. and Fredericksen & Kasler on the \$5,465,481 construction of parking aprons, taxi strips, warm-up pads, firing calibration facility, rocket aircraft service laboratory and related lighting and power facilities, etc. at Edwards AFB, Calif. Other important personnel are: Frank Scully, chief engineer; Frank Nagel, office manager; R. M. Pinching, office engineer; "Slim" Ransdell, master mechanic; and superintendents, Marvin Sandlin, excavation; George Bell, plant; Roland Beadles, underground; Bill Miller, concrete paving; and E. C. Skaggs, carpenter. Foremen: Red Reasner, carpenter; Jim Fair, plant-mix; Norman Masson, borrow; C. A. Nelson, powder. Bill Barr is chief of party, M. H. Whalen is accountant, and F. H. McBee is timekeeper.

* * *

William Rowland, project manager; Archie Edmonds, superintendent; Don Davis, office manager; and Frank Ford, master mechanic, are top men working for Frederickson Bros. on this company's \$579,796 highway job in Mendocino County, Calif., between Reeves Creek and 0.9 mi. north of Hilvilla. Work consists of 2.1 mi. to be graded and surfaced.

* * *

W. J. Loomis, superintendent, assisted by T. J. Serna, grade foreman, is supervising the construction of 4.8 mi. of forest road in Gila National Forest, New Mex. This work was awarded Floyd Haake on a low bid of \$239,000.

* * *

Art Cronin is superintending for Claude C. Wood Co. on a grading and

surfacing job, 6.4 mi. of county road, a welded plate girder bridge, and triple reinforced concrete box culvert in Shasta County, Calif. On this \$359,825 job, Horace Bell is Cat foreman and Dick Morris is labor foreman. Ronnie Klarer and Joe Womack did the pioneering, with six D8's on the clearing. The job is now in full swing, and is estimated to be finished the end of this year.

* * *

Alex Madonna is acting as project manager on the \$2,964,679 contract which recently went to the Madonna Construction Co. for 9.3 mi. of grading and paving and 6 bridges and an undercrossing in San Luis Obispo County, Calif. General superintendent on this 270-day job is Bob Osborne. Burt Crowe is job superintendent. Les Johnson is superintendent on structures, assisted by Bill Collinsworth and Leonard Koll. Livio Villa and Otis Maxwell are pipe foremen; Otis Lustre, plant foreman; Dan Borradorri, master mechanic; and Bob Pote, field mechanic.

SAFETY

Job accidents take their toll

THESE were the accidents that resulted in death or serious injury on the West's construction jobs during the last reported month.

Virgil P. Roberts, 40, Sacramento, Calif., died of injuries sustained in an accident at Nimbus Dam. Roberts was standing on a beam directing the unloading of a truckload of construction steel when he apparently lost his balance.

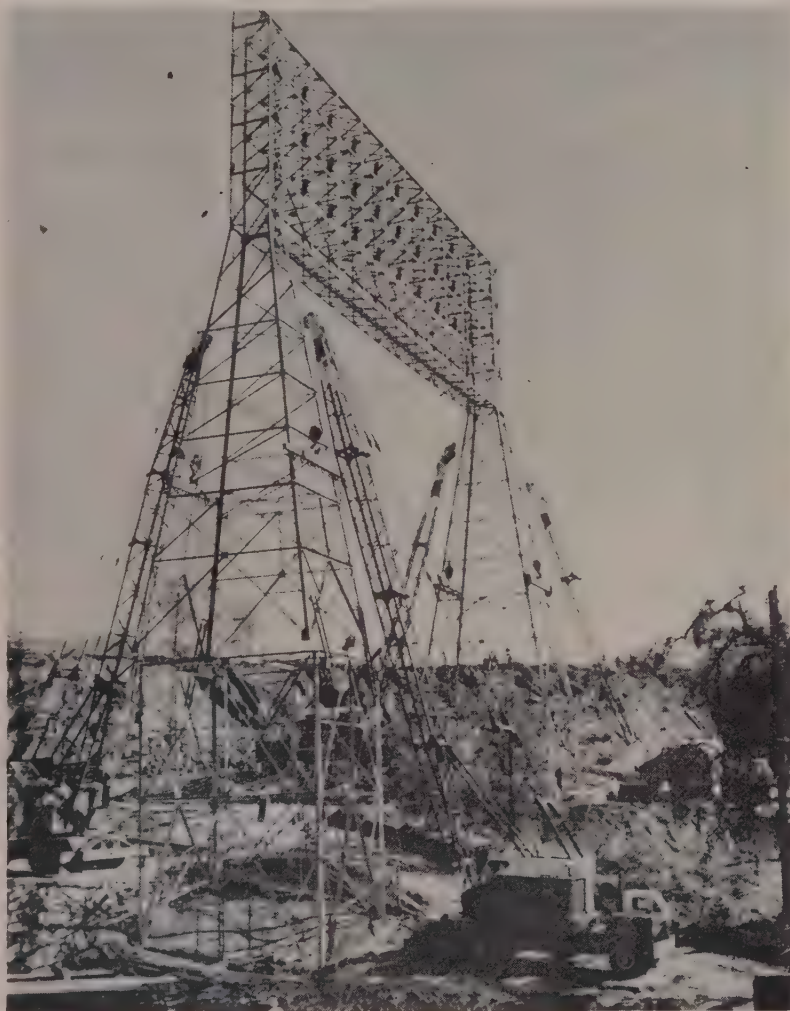
Gregory Diaz, 36, was killed recently in an underground explosion in a water conduit at Santa Barbara, Calif. The blast was apparently caused by accumulated sewer gases.

Robert Wright, 21, Yakima, Wash., recently received head injuries when the bed of a dump truck fell on him. Wright said the truck bed jammed in dump position, and while checking the cause, he pulled the wrong lever and the bed suddenly dropped.

Bill Paulson, 43, Spokane, Wash., escaped injury when trapped for 15 min. in a sewer cave-in. An employee of Western Builders, he was buried in the ground up to his neck.

Mike Antonovich, 27, of Oakland, was drowned when the boom broke on the McCloud River bridge near Redding, Calif., throwing him and Marion W. Page, a co-worker, into the water. Page swam 100 ft. to rescuers, but Antonovich was weighted down with a tool belt.

TRICKS of the TRADES



A "hot lift" with truck cranes

IN AN UNUSUAL and hazardous assignment in Eagle Rock, California, four P & H Model 555 TC Truck Cranes were given the job of lifting this 77,000-lb. power tower 7 ft. while workmen bolted extensions in the framework. The extra height was required to make room for the Colorado Freeway, now under construction.

The job had to be performed without interruption to power service, as the 6,600-volt highline current provides electricity to half of Los Angeles.

The tower-boosting job was handled without difficulties or accidents. The cranes, which are capable of lifting 35 tons each, were rigged with booms up to 85 ft. and are owned by Owl Trucking Co. of Los Angeles.

Reaches high easily

THE TELESCOPING BOOM of a Bucyrus-Erie Hydrocrane is ideal for this close quarter work along busy Wilshire Boulevard in Beverly Hills, Calif. Teaming with a Ford truck equipped with hydraulic lift platform,



the truck-mounted all-hydraulic crane replaces one of 243 street lights. In addition to standards, old 6,000 lumen tungsten lights are being replaced by 20,000 lumen Mercury vapor lights. Contractor is Westates Electrical Construction Co.

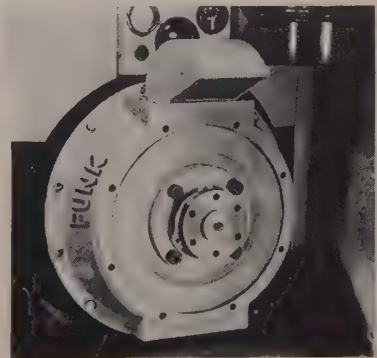
Someone asks, "Where?"

MOLDED RUBBER skirtboards for the loading end of conveyors were suggested on these pages last month. Pacific Coast Aggregate Co. uses them at its Pleasanton, Calif., plant. And the molded rubber out-performs by a long way the old standby of discarded pieces of belting.

But someone asks about this "molded" business. Who has it? The answer is American Rubber Co. It's a feature of theirs. And the illustrated installation at Pleasanton was theirs, too.

Install torque converter for heavy load starts

THE FUNK Aircraft Co., manufacturer of power transmission equipment, have just announced their new Type C-20 torque converter. This new model is an exceptionally short coupled torque converter for use where length is a problem, available in either ventilated or non-ventilated type. The main body is a one-piece steel casting, machined to fit engines with SAE flywheel housings.



Standard outside flanges on this new Funk torque converter quickly and economically attach to right

angle drives, transmissions, gear reductions, power take-off hubs or other types of drives. A catalog of the entire line of Funk power transmission equipment may be secured by writing Funk Aircraft Company, Coffeyville, Kansas.

Torque converters are suitable and are excellent for installation in cranes, winches and any other kind of equipment where there is a heavy load to start after which the power required tapers off. The average maintenance man with good mechanical ability could install one of the torque converters in the field.

Latest in insulation for beer

A NEW AND IMPROVED method of temperature control in refrigerated buildings was employed in construction of the \$20,000,000 Anheuser-Busch brewery in Los Angeles, Calif.

The new dry wall method prevents moisture from remaining in the insulation, permits erection of wall insulation without use of hot asphalt and its attendant dangers, and provides for use of practical interior finish of cement asbestos board. It makes possible also extremely accurate temperature controls.

A total of 1,307,579 lbm. of Fiberglas insulations weighing approximately 1,250,000 lb. was installed in the stock and Borsari cellars and brew house to assist in maintaining average temperatures of 35 deg. F. in cold rooms. Fiberglas products were applied to floors, walls, and roofs to provide an envelope of glass insulation.

Interior concrete walls of cold rooms were sprayed with a non-in-



Rented bridge has served purpose

PRACTICALLY EVERYTHING, including the concrete, in Nimbus Dam, a newly completed \$6,000,000 Bureau of Reclamation structure on the American River near Sacramento, Calif., was taken directly to the site by trucks operating over a rented portable bridge—a key item in the contractor's carefully planned and skillfully executed method of procedure—and a highly successful one.

Soon after Winston-Johnson (Winston Bros. Co. and Al Johnson Construction Co., joint-venturers) moved onto the job, the prefabricated steel bridge arrived on six transport trucks from Bailey Bridge Equipment Co., San Luis Obispo, some 300 mi. distant. Eight days later a 12-man crew had spanned the river with a 370-ft. bridge and the contractor's

trucks began to roll across. Twenty-five months later they had carried a half-million tons of concrete, steel, and stone over the bridge and the dam was completed. The bridge was then retracted, loaded onto trucks and moved off, as good as new and ready for further service.

In addition to the enjoyment of trouble-free service from the bridge, the contractor's other advantages were: (1) no invested capital, (2) privilege to charge rent as an expense, (3) elimination of design and procurement problem, (4) faster and more economical erection, (5) availability to suit schedule, (6) flexibility of structure to fit site conditions and (7) no disposal problem at end of job. A. T. Evans was project manager for Winston-Johnson.

flammable, water-base asphalt emulsion. When this preparation was tacky, aluminum foil .003 in. thick was pressed onto the adhesive. This forms the vapor seal which keeps in-

sulation dry under all conditions. All end and side joints were lapped about 3 in. and cemented.

