WESTERN CONSTRUCTION

AUGUST 1955

EXCAVATION has been taken down to the water table, about 30 ft. below street level, in the first stage of the Webb & Knapp project. Four sumps, one at each corner, are being sunk to allow excavation for an additional 30 ft. In far right corner a load test in one sump is being conducted while a Northwest 80D extracts sheet piling in the left corner from another sump. Buildings are being demolished to the right for continuance of basement excavation across the street. Soldier beams and breast boards line the perimeter of the area.

Denver digs its biggest basement

By JAMES E. SMITH
Assistant Project Manager
Webb & Knapp Construction Corp.

LARGE-SCALE foundation excavation is well under way now on William Zeckendorf's $35,000,000 Court House Square development, officially started last December 29. Zeckendorf, New York real estate tycoon and president of Webb & Knapp, Inc., will build a multi-story hotel, five-story department store, and a one-level building to house smaller retail shops.

All of the buildings will be erected over one continuous basement. This mammoth basement will cover an area 400x481 ft. and will include one and one-half city blocks and a 90-ft. public thoroughfare which will be replaced over the top of the basement proper. There will be four full basements with bottom level approximately 50 ft. below sidewalk elevation. Some footing sub-grades will be as deep as 65 ft. from sidewalk. Total basement level areas will be just under 17 ac. and will provide parking facilities for 2,000 to 2,500 cars.

The initial phase involves the excavation of 380,000 cu. yd. of material. About 70% of this amount is in excellent sand and gravel formations and is being trucked 6½ mi. to an aggregate crushing plant which Webb & Knapp, Inc., has purchased. There the aggregate is separated and

PILEDRIVING was done by this Northwest 80D with 50-ft. boom and 60-ft. leads. McKiernan-Terry 11B3 hammer developed 19,200-ft. lb. blow. Steam was supplied by skid-mounted 90-hp. oil-fired Hamburg boiler.

SOLDIER BEAMS, supplied by the L. B. Foster Co., were driven at 6-ft. intervals around the perimeter of the job site and will be left permanently. Penetration was about 50 ft. A crew follows up installing breast boards which will serve as the exterior foundation wall forms.

stockpiled for future use in the concrete required for the basement and buildings. Gold and other minerals are recovered in the same operation.

Soldier beams are permanent

The cofferdam for excavation of the basement is of the soldier beam and breast board method and involves driving 12-in., 53-lb., H bearing-pile sections approximately 50 ft. in length into the shale formation. The piles are driven on 6-ft. centers around the entire perimeter. The breast boards consist of horizontal timber ranging in width from 3 in. at top elevation to 6 in. at the deepest. These planks are placed by hand as the excavation proceeds and are spaced ½ in. between and thoroughly packed behind with wheat straw. This method retains the fill in back of the cofferdam but allows the subterranean flow of water to filter into the drainage sumps where it is pumped into settling tanks and hence into the city storm sewer system. This soldier beam cofferdam remains in place to become an integral portion of the basement walls by acting as an outside form for the successive concrete pours.

The wale and strut system consists of steel H sections. The rakers or struts, which run diagonally from the perimeter walers to the basement footings, range in length from 96 to 54 ft.

The drainage sumps installed to dewater the area involve the driving of a steel sheet pile cofferdam 18 ft. square. These are set over column centers and excavated into rock down to footing sub-grade. A prefabricated timber crib, 12 ft. square, with vertically spaced sheathing and a wrapping of ¼-in. galvanized wire mesh is centered in the steel cofferdam. Three-quarter inch crushed stone backfill is placed between the inside of steel sheet piles and the outside of the timber crib. When this is completed, the steel sheet piles are extracted allowing ground water to flow into the sumps where electric turbine pumps maintain the water level at the desired elevation.

A "bandstand" frame constructed of 6-in. channel sections and 6-in. steel pipe columns latticed with angle iron bracing was fabricated to act as a guide template for driving the steel sheet piles. The frame was 18 ft. square and 12 ft. high. Eight-inch H piles were driven in each corner of the guide template and then the frame was raised and pinned level on the anchor piles.

Job-made rock breaker

In the drainage sumps, it was necessary to excavate through the shale formation an average of 12 ft. Conventional pneumatic breaker method was found to be extremely slow and costly, therefore, a mandril-type rock breaker was fabricated consist-

ESTABLISHING a sump, steel sheet piles are set around a pipe-frame "bandstand" with aid of Bucyrus-Erie 38B with 70-ft. boom and jib.

TEST LOAD of 120 tons is built up to see if foundation shale can take loading of 15 tons per sq. ft. Only 10 tons is allowed by building code.

ing of a 6-in. steel shaft 3 ft. 6 in. long, tapered to 1 in. at one end and Stellite welded at the tip. The opposite end of the shaft was plug welded and knee-braced to a 2-in. steel anvil plate which was fitted to a McKiernan-Terry 9B3 pile hammer. The hammer, operated free of leads, and on a slight angle, drove the shaft into the shale. The weight of the hammer acting as a lever fractured the rock sufficiently to allow a ¾-yd. clamshell bucket to remove approximately 2½ ft. of the formation at a time. The savings in time over the conventional method amounted to better than 60%.

In three of the four drainage sumps installed, load tests were conducted to determine whether the Denver Building Code allowance of 10 tons per sq. ft. could be increased to 15 tons. To this end a 2-in. steel plate, 2 ft. square, was leveled and grouted into the shale formation. A fabricated steel column was centered on the plate and sway braced to the steel sheet pile cofferdam walers. A fabricated loading platform was attached to the top of the steel column and precast, reinforced concrete slabs, 16 x 8 x 1 ft. were set in 10-ton increments until a total of 120 tons had been placed. This total amounted to 30 tons per sq. ft. on the 4 sq. ft. of plate or 100% overload of the 15 tons desired.

Another major portion of the work will involve the underpinning of two structures whose existing footing is only 16 ft. in a horizontal

DRAINAGE SUMP bottomed out in shale formation has burlap strips hung to keep seepage off the footing while load tests are conducted. Footing is also covered with canvas in the view. Pump at lower left is a 3-in. Homelite.

plane from the perimeter cofferdam. This phase involves jacking down of open end steel pipe piles under existing footings to the shale formation. The piles will be excavated, concrete filled, and then capped with a continuous reinforced concrete grade beam. A continuous concrete cut-off wall, 2 ft. thick, will then be poured to varying elevations as an added precaution against loss of fill from under existing basement slabs.

The general contract for the basement and underpinning phase is being handled completely by Webb & Knapp Construction Corp. with their own forces. Project personnel includes T. J. Smith, project manager; James E. Smith, assistant project manager; F. G. Chaisson, general superintendent; G. Ellory Lapham, assistant superintendent; A. Magee, project engineer; J. Wetzel, office manager.

The consulting engineers for the foundation are Moran, Proctor, Meuser and Rutledge of New York City and the architect is I. M. Pei of Webb & Knapp architectural division.

Do you release planholders' names?

The Wyoming Highway Department asked, and the Western states answered like this:

(1) Do you release the names of those firms or persons obtaining plans or proposals for highway work prior to the date bids are opened?
YES: Arizona, Colorado, Idaho, New Mexico, Oregon, Utah, Washington, and 22 others.
NO: California, Montana, Nevada, Wyoming, and 11 others.

(2) If so, are the names released publicly or privately?
PUBLICLY: Arizona, and 13 others.
PRIVATELY: Colorado, Idaho, New Mexico, Oregon, Utah, Washington, and 9 others.

(3) How long before the bids are opened are names made available?
ANY TIME: Arizona, Colorado, Idaho, Utah.
2-3 DAYS: New Mexico.
4-5 DAYS: Oregon.
7 DAYS: Washington.

(4) Do you approve the releasing of such information prior to bid openings?
YES: Arizona, Colorado, Idaho, New Mexico, Utah, and 19 others.
NO: California, Montana, Nevada, Wyoming, and 13 others.
NO OPINION: Oregon, Washington, and 1 other.

DO YOU RELEASE the names of those firms or persons obtaining plans or proposals for highway work prior to the date bids are opened?

That was the big question circulated to 48 state highway departments two years ago. Wyoming's highway commission was behind the questionnaire, which climaxed 20 years of recurring argument. "No names" was the state's policy during all that time.

Some say yes, some say no

But the pressure exerted in Wyoming became too much. And a first relaxation of the rule was made in May 1953: names of planholders would be released at 4:00 p.m. on the day preceding a letting. (This is right after a customary meeting between department personnel and prospective bidders). The pressure, of course, was to the effect that contractors and materials men could get together in no other way.

Only a month later, the Bureau of Public Roads showed Wyoming a poll that directly contradicted the arguments for releasing names. So Wyoming determined to make its own survey. Four questions were formulated, a letter prepared, and the questionnaire directed to all 48 states. All but 4 responded. The detailed results from the Western states accompany this article; a summary of 33 responses from other states is also included.

The results are not overwhelmingly conclusive. Planholders' names are released by 29 states, withheld by 15 others. This is a 2-to-1 majority, but shouldn't a narrow policy question of engineering administration find an even more clearcut answer? Or, working the other way, isn't it likely that the split in answers would be less conclusive if laws of many states did not require release of such "public information"?

The latter question can partly be answered by noting questionnaire responses to a more specific question: Do you approve the releasing of such information prior to bid openings? Only 24 states said yes to this one, 17 said no; and 3 straddled the fence.

Tallies for the Western states do not disagree markedly from the national totals, considering that the sample is so much smaller. Seven Western states release planholder names, four do not; five approve, four do not; and two straddle the fence.

Why the split vote

Much of the difficulty of getting a hard and fast conclusion doubtless lies in differences among accepted bidding and sub-bidding practices that have developed in different regions of the country. This leads to the further note that 44—or 48—highway departments cannot authoritatively provide an answer. They are, after all, subject to unequal pressures brought to bear by "crusaders," or at least contractors and suppliers having very strong feelings. Quite possibly, a well controlled survey among highway contractors and materials men, conducted by AGC and AED, would reveal a more consistent pattern.

But for the present, Wyoming's survey is the most thorough available. And the comments that came with it are the only basis on which Wyoming, or anyone else, can rationally establish a policy. Notably, none of the answers or comments seemed to reflect concern with notions of "secrecy" or "withholding public information." Within the engineering profession and the contracting business it seems pretty well realized that a policy on planholders is a business matter, not a philosophical one.

Among the comments made by state highway departments, two or three were most common, with but slight variation. For one thing, most requests for publicizing planholders' names comes from materials men. This is to be expected.

Also, one of the main deterrents to publicity, in the minds of highway department personnel, is the possibility of bidding collusion that might be a direct result of releasing names, whether by publication or in response to individual inquiries. Colorado, for example, instituted an open policy during the war years, and favors doing so even today. But they note, "If names of potential bidders are made available, it is a very material assist to anyone who is attempting to frame the bids."

Names only on request

The happy medium most common among highway departments, assuming they do permit the release of names, is to do so only on request. This is the practice in 15 states; 14 others make a published proclamation. In the West, 6 of 7 states employ the "on request" method.

Wyoming, at the time of its survey, was of the "no release" school of thought. However, using the survey as a basis for establishing a new policy, here is what resulted. The new policy and its history over a year and a half were described to **Western Construction** by Thurman D. Sherard, secretary of the state highway commission:

Wyoming makes a choice

"The final decision was reached on August 19, 1953, and is shown in full as follows: 'A motion was then made by Commissioner Wiker, seconded by Commissioner Kriz and carried, that a list of all projects included in a letting be posted publicly on a bulletin board in the main office of the Highway Department in Cheyenne, Wyoming, two weeks prior to the date of scheduled bid openings and that sufficient space be allowed under each project listed for the names of contractors who take out plans on that project. The space will be available for any contractor who wishes to list his name therein, or have his name listed therein by his representatives, except that in no case shall such listing be made by an employee of the Wyoming Highway Department and in no case will any names of planholders, listed or not listed, be released by a Department employee.'

"The above described system apparently is quite satisfactory to the contractors and suppliers. Without any attempt to draw a conclusion, it

as been observed that only in one r two instances have any names een posted until the day before the pening. This has been done during regular meeting between contrac- ors and the highway department eld the afternoon before the letting. Such postings have been delayed de- pite the fact that those same con- ractors, and many others, passed the ulletin board a week or two previ- ously on their way to procure con- truction plans.

"For nearly the past year, there have seldom been more than one or two names posted on the board at closing time on the day preceding the letting. And very few, if any, ma- terials men have been seen consult- ing the board for the names of con- tractors.

"The Wyoming Highway Commis- sion sets the policies under which we operate and in its judgment, after a consideration of many facts and opinions, the present policy presents a fair and reasonable answer to a dif- ficult and controversial problem."

Army reports practices in sawn contraction joints

THE SAWING of contraction joints in airfield pavements is a practicable and desirable method of constructing the joints, according to a report of the U. S. Army Corps of Engineers just made available to the public.

This report, which follows an in- vestigation of the concrete work at a number of air bases and a general study of joint construction, states that the procedure which gives the best assurance of eliminating random cracking of pavements is to saw the joints consecutively at the required spacing in the sequence of concrete placement as soon as the concrete can be sawed without damage. This pro- cedure also results in more uniform opening of the joints during contrac- tion of the pavement.

Projects studied were in paving lanes 25 ft. wide with thickness rang- ing for 6 to 20 in. All sawing was done with a single diamond saw blade. The report discusses pavement details, sawing equipment and pro- cedures, specification requirements, evaluation of sawed joints, joint seal- ing, curing, costs and general com- ments of personnel connected with the construction, and includes rec- ommendations for the standardiza- tion of specifications and procedures for sawed joints. In addition to the experience records, a field study was conducted to determine the mini- mum depth of saw cut that could be used for dummy groove joints.

PB 111536, Investigation of Sawed Joints in Concrete Pavement, 39 pages including a bibliography on sawed joints, may be ordered from the Office of Technical Services, U. S. Department of Commerce, Wash- ington 25, D. C. Price is $1.00.

Two paving materials, 16 bridges, electronic analysis of data —

AASHO Road Test will cover everything

PLANNED RESEARCH being sponsored by the American Associa- tion of State Highway Officials will be undertaken in Illinois. Designed to measure the effects of vehicle weight on roads and bridges, the Bureau of Public Roads will cooper- ate with the state and territorial highway departments, Department of National Defense, and the automo- tive, petroleum, and tire segments of industry in this $12,000,000 road test.

The site selected lies in an area conforming to predetermined re- quirements as to climate, precipita- tion, frost penetration, and soil con- ditions, established to insure wide- spread application of the seasonal test results to particular conditions prevailing throughout the country.

Room for 1,000,000 loads

The tests will be made on a 4-lane divided highway constructed as part of an 8-mi. relocation of route U.S. 6 between Ottawa and LaSalle. Four test loops, each approximately 7,600 ft. in length, will be provided by con- necting the divided roadway with turnarounds. Each loop will have two test lanes with concrete pavement on one side of the dividing median and bituminous pavement on the other. Each loop will be subdivided into sections with pavement varying in thickness to represent existing roads and possible future design require- ments. There will be identical varia- tions in the paired test lanes of each loop. Sixteen bridges of varied design and composition are included.

Three-axle and 5-axle truck-trac- tor semitrailers will be used as test vehicles. They will operate around the loops in the direction of normal traffic, applying controlled axle loads on the paired lanes in each loop, single axles on the inside lanes and tandem axles on the outside lanes. Six vehicles will be operated at uni- form rates in each of the eight test lanes with single axle loadings of a proposed range from 10,000 to 30,000 lb. and tandem axle loadings ranging from 20,000 to 50,000 lb. More than a million axle loads will be applied on each test section.

Financing

The test road, estimated to cost ap- proximately $3,000,000, will be con- structed as a federal-aid project with financing to the extent of salvage value from apportioned federal aid and Illinois state highway depart- ment funds. Test features will be fi- nanced from the joint-State fund con- tributed by the several highway de- partments. An industry contribution of $3,000,000 represents the expense of the test vehicles, gasoline and lu- bricants for their operation, and the tire equipment. The Department of Defense will cooperate.

The Bureau of Public Roads, in re- sponse to broadened research au- thority provided by the Federal Aid Highway Act of 1954, anticipates pro- viding technical personnel, assist- ance and advisory services instru- mentation, and equipment. Direction and administration of the project will be through a Highway Research Board Advisory Committee which will include wide representation of the participants. Direction of the project operations will be under a project manager selected by the Board with the concurrence of AASHO.

Right-of-way acquisition by the state of Illinois is already under way, and construction will follow. Con- trolled loads will be applied for an indeterminate period, after which the post-test phase will include investi- gation of the effects of some of the heaviest military vehicles and of the design requirements for their accom- modation.

Interim findings planned

High-speed, electronic computers will be used to keep current the analysis of test data and to make pos- sible interim findings of significant value to highway construction pro- grams. Final test findings will pro- vide important advances in knowl- edge, contributing both to the econ- omy of highway transportation and to improved bases for assessing the relative cost responsibilities of the different classes of vehicles making use of the highways.

The earlier road tests took place in Maryland in 1950-52 and in Idaho in 1952-54. They were sponsored, re- spectively, by a group of 12 eastern states, including the District of Co- lumbia, and by the Western Associa- tion of State Highway Officials, rep- resenting 11 Western states.

Results for nationwide use

According to G. T. McCoy, Cali- fornia state highway engineer and president of AASHO, "The earlier regional tests yielded valuable infor- mation about the effect of different axle loads on various types and thick- nesses of highway base and pave- ment. They also indicated that further large-scale research would be worthwhile in terms of more defini- tive results for nationwide use."

An active California participant in the planning of the road test project, in addition to McCoy, has been Francis N. Hveem, materials and re- search engineer of the State Division of Highways.

Salt River Power District photographs

Down the canyon there, it's Jim Smith, working on —

The West's most lonesome road

LOADING UP, twice during an ordinary day, Smith pilots an old Cat Thirty, bulldozing decomposed granite through the trap into his truck bed.

FIVE DAYS A WEEK he guides an F-5 Ford truck loaded with decomposed granite over a road that would make the weak-hearted driver reach for the digitalis. He's Jim Smith of the Salt River Power District in Arizona, and his chore is maintenance of the 6½-mi. access road to Horse Mesa Dam.

Built 32 years ago at a cost of about $400,000, the road first served during construction of the dam. It's been used ever since by the dam operators. For a long time, lacking suitable maintenance, the district had a road that was truly a testing ground for its strong-willed employees. Today, the same perilous curves, the same unrelieved narrowness are still there. But slow driving by the motorist and constant work by Jim Smith have minimized danger.

To insure a passable road throughout the year, Smith hauls an average of 60 tons of granite a week from a sole source, the foot of Fishcreek Hill 15 miles away. Undaunted by hairpin turns after 6 years of constant surveillance, Smith knows every station along the route. He seeks out the soft spots and the chuck holes and promptly applies his road building know-how. It's not fancy work, but it has to be done constantly; the desert showers are fickle in flooding

rst this wash, then that hillside.

The heavy rainy season is the worst or Smith. After a thorough downpour, the going is not just difficult; t's hazardous. But Smith has to leave his house as usual—down at the employees' camp — and head upward, weaving and turning and building a picture of the rebuilding he'll have to do for the next several days.

Long hours of work developing a relatively smooth surface are lost in a short time when the water streams down the serrated mountain side. The water comes almost like an avalanche —sweeps everything before it. The road surface is lost down the hillside, and is replaced by a confusion of alluvium and boulders from above. At times like these, Smith will be hauling as many as five 6-ton loads a day for the road. An average day runs from 1 to 3 loads.

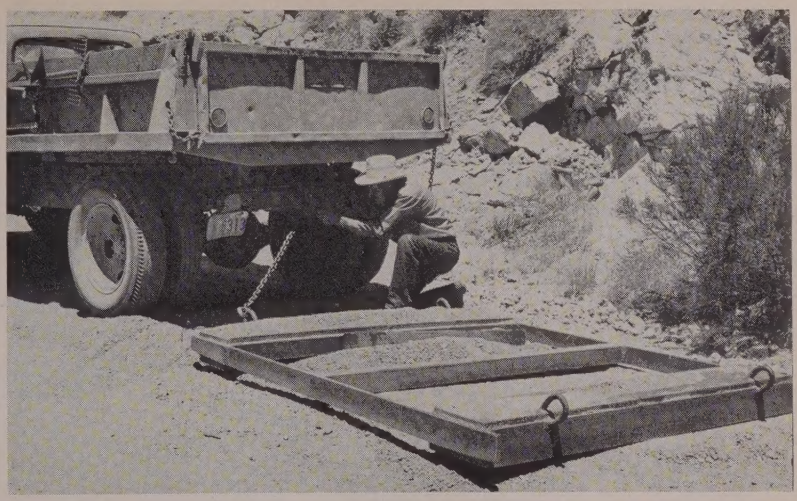
Smith's road has no "extras." It's one lane wide, with an occasional turnout for passing. It has no guard rail anywhere. Natural materials built it, and natural materials maintain it. It's so winding and treacherous that it's become picturesque, known in Hollywood as a useful movie location. World War II saw it used as background scenery for a film about the equally rugged and famed Burma Road.

> "Owing to the exceptionally difficult nature of the terrain, the total cost of road work exceeded $400,000, the solid rock excavation being nearly 400,000 cu. yd."—T. A. Hayden, Assistant Engineer, Salt River Valley Water Users' Association, in **Western Construction,** July 10, 1930.

Jim Smith landed his job by a route as devious as the road itself. He used to be a rancher in northern Arizona. But his wife heard of a teaching opportunity at the Horse Mesa employees' camp, and she applied for the position. Today she has 14 camp youngsters in her class at the schoolhouse. Jim applied for an opening as maintenance man, and he's been smoothing out the road ever since.

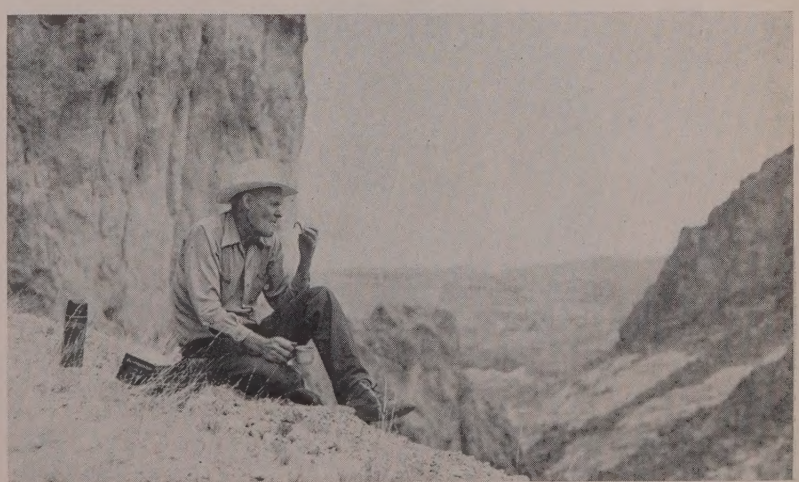
Father of two children, Rosemary and Jim, Jr., who no longer live at the camp, Jim and his wife regularly head "outside" on week-ends, driving 65 miles northwest to Phoenix.

The smooth state highways are probably like heaven to Smith. The rest of the week, hardly ever encountering a passerby — except an occasional power district employee or courageous fisherman — he rattles over his 6½-mile route in a truck cab. It's certainly the loneliest road maintenance job imaginable. "But I don't mind it," Smith says. "Every day there seems to be something different—the animals, the vegetation, and always the road problems."

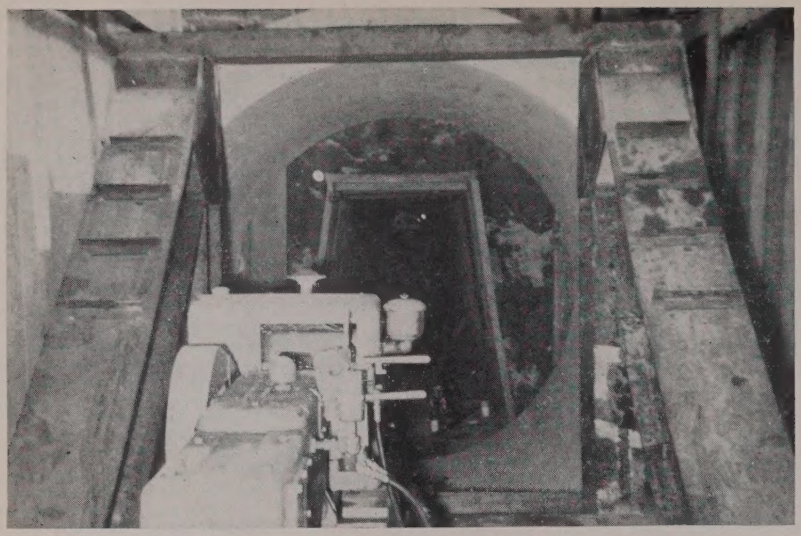


HOOKING UP a drag, Smith gets set to smooth out a stretch of "washboard." Rocky cut slopes get no attention anyhow, so this gadget serves well enough as a blade.

CHECKING UP, Smith finishes up a patrol at the bottom of the canyon, beside Horse Mesa Dam itself. The sun still high, he's off for another trip to stockpile.



RESTING UP, Smith has his pick of the best in postcard scenery when it's time for lunch. Lonely, yes, but there's new beauty every day, everywhere he looks.



BIG PUSH is about ready. The Rodgers gasoline-driven pump in the foreground will actuate two 200-ton jacks against the steel framework and the first section of the culvert will advance.

DRIVING PILOT tunnel first was secret to the success of the operation. It was followed up with a concrete paved invert that served as an accurate, greased skid for the pipe to slide on.

EXTENT OF the material to be removed between the pilot tunnel and the pipe can be seen here. At this stage, 160 ft. of culvert had been shoved forward and operations would now move to far heading.

Jacks push 243 ft. of large culvert beneath freeway

DRIVING THROUGH 243 ft. of pilot tunnel, concreting and greasing the invert, and then using two powerful hydraulic jacks enabled the Wattson-Kier Co., joint venturers, to easily handle the accurate installation of 107-in. outside diameter concrete pipe culvert.

The project was for the Los Angeles County Flood Control District and located on Second Street in Alhambra. What was required was the placing of 243 ft. of the culvert beneath the Ramona freeway at this location.

Pits were first dug at both ends of the culvert location, then a small pilot tunnel was driven through connecting the two pits. The nature of the ground was a sandy silt from the invert to about 2 ft. above the spring line and compact sand above that point. Solid 2-in. lumber lining was required for the pilot tunnel advance. Excavated material for this first stage was removed by a slusher powered by a gasoline-driven, double-drum hoist.

Pipe rides paved invert

The second step was to concrete the invert of the pilot tunnel; concrete was wheeled in with ordinary hand buggies. Accurate line and grade for this invert was one of its important features. The pipe which was later jacked rode on this concrete invert and the surface was lubricated with cheap grease.

The pipe jacking operation took place in two steps with 160 ft. being jacked from one pit, and then repeating the operation for 83 more feet of pipe from the other pit. A steel framework was fabricated that bore against the pipe being jacked. Back of the framework was placed a gasoline-powered Rodgers hydraulic jack unit which actuated two 200-ton rams. These had a 48-in. ram travel.

During the pipe jacking, the dirt excess between the perimeter of the pilot tunnel and the perimeter of the concrete culvert was excavated and taken forward through the pilot tunnel. This method therefore did not interfere with operations in the jack pit. The same slusher and double-drum hoist was used for removal of the dirt now as for the earlier pilot tunnel work.

The organization for this job was as follows: R. A. Wattson Co. was sponsor with R. H. Wattson acting as representative; Aubrey Horn represented the W. E. Kier Construction Co.; Don Lawson was superintendent and Floyd Douglas was foreman. Jacking equipment was sold to the contract r by the Fornaciari Co. of Los Angeles.

HALTING A LANDSLIDE which caused the pavement upheavel in the foreground was accomplished on the south approach road in Yellowstone Park by Bureau of Public Roads men by drilling 200-ft. long horizontal holes and casing them with 2-in. diameter drain pipe.

Special drills drain landslides

WHAT CAN BE MORE economical than the permanent stabilization of a landslide that threatens a road or continually pushes it out of shape? The idea is a challenging one, and it has been met successfully by both the California Division of Highways and Division 9 of the Bureau of Public Roads. The end result has been the development of definite ideas on equipment for drilling horizontal drains. The ideas are discussed on these pages, but first let us have a look at the end objective—what the drain is for.

BPR viewpoint

In Division 9, Robert A. Bohman notes that landslides have been a continuing problem on forest and park highways. Generally, water is the primary cause. Therefore, control has been toward drainage. As Bohman puts it:

"Surface drainage is considered essential, and is usually accomplished first, but it has its limitations. There still exists a need for tapping the deep pockets and flows of water which apparently exist in most of the slides, as determined by visible signs such as seeps and springs and by exploratory borings.

"On Bureau of Public Roads' jobs funds for the installation of the drilled drains have been provided as force account or post construction items on our forest and park projects, and the work has been done under the supervision of the division's materials section, headed by W. L. Eager.

"Because each slide has its own peculiarities, no one control method or perhaps no one combination of methods can be successfully applied to every slide. It is believed, however, that it is necessary to provide adequate subsurface drainage if slides are to be controlled economically, and that at this time drilled horizontal drains are the only feasible answer to deep subsurface drainage."

California viewpoint

A. W. Root of the California Division of Highways has this to say about their work which started initially in 1939:

"Interception and removal of subsurface water is often an effective method of preventing or controlling landslides, especially the "slump" type. Most roadway slipouts are slump-type landslides. One method of subdrainage used extensively consists of installation of horizontal drains, which are 2-in. perforated pipes placed in drill holes bored into a slope. The drains are usually 100 to 300 ft. in length, and on gradients varying from 1 to 20%.

"One of the principal advantages of the horizontal drain method of controlling landslides is the relatively low cost compared to other methods of stabilization. The use of horizontal drains is restricted to soil formations which can be drilled economically with available drilling equipment. Constant efforts to improve methods and drilling equipment have made possible the economical installation of horizontal drains in all but the most difficult formations."

Here is the equipment the BPR uses

By ROBERT A. BOHMAN
Bureau of Public Roads
Denver, Colorado

IN THE summer of 1953 Division 9 adopted the method of installing perforated drain pipe in drilled horizontal holes at such locations in the slides as seem most likely to produce water. These locations are selected after reviewing data obtained by exploratory drilling, and after studying the geological phenomena and surface conditions. Actually the holes aren't horizontal but usually vary from 2 deg. to 15 deg. above horizontal.

The equipment used in installing the drilled drains was not purchased specifically for this purpose, but with a few modifications it is believed it is now as well suited to this type of work as any and, at the same time, the drilling machine is still used on jobs for which it was originally purchased; that is, in investigating bridge foundation materials, tunnel sites, and subgrade soils along new survey lines. The drill is a Joy core-drill machine, Model 12-B, powered by a 4-cylinder Waukesha engine and has a power winch attached. It is mounted on skids and can be moved under its own power by using the winch, or the whole unit can be mounted on a power wagon in such a way that drilling can be done without removing it from the power wagon. This is often done in the more ac-

cessible locations. The drill head will turn 360 deg. permitting drilling in any direction.

In addition to the drill a Bean Royal 20 water pump is used for circulating drilling fluid, a TD-6 tractor for building rough roads to the drill sites and for moving the drill, a 1-ton power wagon for transporting the drill and drilling equipment from one job to the next, and one or two other trucks of different types which also transport equipment between jobs. Recent additions to the list of equipment include a 7-ton stake body truck and an acetylene welding outfit. The 7-ton truck will adequately transport all the drilling equipment except the drill itself which will be left on the power wagon. The welding outfit will be used to make field repairs on equipment and for rebuilding or refacing drilling bits.

It has been observed in drilling any kind of formation that has numerous hard boulders or any solid or fractured ledge rock of various geologic types, that size "N" drill rod is much more satisfactory than the smaller diameter rods, and that the tri-cone type rock bit is likewise superior to the various types of finger or drag bits. For use in Division 9 the 4¼-in. tri-cone type rock bit is preferred.

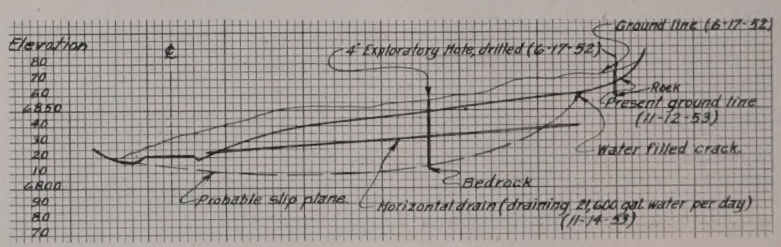
Right kind of pipe

Pipe used as casing has been either 2-in. galvanized water pipe perforated with a double row of ⅜-in. holes at 4-in. centers, or 1½-in. diameter pipe with a single row of ⅜-in. perforations on 3- to 4-in. centers. In most cases the smaller pipe is preferred because: (1) it is less expensive, (2) it is easier to handle, and (3) it has proven more successful in casing the drilled hole for the full depth in cases where the holes have caved and partly filled in again with loose material. This coming season a special 18-gage pipe, fabricated by the Armco Co., will be used in some cases. It will be 1½ in. in diameter and will have the following advantages: It will be less expensive and will be lighter and easier to handle than the galvanized water pipe.

Here's a BPR case in Wyoming to show you how it works

FLOW OF 22,000 gpd. came from one of four drain pipes, each about 200 ft. long, driven into the slide area.

JOY 12-B core drill has 4-cylinder Waukesha engine and drill head that rotates 360 deg. It is also used for other foundation work.



SLIDE AREA cross-section at Station 662 on the south Yellowstone approach road—successfully stabilized by the methods pictured here and at the beginning of this article.

The Station 662 slide on the Yellowstone South Approach Road is situated in an area where slide topography is common. The geological materials in the slide are primarily much altered volcanics and carbonaceous shales.

Trouble began here when a cut was made through the lower portion of an old slide during construction in 1951-52. The removal of this material apparently reduced the resistance to the driving force, causing a mass movement of material toward and into the roadway. The movement was primarily uphill from the road but terminated in an upheaval within the roadway. In an effort to stabilize the moving material, the design grade was raised 6 ft., surface flows were diverted, and 29,000 cu. yd. of material was removed from the upper part of the slide.

These measures apparently checked movement for the remainder of the season, but by the next season (the spring of 1953) cracks appeared in the roadway and in the slide mass above the roadway. During the course of the summer, a section of highway about 150 ft. in length rose 14 in. above the finish grade line. On the upper limit of the slide a large crack opened up to a maximum width of about 3 ft. Water stood within 12 in. of the ground surface in the crack coming from an underground source. Earlier exploratory drilling indicated free water under a hydrostatic head to be present in the slide.

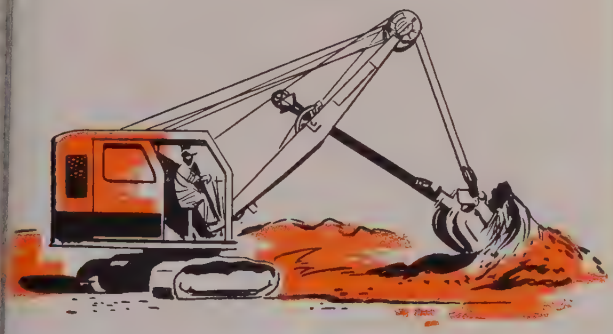
The situation appeared ideal for the installation of drilled drains, and in November 1953 four drains were installed, one of which produced a flow of 22,000 gpd.; the other three produced flows of smaller amounts.

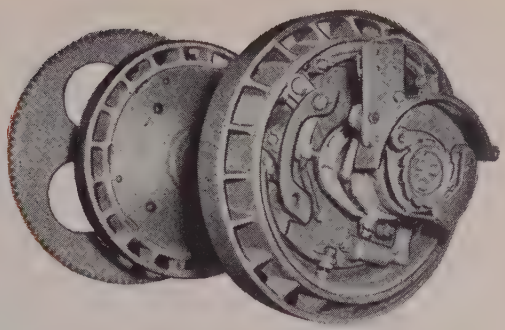
By the following spring no additional movement could be noticed, but as an added precaution, provisions were made for the contractor on a surfacing project on this section of highway to raise the grade through this cut by about 3 ft. This was done and the surfacing was placed. Up until last fall no further distress was noted.

