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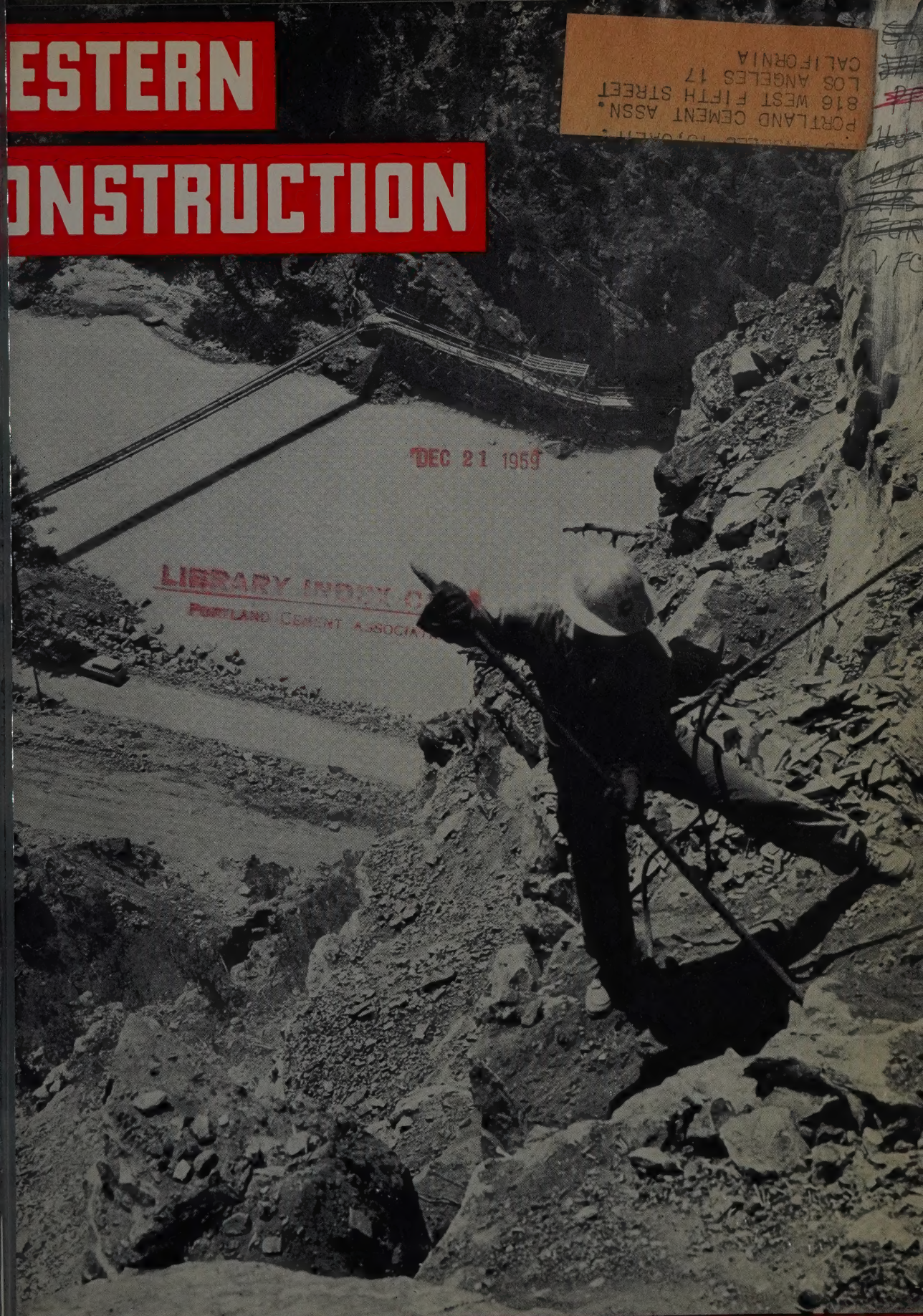

DECEMBER 1959

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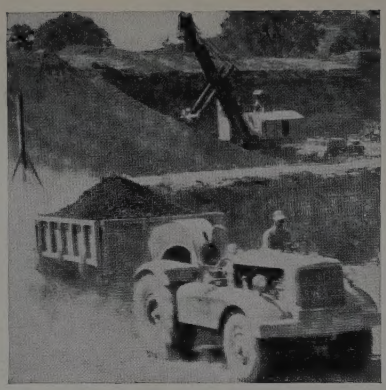

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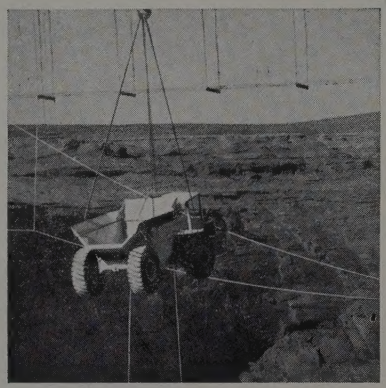
3. SHOCK AND STRAIN won't break the tough film that Texaco Universal Gear Lubricant EP puts on differential and transmission gears, because Universal Gear Lube is designed to take highly concentrated extreme pressure loadings.

4. HYDRAULIC SYSTEMS STAY CLEAN, give steady, powerful hydraulic action, with Texaco Regal Oil R&O. It's inhibited to prevent rust, minimize oxidation and foaming. Keeps air compressors on the job longer, too.