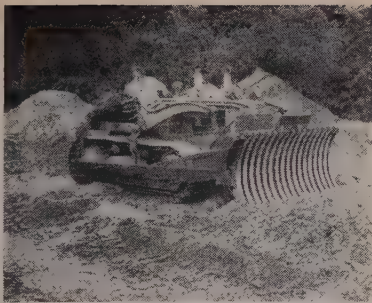
Horizontal 2x3-in. furring strips of Wolmanized treated wood, spaced at 48-in. intervals, were fastened to walls by drive bolts. The first layer of 11½-lb. density preformed Fiberglas insulation was pressed between the strips. A second layer of 2-in. thick furring strips was attached vertically to the first strips with heavy burred nails on 24-in. centers. Another layer of Fiberglas insulation board was pressed between these strips to provide a total thickness of 4 in. of insulation.

Holmes & Narver, Inc., of Los Angeles was the engineer and architect, with Meyers and Evers of San Francisco, consulting architects; Peck-Cahill Co., Los Angeles, was the general contractor and the Fiberglas Engineering & Supply Co., Los Angeles, was the insulation contractor.

How many teeth?

TO ITS STANDARD 9-tooth Heavy Duty Land Clearing Rake, Rockland Allied Equipment Corporation added 8 extra teeth for Gilbane Building Company of Providence, R. I. Gilbane's contract called for clearing of all debris down to 5 in. in prepara-





tion for hard-packing of soil in conjunction with building of a new plant for Western Electric Company in North Andover, Massachusetts.

After the job is completed, teeth will be removed to permit wider spacing for clearing boulders, brush, stumps, and trees. The Rake is mounted on an International TD-18A tractor.

Safety code for industrial rubber hose

FROM James E. Holly, hose development engineer for the Thermoid Co. of Trenton, N. J., comes this valuable list for the "Do" of rubber hose.

1. Use correct hose for material carried.
2. Use hose of correct pressure capacity.
3. Select couplings carefully as to type, size and material and install correctly.
4. Have shut-off valve accessible.
5. Avoid excessive lengths.
6. For steam, use a wire braid hose or hose specifically designed for steam.
7. Tighten couplings periodically.
8. Repair cuts, worn spots as soon as discovered.
9. Use enough hose to reach.
10. Wear protective clothing (goggles, rubber gloves, apron) when handling hot or corrosive material in a hose.
11. Check hose for breaks, loose couplings before using.
12. Provide means of stopping flow when handling corrosive or hot materials by means of valves or nozzles.
13. Protect hose from accidental damage from vehicles, falling objects.
14. When handling inflammable materials such as gasoline be sure it has a ground wire.
15. Know your hose types and particular applications.
16. Watch the bending radius.
17. When using nozzle under high pressure, increase pressure gradually and grip nozzle firmly.
18. Keep hose away from hot surfaces and heat outlets.
19. Never hang hose on a nail, where it is forced to take a sharp bend.
20. Store hose on flat surface (shelf, floor, etc.) in cool room, not exposed to direct sunlight.

TOOLS of the TRADES

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

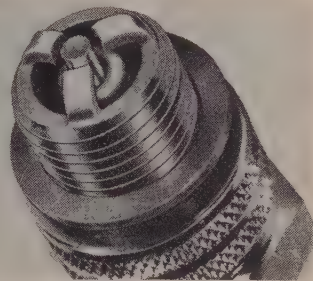
LIGHT-WEIGHT, long-lived tarpaulins constructed with neoprene coated nylon is now being introduced by the Du Pont Company's Fabrics Division. Medium weight "Fairprene" tarpaulin has a proved life expectancy twice that of No. 8 treated duck in common use and is expected to go higher than three times. Tear resistance rates more than four to six times greater. It will not take on added weight in wet weather. Other advantages of not stiffening in freezing weather, easy vulcanize patching, and resistance to grease, most chemicals, and sunlight are claimed. Address inquiries for a list of tarpaulin manufacturers to Room 7145-D, Du Pont Co., Wilmington 98, Delaware.

DESIGNED TO SUPPORT a fully filled 55-gal. drum, a new lightweight, low-cost storage rack has been announced by the **Star Welding Co.**, 1054 East 134th St., Cleveland 10, Ohio. The rack raises drum spouts to pouring heights, or for storage. It has all steel welded construction with wide legs to assure stability. Easily knocked down (only a single bolt is involved), the new rack costs only \$5.99 f.o.b. Cleveland. Quantity discounts are also available.

NEW DATA SHEET on Hobart Automatic Battery chargers is available describing single and multiple-circuit motor generators for industrial and

mine locomotive batteries. Full information is given on the various models and the many advantages to be obtained by their use. Write to **Motor Generator Corporation**, Hobart Brothers Affiliate, Troy, Ohio.

A TRIPLE ELECTRODE spark plug with concave ground electrode is available that "brings aviation spark plug down to earth" for use in gasoline powered construction equipment. This new Auburn TC-3 can be used in all automotive engines to gain four definite ad-



vantages: lower fuel consumption, more power, less plug fouling and easy cleaning. In addition to triple electrodes, the TC-3 also adapts the solid copper gasket

A TRICK OF THE TRADE

When you need fast service on a product, refer to the 1955 W. C. HANDBOOK for name of nearest distributor. Turn to page 61 for details on getting an extra copy of the Handbook — with convenient spiral binding.

and high quality 95%+ aluminum-oxide insulator used in jet plugs.

With three electrodes, the TC-3 carries its own insurance. The three gaps are factory set. If one electrode burns or erodes away beyond the most efficient gap setting, two others remain properly set to make sure of complete combustion. Plug life is doubled. Turbulence of the fuel mixture around the three electrodes and through the open gaps minimizes lead fouling and cools the nose of the plug. The exposed gap of the plug is exceptionally easy to clean.

In field tests of the plug made by operators, fuel savings up to 40% have been noted. Acceleration and power increased 6% simply by switching to triple electrode plugs. Some TC-3 plugs installed in trucks ran for more than 40,-

000 mi. before they were removed for examination.

More information on triple electrode spark plugs can be obtained from the Auburn Spark Plug Co., Auburn, N. Y.

VALUABLE SUGGESTIONS on reducing brake maintenance costs while increasing drum life and brake safety are contained in a new 16-page book published by the Grizzly Manufacturing Division, makers of Grizzly Silver-tip heavy duty brake blocks. Fully illustrated with photographs, diagrams, and charts, this book tells how to increase effective service life of brake drums as well as blocks. This three-fold goal is accomplished through nine basic steps. Practical assistance in diagnosing and correcting brake troubles is

provided. Copies of the booklet can be obtained from Grizzly Manufacturing Division, 700 West Caroline St., Paulding, Ohio.

THE NEW GOLDBLATT 1955 Catalog which lists 1056 individual tools in 200 families of tools used by cement finishers, plasterers, lathers, masons, tilers, setters, dry wall applicators is now available. The catalog's 99 pages list tools that may be purchased direct by mail, or through dealers everywhere. For your free copy write to Goldblatt Tool Co., Dept. Y40, 1960 Walnut St., Kansas City 8, Missouri.

USEFUL ACCESSORIES facilitating installation of Flexaust hose and Portovent duct for industrial applications are described in illustrated Bulletin No. 41, Accessories and Installations, newly published by The Flexaust Co., 100 Park Ave., New York 17, N. Y. The bulletin shows the use of screw couplings, soft-end cuffs, and flanges for assembling Flexaust hose in long lengths, attaching it to pipe of varying sizes, connecting to outlets of different shapes, and applying to equipment. Any length of Flexaust may be flexed to form an elbow or compressed or deformed to rectangular, oval, or other, cross section.

A HANDY-TYPE WIRE STRIPPER for general work, new and inexpensive, has been announced by Crown Industrial Products Co., Dept. S-18, Amsterdam St., Woodstock, Illinois. Fabricated of hardened steel construction throughout, the stripper has interchangeable, precision-milled stripping blades carefully matched to strip insulation clean without damaging the wire. It strips both stranded and solid wire.

A patented lock-open feature holds the jaws open automatically, so that the wire can be removed after stripping without crushing. Release of the jaws is accomplished with a single finger-tip touch on the lower handle, making it unnecessary to shift the grip on the stripper for the next operation.

Durable, but light in weight, the stripper is available in three models. Replacement blades are also available. Changing of the blades can be done in a matter of seconds by removal of two screws. Catalog sheet available for further information.

LONG STEEL TAPES have been added to the line of White Clad tapes and tape rules made by The Lufkin Rule Co., Saginaw, Michigan. The new tape, called the White Clad Banner, is furnished in four lengths, 25, 50, 75, and 100 ft.

The tape has a triple baked white finish and a coating of clear, abrasion resistant plastic over a bonderized, tempered steel line. Jet black markings are graduated to 8ths of inches with both feet and inches marked every inch. It is offered with either folding hook or plain end ring.

The case has a maroon vinyl cover, stainless steel band, and plated fittings over a rust resistant welded metal liner. The folding re-wind handle folds flush with the side of the case, and opens readily with push pin. Each Banner steel tape is packaged in a transparent, plastic box that has many handy re-uses.

NOW! DOUBLE AND TRIPLE-DECK VIBRATING SCREENS

are available on the

KOLMAN

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

Multiple separation with a Portable Conveyor-Screen Plant? Yes, that's just what these owners of KOLMAN Plants have got! Two and three-deck Vibrating Screens are now available on the KOLMAN Model 101 Portable Conveyor. KOLMAN Screens, designed to eliminate all excess weight, are ideally adapted to conveyor installations. Their "Floating Action" delivers vigorous impact without transmission of vibrations to the conveyor.

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.

Above, a 6' x 36" double-deck KOLMAN Vibrating Screen on a 50' x 30" Model 101 KOLMAN Conveyor. This plant is loading and sizing coal for Rasmussen Bros., Sheridan, Wyoming. Note the conveyor supports these multiple-deck screens without extra bracing.

SEND this coupon for FREE literature

KOLMAN Manufacturing Co.