On this slide a total of 832 ft. of drains was installed at a cost of $2,500 or about $3.00 per ft. of hole drilled and cased. It is felt that by the combination of draining, raising the grade, and unloading the head of the slide, this particular problem has been solved.

OMPARE Koehring 205

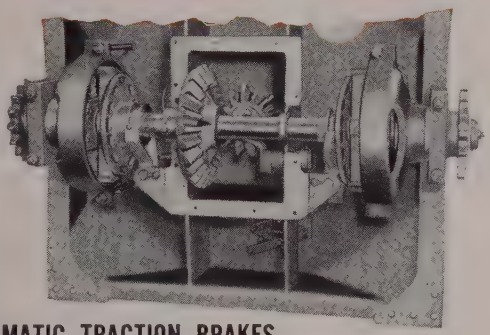
ith any other half-yard:





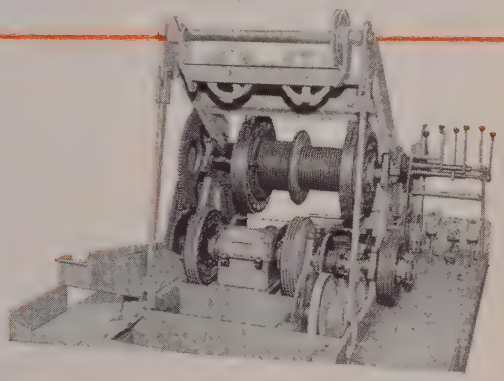
BIG 20-INCH MAIN DRUM CLUTCHES

Operating clutches in the Koehring heavy-duty 205 are among the largest size used in the ½-yard class. You get: 20x3" crowd clutch . . . 18x3" clutch on swing . . . 14x3" clutch on boom-hoist and retract. All clutches are of the internal expanding type . . . with reversible bands.



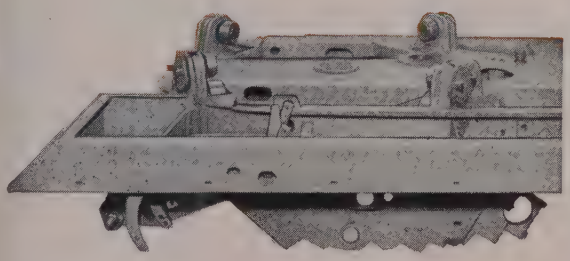
AUTOMATIC TRACTION BRAKES

Brakes are automatically engaged at all times, except when tractive power is applied. This simplifies operation . . . locks and holds the 205 when working or parked. Traction brakes are of the internal expanding type . . . reversible bands require no adjustment for the life of the lining.



ONLY 2 MAJOR SHAFTS in upper machinery

With just a main-drum shaft, and a swing-and-traction shaft there are fewer parts in the 205's upper machinery. Maintenance is simplified. Each assembly is an independent unit mounted on antifriction bearings. Splined shafts and carburized hardened gears assure maximum strength.



4 HOOK-ROLLERS . . . eccentric adjustment

Revolving turntable is held securely to carbody by 4 conical hook-rollers that resist tipping in any direction. Rollers are mounted on non-metallic bushings . . . and are readily accessible for easy eccentric adjustment. Turntable rollers coincide perfectly with machined roller path.

With HEAVY-DUTY 205 you also get:

- Antifriction power-flow for dig, hoist, swing and travel
- Standard or extra-long crawlers with 16, 20, 24" shoes
- Independent traction . . . optional
- Rubber-tired truck mounting, 32½ m.p.h. travel speeds
- ½-yard hoe attachment (digs 32" wide, 17¾' deep)
- ½ to ¾-yard capacity clamshell or dragline
- 10-ton capacity as crawler crane; 15-ton truck crane

All these Koehring 205 advantages add up to a big "plus" in WORK CAPACITY over any other machine in the ½-yard class. Before you invest in any excavator or crane, be sure to look into this new ½-yard, 10-to-15 ton 205. Your Koehring distributor is listed here . . . call him now.

K488R

SEE YOUR KOEHRING DISTRIBUTOR FOR COMPLETE FACTS

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Los Angeles, California
STANDARD MACHINERY CO., San Francisco, California
KIMBALL EQUIPMENT CO., Salt Lake City, Utah
NEIL B. McGINNIS CO., Phoenix, Arizona
THE HARRY CORNELIUS CO., Albuquerque, New Mexico
SAN JOAQUIN TRACTOR CO., Bakersfield, California
ENGINEERING SALES SERVICE, INC., Boise, Idaho
McKELVY MACHINERY CO., Denver, Colorado

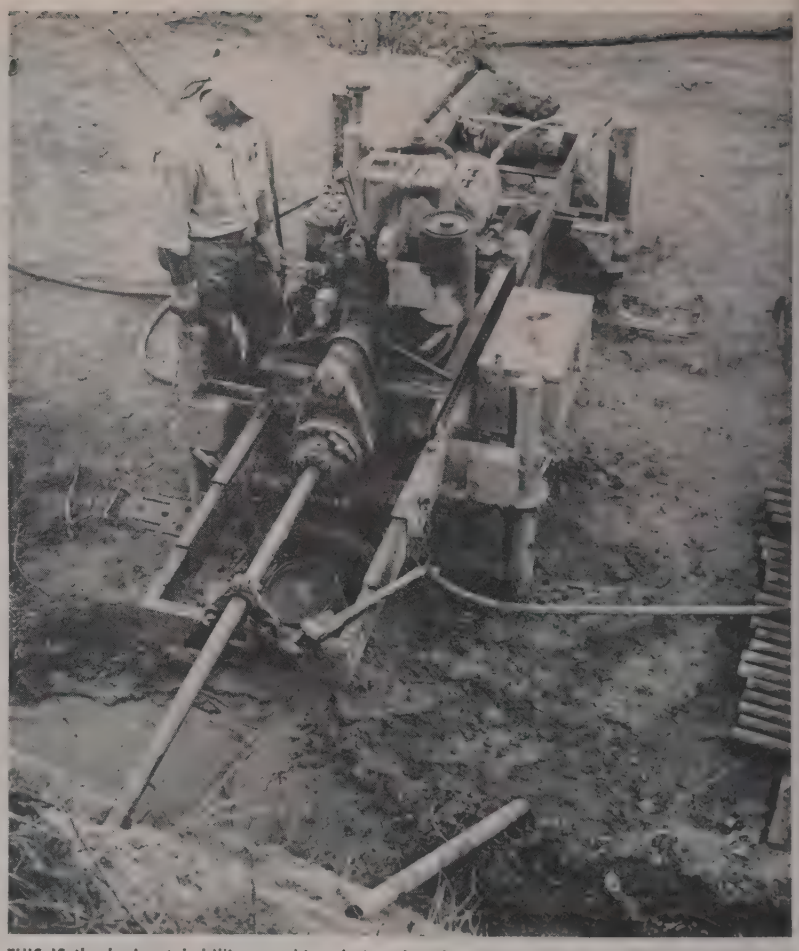
The installation of the pipe in the drill hole takes place after the rod and bit have been retracted by using a special adaptor tooled to thread onto the water pipe on one end and to the drill rod on the other end. The pipe is then inserted by the same method as the drill stem during the drilling operation. A standard pipe cap is used on the first section of pipe to enter the hole to prevent the drain from filling up with loose material during and after installation. It is frequently necessary to rotate the pipe slowly during installation in badly caved holes.

At this time the A-2 head on the drill is being replaced with an N-2 head. This will make it possible to feed the water pipe directly through the drill head without the use of an adaptor. It should greatly simplify the operation.

What does it cost?

Using these methods and equipment a total of 7,234 ft. of drain holes has been in eight different slides during the past two seasons. The total cost of the work was $32,455, including cost of the pipe, or an average of approximately $4.50 per ft. of hole drilled and cased. Seventy-four per cent of the 53 holes drilled produced water varying from a few gallons to over 21,000 gpd., and 94% of the footage drilled was successfully cased with water pipe. The maximum depth of any one drain was 290 ft., and the average depth for each hole was 137 ft. In some of the formations holes could be drilled deeper if considered necessary.

The above text was condensed from material presented by the author before a recent Bureau of Public Roads materials conference held in Denver.



THIS IS the horizontal drilling machine designed and constructed by the California Division of Highways. How it performs and what led to its development is described in detail below.

Here is California's equipment

By A. W. ROOT
Supervising Materials and Research Engineer
California Division of Highways

FOR SEVERAL YEARS all of our drilling was done with "Hydrauger" equipment and some of these units are still in use. Diamond drill A-rods are used with these drills; all of our earlier drilling was done with fish-tail or auger-type discs having tungsten carbide inserts. These bits were made up in our own shops. When small size oil field type roller bits became available, we experimented with them and found them greatly superior to the fish-tail and auger bits for drilling rocky formations. Accordingly, we adopted the roller-type bit for all drilling except in rock free earth.

Adoption of the roller-type bit enabled us to drill to greater depths and through more difficult rock formation which could not be penetrated with the fish-tail and auger bits previously used. But at the same time a more difficult drilling increased power requirements and caused greater stresses on both the drill rods and the drill unit. As a result, breakage of the A-rods became excessive, and it was found that the Hydrauger air motors did not supply sufficient power. The type of drilling which we do with the rock bits appears to require a more rugged and more powerful drill unit than the Hydrauger which had been used exclusively in the past.

Our first attempt to use heavier drilling equipment was with the McCarthy rock boring machine. This drill, which was designed for use with continuous helical augers, drills rapidly in earthy formations, but cannot drill to depths greater than 150 ft., nor will it penetrate broken rock formations. By means of a water swivel fabricated in our shops the McCarthy machine was converted to a rotary-type drill, using Diamond N-rods and a 4½-in. roller-type rock bit.

The converted machine operated very satisfactorily, and we have found that the use of heavier drill rod, the hydraulic feed, and superior power all are advantageous. This machine, however, has one serious drawback; when using the machine for forcing the casing into the drilled hole, the casing must be in front of the drill carriage, as the design of the machine prevents working through a chuck; this necessitates using lengths of casing which can be inserted between the carriage and outlet end of the drain at the ground surface. In restricted working areas it is necessary to use 5-ft. lengths of casing, with a correspondingly large number of field wells. Also the McCarthy machine is somewhat larger and more powerful than necessary for the rotary drilling work on our drain installations, which results in some sacrifice in mobility.

California designs its own

We could find no drill rig on the market designed specifically for drilling holes for horizontal drains, and none which satisfied our requirements. We desired a drill rig incorporating the following features: the drill unit should be complete with a gasoline engine of adequate power; a suitable transmission to permit con-

KOLMAN

Model 101 is the ONLY Completely Portable Conveyor-Screen Plant with all these advantages

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COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
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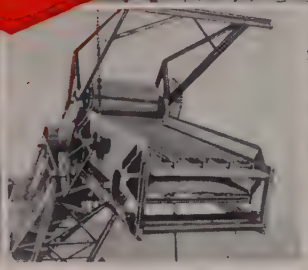
50" x 36" Kolman 101 Conveyor-Screen Plant

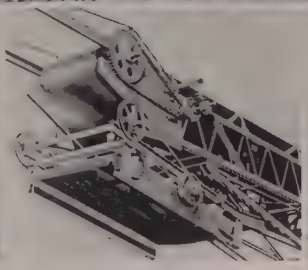
NO DISASSEMBLY FOR TRANSPORTATION

The heavy-duty Kolman conveyor, available in lengths to 70 feet, is capable of supporting the complete unit during travel. You'll save valuable time with its rapid set-up and take-down.



SINGLE, DOUBLE, OR TRIPLE-DECK SCREENS

Rugged construction of Model 101 permits use of one, two, or three-deck Kolman screens without additional supports to make several sizes of material at once! Available in widths from 18" to 36".



SINGLE-DECK SCREENS FOLD UNDER FOR TOWING

No need to remove screen for towing. Kolman's "Folding Feature" shifts weight of the screen forward, reducing total length and eliminating sway. Faster, safer, easier to move.

PORTABLE FEEDER-TRAP COMBINATION

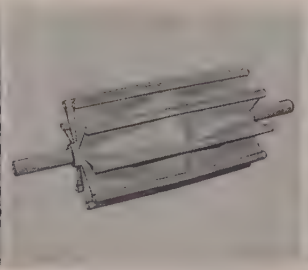
Reciprocating plate feeder is installed in trap so both are integral part of conveyor. Gives positive constant flow of material. Adaptable to any type of feeding.

MOTOR-TO-GROUND CONTROLS

Power unit throttle and clutch controls are extended to a point easily accesible to the operator on the ground. Both controls save time and steps.

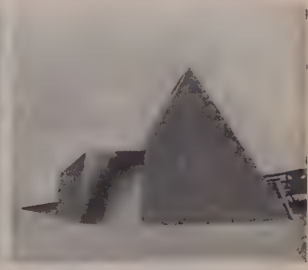
HEAD PULLEY CLUTCH CONTROLS BELT

Conveniently located where operator can observe trucks, clutch increases screening efficiency and permits screen to run empty to clear it of sticky or lodged material.



SELF-CLEANING WING-TYPE TAIL PULLEY

Self-cleaning feature of the wing-type design protects belt against stone cuts and bruises. Welded steel plate construction. Bar type head pulleys eliminate lagging.



WING WALLS PORTABLE WITHOUT REMOVING

Rigidly braced steel plate enclosure prevents gravel from working into tail section. No planking to be picked up and moved from one location to another. Greater convenience.

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SANTA ROSA—Empire Farm Equipment Co., 1470 Santa Rosa Ave.

IDAHO

BOISE — The Sawtooth Company, 1115 Grove St.

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ELKO -A-D Machinery Co., 251 West Commercial St.

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PORTLAND—Western Equipment Co., 2244 N.W. Savier St.
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trol of speed of rotation over a wide range; a hydraulic feed with a minimum stroke of 6 ft., capable of exerting a 4,000-lb. thrust; provision for slowly rotating the casing concurrently with the jacking operation when necessary; a chuck readily interchangeable for A-rod, or N-rod, or casing and so designed that long lengths of rod or casing can be operated through the chuck; rugged but easily operated studs for maintaining alignment and grade of the drill; rubber-tired wheels and three point suspension to permit sharp turns; and, finally the overall length not to exceed 12 ft. and the weight of the complete drill to be not more than 3,000 lb.

Since no completely suitable machine could be purchased, it was decided to design and build this unit specifically for horizontal drilling. Jim Keleher, equipment design engineer, with the cooperation of the author and other personnel of both the equipment and materials and research departments began designing the rig in January 1954. By June 30 the shop had completed its construction.

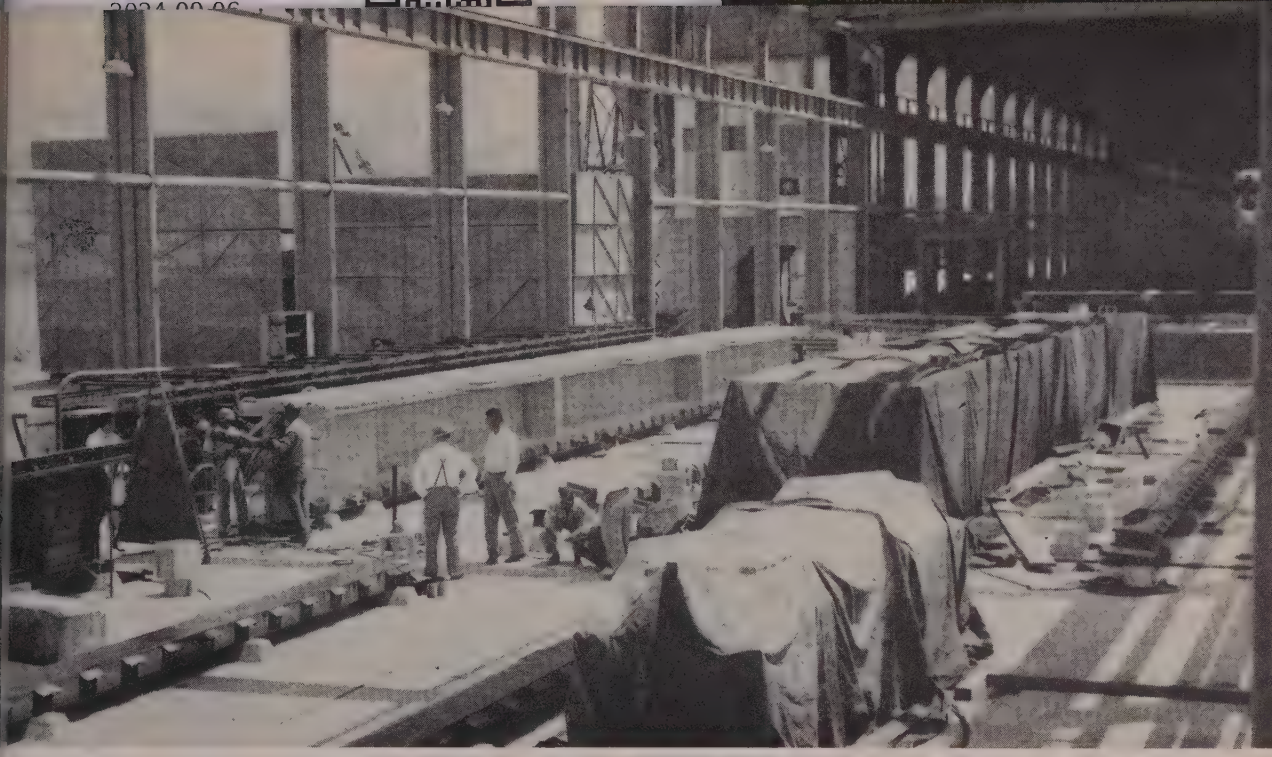
What parts make it run?

The new drill rig, for the most part, is comprised of standard or proven parts or subassemblies similar to those used in manufactured drills. The power unit is a 20-hp. Wisconsin, 4-cylinder, air-cooled engine, connected through a fluid drive to a 4-speed Ford transmission. Rotation of the chuck is accomplished by a gear train from the transmission enclosed in an oil tight housing. The entire drive assembly is mounted on a hydraulically-operated carriage with a travel of 5 ft. A Vickers 10-gpm. oil pump, driven by the Wisconsin engine, supplies oil to two hydraulic cylinders, by means of which the thrust can be controlled at any desired feed pressure up to 4,000 lb.

A specially designed chuck assembly was required to permit the use of long lengths of drill rod or casing, and to provide for interchanging chucks for different size rods. Standard A-rod and N-rod chuck heads are used, with a shop designed chuck holder which permits quick change of chuck heads. A special chuck for gripping the 2-in. casing is used in the same chuck holder.

The drill rig has performed satisfactorily on several horizontal drain jobs. On one of these installations 18 drains were installed, five of which were 300 ft. or more in depth, and seven others at least 250 ft. deep. This drilling was done at a very reasonable unit price, comparatively speaking, and the drains were very successful in intercepting the subsurface water.

The above text was condensed from material presented by the author in the California Highways and Public Works magazine, March-April 1955, p. 26-29



PRECAST PLANT LAYOUT in 200-ft. long section of 1,056-ft. long structure allows for producing two girders per day. At far left, one is formed, ready to be poured. Post-tensioning is going on in the center, and under canvas, another girder being steam cured.

Mass producing prestressed girders

For quantity, 270 of them, and for price, only $41 per cu. yd., one of the outstanding prestressing operations in the West for bridge girders is under way.

FORMING, POURING, and the prestressing of concrete sections of most bridge construction is done at the job site — usually because of the small number of units involved or because the transportation handling problems are difficult. In contrast, at the Richardson Bay Bridge north of San Francisco, a subcontractor located 40 miles from the job site, has a regular manufacturing plant for turning out the 270 prestressed girders required.

The girders are husky ones 80 ft. long and weighing 40 tons a piece. They have a T-section 54 in. wide at the top and a 52-in. depth. Web thickness is 8 in., while the ends and bottom part of the stem are 20 in. thick—the increased amount there being necessary to enclose the prestressing cables and anchorages. Diaphragms are located at the 1/3 points and also are 54 in. wide.

When erected, the girders will be placed 15 to the span, with an 18-in. gap between each. The gaps will be formed and poured on the job to connect the slab and diaphragm sections. Out-to-out of the girders will be 90 ft. for six lanes of traffic. There are 18 spans in all of the prestressed sections.

The subcontractor under joint venturers, The Duncanson-Harrelson Co. and Pacific Bridge Co., is Basalt Rock Co., Inc., whose plant is located at Napa. Here they have a precast plant building 65 x 1,056 ft., of which a 200-ft. section is devoted to the prestressing operations. Two 20-ton overhead cranes are used for handling concrete and the finished units.

As now planned, the company will be turning out two of the girders a day. Several interesting innovations are to be found at various steps of the process—many of them hinging about the system of prestressing.

New prestressing cables

The Freyssinet prestressing system, whereby several individual wires within one conduit are stretched and then anchored at the ends of the girders, has been modified for this project. For the first time anywhere, the following combination is being used. Each girder has six prestressing units, each unit being composed of twelve 7-wire strands. Each strand has a 5/16-in. diameter. The Freyssinet end anchorage has also been modified with the substitution of steel female cones for concrete cones. The male plug is still of concrete.

A special jig has been set up to allow the speedy assembly of just the reinforcing steel and the prestressing units by themselves. Tack welding and tie wire hold these items together so that a cage is formed that can be picked up intact and lifted to the forming area by one of the overhead cranes.

Three sets of Economy steel forms are being used to form the intricate section of the girders and to get good repeat usage of the forms. There are three and one-half complete side form sets and nine soffits, the greater number of the latter being required for the period when the girders are curing. The forms are quickly and easily assembled upon a soffit, after the reinforcing cage has been placed, by the simple pin connections that hold the individual metal sections together.

One excellent future erection problem is taken care of at this time by having the dowel bars protruding from the slab section of the girder staggered on each side of the girder. When they are erected in the field, the dowel bars of adjacent girders will dovetail in but not touch.

Concrete for the girders is a seven-sack mix using 1¼-in. maximum aggregate. The concrete is mixed in a central batch plant located adjacent to the precast plant structure and delivered in 4-yd. buckets that are

ECONOMY STEEL FORMS are used to good advantage in forming the intricate girder section and will be reused about 90 times.

FREYSSINET SYSTEM of prestressing is used. New features on this job include twelve 7-wire strands per unit and steel female cones.

picked up by the overhead cranes. Each girder takes 20 cu. yd. Thorough vibration of the placed concrete is assured by the use of external Viber P 8 air operated vibrators.

New-type concrete mixer

The concrete mixer, incidentally, is a new English Cumflow, manufactured by the Liner Concrete Machinery Co. Ltd. It is a large flat tub revolving clockwise while two 3-armed spiders revolving in the opposite direction agitate the concrete mix like a big egg beater. About 40 cu. ft. can be mixed at one time in a 30-sec. period, although at least a minute is used for the concrete used in the girders. Discharge of the concrete from the mixer is through a gate controlled central opening in the bottom of the tub.

After concrete is poured, a girder is steam cured until it has reached a 4,500-psi. strength. Covering a girder with canvas and maintaining a temperature of 140 deg. F. for 85 hr. was sufficient time for the first girder to reach the required strength.

For prestressing work, the jacking of the units can all be done from one end. In the 80-ft. length of a girder the frictional resistance of the wire strands within the conduit is small, even though on curved paths. For longer lengths, stretching from both ends would be necessary to assure even tension throughout the units.

Total elongation for any one of the six units in each girder is 5¼ in. This requires a total pull of 111,000 lb. per unit. Each unit is stressed initially to 70% of the ultimate strength—the design stress being only 60%. The overstressing is to allow for possible creep in the concrete and the anchorages. Under the Freyssinet system the male cone anchors the prestressing units until grout has been forced in to fill the void space between each unit and its conduit housing.

Finished prestressed girders are loaded on special dollies and taken ½ mi. over Basalt's private road to be transferred to a barge on the Napa River. A loaded barge will then be towed to the bridge site where the girders will be erected by a floating derrick.

Basalt precasts everything

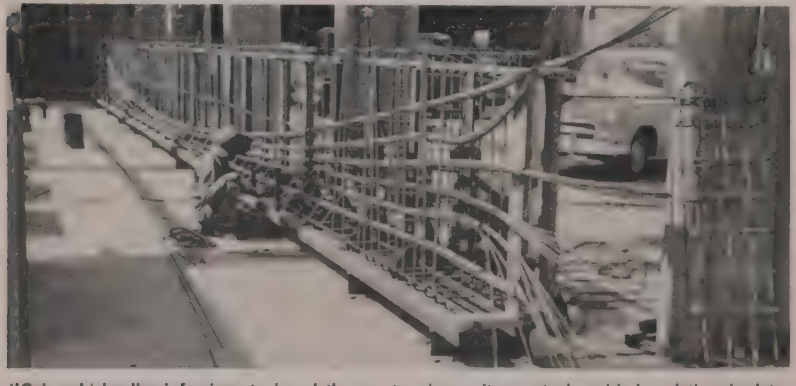
Other interesting features of the Basalt Rock Co.'s precast plant are the variety of products produced there. Here are some of the items they manufacture: wall panels for residential and commercial use, flat roof slabs, columns and girders, septic tanks, and highway cribbing. As standard items, they also use expanded shale lightweight concrete for producing precast roof slabs in three standard sizes of 2x8-, 2x20-, and 4x24-ft. areas. Most of these products are cast upon large steel tables that can be tilted hydraulically to a vertical position. This allows the overhead cranes to make vertical lifts in 8 to 10 hr. after pouring of the various units. Efficient use is obtained of the tilting tables by having concrete pouring done on a day shift and stripping and lifting of precast units on a graveyard shift.

The company will soon be entering the pre-tensioned concrete field. They are in the process of setting up a 200-ft. long pre-tensioning bed for the manufacture of double-T sections. This unit should be in operation some time this month.

Key personnel on this project for the Basalt Rock Co., Inc., are Harold Price—manager of the structural concrete products division; Don McCall—chief engineer; Ray McCann—assistant chief engineer; Jim Tobin—plant engineer; Nute Trotter—plant superintendent.

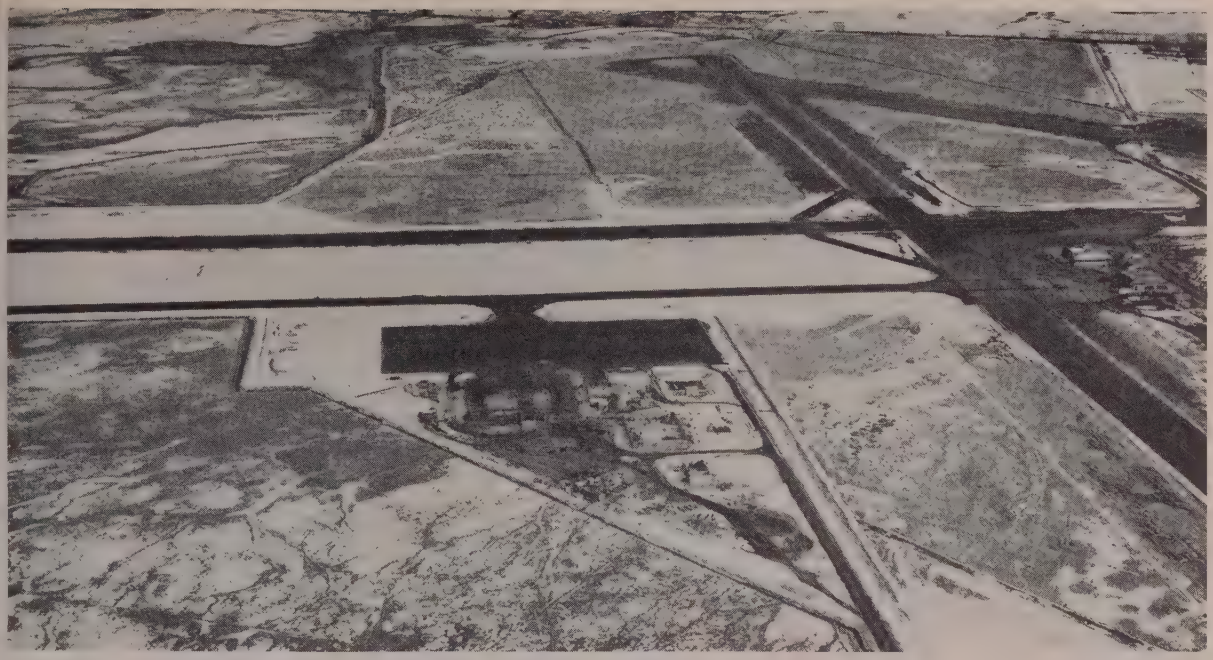
For the California Division of Highways Wayne M. McAuley is resident engineer.

James R. Libby is West Coast manager for the Freyssinet Co., Inc.



JIG in which all reinforcing steel and the prestressing units are tack-welded and tie-wired together allows a completed cage to be picked up by overhead crane and set directly in the forms.

ANCHORAGE UNIT is new in that steel female cone is required for high stresses.



CONSTRUCTION at Hubbard Field consists of new 8,000-ft. north-south runway and taxiway (horizontal in air view). In center is new Air National Guard hangar and facilities. Work done this summer was to finish up south half of runway—to the right and out of view.

High compaction for Nevada airport

RENO MUNICIPAL AIRPORT, also known as Hubbard Field for its Air National Guard facilities there, has just gone through a complete reconstruction under a $1,313,183 contract held by Isbell Construction Co., Inc. Work began in late summer of last year and is nearly complete at this time.

The new construction provides for an 8,000-ft. long main runway that is paralleled by a taxiway nearly as long. The runway has a 150-ft. surfaced width with a 200-ft. shoulder on each side, while the taxiway has a 75-ft. surfaced width and 50-ft. shoulders on each side. Each end of the runway, and the two sections connecting it to the taxiway, has a concrete slab construction varying in thickness from 11 to 14 in. A separate blast pad—a warmup area for jet planes—has an 11-in. slab.

The north-south runway was reconstructed and lengthened to modern standards. The existing east-west runway remains as is for the use of commercial planes. The very high impact loadings from aircraft—design in this case was for 40,000 lb. per sq. ft.—required that a good base for the flexible pavement be constructed.

Thick subbase required

The main runway section has a minimum 31-in. depth from bottom of select placed material to top of surfacing. This is made up—from bottom to top—of a 17-in. select material subbase (max. of 4-in. material), 5 in. of select material (2-in. minus), 6 in. of stabilized aggregate base course, and two 1½-in. courses of asphaltic concrete.

All aggregate for the various lifts of material from the subbase to the surface course and for the concrete and asphaltic concrete was obtained from Isbell's existing borrow pit about 1½ mi. north of the runway. An extensive screening plant setup was necessary to process pitrun materials to give sizes that could be recombined to fulfill grading requirements for all the various uses. The most extensive production was for the select subbase material that had to meet the following requirements: 60-95% pass the 1½-in. screen, 30-60% pass the #4, and 0-8% pass the #200.

Here are two interesting factors about the runway subgrade. There existed in place the old runway about 1 mi. long with its 4-in. thick asphaltic concrete surfacing. This was removed in its entirety and

LOADING select base material at Isbell Construction Co.'s pit was done with a Northwest shovel with 2½-yd. dipper. Hauling units were all Euclid and varied in capacity from 20 to 50 tons.

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placed on the shoulders. The extension of the runway, about ½-mi. long, required a fair amount of grading on the shoulders, 119,000 cu. yd., before placement of the select base material. This subgrade was tested for weak spots where no subgrade fill was required with 95% compaction being required for the fill.

Big fleet of hauling units

For hauling, placing, and compacting subbase material, Isbell used equipment common to highway and earthfill dam construction with added emphasis on the compactive phase of the work. A Northwest shovel with 2½-yd. dipper was used for loading material in the widely varying capacities of the hauling units. Euclid trucks carrying 20 tons and Euclid bottom dumps carrying 50 tons were all in the same parade. An average of 4,000 tons per 8-hr. shift shows that high production was the key word. Two shifts were run during much of the work. All material except some compacted fill was paid for on a tonnage basis. A set of Murphy scales, 75-ton capacity, was used that could handle wheel base lengths up to 60 ft.

Variety of equipment

Subbase material was spread on the run by the bottom dump units for 6-in. lifts with spreading of windrows being done by a Cat D8 with U-dozer. Available for compaction was a sheepsfoot roller, two 9-wheel Tampos, and a 50-ton Southwest 4-wheel compactor. These were used in varying combinations with the final compaction being given by the 50-ton Southwest. Specifications called for 95% compaction based on the modified AASHO for all the sub-

EQUIPMENT LIST

1—P & H shovel, 3 cu. yd.
1—Northwest shovel, 2½ cu. yd.
3—Euclid Model T, end dump 20 ton
3—Euclid Model FDT bottom dump, 35 ton
3—Euclid Model LDT bottom dump, 50 ton
4—Euclid scrapers, Model 12TDT
3—Caterpillar D8 tractors, two with dozers
3—Model C Tournarockers
1—Tournatractor
2—Caterpillar No. 12 graders
2—Buffalo 2-wheel rollers
2—Buffalo 3-wheel rollers
1—Buffalo 3-wheel tandem roller
2—Tampo pneumatic rollers
1—Bros pneumatic roller
1—Southwest pneumatic roller, 50 ton
2—Barber-Greene pavers
1—Murphy 75-ton scales
2—Water trucks, 5,000, 2,000 gal.
1—Lubrication truck
1—Sheepsfoot roller

CRUSHING PLANT

1—25x40 Cedarapids jaw crusher
1—18x36 Cedarapids twin jaw crusher
1—4-ft. Simons cone crusher
1—4x12-ft. Cedarapids screen
1—3x9-ft Cedarapids screen
1—4x16-ft. Simons screen

HOT PLANT

1—3,000-lb. Madsen plant

SPREADING on the run was done with the large bottom-dump units, while the smaller trucks were spotted and end-dumped. Lift thickness was 6 in. for select base being placed here.

LEVELING out the windrows and spotted loads was done by this Cat D8 equipped with U-dozer. In background is maintenance truck that kept downtime of equipment to a minimum.

WATERING to get optimum moisture content and then blading with a Cat 12 to get uniform distribution of the moisture was necessary in the arid climate. Total depth of base was 28 in.

FINAL COMPACTION was given with this 50-ton Southwest pneumatic roller pulled by a Tournatractor. For 100% modified AASHO density, four passes were usually enough.

base except the top 5 in., which was to be 100%.

The upper 6-in. stabilized base course of 2-in. minus material had no special admixture—but it had a finer gradation control requirement as compared to the subbase material. Here too, 100% compaction was required.

Compaction results

Compaction being one of the more important features of the job, here are some of the interesting results. Usually, four passes of the 50-ton pneumatic roller were enough to bring the subbase to required compaction. In one case, however, it is known that two passes of this roller on shoulder material increased the compaction from 86% to 99%. In another shoulder area, where much of the removed old 4-in. asphaltic concrete had been mixed in with the subbase material, a very high degree of compaction was also obtained.

For the asphaltic concrete binder and surface course, standard methods were followed using two Barber-Greene pavers. Breakdown rolling was done with Buffalo-Springfield 3-wheel rollers followed by tandems—the final rolling done with a Buffalo-Springfield 3-wheel tandem roller going diagonal to the laydown direction. As a final, final touch, the 50-ton pneumatic roller was run at high speed over the surfacing.

Of the two 1½-in. paving courses laid down, the binder course used 1-in. minus aggregate and the surface course ¾-in. minus. About 5.5% to 7% of 120-150 penetration asphalt was used.

A sharp-eyed man was necessary to give the stop and go signals for hauling equipment going across the east-west runway that remained in use for commercial planes. At night on the swing shift the control tower would signal the controlman who would then use green or red lights to direct the equipment.