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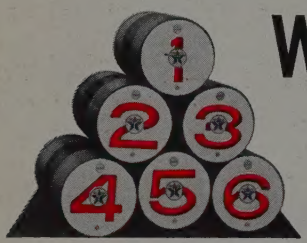

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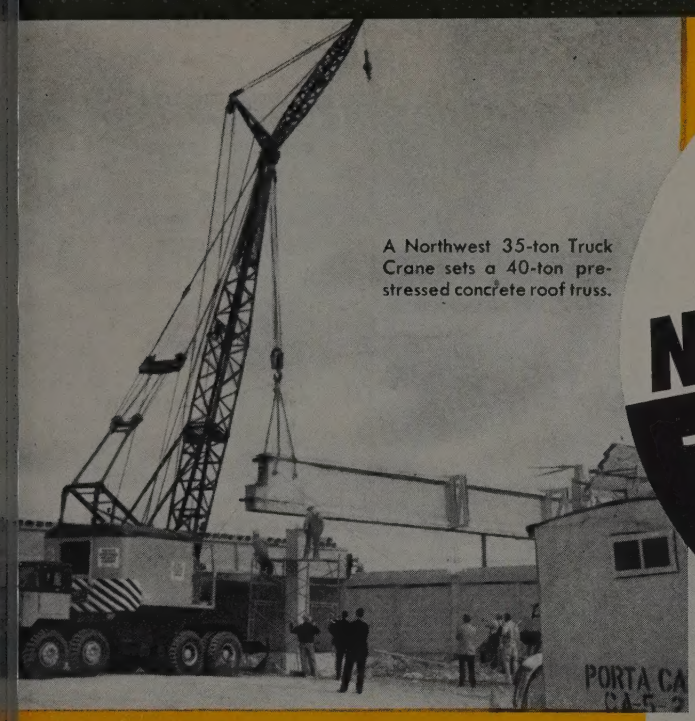

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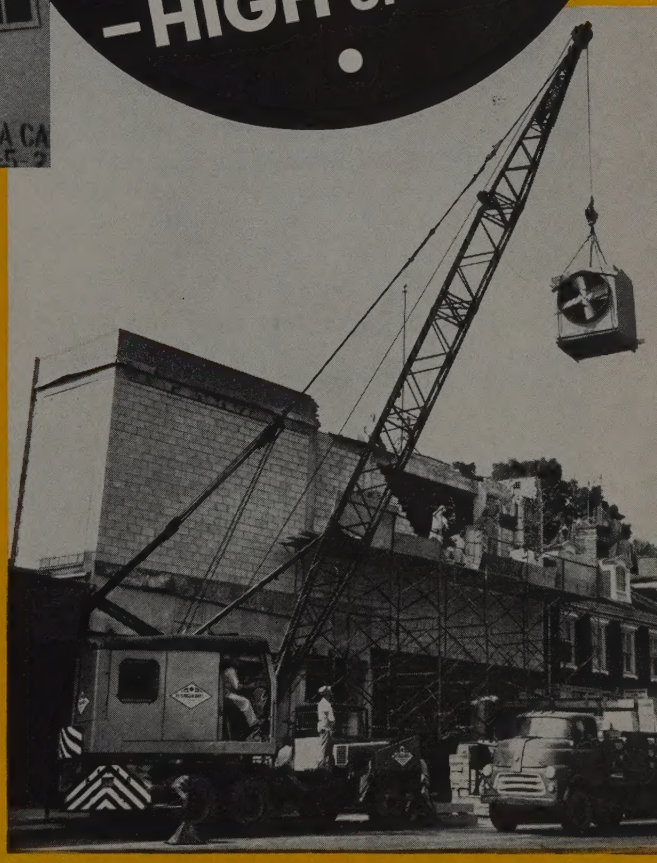

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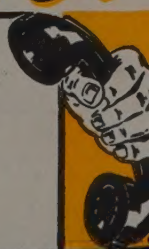