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

Please send () Conveyor Bulletin 101, and

price of _____ lgh. () Vibrating _____

109, 112 and price of _____ x _____ ()

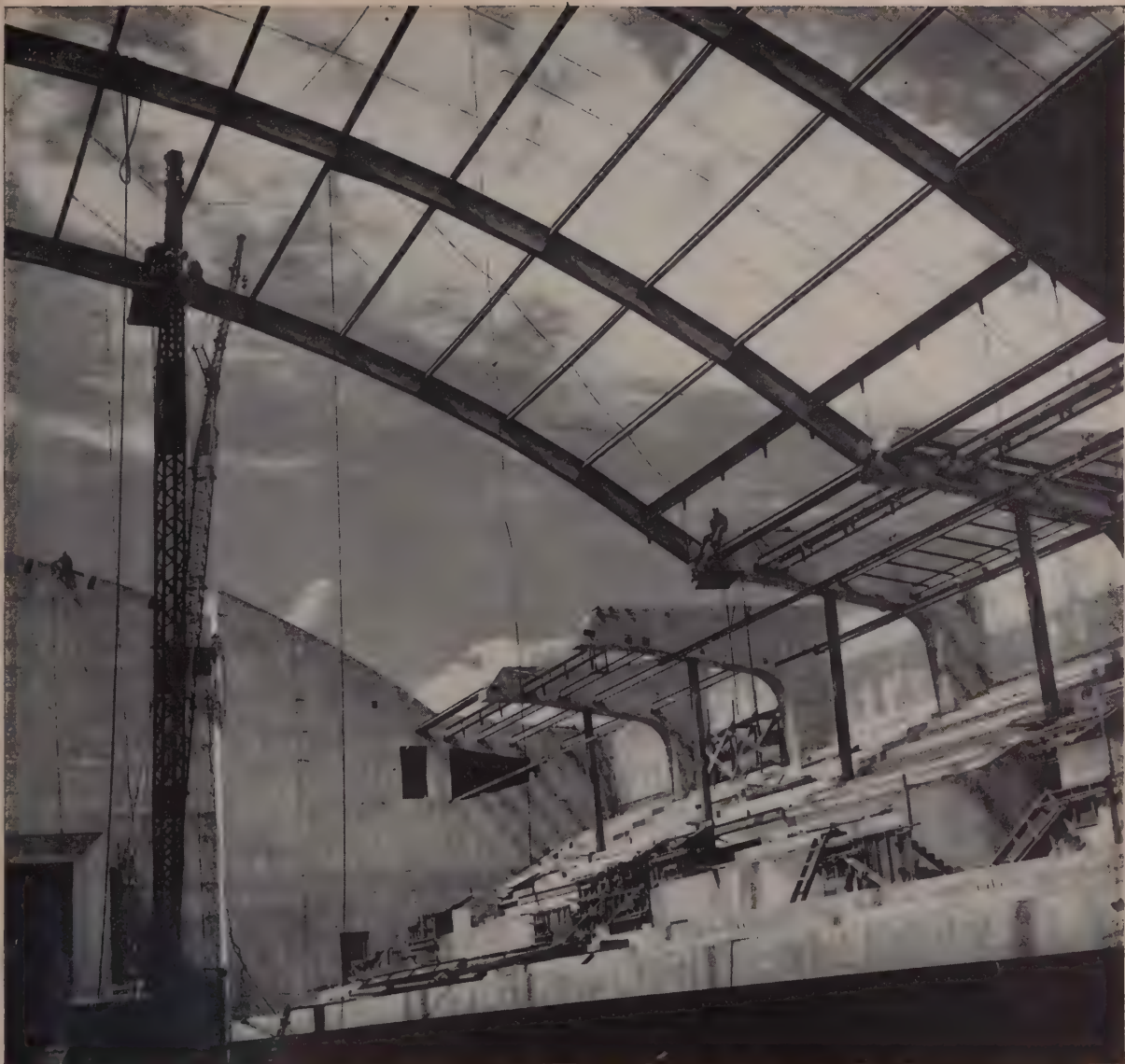
single () double () triple-deck.

Name _____

Address _____

City _____

With either a double or triple-deck screen it is now possible to accurately make several sizes of material at one time. Ideal also for scalping out oversize and rejecting fines in a single operation. And all this on a portable outfit!



Spokane Coliseum is largest in Pacific Northwest

Spokane's new civic auditorium, opened officially in December, is an imposing \$2½-million building which fills a long-felt need in the heart of the Inland Empire. Its main auditorium, measuring 210 ft by 125 ft, makes it the largest in the Pacific Northwest, according to Ben Moore, manager of the Spokane Coliseum.

Bethlehem Pacific supplied nearly 500 tons of reinforcing steel from its Seattle plant for the 8500 cu yd of concrete and also fabricated and erected the framework of structural steel which

spans the spacious auditorium. Galvanized steel sheets for the heating and air-conditioning system also came from Bethlehem Pacific.

Designed as a multi-purpose center, the coliseum caters to a variety of tastes—civic, cultural, recreational and commercial. Here the public is already enjoying concerts, musicals, ice shows,

conventions, trade shows, dances, basketball, boxing, hockey and other events. It seats 8000 for stage shows and can be sub-divided for smaller functions.

General Contractor: Henry George and Sons

Architect: Whitehouse and Price

Associate Architect: Henry C. Bertelsen

Consulting Engineer: Ben Moore

Ductwork by Fox-Smith Sheet Metal

Works

(all are Spokane firms)

BETHLEHEM PACIFIC COAST STEEL CORPORATION

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

BETHLEHEM PACIFIC



NEW EQUIPMENT

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

Hydraulic controls boost production

A new addition to the Link-Belt Speeder line is the LS-58 shovel-crane, claimed by the manufacturer to have all the essential production and dependability features of bigger machines.

The big item is finger-tip hydraulic control for the operator, following a new standard for all current Speeder

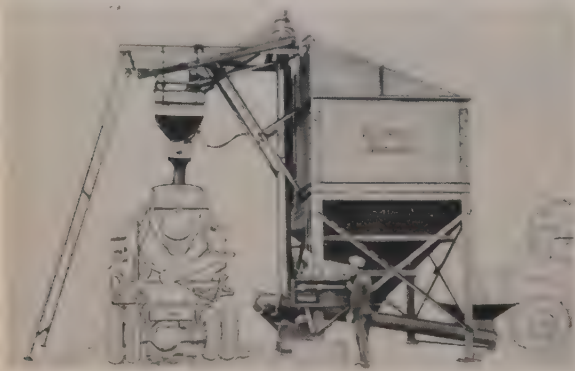


models. For meeting different job requirements, 3 crawler lowers are available. The standard is 10 ft. 3 in. long, the intermediate 11 ft. and the long-wide 12 ft. 1 in.

Other optional equipment includes independent swing and travel, reversing clutches for either or both front and rear drums, and patented retractable high gantry. For more information, including Book No. 2537, write to Link-Belt Speeder Corp., Cedar Rapids, Iowa.

Automatic batcher has screw-action lift

A new batch lift design with a screw-action lift, low bin, and automatic batcher has been announced by L. Burmeister Co., 4535 W. Mitchell St., Milwaukee, Wis. Automatic controls eliminate manual levers and allow batching to be faster and more accurate. The unit has its



own compressor for actuating the automatic controls and its own electric or gasoline engine. All air and electric lines are permanently installed so that there are no connections to break and make for moving. It requires a single truck for transport. No fitting or ramps are required since bulk trucks deliver at ground level.

When bulk truck is unloading the feeder screw brings

material from ground-level hopper to the vertical screw lift. The lift augers material to the batcher. As soon as the weight is reached, surface material is automatically diverted to storage bin. The conveyors stop automatically when batch weight is reached.

Roebbling ups wire rope strength 15%

A new line of steel-cored wire rope, from ¼-in. to 3½-in., is announced by John A. Roebbling's Sons Corp., Trenton 2, New Jersey. Refinements in wire manufacture and rope fabrication practices give the new rope 15% higher strength, with no proportionate decrease in other qualities.

Lab tests and field applications show the rope to have high resistance to wear from bending and abrasion. Here is a rope where high strength and long life go together.

Construction applications are those that use a pre-formed wire rope: shovels, draglines, scrapers, slushers, dredges, slings and chokers, etc.

Truck-mounted ditcher goes 45 mph. or 13 ft. per min.

A 4-wheel drive Dodge truck is the basis for Barber-Greene's new Model 711 ditcher. The machine moves fast between jobs, and it is designed for high flexibility in trenching.

Two digging booms are available, with maximum dig-



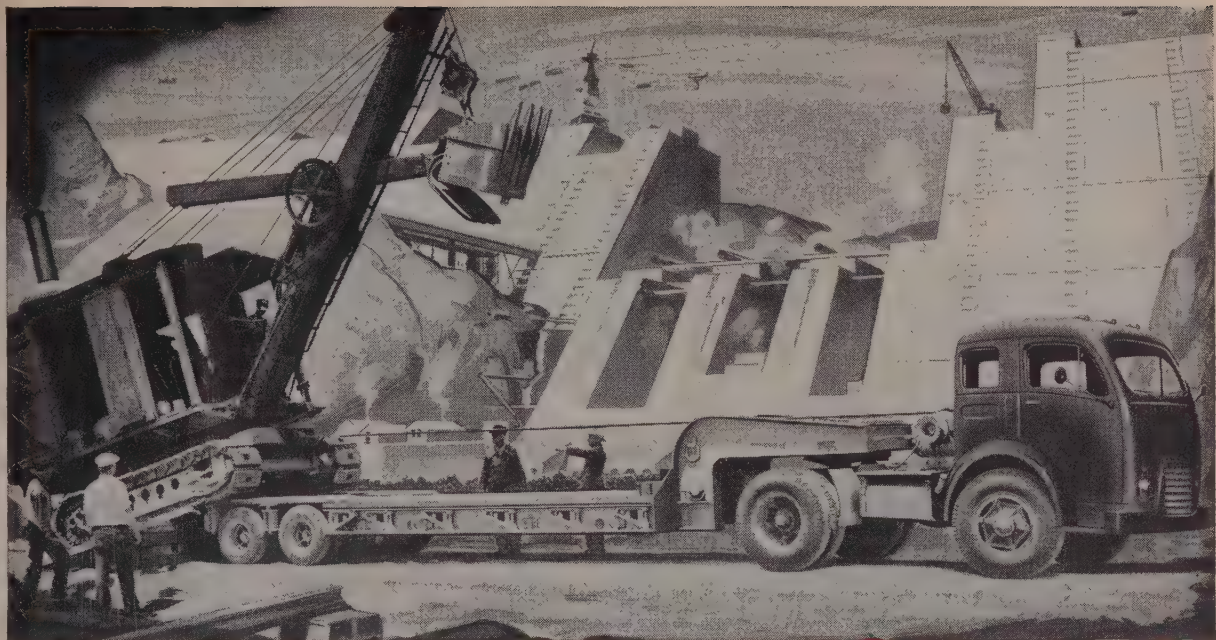
ging depths of 3½ ft. and 5 ft. Quick changes of teeth and cutter bars, with no adjustments to sprockets and bucket line chain, give trench widths of 8½, 12, 15, or 18 in.

A single hydraulic control regulates crowding speed from zero to 13 ft. per min. There is a choice of 3 bucket line speeds. And operation is controllable either in the cab or alongside the machine. Low overall height is handy in a machine of this type, according to the manufacturer. Maximum operating height (with the big boom) is 6 ft. 8 in. When ready to roll to the next job, the height is 10 ft. 4 in. For full specifications write to Barber-Greene Co., 400 North Highland Ave., Aurora, Ill.

New 315-cfm. rotary compressor

First of a new line of portable rotary air compressors from Worthington Corp., Harrison, New Jersey, is the 315-cfm. model available for the first time this month.

Preventive maintenance is built into the new compressor, according to manufacturer, and the new design emphasizes easy accessibility for repairs. Item: An hy-



Where "Engineered Transportation" Counts!

Where The Going Is Rough . . .

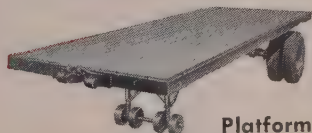
When Time Lost Can Be Costly . . .

Dependable Fruehaufs Pay Off!

These Fruehaufs — And
Many More — Are Built To
Last On The Tough Jobs!



Tilt Decks



Platforms



Chassis



Hopper Dumps

CONSTRUCTION men, oil field men, and highway engineers have many *special* transportation problems in regard to their field equipment and materials. And where special hauling problems arise, Fruehauf's kind of "Engineered Transportation" really helps. It helps to save time, manpower, and money.