Key personnel for Isbell Construction Co. include Henry Isbell, superintendent; Ed Dempsey and Arnold Blair, assistant superintendents; George Conley, day shift grade foreman; Clarence Wible, night shift grade foreman; Clarence Boegle, plant foreman; Buck Pirialto, paving foreman; Harry Verischetti, office manager; Larry Calahan, engineer.

For the U.S. Army Corps of Engineers, who are directing the work, Col. John A. Graf is San Francisco district engineer; J. H. Caniff is project engineer.

Speedy paving show for Asphalt Institute

IN A DRAMATIC DISPLAY of high-speed street paving, highlighting the May 5 dedication of the new executive offices and laboratories of The Asphalt Institute on the University of Maryland campus at College Park, Md., a 28-man team of the Corson & Gruman Co., Washington, D. C., resurfaced 1,100 sq. yd. of road in 24 minutes.

Maryland sophomore, Leoma Naughton, the National Football Queen and former national Press Photographer Queen, fired the starting gun which set the tandem spreaders and rollers in motion down a 393-ft. stretch of road in front of the new building, laying a 1½-in. course. A fleet of 14 trucks, loaded with hot asphalt mix, fed the moving spreaders as they passed beneath arches strung with college colors.

The paving demonstration took place while formal dedication exercises were being held in the university armory before more than 500 guests. At the conclusion of the hour-long ceremonies, the guests returned to the building to find the block-long stretch of badly worn pavement completely refinished.

First car to travel over the paved surface was a 1923 Stanley Steamer which bore the legend: "I've Been Looking for a Road Like This for 32 Years."

STRUCTURAL FAILURES: They point up shortcomings in building codes

By NORMAN B. GREEN
Structural Engineer
Los Angeles, California

THE PRIMARY purpose of a building code should be to prevent structural failures and thereby assure the safety of the general public and also the safety of workers on construction projects. It follows that there is an intimate relationship between the cause of structural failures and the framing of adequate building regulations. Unfortunately there is a dearth of published information concerning the circumstances and causes of structural failures. Many or most of these are not reported in engineering publications. However an analysis of such information as is available develops some interesting facts which seem to indicate an inadequacy of most building codes.

Here's why they happen

The accompanying table gives the causes of some structural failures. It is apparent that two-thirds of these failures could have been prevented by adequate inspection and testing of materials and by the employment of proper construction procedures. Most building codes do not regulate construction procedures. The design of formwork, the provision of adequate bracing at all times during construction and the avoidance of excessive construction loads are left entirely to the discretion and judgment of the contractor and of the inspector, if there is one on the job. These procedures in many cases can be properly determined only by engineering design or calculations.

Importance of material testing

It seems apparent that the only way to obtain a reasonable assurance that concrete or masonry will have adequate compressive strength is by making a sufficient number of compressive tests during the construction. Most municipal building codes do not require such tests or require them only under certain circumstances. For example the Uniform Building Code of the Pacific Coast Building Officials Conference does not require compressive tests for concrete, masonry, or mortar unless

SUMMARY OF STRUCTURAL FAILURES

NO.	PLACE	TYPE OF STRUCTURE	CAUSE OF THE FAILURE: Inadequate design	Weak concrete or masonry	Improper construction procedures: Bracing	Concrete forms	Placing conc. reinf.	Construction loads	DESCRIPTION OF FAILURE	REFERENCE
1	San Pedro Calif.	1-Story wood mess hall	X						Wood trusses failed	ENR 5/1/47
2	Washington D. C.	Theatre steel & brick	X						Steel roof trusses collapsed	ENR 3/30/22
3	Atlanta Ga.	1-Story skating rink	X						Wood trussed arches collapsed	ENR 7/13/16
4	Coronado Calif.	1-Story conc. mess hall	X	X			X		Pre-cast conc. rigid frames collapsed	ENR 11/11/54
5	Boston Mass.	2-Story school conc. & brick		X					Failure of brick piers supporting conc. flat slab	ENR 9/2/16
6	Youngstown Ohio	2-Story conc. office bldg.		X					Complete collapse of bldg. when forms removed	ENR 12/31/14
7	Benton Harbor	8-Story conc. hotel		X					Progressive and complete collapse when forms removed	ENR 2/7/24
8	Spokane Wash.	Masonic Temple steel & conc.			X				Steel frame collapsed due to lack of temporary bracing	ENR 6/19/24
9	Evanston Ill.	4-Story conc. hotel		X					Roof and 4 floors collapsed when 1st story forms removed	ENR 11/12/25
10	Everett Mass.	Conc. tank flat slab roof				X			Roof forms collapsed during conc. pour	ENR 10/15/53
11	Spokane Wash.	826-ft. guyed steel tower			X				Frame failed due to improper erection of guys	A & E 11/54
12	Redwood City, Calif.	1-Story market			X			X	Seven wood trusses collapsed during placement of joists	ENR 5/27/54
13	Salina Kansas	6-Story concrete		X		X		X	Shores and conc. failed 40 days after last pour	WSE 4/22
14	New York City	6-Story conc. coliseum				X			10,000 sq. ft. of forms collapsed during conc. pour	ENR 5/12/55
15	Scarsdale N. Y.	4-Story conc. flat slab		X		X	X		One corner of bldg. collapsed during 4th fl. conc. pour	ENR 11/26/53
16	San Mateo Calif.	1-Story Lift-slab	X		X				250-ton conc. roof slab fell during lifting operation	ENR 7/29/54 also A & E 11/54
17	New York City	6-Story brick bearing wall	X	X					Tower and portion of walls collapsed. Eccentric beam loads	ENR 6/15/37
18	Los Angeles Calif.	1-Story steel & wood	X		X				Complete collapse of tapered steel roof beams during construction	ENR 3/17/55

ENR—Engineering News Record
A & E—Architect and Engineer
WSE—Western Society of Engineers

there is evidence that the material or construction does not conform to the code requirements. The same applies to the Los Angeles City Building Code, except that compressive tests are required for all light-weight concrete and for all concrete having a designed ultimate compressive strength equal to or greater than 4,000 psi.

Allowable working stresses

An attempt is made in the above mentioned codes to secure safe masonry construction by means of what has been called a "stress penalty." If the calculated stress exceeds 50% of the normal allowable working stress, continuous job inspection of the masonry by a qualified inspector is required. This requirement appears to involve two fallacies, that the strength of masonry can be determined by inspection and that the strength of poor masonry will never fall below 50% of normal. Referring to the fifth failure listed in the table, an engineering investigation showed that the ultimate strength of the brick piers that failed was only 167 psi.

Past experience guides the way

In this connection it is of interest to note that compressive tests are required for the mortar and grout for masonry and for the concrete that is employed in all public school buildings in the state of California. It is also required that masonry cores be taken from the completed structure and tested in compression. These requirements are embodied in Title 21 of the California Administrative Code. The requirements of this code are based on extensive studies of the causes of building failures in earthquakes. They are obviously just as pertinent to the structural failures of the type that are here recorded.

An inspection of the table shows that the remaining failures were caused either by inadequate design, or by a combination of poor design and one or more of the other factors. With respect to design, building code requirements usually represent the best practice and are generally adequate. Failures due to mistakes in design can therefore be prevented only by adequate plan checking by the building authority and by the designing agency. It is of interest to examine the tabulated failures that fall in this category.

Sometimes poor detailing

Four of the seven failures that involve improper design may be attributed to poor details and emphasize a tendency amongst both designers and checkers to give insufficient attention to this phase of design. The first failure listed resulted from inadequate tensile resistance on the net section through split ring connectors. The second failure was caused by eccentric heel joints at the supports of steel trusses that rested

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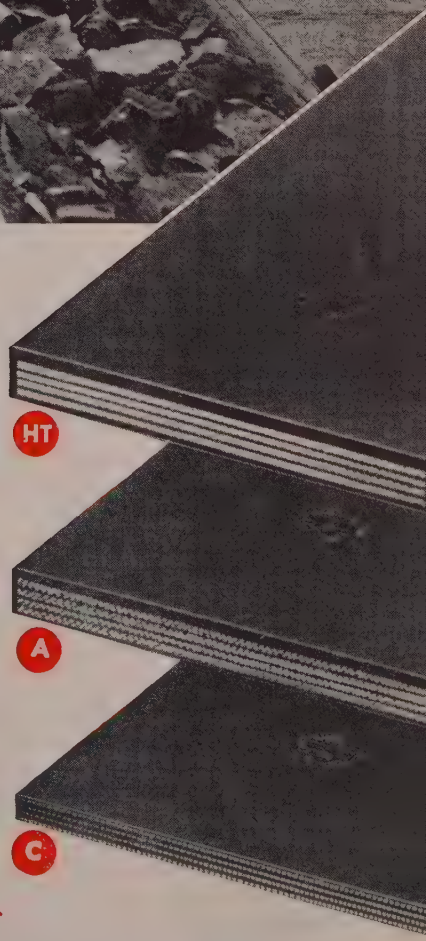

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on masonry walls. No. 4 in the table was a failure of pre-cast concrete rigid frames at the outside corner of the knees, in a tension area that was unreinforced due to improper detailing and placement of large reinforcing bars. No. 17 involved poorly designed steel beam supports at masonry walls. The weakness of the walls was accentuated by these details.

The third failure listed involved the collapse of 86-ft. span wood trussed arches. These arches were of obviously very poor design, however the referenced report of this failure states that no structural plans were filed for a building permit.

The eighteenth failure listed in the table was caused by lack of lateral bracing of the top flange of tapered steel roof beams supporting wood joists. A number of long-span beams buckled and collapsed during construction.

The failure listed as No. 16 was the collapse of a lift-slab and it emphasizes the importance of having adequate building code regulations applying to any new type or method of construction, before its use is permitted. The primary cause of failure was buckling collapse of the steel columns due to their excessive unsupported length. It was also found that the collars used to connect the slab to the columns had a large clearance which allowed excessive wobbling of the connection. Lack of bracing was an important factor, since the columns were seriously out of plumb and must have been subjected to high eccentric stresses prior to the collapse. The provision of adequate bracing in this method of construction, during the lifting operation and before the walls were in place, presents a rather difficult problem.

A consideration of the structural failures of buildings that are here reported makes it apparent that the present building regulations and building codes do not adequately protect the general public and the construction workers against structural failures due to weak materials and improper construction procedures. The occurrence of defective and weak materials can probably be prevented by adequate test requirements. The prevention of failures due to improper construction procedures presents a more difficult problem.

Who checks construction methods?

It might be possible to assure adequate concrete forms, shores, reshores and to prevent overloads during construction by making this the responsibility of the designing agency. However it is doubtful if most engineers or architects would wish to assume this added responsibility, particularly since it appears to belong primarily to the contractor. Perhaps the same code design requirements that apply to permanent construction could be made applicable to concrete forms, shores, bracing, etc. If these requirements could be reduced to tabular form and rules of thumb for inclusion in construction specifications, it might be practicable to apply them on the job, leaving only special or unusual conditions to the designing agency.

The employment of new types of construction and new construction procedures should be preceded by adequate code regulations.

Winter concreting

A SYMPOSIUM on "Winter concreting—theory and practice" is to be held in Copenhagen, Denmark, during February 1956. The agenda includes a discussion on such topics as the following: definitions and characteristics of weather conditions; laboratory experiments; hardening of concrete as influenced by temperature; resistance of concrete to frost at early ages; obtaining high quality concrete; winter concreting on the job site; visits to jobs under construction in Copenhagen and Sweden. Further information can be obtained by writing to RILEM Symposium 1956, c/o The Danish National Institute of Building Research, 20 Borgergade, Copenhagen K, Denmark.

COMBINATION of truck, trailers, and steel beams looks like a haphazard way to transport this delicate piece of electrical equipment, but actually, much engineering skill was necessary in the figuring of load distribution to make the move possible.

228 tons needs 82 tires

THE GENERATOR STATOR above was one of the heaviest single pieces ever to be transported by truck over local streets. The stator weighed 228 tons and was concentrated in a package 27 ft. long by 13 ft. in diameter. It was designed and built by the General Electric Company and was rail shipped from Schenectady, New York, to California for installation in a Southern California Edison Company generating plant.

The equipment used to haul the stator brought the total weight up to 311 tons. This tremendous load was distributed on a framework 108 ft. long. Eleven axles and 82 tires distributed the weight so that no damage would be done to the highways or asphalt access roads.

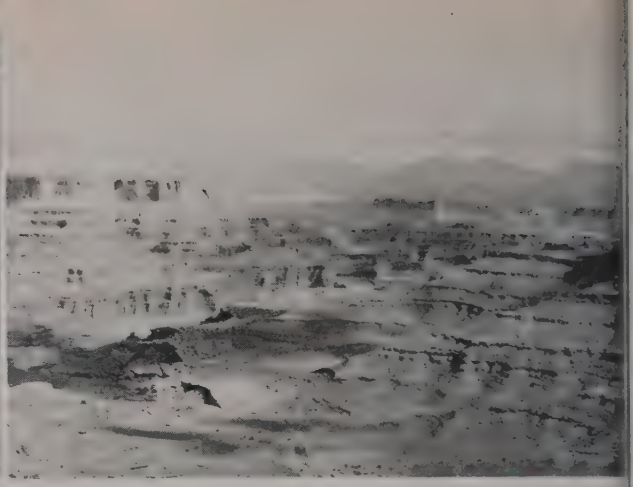
An engineering job

Truck transporting of the stator necessitated considerable engineering and fabrication of special equipment. This part of the work was under the direction of Marcus Woods, Jr. The loading from rail car to truck and the hauling to the job site was under the charge of Ed Harrell and Robert Powers. The lifting and placing operation was handled by Howard Molloy and Jack Moon.

It's no small trick to handle these large pieces of electrical equipment. The May 1955 issue of **Western Construction** described a move similar to the one above with the difference that wood planking had to be laid on the concrete highways to further distribute the loaded truck-trailer combination. The August and October 1954 issues described how two other stators were lifted to permanent positions.

THE GENERATOR is being jacked into place. This was done with the use of special hydraulic jacks of 50-ton capacity each which lifted the stator 6 in. at a step.

MOUNTAINOUS pioneer road being bulldozed here by a Cat D8 leads to a uranium claim located 75 mi. south of Green River, Utah.



RUGGED DESERT country near Dead Horse Point on the Colorado River near Moab, Utah, is the site of some of the rich uranium strikes.

Roads to uranium in Utah or to oil in Alaska, you still need—

Dozers for the rough stuff

TOUGH ROADBUILDING to reach resources in a remote area applies to both of the jobs pictured on this page—but the similarity ends right there. On one the contractor was faced with the ice, forests, and mountains of Alaska; on the other—the rocky desert of Utah. In both cases Cat crawlers did the heavy work.

The Alaska job is located near Icy Bay, one of the more remote portions of the world. This job was begun in mid-summer but ice was the major obstacle in unloading the shipments of equpiment. Once out of the glacial area swampy conditions were encountered which necessitated several miles of corduroy construction. Between 1 and 9 in. of rain fell daily. It took from December to February to build 4 mi. of road working 24 hr. per day.

The Utah work is near Moab and Green River. The aerial view shows the type of topography encountered. This is the center of prospecting activity and most of the rich uranium strikes have been made in this vicinity.

ROY CRAM owns one of the Cat D8's used for building roads in the uranium area.

PIONEER ROAD to an oil drilling site near Icy Bay, Alaska, is built with this Link-Belt Speeder dragline (Cat powered) loading gravel fill.

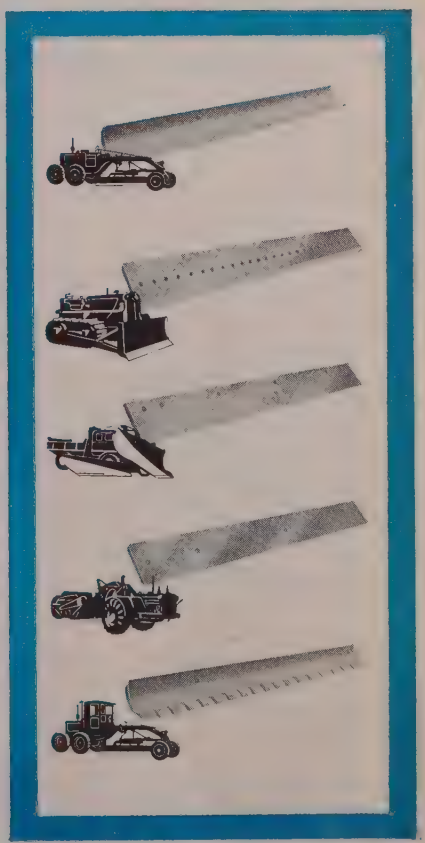
ATHEY WAGON hauls the gravel over boggy ground to have it dumped with aid of Cat D8 dozer to make this fill section of road.

LEPRECHAUNS or BLUE OXEN?

Many remarkable tales about construction miracles came out of the early days of the West. Like the ways Leprechauns helped Irish workers build our transcontinental railroads. Or the way Paul Bunyan used his big blue ox, Babe, to turn Kansas under, "a square-mile at a time."

Of course, no man could verify these tales. But there are many men who'll tell you *from first hand experience* about the ways CF&I Cutting Edges help modern contractors. They'll tell you about the extra-rugged and long-lived service that CF&I Cutting Edges give on dozers, scrapers, graders, snow plows and allied equipment, and that's no miracle.

You'll find that CF&I Cutting Edges are supplied in a wide variety of lengths, widths, thicknesses and hole spacings—flat or curved—with beveled or square ends. For full details, contact your nearest CF&I Representative.



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Concrete best by atomic test

AN ATOMIC BLAST near various types of housing, located at varying distances from the center of the blast, brought out some interesting observations at the test held by the Federal Civil Defense Administration in southern Nevada in May. The nuclear bomb set off was a relatively small one rated at only 35-kilo tons (equivalent to 35,000 tons of TNT). Nuclear bombs have been developed that are several hundred times as powerful.

Of the five different types of housing tested, one of each kind was located about 1 mi. from the center of the blast and another similar group at 2 mi. Building types tested included the following: 2-story brick and cinder house, 1-story frame rambler, 1-story reinforced lightweight expanded shale concrete block house, 1-story precast lightweight concrete house, and a 2-story redesigned frame house.

Principal results show that heavy damage resulted to all buildings at 1 mi. except the precast concrete block house and the precast slab house—these were the only ones designed for earthquake resistance.

4,700 ft. and 10,500 ft.

Here are the results as stated by the FCDA. The above ground portion of the 2-story brick and cinder block house located 4,700 ft. from the explosion was almost completely destroyed, and the first floor system was partially collapsed into the basement. None of the brick work remained standing, and the structure as a whole was beyond repair even for emergency shelter from the elements.

The 1-story frame rambler located near the 2-story brick dwelling 4,700 ft. from the explosion was likewise almost completely destroyed. Only the reinforced concrete bathroom shelter remained intact. Both the 1-story reinforced lightweight expanded shale concrete block house and the 1-story precast lightweight concrete house suffered only minor structural damage. These houses were also located 4,700 ft. from the explosion. With the replacement of doors and window sash, both houses could be made habitable.

The 1-story precast light aggregate concrete house and the 1-story reinforced masonry block house, both located 10,500 ft. from the explosion, suffered relatively minor damage. Only minor repairs would be required to make these dwellings suitable for reoccupancy.

The 1-story frame rambler, also located 10,500 ft. from the explosion, suffered relatively heavy damage, but nevertheless could be restored for occupancy at moderate costs.

WESTERN CONSTRUCTION NEWS

ARIZONA

APPOINTMENT of William E. Willey as Arizona's new state highway engineer will bring about some new developments for contractors. One will be the scheduling for the following year of all work by project and month. This will help maintain an even flow of work for contractors on a monthly basis. Maintenance practices of the state are to be revised to establish uniformity and standardization.

To help in the planning of the expanding Arizona highway program a new highway administration building is also going to be built in Phoenix. Another phase of the highway program involves the summer employment of young engineering students. Students who joined the highway department upon graduation will help ease the tight personnel situation caused by the expanding highway program needs and the retirement of older personnel.

RECENT MAJOR CONTRACT AWARDS and low bids in Arizona include a low bid of $459,939 by **Peter Kiewit Sons' Co.** of Phoenix for 16 mi. of grading, surfacing, and construction of two concrete bridges on US 66 beginning at the Navajo-Apache county line. **Larsen Contracting Co.** of Phoenix submitted a low bid of $220,199 for 2.5 mi. of grading, draining, and surfacing the Superior-Winkelman highway northwest of Winkelman. **Martin Construction Co., Inc.,** of Tucson submitted a low bid of $127,484 for 2.8 mi. of grading and surfacing east of Nogales. **Pioneer Constructors** of Tucson submitted a low bid of $549,613 for grading, surfacing, and widening bridges and culverts on US 80 south of Tombstone.

DAM TO BE COMPLETED HERE BY OCTOBER 1956

Foundation excavation for the Monticello Dam project is nearing completion and concrete for the first lifts should be poured soon. Viewed above, the trestle which follows the path of the downstream face of the dam is being erected by the gantry crane—erected on the first portion of it in turn by the stiff leg derrick further up the hill. Batch plant will be set up on ridge in upper left. Morning-glory spillway is located in prominent rock outcrop in the right middle one-third of the view. Diversion tunnel passes through the far abutment, where stream flow is from right to left.

Here are some statistics on the dam: maximum height—300 ft.; maximum bottom width—109 ft.; crest length—1,000 ft.; concrete in dam—319,000 cu. yd. The dam is located on the west side of the Sacramento Valley in California and is being built by a joint venture of Peter Kiewit Sons' Co. and Parish Bros. Construction Co. on a $4,628,991 contract awarded by the Bureau of Reclamation.

CALIFORNIA

PIPELINE CONSTRUCTION is big business. Recently two southern California gas companies applied to the California Public Utilities Commission for the proposed building of a 277-mi. pipeline from Alhambra to Topock at the state line. The natural gas would originate in the San Juan Basin of southern Colorado and northern New Mexico. Companies proposing the work are Southern California Gas Co. and Southern Counties Gas Co.

A REVISED SCHEDULE of liquidated damages to be included in contracts awarded has been announced by Frank B. Durkee, California director of the department of public works. Since the original enactment of the law requiring liquidated damages, the amount has been $50 per day for every day of contract overrun regardless of the amount of the contract. Under the revised schedule the liquidated damage rate varies from $50 per day for contracts under $50,000 to $250 per day for contracts over $1,000,000.

THE PACE OF California state highway construction continues at the over $200,000,000 per year level. Recently there were 321 contracts under way, which affected another 305-mi. of new construction. A great deal of this is for either full freeway or expressway that will be added to the state's 1,328 mi. of multi-lane divided highway.

THE CALIFORNIA STATE reclamation board is suing the federal government for $764,741 damages for levee figures said to have been caused by the operation of Shasta Dam in May 1948. At that time the Federal Bureau of Reclamation shut off the flow of water at Keswick

NIKE GUIDED MISSILE SITE
Peterson, Conrad & Reed do the grading for this guided missile launching platform being built in Southern California. Three International TD-24 crawlers—two of them pulling scrapers, the other a ripper—have 154,000 cu. yd. of rock and earth to move to form the correct grade.

Dam to permit work on the dam. The sudden decline in the water release resulted in the river banks slipping into the water and making the levees unsafe for miles downstream.

A 13-STORY, $4,000,000 structure is to be added on Los Angeles Wilshire Blvd. The steel, aluminum, and glass office building will have a 5-level garage for 350 cars and a rentable floor space area of 203,000 sq. ft.

THE HOUSE appropriations committee has authorized $49,804,000 for work to be done by the Army Engineers and the Bureau of Reclamation in California in the fiscal year starting last July 1. Some of the major projects that would be covered by this appropriation include $1,000,000 for the Trinity River Water and Power Project, $2,650,000 for Folsom Dam, and $14,000,000 for the Los Angeles County Drainage District.

THE DIVERSION TUNNEL beneath Folsom Dam is being sealed off. The 300-ft. concrete plug is being poured in 50-ft. sections by the use of bulkheads. Concrete is pumped up to 1,700 ft, for placement. Two years from now when the concrete mass in the plug has reached a stable temperature, all the crevices resulting from the shrinkage will be grouted.

THE NEW CARQUINEZ Bridge should be built and tolls imposed by July 1958. This new structure will parallel the present 28-year-old Carquinez Bridge across the Sacramento River where it enters San Francisco Bay near Vallejo. Bids on the first units of the project will be called in October if the revenue bond financing procedures are worked out by then. Cost of the project is estimated to be $73,000,000 including the approaches.

RECENT MAJOR CONTRACT AWARDS and low bids in California include a low bid of $155,876 submitted by **Dicco, Inc.,** of Bakersfield for 30.9 mi. of surfacing at various locations in Kern County. **Gallagher & Burk, Inc.,** of Oakland submitted a low bid of $244,071 for 4 mi. of grading and surfacing near Walnut Creek, Contra Costa County. **Lord & Bishop, Inc.,** and **Alvin O. Erickson & Co.** of Napa submitted a low bid of $183,314 for construction of a reinforced bridge across the Napa River near Napa.

Matich Bros. of Colton submitted a low bid of $252,183 for 33.3 mi. of surfacing at various locations in Riverside and San Bernardino counties. **Earl L. McNutt Co.** of Eugene submitted a low bid of $586,134 for 3 mi. of grading and surfacing in Trinity County. **M. S. Mecham & Sons** of South Gate submitted a low bid of $473,234 for 2.8 mi. of grading and surfacing in Pomona, Los Angeles County. **Morrison-Knudsen Co., Inc.,** and **R. A. Westbrook** of Los Angeles submitted a low bid of $4,746,417 for runway extension at March Air Force Base. **Stolte, Inc.,** of Pasadena submitted a low bid of $2,063,800 for construction of a flight test hangar at Edwards Air Force Base. **Sully-Miller Contracting Co.** of Orange submitted a low bid of $138,200 for 1.8 mi. of grading, surfacing in Orange County.

COLORADO

A. S. HORNER Construction Co. of Denver is constructing an interesting 1,494-ft. vehicular tunnel in the Mesa Verde National Park of Colorado. The tunnel pierces a ridge between Prater and Morfield canyons to by-pass a dangerous knife-edge surface route which traverses an escarpment in advanced stages of collapse.

An unusual feature of this project is that it provides for interim lining of shotcrete immediately following excavating, thus preventing air slacking prior to installation of the permanent lining. The tunnel will be 30 ft. wide, 14 ft. high with a circular arch section on a 6-ft. 6-in. spring line. Jack S. Lacey is project engineer for the Bureau of Public Roads.

A CREW OF 150 men have started work near Laramie, Wyo., laying the first link in the Colorado Interstate Gas Co., 380-mi. natural gas pipeline from Rock Springs to Denver. The first construction covers the installation of 540 mi. of 22-in. line and will cost $8,000,000. Contract for the first portion of the line has been awarded to the Houston Contracting Co. of Houston, Texas, and is to be completed in 4½ months. Eventually the outer link from Laramie to Rock Springs will be built, tying in with the line of the Pacific Northwest Pipeline Corp. running from Colorado's San Juan Basin to the Pacific Northwest.

THE DENVER AREA is undergoing a record breaking construction boom as measured by building permits. Including Denver, Adams, Jefferson, and Arapahoe counties the figure for May was $19,000,000—more than $5,000,000 over May of 1954. For the first five months of this year permits totaled $85,000,000—half of which is in Denver itself.

RECENT MAJOR CONTRACT AWARDS and low bids in Colorado include a $381,000 award to **Hinman Bros. Construction Co.** of Denver for 3.3 mi. of grading in the San Isabel National Forest, Custer County. **Nowers Construction** of Pueblo received a $461,707 award for 9.3 mi. of internal arterial road construction at the Air Force Academy near Colorado Springs.

IDAHO

BIDS ARE BEING called by the Bureau of Reclamation on six Idaho projects. One of these is for the rehabilitation of Black Canyon Dam above Emmett, where a new concrete face on the downstream side of the dam is to be placed. On the Palisades project, construction involves concrete foundations, switch yards, and installation of parts of four 39,500-hp. turbines.

RECENT MAJOR CONTRACT AWARDS and low bids in Idaho include a $610,540 award to **Arrington Construction Co.** of Idaho Falls for 1.4 mi. of roadway construction and surfacing and construction of an

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

IDAHO
Southern Idaho Equipment Co.—Idaho Falls and Boise

MONTANA
Mountain Tractor Company—Missoula
Richland Machinery Company—Sidney
Seitz Machinery Company, Inc.—
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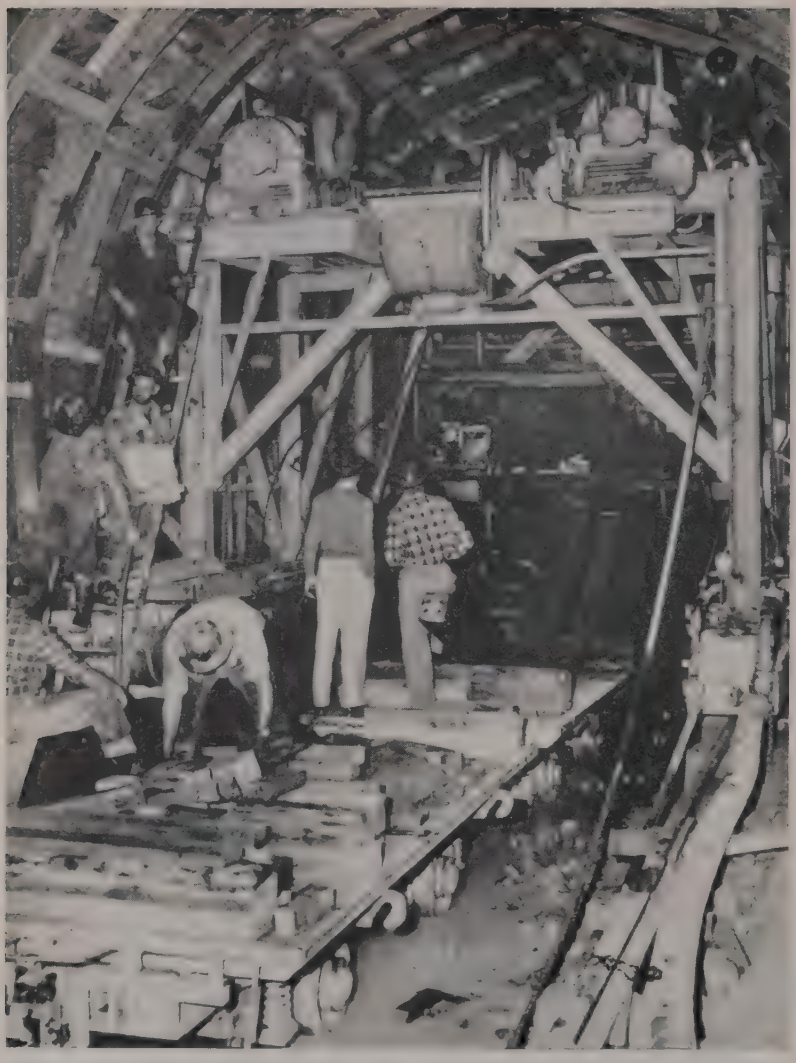

Here is the drilling jumbo and tunneling crew that is helping bore the 14-mi. Eucumbene Tumut tunnel, part of the Snowy Mountains hydro-electric project being constructed by the Kaiser-Walsh-Perini-Raymond group.

Western contractors establish new tunnel advance record in Australia

ANOTHER TUNNEL DRIVING RECORD has been established for tunnels larger than 20 ft. in diameter. This time it was the Kaiser-Walsh-Perini-Raymond team on the Eucumbene Tumut Tunnel and Dam of the Snowy Mountains Development of Australia. During a 6-day driving period in late May crews advanced a total distance of 402 ft., averaging 67 ft. per day in a tunnel with an excavated diameter of 24 ft. About 18 cu. yd. of solid rock were removed per foot of tunnel.

American personnel for the joint venturers on the job include J. H. Tacke, project manager; J. D. Jacobs, chief engineer; C. C. Turner, general tunnel superintendent; J. C. Hester, superintendent at the Eucumbene portal—the man who deserves credit for the tunnel record. Hester was on the PG&E Pit 4 Tunnel as a walking boss for Walsh Construction Co. where the previous weekly progress record of 363 ft. was made about 3 yr. ago. Aside from Kaiser supervisory personnel in the head office and four other field men, the rest of the crew were Australians.

Tunnel driving equipment consisted mainly of American built Conway mucking machines, Gardner-Denver drills with hydraulic jibs, and Goodman electric locomotives. The rest of the equipment was mostly Australian and British built, although there was some Swedish built equipment in the way of compressors and jack hammers.

underpass on US 30 near Pocatello. **Inland Asphalt Co.** of Spokane submitted a low bid of $165,753 for 4.9 mi. of roadwork on route 10 between Willow Creek and Lookout Pass. **Western Construction Co.** of Pocatello received a $129,991 for 8.8 mi. of grading, draining, and surfacing in Fremont County, Idaho.

MONTANA

THE MONTANA POWER CO. has applied to the Federal Power Commission for a license to build a 60,000-kw. power plant on the Missouri River near Great Falls. It would be named the Cochrane hydroelectric development in honor of Harry H. Cochrane, chief consulting engineer for the company and one who has served the electric utility industry in Montana for nearly 50 years. The dam would be a concrete, gravity-type structure 103 ft. high and 820 ft. long. Storage capacity of 2,700 ac. ft. of water would be provided by the dam. Engineers contemplate installation of Kaplan water wheels with adjustable propellor type blades capable of operating at high efficiency on low loads.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include a $237,889 award to **Kiely Construction Co.** of Butte for 7.1 mi. of grading and surfacing in Ravalli County. **Albert Lalonde Co.** of Sidney received a $360,369 award for 10.6 mi. of grading, draining, and surfacing in Richland County. **Northeastern Engineering Co.** of Rapid City received a $3,186,994 award for airfield paving at Glasgow Air Force Base. **Union Credit Co.** of Butte received a $174,798 award for 4.4 mi. of grading and surfacing in Mineral County. **L. A. Woodward Construction Co.** of Missoula received a $224,434 award for 4.7 mi. of grading and surfacing in Lake County.

NEVADA

THE SENATE INTERIOR Committee in Washington has approved legislation granting California and Nevada authority to sign water pacts. This makes plans for the construction of the WASHOE project to improve the resources of the Truckee and Carson rivers closer toward realization. The WASHOE project would be a multi-purpose one under the Bureau of Reclamation. Major features of the project would be the Stampede Dam and reservoir on the Little Truckee River west from Reno and just over the line in California; the Stampede tunnel; Cal-Vada power plant with 20,000-kw. capacity. On the east fork of the

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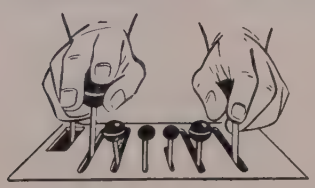

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Carson River would be another dam, reservoir, and power plant of 8,000-kw. capacity. Canals and laterals for irrigation and drainage would be included. Total estimated construction cost based on July 1954 prices is about $41,600,000.

THE FRED C. MACOMBER Construction Co. of Los Angeles and Everett S. M. Brunzell Construction Co. of Culver City, Calif., as a joint venture will be building an 8-story reinforced concrete building in Reno. Cost of the project will be about $2,000,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include a $249,187 award to **Isbell Construction Co.** of Reno for roadwork in Washoe County. **Silver State Construction Co.** of Fallon received a $159,892 award for 1.6 mi. of grading in Lovelock.

NEW MEXICO

A NEW $1,000,000 4-lane bridge over the Rio Grande at Isleta will be open for bidding in September. The new bridge will replace the narrow 2-lane span now crossing the Rio Grande south of Albuquerque. It will serve as a connecting link between state highway 47 and U.S. 85.

THE SANTA FE engineering firm of R. E. DeBolt & Associates has had its contract with the State Fish & Game Commission for construction of the new $200,000 Clayton Dam terminated. DeBolt was representing the Fish & Game Commission for a 6% fee and also receiving a 5% fee from the contractor.