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WESTERN CONSTRUCTION

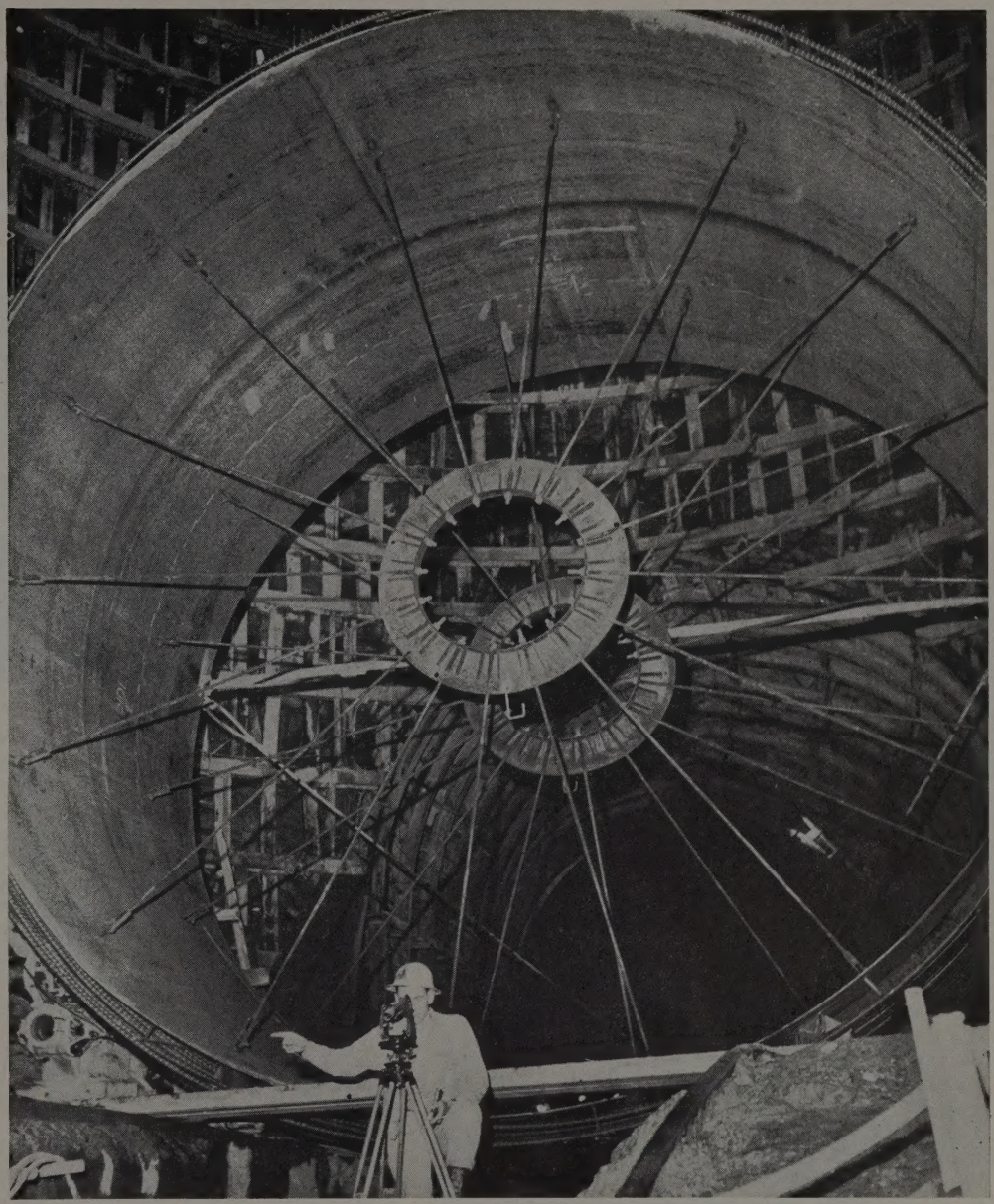
KING PUBLICATIONS

DECEMBER
1959
Vol. 34 No. 12

FEATURES OF THREE RECORD DAMS

COVER—Symbol of Western dam construction is the "high scaler." This illustration shows one working above the access road at Flaming Gorge Dam. (Article starts on page 40.) Note the Green River and the bridge that carries the concrete pipe line for lining the diversion tunnel. *Bur. of Recl. photo.*

For 33 years serving the construction needs of the Western States



25-foot diameter section of Swift Dam tunnel liner inside 55-foot diameter surge chamber.

Delivers the "PAY LOAD" at Swift Dam

Fifteen and a half million cubic yards of rock and compacted earth, holding back a 740,000 acre foot reservoir, are the biggest ingredients of the Pacific Power & Light Company's recently completed Swift Dam on the Lewis River in Washington. But the "pay load" conveyor of this man-made mountain is the 1,575-foot, steel-lined power tunnel which carries water under high pressure into three 13-foot diameter penstocks for the 68,000 kilowatt generators.

The plate steel lining of the power tunnel, the penstocks, and the 55-foot diameter surge chamber were all fabricated by American Pipe and Construction Co. at an "on the job-site" assembly plant. American's steel plate products, engineering, fabrication and erection abilities were proved once again at Swift Dam.

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NEW EQUIPMENT

Obtain more information on these new developments in construction equipment by circling the corresponding numbers on reply postcard.

Bullgrader for International T-340

A hydraulic bullgrader, 85¼ in. wide and heavily reinforced for high-capacity earthmoving, has just been introduced by **International Harvester Co.** for use with the International T-340 crawler tractor.

Only two control levers are needed to deliver a wide range of angle, tilt and height adjustments. The blade can be set to a depth of 12 in. below grade and raised to a height of 35 in. above grade. Angling positions vary from 25 deg. right to 25 deg. left. Either end

of the blade can be raised or lowered as much as 15 in.

Harvester's hydraulic bullgrader is mounted on the T-340 by means of a heavy sub-frame assembly which distributes the shocks and strains of heavy dozing along the entire unit. Dozer side-booms are located inside the tracks to provide maximum support and to allow working against banks.

The rear of the sub-frame is bolted to the final drive housing, while the front of the frame ends in a heavy, box-section C-frame assembly to which the blade is pinned. A 6-in. cutting edge is reversible.

With its high lift capacity, the bullgrader makes an ideal tool for work on slopes, banks and shoulders and provides sufficient leverage for removing trees and stumps. When in the tilt position, the blade can be used for ditching and cutting irrigation ditches.

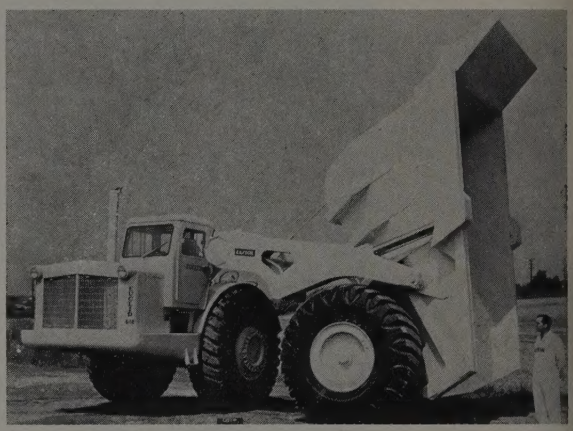
. . . Circle No. 150

35-ton Euclid-Easton rear-dump

Euclid Division of General Motors announces the addition of a new variable wheelbase machine to its line of off-highway rear-dump haulers. Designated as Model S-18, this new "Euc" consists of an overhung engine type tractor with an Easton-built semi-trailer.