Yes, Fruehauf specializes in solving specific hauling problems. By "Engineered Transportation" Fruehauf means Trailers specially designed to work at a particular job — to work hard, and profitably, on the *toughest* jobs, for a long time.

With 38 years of experience in designing and building rugged, long-lasting Trailers for construction work, Fruehauf is certainly qualified to build the special Trailer that *your* job needs. In fact, because of the nationwide usage of Fruehauf's broad line of Trailers, there is probably a standard unit in the Fruehauf line with features and specifications matched to your job.

And it's important to know that your Fruehauf will never be an "orphan"—that is, a Trailer for which parts and service are not always available. The Fruehauf family of 80 fully-equipped, fully-stocked service Branches is permanent protection for *you*—in the city, on the road, or in the field.

Ask your Fruehauf Branch for a free,
illustrated Catalog!

FRUEHAUF
TRAILERS
"ENGINEERED TRANSPORTATION"

World's Largest Builder of Truck-Trailers

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SALES AND SERVICE: Los Angeles • San Francisco
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Sacramento • Spokane • Billings • Salt Lake City
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draulically operated clutch permits warming up the engine before cutting in the compressor. Item: The design allows full gravity draining of oil during shut-down, to avoid having liquid settle in the cylinders or interstage chamber.

For maintenance, blades may be replaced in the field without special tools. The fuel tank is set low for easier filling.

If size is what you want, try the LD 20!

A front-end loader that tips the scale at 48,000 lb. has been announced by **Mixermobile Manufacturers**, 8027 N. E. Killingsworth, Portland, Oregon. Lifting capacity is 18,000 lb.—and to a discharge height of 14 ft. The



machine in 9 ft. 4 in. wide and 12 ft. high. Equipped with the bucket illustrated here, it is 32 ft. 8 in. long!

As the special 10-yd. bucket would indicate, the machine was designed for handling light weight bulk materials. For more conventional use, a 4-yd. bucket is available.

The loader employs diesel power and a torque converter in conjunction with 4-wheel drive, power steering, and full hydraulic operation. Top speed is 16 mph. The turning radius (outside wheels) is 22 ft. 4 in.



BARNES PRIMES WITHOUT FAIL WITH ONLY 1/3 WATER LEVEL IN PUMP

The patented self-priming principle in Barnes *133,000 for 1" Pumps picks up the prime with only 1/3 normal water level in the pump—and primes extra fast. Reduces down time due to priming failure. Cuts hauling of priming water to a minimum.

BUY BARNES SELF-PRIMING CENTRIFUGAL PUMPS
See your BARNES distributor today or write for Catalog R3.



BARNES MANUFACTURING CO.
Mansfield, Ohio • Oakland 21, Calif.
Buy the best . . . Buy Barnes

Barnes Manufacturing Co., Oakland, California; Central Equipment Co., Berkeley, California; The C. H. Jones Equipment Co., Salt Lake City, Utah; Larson Equipment Co., Los Angeles, California; The Rix Company, Inc., San Francisco, California; Universal Equipment Co., Seattle, Wash.

83-M is 2-yd. shovel or 60-ton crane

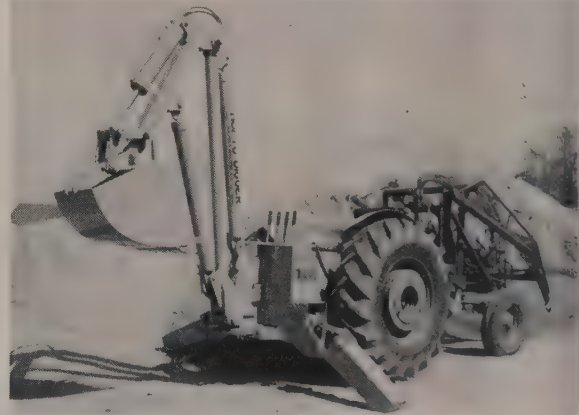
This new model Marion is built primarily as a construction or mining shovel, but design features fit it for crane duty too. It has a third drum to take an extra line or operate as a high-speed boom hoist. Independent boom hoist is available as an option for power control of loads both up and down. Extra stability for crane service comes from optional crawler width and length of 13 ft. 5 in. and 19 ft., respectively.

Machinery features that pay off in easy, dependable operation are claimed by the manufacturer, **Marion Power Shovel Co.**, Marion, Ohio. All 83-M models have torque converters as standard equipment. Self-cooling swing clutches were tested for 2 yr. without heat-damage failure to the expanding rubber tube. There are two propel brakes for easy steering. Clutch adjustments are at a minimum—none for swing, propel, and crowd retract; and only one each for hoist and crowd-out.

The 83-M is adaptable for diesel, gasoline, or electric power.

The first Hopto digger for wheel tractors

This is the Model 80 RTM Hopto digger, built by **Badger Machine Co.**, Winona, Minn. Complete mountings adapt the unit to the Minneapolis-Moline RTI, the Fordson Major Diesel (pictured), the Oliver 77 Indus-



trial, the I-H Super C, the Power Horse 40, and the John Deere Model 60. Special RTM kits cover other wheeled tractors.

Bucket widths range from 8 to 36 in., and capacities up to 1/4-yd. The machine will dig to a depth of 10 ft. and cast anywhere up to 90 deg. right or left of center. Out riggers are hydraulic, and have independent controls for leveling the machine.

Jaeger has a new truck mixer

This mixer is designed to haul 3 to 3 1/2 yd. on a single axle truck, or 4 to 4 1/2 yd. on a light tandem-axle truck. Here are the high points of its construction and operation, according to **The Jaeger Machine Co.**, Columbus 16 Ohio:

Drum speeds forward and reverse from 1 1/2 to 16 rpm, with engine speeds in an economical range of 800-1,600 rpm. Improved chute carriers and chute design save time and effort, and permit direct discharge of concrete into hoppers. "Quick-day" water injector eliminates water bells and packing glands. Discharge blades are 25% larger than before, for fast discharge of stiff mixes. Steeper angle and bigger throat of open-end loader speeds charging of drum.



"Century" Pipe, 4" Class 150, ready for laying in trench in Oakland, Oklahoma.

SMOOTH BORE

"CENTURY" PIPE[®]

The smooth bore of "Century" Asbestos-Cement Pipe means less resistance to water flow and, consequently, lower pumping costs. Formed on a smooth steel mandrel, the pipe has an interior surface to match. The Williams and Hazen Constant "C" is conservatively placed at 140 for "Century" Asbestos-Cement Pipe. Being non-metallic, it cannot tuberculate.

More and more cost and tax conscious communities are recognizing the economy of "Century" Pipe. We will gladly furnish information about its advantages. Write today for a copy of our free booklet, "Mains Without Maintenance."

QUALITIES THAT MAKE "CENTURY" PIPE ECONOMICAL, TROUBLE-FREE, LONG-LIVED

1. NON-TUBERCULATING
2. NON-CORROSIVE
3. EXCEPTIONALLY STRONG
4. DURABLE
5. IMMUNE TO ELECTROLYSIS
6. TIGHT JOINTS
7. SMOOTH BORE
8. EASILY, QUICKLY LAID
9. LIGHT WEIGHT
10. LOW COST

"Century" Pipe meets the A.W.W.A., A.S.T.M. and Federal Specifications for asbestos-cement pressure pipe.

KEASBEY & MATTISON COMPANY • AMBLER • PENNSYLVANIA

Nature made asbestos . . . Keasbey & Mattison has made it serve mankind since 1873



High-pressure hose by Joy

"Surgepruf" is the trade name for a line of hydraulic hose and couplings announced by **Joy Manufacturing Co.**, Oliver Bldg., Pittsburgh 22, Pa. According to Joy, the couplings can be assembled on rubber-covered hose without skiving. No special tools required.

Model C Tournapull ups capacity

With no change in price, **LeTourneau-Westinghouse Co.**, Peoria, Illinois, has boosted the capacity of the Model C rear-dump from 18 to 22 tons. This means a struck capacity of



14.7 cu. yd., and heaped loads of 17 cu. yd.

Dimensions have been changed like this: rear-dump width increased 10 in. at the top, length increased 2 in. Overall length of machine is now 30 ft. (9 in. more). Gage (center to center of tires) is 9 ft. (9 in. more). Ground clearance is down 8 in. to a new figure of 22 in.

Torque converters by Clark

A complete line of torque converters for stationary power plants and off-highway vehicles is announced by **Clark Equipment Co.**, Automotive Division, Falahee Road, Jackson, Michigan. Trade name for the new line is Torcon.

Rated capacities range from 30 to 600 hp. The units are available in diameters from 11 to 19 in., inclusive, and 26 in. The package includes a pump, cooler, and pressure regulator.

According to Clark, a big feature is "free wheel" mounting for the stator or reaction member. This gives the unit the combined advantages of a torque converter and a fluid coupling. Torque multiplication is obtained under load. But with increased speed and less load, the multiplication drops to 1:1—a fluid coupling.

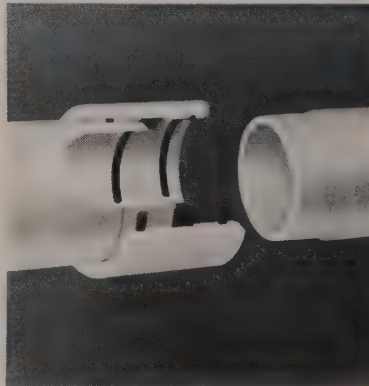
New high-speed, compact excavator

Introduction of the "Dixie Crane," an excavator in the $\frac{3}{8}$ -cu. yd., 5- to

6-ton class, has been announced by the **Dixie Crane & Shovel Co.**, 2343 North 7th St., Harrisburg, Pa. Crane, shovel, or trench hoe rigs are available on either rubber tired crane carrier or on 20-in. crawlers. A complete line of attachments for dragline, clamshell, magnet, pile driver, grapple, or concrete bucket work is offered. Crane rigged, the Dixie has a lifting capacity of 6 tons with the standard 25-ft. boom at a 10-ft. radius. Equipped as a shovel, excavation can be carried to a maximum height of 18½ ft., dumping at 13 ft.; digging 2½ ft. below ground level is possible. As a trench hoe, the Dixie can cut 13½ ft. below ground. The crane features complete hydraulic controls of the most advanced type with separate master cylinders for each working part, and has a low center of gravity. Complete information can be had by writing the company.

New Transite pipe coupling

Johns-Manville has developed a new, pre-assembled Ring-Tite coupling for installation by hand without tools. It is for use with Transite building sewer pipe, and asbestos-cement pipe. The coupling is a sleeve of Transite containing three rubber



rings, a T-shape middle ring and round outer rings. All of the rings are positioned within their retaining grooves at the factory. When the pipe ends move into the coupling, the outer rings are compressed making a tight and leakproof joint. The T-shaped middle ring forms a seal between the pipe ends and is designed to eliminate offsets. Application of a specially prepared Johns-Manville soap lubricant to a pipe end is the secret of pushing the parts home by hand. Address: 22 East 40th St., New York 16.