CONVENTIONAL STEEL and concrete or lift-slab construction will be used on a million dollar 175x 142-ft. building for the Mountain States Telephone & Telegraph Co. at Albuquerque. The contractors will be Utah Construction Co. of San Francisco and Kitchell-Phillips of Phoenix and they will own the building. They in turn will lease the building to the telephone company.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include a $235,793 award to **Jack Adams** of Santa Fe for grading and construction in San Juan County. **Cannon Diamond Drilling Co. Ltd.**, of Compton submitted a low bid of $67,037 for drilling and grouting El Vado Dam on the Middle Rio Grande Project. **G. I. Martin** of Albuquerque received a $549,777 award for 11.1 mi. of grading and surfacing in Catron County. **Miller, Smith & O'Hara, Inc.**, of Albuquerque received a $152,929 award for 9.3 mi. of grading and surfacing in Bernalillo County. **Northwestern Engi-**

neering Co. of Denver received a $353,543 award for 21 mi. of grading and surfacing in Dona Ana County.

OREGON

ONE OF THE LAST contracts for heavy construction at The Dalles Dam was called last month for the closure dam across the Columbia River. Bids will be opened September 12. Major estimated quantities include removal of 100,000 cu. yd. of rim rock; 1,350,000 cu. yd. of quarry-run rock and rock spalls; 317,000 cu. yd. of gravel embankment; other embankment materials, and 90,000 lb. of reinforcement steel. Contract amount will be close to $10,000,000 with all work to be complete by August 1, 1957.

THE OREGON HIGHWAY COMMISSION announces that $26,000,000 has been earmarked for all roads for construction between June 30 of this year of April 30 of 1956. Of this amount $12,000,000 will be put up in federal aid funds. Normally the projects would be released for contracting in August or September of this year; however, new highway legislation being considered by Congress may not make it possible to contract for any federal aid projects before the end of 1955.

A COMPREHENSIVE PLAN has been advanced by Engineer R. H. Baldock to the state highway commission for the expected 150% increase in motor traffic in the Portland metropolitan area by 1975. The basic plan would use 14 expressways, 14 freeways, and 24 major streets. Five new bridges would be built and two would be widened. The proposed 96 mi. of freeway would cost $275,000,000. Proposed expressways, 74 mi., would cost $53,000,000. The major street program would total 121 mi. and cost $43,000,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include a low bid of $133,970 submitted by **George S. Berry** of Beaverton for construction of guard rail and snow fencing in Umatilla County. **Central Paving Co.** of Independence submitted a $145,399 low bid for grading and paving in Clackamas County. **Manson Construction & Engineering Co.** of Seattle submitted a $419,580 low bid for construction of a bridge in Multnomah County.

C. R. O'Neil of Pendleton submitted a $188,927 low bid for grading and paving in Josephine County. **Rogers Construction Co.** of Portland submitted a $167,284 low bid for grading and oiling in Deschutes County. **F. L. Somers** of Medford submitted a $102,705 low bid for stone base and oiling in Lake County.

UTAH

SALT LAKE CITY will construct a new $2,000,000 administration building at the municipal airport. Work will probably start early in 1956. The 2-story structure will be built on the west side of the new runway and will have a basement. It will be possible to expand the building in the future in both north and south directions.

IF THE GRAND CANYON Dam is approved as part of the Upper Colorado River storage project both the states of Utah and Arizona will be competing for a road leading into the site over which construction materials can be moved. Utah is ready to appropriate $50,000 on location and grading work for a 60-mi. access road into the site.

RECENT MAJOR CONTRACT AWARDS and low bids in Utah include a $174,572 low bid by **Bouchard & Stark Construction Co.** of Ogden for curb, gutter, and sidewalk in Roosevelt. **LeGrand Johnson Construction Co., Inc.,** of Logan received a $127,595 award for 4.7 mi. of grading, surfacing, and construction of a concrete bridge in Cache County. **Jack B. Parson Construction Co.** of Smithfield submitted a $484,721 low bid for 13.8 mi. of grading and surfacing in Tooele County.

Carl E. Nelson Construction Co., Inc., of Logan received a $362,432 award for 11.9 mi. of grading and surfacing in Salt Lake City. **Paulson Construction Co.** of Salt Lake City submitted a low bid of $1,258,500 for construction of a high school in Salt Lake City. **Reynolds Construction Co.** of Springfield received a $287,837 award for 12.3 mi. of grading and surfacing in Salt Lake Couuty. **L. A. Young Construction Co.** of Richfield submitted a $192,000 low bid for 5.1 mi. of grading and surfacing and construction of one bridge in Uintah County.

WASHINGTON

THE TACOMA UTILITIES board has awarded a $10,863,140 contract to joint venturers Arundel Corp. and L. E. Dixon Co. of Los Angeles for general construction of the Mayfield Dam, powerhouse, and related projects. This is the first of two dams planned by the city on the Cowlitz River development. Contract bid amounts were considerably below the manufacturers' estimates —amounting to $5,000,000 on the dam itself and over $9,000,000 on the entire work. The joint venturers are expected to move their equipment directly from Chief Joseph Dam in central Washington to the Mayfield dam site.

A $23,000 access road to the site has been completed by Helmer Gustafson Co. of Washington. At the site, core drilling is being continued by Lynch Bros. of Seattle. For Tacoma City Light, Verne W. Jenkins is in charge of three survey crews at the site also.

Key engineers in the design and construction include Dean Barline, director of public utilities; Henry A. Cole, superintendent of Tacoma City Light; Vivian B. Jones is assistant superintendent; Hal W. Birkeland is head civil engineer; A. B. Francis is electric engineer; Carl F. Pflugmacher is in charge of administration.

ANOTHER LARGE PROJECT in the Northwest is the Noxon Rapids Dam to be built by the Washington Water Power Co. Bids on the $12,000,000 initial stages of the project were to have been called early last month. First phases of the development include relocation of 17½ mi. of Northern Pacific railroad tracks in northwestern Montana and clearing of 8,000 ac. of land for the reservoir. Total cost of the 400,000-kw. plant on the Clark Fork River in Sanders County, Montana, will be $85,000,000. This dam will be similar to the Folsom Dam of California in that it will have earthfill wings connected to a central concrete gravity section about 190 ft. tall.

FROM SEATTLE CITY LIGHT comes the following information on the Gorge High Dam project. Contractors Merritt-Chapman & Scott Corp., and Savin Construction Corp. have about 225 men on the job working a single shift except for a crew drilling dewatering wells—working three shifts 7 days per week. At the present time men are at work building the diversion channel, excavating at the left bank, and constructing the new highway. They are getting ready to start drilling holes for the freezing points for that part of the cofferdam which is to be formed by freezing the riverbed.

SPOKANE CONTINUES to grow. 200 homes valued at $3,000,000 will be constructed by Western Builders Co. in northwest Spokane this year.

MORRISON-KNUDSEN CO. ran into an interesting technicality in Spokane County where they have a 2-yr. contract for airfield paving work at Fairchild Air Force Base. An 80-ac. sand and gravel deposit and an option of 20 ac. more near this field have been developed for a concrete batch plant and for an asphalt plant. The catch in the situation was that the area classified as agricultural under county zoning requirements. This was brought to their attention only after their in-

stallation had been completed. It will cost the company approximately $300,000 unless a zone change can be arranged.

THE SENATE ARMED SERVICES subcommittee has added more than $35,000,000 worth of military projects to the growing list of projects that have been authorized, but for which money is yet to be appropriated. One of the bigger projects is a $2,000,000 planning and design fund for a giant drydock at the Puget Sound Naval Shipyard at Bremerton, Washington.

RECENT MAJOR CONTRACT AWARDS and low bids in Washington include a $139,691 award to **Don Akins, Inc.**, of Ellensburg for 5.9 mi. of grading and surfacing in Kittitas County. **The Arundel Corp.** and **L. E. Dixon Co.** of San Gabriel, Calif., submitted a $10,863,140 low bid for construction of the Mayfield dam and powerhouse on the Cowlitz River for the City of Tacoma. **Cherf Bros., Inc., & Sandkay Contractors, Inc.**, of Ephrata submitted an $868,671 low bid for earthwork, pipelines, and structures in Block 47 of the Columbia Basin Project. **James Crick & Sons** of Spokane received a $162,467 award for 2.1 mi. of grading and surfacing in Spokane County.

K. L. Goulter & Co. of Seattle received a $529,671 award for 2.4 mi. of grading and surfacing in Skagit County. **Lakeside Bulldozing Co.** of Bellevue received a $148.331 award for 3.8 mi. of grading and surfacing in Cowlitz County. **Murphy Bros., Inc.**, of Spokane received a $261,872 award for 3.4 mi. of grading and surfacing in Okanogan County. **P. L. Saddler** of Wenatchee received a $525,694 award for 8.3 mi. of grading and surfacing in Grant County. **H. C. Werner & Tauf Charneski** of Eugene submitted a $1,211,386 low bid for Block 89 laterals, wasteways and drains in the Columbia River Basin Project.

WYOMING

A TWO-CONSTRUCTION season project was being offered for bid about July 1 by the Bureau of Public Roads for an eastside highway in the Grand Teton National Park of Wyoming. It will traverse virgin country from the east boundary of the park southeasterly 21 miles on the eastside of the Snake River to a connection with an existing road in the vicinity of Moose. It will be essentially a bypass road to relieve commercial traffic on U.S. Highway 187 from winding through the recreational area of the park.

First stage construction will afford a 24-ft. bituminous stabilized driving surface flanked by 4-ft. stabilized turf shoulders. Included ar

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two major structures (bridges), numerous roadside parking areas, and picture turn-outs to develop use of the Tetons.

THE LARGEST CONTRACT letting in Wyoming state highway history was done the first of last month. Nineteen contracts were up for bid covering 197 mi. of Wyoming highways—including a 2½-mi. extension of the 4-lane divided highway south of Cheyenne. Floods which ripped through eastern part of the state during the first of July would be repaired from the highway's special emergency fund and would not subtract funds from new construction.

RECENT MAJOR CONTRACT AWARDS and low bids in Wyoming include a $155,386 award to **W. E. Barling, Inc.**, of Meeteetse for 3 mi. of grading, draining, and surfacing in Big Horn County. **Knisely-Moore** of Douglas received a $370,221 award for 1.9 mi. of grading and surfacing in Laramie County. **Platte Valley Construction** of Grand Island, Neb., received a $445,365 award for 5 mi. of grading, draining, and surfacing in Sheridan County. **A. E. & W. R. Schmidt** of Arvada received a $391,573 award for 4.5 mi. of grading, draining, surfacing in Lincoln County. **Taggart Construction Co.** of Cody received a $342,178 award for 5.4 mi. of grading, draining, and surfacing in Hot Springs County.

ALASKA

EQUIPMENT SHIFT—Anchorage sources report that a large amount of construction equipment has already been shipped to one of the radar sites in Alaska. The writer was told by one official that equipment shipped by the military to the site included seven Cat D8's, 15 to 20 dump trucks, grader blades, motor patrols, and other equipment. The official added that he didn't know what they were sending the equipment to the site for, but, "it wasn't for snow removal."

COMMERCIAL CONSTRUCTION—As military building in the Territory tapers off, commercial construction activity in the major cities is beginning to assume greater importance. Commercial building in both Anchorage and Fairbanks is going full blast and giving employment to hundreds of construction workers. As the peak of summer approaches, individual home building in Anchorage suburbs is going ahead at its highest rate.

Here and There

THE ASSOCIATED GENERAL CONTRACTORS has launched a nationwide program to increase the number of apprentices coming into the construction industry each year. In order to supply the skilled workers necessary to carry out an expanded construction program in the coming years, the groundwork is being laid to promote more local participation between general contractors and others in apprentice training to show young men getting out of school the advantages of a career in construction.

SUBJECT TO AEC APPROVAL, a full scale nuclear power plant, financed entirely with private funds is to be built by a group known as Nuclear Power Group, Inc. The plant will be owned and operated by Commonwealth Edison Co. and located in Illinois. There will be several power companies joining in with Commonwealth Edison in the construction project, including Pacific Gas & Electric Co. of California. Bechtel Corp. will do the engineering work. General Electric Co. has contracted to build the plant for $45,000,000. The plant would be ready for operation in about 5 yr. if approved.

ALTHOUGH DAMS BUILT by the Corps of Engineers have navigation or flood control as the primary reason for their being built, hydro-

electric power is often produced as a by-product. When the 40,000-kw. unit went into production at Lookout Point reservoir, Oregon, the Corps passed the 3,000,000-kw. production mark on a national level. Of this power production 45% is in the 11 Western states.

IN PREPARATION FOR a construction authorization from the Federal Power Commission, the Pacific Northwest Power Co. has nearly completed four months of surveys for its proposed dams at the Pleasant Valley and Mountain Sheep sites on the Snake River. Overall cost of the two dams would be $210,000,000. If built, the Pleasant Valley Dam would be a concrete-arch structure 500 ft. high and 1,200 ft. long. The Mountain Sheep Dam would be a rockfill structure with earth core, 250 ft. high, 600 ft. long, and 700 ft. wide at the base.

RECENT BID OPENING on the construction of outlet works, stage 4 and control substructures on the Oahe Reservoir project near Pierre, So. Dak., was won by joint venturers Foley Bros., Inc., Winston Bros. Co., Donovan Construction Co., C. F. Lytle Co., Inc., and Missouri Valley Contractors. Contract price was $4,631,805. Included in the work is construction of six control substructures including tunnel transitions to a depth of about 200 ft. Quantities include 79,000 cu. yd. excavation, 53,000 cu. yd. concrete, 5,300,000 lb. of reinforcing steel, 2,000,000 lb. structural steel for bracing. The work will also include pneumatically-placed mortar, consolidation grouting. Col. Thomas J. Hayes, III, is district engineer for the Omaha District Corps of Engineers.

ANOTHER LARGE PROJECT under the same Corps of Engineers District was the initial bid opening in late June for the construction of the Minot Air Force Base in North Dakota. Initial work for the runway, taxiway, and aprons will involve about 2,460,000 cu. yd. of excavation and 116,000 cu. yd. of concrete pavement. Low bidder on this work was Peter Kiewit Sons' Co. of Sheridan, Wyo., at $3,643,000, almost $430,000 under the government estimate.

THE 1,000-MI. LONG gasoline and diesel fuel pipeline being constructed through Arizona from Texas to California has been started by Southern Pacific Pipelines, Inc. Contract awards recently announced include an 8-in., 160-mi. line between El Paso and Lordsburg, New Mex., by Morrison-Knudsen Co. of Los Angeles; an 8-in., 250-mi. line between Lordsburg and Tucson to R. H. Fulton & Co. of Lubbeck, Tex.; a 12-in., 200-mi. line from Yuma to Colton, Calif., has gone to the Conyers Construction Corp. of San Pablo.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

SHOT-IN-THE-ARM — Continental defense requirements have given Alaska construction a much-needed boost. Emphasis in Alaska now is on radar warning stations and guided missile sites. Published reports in Anchorage on July 2 disclose that communications facilities are slated at 23 separate Alaska sites. Communications work will have a price tag that may go as high as $35,000,000 with Morrison-Knudsen and Western Electric the contractors involved. About 21 radar sites, strategically located at various undisclosed sites in Alaska, also are scheduled. All in all, it doesn't look as though Alaska construction workers are going to have a bad year.

COSTS TAKE NOSEDIVE — Anchorage city officials are jubilant over an apparent substantial reduction in street construction costs from 1954 contract levels. As an example, the city recently awarded a $578,000 contract for street work. This represented a saving of over $310,000 in 1954 prices, officials stated.

PIONEERS AND RUBBLE — Rickety structures lining Fairbanks streets, built by Alaskan pioneers, will soon be no more. These days, the old buildings are considered in the "slum" category—and as part of "Fairbanks Downtown Slum Clearance Area No. 1." Old, unoccupied log and frame buildings, including the "Barbary Coast" area of Fairbanks, will be sacrificed to modern progress. These unsightly and undesirable structures will be replaced by a civic center, off-street parking, commercial development, and some multiple-family housing. The present Fairbanks city hall is included in the condemned area.

PUBLIC WORKS PLAN — The armed services committee has asked $58,695,100 for military public works in Alaska. About half the amount—$28,829,000—is for Air Force construction with the lion's share slated for Elmendorf work and $9,700,000 for Fort Richardson. Other localities where public works projects are required are Big Delta, Whittier, Eielson, Naknek, Galena, Kenai, Adak, Kodiak, and Ladd field. Incidentally, public works projects totaling $8,952,000 have been constructed, are under construction, or are planned in the city of Anchorage alone.

BAD BLOOD continues to exist between construction people and the representatives of Uncle Sam, in some instances, in Alaska. Latest incident where tempers have flared and charges have been hurled involves the federal Fish & Wildlife Service. When it was reported that the FWS was trying to hire workmen off a contractor's job at Tok to erect a residence under force account, the pot boiled over. Protest wires were sent to Juneau and Washington, D. C., offices of the federal agency by the Alaska Chapter of Associated General Contractors. An explanation was asked as to why the project was not advertised for competitive bidding by private contractors. A similar incident on the part of FWS at the town of Kenai also was charged. So far, there's been no reply to the charges.

UNION OFFICIALS in Alaska will be inclined to "walk on eggs" where jurisdictional strikes are involved. Handwriting on the wall is the heavy damages one union had to pay for calling an illegal strike in the territory. The union was the International Longshoremen and Warehousemen's organization which recently paid the Juneau (Alaska) Spruce Corporation $250,000 damages following a ruling by a federal court that the private firm had been damaged to that extent by a jurisdictional strike. The union's funds were frozen until payment was made to the firm. Alaska jurisdictional strikes are likely to become as extinct as the mastadon, labor officials here concede.

COST-CUTTING—Slicing costs in Alaska was tried by the military with great success—and along lines that construction contractors might emulate. Army headquarters in Anchorage reports that more than $1,500,000 and 11,000 man-hours were saved in the last year alone. This was done by, among other things, inaugurating a new safety program, instituting education of personnel in safety and fire-prevention procedures, and calling for suggestions and ideas to save time and cut costs. One such money-saver resulting from the program was a floating machine shop equipped to perform maintenance on harbor vessels at the Army's post of Whittier and subport of Seward, thus eliminating the need to send vessels to Seattle for repairs.

ROAD WORK—The Alaska Road Commission has received more than $380,000 from the Territorial Highway Engineer's office for new road construction and maintenance of existing roads during the coming year. Funds included $200,000 for work on the Chena Hot Springs road and $150,000 for about 8 mi. of new roads to the proposed Nome-to-Fairbanks route. Federal funds have been made available for constructing a road from Fairbanks to the railbelt community of Nenana. The road will cost about $15,000 a mile with a total of $500,000 allocated for the work, which is now under way.

YOUR COSTS—HIGHER, LOWER—As a contractor doing business in Alaska, your costs will be higher in some categories and lower in others due to some recently-effective changes. Alaska's new wage-hour law will cost most employers more. The law stipulates an employer can't work a person more than 8 hr. in any one day or more than 40 hr. a week unless he is paid overtime at the rate of time and a half. Minimum wage has been raised to $1.25 an hour.

Also higher is cost of the fuel you must use on construction work. On July 1, the 1955 Alaska motor fuels tax went into effect. Under provisions of this law, you must pay a territorial tax of 5 cents a gallon for all your motor fuel except aviation fuel which has a 3-cent rate. In the lower-cost category is a promise by Reginald N. Whitman, new general manager of the Alaska Railroad that freight rates on the railroad will be reduced. He reminds, however, that the decrease will not be rapid or spectacular. Also reduced by the last Alaska legislature is the cost of smoking: the tax on cigars and other tobacco products has been repealed. You're still taxed on cigarettes.

BIG CITY BOOM — Commercial construction in Anchorage is still booming. More than $1,000,000 in new church construction is currently in progress. A new $300,000 office building is planned by Bob Dow & Associates for downtown Anchorage, with Ed Crittenden as architect. The city has allocated $40,000 for a preliminary engineering study of improved dock facilities for the city. The J. B. Warwick Co. of Anchorage has been awarded a $617,000 contract for a new 12-room local grade school.

CONSTRUCTION NEWS CAPSULES—The Alaska District of the Corps of Engineers now is nine years old . . . Ketchikan Construction Co. has been awarded a contract for the city's new amphibious seaplane facility . . . Possibility of a railroad from Alaska to U.S. raised again at recent Sixth Alaska Science Conference held in Fairbanks . . . Bureau of Reclamation survey crews are studying possibility of a new dam on Caribou Creek about 100 mi. north of Anchorage.

ENGINEERS on the move

Frank R. Austgen, area construction supervisor, with headquarters at Los Angeles, on July 1 retires after 33½ years continuous service with the California Division of Architecture. He is being succeeded by **C. T. Troop** of Oakland.

* * *

Arizona Building Contractors, a group of general contractors who operate throughout the state, engaging principally in building construction, was recently chartered as a chapter of the The Associated General Contractors of America. The chartering of this new group gives Arizona two AGC chapters, the other being Arizona Chapter. President of the newly chartered group is **Samuel F. Kitchell,** manager of Kitchell-Phillips Contractors, Inc.

* * *

Miller Simpson of Ball & Simpson, Berkeley general contractors, has been named to the board of directors of Northern California Chapter, Associated General Contractors, according to recent announcement by President **E. L. Clements.** Simpson replaces his associate, **Gordon H. Ball,** who resigned from the directorate for business reasons.

* * *

Virgil Kester, Sr., for many years with Granite Construction Co., recently joined with his son, **Virgil Kester, Jr.,** to form a contracting firm engaging in private paving and grading. Headquarters of the new company are at Santa Cruz, Calif.

* * *

John MacLeod, president of Macco Corporation, announces the purchase of Pacific Crane & Rigging Co., which will continue to operate under its present name. MacLeod further announced that **Eldred Northrup,** managing-partner of Pacific Crane & Rigging, was elected director and vice president, and appointed general manager of Macco.

* * *

H. M. Cresap, until recently with the Seattle District Office of the Corps of Engineers, is now working for the Bureau of Public Roads at Portland, as a highway engineer.

* * *

Ralph Lowry, Jr., and **Carlos Alzueta** have formed a partnership known as Trinity Construction Co. They will maintain headquarters at Redding, Calif., and will specialize in bridge and culvert contracting. Alzueta was formerly with the California Division of Highways and Lowry was connected with James H. McFarland, San Francisco contractor.

* * *

L. E. Rydell, chief of the planning branch of the Walla Walla, Wash., District of the Corps of Engineers has been selected to make a flood control study of the River Shannon in Ireland. Rydell expects to be in attendance at the Fifth Congress on Large Dams in Paris before proceeding to Ireland.

THE 1955 EDITION of the American Road Builders' Association's directory of "Highway Officials and Engineers" is now available for distribution.

This convenient, pocket-sized directory contains more than 1,500 names, titles, and addresses of administrative engineers and officials in the 48 state highway departments and the District of Columbia. It also lists the administrative personnel of the toll road authorities; officers and directors of ARBA, its divisions and its Washington headquarters staff. A tabulation by states showing highway funds expended during 1954 and an estimate for 1955 is also included, as well as a tabulation of states having legislative authority to construct toll roads. As in previous years, this directory sells for $1.00 per copy, net, and is obtainable from the **American Road Builders' Association,** World Center Bldg., Washington 6, D. C.

John H. Obermuller, assistant planning engineer for the California State Division of Highways, recently retired after 27 years with the state and nearly 50 years in engineering work.

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John A. Keimig recently retired as project development engineer with the Bureau of Reclamation at Denver.

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Rolland F. Kaser, Bureau of Reclamation hydrologist at Boulder City, Nev., left government employ to accept a new post with Knappen, Tippetts, Abbett & McCarthy, international engineering firm in New York.

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Col. George E. Pickett, assistant district engineer of the Seattle District, Corps of Engineers, has been reassigned to Fort Belvoir, Va., after two years service at Seattle.

* * *

L. D. Wilson, the new chief highway engineer of New Mexico, has put into effect a reorganization program which gives supervision over both construction and maintenance to the district engineers. In the past few years, district engineers were responsible only for maintenance.

Ira B. Miller, maintenance engineer, has been appointed operations engineer, second in command under Wilson. **C. O. Faulk,** who was manager of the Associated General Contractors of New Mexico, has returned to the highway department as assistant to the operations engineer.

R. E. Miller has resigned as construction engineer to take over as manager of the AGC chapter. **H. F. Leslie** was promoted to Miller's vacated post. **A. M. Morrison,** project engineer at Roswell, has moved to Deming as district engineer, replacing Leslie there. **D. B. Dixon** is the new assistant district engineer at Deming.

D. R. Roser, administrative assistant, is now administrative engineer in place of Wilson. **L. E. Wheeler,** secondary engineer, has taken Roser's former position, and **S. A. Bannett,** assistant maintenance engineer, also is now administrative assistant—maintenance section. **Burton L. Smith,** who was assistant to Wheeler, is now engineer of secondary highways.

The post of technical engineer, held by **T. B. White,** has been abolished and White is retained in the consulting engineer classification.

L. F. Root, formerly supervisor of the reports and information section, has been made supervisor, information and services section.

The shuffle has involved several district engineers and their staffs also. **G. C. Lassetter** has become assistant construction engineer under Leslie. Lassetter is replaced as district engineer at Santa Fe by **John Fairly, Jr.** Fairly's post as district engineer at Las Vegas has been filled by **J. A. Bird,** former district engineer at Roswell.

T. H. Card, assistant construction engineer at Deming, is now acting district engineer at Roswell, and **J. J. Pease,** who was assistant construction engineer at Albuquerque, now has the Roswell post of assistant district engineer.

C. P. O'Bannon, assistant district engineer—maintenance at Albuquerque, now has the same title in construction.

Equipment inspector **John W. Whittington** has been made equipment superintendent.

UNDER DIRECTION of these men, plans are progressing for the 24th Annual Convention of the Structural Engineers Association of California to be held at Yosemite Valley, October 6-8: From left to right (seated): *Al Sperry*, attendance and registration chairman; *Ted Newman*, general chairman; *George A. Sedgwick*, president; *Byron Nishkian*, technical program chairman; *Bill Dreusike*, social program chairman; (standing): *Charles Scurich*, publicity chairman; *John Sardis*, house chairman; *Michael Pregnoff*, director; *Russ Graff*, golf chairman; *James Stratta*, secretary; *Bill Brewer*, banquet chairman, and *Earl Paddack*, finance chairman. This year's plans are being handled by the Northern California section of the Association.

Silas R. (Ray) Overholser, resident engineer for the Corps of Engineers at the Lookout Point Dam Project, recently completed, has been granted a year's leave of absence from the Corps. Overholser will be employed by Tudor Engineering Co. as resident engineer on the Tri-Dam Project near Sonora, Calif. Prior to his Lookout Point assignment, he was assistant resident engineer at Detroit Dam.

* * *

Harry L. Kile, budget engineer for the California Division of Highways and administrative engineer for the planning department, recently retired after more than 22 years of State service.

* * *

John B. Kirkpatrick, vice president and director of The H. K. Ferguson Co., nationally known industrial plant engineering and construction firm, becomes manager of its Western district, with offices at 55 New Montgomery St., San Francisco. He succeeds **C. J. Haglund** who recently resigned because of ill health. Kirkpatrick joined the Ferguson company when it was purchased by Morrison-Knudsen Co., Inc., in 1950. In his new post he will direct an engineering and construction organization which is at present handling work in the Western states amounting to $25,000,000.

* * *

Enoch R. Needles has been named by the Board of Direction of the American Society of Civil Engineers as its nominee for president of the 38,000-member society, oldest national organization of engineers in the country. Needles is currently a vice president. He is senior partner of Howard, Needles, Tammen & Bergendoff of New York and Kansas City.

Don G. Evans is the new district engineer for The Asphalt Institute in Los Angeles. He was formerly construction engineer with the California Division of Highways.

* * *

James R. Blinn is project engineer in the employ of Merritt-Chapman & Scott and Savin Construction Corp. on construction of Gorge High Dam on the Skagit River. Located at new Newhalem, Wash., this project is the third in a series of dams constructed by the City of Seattle.

ASCE hydraulics division meeting

The University of California at Berkeley will be the scene August 24, 25, and 26 for a well-programmed meeting at which the San Francisco Section of the ASCE plays host for a hydraulics division meeting. Included in the program are sessions on hydrology, floods, design, and research. Inspection and field trips can be made to many points of interest in the area.

Walter L. Huber, a distinguished engineer, was further recognized when the University of California conferred upon him an honorary Doctor of Laws degree at its 92nd commencement exercises in June. Huber, a Cal graduate of 1905, with many hydraulic, structural, and architectural projects in the West to his credit, played an important part in the building of the Central Valley Project of California, Union Square garage and the U. C. Medical Center in San Francisco.

* * *

R. B. McRae until recently a construction engineer with the Board of Water Commissioners at Denver, Colo., is now working as an estimator at Houston, Tex., for Brown & Root, Inc., engineers-constructors.

* * *

William E. Willey of Phoenix has been appointed state highway engineer of Arizona, succeeding **George E. Lang** who resigned July 1. Willey joined the bridge division of the highway department in 1932 after obtaining his civil engineering degree. By 1940 he had become a top-flight designer. Upon release from military duty in 1946, Willey rejoined the bridge division, subsequently being named engineer in charge of economics and statistics. The interna-

***William Willey* Takes charge**

tionally recognized Sufficiency Rating System was brought into use almost solely as a result of his efforts. He was holding the position of assistant deputy state engineer in charge of the Division of Office and Planning when he received the appointment as chief engineer. Lang has had 44 years of service with the State. The Highway Commission expressed its desire that he remain and he was appointed statewide maintenance engineer. **J. S. Mills** was appointed to Willey's old position. Two other appointments are **H. H. Brown** who has the new title of assistant deputy state engineer—construction, and **William S. Johnson**, engineer of contracts and specifications.

DEATHS

Murphy Bonahoom, 70, pioneer New Mexico builder, died recently of a heart attack at Raton.

* * *

John J. McMenamin, 82, died June 23 at a Phoenix, Ariz., hospital after several months' illness. As an employee for the U. S. Forest Service from 1919 until retiring in 1942, he was in charge of construction of most of the roads and trails of Coconino and Sitgreaves national forests in Arizona.

* * *

Allan R. Bradley, 71, building contractor at La Jolla, Calif., for 17 years, died recently.

* * *

Henry J. Mullan, 53, civil engineer of Boise, Idaho, died recently in a Laramie, Wyo., hospital while en route to St. Paul, Minn.

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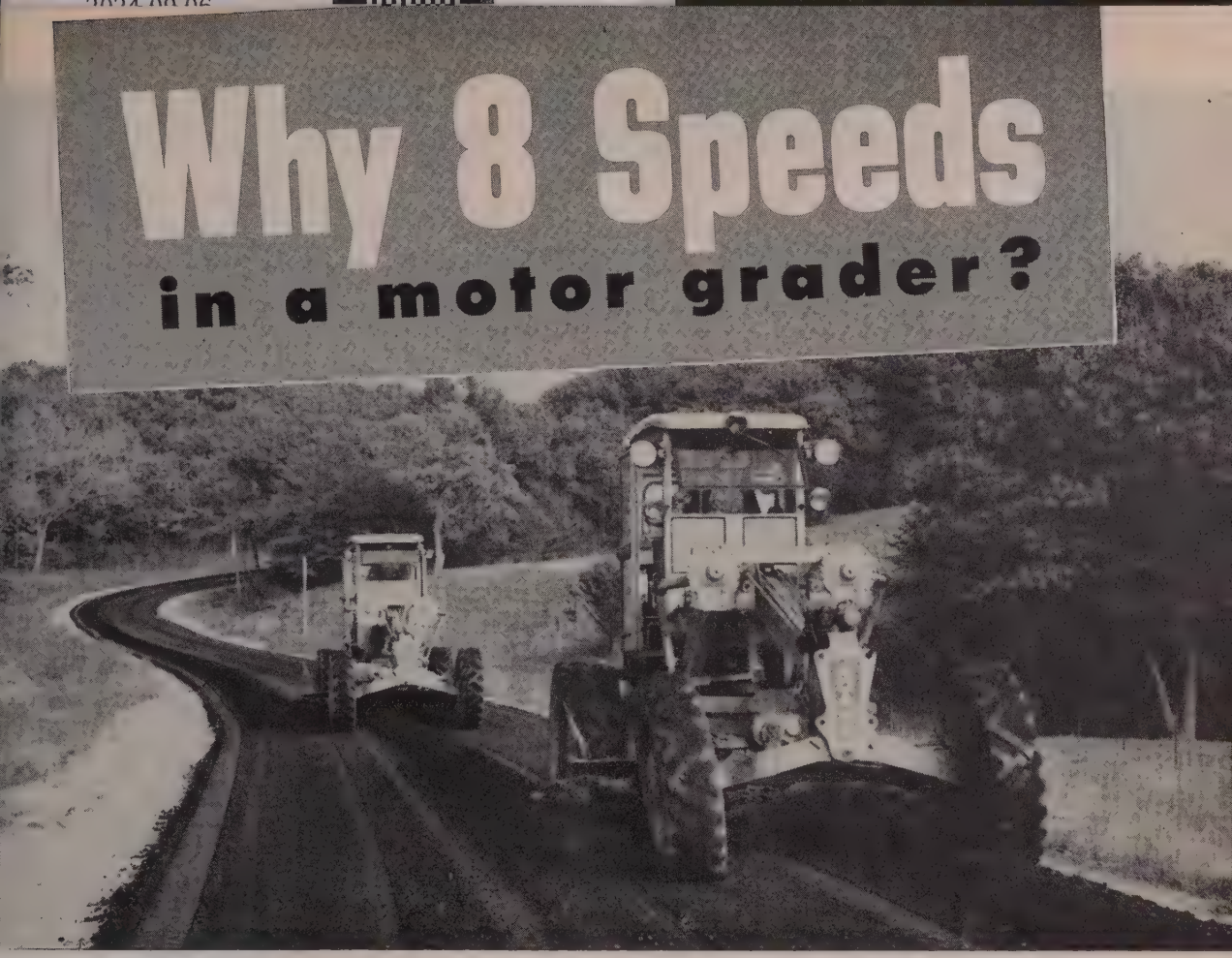

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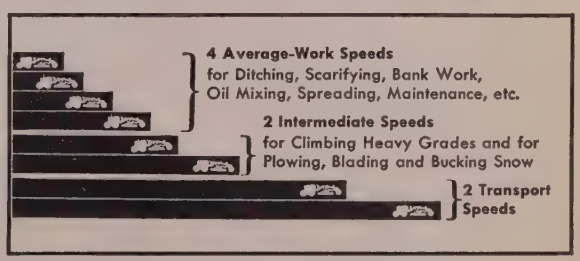

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SUPERVISING the jobs

A. M. Harsh is superintendent; **Joe Mancebo,** master mechanic; **Alf Jacobson,** timekeeper; and **R. B. Kurtz,** project manager, for Fredrickson & Watson Construction Co. on a $555,355 project in Shasta County, Calif. Another important man on this 4.9-mi. grading and paving job between Deb's Place and Summit Hatchet Mountain is **A. L. "Pete" Pace.** Contractor started work the middle of May and expects it completed in 135 days.

* * *

Laban B. Shephard is superintending the construction of three bridges on the Coast fork of the Willamette River divide unit on Pacific Highway in Lane County, Ore., for W. H. Shields Construction Co. Work started on this $140,187 contract June 1 and will probably come to a close Oct. 31.

* * *

William M. Nellis, superintendent; **C. L. Blackwell** in charge of hot plant; and **James McManis,** mechanic, have all been working on B. L. Gustafson's recent contract for grading, draining, and appurtenant work near the Mesa city limits in Arizona. Gustafson received this contract on a bid of $151,949.

O. M. Brown, general superintendent, assisted by **S. N. Long** and **C. R. Brown,** area superintendents, is in charge of Campbell & Kay's job of building facilities at Holloman AFB, Alamogordo, New Mex., a $217,120 contract which got under way in March. About 270 days are estimated for completion.