The S-18 tractor is powered by a GM 6-110 engine of 336 hp. It has an Allison 4-speed Torqmatic Drive with converter lock-up (Torqmatic Brake is available as optional equipment). Top travel speed with full payload is 25 mph. Tractor and trailer tires are 27.00x 33 and interchangeable.

Designed as a complete unit, the S-18 rear-dump is well balanced and provides exceptional maneuver-



ability for close quarter work on heavy construction jobs. Full hydraulic steering enables the tractor to make full 90-deg. turns. With the hopper raised, turning width is only 28 ft. 8 in. since wheelbase is shortened by 6½ ft.

The Model TS 2635 Easton trailer is of high strength, heat treated alloy steels and has a struck capacity of 23 cu. yd. Heaped load is 26 yd., and rated payload is 70,000 lb. A new single stage double acting hoist provides fast and smooth dumping. The operator has full control of body position through the entire dumping cycle. There is no sudden shock or impact when the body reaches its maximum height or returns to the travel position.

Wheelbase of the S-18 rear-dump is 20 ft. in hauling position. Weights are 67,000 lb. net, 137,000 lb. gross with distribution of gross weight 50% on both axles.

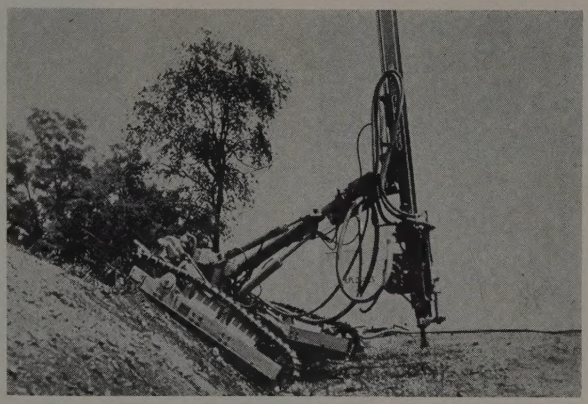
Since the tractor can be used with the Euclid S-18 scraper or the Easton rear-dump, the conversion offers maximum flexibility for all types of work with a minimum equipment investment. Wheels, tires, brakedrums and related parts are interchangeable from scraper to rear dump.

. . . Circle No. 151

Blast-hole drill for rough terrain

An all-purpose blast-hole drilling rig especially suited to rough terrain, has been introduced by **Gardner-Denver.** The machine combines the flexibility of a swing boom with the features of an "Air-Trac." The Model contains several advances in crawler-mounted rock drilling equipment.

Because of the rig's symmetrical design, drilling can be done over the side of either track in an 11-ft. 10-in. swing arc. This means more holes drilled from a single set-up and greater spacing is possible, according to company engineers. The swing boom, which mounts either a 4- or 4½-in. drill, is readily adaptable for low horizontal drilling, angle drilling in any position and breast-hole drilling up to 9 ft. 6 in. from ground level.



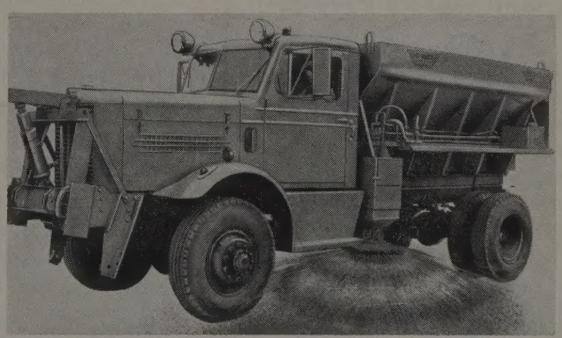
The boom arrangement makes faster hole collaring easy in roughest terrain. Both bracket and boom are controllable by a single operator providing faster and more accurate hole spotting, engineers say.

The boom is mounted on extra-long tracks that have 6 ft. 3 in. of ground contact assuring equal stability under all terrain conditions. Two large, independently controlled piston-type air motors power the tracks through chain drives. The operator has access to controls from both front and rear of the rig, simplifying one-man operation. It is equipped with laminated rubber pads, with steel track shoes available as optional equipment.

. . . Circle No. 152

Improved spreader for ice control

For ice control work a new spreader has been developed by **Highway Equipment Co.** to overcome common problems caused by stoppages due to frozen materials. The new conveyor system is chainless, beltless, and is all-steel, providing an oscillating motion to move material. Even frozen lumps are handled without trouble as the shaker motion breaks up such frozen



material. The location of the spinner near the front of the truck is another advantage in permitting the operator to observe the spread and gets the material in front of the rear wheels for extra traction. An 18-hp. rear-mounted engine drives the conveyor and hydraulic system. The 20-in. spinner, hydraulically operated, spreads from 2 to 4 lanes wide without difficulty.

. . . Circle No. 153

(Turn to page 98 for more new equipment. New Literature can be found on page 94.)

The WEST from WASHINGTON

By E. E. HALMOS, JR., Washington, D. C.

It is not at all surprising to Washington that all of the projects so far "in the works" under the small projects loan program have come from Western areas.

But it is surprising that applications for loans under the two-year-old program have been coming in at a very slow pace; and only one or two are for rehabilitation of existing works—the others for new work.

As of this moment, a total of only 19 such project applications have been received, seeking Federal loans of $36.6 million. One of these has been shelved by its sponsors.