High accuracy level

UMECO Optical Division announces the availability of a new, high accuracy, 18-in. dumpy level. The 32-power telescope has a minimum focus of 11½ ft. with all interior lens surfaces coated. The weight of the instrument is 9.8 lb., and with a carrying case is 18.5 lb. The instru-

ment is precision made by experienced optical craftsmen to American specifications and under American supervision. American parts and accessories can be interchanged. Every instrument is thoroughly checked before delivery and with it—carries a full money back guarantee of satisfaction. The list price is \$225. For further information write to **UMECO Optical Division**, 465 California St., San Francisco 4, Calif.

New 1955 TerraTrac loader

Model 500, manufactured by the **American Tractor Corp.** of Fort Wayne, Ind., announces many new features this year including improved operator vision, power-controlled dig



and dump, longer and wider tracks, heavier track and side frame assemblies, simplified hydraulic system, and other refinements. The TerraTracs are available in ½, ¾, and 1 yd. sizes with a low-cost tilting trailer to speed transport between jobs. They can be obtained under an exclusive new long-term lease plan for less cash down and lower monthly payments than it takes to finance the average farm-type wheel tractor.

Pre-mixed grout and mortar

Non-shrink Embecco, for more than 30 yr. a product of **The Master Builders Co.**, is being made available in ready-to-use form for the first time. Scientifically, accurately blended amounts of portland cement, sand, and Embecco make the two products Embecco Pre-mixed Mortar and Grout easy to use and convenient to transport and handle at the job site. Advantages claimed by the manufacturer are non-shrinkage, high compressive and impact resistant strength, toughness, oil- and water-resistance, and fast hardening. Followers describing these two products can be obtained by writing to **The Master Builders Co.**, Cleveland 3, Ohio.

Wagon cranes from 25 to 60 tons

Diesel-electric power for the first time in a rubber-tired wagon crane, says **Industrial Brownhoist Corp.**, Bay City, Michigan. The first unit,

The New RUMAC LOADER FOR DOZER



With RUMAC loader attachment
on your dozer your tractor
works for you
ALL the time *not* 1/2 the time!

See your **RUMAC** dealer

With a RUMAC Loader Attachment
on Your dozer, cable or hydraulic,
You are fully equipped to do **ALL**
the job—the rough dozer work
or excavation and loading. The
RUMAC Loader Attachment is
easily and quickly attached or re-
moved—10 minutes—so that
Your one tractor does **ALL** the job
—NOT part of it.

or send for
INFORMATION
Yours
for the asking!

RUMAC Manufacturing Company
P. O. Box 655, Pueblo, Colo.

Without obligation to me furnish me with complete
information about a RUMAC Loader Attachment for
my tractor.

Name.....

Address.....

City..... State.....

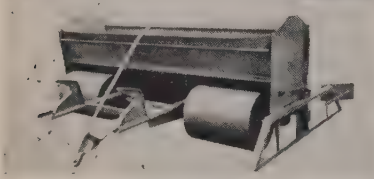
Make and size of my tractor.....

Dealer Inquiries Invited

delivered last year, is a 30-ton model, equipped with 60-ft. boom and intended for quarrying aggregates. The engine is rated at 165 hp. at 1,800 rpm. Both travel and rotation are electric. Operation is by one man, for both crane and carrier controls.

Low-cost asphalt and aggregate spreader

This hopper-type asphalt and aggregate spreader was designed to meet the needs of contractors and highway personnel for a simple, practical, easy-to-operate, low-cost machine that will spread a smooth car-



pet of dry materials as well as asphalt. It hooks to any standard dump or semi-dump truck without the use of truck mounted attachments. It is transported from one location to another on a truck tail gate. The hopper is mounted on large diameter, wide, steel rollers, enabling it to travel over subgrade or base without digging in or gouging. The "strike-off" unit floats free of the hopper, riding on 6-ft. long steel runners. The unit will spread hot or cold plant-mix asphalt, tank-run gravel, coarse or fine slag and limestone, cinders, and practically any kind of base material. Any thickness of spread up to 8 in. is possible. The standard model has an 8-ft. 6-in. overall width for laying an 8-ft. spread. The width of spread can be extended up to 10 ft. For further information write to **Good Roads Machinery Corp.**, Minerva, Ohio.

New electric impact wrench

The Thor SpeedWrench No. 55 is a completely new ½-in. drive electric impact wrench. All of the quality features of tools in the same type and capacity, plus a new finger tip reverse in the handle, are incorporated in the new wrench. The manufacturer claims that finger tip reverse eliminates armature brush shifting, permits more rigid armature support to develop extra power and longer motor life. The new SpeedWrench is rated for a standard capacity of ¾-in. bolt size nut setting, with an

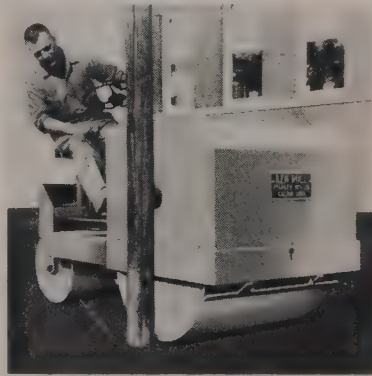
extra capacity of ¾ in. The tool is designed for use with a standard ½-in. square drive wrench socket, and may be adapted for driving square end taps, round shank drills, reamers, wire brushes, and other accessories. Manufacturer is the **SpeedWay Division of Thor Power Tool Co.**, Aurora, Illinois.

Improvements to the Payloader

A new transmission built by Hough, plus torque-converter drive, makes the Model HFC Payloader a better producer, says **The Frank G. Hough Co.**, 707 Seventh St., Libertyville, Illinois. This is the tractor-shovel model with ¾-yd. struck bucket capacity—1 yd. heaped.

1½ tons in a small package

Like the miniature crawler tractors, this pocket-size roller is a handy item for light jobs and tight corners. The Ken Roll can work within 1 in. of a wall or post. According to **Pfahler Manufacturing Co.**, Route 3, Galion,



Ohio, it's just the thing for compaction on driveways, playgrounds, parking lots, sidewalks, and patches.

Power is a 6-hp. air-cooled gasoline engine working through a planetary transmission. In conjunction with band-type clutches, one lever controls forward and reverse drive. Maximum dimensions of the Ken Roll go like this: width 41 in., length 84 in., height 55 in.

New 140-hp. gasoline engine

International Harvester Co. announces the new 140-hp. International Black Diamond 264, a high torque, valve-in-head gasoline engine providing exceptional power output and fuel economy as optional equipment for five International R-160 series truck models. Designed to power trucks in the 14- to 17,000-lb. GVW range and highway tractors rated at 29,000 GCW, the six-cylinder BD-264 incorporates such advantages as economy, greater performance, and longer life. Important factors in achieving fuel savings are a newly-designed, dual-barrel downdraft carburetor and latest type manifold. The engine's sustained power exerts

definite lessening influence upon such normal operational conditions as down-shifting, lugging, fuel-consuming variance in engine speed and driving effort. Address: 180 No. Michigan Ave., Chicago 1, Ill.

Greater horsepower for tractors

Caterpillar Tractor Co. announces greater horsepower and faster engine speeds for the D6, D4, and D2 tractors. This will mean more production for owners, more profitable operation because of the increase travel speeds and greater power. Increases are as follows: D6 drawbar horsepower increase from 66 to 75 and rpm. from 1,400 to 1,600; D4 drawbar horsepower increased from 43 to 48 and rpm. from 1,400 to 1,600; D2 drawbar horsepower from 35 to 38 and rpm. from 1,525 to 1,650. Address: San Leandro, Calif. and Peoria, Ill.

The straddle truck gets bigger

Hyster Co., Portland 8, Ore., announces a Model MD straddle truck. With 20,000-lb. capacity, the machine beats earlier models by 2,000 lb. Correspondingly, horsepower has gone up from 82 to 91 hp.

Literature on the new model is available from the manufacturer. Ask for Form No. 1324 (specifications) or Form No. 1164 (applications, illustrated).

Cardinal diamond blades

One-third longer life is the feature claimed by **Cardinal Engineering Corp.**, Philadelphia 27, Penn., for its new wet-cutting diamond blades for masonry saws.

The new blades are available in 14- and 16-in. diameters. There are blades for specific cutting jobs, as well as the general purpose model. A price list and bulletin P-10 covers Cardinal masonry blades.

Precision for a (low) price

According to **Mikron Instruments, Inc.**, 1966 East Walnut St., Pasadena, Calif., the new Mikron transit is de-



signed for simplicity of use without sacrifice of precision. Its optical system is accurate to reading ¼ in. at 1,000 ft. The price is \$205.

Operational features include 180-deg. plunging telescope, internal focusing with an erect image, hori-



With Homelite Carryable Generators

No matter where you are . . . with a Homelite Carryable Generator, time-saving, *money-saving* power is always by your side. Yes, take a Homelite out on the job and you have instant, dependable power to operate standard universal power tools and floodlights *plus* (if you have a Homelite Dual Purpose Generator) high cycle power tools.

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zontal and vertical verniers reading direct to 5 min. of arc.

Torque converter couplings

Three new models of torque converter couplings are announced by the Fuller Manufacturing Co. for application to a wide variety of industrial machines and materials handling equipment. These single-stage couplings meet the demand for a hydraulic power transmission unit for engines developing 180 to 225 lb. ft. of torque governed at 2,000 to 2,200 rpm. or higher. The simple design of these converter couplings offers equipment manufacturers a readily adaptable unit where there is a need for automatic torque multiplication. The Model 12-T is equipped with SAE No. 3 housing at the output end for the application of automotive clutch and mechanical transmission. Model 12-U is equipped with 1½-in., 10-spline shaft for straight line drives with universal joint. The Model 12-H is available with flanged output shaft for the attachment of industrial-type couplings. For complete information and a descriptive folder giving performance data of the three models, write to the Fuller Manufacturing Co., Kalamazoo, Mich.

1-yd. bucket rises 10½ ft.

The Model 50 Powerloader is offered by the J. I. Case Co., Racine, Wisc., for excavating and heavy materials handling. Speed, reach, and



easy operation are the principal features claimed.

The bucket can be raised to 10½ ft. in 10 sec., with enough reach for end loading of trucks. Interaction of lift and bucket-control cylinders provide automatic crowd and automatic tilt as the bucket goes up. The bucket is automatically level at every height to prevent spillage.

Portable propane floodlight

Fitted with a 20-lb. propane tank, this light will furnish illumination for about 50 hours and to a maximum intensity of 6,000 candlepower. Light may be decreased by the use of a regulator.

The item is completely portable and self-contained. It may be oper-

ated at temperatures as low as 45 deg. below zero.

Made by the Tilley Lamp Co., the floodlight projector is available from William W. Lee & Son, 20 East Jackson Boulevard, Chicago 4, Ill. The complete light includes the regulator but not the fuel tank.

The tight-spot trencher

A new attachment for the little Agricat crawler is the Agrihoe. It is hydraulically operated and comes with interchangeable buckets of 9- or 12-in. widths.

The Agricat itself is only 58 in.



long, 38 in. wide, and 41 in. high. With the Agrihoe attachment, it can reach 10 ft., dig 6 ft. down, and load to an 8-ft. height.

For more information on tight-spot trenching with the Agrihoe, get in touch with Earl H. Pence & Co., Inc., 2150 Washington Ave., San Leandro, Calif.

Equipment briefs . . .