* * *

"Dutch" Hapgood, superintendent, along with **George Best,** master mechanic and **"Doc" Smiley,** office manager, are important men working for Gordon H. Ball on a $1,093,778 contract for strengthening operational apron at George AFB, Victorville, Calif. Under way since March, the job is expected to be completed in October.

* * *

R. Jensen is superintending for W. W. Clyde & Co. a $92,046 job consisting of 1.6 mi. of grading and surfacing in Nephi, Juab County, Utah. Work started Mar. 20 and will probably conclude July 1.

* * *

Sheldon Nielson is directing the work of grading and surfacing 1.9 mi. and erecting two concrete bridges on S. R. 53, near Wellington, Carbon County, Utah, a contract which went to W. W. Clyde & Co. on a bid of $148,824. Scheduled for completion Nov. 1, job has been running since early April.

* * *

Blaine C. Clyde, superintendent, is presently supervising 3.7 mi. of grading and surfacing and overpass construction on US 6 and 50 in Utah County, Utah, for W. W. Clyde & Co., which started work on this $454,565 contract Mar. 20 and expects to finish about Nov. 1.

* * *

John Sorbo is superintending a recent award to Carl N. Swenson Co., Inc., for construction of Willow Glen and Markham high schools at San Jose, Calif. Costing nearly $1,000,000, the project, which is being built for the San Jose Unified School District, comprises gymnasium and locker rooms of concrete tilt-up construction; a reinforced concrete shop building, and several buildings of

Sorbo *Riedel*

frame and stucco construction. Engineered fill was started in January; actual construction got under way in February. An effort is being made to complete the buildings for opening of school in September. Shown here with Sorbo is **John Riedel,** inspector for the project, who during the past seven years has supervised some 30 new schools in San Jose. Superintendent Sorbo, who has carried out many large projects for the Swenson contracting firm, last year headed all the concourses at the newly constructed San Francisco Airport.

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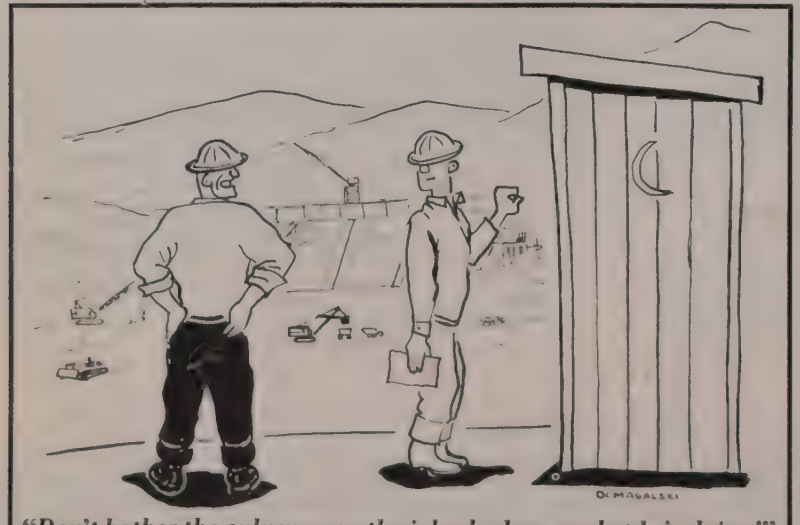
E. C. Reiter, project manager; **V. R. Golden,** general superintendent; and **Doyle Williamson,** general foreman, comprise the top supervi-

Down-time . . . . . By Domagalski



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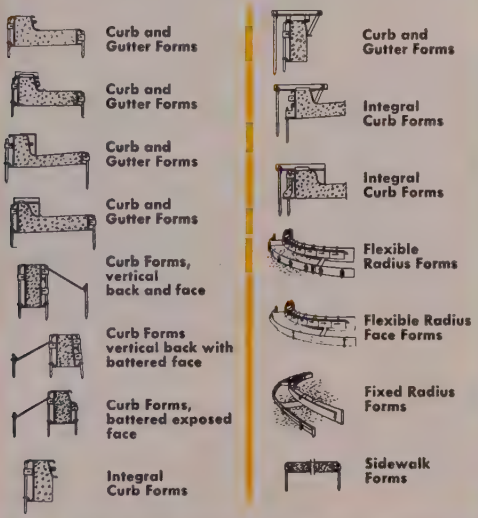

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sory personnel of M. R. Smith Construction Co. currently constructing family living quarters at Kenai, Alaska. A $1,094,429 contract, work got under way in mid-April and the project will probably be completed by Feb. 1, 1956.

* * *

William R. Clyde is supervising a $366,056 contract of W. W. Clyde & Co. for 6 mi. of grading and surfacing and a concrete bridge on SR 10, Emery County, Utah. Started Mar. 20, the job will probably end Oct. 1.

* * *

J. H. Lindstrom, superintendent, is top man on a $123,775 contract awarded to L. B. Read for construction of bridge, grading, and paving, Blodgett overcrossing section of Corvallis-Newport highway in Benton County, Ore. This work will soon be finished.

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J. C. Henson, general superintendent; **Charlie Joy,** job superintendent; and **Harvey Harden,** equipment superintendent, comprise the top supervisors for W. J. Henson on a 7.2-mi. grading and surfacing job on SR 69, beginning at junction of Routes 69 and 79 in Arizona. Work on this $427,535 contract has been going on since the first of March and is close to completion.

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W. R. Hanson, superintendent, with the help of **John Willis,** carpenter foreman, is directing the construction of a bridge over the Big Horn River at Lovell-Burgess Junction road in Big Horn County, Wyo. A $113,097 award, work started Mar. 24 and will come to an end about Oct. 1.

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Leo Dietrich has been superintending storm drain construction in Bon Air St. and La Jolla Blvd., San Diego, Calif., for Charles J. Dorfman, who is just about finishing up this $77,458 job. Equipment superintendent **Glen Wilcox** has been assisting, as well as **C. A. Weatherford,** master mechanic.

* * *

H. S. Thompson is project manager for Winston Bros. Co., and is in charge of construction of the Santa Ana-Tustin freeway, a $2,000,000 contract. General superintendent of the job is **C. W. "Chuck" Goss. George Kaiser** is engineer and **James L. Morton** is in charge of the office. Others assisting at the construction site are **S. L. Henderson,** grade foreman, and **Leo Sutliff,** mechanic. Five bridges and 2½ mi. of highway are involved in this work which is expected to be finished this coming October.

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Edward M. Raimer is project superintendent for Guy F. Atkinson Co. on a 2.4-mi. state highway job at Montecito, near Santa Barbara, Calif., a portion of the Santa Barbara Freeway. Structures superintendent is **Richard L. Hood.** Foremen are: **Charles LaHa,** excavation; **James Waugaman,** equipment; **Charles Skelton,** carpenter; and **Charles R. Ruprecht,** labor. **O. J. Sparrow** is handling the office details for this $1,500,000 project, scheduled for completion next February.

* * *

Bill Vian, as foreman for Tom Lillebo, is handling this contractor's $149,014 award covering grading and structural excavation for two bridges to be constructed on the Oregon Coast Highway, Frankport-Greggs Creek Unit, in Curry County, Ore. Started in June, Lillebo expects to be finished in September.

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Earl Nelson, assistant superintendent; **William Briggs,** carpenter foreman; and **A. "Bud" White,** foreman, are the top men on construction of a 5-span continuous steel girder bridge and grading and surfacing of approaches, 9 mi. south of Tucson on Mission Road No. 2, Arizona. Martin Construction Co. is doing the work at a cost of $82,897; started working in March, and expects to finish the job in September.

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Carter R. Bassett, formerly with Morrison-Knudsen Co., is now in the employ of Peter Kiewit Sons' Co. which has a contract at the Hill AFB, near Clearfield, Utah. Erection of the batch plant was completed the end of June and Bassett stayed on to supervise the plant operation for runways, taxiways, and blast-off aprons.

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Reginald S. Williams, superintendent for Frematic Homes of Long Beach, Calif., is supervising construction on buildings for Ross W. Cortese Enterprises in Long Beach.

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James Ward, project manager; **C. W. Real,** general superintendent, and **R. L. Johnson,** assistant superintendent, are important men working on the $350,000 construction of a bridge at Shady Point, south of Roseburg, Ore., a state highway job which will soon be completed by Peter Kiewit Sons' Co. Work covers a steel span of 275 ft., north approach 384 ft, and south approach 219 ft. Jay Oldham's equipment is on the job. Steel Construction Co. has the structural steel, and Soule Steel Co., the reinforcing steel.

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Harold Haneke, crushing superintendent, and **Richard Ward,** truck superintendent, were key men on the recent contract of F. R. Hewett Co. for grading and surfacing 7.2 mi. of road in Pend Oreille County, Wash.

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Jack McLeod, superintendent, and **Chris Olsen,** office manager, are two top men for Beck Constructors which is constructing a school addition at Nome, Alaska, at a figure of $554,990. Boen-Koon & Egge Cummins' (parent company) foundation design calls for refrigeration of footings to prohibit any settlement. This is the first design of this type in Alaska. A 400-day job, work got under way the first of July.

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C. Luttrell and **George Adams,** grade foremen, are working on a contract of Jack Adams in the amount of $235,793 covering erection of structure and grading on highway SR-17, La Plata-Colorado line in San Juan County, New Mex. Oil foreman is **J. Lee,** and **H. Dobson** is field clerk.

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Lou Curtis, superintendent, assisted by **Dick Green,** foreman on earthwork, **Andy Anderson,** foreman on concrete, and **Del Blake,** master mechanic, is in charge of a $868,671 contract held by Cherf Brothers, Inc., and Sandkay Contractors, Inc., for earthwork, pipe lines, structures on Block 47 laterals, sublaterals and wasteways, East low canal laterals, on the Columbia Basin Project, Wash. Job started June 30 and will run for 550 days.

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J. J. Sprouse, superintendent; **Dick Webb,** grade foreman, and **L. C. Crawford,** office manager, are three top men in the employ of Akins, Inc., excavating and asphalt paving contractor working principally in Kittitas County, Wash. Currently under way is a $139,691 job consisting of 5.9 mi. of grading and surfacing on highways 3 and 7, Hayward Hill to Ellensburg city wells. Started July 5, job is expected to be complete by mid-November.

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S. H. Davis, project manager, and **R. L. Johnson,** general superintendent, are chief men for Ehrhart & Arthur, Inc., which is doing the $1,000,000 refinery expansion for General Petroleum Corp. at Ferndale, Wash. Others on this important project, which started in mid-April and is scheduled for completion Oct. 1, 1955, are **Walt Howell,** piping superintendent; **Clarence Dunn,** piping foreman; **Walt Bishop,** carpenter foreman; **M. Lonseth,** labor foreman, and **Dewey Jensen,** material handling.

* * *

Virgil L. Beecher is Ruud Construction Co.'s superintendent on construction of a warehouse and utility building which is just about finished at Chief Joseph Dam in Washington. **Bill Bolding** is steel foreman. Building is of reinforced concrete, all tilt-up construction, 70 x 250 ft., piers and wall slabs poured on deck. **Jack Monarch** has been chief inspector for the Corps of Engineers.

* * *

Roy C. Gustafson is acting as his own superintendent on a subcontract which Gustafson Coating & Blasting Co. has at Chief Joseph. Assisting as foreman on the job of coating and blasting scroll cases and penstocks is **Roy Gustafson, Jr.**

Swanson *Kennish* *Kuhnle*

Zito *Butler* *Luck* *Blake*

Clark *Watson*

Hahn *Bierhaus*

Bailey *Silva* *Odegard*

Ware *Moore* *Taylor*

Ring *Hamby*

Brown *Goodfellow* *Scheimer*

Hamby *Shaw*

Paul H. Swanson, project manager; **William J. (Bill) Kennish**, general superintendent, and **L. B. (Brent) Kuhnle**, job engineer, top men working for Palisades Contractors, joint venture of J.A.Jones and Charles H. Tompkins Co. handling the $30,000,000 construction of Palisades Dam, Idaho, have a long list of supervisors and workers assisting them, among whom are: **Quenten Holmes**, engineer coordinator; **R. M. Corry**, field engineer; **George A. Watson**, office manager, and **P. E. Jaeger**, purchasing agent. **A. L. McGowan** is safety engineer; **"Pappy" Moore**, camp manager, and **"Ollie" Marriott**, head warehouseman.

Superintendents are: **Dick Fegert**, rock; **Harold Taylor** and **"Gears" Bierhaus**, excavation; **Charles Silva**, carpenter; **Dick Cain**, concrete, and **Lloyd Clark**, batch plant. Master mechanic is **Jim Brown**. Among the foremen are **Joe Hamby**, **Bill Larimer**, and **F. L. Shaw**, all shop foremen, with Hamby working the swing shift; **George Carey**, **Sam Ware**, and **B. T. Phipps**, excavation; **Bud Sisk**, equipment; **Dick Whitmore**, **J. G. Scheimer**, and **R. J. Goodfellow**, mechanical. Also **N. G. Davis**, **H. P. Russell**, **W. I. Linnenberger**, **L. R. Haag**, **J. A. Bloom**, **J. I. White**, and **C. R. Stiles**, carpenter foremen, with **G. J. Odegard** and **A. O. Radford** in the carpenter shop. Labor foremen: **E. C. Haderlie**, **R. K. Haderlie**, **K. V. Clement**, **J. L. Davis**, **H. L. Fenton**, and **H. L. Morris**. And **C. H. Parker**, ironworker foreman; **W. A. Blanton**, plant foreman; **R. J. David**, cement finisher foreman, and **Carl Ring**, lube foreman. Sawfiler is **Dick Bailey**.

On American Pipe & Construction Co.'s contract for penstocks and imbedded turbine parts, gate and butterfly valves, **Al Zito** is in the project superintendent's spot and **Ed Butler** is job engineer. **Gordon Blake** is general foreman and **Bert Kaufman** heads the riggers. **Frank Luck** is office manager. This contract will probably end about April 1957.

Handling the electrical work at the dam is Hahn Electrical Co., with **Oscar Hahn** doing the superintending, assisted by **John Warden**. Aiding as foremen are **Ray Scroggins** (line); **Truman Wilson** and **Kenneth Fisher**. Hahn started work in April 1952 and expects to finish by September 1957.

The *Western Construction* camera with Columbia River Constructors

Piedmont *Swearingen* *Chevrolet*

Ray McGuire *Bunce Young* *Meador Wick*

Haggerty *Napper* *Lukas* *McGee*

Hixson *Boyd* *Lamberson* *Ray*

George Piedmont, project manager, heads the following list of job personnel working for Columbia River Constructors on the $40,000,000 Chief Joseph Dam powerhouse going up at Bridgeport, Wash., for the U.S.E.D.: **P. A. Campbell**, office manager; **A. W. Campbell**, project engineer; **Russell Martin**, office engineer; **Fred Bader**, accountant, and **W. H. Smith**, paymaster. Superintendents—**Jim Napper**, carpenter; **Bill McGee**, rigging; **Mike Soreng**, ironworker; **Archie Lamberson**, paint; **Bill Haggerty**, electrical; **Ed Gore**, excavation; **Lloyd Hixson**, concrete; **Chester Tryon**, graveyard; **Bynum Swearingen**, swing shift; **Joe Ray**, pipe; **Roy Smith**, batch plant; **Tony Zaversnik**, master mechanic; **Tom Boyd**, safety engineer.

Foremen — **Nick Piedmont**, concrete; **Mike Lukas**, general labor; **Dewitt Trovillo**, oiler; **Glenn Angst**, **Leroy Fleischmann**, and **Harold Corpe**, electrical; **George Dempsey** and **Nuton Elkins**, ironworker; **Bill Little**, batch plant; **Raymond Butler**, **Francis Nash**, **Sidney Bartels**, **Metz Pachosa**, and **Alvin Busse**, carpenter; **Elmer Prokash**, cleanup; **Richard Hixson**, **Willard O. Kessler**, and **Verland Benny**, concrete; **Louis Carollo**, **Ruben Vaughn**, and **George Dosen**, labor.

Also among the foremen are: **Ira McGuire**, **Claude Young**, and **Jim Wick**, pipefitters; and **George Bunce** and **W. Meador**.

W. E. Sims, project superintendent; **W. E. Lake**, general superintendent, and **R. Armstrong**, **J. Patton** and **G. D. Hammond**, handling the engineering, administration, and labor relations respectively, head the personnel working for Bechtel Corporation on the Shell Oil Co. refinery currently under construction at Anacortes, Wash. Assistant superintendents are **D. McNabb**, piping; **C. Elliot**, electrical, and **J. Williams**, rigging. Under **F. Perron**, on-plot superintendent, are **H. Henry**, **J. Shankland**, **R. Zampedri**, **E. Wilson**, and **R. Guy**, area superintendents. Under **B. K. Lyons**, off-plot superintendent, are **W. Gould** and **C. D. Brown**, area superintendents; and under **B. Ince**, utility section superintendent: **C. M. Able** and **R. Culler**, also area superintendents. **A. Thro** is material man under Patton. **B. B. Ball** is senior field engineer (on plot) and **E. F. Hall**, senior field engineer (off plot) under Armstrong. Bechtel has the work scheduled for completion by mid-November.

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D. E. Stinson, project manager, and **Fred Arp**, general superintendent, head the construction crew working on the $15,000,000 contract awarded to Merritt-Chapman & Scott Corp. and The Savin Construction Corp. by Seattle City Light for Gorge High Dam and road work at Newhalem, Wash. Other key men are **J. R. Blinn**, project engineer; **J. A. Whitelaw**, office engineer; **Joe McGurty**, office manager, and **Jerry Hewey**, purchasing agent. Still others are **Charles Walker**, excavation superintendent; **John Gately**, electrical superintendent; **Jim Forrest** and **R. Kruse**, excavation foremen, and **"Chic" Alexander**, aggregate plant superintendent. Also **Mack Kielgass**, master mechanic, **Don Anderson**, carpenter foreman; **Ernie Fritz**, ironworker foreman, and the following labor foremen: **O. D. Jones**, **A. T. Wallace**, **Bob Ellison**, **L. Scott**, **Cecil Bozarth**, **C. A. Chambers** and **R. Skellenger**.

* * *

B. V. Fredrickson is superintending a recent award to Fredrickson & Watson Construction Co. for 3.7 mi. of grading and surfacing west of

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Engineer: F. Thomas Collins
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Arroyo Hondo and Gaviota in Santa Barbara County, Calif. Other key men on the $786,666, 160-day job, which started June 1 are **J. J. Gahan,** office manager; **W. D. Wilcoxon,** grade foreman; **E. L. King,** concrete foreman, and **J. C. Hudgens,** master mechanic.

* * *

Jim Ward, job sponsor; **Dennis Dillon,** job superintendent, and **Ralph Carlton,** assistant superintendent, head the work on a Washington State Highway Department bridge job at Mount Vernon for Peter Kiewit Sons' Co. which is doing the work at a cost of $1,328,367. Others among the key personnel are **Al McCann,** job engineer; **Pete Real,** job office manager, and the following foremen: **Wafe Holmstrom** and **Al Knapp,** pile butt; **Fred Duncan,** carpenter; **Bill Bogle,** labor, and **Fred Pitschner,** master mechanic.

* * *

On another Kiewit job on which **Jim Ward** is sponsor, **W. D. Hitt** is doing the superintending. Located at Seattle, this is a State Highway, $665,983 award for bridge construction which will be finished this year. Assistant superintendent is **Norm Westling. Mike Rothwell** is engineer, **Gene Rhode** is job office manager, and among the foremen are **Jim Faulkner** and **"Chuck" West,** carpenter, and **John Miller,** pile-driver.

* * *

Paul Patchin is Roy T. Early Co.'s superintendent for the south approaches of Duwamish bridge being built for the Washington State Highway Department at Seattle at a cost approximating $1,400,000. **Harry Doremus** and **Mike Williams** are carpenter foremen, and **Don Zinovich** heads the labor crew as foreman. Resident engineer for the State is **Frank Culp.** Started in January, the job will be completed this year.

* * *

Merne Nottingham is superintending a building contract held by C. L. Peck-Millie and Severson, Inc. Located on E. Slauson Ave., Los Angeles, the buildings are being erected for Lucerne Milk Co. and Regal Ice Cream Co. **Rock Nottingham** is acting as foreman on the work, and **L. C. Van Winkle** is also foreman. **W. M. Tennant** is office manager.

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C. H. Yates, general superintendent, along with **Carol Glenn,** superintendent on off-shore work; **Dave Dool,** general foreman; **H .S. Walker,** office manager; **Dominic Billi,** master mechanic (on all work for Atkinson); and **Graham King,** carpenter foreman, comprise the top men for Guy F. Atkinson Co.'s contract at Long Beach Harbor, Calif., a $4,500,000 project consisting of tanks, sludge plant, and docks known as Richfield Marine Terminal 2, tank addition. Present work is on foundations for 7 tanks: three of 90-ft. diam.; two, 140-ft.; one, 160-ft. and one of 30-ft., all to be surrounded by a concrete wall.

Pile-driving has been subcontracted to Raymond Concrete Pile Co., and consists of 4,000 wood, 6,000 steel, and 300 concrete piles. Supervising for Raymond are **Edward Alley,** project superintendent; **Emil Geist** and **W. R. Greig,** both superintendents; and **Charles Guth** and **Harvey Hunt,** foremen. Rutherford & Skoube got the subcontract for reinforced steel, with **Bob Downing** supervising the work. Mechanical and piping is being done by Offco Construction Co., **Julius Hermann,** superintendent.

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Al Thompson is general manager and superintendent on all construction for Thompson Construction Co., Inc., of Orange, Calif., specializing in tilt-up construction. Currently being constructed by them is a school building at Oceanside, under Al Thompson's supervision.

* * *

K. C. (Casey) Yound is supervising erection of The Farmers & Merchants Bank Bldg. at Garden Grove, Calif., about a $200,000 project of Beswick Construction Co. Foreman is **Ed Atkins.**

* * *

Lester Haug is in charge of the force account work on the outfall sewer program of the Los Angeles County Sanitation Districts, which currently is engaged in the first stages of constructing a tunnel at Whites Point, Long Beach. Others here among the Districts' key personnel are **Don Schmid,** project engineer, and **Harry Panoccione,** in charge of the construction. Another top supervisor is **Dan Boone,** with **Walt Miller** barge captain on the No. 1 shift and **Ben Ostrom** on No. 2. Among the foremen are **Jess Butler,** electrical, and **Herb Maydew,** carpenter. **Art Bauer** is shifter. The office is in charge of **Art Bonnell.**

On the District's pipe-laying job now nearing completion at Long Beach, **Hank Ewert** is superintending. Foremen are **Hazen Deering** (day) and **Anthony Martin** (night). **Horace (Tex) Bydum** is master mechanic, and **Danny Daggs** is pipe-laying foreman.

* * *

Healy Tibbetts Construction Co. has the job of laying pipe at the ocean end, a $486,000 contract. Superintending this job is **N. E. Jennings.** Other key men are **Kenneth K. Knott,** diving engineer; and **Harry Digby** and **Ray Bragance,** foremen.

* * *

George Foster, project manager; **Charles Hageman,** assistant project manager and project engineer, and **Robert Harles,** tunnel superintendent, are important men on tunnel construction being handled by Utah-Bates & Rogers at the Pacific Gas and Electric Co.'s $15,000,000 Feather River project in California. Other key personnel are **Cecil Welton,** surface superintendent; **Harry Fredrick, Ira Bashaw** and **Herb Alexander,** superintendents. In the engineering department: **Dean Buehler** and **Ben Ornburn** are in the office and **Art Kipke** and **John Perme,** in the field.

* * *

H. N. Lankins is general superintendent on the Meier & Frank department store under construction at Salem, Ore. About a $3,000,000 contract, Viesko, Post & Hoffman started work last October and completion is scheduled for this coming October. Foremen are **L. D. Scott** and **Harlan Selby,** carpenter; and **Harold Hinson,** labor. The new store will have about 160,000 sq. ft. of merchandising area, with parking facilities for 700 cars.

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Dave Christian, general superintendent for Stewart & Nuss, Inc., is in charge of a $116,067 contract for 23.2 mi. of surfacing at various locations in Fresno and Madera counties, Calif. Foreman is **Pete Hamby.** Others assisting in the work are **Bill Redman,** roller operator; **J. Hilliard,** Adnun operator; **Al Steitz,** hot plant superintendent, and **Ben Everett,** rock production superintendent. Work was expected to progress at the rate of a mile a day and is probably now completed.

* * *

O. P. Pope, project manager, **D. J. Westbrook,** project superintendent; **Frank Scully,** project engineer, and **T. J. Hopper,** office manager, comprise the top personnel working for Morrison-Knudsen and R. A. Westbrook on the $4,746,417 runway extension and additional parking facilities at March AFB in California. Other important men on the job are **Dallas Matthews,** master mechanic; **D. O. Hoyt** and **B. F. Shultis,** excavation superintendents; and **Bill Southworth,** concrete superintendent.

* * *

C. W. Rand is acting as his own general superintendent on construction of three bridges on 11.3 mi. of Sundance-Beulah road in Crook County, Wyo., which was recently awarded to Rand Construction Co. on a $100,830 bid. Started June 15 and expected to run 150 days, **Cecil Bidwell** is doing the superintending, aided by **Leon Lowe** and **Duval Miller,** foremen.

* * *

O'Neil Jones, project manager, assisted by **Bert Lalonde,** dirt superintendent, and **Carl Lowry,** gravel superintendent, is in charge of Albert Lalonde Co.'s $360,369 contract for grading, draining, and surfacing 10.6 mi. of the Circle-Sidney highway, Richland County, Mont.

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Bill Ille and **Larry Heilman,** both foremen, are at White Sulphur Springs, Mont., where they are on S. Birch & Sons Construction Co.'s $112,327 job covering 10.4 mi. of plant-mix oiling on the Townsend-White Sulphur Springs highway. Also on this job is **Gilbert Baatz,** paver operator.

* * *

A. Miller, crusher foreman, and **Larry Heilman,** foreman, are working on a $101,339 job being done by S. Birch & Sons Construction Co. in Big Horn and Rosebud counties, Mont. Started June 15, this is a 50-day job consisting of 62.4 mi. of seal-coat oiling on the Crow Agency-Broadus highway.

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Henry B. Isbell, superintendent, assisted by **Harry Verischetti,** is in charge of construction of portions of state highway in Washoe County, Nev., for Isbell Construction Co. Lying between Sparks and Sutcliffe, work on the 22-mi. stretch got under way June 20 and is expected to be complete in 75 days. **George Conley** is paving foreman on this $249,187 job.

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Larry Ashworth, project manager, **Ray Pereira,** superintendent, and **Carl Burk,** foreman, comprise the top supervisors for Gallagher & Burk, Inc., which recently received a contract for 4 mi. of grading and surfacing at Walnut Creek, Calif. A $244,071 contract, work started June 5 and is expected to take 120 days.

* * *

Neal A. Degerstrom is to supervise a $430,604, 240-day contract which the N. A. Degerstrom Co. recently won for work in Spokane County, Wash. Foreman on this 2.30-mi. of grading and surfacing of Primary State Route 2, Custer St. to Felts Road, is to be **H. Tex Brewer.** Actual construction is scheduled to start Sept. 1.

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G. I. Sanderlin is project manager, and **W. C. Wessell** is superintendent for Lindgren & Swinerton, Inc., which has been working since May 15 on shop construction at Norton AFB, San Bernardino, Calif. **P. F. Kay** is handling the office detail on this year-long, $1,605,374 project.

* * *

T. C. Latham, construction manager; **C. S. Baker,** superintendent; **B. Berry,** general foreman, and **C. S. Christenson,** expeditor, are key men on a recent award to Dicco, Inc., for about 30.9 mi. of surfacing at various locations in Kern County, Calif. Work on this $155,876 contract has been under way since June 20 and is expected to be finished in 60 days.

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F. O. Garcia, superintendent for Matich Brothers, is in charge of a 33-mi. surfacing contract at various locations in Riverside and San Bernardino counties, Calif. A 60-day job, work started July 1. Contract price, $252,183.

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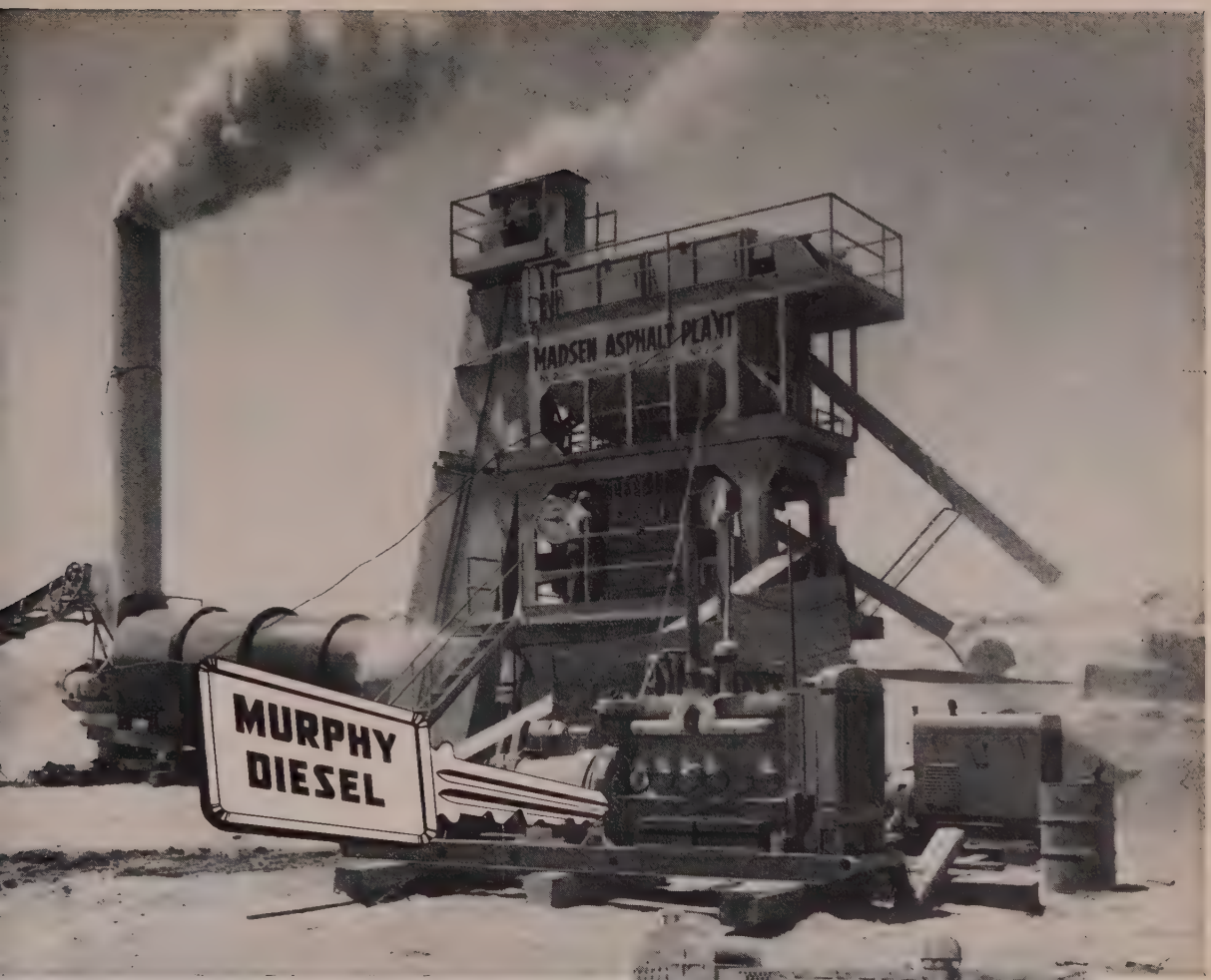
Howard Nelson is superintending for Fred N. Slate Co., Oregon Ltd. and E. C. Hall Co. on a recent $524,648 award for grading and surfacing 2.5 mi. of primary state highway in Wahkiakum County, Wash. **Jules Ringsmeyer** is assisting in the work as foreman, and **Howard Butler** as mechanic. Under way since March, the job will probably end Oct. 1.

* * *

Here are some of the principal personnel on the new Alamitos steam station of Bechtel Corporation at Long Beach, Calif. **James M. Reimers,** general superintendent; **Leo M. Allen,** superintendent (structure); **Ralph E. Allen,** assistant superintendent (boilers); **Harry B. Burkhammer,** job superintendent; **Harry O. Reinsch** and **Ross M. Luken,** assistant superintendents (piping); **Charles T. Russell,** assistant superintendent (electrical); **Daniel W. Dailey,** senior field engineer (electrical); **E. P. Hadsell,** field engineer (survey); **Charles Marchese** and **Fredrick J. Cashman, Jr.,** senior field engineers; **Fredrick H. Hanson, Thomas J. Reiser,** and **Arthur L. Taylor,** field engineers; **Irving R. Ojala,** field cost engineer. The office



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is managed by **William M. Lewis,** with **James G. McKenna, William R. Plantz** and **Joe M. Xiras,** timekeepers, and **Richard D. Mosely,** paymaster.

Foremen are: Labor—**Frank C. Davis** (general); **David J. Reed, Ross E. Stanley, Robert J. Stearns, William A. Wiesner** and **Robert E. Leinweber.** Carpenter—**Charles D. May,** (general); **Jim Atkins, Edward A. Gardner, Frank Hamilton** and **Ralph W. Murdock** (detail). Plumbing—**Thomas H. Conn** (general), **Lester E. Belline** and **Lewis N. Burdett.** Electrical—**Art Patzer,** (general); **Charles E. Walker, B. B. Edwards, Edgar A. Hall** and **Edward O. Clark. Aaron C. Tow** is pipefitter foreman. Reinforcing—**Orval C. Lockner** (general) and **Lavoy D. Coppin.** Rigger general foreman—**Jerry DeSpain.** Painter—**David H. Wolfe.** Equipment—**Harold F. Bartley.**

* * *

Earl S. Jordan is superintending a $316,999 job in Ruidoso, New Mex., for J. W. Jones Construction Co. Work consists of grading and surfacing 6.5 mi. of the Ruidoso Airport-Angus rd. Assisting Jordan are **Cecil Reams,** grade foreman, and **Tommy Crawford,** crusher foreman.

* * *

Tom Hawley, project superintendent; **Jake Billi,** mechanical superintendent; **Andy Arnosti,** project engineer, and **Ward Golston,** project office man, comprise Guy F. Atkinson Co.'s chief men on a recent $1,620,049 award involving 28 mi. to be graded and surfaced between Euclid Ave. and east of College Ave., with 2 steel plate girder bridges, all to provide a 6-lane divided freeway in San Diego County, Calif.

* * *

Richard Benzel, superintendent, aided by **Melvin Nichols, Larry Schierman** and **Wallace Sevedge,** all operator foremen, is directing work on Schedules 1 and 2, canals and laterals, Bluff pumping plants, a part of the Bighorn Basin Division of the Missouri River Basin project in Wyoming Awarded the contract at $403,337, Commercial Builders, Inc., started work May 1 and expects to finish by July 1 next year.

* * *

Webster Freed, superintendent, and **Tom Henson,** engineer, were the two key men of Mazzocco Construction Co. which had the $71,955 contract for earthwork and structures for South Platte supply canal on that section of the Colorado-Big Thompson Project in Colorado.

* * *

Elmer Cross, project manager, and **John A. Crowl,** project engineer, are the top men working for MacDonald, Young & Nelson, Inc., on this contractor's $5,213,162 job which started in April and covers portions of a separation structure connecting with the San Francisco-Oakland Bay Bridge.

* * *

Frank Morrell, superintendent; **J. R. Simpson, Jr.,** engineer; **A. C. Sharp,** field office manager, and **Ray Bailey,** general foreman, head the supervisory personnel on Robert E. McKee's contract in the amount of $857,200 for construction of the Freemont Hotel, Las Vegas, Nev. Work is expected to be finished by the end of the year.

* * *

Frank C. Wood, project manager; **Wes Myers,** project superintendent, and **James Hall,** project engineer, comprise the top personnel working for Clyde W. Wood & Sons, Inc., which started on a $1,623,018 job in April for improvements to the Los Angeles river channel, Wardlow Road to Willow St., Los Angeles County, Calif. Completion is scheduled for December this year.