Bureau of Reclamation officials who handle the program think that the reasons for slowness to take advantage of Federal money offered are principally two: The projects must be locally inspired, BuRec thus can't beat the bushes for this work; many irrigators don't seem to be aware of what they can get.

The program was activated in the middle of 1957 (although the law was passed in 1956) with an offer of Federal funds up to $5 million for projects that wouldn't cost more than $10 million. Two categories of small projects were set up: rehabilitation of existing projects; or a complete irrigation project, or a unit of such a project. Loans are restricted to work where irrigation is the principal purpose.

Here's the status of the 18 projects now in some stage of activity:

Under construction—South Davis County Water Improvement District, Utah, $634,000 (Federal funds); Bountiful Water Subconservancy District, Utah, $3.5 million (for high pressure pipelines for irrigation for 4,400 ac.); Walker River Irrigation District, Yerington, Nev., $700,000 for reconstruction of spillway and outlets of Bridgeport Dam; Cameron City Water Co., Texas, $4.6 million.

Approved by Congress and the Secretary of Interior, and waiting for loans—Goleta City Water District, Calif., $2.1 million; Roosevelt Water Conservancy District, Ariz., $2.8 million; Centerville-Deuel Irrigation Co., Utah, $402,000; Santa Ynez River Water Conservancy District, Calif., $3.8 million; Georgetown Divide P.U.D., Calif., $3.9 million; Jackson Valley Irrigation District, Calif., $1.4 million; Pleasant Valley Irrigation District, Calif., $2.1 million.

Project applications are processed by regional BuRec offices; reviewed by the Secretary of Interior; approved by the House and Senate Interior and Insular Affairs committees; finally reviewed by local courts before loan money becomes available.

* * *

Another California engineering firm has brought a labor matter before the U. S. Supreme Court, this time on the ground that its employees are being forced into a union not of their choice by virtue of a clause in contracts between a prime contractor and labor unions.

According to papers filed by the firm, Saint Maurice, Helmkamp & Musser of Marysville, a state-wide agreement between California AGC members and the unions provides that a subcontractor's personnel must join the union with which the prime has been dealing.

The engineering firm was employed by a contractor joint-venture, to figure quantities and make earthmoving diagrams for work on Travis AFB. Operating Engineers on the site struck to force the engineering firm's employees to join their union, although these employees already were members of Engineers and Scientists of California, an independent union group.

A lower court decided that the Operating Engineer strike was illegal, but said that the contract clause itself was not. The firm has appealed, on ground that the contract clause forces the employer to interfere with the free choice of his employees.

* * *

Two other high court cases—although neither happens to originate in the West—will have broad implications for construction men.

One (actually embodied in two separate cases) seeks determination as to whether a U. S. tax lien supersedes a subcontractor's mechanic's lien on a structure. In one case before the court, a New York court held that the tax lien does override the mechanic's lien; in another case, a North Carolina court held that the subcontractor's claim is superior to the Federal tax.

The second matter seeks clarification of the power of the Corps of Engineers to order private companies to repair damage to navigable streams caused by dumping of industrial wastes. This case—carried over from the summer court term—names Republic Steel and two other companies, which were cited by the Corps for dumping wastes into the Calumet River (near Chicago) without permit, thus making the waterway shallower and less navigable. A lower court decided that the Corps didn't have statutory basis for ordering the firms to clear out the channel. But the Government, fearing an undermining of its authority to maintain stream usage, has appealed on the contention that the Rivers and Harbors Act prohibits "obstruction of navigable waters under Federal control."

* * *

Highway money has started to flow out of Washington again, as the Bureau of Public Roads finally was able to make apportionments to the states under the new 1-cent added tax.

As predicted in this column (*Western Construction*, October, 1959, p.34) the funds available to the 12 Western states comes out to about $180 million less than had been programmed for Federal contributions to the Interstate program. There was also a slight drop in money to be available for the ABC program.

But there was an added trickle of highway money to Western states for another purpose—improvement of highways in and adjacent to national forests. Almost $29 million of the $33 million apportioned went to the 12 Western states and Alaska. Here are the amounts:

Alaska, $2.9 million; Arizona, $1.9 million; California, $4.7 million; Colorado, $2.4 million; Idaho, $3.4 million; Montana, $2.6 million; Nevada, $591,970; New Mexico, $1.3 million; Oregon, $4.6 million; Texas, $104,462; Utah, $1.1 million; Washington, $2.3 million; Wyoming, $1.4 million.

As you'll recall, these apportionments are made by the Department of Interior in proportion to the area and value of land owned by the Federal government within national forests in each state. Almost all other states participate in small sums, the smallest being North Dakota, which got exactly $117.

Don't be too much concerned with the rumors about "reorganization" within the Bureau of Reclamation. There is a reorganization, of a sort, going on. But, say top officials, it's in the nature of a reshuffling and realignment of functions, rather than any drastic top-to-bottom shakeup.

Principal objective is to follow Commissioner Dominy's often-stated program of sensible arrangement of duties. For instance, he can't see why jurisdiction over a far-ranging power distribution should be interrupted by arbitrary district or division boundaries.

An example of the thinking on this matter was the recent appointment of W. H. Taylor, Region 3 director, to the newly-created post of Chief of the Division of Power Operations and General engineering.

The job was created, said Dominy, to supervise and coordinate power and maintenance operations, the small projects loan program, and special assignments. Principally, however, the objective is to provide the Bureau's chief engineer with a staff man to help unscramble the growing complexities of power production and marketing.

But do look for one thing out of Dominy's "new-broom" attitude. It could mean more construction work. What he wants is a new formula for determining project feasibility. He wants to add such benefits as flood control, recreation, fish and wildlife improvement, salinity and pollution control to considerations of purely reimbursable items as irrigation, power and municipal and industrial water.