A NEW CLAMSHELL bucket for the H-3 Hydrocrane is announced by Bucyrus-Erie Co., South Milwaukee, Wisconsin. Two rams instead of one handle bowl action, the idea being to speed up digging output. Struck measure capacity is 10.4 cu. ft.

GREATER FLOTATION for the D8 Caterpillar comes with a new 7-roller, oscillating-type track roller frame. The frame requires 42 sections of track instead of 39, also new arrangements for bulldozer and hydraulic control mountings. Caterpillar Tractor Co., San Leandro, Calif.

TIP-BACK BUCKET action is available now for the TL-12 Tractor Loader. The bucket rolls back 25 deg. at ground level, and 41 deg. at a carrying height of 3 ft. Tractomotive Corp., Deerfield, Illinois.

MANHOLES BY THE MILE—It can be done with specially de-



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HERE'S A tip of our hat and a thank you to you western builders for the confidence you have shown in us.

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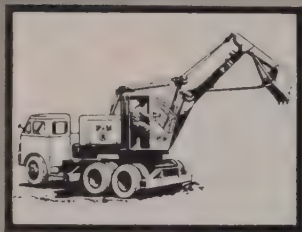
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Be on the lookout for Miti-Mite Big-time operator. Fast worker, always on the move. Surprises you for jobs it tackles. Lifts, loads, digs. Pockets real money for owners. Swings 32" hoe bucket with ease; is deft at handling loads to 7 tons. A fast-change artist for shovel, crane, clamshell, dragline, trench hoe, magnet, pile driver. Mounts quickly, easily on most any truck, new or used. Carries low price tag. Get the facts. Harnischfeger Corporation, Pacific Division, Milwaukee 46, Wisconsin. Or better yet . . .

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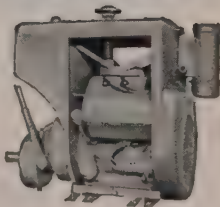


SEAMAN TRAV-L-PLANT

*Sets Soil-Cement
Highway Processing
Record with Help of*

WISCONSIN

HEAVY-DUTY *Air-Cooled* ENGINE



Model VG4D Wisconsin Heavy-Duty Air-Cooled Engine specified as standard equipment on Seaman Trav-L-Plant. Equipped with Stellite exhaust valves and valve seat inserts and valve rotators for long engine life and minimum servicing.

Morrison-Knudsen purchased two Seaman Trav-L-Plants, built by Seaman Motors, Inc., Milwaukee, Wis., for one-mile-a-day production of high quality soil-cement base.

Road materials are pulverized, mixed, blended and correctly assembled for maximum strength and durability. The Wisconsin engine provides a uniform flow of water or bituminous binder to the materials during mixing operation. Picture shows the Trav-L-Plant in a mixing operation, preparatory to liquid application.

This is just another typical power assignment in which Wisconsin Heavy-Duty Air-Cooled Engines play important roles. Construction contractors, equipment designers and builders . . . men who are most familiar with power equipment service demands . . . specify "WISCONSIN ENGINES" as their best guarantee of dependable service and low-cost maintenance.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

signed, octagonal shape concrete form panels. It has been done by Symons Clamp & Manufacturing Co., 4249 Diversey Avenue, Chicago, Illinois.

FASTER TRAVEL SPEED for the Traxcavator No. 6 shovel results from redesign, including a 100-hp. (flywheel) engine. A new hydraulic pump and a jump in bucket size from 2-yd. to 2½-yd. mean higher production too. Caterpillar Tractor Co., San Leandro, Calif.

HYDRAULIC MOLDBOARD is a new accessory for the Allis-Chalmers Model D motor grader. The unit goes 16 in. either way, for a total of 32 in. Allis-Chalmers Manufacturing Co., Tractor Division, Milwaukee 1, Wisconsin.

INTERNAL FOCUSING is now a standard feature of all models of Gurley transits and alidades. For "Facts on Focusing," write to W. & L. E. Gurley, Troy, N.Y.

BIGGER JACKS are now available on a rental basis from Richard Dudgeon, Inc., 789 Bergen St., Brooklyn 38, N.Y. The new line is a series of hydraulic jacks with capacities from 50 to 400 tons and strokes to 48 in. They are provided with gasoline- or electric-driven pumps, and are designed for 6,000-psi. pressure at capacity in jacking large-diameter pipe.

MORE BRAKE HORSEPOWER is available now in the Allis-Chalmers W-226 power unit. The unit can be specified for gasoline, distillate, natural gas, or LPG fuel. Allis Chalmers Manufacturing Co., Tractor Division, Milwaukee 1, Wisconsin.

EASIER OPERATION is built in on ½-yd. and ¾-yd. machines by the Thew Shovel Co., Lorain, Ohio. The company's "E-Z" action controls are now standard equipment, requiring 70% less effort and giving much faster response.

NO STOOP, NO SQUAT with the clearing attachment now available for the Model 17 Homelite chain saw. Check it with Homelite Corp., 48 Riverdale Ave., Port Chester, N.Y.

A PACKAGE DEAL — Engine-torque converter combinations are now provided for the three biggest Cat diesel models, the D397, D386, and D375. Caterpillar Tractor Co., San Leandro, Calif.

DESIGN CHANGES in the front axle assembly of the Model D motor grader are announced by Allis-Chalmers Manufacturing Co., Tractor Division, Milwaukee 1, Wisconsin. Front-wheel lean and steering mechanisms now have fewer wear points.

TWO BLAW-KNOX BASE PAVERS SPREAD 800 TONS PER HOUR ON MARYLAND RELOCATION JOB



These two Model P-150 Base Pavers each spread 400 tons of No. 4 stone per hour on Maryland Route 40. On this 14 mile stretch they spread 12-ft. strips to a depth of 13 inches.

Paving base course to specifications on any highway or airport job is fast, accurate and economical with the big-capacity Model P-150. It lays large stone, slag, gravel, soil cement or crusher run aggregate evenly, *without segregation*, in widths up to 16 feet and depths to 20 inches. Oscillating V-type screed assures "straightedge" leveling. Large low hopper permits practically any truck to back up and dump easily. Wide tracks provide plenty of traction for soft going and there's ample power to push your trucks.

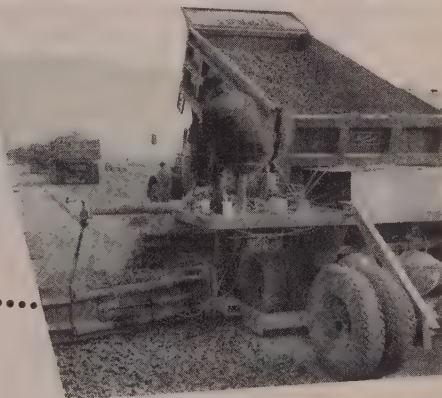
High-speed performance and low-cost operation of Blaw-Knox Base Pavers can help you put your job in the high profit class. Your Blaw-Knox distributor will gladly explain every feature.



BLAW-KNOX COMPANY
CONSTRUCTION EQUIPMENT DIVISION

Pittsburgh 38, Pa.

Offices in Principal Cities



BLAW-KNOX ROAD WIDENERS SPREAD CONCRETE WITHOUT FORMS ASPHALTIC CONCRETE OR AGGREGATE

Profitable widening jobs are the result of speedy, efficient operation that builds earth shoulders at a 200 ton per hour pace . . . spreads and finishes concrete up to 1½ miles per day. Big savings on widening costs, because forms are not required for laying concrete. On a 10-mile strip, 6 feet wide, a Blaw-Knox Widener saved almost \$20,000! Two models available to handle widths from 2 to 10 ft

BLAW-KNOX PACIFIC COAST BRANCH

818 Monadnock Bldg., 681 Market St., San Francisco 5, Calif.

CONTRACTORS EQUIPMENT CORPORATION, Portland, Oregon; FOULGER EQUIPMENT CO., Salt Lake City, Utah; THE O. S. STAPLEY CO., Phoenix, Arizona; C. H. GRANT CO., Oakland, Calif.; COLORADO BUILDERS' SUPPLY CO., Denver, Colorado. LIVELY EQUIPMENT CO., Albuquerque, New Mexico—El Paso, Texas; INDUSTRIAL EQUIPMENT CO., Billings, Montana; NORMONT EQUIPMENT CO., Great Falls, Montana; STAR MACHINERY CO., Seattle, Wash.; Spokane, Wash.; SHAW SALES AND SERVICE COMPANY, Los Angeles 22, Calif.—Branch: San Diego, Calif.; INTERMOUNTAINS EQUIPMENT CO., Boise & Pocatello, Idaho

News of DISTRIBUTORS

IH appointments

Three new dealers have been named by International Harvester Co.: Bay Cities Equipment, Inc., Oakland—distributor for IH industrial power products; Howard-Cooper Corp.—distributor for IH power units in western Oregon and western Washington; Northwestern Equipment Incorporated, Fargo, N. Dak.—distributor for IH diesel and carbureted power units for the three northeast counties of Montana and all of North Dakota.

Euclid service classes

A new General Motors Western training center which opened at San Leandro, California, in January offers service training courses on all Euclid earth moving equipment for dealer and owner service personnel. Information and applications for enrollment may be obtained from Eu-

clid dealers or from the Service Training Department, Euclid Division of General Motors Corp., Cleveland 17, Ohio.

Edward R. Bacon Co. moves

Edward R. Bacon Co. has moved to a new building at 211 North 7th St. at North B St., Sacramento, Calif. The new location provides additional shop space and parts storage, with a large paved area which will permit stocking of heavy equipment for immediate delivery throughout the area. Heading up the Sacramento operation is N. B. Denney.

Additions, changes, new lines

Bay Cities Equipment, Inc., recently added three new accounts: International Harvester Co.; The Frank G. Hough Co., and Drott Manufacturing Co. Recent additions in sales are: Ivan H. Brown, sales

manager of Tractor Division; and Dick Knutson, parts, government sales. Other personnel changes are: George McIntosh, sales manager, general construction equipment; Harold Close, service manager; and Ben Friez, rental department.

Change of address

Intrusion-Prepak, Inc., and The Prepak Concrete Co. announces the new location of its Northwest region office at 300 Twelfth Ave., Seattle, Wash.

Les Hall joins Western Machinery

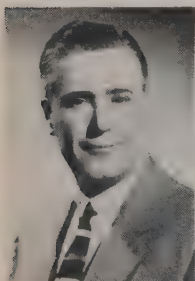
Lester Hall was recently appointed new parts man in charge of rentals for Western Machinery Co., Phoenix, Ariz.

New Heil distributor

General Truck Equipment Co., Long Beach, Calif., is now the southern Los Angeles county distributor of Heil dump bodies and hydraulic hoists, and Heil loader hydraulic elevating tailgates.

Personnel changes

Wayne C. Bailey was recently appointed general manager of Braman-Dickerson Co., Riverside, Calif., and James K. Pace was named sales manager. Floyd Remington and Glyn



Finn



Laskey



Dufford



Kershaw

36th annual A.E.D. meeting

NEW NATIONAL PRESIDENT of Associated Equipment Distributors is Ray J. Finn, president of Bode-Finn Co., Cincinnati, Ohio. Installed during the business session of the 36th annual A.E.D. meeting in Chicago Jan. 23-27, Finn succeeds George W. Gagel, president of Machinery & Supplies Co., Kansas City.