* * *

G. V. "Jerry" Hendricks, superintendent, assisted by **Richard M. Pitcher,** grade foreman, and **Royal Sparrow,** hot plant and crusher foreman, has been in charge of surfacing, coating, and miscellaneous work on 7.5 mi. of Wilson-Moose Road in Teton County, Wyo., a $95,372 job of Olof Nelson Construction Co.

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.

Ray Russell died recently as a result of injuries sustained the day before when he was thrown from his tractor while working at Palisades Dam, Idaho.

* * *

Dale Tenney, 20, was seriously injured recently at Salt Lake City when he was thrown from his road grader when the vehicle overturned as it rounded a corner.

* * *

Jack Pope, 53, construction superintendent for W. R. Cahoon Construction Co. at Twin Falls, Idaho, was critically injured when a jackhammer accidentally exploded a charge of dynamite while he was working on a new wing of a state hospital at Gooding.

* * *

Felipe Sanchez, 61, was killed recently when he fell into a rock crusher. An employee at the plant since 1941, Sanchez was a lifelong resident of Belen, N. Mex., where the plant is located.

* * *

Mahlon Heil, 36, died of injuries suffered while working at the new Poe hydroelectric project of the Pacific Gas & Electric Co. near Oroville, Calif. He was at work hoisting some timbers when a rock rolled down the steep canyon wall and hit him on the head.

* * *

Bonifacio Romero, 23, and **Samuel Lane,** 37, workers on a construction project near Lake George, Colo., were crushed to death when high winds apparently caused two sections of 5-ton pipe to roll from their skids into the trench where the men were. Five other workmen, warned by shots, were able to scurry to safety.

* * *

Juan Rodriques, 28, Hayward, Calif., was killed when a tractor he was driving slid off an embankment and rolled over on him.

* * *

Ralph Dazey, 53, carpenter on a bridge construction across Lake Pend Oreille near Sandpoint, Idaho, was seriously injured when apparently he lost his balance as a piece of steel reinforcing rod gave way and he fell 18 ft. into a rock-fill abutment.

* * *

John Brensfield, 21, was guiding a piece of heavy sewer pipe into a trench on an installation at Sacramento, Calif., when he grabbed a cable attached to a crane boom just as the boom struck a 4,000-volt high tension wire, killing him instantly.

POSITIVE EJECTION WITH A 140,000-LB. PUSH!

QUICK & CLEAN...Caterpillar DW21 powered MOVALL dumps mucky mud and rock mixture whistle-clean in 12 to 14 seconds on Geo. M. Brewster & Son's New York Thruway job, near West Nyack, New York.

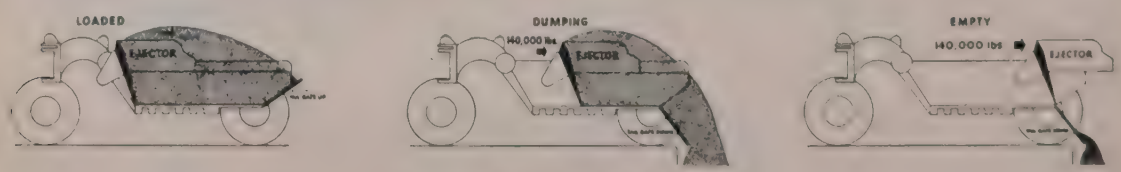
C & D MOVALL's "scraper-in-reverse" design puts a 140,000-pound push behind the ejector for unloading. This gives you positive ejection and controlled dump or spread for handling any material you can load with shovel, dragline or belt loader. MOVALL can place the load where and how you want it... over the edge of a fill, spread in even lifts of any desired depth, or into hoppers at a controlled rate. The 140,000-pound push scrapes the bowl whistle-clean, even in mud, gumbo, or frozen ore.

3 BIG ADVANTAGES

The MOVALL offers you the widest work range of any hauling unit available today, enables you to: (1) "tool up" for more types of work for less money; (2) keep your MOVALLS busy on jobs where special-purpose hauling units stand idle; (3) use same Cat DW20 or DW21 prime movers for both scraper and top-loading jobs.

C & D MOVALLS are available for Cat DW20 and DW21 tractors; handle 31-ton, 25 cu. yds. (heaped) loads of any material you can top load. They cost no more than comparable-size limited use wagons; they pay off on many more types of work. See your Caterpillar - C & D dealer, or wire us now about a MOVALL demonstration on your job. C & D MANUFACTURING COMPANY, Perkins (suburb of Sacramento), California; phone HIllcrest 5-8592.

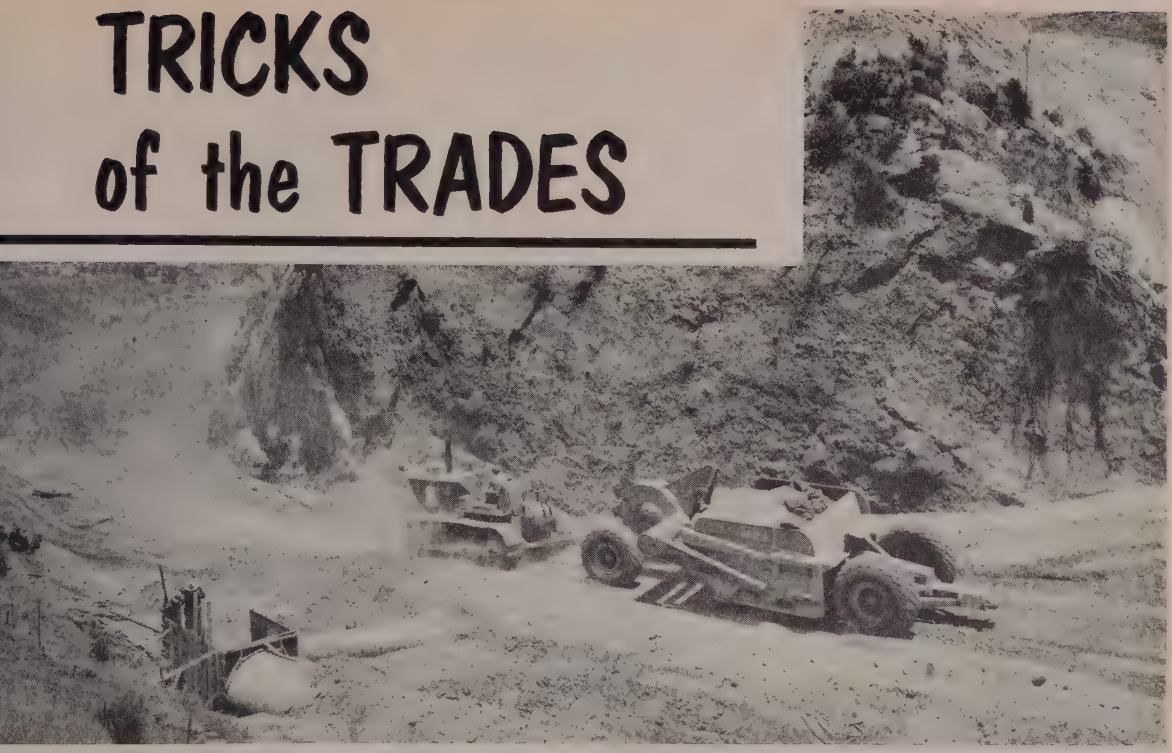
#5



HOW IT WORKS

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

TRICKS of the TRADES



Are you getting the tire life you should?

By FRANK W. FOX
Truck Tire Department
The Goodyear Tire & Rubber Co., Inc.

NCE TIRE COSTS are an impor-t part of the expense of operating ge earthmover vehicles, contrac-s, mine and quarry operators find necessary to estimate their tire ts when calculating the over-all rating costs of new projects.

avings in the cost-per-unit of ma-al moved have been accomplished recent years by the development arger scrapers, wagons, and other ipment. But because the tires on se vehicles are larger, more ex-sive, and cost more to service, r-all tire costs make up a propor-nately bigger part of the total op-ting expense.

Realizing this, engineers of The odyear Tire and Rubber Company e been studying tire performance cost records for several years and e developed a formula for esti-mating the life of tires under any set of operating conditions.

This formula—made after observation of tire service on large dam, levee, and road construction projects, open pit ore mines, coal mines, and quarries—is certain to be an invaluable aid to off-the-road tire users in estimating probable tire costs.

The study showed that the optimum average life of off-the-road tires is 50,000 miles (or its equivalent of 5,000 hours), if the average vehicle speed is 10 miles per hour. Based on that figure, the following table shows the calculation which should be made to obtain a reasonably accurate estimate of tire life.

For instance, the tire in question might be on the driving wheel of a rear-dump truck operating in an open pit or mine where vehicle maintenance is average. The vehicle is driven at speeds not over 20 mph and is not overloaded. The haul road has maximum grades of 15 per cent, curves are medium. The surface is well-maintained gravel.

To figure the total mileage that could be expected from this tire, the mine operator—referring to the table—would multiply 50,000 x .8 x .9 x .8 x .7 x .9 x .9—for a total of 16,300 miles.

Using this table, it takes little study to show the vehicle owner the effects of adverse conditions on his tires' life expectancy. The best ways to cut these expenses are outlined in tire-care manuals which may be obtained from any Goodyear representative.

By applying this estimating table of calculating tire life, the equipment owner can see the importance of a definite tire-care program. The small additional cost involved in installing such a program will be more than made up for in longer tire life, assuring the operator of using every minute of work built into the tires.

TIRE MILEAGE ESTIMATING TABLE

MAINTENANCE		SPEEDS (Maximum)		GRADES (Drive Tires Only)		OTHER MISCELLANEOUS COMBINATIONS*	
Excellent	1.0	10 mph	1.0	Level	1.0	None	1.0
Average	0.9	20 mph	0.8	6% maximum	0.9	Medium	0.9
Poor	0.7	30 mph	0.6	15% maximum	0.7	Severe	0.8
CURVES		**WHEEL POSITIONS**		**SURFACE CONDITIONS**			
None	1.0	Trailing	1.0	Soft earth, no rock	1.0		
Medium	0.9	Front	0.9	Soft earth, some rock	0.9		
Severe	0.8	Driver:		Well maintained gravel road	0.9		
LOADS*		Rear dump	0.8	Poorly maintained gravel road	0.7		
No overload	1.0	Bottom dump	0.7	Blasted sharp rock	0.6		
20% overload	0.8	Scraper-drive	0.6				
40% overload	0.5						

* Covers overloading when combined with other adverse conditions such as maintenance, speeds, surface conditions or curves which bring into play such intermittent hazards as impact breaks, occasional areas of sharp rock after blasting, severe weather hampering road maintenance, driver carelessness, and other unforeseen conditions.

Up and over from crane to dozer

By CHARLES ELLIS
Field Engineer
LeTourneau-Westinghouse Co.

THERE HAVE BEEN a lot of utility cranes mounted on trucks, tractors, and other equipment.

Recently a power company in Indiana needed a general purpose light duty boom that wouldn't interfere with the C Tournatractor's primary duty of coal stockpiling. The result, produced in the shop of Stockberger Machinery Co., has some features we have not run across before.

The crane was constructed to handle 3 to 4 tons 10 ft. out ahead of the blade where the operator can see the load and uses the double drum electric power unit for boom and hook lines. A primary design feature of the crane is the ability of the operator from his seat to stow the boom out of the way and re-erect it in a matter of several minutes. Put into use several months ago, service to date is reported very satisfactory, although the original single part hook line has been converted to a two-part line to slow it down.

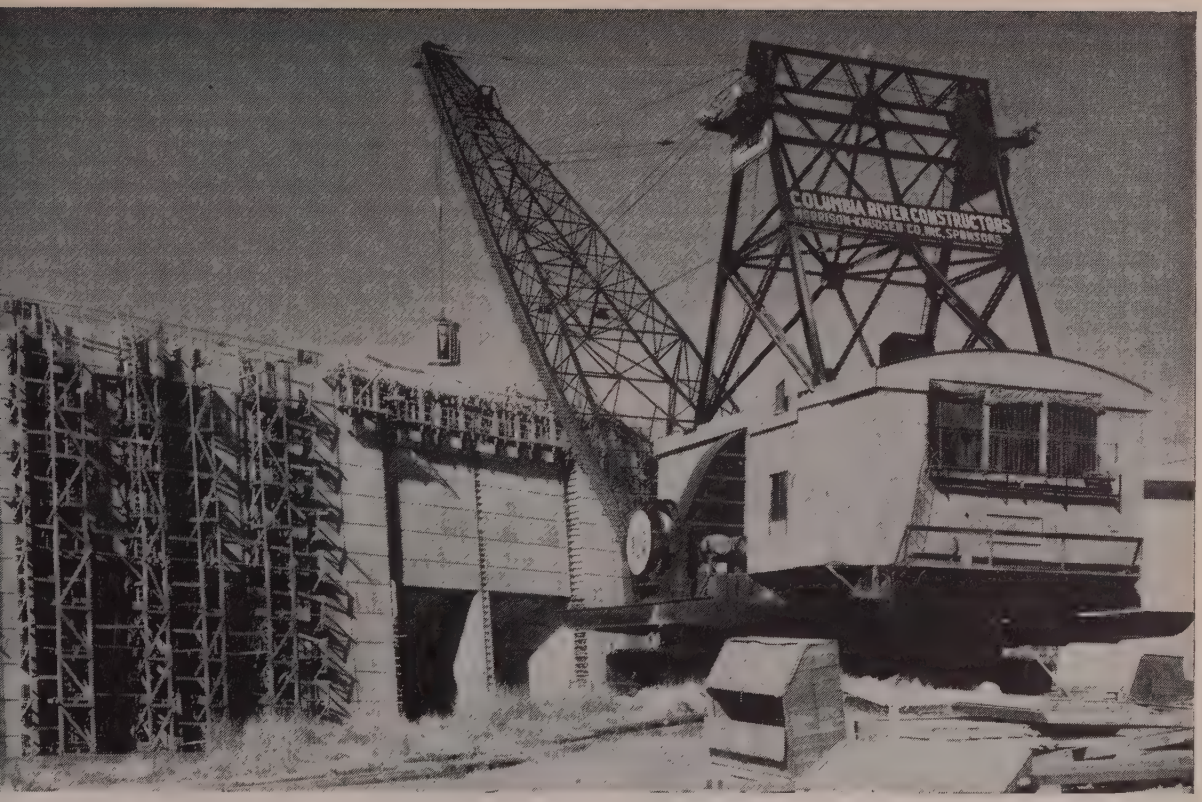
Picture series shows how the boom goes up and over from operating to stowed position.

The distributor reports parts and labor for tailor-making this attachment at approximately $850.00.

Smudge pots keep Alaska culverts flowing

HERE IS SOMETHING COOL to read during the hot summer months, and a trick that may help you keep your job going later into the fall if faced with this problem. The information comes from B. D. Stewart, Jr., chief of the operations division of the Alaska Road Commission:

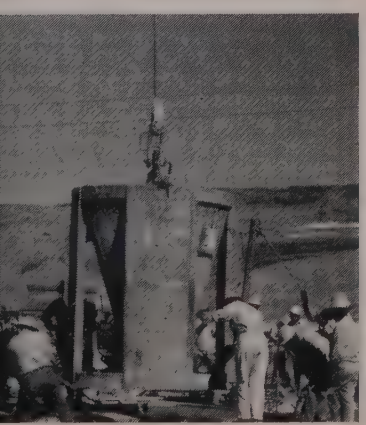
"In connection with our problem of preventing the accumulation of land ice on the surface of roads kept open during the winter months, we have found it necessary to devise a means of keeping some waterways open in sub-zero temperatures. This problem appears to have been successfully solved by our development of oil-fired immersion heaters that will keep the water flowing. These heaters consist of a pot-type oil burner, complete with carburetor, set in an oil drum. Necessary draft holes and stack are provided, as in a 50-gal. fuel tank. The drum heater is placed at the intake of the drainage structure and sufficient warming of the water occurs in flowing around the drum to cause it to continue on through the structure without freezing. Photos of a typical installation, showing the chimney projecting from the thawed area at a culvert invert are shown here."



Putting the right wire rope on the job boosts service life from 6 weeks to 7 months

Columbia River Constructors had been using a regular-lay wire rope to handle concrete and other loads at the site of Chief Joseph Dam. This short section of wire rope, suspended from the hoist line of a huge crane, lasted only from two to six weeks because of the terrific impacts and heavy loads.

A Bethlehem wire rope man studied the conditions and recommended a special 1¾-in. diameter non-rotating rope. The first piece of Bethlehem rope was installed in August 1953 and was in use until the end of March, more than seven months later!



Bethlehem wire rope is top-quality, of course. But on this job, even more important was the ability of the Bethlehem man to analyze the service conditions and to know the right rope for the job.

Bill McGee, rigging superintendent, says, "We believe the rope could have been retained in service for a considerably longer period with complete safety." Other sections of this rope are also used at the job, but on less punishing types of service.

During its 7½-month service, the first section of rope really took a beating. It handled 136,000 cu yd of concrete in addition to hoisting thousands of tons of forms, steel and other material. McGee further states, "It was the non-rotating design which Bethlehem made for us that did the trick. We certainly are happy with the results."

Whether your wire rope needs are ordinary or unusual, there's a Bethlehem grade, size and construction to give you reliable, low-cost service. And there's a Bethlehem Pacific expert to lend a hand in solving your rope problems.

For full details please get in touch with your nearest wire rope distributor or the Bethlehem Pacific sales office at Los Angeles, San Francisco, Portland, Seattle or Spokane.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

BETHLEHEM PACIFIC

BETHLEHEM STEEL

TOOLS of the TRADES

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

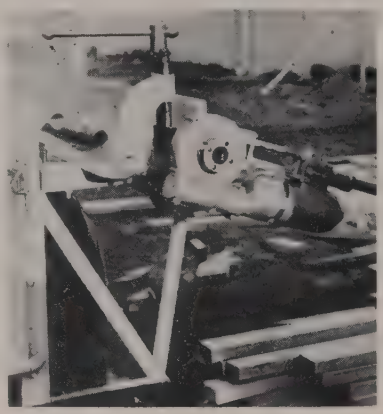
AN ALL-ELECTRIC pliers soldering device in conjunction with a 1000-watt portable power unit has been developed by **Wassco Electric Products Corp.,** Joliet, Ill. It eliminates gas supply problems. It is designed primarily for soldering copper tubing "sweat" fittings up to 1¼ in. but can also be used on heavier wire and cable. It will solder ½-in. OD tubing fittings liquid tight in 20 sec. Ask the manufacturer for Bulletin 105H.

A HOOK with a deep straight throat and tapered point is being offered by **Cleveland Hardware & Forging Co.,** 3270 E. 79th St., Cleveland 4, Ohio. The design gives the hook self-releasing action, and the long point permits an easier grab in rings, pear links, eyebolts, and lifting holes. It is also efficient for handling flat plates and cylindrical shapes. The hook is made of drop-forged, heat-treated steel.

TRUCK-MOUNTED CRANES and hand-operated winches are being manufactured by **H. S. Watson Co.,** 1316 67th St., Emeryville, Calif., in capacities of 500, 1,000, and 2,000 lb. A feature of the cranes is the full circle swing which simplifies one-man loading and handling. The ratchets are spring loaded for safety.

FORM A-7 is a cutaway template that can be used in measuring the wear of Caterpillar rails, sprockets, idlers, grousers, and rollers. Form A6-1 is a reference chart giving exact specifications for Caterpillar, International, and Allis-Chalmer tractor rollers and idlers. Both of these pieces can be obtained by request from **Rankin Manufacturing Co.,** 3072 West Pico Blvd., Los Angeles 6, Calif.

CONVENIENT pipe threading on the job is now possible through the Lawco Junior portable power pipe threader



available from **Velocity Power To Co.,** 201 N. Braddock Ave., Pittsburg Pa. Simple adapters and a speed-r ducer make it possible to handle pi from ¼ in. up to 10 in. The thread weighs 20 lb. and is 27 in. long. It designed for one-man operation. T tool may be used as an auger, post ho driller, for driving nuts and bolts, a as a hoist for weights up to 500 lb.

QUAD-RINGS — their compositio specifications, applications, and adva tages—are discussed in a recently-issu folder. The 10-page booklet describ methods for installing these hydrau seals. Illustrations and instructions a given for finding correct groove dime sions. Write Dept. KP, **Minnesota Ru ber & Gasket Co.,** 3630 Wooddale Av Minneapolis 16, Minn.

TAPPETS enclosed in a steel shell a being manufactured by **S-M Tapp Sales,** Dunedin, Fla. They automatical adjust the length of the valve mecha ism to compensate for wear and t effects which a cold, idling, or h engine has on this mechanism. T tappets are available for almost standard makes of autos and for ma trucks.

TIGHT CORNERS need never aga bother those who have to work wi pipe wrenches. The Handi-Flex pi wrench "bends" by a simple ratcl principle to allow for any number of a justments to fit tight places. It al serves as a conventional ½-in. ratch wrench. **Tedd Products Co.,** P. O. B 1621, Rockford, Ill. Price is $7.95.

NEW EQUIPMENT

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

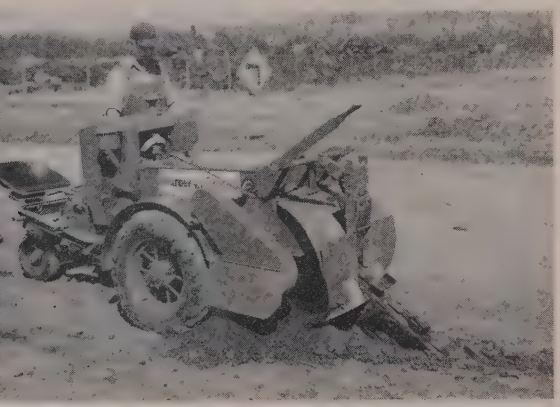
Woolridge Scrapers—41 cu. yd.

Wooldridge scrapers with capacities up to 41 cu. yd. re believed to be the largest available. The open bowl, able-operated units have a capacity of 34 cu. yd. struck. he complete line includes six basic models covering a

ange 10.5- to 41-yd. capacities. The other models include the OS-152, rated at 18 cu. yd. heaped and 15.1 ruck; the OS-90, 15 yd. heaped and 12.2 struck; and the S-80, 10.5 heaped and 8.4 struck. Further information given in Bulletin No. OS-251. **Wooldridge Mfg. Division,** Continental Copper & Steel Industries, Inc., of unnyvale, Calif.

ubber-tired ditcher

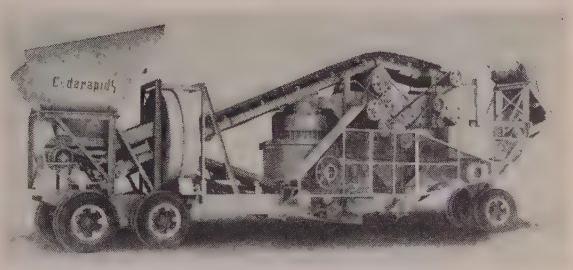
The Model 702 ditcher, a new **Barber-Greene** product, as designed for small trenches, such as those required or house services. It can be equipped with either of two gging booms. One digging 30 in. deep can be equipped



ith either a 2¼-in. or 4½-in. bucket line. The other, gging 40 in. deep, can be equipped with 2½-in. or 5-in. nes. The width of the ditcher is 36 in. and its weight is 000 lb. A passenger car can tow it. Further information an be obtained by writing to the company at 400 No. ighland Ave., Aurora, Ill.

ortable secondary crusher

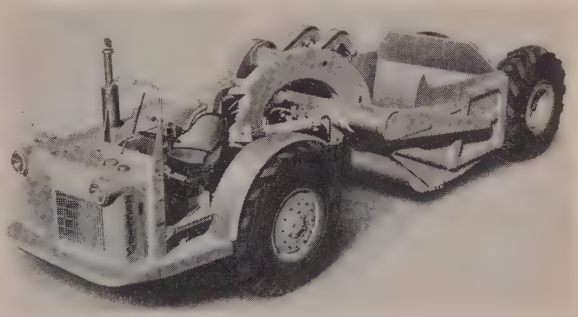
A Model 30-C portable secondary crushing and screening plant has been announced by **Iowa Manufacturing o.,** Cedar Rapids, Iowa. The material is fed to the plant opper which discharges onto a 30-in. wide feed conveyor to a horizontal vibrating screen. Material retained n the top deck goes through the crusher and is recirculated back to the screen for final sizing. The Model



30-C can be driven by 150-175 hp. gasoline or diesel engine or electric motor. Complete specifications are available.

New 7-yd. Euclid Scraper

The Model S-7 has been added to Euclid's line of motor scrapers. It is the company's first overhung engine model. It is powered by a 143-hp. diesel with a 5-speed trans-



mission. All of the scraper operations, bowl, apron, and ejector are controlled by hydraulic lever action. Engine, clutch, transmission, drive axle, hydraulic system are easy to reach for repairs without major disassembly. Literature is available. **Euclid Division,** General Motors Corp., Cleveland 17, Ohio.

27-ft. conveyor for motor grader

The Elegrader incorporates outrigger design for 27-ft. conveyors. The unit has been adapted for Adams and Caterpillar motor graders. It can handle 800 cu. yd. per

hr. with 11-ft. clearance under the head pulley pipe guards. The Elegrader is a standard 16-ft. carrier with an 11-ft. extension and outriggers. Shipping weight is 10,000 lb. Manufacturer: **Reisser Corp.,** Blair, Neb.

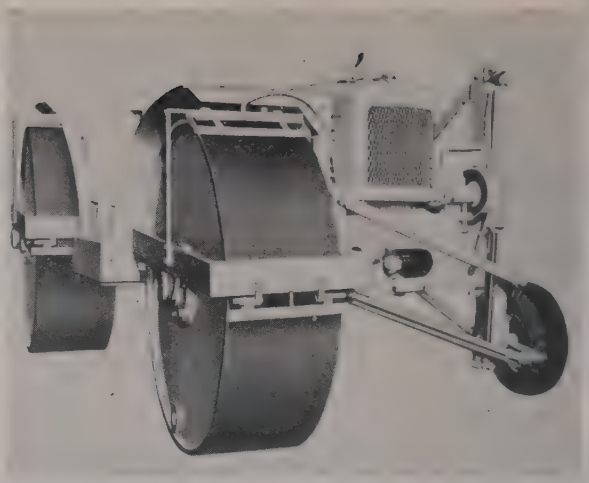
New Fruehauf bulk cement transporters

New Fruehauf cement transporters can unload 120 bbl. of bulk cement in less than 7 min. This is done by means of air forced through the load. The twin panel unit is

available in capacities from 75 to 125 barrels. The overall lengths vary from 18 to 24 ft. and when mounted on 10:00x20:00 tires it has an overall loading height of 10 ft. 10 in. with a coupler height of 47 in. In semi-trailer form with reinforced telescopic landing legs, the trailer weighs 9,500 lb. Manufacturer: **Fruehauf Trailer Co.**, 5137 S. Boyle St., Los Angeles 58, Calif.

Trench roller for road widening

The first dual-compression trench roller for road widening jobs has been announced by Construction Equipment Division, **Blaw-Knox Co.**, Pittsburgh, Pa. The roller is equipped with two rolls of 60-in. diameter and 20-in. width which will exert a compression of 345 lb. per lin. in. of roll face, with water ballast for each roll. By changing the position of the rolls, which can be done



while in motion, the compaction width can be varied from 20 to 39 in. The rolling depth reaches up to 24 in. below existing pavement. Water sprinkling is controlled by a foot pedal.

½-cu. yd. shovel—15-ton crane

A new ½-cu. yd. power shovel, 13 to 15-ton capacity crane, known as the Jobmaster, has been introduced. The machine is available with crawler or rubber mountings and is readily convertible to shovel, crane, dragline, or pull shovel application. On a truck or wagon mount the

Jobmaster crane has a lifting capacity of 15 tons at a 10-ft. radius. As a crawler crane it has a capacity of 13 tons at a 10-ft. radius. Optional features include independent propel, auxiliary third drum, and power load lowering. The unit is made by Construction Equipment Division of **Baldwin-Lima-Hamilton Corp.**, Lima, Ohio.

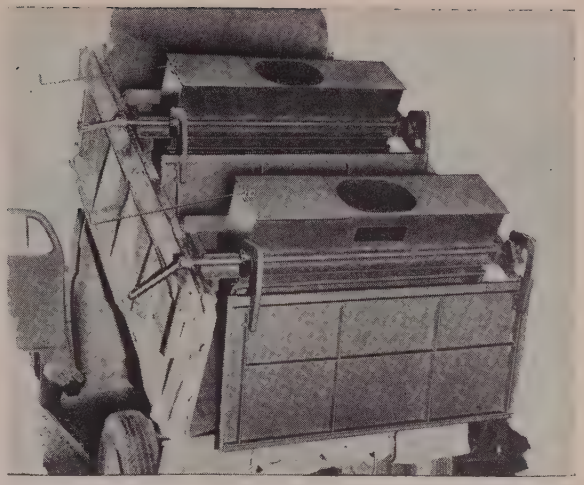
Hopper-type aggregate and asphalt spreader

A hopper-type asphalt spreader which rides on wide steel rollers is being manufactured by **Good Roads Machinery Corp.**, Minerva, Ohio. A strikeoff unit, mounted free of the hopper, rides on steel runners for smooth spreading of the material. The "Odell" spreader has a universal hitch for attaching to any standard dump or semi-dump truck, without use of truck-mounted attachments. Once depth and flow are set they remain constant

through successive loads. The unit will handle hot or cold mix asphalt, bank-run gravel, or coarse slag from feather edge to 8 in. in depth. Width is from 1 to 10 ft.

Combination cement box batchboards

The Heltzel combination cement box batchboard is designed for use on any size truck. The box, which holds 13½ cu. ft., will handle cement for a 34-E paver with a 10% overload. The cement box is sealed with the batchboard so no moisture or aggregate will come in contact with the cement in the box. When the batchboard is tripped, the cement is dumped on top of the aggregate and flows into the paver skip in a manner that prevents cement loss due to adhesion to the bottom of the skip. The boxes and batchboards can be moved from a truck by merely loosening four bolts, and the truck can be used for other work. The Heltzel design is available in size



and style to suit individual requirements. Manufacturer: **Heltzel Steel Form & Iron Co.**, 1750 Thomas Rd., S.E., Warren, Ohio.

Model 308 Buckeye ditcher

A pipeline and utility ditcher, the Buckeye model 308, has been announced by **Gar Wood Industries, Inc.**, Wayne, Mich. It is a wheel-type machine especially designed for digging cross-country ditch and for city utility lines. It digs to a maximum depth of 5 ft. 6 in. with optional width of cut varying in 6- to 32-in. increments. The hoist is operated by controls from the operator's seat and the lowering and raising of the digging wheel is independent of digging, wheel or crawler speeds. The Buckeye 308 has 16 digging speeds forward, ranging from 0.80 to 19.10 ft. per min.

Shot hole drill head

Peterson Engineering Co., Santa Clara, Calif., has announced the Pengo fish tail screw bit. It is avail-

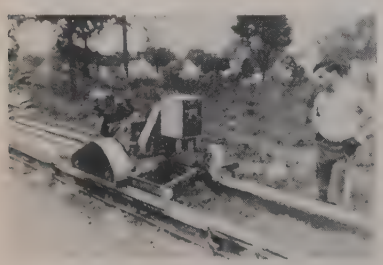
able in ten sizes ranging in diameter from 2½ to 10 in. for boring to depths of 300 ft. The bit is designed for use with any make of continuous helix auger for small diameter holes.

Vibrating screen

A vibrating screen for the screening and sizing of coal, ore, and chemicals is being produced by **Hewitt-Robins, Inc.,** Stamford, Conn. Controlled resonance produces vibrations which separate materials according to size. The screen will be made in sizes from 4x10 ft. to 6x28 ft. The cost will range from $4,000 to $15,000, depending on size.

Curb and gutter tamper

A new tamping attachment can eliminate spading and hand tamping on integral curb and gutter construction. The device is for use with the



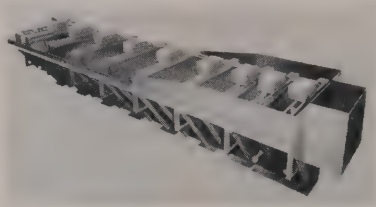
Dotmar paver. Two adjustable tamping bars, equipped with flat shoes at the bottom, operate inside of the hopper. **Dotmar Industries, Inc.,** 105 N. Burdick St., Kalamazoo, Mich.

Self-priming sump pump

Submerged pumps may become mired in the sump slime, or be put out of service by flash floods. The model 81 ¼ A-E handles these problems by having only the suction and strainer guard in the sump. The pump is high and dry and keeps dewatering until the job is finished. The pump may be remotely located, if desired. **Gorman-Rupp Co.,** Mansfield, Ohio. Ask for Form 4-IP-85.

Scalping tanks

An electric-hydraulic valve controls depth of settled sand in these scalping tanks. There is no possibility of build-up of sand at any one bleeder



valve on the bottom of the tank, which occurs if a valve does not open in time. A uniform ratio of solids to water is maintained at all times. **Eagle Iron Works,** 127 East Holcomb St., Des Moines 13, Ia.

Ford reversible scoop

A Ford rear-mounted reversible scoop is now in production. The scoop attaches to the three-point implement linkage of any Ford tractor and carries up to 7 cu. ft. of material.

It has a tapered cutting edge and can be used for digging, scooping, backfilling, or transporting materials. The digging depth is 6 in. The weight is 200 lb. Tractor & Implement Division, **Ford Motor Co.,** Birmingham, Mich.

95-lb. electric plant

The 17A Gen-A-Matic has a 4-cycle engine, weighs 95 lb., and puts out 1.7 kilowatts. A 12-volt crank winding that provides for easy installation of push-button or automatic control is standard equipment. Catalog available on request. **Multi-Matic Corp.,** Van Nuys, Calif.

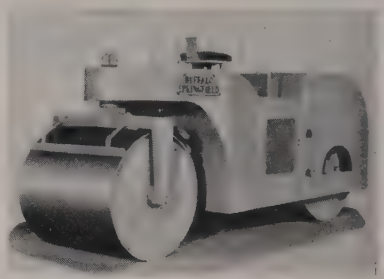
36-hp. concrete saw

The Target self-propelled Model 360 concrete saw is powered by a 4-cylinder engine. The operator can adjust the forward speed from 1 to

25 ft. per min. while the saw is in motion. Hydraulic pressure feeds the blade into the concrete and lifts the blade out of the cut in a single sweep at the end of the cut. Blade depths can also be adjusted while the saw is in motion. A pointer shows the sawing depth. **Robert G. Evans Co.,** 6315 Brookside Plaza, Kansas City, Mo.

8-14 ton tandem rollers

A series of 8-12- and 10-14-ton random rollers has been announced by **Buffalo-Springfield Roller Co.,** Springfield, Ohio. The rollers have



torque conyerters to match power and speed to grade and material variations. Speed is maintained constant from 1 to 5 mph. Two-speed mechanical transmissions are available.

8 cycles in 81 sec.