A cost formula including these items could make it easier to justify a project to Congress and the administration, put less of a burden on the reimbursable items.

* * *

Evidence of the speed with which Federal agencies can move — once money has been provided — is the newest action on the Seedskadee project in Lincoln and Sweetwater counties, Wyo.

This was one of the "new starts" to which President Eisenhower objected when he vetoed the Public Works Bill, only to have it passed over his objections.

But, with money available, the Bureau of Land Management has announced it will withdraw 46,155 ac. of public land, on both sides of the Green River between Green River and Labarge, for use of the project.

WESTERN CONSTRUCTION

Congress Has Shortchanged the West

THE WEST was not given proper consideration by Congress in selecting membership on the new special committee to investigate the Federal Aid Highway Program. The chairman is a representative from Minnesota, and among the seventeen other members on the committee only two are from this Western region. They are from California.

Applying any reasonable yardstick, this does not provide adequate representation for the highway interests or problems of the West. This is true considering only such obvious comparisons as dollars to be spent, miles of highway, or other measures for the various regions of the country. But, when the problems that are peculiar to the West are considered the deficiency in representation and the lack of Western voices is even more significant.

There is not a single member of the committee from the Intermountain States, where mountains, long distances, and scattered population create special highway problems. There is no representation from the entire Pacific Northwest which has many of these same problems and others of equal importance. By comparison, two of the committee members are from Illinois, one from Ohio, and one from Iowa. Surely there is not enough regional difference in the highway problems of that geographical area to justify this amount of membership. Likewise, Florida, Mississippi and Alabama have membership on the committee, and this would appear to be excessive representation from another region with rather common highway problems.

Realizing that committee appointments in Congress involve a multitude of factors including seniority, party affiliation, other committee assignments, as well as geographical apportionment, the fact remains the West has been shortchanged on this important new investigating body.

The chairman has already indicated that he intends to make a thorough and complete probe of all phases of the highway program, particularly since the Federal Government is paying 90% of the cost on such a large part. Investigators have been appointed, and their background indicates their explorations will be far-reaching as well as searching. Therefore it becomes all the more important that members of the committee be familiar with and able to properly appraise resulting information from every region of the country. On this score the West has a legitimate complaint.

Without the network of railroads common throughout the Eastern states, this Western region has grown up on highway transportation and communication. Hardly an Eastern town is not adjacent to railroad transportation whereas hundreds of towns in the West depend entirely on highways for their only contact with the outside world. The Interstate System will provide several east-west arteries and two north to south routes through the West connecting the larger population centers. But, how about the towns in these fast growing states that must be served by the ABC system. What about the fact that about 50% of the land area in these eleven Western states belongs to or is administered by the Federal Government? These are just two of the differences that justify adequate representation from the West on a large Congressional committee that intends to probe deeply into all highway problems.

Jim Ballard

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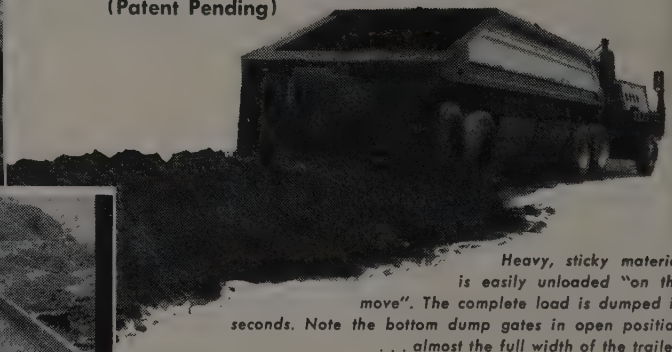
Sticky, river bottom "gumbo" loaded into C-B's New Earth-king, equipped with special bottom dump mud gates. These special gates are also available on C-B Bottom Dump Trains.



Heavy, sticky material is easily unloaded "on the move". The complete load is dumped in seconds. Note the bottom dump gates in open position . . . almost the full width of the trailer.

Steep hopper sides and full opening gates permit hauling and unloading any type material.

Wet, heavy, sticky material is no longer an unloading problem with the new C-B Bottom Dump Mud Gates (Patent Pending). See these gates *in action*—arrange for a demonstration now!

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KING PUBLICATION

WESTERN CONSTRUCTION

DECEMBER 1959

The West is Big Dam Country

Flaming Gorge

Glen Canyon

Trinity

EVERY YEAR places more emphasis on dam building as the key to Western growth. As sites are used up, every completed dam means the next one will be at a tougher location for both designer and contractor. But the work being carried on by so many agencies must go forward until every surplus acre foot of water is conserved and put to fullest use.

The combination of rising construction costs and more difficult sites adds to the price of stored water. Cheap storage can be supported by a single use, as was possible in the older irrigation developments. Power development came along to add its revenue and increase feasibility. Today, and in the future, the indirect benefits will be used in a justifiable process of spreading the cost load.

Building of these projects represents the ultimate in construction management, ingenuity and execution. Contractors must take risks commensurate with the size of the undertaking, and to these physical problems are added those of economics for construction projects that must extend over several years. In this issue are three comprehensive articles describing progress, methods and procedures on three outstanding dam construction projects of the West.