Election and installation of new officers was a highlight of the 5-day meeting, attended by some 2,500 U. S. and Canadian equipment distributor and manufacturer members of A.E.D. The convention's program was designed to acquaint members with current trends and to arm them with up-to-date management information, as well as to attack industry-wide problems.

Election to the presidency climaxes Finn's rise through a succession of A.E.D. executive positions. During

1954, he was Executive Vice President, Chairman of the Membership Committee and member of the important National Affairs Committee.

S. F. (Stan) Laskey, president of Northwestern Equipment Inc., Fargo, North Dakota, was elected Executive Vice President.

Philip A. Dufford, vice president and general manager of Intermountain Equipment Co., Boise, Idaho, was installed as Director of A.E.D. Region XII (Idaho, Montana, Oregon and Washington). And Walter W. Kershaw, president of Wheeler-Kershaw Co., Salt Lake City, was installed as Director of Region XIV (Colorado, Utah, New Mexico and Wyoming.) Both were chosen for the posts by distributor members in their regions by elections last December.

Highlights of the meeting were speeches by new-president Finn and

by John MacLeod, president of The Associated General Contractors. Finn stated that the nation's construction machinery dealers are prepared to meet the challenge presented by President Eisenhower's mammoth projected highway building program. MacLeod spoke on the increasing teamwork evident among contractors, distributors and manufacturers. He pointed out that construction is now the nation's greatest single production activity, accounting for 15% of the gross national product, and predicted that 1955 construction nationally will total close to \$56,000,000,000—a new record.

Noting that competition among general contractors for new jobs is becoming terrific, MacLeod emphasized the importance to contractors of knowing that pieces of equipment will do each part of the job most economically. Here, he said, the distributor can provide great service to the contractor in knowing the capacity and limitations of the equipment he handles, and in giving the contractor reliable information on the best equipment he needs for the job.

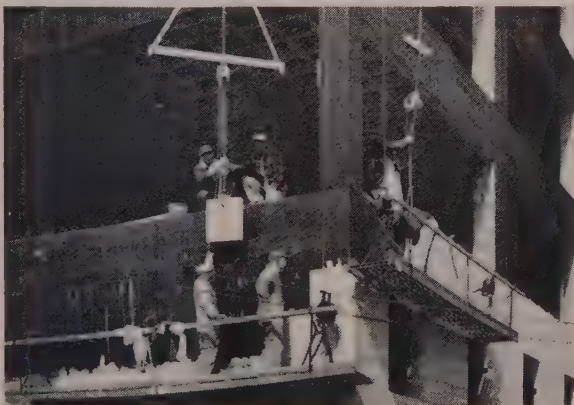
"After the dealer has sold the contractor a new and improved piece of equipment, I think it is logical to expect that the dealer should be able to instruct the contractor's operators in the proper and safe handling of the equipment, and to maintain it . . . One of the greatest services the distributor can give to the contractor is to have repair parts available promptly," stated MacLeod.



CURVES ON MIAMI BEACH—Three different types of PS Scaffolding can be seen doing three different jobs on the 14-story, \$14,000,000 Fontainebleau Hotel that curves 440' along the ocean front at Miami Beach. While 5-ft. wide "Trouble Saver"® Shoring frames are supporting formwork for 10th floor, single post Burton's Shores are being used for reshoring on the lower floors. At right, "TubeLox"® Scaffolding makes runways for wheeling concrete from hoist tower. Taylor Construction Co., general contractor.



WORLD'S TALLEST—Materials for three 707-ft. (from foundations) chimneys being built for the Indiana-Kentucky Electric Corp. near Madison, Ind. are hoisted by "Gold Medal"® Steel Hoist Towers 721 ft. 6 in. high. Custodis Const. Co., chimney contractor.



TEAMED UP FOR SPEED—"Gold Medal" Junior Safety Swinging Scaffolds and a block and tackle stone-lowering arrangement keep stonemasonry job moving at a rapid pace on the Prudential Life Insurance Bldg., Minneapolis. 15 of these light duty Scaffolding Machines, with 20-ft. platforms, keep men at correct working height as work advances. Block and tackle, hung from trolley beams on roof, rolls and lowers stone to men. Stonemasonry contractor, Axel Ohman. General contractor, C. F. Haglin & Co.



TREND TO MECHANIZATION—A clear area for maneuvering buggy loaded with half-pallet (120 bricks) to masons' stations is provided by 8-ft. wide "Gold Medal" Safety Scaffolding Machines. Scaffolding Machines are set away from wall to give masons an unobstructed 20-in. platform. This specially-designed PS Scaffolding, required by palletizing and mechanized handling of masons' materials, is furthering the trend to more efficient operations. Job is Cedar Apts. Extension, Cleveland. Mason contractor, W. M. West & Son.

Builders Supply & Equipment Co., Bakersfield, Calif.; Squires-Belt Material Co., 12th and I. Streets, San Diego 12, Calif.; Contractors Service Co., 221 W. Colorado Street, Las Vegas, Nev.; Sierra Machinery Co., Inc., 2211 S. 19th Avenue, Reno, Nev.; Hansen Lime & Stucco Co., 1574 S.W. Temple Street, Salt Lake City, Utah; Superior Equipment Co., 2221 S. 19th Ave., Phoenix, Ariz.; Contractors Equipment & Supply Co., 707 N. Broadway, Albuquerque, N.M.; The United Materials, 814 West 14th St., Denver, Colorado

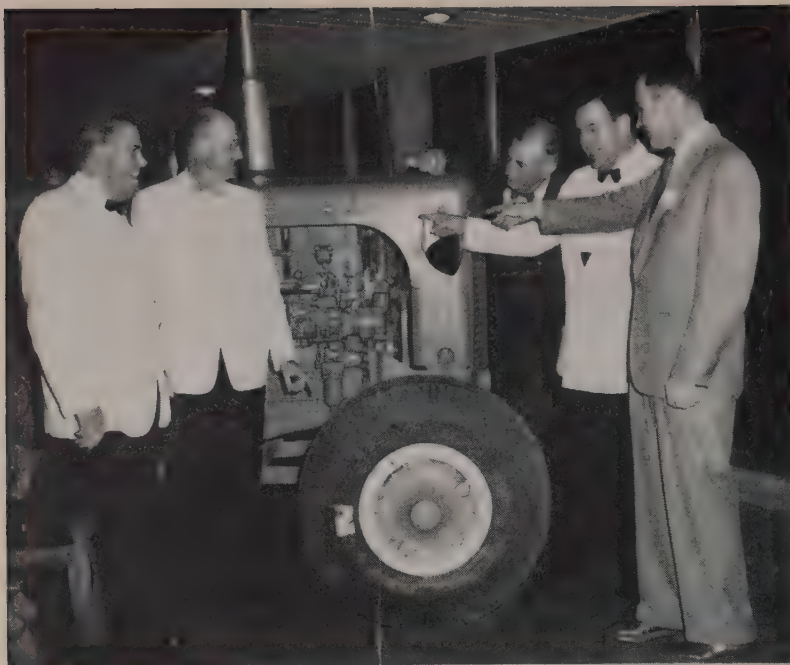
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420 Eighth Avenue, N., Seattle, Washington. Phone: Seneca 7142

MANUFACTURERS



PARTICIPATING in the recent celebration of Superior Equipment Co. in connection with moving into their new showroom, parts room and offices at 2402 So. 19th Ave., Phoenix, Ariz., were about 300 persons. Among them, pictured here, l. to r.: Robert E. Quigley, sales manager of the company; John M. Hazelett, general manager; Harry Scott, industrial representative of J. I. Case Co.; John F. Fisher, president of Superior Equipment Co., and Pat Jones.

McCook are industrial salesmen. Bob Knox is manager of the parts department and Roy Bigler is service manager. The office is in charge of Charles Bray.

New line, new salesman

"Micky" McGuire has been added to the sales staff of Contractors Equipment Corp., Portland, Ore., specializing in the sale of industrial wheel type tractors and accessories. The company recently took on the Ferguson industrial wheel tractor line for the Portland area.

H.C.L. distributes Holland line

H. C. L. Equipment, Inc., of Billings, Mont., was recently appointed distributor for the state of Montana and northern Wyoming for the Holland Hitch Co. Stocks of all Holland products are carried at both the Great Falls and Billings warehouses.

Sales appointment

C. S. (Bart) Barton recently joined the Rocky Mountain Machinery Co., Salt Lake City, as a salesman. His territory covers the counties of Uintah, Duchesne, Carbon, Grand, Emery, and San Juan. Barton is well known in equipment selling, having spent all of his business life in that field.

Sales manager named

Gard Spaulding recently succeeded to the position of sales manager at Central Machinery Co., Great Falls, Mont., a post vacated by the resignation of Dave Vaughn. L. R. McKinney is Helena representative and

Earl Schott is industrial representative.

Exclusive dealership

Newt Crum now represents Flexible Steel Lacing Co. on an exclusive basis. For the past five years he has

**Newt
Crum**



been handling the firm's "Flexco" and "Alligator" belt fastener products from his Long Beach (Calif.) headquarters along with other conveyor and power transmission lines.

News from Marion Power Shovel Co.

Marion Power Shovel Co. recently changed its Western address to 326 Shaw Road, South San Francisco, Calif., where its facilities have been combined with those of Osgood-General. Dean Calland is in charge of sales for both companies. Roy Risdon is parts manager for Marion, while O. C. Osborne is parts manager for Osgood-General. A new distributor to serve for both companies has been appointed: Buran Equipment Co., Oakland and Santa Clara, covering the Northern California area.

M and M enters into plastic pipe

M and M Wood Working Co.'s National Tank & Pipe division will be in the plastic pipe business when it gets into production at an early date. A substantial addition to the concern's present plant in Portland will soon be constructed. President Clay Brown characterized the entry into the plastic pipe field as "entirely normal to our operation." He explained "that in the process of producing plywoods, glues, and wood tanks and pipe, M and M has for years been in touch with the resins and plastics field." The new pipe will start at 8-in. diameter, decreasing to 1/2-in., whereas wood pipe runs from huge diameters down to a minimum of 2 in.

Power Crane & Shovel Assn.

Walter W. Walb, president and general manager of American Steel Dredge Co., Inc., was elected to the presidency of the Power Crane and Shovel Association at the annual meeting in Chicago. He succeeds Julian Steelman, president of the Koehring Company. The Wayne Crane Division of American Steel Dredge is one of fifteen manufacturers of power cranes, shovels, trench hoes, industrial cranes, and other earth-moving and materials handling equipment comprising the association, which has headquarters in New York City.

GMC appointments

A new fleet division for truck sales headed by A. S. McEvoy has been established in the General Motors Corp. Truck & Coach Division. He had been assistant sales manager of the coach division. Several appointments to coincide with establishment of the new fleet division were made: George W. Sheldon to be assistant general sales manager in charge of Central and Western regions; J. R. Clements, former Oakland, Calif., zone manager, to be Western regional manager in place of Sheldon; and Walter J. Carvey, former assistant Oakland zone manager, to be manager, succeeding Clements. Also announced is the establishment of a Los Angeles, Calif., zone office, to be headed by A. B. Campbell, Jr., former GMC retail store manager in Los Angeles.