The Merton Overloader uses the straight line loading principle and has been clocked in 8 loading and discharging cycles in 81 sec. It can load

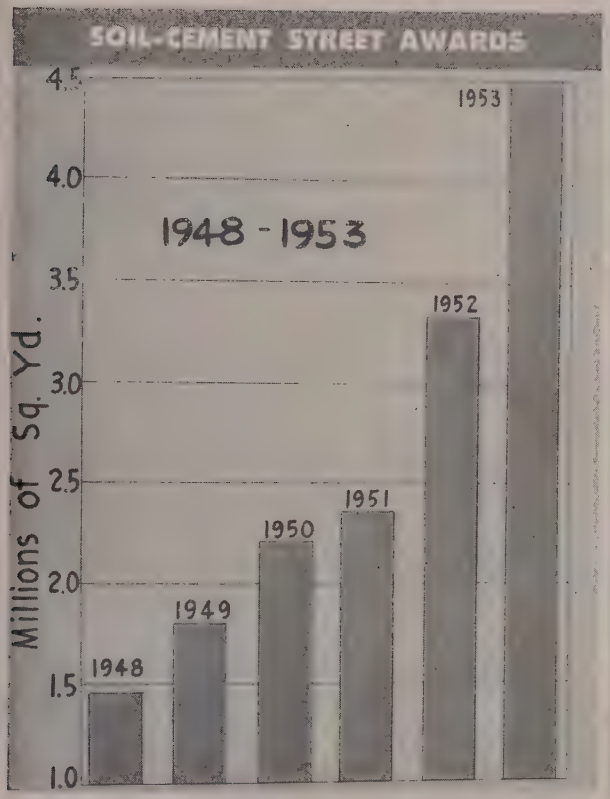
blasted rock at the quarry face at the rate of 1 ton per min, or sand from a stockpile at the rate of 5 cu. yd. in 2¼ min. The bucket can be discharged from a minimum of 6 ft. 11 in. to a maximum of 11 ft. 2 in. **Seaboard Equipment Co.,** 7 Hanover St., New York City.

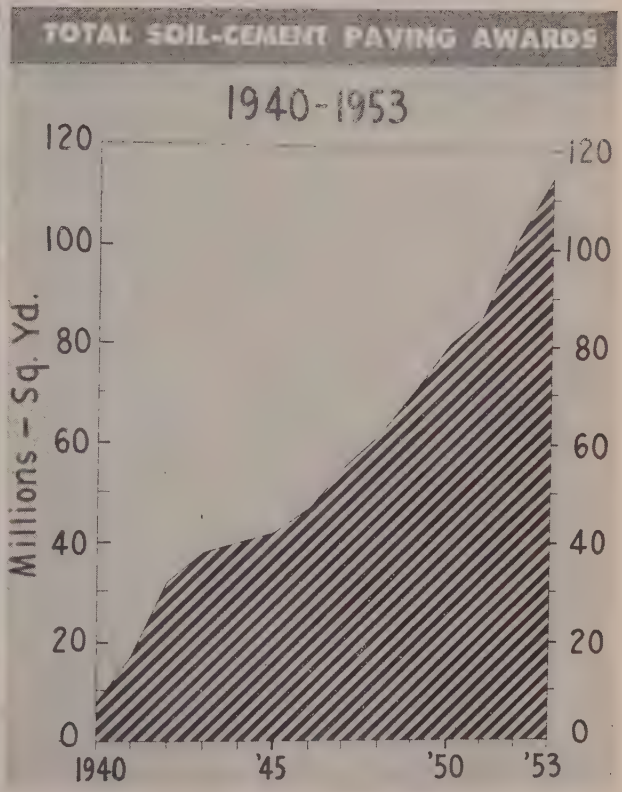
Pneumatic sponge pump

No priming is needed with this sponge pump. It is ready to go if connected to a 105- or 125-cfm air compressor. An exhaust pipe prevents muck and water from entering the motor and the length of this exhaust can be extended as required. The pump was built to deliver up to 380 gal. per min. Literature is available. **Byron Jackson Co.,** Pump Division, P. O. Box 2017, Terminal Annex, Los Angeles 54, Calif.

Soil Cement Is Climbing Fast

As Base Course for Streets, Roads and Airports





Most Soil Cement Is Mixed With Pettibone Wood Mixers

Average soil cement bid prices range from 80 to 90 cents per square yard. A soil cement base course resists moisture, erosion and pumping action of concrete slabs. It virtually eliminates vertical displacement and nullifies plasticity. It substantially prolongs the life of other surfaces, too. Write for informative case histories.

Model 42 Roadmixer Illustrated—Single Pass, Self Propelled; Model 54, Single Pass, Tractor Drawn and Powered also Available. Capacities up to 350 tons per hour.

PETTIBONE WOOD MFG. CO.

6900 Tujunga Avenue, North Hollywood, Calif. • STanley 7-3281

Subsidiary of PETTIBONE MULLIKEN CORP., Chicago, Illinois

Huber-Warco maintainer

A maintainer featuring torque converter and power sliding moldboard as standard equipment has been announced by **Huber Warco Co.**, Marion, Ohio. The power sliding moldboard means no deviation from the line of travel when reaching culverts, abutments, or posts. Either gasoline or diesel power is available. Five speeds range from 1.7 to 21 mph.

Austin loader attachment

A front-end loading attachment, designed for mounting on Models 6-C, 7-C, and 8-C hydraulically operated Austin overshot loaders has been announced by **Austin Division, Central Ohio Steel Products Co.**, Galion, Ohio. It consists of an open-end bulldozer blade on which is mounted a large steel hook actuated by a double-acting hydraulic cylinder. This enables the loader to handle logs, piling, and all kinds of large pipe.

Tractor-mounted sweeper

A tractor-mounted sweeper has been built for the Oliver 55 tractor. The sweeper features a standard broom, 72 in. long and 32 in. in diameter. The broom can be turned end for end for more even wear. Ground pressure is spring-loaded to accommodate shocks and bumps. **M-B Corporation**, New Holstein, Wis.

"1-man" vibrator

A "1-man" vibrator that operates from regular 115-volt AC or DC outlet or portable generator is being manufactured by **Master Vibrator Co.**, 164 Stanley Ave., Dayton, Ohio. The device has the motor in the head. This eliminates the need of dragging a motor behind the operator. Complete details are given in folder MV 1162.

Built for transit-mix

Oshkosh calls it the "50-50." It's a 4-wheel drive truck specially built for ready-mix producers. The design puts an 18,000-lb. loading on each axle—this distribution gives the carrier its name.

The 50-50 will haul as much as 5 cu. yd. legally. Its 4-wheel drive will take it anywhere the concrete is needed. Its 144-in. wheelbase gives it exceptional maneuverability, both in traffic and on the jobsite. Engine maintenance gets a big assist from an overhung design that puts the power clear forward of the front axle. The driver benefits from Vickers power steering.

More information and literature can be obtained from **Oshkosh Motor Truck, Inc.**, 2300 Oregon Street, Oshkosh, Wis.

Presenting . . .

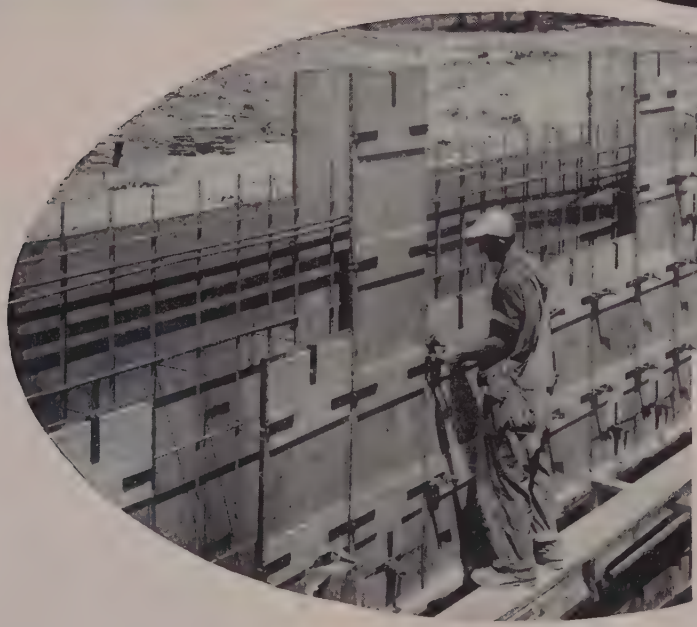
AN ENTIRELY NEW PRINCIPLE IN PANEL FORM DESIGN

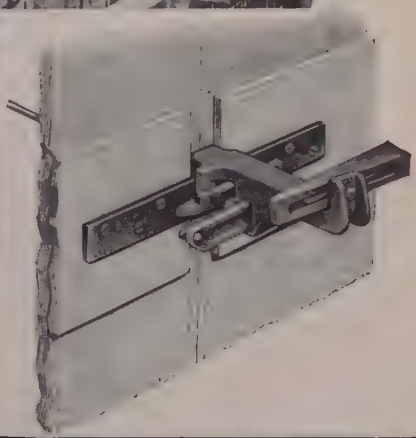
SUPERIOR ALL-PLY

PAT. APPLIED FOR

PANEL FORMS

FOR SIMPLIFIED, FAST CONCRETE FORMING

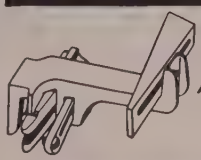




The Superior All-Ply is an entirely new principle in panel form design. Here for the first time is a form panel without a metal or wooden frame, yet providing great strength and rigidity. The simplicity of this system, employing only one working part (the Combination Clamp, illustrated at right), assures lowest labor costs in erecting and stripping. With average care, All-Plys have been used for as many as 100 pours. Standard panels are 2′ wide by 4′, 6′, and 8′ high. Fillers of proper width can be made on the job quickly and easily of ordinary 2″ lumber. Made of 1⅛″ plywood, All-Plys weigh less than 5 lbs. per sq. ft. All-Ply Panels come ready for use with Superior Snap Ties on both residential and general construction.

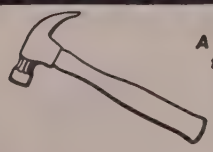
For complete details write for new 12-page catalog.

SIMPLICITY



Only ONE Working Part . . . ALIGNS and LOCKS form, RECEIVES Tie Rod, and HOLDS liner.

ONLY ONE TOOL NEEDED



A hammer is the only tool required with ALL-PLY forms

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office: 1775 Broadway, New York 19, N. Y.

Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

Galanot tire-tracks

Built for a range of sizes from 6:00x17 truck tires to 18:00x26 earth mover tires. Galanot tire-tracks can

be installed and ready to go in 30 min. The weight is 1,480 lb. and the load limit is 24 tons. Price is $1,869. **Keck-Gonnerman Co.**, Mt. Vernon, Ind.

Dust control machine

Just the ticket for situations in which dust control is a legal requirement and dry drilling is being used are Kadco dust control machines. Rock dust and chips can never ac-

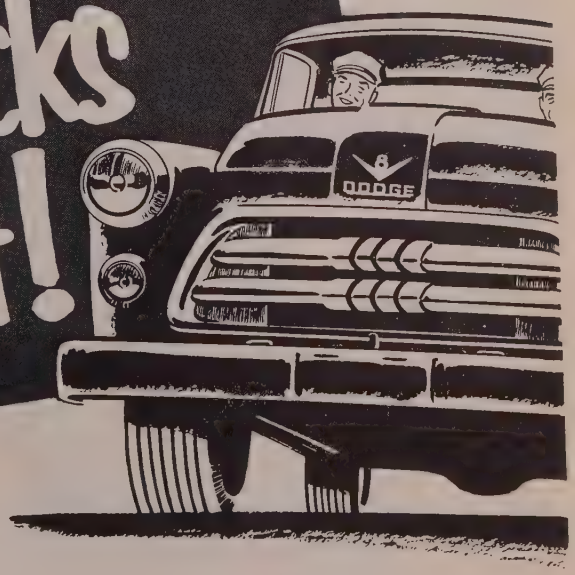
cumulate at the cutting edge while drilling is in progress. This allows the bit to cut new rock at all times instead of regrinding and pulverizing the accumulated cuttings which continuously build up before "blow-back." The Kadco units are available with either gas, diesel, or electric motor drive. **Kadco Corporation**, 36-40 Eleventh St., Long Island City 6, N. Y.

Ford-powered generating plants

Two new series (25EC, 25,000-watt and 35ED, 35,000-watt) of Ford-powered electric generating plants have been announced by **D. W. Onan & Sons Inc.**, Minneapolis 14, Minn. The units are powered by 6-cylinder (25kw.) and V-8 cylinder (35kw.) overhead-valve Ford engines. A large selection of optional items can be furnished. Literature is available.

NOW! Lowest Prices!

Highest Powered Dodge Trucks Ever Built!



LOWEST PRICES! Many standard models of Dodge trucks are priced lower than all other makes! Yet with these low prices, quality-built Dodge trucks are dependable as ever.

HIGHEST POWER! Power-Dome V-8 engines, with 169 to 202 hp., are the most powerful of any leading trucks. Save time, save on operating costs, with these short-stroke V-8's! You'll save with Dodge thrifty 6's, too!

THE FORWARD LOOK! Now Dodge brings the Forward Look to trucks. New wrap-around windshield (biggest of any make!) means added visibility and safety! More reason why you should look at Dodge before you buy any truck. Why not phone your dependable Dodge truck dealer, today?

DODGE *"Job-Rated"* TRUCKS WITH THE *FORWARD* LOOK!

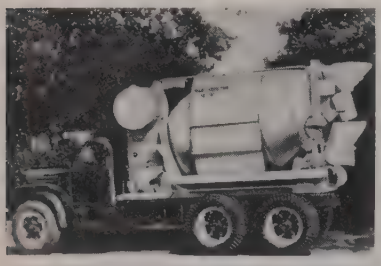
New diesel motor grader

Allis-Chalmers has introduced the Model D Diesel motor grader with a 6-cylinder, valve-in-head engine rated at 50-brake max. hp. at 1,625 rpm.

Weight of the Model D is 9,350 lb. Blade pressure is 4,900 lb. Speeds with 7:50x20 tires range from 2.6 mph. in first gear to 25.2 mph. in fourth. **Allis-Chalmers Mfg. Co.**, Tractor Division, Milwaukee 1, Wis.

8-yd. truck mixer

A new 7½-8-yd. truck mixer has



been announced by **Worthington Corp.**, Concrete Machinery Division, Plainfield, N. J. The unit features a transmission with forward and reverse clutches, and drum and brake gears totally inclosed in an oil bath. The chute extends 8 ft. when open and 11 ft. with the extension chute.

Tilting dumpy level

A tilting dumpy level of the coincident bubble type has been introduced by **Umeco Optical Division**, 465 Cali-

fornia St., San Francisco 4, Calif. It is designed for use where extreme accuracy is necessary. The instrument weighs 6 lb. 6 oz. List price is $300.

Paving breaker—spike driver

The model DB-60 paving breaker has been announced by **Davey Compressor Co.**, Kent, Ohio. It can be used for trimming work as well as down breaking. It can be converted into a spike driver by changing the front head. The DB-60 has a net weight of 63 lb., length of 26⅜ in. and width of 14¾ in.

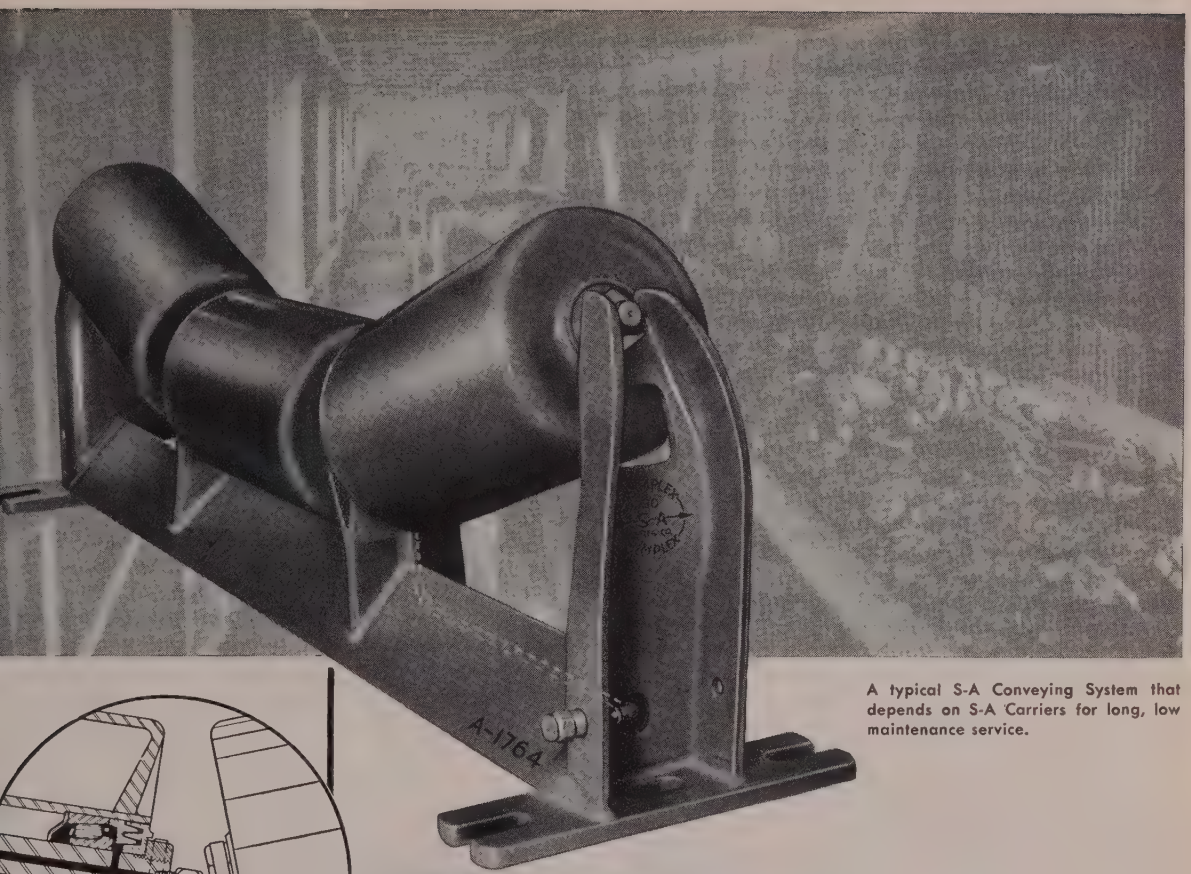
Push type shoulder maintainer

A new device known as the Gledhill Push Shaper is intended to provide a shoulder maintainer that can be

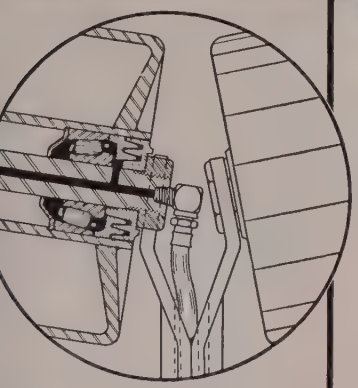
mounted on a truck's underframe or on the front push frame for snow plows. The weight is 600 lb. and it covers a 6-ft. span. **Gledhill Road Machinery Co.**, Galion, Ohio.

Hose for pile-drivers

A wire-braid hose designed for pile-driver service has been announced by **Thermoid Co.**, Trenton, N. J. The hose will handle saturated steam at 385 deg. at 200 psi. It is available in four sizes—1½-, 2-, 2½-, and 3-in. inside diameter.



A typical S-A Conveying System that depends on S-A Carriers for long, low maintenance service.



ller is spun from a single piece of avy gauge tubing with inner bear- g tube welded to spun-ends. "One- ot" lubricates bearings at both ends rollers.

"SIMPLEX" Carriers . . . the "Foundation" for Belt Conveyors that Means Lower Operating Costs

By providing a low friction, low maintenance "foundation" for belt conveyors, "SIMPLEX" Carriers are helping to cut power and servicing requirements on hundreds of conveyor installations. Unique cost-cutting "SIMPLEX" features include:

SPUN-END, ONE-PIECE ROLLERS — Recessed ends permit close roller spacing for maximum belt support and longer belt life.

BELT TRAINING DESIGNS — Automatically trains belt without edge rollers. Excessive edge wear caused by these rollers is eliminated.

FAST, SAFE LUBRICATION — Flexible tube to center roller permits lubricating without reaching under moving belt. Both bearings are greased with one "shot". Outside rollers may be greased direct or through tube from most convenient side of carrier.

LABYRINTH GREASE SEALS—Retain lubricant, keep out dirt and moisture, promote longer bearing life.

INTERCHANGEABLE PARTS—Permit fast easy replacement, reduce stocks.

ALL-STEEL CONSTRUCTION—One piece frame accurately jig-welded for strength with minimum weight.

"SIMPLEX" Series 220 Carriers are available with five or six inch diameter rollers for any belt conveyor 18 to 60-in wide. They are one of a complete line of carriers manufactured by Stephens-Adamson — for over 50 years leaders in the design and construction of complete conveying systems. Full "SIMPLEX" data in Bulletin No. 453. Write for a free copy.

Ask S-A to Engineer Your Conveying System

SINCE 1901 S-A STEPHENS-ADAMSON MFG. CO.

STEPHENS-ADAMSON MFG. CO.

Factories at Aurora, Illinois; Los Angeles, Calif.; Belleville, Ontario

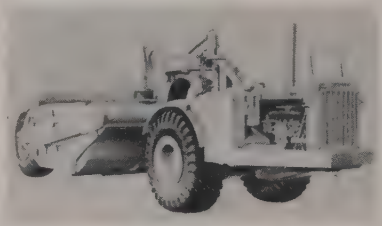
2227 E. 37th Street, Los Angeles 58, Calif. | 1007 E. Burnside St., Portland 14, Ore. | 145 Mission St., San Francisco 5, Calif. | 714 Joseph Vance Bldg., Seattle 1, Wash. | 210 W. 33rd St. South, Salt Lake City, Utah

Air entraining agent

Sealtight is an air entraining agent now offered by **W. R. Meadows, Inc.,** 7 Kimball St., Elgin, Ill. It is guaranteed not to segregate, settle out or become gummy. It is accepted as an approved material by ASTM, Corps of Engineers and Bureau of Public Roads.

New Caterpillar earthmovers

Two rubber-tired tractors have been added to the Caterpillar line. They are the DW21 (Series C) and the DW20 (Series E), both featuring



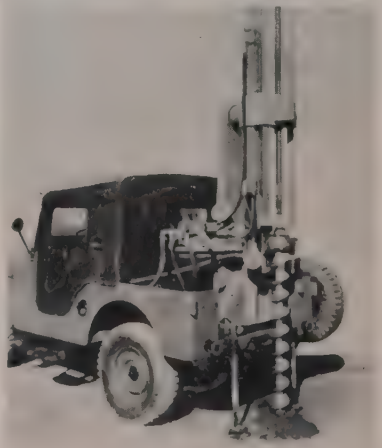
more horsepower than the company's current models. The tractors have diesel engines rated at 300 hp. at 1,800 rpm. The tractors have matching scraper units—the No. 456 for the DW20 and the No. 470 for the DW21 The capacities are 18 yd. struck and 25 yd. heaped. **Caterpillar Tractor Co.,** Peoria 8, Ill.

105-hp. diesel power unit

A new 105-hp. diesel power unit has been announced by **Minneapolis-Moline Co.,** Box 1050, Minneapolis 1, Minn. The base pan is jacketed with a coolant which circulates continuously. Uniform operating temperature from cylinder heads to bottom of base pan is maintained. Sight oil glass is standard equipment.

Toledo earth drill

Exploring the subsurface for data on soil structures and rock formations can be done with the Toledo earth drill mounted on either a 2- or 4-wheel drive vehicle. The drill can be mounted on a jeep. It can be used for post hole digging, drilling concrete cores from pavements or floor slabs, drilling blast holes, or for shallow well digging about 100 ft. into the soil. With diamond bits the unit will penetrate rock up to 300 ft. Additional information can be obtained from **Continental Equipment Sales, Inc.,** 1810 N. 12th St., Toledo, Ohio.



Transcrete truck mixers

One of the features of the Transcrete line of truck mixers is a chute arrangement that gives flexibility on any kind of pour. Extra chute sections are racked on edge and locked in place with spring latches. A hydraulic spout lift is available as optional equipment. Transcretes are available in 3½- to 6-yd. capacities. For further information ask for Bulletin TM 1055, **Construction Machinery Co.,** Waterloo, Iowa.

Portable rotary compressor

A portable rotary air compressor is now being made by **Canadian Broomwade Ltd.,** Toronto, Canada. It is a two-stage, oil cooled unit

which delivers 600 cfm. at 100 lb. pressure. Overall dimensions of the compressor are: weight (net) 9,900 lb., height 90 in., width over fenders 84 in. and length 154 in. (excluding tow bar). A Caterpillar D337 diesel engine provides the power.

Fuel system for P&H diesels

A new fuel system designed around the Roosa-Master pump is now standard equipment on all diesel engines being produced by **Harnischfeger Corp.,** Crystal Lake, Ill. The new pump was engineered strictly for P&H diesel engines. It is self-lubricating and has no ball bearings, no operating valves, no gears. Literature is available.

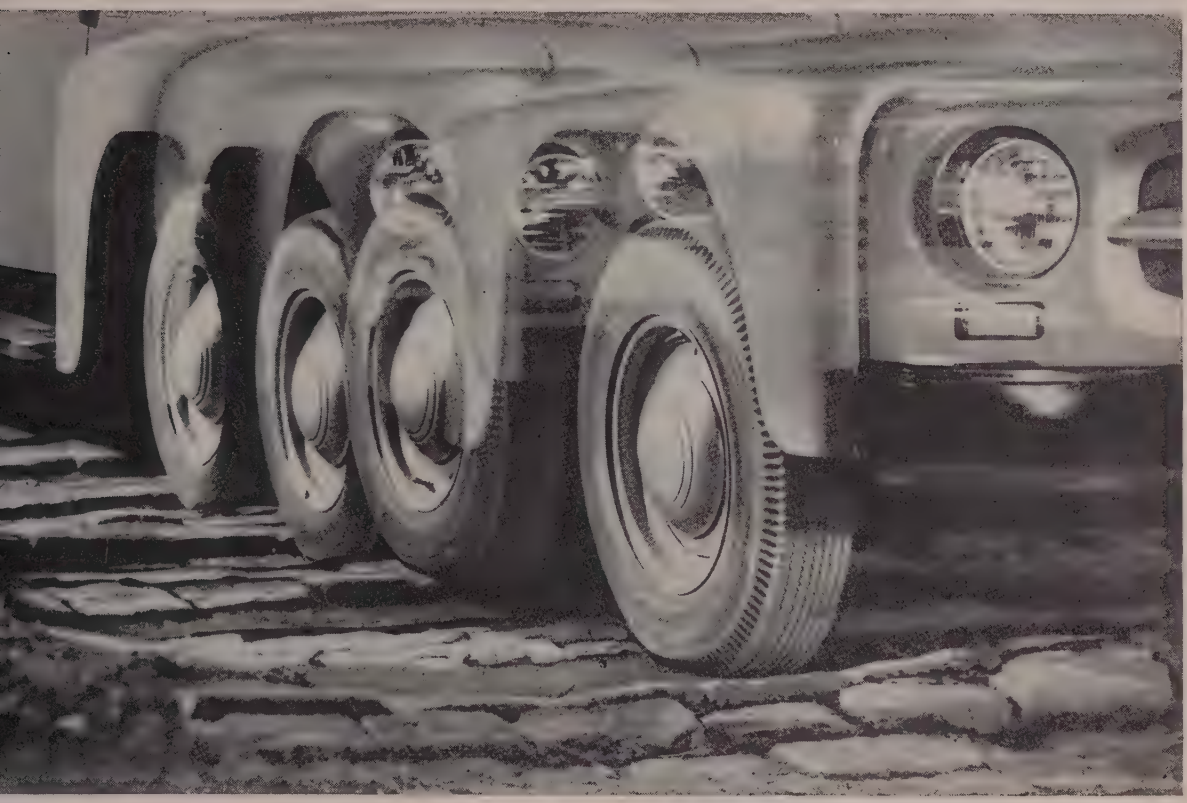
Portable steam generator

A portable steam generator which can be mounted on a trailer has been developed by **Clayton Mfg. Co.,** El Monte, Calif. After hooking up steam and water supply lines, the generator can be ready to supply steam under pressure in five minutes. Kohler engines power the various adaptations of the Clayton generator.

Roller bearing roll crusher

A new 55x30-in. roller bearing roll crusher has been announced by **Iowa Mfg. Co.,** Cedar Rapids, Iowa. It can

1,400 crash landings a minute...



ere's a beating your truck will never have to take. This INTERNATIONAL uck is pounding over the Belgian Block course . . . a torture track so mpy that, at only 12 miles per hour, it slams wheels up and down 1,400 nes a minute—so rugged that drivers are replaced every 20 miles of the 0-mile test.

ou save the BIG money in construction hauling with all-truck built TERNATIONALS. 200 basic models from 4,200 to 90,000 lbs. GVW—con-ntional and COE, 4-wheel, 6-wheel, four-wheel-drive. Axle and trans-ssion ratios for every need.

to save you the BIG money

We torture INTERNATIONAL Trucks this way to be sure that sheet metal, cabs, springs and all running parts will stand up *longer*. So that our trucks will have utmost roadability, minimum wheel fight, maximum comfort. It's all a part of INTERNATIONAL engineering and design to save you the BIG money—the operating and upkeep money.

INTERNATIONAL engineers are never called upon to adapt passenger car engines or components. They design INTERNATIONALS with extra margins of strength—build them to save you the BIG money in the long run.

Yet with all this all-truck extra value, INTERNATIONALS are competitively priced. Let your INTERNATIONAL Dealer or Branch show you the right INTERNATIONAL for you—*all-truck built to save you the BIG money!*

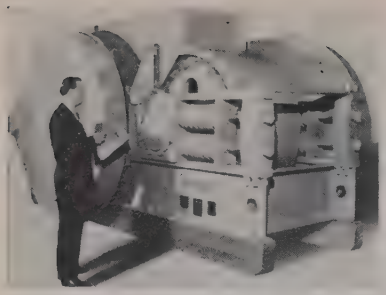
INTERNATIONAL HARVESTER COMPANY • CHICAGO

All-Truck Built to save you the BIG money!

Top TV Comedy! Ronald Colman and Benita Hume in "The Halls of Ivy," CBS-TV. See your paper for date, time and channel.

INTERNATIONAL®
TRUCKS

International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors... Motor Trucks... Industrial Power... Refrigerators and Freezers



be used for any secondary crushing operation where a roll crusher can be used. Capacities range up to 520 tons per hr. depending on material characteristics. Maximum finished size is 5 in. and minimum is ¼ in. Complete specifications are available from the manufacturer.

New 6-cylinder diesel engine

A new 5¾-in. bore by 8-in. stroke 6-cylinder diesel engine has been announced by **Caterpillar Tractor Co.**, Peoria 8, Ill. The 190-hp. unit is composed of many parts already standard in all of the company's 5¾-in. bore engines. Specifications will be sent on request.

Electric-driven air compressor

A 125-hp. electric-driven air compressor has been added to the Ingersoll-Rand line of air-cooled two-stage Type 40 stationary compressors. Either constant-speed control or dual control can be furnished. Dual control is available with either automatic or manual selection. Form 3188 describes the new unit. **Ingersoll-Rand Co.**, 11 Broadway, New York 4, N. Y.

Galion adds roller to line

A 3-axle tandem roller has been announced by **Galion Iron Works Mfg. Co.**, Galion, Ohio. It has a variable weight range from 14 tons (metal weight) to 20 tons fully ballasted with water. The roller is supplied with a Roll-O-Matic torque converter drive as standard.

175-hp. Turbodiesel

A 175 hp. Turbodiesel has been announced by **Cummins Engine Co., Inc.**, Columbus, Ind. Designated the JT-6, it is a 6-cylinder in-line type with a displacement of 401 cu. in.

Equipment briefs . . .

A THIRD DRUM assembly is now available for Bucyrus-Erie 38-B, 51-B, and 54-B machines equipped with lifting crane or clamshell front ends. **Bucyrus-Erie Co.**, South Milwaukee, Wis.

A NEW ATECO rock ripper for the Caterpillar D8 tractor has been developed by **American Tractor Corp.**, 9131 San Leandro Blvd., Oakland 3, Calif.

AN INCREASE of 30% in power has been announced for the P-600 Preparizer, manufactured by **Pettibone Wood Mfg. Co.**, North Hollywood, Calif.

A LARGER BUCKET with 25 deg. of tip-back at ground level for the TL-10 Tractor-Loader has been announced by **Tractomotive Corp.**, Deerfield, Ill.

GALVANIZED PROTECTION is now a standard feature of Ezebilt steel scaffolding. There has been no resulting increase in price, according to **Universal Manufacturing Corp.**, Zelienople, Pa.

POWER AND SPEED have been increased in the International UD-264 four-cylinder diesel power unit. It is now in production at 55 net hp. at 1,800 rpm. **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill.

A 186-HP. engine is the main feature in the DW15 (Series C) tractor being manufactured by **Caterpillar Tractor Co.**, Peoria 8, Ill.

A 3-WHEEL ROLLER is now available with either spoke wheels or ballast wheels. Four sizes offer a weight range from 10 to 16 tons. Standard width of drive rolls is 20 in. A torque converter drive is standard equipment. **Galion Iron Works & Mfg. Co.**, Galion, Ohio.

ROCK GUARDS are now available as an accessory for all models of C & D Movall wagons. The rock guards are installed by bolting to beams welded to the ejector. **C & D Manufacturing Co.**, Perkins, Calif.

TORQUE CONVERTER drive is now offered for the Hyster 3,000-lb. capacity UC-30 and the 4,000-lb. capacity YC-40 lift trucks. Specifications are available. **Hyster Company**, 2902 N. E. Clackamas St., Portland 8, Oregon.

THE ENTIRE Shawnee line of earth moving equipment is now approved for mounting on the I-H Model 300 tractor. This includes the loader, backhoe, ditcher, angle dozer, and bulldozer. **Shawnee Mfg. Co.**, 1947 N. Topeka Ave., Topeka, Kan.

LIMA wagon cranes are self-propelled units with one engine mounted in the rotating assembly supplying the power for all crane operations. LIMA wagon cranes are available in 15, 20, 25, 30, 40 and 50 ton capacities.

LIMA'S fast service cuts costly downtime

From coast-to-coast Lima service engineers, warehouses and distributors are prepared to give you that extra-fast service or parts delivery which can make all the difference between continuous, profitable production and high-cost idleness of equipment.

When you buy a LIMA you can depend on long, trouble-free service, thanks to those extra quality features built into every LIMA. But if trouble happens and you need help, you get it from Lima . . . fast!

COMPARE QUALITY! No other machine gives you as much as LIMA!

1. Piston ring type dirt seal rings and retainers in crawler rollers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at every vital bearing point.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional on certain types).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels (to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

DISTRIBUTORS

Our Seattle Office . . . . . 1932 First Ave. So., Seattle 4, Wash.
Greenaughty Machinery Co. . . 112 S.E. Belmont St., Portland 14, Ore.
Greenaughty Machinery Co. . . . . 600 Front St., Boise, Idaho
Smith Booth Usher Co. . . 2001 Santa Fe Ave., Los Angeles 54, Calif.
Modern Machinery Co. . . . . 4975 Third Ave. So., Seattle 4, Wash.
Alaskan Distributor: Western Tractor & Equipment Co., 2230 First Ave. So., Seattle, Wash.
Shriver Machinery Co. . . . . P. O. Box 1270, Phoenix, Ariz.
Meiner Equipment & Supply Co. . . 501 W. 7 So., Salt Lake City, Utah
N. C. Ribble Co. . . . . 1304 North Fourth St., Albuquerque, N. M.
Bay Cities Equipment, Inc. . . 2606 Cypress St., Oakland 7, Calif.
Acme Iron Works . . Culebra Ave. at Expressway N.W., San Antonio Texas
Cascade Industrial Supply . . . . . Highway 99, So., Redding, Calif.
Modern Machinery Co. . . . . 4412 Trent Ave., Spokane 2, Wash.
Feris-Moritz Equipment Co. . . 1095 South Jason St., Denver, Colo.
McGaraghan Supply Co. . . . . 529 Broadway, Eureka, Calif.

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

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

News of DISTRIBUTORS

Ingersoll-Rand appointments

Andrews Machinery of Washington, Inc., Seattle, and Mid-State Equipment Co., Wenatchee, were recently appointed to handle the Ingersoll-Rand line in the Northwest.

More news from Foulger

Three new men were recently taken on in the sales department of Foulger Equipment Co. at Salt Lake City: Robert M. Zabriskie, J. W. Plant, Jr., and Wilford (Bish) Ruff (will work the southern Utah uranium fields.) Foulger is now representing the Hazard wire rope division of American Chain & Cable Co. and Huber-Warco graders and rollers.