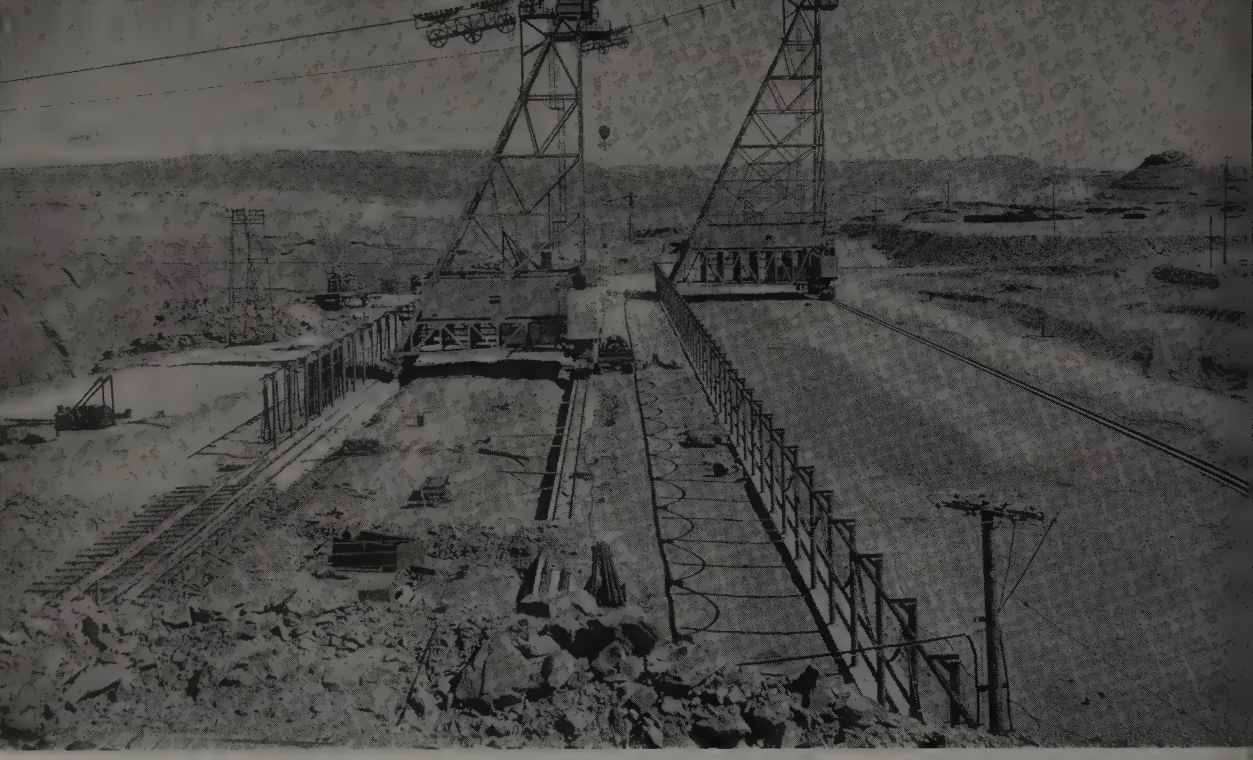
At Glen Canyon Dam, already achieving construction fame to put it on a par with Hoover Dam, the outstanding construction feature will be the modern cableways for handling concrete. The first authoritative review of these units appears in an article starting on the following page.

Flaming Gorge is typical of those projects for which the West is famous. As distinct from Eastern construction jobs here is a site where transportation, the providing of housing facilities and the establishment of supply lines for material represent Western construction fit for a novel or the movies. Conditions, plans and progress are reviewed in the article starting on page 40.

At Trinity Dam, the typical ingenuity of Western contractors resulted in the use of a long conveyor belt to move 10,000,000 cu. yd. of core material into this record-breaking earthfill. The operation of this material handling system from scrapers-to-belt-to-bunkers-to-trucks is a story of construction innovation, planning and equipment coordination. The progress at Trinity Dam is reviewed in the article on page 48.

Last month an article of equal importance described the methods and program by which contractors on Rocky Reach Dam pushed the mighty Columbia River from side to side as a tight construction schedule was timed to match the seasonal flow of the stream.

These four articles can be taken as the latest chapters in the history of Western dam building, representing a variety of problems and equally ingenius solutions.



Cableways for Glen Canyon Dam

Two parallel traveling cableways, each of 50-ton capacity and handling 12-yd. concrete buckets at fast operating speeds will place more than 5,000,000 cu. yd. in the dam and power plant.

By Raymond M. Welsh
Chief Engineer
Cableway Division
Lidgerwood Industries, Inc.

FOLLOWING the method used on the world famous Hoover and Shasta dams, concrete placing on Glen Canyon Dam will be carried out by cableways. More than 5,000,000 cu. yd. of concrete going into the dam will be moved into position by two, 50-ton, high-speed cableways which will introduce improved design and operating features compared to their predecessors.

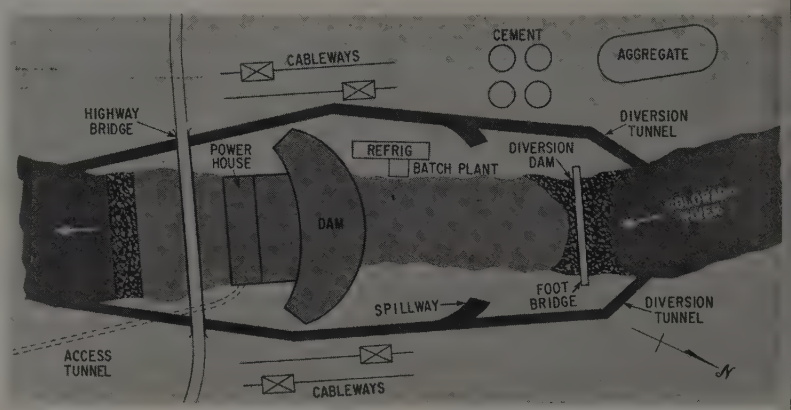
The basic changes in these modern units relate to the higher speeds attained in all movements of the cableways and their increased size which will permit the handling of 12-yd. buckets.