Huber-Warco prexy

According to recent announcement, Don A. Howard was selected as president for what is to be known as The Huber-Warco Co., and plans for consolidation of general offices in Marion and the continuance of manufacturing operations in Marion and Bucyrus were also announced. The Huber-Warco Co. name becomes official following necessary legal steps to make it the successor of what was formerly The Huber Manufacturing Co. and W. A. Riddell Corp.

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Johnston Stainless Welding Rods

Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

Strong—
Low in cracking

A. P. JOHNSTON CO., INC.
1845 E. 57th St., Los Angeles 58

BACKFILL, uncompacted

Just one life for this Cat—but a long one

When Caterpillar Tractor Co. was running all over the country last year looking for the oldest tractor still in service, we hoped they might possibly find a contender among contractors' machines. We didn't give up even when the winner was announced as being a 36-year old farm tractor.

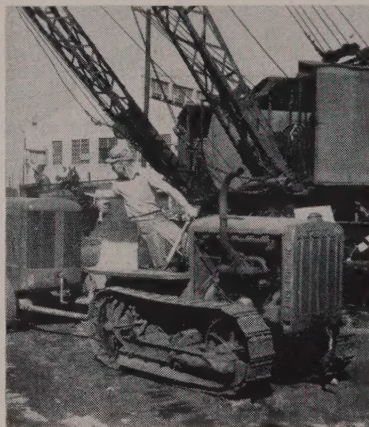
Sure enough, it turns out that Arundel Corporation had a 4th place contest entry among its equipment. Pictured here is the firm's Model 15 Cat, Serial No. PV 7055, purchased new in August 1931.

The tractor has slowed down some in its later years, but it has all its original equipment except the carburetor, and the head had never been off the engine as of last July. Pretty fair record on a \$1485.25 investment.

For its first 4 yr. the Model 15 was rigged with a bulldozer and a hand-operated Miami backfill scraper. It worked on some railroad utility conduit grading. This set the pattern for the next 4 yr. or more—two more

jobs of grading, backfilling and delivering materials.

At the ripe old age of 9, the Cat went into Arundel's yard, where it



has been in daily use for the last 14 years as a utility machine. According to the Caterpillar contest report, sentiment has now gotten the upper hand, and Arundel will never give up

Twenty-five years ago in Western Construction

"Schramm, Inc., West Chester, Pa., has produced a new engine-driven welder compressor combination for steel and tank erection contractors and also for pipeline work, consisting of a 300-amp. welder and a 120- or 60-cfm. Schramm compressor mounted on a Ford truck chassis."

* * *

"The city and county of San Francisco purchased the water system of the **Spring Valley Water Co.** on February 26 for \$40,021,540. This will form the distributing system for the Hetch Hetchy water supply project now nearing completion."

* * *

"The 1,200-ft. main cantilever span for the **Columbia River bridge** connecting Longview, Washington, and Ranier, Oregon, was closed on February 13, eight months after superstructure erection began."

* * *

"The **Will F. Peck Co.**, Hollywood, has completed two contracts for improving Ventura Blvd. in the city of Los Angeles. The work included grading, portland cement concrete paving, sewers, water and gas mains, conduits and storm

drains for 6½ mi. between Lankershim and Sepulveda Blvd."

* * *

"The **Davenport Locomotive & Manufacturing Corp.** recently announced a new line of crawler-type dump wagons to be marketed under the name of 'Davenport cat-tread wagons.'"

... Their large capacity, combined with the ability to operate successfully regardless of weather or surface conditions, enable them to move much greater yardage than is possible with teams, and to continue working when conditions would prohibit the use of teams and ordinary round-wheel dump wagons."

* * *

"**Fred J. Klaus**, of Berkeley, has been appointed city engineer of Sacramento, California, at a salary of \$6,000 a year, succeeding Baylies Clark."

* * *

"The **Northwestern Electric Co.** has begun work on a 100,000-hp. hydroelectric development at Ariel on the Lewis River 13 mi. above Woodland, Washington. A diversion tunnel 25 ft. diam. and 1,600 ft. long is now being driven and the construction camp is nearly completed."

the machine. Of course not. It still has eight lives to go.

Bridge builders blues

Quite often we run into a pretty dramatic operation in the course of observing construction. Quite rarely do we do anything about it. That is, we just don't carry the "feel" of the work into our articles very often. Now we resolve to do better, because we have found someone else who catches the spirit of a construction job.

He's Ozzie Driggers, and he has found poetry in pile driving. Working for Atkinson as a pile butt at Mt. Vernon, Washington, Driggers worked almost the whole crew into his "Bridge Builders Blues:"

We're gonna build a bridge.

We're gonna build it high,

We're gonna build a bridge,

Right in the sky.

Ol' Lee Cox is the super now—

Look out, boys, 'cause he knows

how.

Stab those sheets and drive those piles!

Drive 'em miles, an' miles, an' miles.

It's a 9-B hammer and she's ready to go;

So turn on the steam and watch her blow.

Bob McKee and Higdon, too—

Just pile butts like me and you.

It's a Foss 300 and a concrete show;

So stand back, boys, and watch her go.

Smiley is a brave engineer,

Old Norm is the fireman dear.

He's got a full head of steam

And the lines are tight—

We'll pour concrete!

Right through the night!

—Oscar Driggers, 1954

NEXT MONTH

COFFERDAMS are tricky at best. And when one collapsed around a bridge pier site at Aberdeen, Washington, there was nothing to do but build a stouter one. Ralph Finke, construction engineer for McRae Bros., reviews the contractor's cofferdam design and construction in **Western Construction** next month.

DOG-LEG CHARLIE is a happy, unspectacular guy. But what he can't do to a jackhammer, or to a powder man's temper! Get the straight dope on some extremely poor rock drilling practice next month. It might be worth your leg, or your job, to read this article.

... The Editors

Organization pays off

The production methods of manufacturing industry and of heavy construction have come also to homebuilding. And, for the editor of **Western Construction** they have come with a startling and emphatic fanfare.

We live in a brand-new subdivision house, one of 243 products from what is happily a rather imaginative and flexible assembly line. The grading isn't finished, the fences aren't in, and some houses on the same street aren't even completed yet. But in this situation, and with a couple of days off to install can openers and curtain rods, we have seen modern homebuilding techniques in full swing.

This means a chance to observe the business-like manner in which the builder and his subcontractors operate. The purpose is economy but the key word is organization.

As we see it, organization in this work means scheduling. But it also means lots of overtime at night and on weekends and holidays. It means coordination. But it also means high telephone bills for the builder.

It means unbelievable dovetailing of diverse activities—advertising and selling efforts with model home construction, loan and title processing with tract construction, final inspection and utilities hook-up with an owner's desire for occupancy on a certain date.

Even after that it means remarkably prompt attention to the dozens of minor repair and adjustment items that come up—and must be acted upon by separate subs.

But the organization pays off. It achieves the purpose of economy to the extent that housing today can be advertised, merchandised, and sold like automobiles and soap. The editor's house even came with a warranty, a service policy, and a manual of instructions telling how to live in it!

The Shepherd Scholarship

Last December the earthmoving industry customers of Shepherd Machinery Co. in southern California received unusual Christmas greetings. This was the message:

"Our gift to you this year—

One Civil Engineer

"On behalf of our good customers in the earthmoving industry, we are extending a more lasting remembrance of Christmas this year—a four-year civil engineering scholarship at the California Institute of Technology."

The scholarship competition for the coming school year is now in its final stages. Applications were taken until mid-February, and examinations have since been held. Announcement of the first scholarship winner will be made next month.

Only in a small way is the scholarship regulated or restricted to reflect the business identity of its sponsor. Scholarship applicants must be sons of individuals in the earthmoving industry residing in the counties comprising Shepherd Machinery's territory.

Such is the Shepherd Scholarship. In this single gesture the company has combined good business and good will in a peculiarly effective manner. The short-range benefits to the sponsor are self-evident. But the eventual careers of the scholarship students are the pay-off, and they are long-range benefits. They will go far beyond the Shepherd Machinery territory; they will enhance the whole profession of civil engineering and the whole construction industry. Shepherd has contributed to the building of a great resource.

It is neither improper nor immodest for Shepherd to concur in these thoughts. To the contrary, the humble and sincere motivation of W. W. Shepherd and his firm is well expressed in the company's own comment on this unusual Christmas gift:

"Our past practice of personal remembrance in the form of fruitcakes was as practical as such a program can be—yet all companies recognize the diminishing value and the lack of widespread acceptance . . . I believe we can best sum it up by saying our scholarship program is our answer to a challenge to do things better, as is necessary in the world of business, engineering, or human relations.

"In this manner we include many more people than before. We contribute a lasting gift that promotes our industry and adds to the technical and engineering skills from which everyone benefits—in better roads and civic and national improvements. We are sure it will receive more widespread acceptance and better reflect our appreciation to the industry in a more valid meaning of the Christmas spirit."

HERE'S PROOF THAT A-W GRADERS WITH ALL-WHEEL DRIVE HAVE 30% MORE POWER AT THE BLADE



To calculate Power-at-the-Blade, it is necessary to determine (1) skid pull due to traction and (2) maximum rim pull due to engine; using the formulas at the right, which are those used by manufacturers of tires and farm tractors.

The *effective* Power-at-the-Blade will be the *lesser* of the two figures. If you have more power than is necessary, and insufficient weight on driving wheels, you will slip the wheels, making SKID PULL the *limiting factor*. If you have insufficient power to slip the wheels, RIM PULL due to engine will be the *limiting factor*.

Working in average dirt in first or second gear, all graders have more than enough weight to spin their drivers; therefore Skid Pull is the limiting factor, and the measure of comparative performance. The Austin-Western Power Grader, with its exclusive All-Wheel Drive, has 30 per cent more weight on driving wheels than any other grader; consequently moves 30 per cent more material . . . it's as simple and inescapable as that.

SKID PULL
(DUE TO TRACTION)

SKID PULL = $W \times f$

W = WEIGHT ON DRIVERS

f = FRICTION COEFFICIENT
BETWEEN TIRES AND
GROUND

MAXIMUM RIM PULL
(DUE TO ENGINE)

RIM PULL = $\frac{T \times 12 \times R}{Y}$

T = ENGINE TORQUE AT PEAK
(INTERMITTENT RATING)

R = TOTAL RATIO, ENGINE TO
REAR WHEELS

Y = LOADED RADIUS OF TIRE
(INCHES)

EFFECTIVE POWER AT THE BLADE WILL BE
THE LESSER OF THE ABOVE TWO FIGURES

HERE'S WHY
A-W GRADERS
DELIVER
MAXIMUM
POWER



REAR DRIVE ONLY

No grader with a dead front end can possibly deliver maximum power at the blade. Weight carried on the idling front wheels of the conventional tandem-drive grader is *dead* weight, contributing nothing to traction—*lazy* weight, consuming power to no purpose. Every pound of weight not carried on a driving wheel *handicaps* your horsepower.



ALL-WHEEL DRIVE

On the Austin-Western Power Grader there are no idling front wheels—no dead front end to consume power and decrease efficiency. Every pound of weight rides on a driving wheel. Every pound is working weight—contributing 100 per cent to traction, utilizing the torque of the engine to best advantage, delivering maximum power where it counts—at the blade.

AUSTIN-WESTERN COMPANY

Construction Equipment Division
Baldwin-Lima-Hamilton Corporation

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