International—Galion link

Look for Galion equipment at your International Harvester Co. distributor from now on. Under terms of an agreement between IH and Galion Iron Works, the latter's line of rollers and graders will be handled by International distributors for the coming 10 years.

Nelson Stud appoints

Promotion of George E. Kennedy as architectural representative for the Nelson Stud Welding Division of Gregory Industries, Inc., on the West Coast is announced by Verne C. Bender, Western branch manager. Kennedy will work directly with architects and angineers in the Los Angeles and San Francisco Bay areas. Also announced is the transfer of Walter E. McArthur, field engineer, from Cincinnati to Los Angeles.

Seattle organizations merge

Karl P. Heideman, distributor for Utility Trailer Manufacturing Co. in the Northwest area for some years, and Earl R. Staley, whose association with Utility goes back to his

Earl R. Staley

Utility man

high school days, have joined forces to form the Transport Trailer & Equipment Co. which will sell and service Utility trailers and equipment in northwest Washington, British Columbia and Alaska. Staley is general manager for the newly-formed company, with headquarters at 3400 Sixth Ave., South, Seattle.

New Western headquarters

Metal & Thermit Corp. recently moved its Western headquarters into a new warehouse and office building at 1926 Maple Ave., El Segundo, Calif. Under the direction of E. E. Anderson, vice president and general manager for all West Coast operations, the new office space will house the Pacific Coast regional sales headquarters personnel.

Leschen names Dougherty

Pat E. Dougherty has been appointed district sales representative

Pat E. Dougherty

Wire for Northwest

for Leschen Wire Rope Division, H. K. Porter Co., Inc. His territory covers the state of Washington, western Idaho and northwestern Montana.

Min-A-Con Equipment Co. addition

Min-A-Con Equipment Co., distributor for the state of Arizona for Euclid and Detroit Diesel Divisions of General Motors Corp. and Stratoflex Incorporated, announces the addition of William S. "Bill" Bodine to its sales staff as sales engineer. Just prior to association with Min-A-Con he was a special representative for Euclid. He is well known throughout Arizona, having been associated for some years with the construction and mining industry in the state.

Bodine

Barnthouse

Barnthouse named sales rep in Utah

R. W. "Barney" Barnthouse has been appointed sales representative with the J. T. Holland Co. in Salt Lake City. He will cover the southern Utah territory on all company lines. Barnthouse is well known in the Intermountain area through his previous association with equipment distributors in that section.

Chain Belt news

Chain Belt Co. recently appointed a new district manager for the West Coast. He is Charles R. Angell, 1324 Orange Ave., San Carlos, Calif. Also recently announced by the company is the appointment of Pioneer Equipment Co. of Reno, Nevada, as exclusive distributor for Rex construction machinery equipment in all of Nevada except White Pine, Elko and Clark counties.

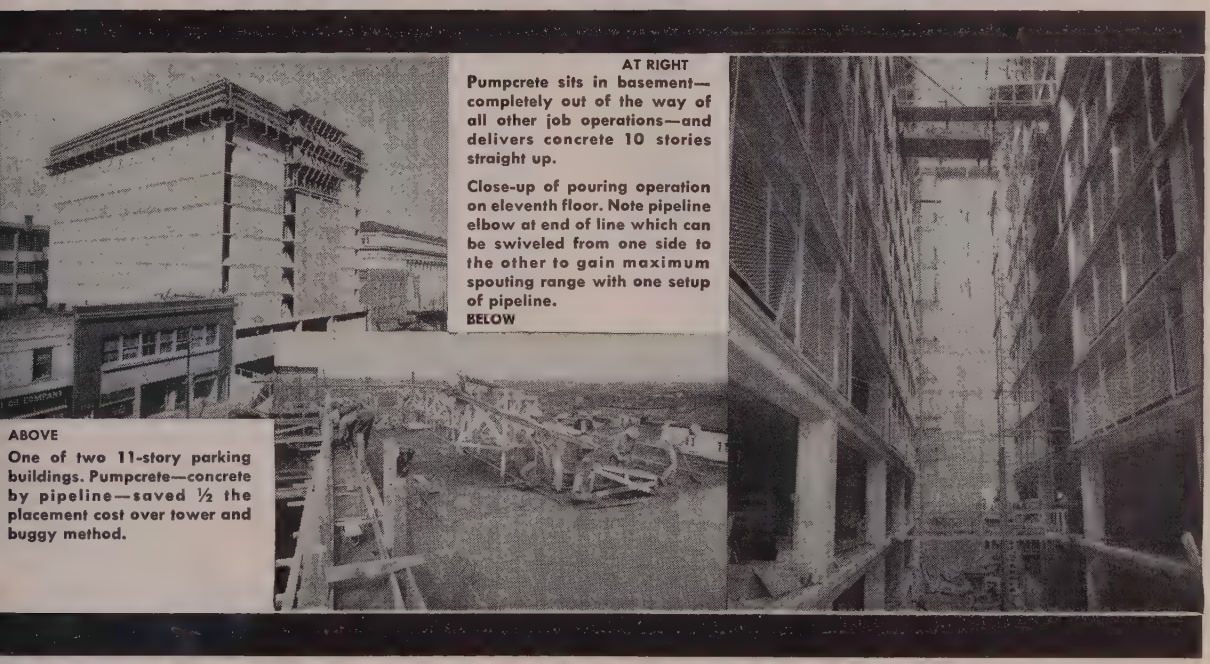
DISTRIBUTORS' representatives from Arizona, California and Nevada convened recently at Los Angeles with Frank G. Hough Co. officials to preview the new Payloader tractor shovel. Host distributor for the demonstration was *V. V. Bailey* of Brown-Bevis-Industrial Equipment Co. Shown here is *Merle Fate*, Hough's Southwestern district representative putting the new equipment to work loading dump truck from stockpile at right.

Concrete for Two Parking Buildings Pumped at ½ Original Estimate

Using a single 160 Pumpcrete, a wise contractor placed the concrete for two 11-story parking buildings—at a saving of ½ the original estimate for doing the job with towers and concrete buggies. The jobs were several blocks apart, but the readily portable Pumpcrete was easily shuttled between the two for alternate pours.

Located at basement level, Pumpcrete was readily accessible to truck mixers that delivered concrete to the site through the alley. Pipeline was run up floor by floor as fast as pouring progressed. Compare this simplicity with ramps, buggy runs, towers, and other cost-adding preparatory work.

Important too, on a job such as this where job area is congested, was the absence of interference among the various trades. Form setters, steel setters, masons, electricians, etc., could work on schedule without being hampered by pouring crews and buggy traffic.



ABOVE
One of two 11-story parking buildings. Pumpcrete—concrete by pipeline—saved ½ the placement cost over tower and buggy method.

AT RIGHT
Pumpcrete sits in basement—completely out of the way of all other job operations—and delivers concrete 10 stories straight up.

Close-up of pouring operation on eleventh floor. Note pipeline elbow at end of line which can be swiveled from one side to the other to gain maximum spouting range with one setup of pipeline.
BELOW

When you pump concrete . . . costs come down

IF YOU'RE INTERESTED in seeing other types of jobs on which Rex Pumpcrete has cut the cost of concrete placement, we will be happy to send you copies of "It was done with Pumpcrete."

There may be helpful data you can use to cut costs on your jobs. See your Rex Distributor, or write Chain Belt Company, 7601 Telegraph Road, Los Angeles 22, California.

Dewsnup

Clawson

Tucker

Morrow

Lang Co. appoints

The Lang Company, Salt Lake City, appoints Edwin G. Dewsnup as new parts manager for the industrial equipment division.

New sales rep in Idaho

Leo R. Clawson started working for Western Machinery Co., Salt Lake City, in mid-May as sales representative in the Idaho territory, with headquarters at Idaho Falls. He was formerly with the Atomic Energy Commission in that city.

Tucker joins Cummins field sales

John W. Tucker has joined the field sales staff of Cummins Engine Co. as a regional representative, with headquarters in Los Angeles. He succeeds J. P. Jung, who now heads a Cummins regional office.

New division sales mgr.

The Rucker Co., Oakland, Calif., has named Thomas B. Morrow as division sales manager for Northern California, Oregon, southern Idaho, and Nevada.

Johnston

Reinig

Aney

List

Brown-Bevis increases sales force

Addition of three new salesmen has been announced by Brown-Bevis Industrial Equipment Co., Los Angeles: H. R. (Red) Reinig is assigned to International tractor, industrial machine, and power sales in eastern Los Angeles County. W. C. (Bill) Aney is appointed tractor sales representative and will cover all of Orange County. J. E. (Jim) Johnston becomes general line salesman in the Los Angeles area.

List joins Anderson-O'Brien

Anderson-O'Brien Co., Los Angeles, Southern California distributor of General Motors diesel engines, announces the appointment of Ray F. List as construction equipment specialist. Since coming to Los Angeles a few years ago, List has been connected with contractors working mostly on street grading and allied construction. In his new post, all the firm's construction equipment accounts are his responsibility.

Heil names new distributor

Bowyer Motor Co., Inc., Tucson, Ariz., is now distributing Heil truck body and hoist equipment in Mexico, in the states of Sonora, Sinaloa and Baja, according to H. A. Stoller, export sales director for The Heil Co.

Thor appoints service engineer

Thor Power Tool Co., Seattle, Wash., announces the appointment of Tom Hill to service all electric tool accounts as service engineer.

Universal Form names two reps

McCraken-Ripley Co. of Portland, Ore., and Universal Equipment Co., Seattle, Wash., have recently been appointed exclusive distributors for Universal Form Clamp Co. to cover the Northwest territory. Products of this manufacturer, including Uni-Form Panels, will be maintained by the Oregon and Seattle distributors.

New outlet for Madsen

Madsen Iron Works, Inc., of La Mirada, Calif., subsidiary of Baldwin-Lima-Hamilton Corp., has appointed Modern Machinery Co., Spokane, Wash., as distributor of its products in the state of Washington, except those southern counties which are covered by Cramer Machinery Co. which has the Oregon territory for Madsen.

Four N.W. distributors named

R. S. McBeth, district manager of Chicago Pneumatic Tool Co. at Seattle, Wash., announces the recent appointment of the following distributors: P. L. Crooks & Co., Portland, Ore.; Cal-Ore Machinery Co., Medford, Ore.; Treasure State Equipment Co. at Kalispell and also at Missoula in Montana.

Lingenfelter appointed Western rep

Ben E. Lingenfelter of Salt Lake City, Utah, has been appointed as Western district representative for Buffalo-Springfield Roller Co., representing the company's complete line of road-roller compaction equipment in states west of the Mississippi.

Harley Reese appointed

Harley Reese was recently appointed manager of the Construction Equipment Division of Harron, Rickard & McCone Co. of Los Angeles, Calif.

Reese

Gregor

Gregor named Cedarapids district rep

Iowa Manufacturing Co. announces appointment of R. C. "Dick" Gregor as district sales representative, with headquarters in Salt Lake City, Utah. His territory includes Utah, Wyoming, Montana, Colorado, and Alberta and Saskatchewan in Canada. Gregor first entered the construction field in 1939 when he was employed by Peter Kiewit Sons' Co. In 1947 he went into the selling field and worked for Seitz Machinery Co., Inc., Cedarapids distributor in Billings and Great Falls, Mont. From 1950 to his present appointment, he engaged in business for himself, selling used construction equipment.

Williams named general supt.

Thomas E. Williams, in addition to his present duties as superintendent of the Los Angeles steel service plant of Joseph T. Ryerson & Son, Inc., has been named general superintendent of the company's West Coast plants on a staff basis.

Totem handles Michigan line

Totem Equipment Co., Seattle, Wash., has been appointed to sell and service the Michigan line of tractor shovels and excavator cranes manufactured by Clark Equipment Co., in all counties of Washington except five, and in ten counties of Idaho.

US RUBBER

nited States Rubber Company 4-year project pays off—
ading operators report they are well ahead with U. S. Royal!

"Practically eliminated our downtime"
says P. Correale, Correale Construction, Hazleton, Pa.
"There's no tougher test for tires than anthracite coal stripping. Tire failure here can knock out a truck for a 7-hour shift—*for a $400 loss.* But U. S. Royal Con-Trak-Tors have practically *eliminated* our downtime."

Down Goes Downtime!

The new U. S. Royal Con-Trak-Tor—Full Lug, an important result of U. S. Royal's 4-Year Truck Tire Project, is cutting equipment downtime 'way down for leading operators like Correale Construction Company.

Good reasons, too! The Con-Trak-Tor's *Nylon cord carcass* stands up to vicious shocks, shrugs off rocks and snags. It has *triple impact protection*—extra rubber between plies, double shock-pads under the tread, extra-tough construction at the crown. Its *full lug traction* pulls right through toughest going, just *won't* bog down!

Why not let the Con-Trak-Tor prove it can reduce *your* downtime, lower *your* operating costs? Your U. S. Royal Dealer has this great tire in your size. Have him put it on your wheels—and prove to yourself why leading operators like Correale Construction Company report they're *well ahead* with U. S. Royals!

U.S. ROYAL

NYLON
CON-TRAK-TOR
FULL LUG

K YOUR U. S. ROYAL DISTRIBUTOR TO SHOW YOU THE NEW FILM ON BETTER HIGHWAYS: "MEMO TO MARS"

Morrissey named Cyclone rep

Morrissey Equipment Co., Los Angeles, was recently appointed exclusive factory distributor in the Southern California area for the Safetee Products Co.'s Cyclone sandblasting equipment.

New Andrews men

Andrews Machinery Co. of Washington, Seattle, recently added Earl Hurst to its staff. Coming from Chicago, he is quickly becoming an accepted part of the Seattle machinery industry. Bob Ross has replaced George Schwab (resigned) as a salesman.

McKay Co. to handle Clark line

Harlan C. McKay Co., Portland, is appointed to sell and service Clark Equipment Co.'s line of automotive products in Idaho, Oregon, Washington, B.C. and Alaska.

Albuquerque firm adds Adams grader

Contractors Equipment & Supply Co. of Albuquerque, N. Mex., announces the addition to their lines of the J. D. Adams Motor Graders—Division of LeTourneau-Westinghouse.

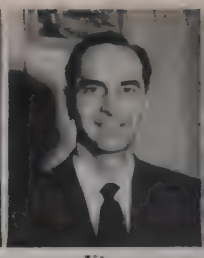
Intermountain Equipment Co.

Intermountain Equipment Co., Spokane, Wash., has a new salesman.

Killgreen

Staben

Walton



Vice

Changes and additions in N.W.

Several important changes and additions to the sales and administrative staff of Interstate Tractor & Equipment Co., Portland, spotlight the following men: John D. Killgreen, for the past six years active in company sales, becomes sales manager of the Portland store with complete responsibility of sales administration. Melvin A. Staben, previously a district representative for Gar Wood Industries, joins Interstate as construction territory manager. Charles F. Walton, formerly a resident engineer with the Bureau of Public Roads, is also working in construction equipment sales. William A. Vice has been promoted to Portland territory manager in Killgreen's territory. Thomas McNeill continues as vice president and takes over as general parts manager, in addition to supervising the parts department.

He is Bill Bopp, covering the Ephrata area. Bopp makes his headquarters at the company branch office at Ephrata. The warehouse at Bridgeport having been closed, its manager Wayne Lybecker also has moved to the Ephrata branch.

Wayne Div. names distributors

Appointment of two new distributors is announced by the Wayne Shovel & Crane Division of American Steel Dredge Co., Inc. Richland Machinery Co. of Sidney, Mont., is the new distributor for eastern Montana and western North Dakota. Contractors Equipment Corp. of Portland, Ore., has been appointed for the entire state of Oregon, and part of Washington.

w rep named

Ralph E. Bennett & Associates, verly Hills, Calif., has been apnted sales representative for Unit ructures, Inc., manufacturer of it glued, laminated construction. nnett will cover the sales terriy of Southern California and Nefa.

amond names Utah rep

Diamond Chain Co., Inc., recently pointed the Utah Sprocket & Manery Co., Inc., Salt Lake City, ah, as a stock-carrying distributor its products in that area.

W. district sales mgr.

Robert B. Yettick has been apnted district sales manager in ttle, Wash., of the Birdsell Mfg. ., Inc. Since 1945 he has been mang owner of East Pacific Co., nufacturers' representative in the cific Northwest and has repreted Birdsell for the past year.

w distributor in Washington

C. S. Johnson Co. announces new tributor appointment for the state Washington. Andrews Equipment vice, Inc., Spokane, will cover the tern half of the state along the rthern section of Idaho to the nadian border.

California distributorship

Rodgers Hydraulics, Inc., has apnted Fornaciari Co. as exclusive tributor for the Southern Califor- area for Rodgers special pipe keting equipment. The Fornaciari n recently received special recogion when it took first place in a Culloch Motor Co. dealer sales ntest for the Southern California a. Award was based on increased ivity in chain saws, portable earth lls, and fire pumps.

rdling adds Clinton line

D. N. Nordling Parts Co., Boise, aho, has been appointed as a cenl distributor for the Clinton line engines, chains saws, etc.

or adds to staff

Thor Power Tool Co., Seattle, ash., has taken on a new service gineer. He is Thomas B. Hill of llevue.

r-Mac expands sales staff

E. C. Stephenson recently joined sales staff of Air-Mac, Inc., at ttle. He will cover western Washton and will assist in covering the ntral part of the state also.

vde adds six men, two lines

Clyde Equipment Co. recently ded the following sales personnel: J. Zuger, assistant sales manager, isting W. H. Booth, vice presnt and manager; F. E. Proffitt, H. Oliver, M. L. Wood, J. N. aters, all salesmen, and P. K. Reinlt, parts manager. The Gabb Moto-

JACK DONOVAN, district manager of Mack Motor Truck Corp., San Francisco, receives contract award for 440 motor coaches from *Harold Jones*, purchaser of supplies for the City and County of San Francisco. These new coaches will be powered by the Mack END673 thermodyne diesel truck and bus engine, and delivery dates extend from 1955 to 1960.

roller and the Tirfor Griphoist are two new distributor accounts taken on by Clyde.

Star personnel changes

William T. Francke is the new construction equipment manager of Star Machinery Co., Seattle, replacing Bert McNae, who is no longer with the company. Robert W. Seelye has joined the firm as construction equipment salesman.

Galbraith resigns; Fred Wiese named

W. H. Pahl, partner in the firm of Sacramento Valley Tractor Co., Sacramento, Calif., reports that, "Jim Galbraith who has been with us for the past eight years has just accepted a position as sales manager for the Sullivan & Crowe Equipment Co., Redding. We wish Jim all the luck in the world. Replacing him is Fred Wiese, who has had considerable experience in the construction industry and who is well qualified for the job." Sacramento Valley Tractor recently discontinued the Adams grader line and is now dealer in their territory for rollers and graders manufactured by Galion Iron Works & Mfg. Co.

Northwest transfers; line added

Ralph Thomas, former branch manager of Howard Cooper Corp. at Seattle, transferred to the Portland office where he is branch manager and assistant sales manager. Melvin R. Aitken, who was formerly branch manager of Central Point branch, Ore., has become manager at Seattle. The Seattle branch has recently taken on the Link Belt Speeder line.

Western sales mgr.

Floyd Baker was recently named Western regional sales manager of the Austin Division, Central Ohio Steel Products Co., making his headquarters at the company offices in Denver, Colo.

MANUFACTURERS

Factory-field coordination

Appointment of H. A. Wiley, Jr., as manager, belting and packing sales, Quaker Pioneer Rubber Mills, division of H. K. Porter Co., Inc., San Francisco, is announced. In his new position, Wiley will coordinate the factory and field activities of the belting and packing departments.

New Kenworth corporation

With the awarding of a $500,000 contract, construction is starting on a 44,000-sq. ft. plant for the manufacture of Kenworth heavy-duty trucks in Vancouver, B. C., by a new corporation, Canadian Kenworth, Ltd. The new company will be a wholly owned subsidiary of Pacific Car & Foundry Co. and will manufacture heavy-duty Kenworth trucks, the same as the Seattle-built Kenworth models. In addition, service and repair facilities are included in the new factory. Kenworth has been represented since 1937 in Canada by Ferguson Truck & Equipment Co., Ltd., of Vancouver, serving as distributor. The Ferguson sales and service organization will be moved intact to the new manufacturing headquarters and its personnel integrated into the new Canadian firm.

FABCO delivers

F. A. B. Manufacturing Co. of Oakland, Calif., has just finished delivery of 15 of its Front Wheel Drives to the Bechtel Corporation at White Plains,

N. Y. These are on F-600 and F-750 Fords and were installed at Norwalk, Conn., by F. A. B.'s distributor there. These units as winch trucks and equipped for general hauling are being used on pipeline extension for Tennessee Natural Gas Co.

New division of Poor & Co.

Crusher Engineering, a new division of Poor & Company, with headquarters in Philadelphia, is announced. The new division will make available a complete line of jaw and roll crushers, hammermills, impact breakers, Bradford breakers and pulverizers to industrial markets, and forgings and alloyed and manganese

STRAUB MANUFACTURING CO., Inc., designers and builders of the Kue-Ken jaw and gyratory crushers, recently moved into this brand new plant. Situated at Oakland, Calif., the plant serves the Western states, western Canada and Alaska, as well as Latin America. *John M. Sardis* of San Francisco was consulting engineer for building design and construction.

steel castings for their maintenance and repair. Design and engineering will be done in Philadelphia with fabrication distributed among various other Poor divisions and subsidiaries. John Plimpton has been appointed vice president in charge of the new division and F. H. Neely has been chosen chief design engineer. Both men were formerly with Pennsylvania Crusher Co.

Thew acquires Byers Machine

The Thew Shovel Co. announces completion of negotiations for acquiring the former Byers Machine Co. for a little over $900,000. A new subsidiary corporation, Byers Machine, Inc., has been formed to operate the plant in Ravenna, Ohio. The company will be headed by A. C. Lundgren as president.

Proposed merger

Directors of Hercules Steel Products Corp. and Central Steel Products Co. made announcement recently that they will ask stockholders to approve a merger of the two firms. All operating divisions and products of both companies are included in the plan. Hercules, founded in 1905, in addition to manufacturing dump bodies and hoists, produces lime, fertilizer, and cement spreaders and hydraulic lift gates. In 1954 Hercules purchased the Unisteel Body Division of Gramm Trailer Co., which is now operated as Unisteel Body Co. Division and manufactures van type bodies for general hauling and freight handling.

Central Ohio Steel Products Co. was organized in 1914. Its principal products are Galion Allsteel dump bodies, hydraulic hoists, refuse collection units, and hydraulic loaders, all of which are made by its major division, Galion Allsteel Body Co. Another of its divisions is the Austin Overshot Loader Division.

Harnischfeger appoints special rep.

Ray Morgan, as a special representative for the Harnischfeger Power Crane and Shovel Division, will promote and coordinate all sales activities for the P&H single pass soil stabilizer and the Sierra elevating loader.

CF&I appoints Bourne

Robert F. Bourne has been appointed to the newly created position of director of sales—national accounts for The Colorado Fuel & Iron Corp., according to announcement by F. S. Jones, vice president in charge of sales. Bourne will maintain headoffices in Wilmington, Del.

Gar Wood names sales exec.

E. F. Fisher, president of Gar Wood Industries, Inc., announces the appointment of Milton G. Peck as

ce president and director of sales
d advertising.

arion Power sales head

Marion Power Shovel Co. an-
ounces the appointment of Robert
ampello as sales manager. A veteran
long-standing in the power shovel
dustry, Campello was associated
ith Bucyrus-Erie for 17 years in
rious sales capacities prior to join-
g Marion. In his new post he will
in charge of sales of all Marion
achines sold through distributors in
e U. S. and Canada.

Campello

Oberlink

-C streamlines operations

Allis-Chalmers Manufacturing Co.
nounces the realignment of its op-
ating divisions, establishing six
ajor operating units. Of the six di-
sions, each headed by a general
anager, three are in the Tractor
oup and three in the Industries
oup. W. G. Scholl, vice president
d director, heads Tractor, and J. L.
ngleton, also vice president and di-
ctor, heads Industries.

The three new divisions in the
actor group are Construction Mi-
inery Division, Buda Division, and
rm Equipment Division. Boyd S.
erlink, vice president of the Trac-
r Division, is made vice president
d general manager of the Con-
uction Machinery Division. R. K.
angan continues as president and
neral manager of the Buda Divi-
n; L. W. Davis is made general
anager of the Farm Equipment Di-
ion. Staff operations of the Trac-
r group continue to be in charge of
. J. Klein, general sales manager;
W. Van Hercke, director of engi-
ering; and John Ernst, general
rks manager.

M. Heede moves

B. M. Heede, Inc., announces the
nsolidation of its offices and ware-
use under one roof at 30-01 37th
e., Long Island City 1, N. Y., with
e same personnel and management
erating.

en Coulson named chief engr.

Appointment of Glen Coulson as
ief engineer of Moffett Engineer-
g Co., Albany, Calif., is announced.
e succeeds Robert Blau, who has
ined McDonald Engineering Co.,
icago.

(Continued on Page 134)

Space is sold as advertisers' inches. All advertisements in this section are ½ in short of contracted space to allow for borders and composition.

CLASSIFIED

Rates are $8.50 a column inch. Copy should be sent in by the 15th of preceding month if proofs are required; by the 20th if no proofs are required.

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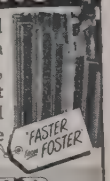

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68 pcs. 50 & 45 ft.	Beth SP4 new	Oregon
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147 pcs. 60 & 30 ft.	Carn M116	Kansas
98 pcs. 60 & 50 ft.	Carn 115	Colorado

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FOR SALE

Excellent buy on Woods Model 36 Roadmix machine. New in 1950. Used two seasons. UD-14 Diesel on mixer, Chrysler industrial on oiler. Windrower available with machine. Telephone VErmont 4131.

CONTRACTORS EQUIPMENT CORPORATION
2727 S.E. Union Avenue P. O. Box 2191
Portland 14, Oregon

LOW COST INSTALLATION AND OPERATION

CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 3 to 20 TONS
SELL, RENT or BUY

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FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION

AMBURSEN DAM CO INC
295 MADISON AVE NEW YORK

One (1) 1½ cu. yd. Pettibone-Mulliken Shovel Dipper, Serial No. 11738 manganese front, all purpose type.

Never used. Price $2,125.00 Where is, Portland, Oregon.

Reply Box No. 8-A,
c/o WESTERN CONSTRUCTION,
609 Mission St., San Francisco, Calif.

COMPACT TEN TOOL KIT

Ten steel hardened, nickel plated tools that fit into sure grip handle. Individually packaged in compact plastic container. Perfect for use in home, office, shop, car or boat.
Constant use plus constant reminder of your product or service make tool kit ideal premium. Your firm name is imprinted on each handle.
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STEEL SHEET PILING
NEAR BREWSTER, WASHINGTON
Shipped New — Used Only One Job

Camegie Length	MP-101 Pcs.	MP-102 Pcs.	Tees Pcs.
72-65 ft.	105	100	2
65-60 ft.	210	50	9
60-50 ft.	210	5	18
50-45 ft.	290	2	7
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K. O. Duncan dies

Kenneth O. Duncan, 61, designer and developer of the Duncan hydraulic Roc-Jak, died June 5 in Los Angeles, Calif. He was a mining and construction man for 45 years and particularly active in the demolition field in his later years, holding several patents on demolition and allied equipment. Just recently he authored an article on the proper use of jackhammers which appeared in **Western Construction**—April 1955, pp. 39-40. The Roc-Jak business will be continued by his oldest son John Duncan.

Marmon-Herrington buys Cardox

Announcement is made that Marmon-Herrington Co., Inc., has purchased substantially all the common stock of Cardox Corporation, Chicago. Cardox manufactures chemicals, mining, and other similar equipment.

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ADVERTISERS in this issue

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Slide rule vs. shop realities

Last spring, when we were thinking and talking highway equipment in our travels around the West, we thought perhaps we'd uncover some fine new ideas in construction equipment. Ideas that hadn't been built, that is. There were a few, to be sure, but for the most part contractors seemed to accept the idea that equipment application is their business. Leave the idea business and the design chore to the people who have a broader view of total industry needs.

Where there were suggestions, mostly they were on details of construction and not on principles of operation. One man jumped from there right into the field of marketing. We wouldn't say he was right, but we're sure he spoke for every operator and mechanic in the West, somewhere, sometime:

"The men who design the equipment—let them double in brass as repair men. I'm sure there would be some changes made.

"The use of operators or construction men to write the brochures, instead of soap advertising agents. So when we read something, the machine will come closer to doing it."

Still, this is the guy we quoted in the Highways Issue when he said: "However, over and above all things the construction machine of today is quite a contraption. Which, believe me, I wouldn't be without!"

Maintenance with a capital "J"

The "J" is for Janitor. And playing janitor to the traveling public of the West has come to be a big function of state highway maintenance forces. A couple of illustrations come to mind. They have no special moral, at least not for the **Western Construction** audience, but they certainly show what a frustrating thing maintenance can be.

You patch up a chuck hole because you know it will get worse if neglected. You don't ordinarily figure that a rusty tin can will "grow" if left alone. But it will. One rusty tin attracts more, because people dump any place they see other trash.

In this regard, Idaho experience shows you have to be Captain Kidd himself to do a good job of highway rubbish disposal. The big trick is to hide the refuse — like treasure! — where no one can find it.

The trouble is worst near towns. People follow the maintenance truck tracks off into the brush beside the road and use the highway department's private pit as a city dump. According to Idaho's maintenance department, the rubbish problem really grows this way. So, if you see an Idaho maintenance truck driver with a whisk broom dusting out his tire tracks beside the road, you'll know he's been dumping trash.

In Nevada the problem is even more concentrated. You might say the concentration is 3.2 or so, because beer bottles and cans are the whole story. And Las Vegas is the place, with a material assist from Reno.

According to H. D. Mills, the state highway engineer, Nevada's total annual maintenance budget runs about $250,000. This covers patching and snowplowing and other such traditional and legitimate items. It also covers janitorial service to the tune of about $50,000, or 20% of the budget.

Mills says this roadside cleanup of beer bottles is practically all within a 35-mi. radius of two cities, Reno and Las Vegas. Working close to town, the yield is about a truckful of empties per mile—or so it seems.

It's costly, too. All hand work. And not much salvage value in today's non-returnable bottles and cans.

Twenty-five years ago in *Western Construction*

"Effective on and after August 1, the **Colorado State Highway Department** will require that all persons, firms, or corporations submitting bids on highway work for the Department shall have been qualified as bidders by submitting financial, experience, and equipment statements on forms provided by the Department."

* * *

"The **Le Tourneau Manufacturing Co.**, Stockton, California, announces a 2-wheel chariot type dump cart with a capacity of 12 cu. yd. (water level) or 16 cu. yd. maximum. The body is 9x11x4 ft., built of structural shapes and heavy plate steel, and is of electric welded construction; it weighs 7 tons empty."

* * *

"Aerial photographic surveys will be used to provide typographic maps of three strips from which locations and profiles can be projected and preliminary cost estimates made for the Lewis & Clark highway between the Montana state line and Lewiston, Idaho."

"**W. A. Bechtel Co.**, engineering contractors of San Francisco, announce the removal of their offices from 206 Sansome St. to 155 Sansome St. This firm, as a joint bidder with the Utah Construction Co., was awarded a contract July 29 for the 112-mi. Western Pacific railroad extension from Keddie to Bieber, California."

* * *

"The **Queen City Construction Co.**, Seattle, completed its contract July 3, or 25 days in advance of the specified completion date, for paving Pike St. between First and Summit Ave. with high early strength portland cement concrete, total cost $138,000. This was a repaving project on a 54-ft. roadway for a distance of 4,040 ft., or 13 blocks."

* * *

"More than 400,000 cu. yd. of roadway excavation moved with a loss of working time of less than 16% is a record set by the **H. W. Rohl Co.** of Los Angeles in grading 2.6 mi. of the new La Canada-Mt. Wilson state highway."

NEXT MONTH

THE DALLES DAM is the location of a new television channel! To phrase it in a pun, the channel is the Columbia River, where the Corps of Engineers checked closure damsite conditions with a TV camera. An article next month tells how the camera eye got right down there on the bottom of the river, in currents a diver could never buck.

KOMPACTION is the word, now that Buffalo-Springfield's K-45 "Kompactor" has come West. This is the self-propelled segmented wheel roller that does your fill compaction in a hurry. See the September issue for a California job application, complete with figures.

UTAH IN UTAH—It's Wanship Dam, where Utah Construction Co. is moving a lot of dirt for the Bureau of Reclamation. Features of the project operation, and plenty of pictures, come to you in these pages next month.

...The Editors

Editorials

owder pays too

Two months ago, using the words and experience of l Myers, Columbia Equipment Co., we said, "Let's look the operator—he is the boy who makes the dough for nagement."

This month, using the words and experience of Bob ubbs, we're on record as knowing that "it requires every an on the job from the lowly mucker to the superinndent to get the job done, and how well the job is done pends on the ability of each individual in carrying out part of the project."

What Grubbs says is what we meant to say. The viewint of Bill Myers was only one example. The right attide for a shovel runner is no different from the right itude for a powder man. Grubbs is a powder man. So 'll let him shoot this round:

"If I were conceited enough, I would say that the man ponsible for blasting the rock is the man that can make break a company.

"I just completed a job on a dam here in California, nstituting some quarter of a million yards of rock, which as all more or less precision shooting. What I mean by at is we had to put her on the money both for grade d slope.

"We were breaking about 10,000 yards per shot. We d one shovel—a Northwest 80D—three Eucs and one it. We were blasting and hauling those rounds out on a nedule that never varied more than a couple of hours a round—with the exception of one bad shot I made, sulting in a lot of oversize boulders.

"This meant a lot of secondary drilling, and the extra ne it took to clean up that shot cost approximately $400 ore than the previous shots where the ground broke operly.

"So I maintain that regardless of how good a runner a an may be, or how good the shovel you set him on—if e powder man doesn't know how to break the rock for m, he can't make any money for his company . . . but can tear up a lot of equipment trying!"

The "Junior Civil" controls the access

Highway engineering for California's Division of Highways is getting to be like the freeways they build. So far as employment opportunities are concerned, "controlled access" is now the policy. Beyond the beginning grade of Junior Civil Engineer, civil service examinations for highway engineering positions are, with one exception, "promotional" only. That is, they are open only to present employees.

This fact shocks at least one veteran of California state highway service, now retired. He cites the ingrown viewpoint that will be encouraged from now on. In a relatively few years, policy positions will be filled exclusively by men having no experience other than in the Division of Highways.

What is the answer? Perhaps more important, what is the cause of this situation?

It would seem that California's drastic action is a matter of expediency. The primary objective is to hold men, by reserving advancement opportunity to present employees only. This is a serious problem in California, a state that is regularly advertising nationwide for young engineers and recruiting aggressively at Western engineering schools.

It used to be that the Associate level was the break point beyond which examinations were promotional only, with plenty of competitors inside the department. The Associate Highway Engineer examination was open to outsiders, and it still is.

But, to ease recruiting of Junior Civil Engineers, the Assistant level examination has now been made promotional only. Every man hired as a Junior, from school, now knows the extent of his competition for advancement: it is solely among his colleagues as a Junior Civil Engineer.

The most recent move completely reveals the urgency of the situation and thereby does much to justify the "controlled access" personnel policy. Junior Civil Engineers were still being lost at an uneconomical rate, and at a rate that hampered highway department progress. The solution was to cut in half the experience requirement for promotion to Assistant level. (The effect is to open up a broader salary range for a given range of experience. To have frankly adjusted salary schedules alone would have been more difficult; it would have been largely an irreversible course, and one the state was logically reluctant to take.)

So it turns out that California is indeed slated for an inbred staff in its Division of Highways. The drawbacks are obvious. But so is the alternative, a highway program hamstrung by a personnel shortage. The Junior Civil Engineer is the cause of it all: the demand for his services, and his own demand for advancement opportunity, control the access to highway engineering in the Division of Highways.

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