Project features

Location, purpose, and principal design features of the Glen Canyon Dam and power project have been reviewed rather fully in previous issues of *Western Construction*. A pre-bid look at the project and its problems appeared in the February 1957 issue, and the December 1958 issue was devoted to a group of articles reviewing construction plans and progress. It is assumed that the reader is familiar with this background.

A new trend in dam construction

Economics of constructing large concrete dams, with the contract extending over several years, has changed since the cableway installation at Shasta Dam some 20 years ago. Not only are basic costs higher, putting more emphasis on mechanization and total construction



COVERAGE of the dam and powerhouse area is provided by the two cableways operating on parallel tracks. The longer and higher unit has a span of 2,050 ft. with tracks 910 ft. long, and the shorter and lower cableway has a span of 1,800 ft. and 810-ft. tracks.

HEAD TOWERS on the east side of the canyon. The shorter tower in the foreground can move under the cableway shown in the background. The relation of the cableways to the dam is indicated in the diagram at the bottom of the opposite page.

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time, but the risk of rising costs during the construction period emphasizes the importance of both these factors.

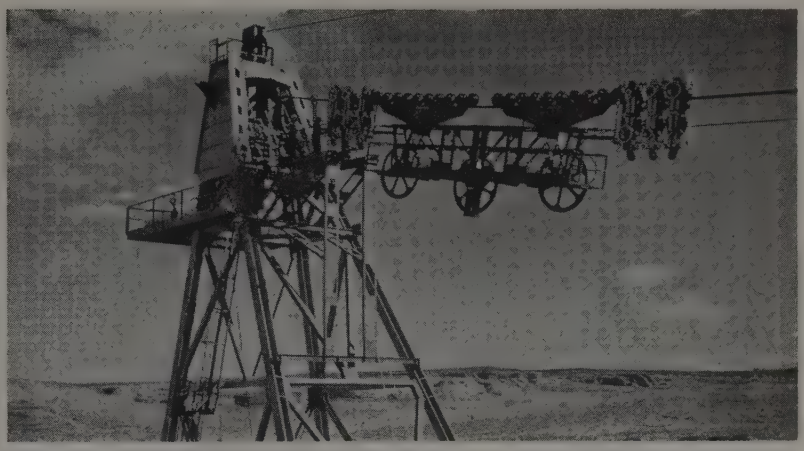
Recognizing this trend, Lidgerwood began to explore the problem of larger and faster cableways about ten years ago. It was obvious that the contractors bidding on Glen Canyon Dam, and other similar projects would demand construction plants which would be capable of handling larger quantities of concrete in a given time, to help offset the rising spiral of costs.

The cableways placing concrete in Hoover Dam (4,000,000 cu. yd.) and at Shasta Dam (6,500,000 cu. yd.) were all of 25-ton capacity and designed to handle 8-yd. buckets. The design also provided for hauling the carriage at 1,200 to 1,400 ft. per min. and the raising and lowering speed for the bucket was between 300 and 350 ft. per min. Starting from this size and capacity of cableway unit, our organization discovered many difficult problems in advancing size and capacity. Some of these were beyond the immediate scope of a cableway designer. For example, there were existing limitations of securing allied parts that would be necessary for a heavier cableway system. Also, the engineering limitation of 8-yd. buckets would have to be modified if greater cableway efficiency and output was to be realized. Finally, the customary limitation of 5-ft. lifts of concrete would have to be increased if output was to be materially increased.

Several years after these design studies began it became evident that buckets of 12-yd. capacity could be provided with characteristics that would be acceptable to the designer of concrete dams. Credit for this advance can be given to the manufacturers of concrete buckets who were able to provide gates that included definite controls, which regulated the proper distribution of the 12-yd. load of mass concrete.

Paralleling this development, and contributing to the possible use of larger buckets was the change in the rules of the U. S. Corps of Engineers which permitted 7½-ft. lifts.

Another element in the design of a heavier cableway was the need for a heavier track cable. Track cables at Hoover and Shasta dams were of 3-in. diameter locked coil type. Although it is possible to use multiple track cables such an installation is not considered practical for radial systems. For the record, Lidgerwood has produced cableways where the carriage runs on a series of six track cables, but these are of the stationary type.



TWENTY-WHEEL carriage that operates on the 4-in. track cable. Travel speed will be 1,200 to 1,400 ft. per min. Note the platform at the top of the tower for servicing.

The problem of a larger track cable was solved when rope manufacturers indicated they could produce a 4-in. diameter locked coil cable. With this advance in another phase of the improvement program, we felt it was only a matter of time before larger cableways would be in demand for handling 12-yd. buckets at improved speed.

Requirements at Glen Canyon Dam

Early 1957, when the Glen Canyon Project was being studied for bidding purposes, Lidgerwood received requests for quotations on cableways from all leading contractors. Naturally there was some difference of opinion among the various contractors as to the probable cableway requirements. However, Lidgerwood consolidated these requests and quoted all contractors on an arrangement of two 8-cu. yd. cableways designed to handle the buckets at *very high* speeds. Alternatively two 12-cu. yd. capacity cableways were designed to operate at *moderately high* speeds.

Both arrangements were quoted as radial type, also as parallel travelling. The average movement of bucket and duty cycles was such that either two 8-yd. or two 12-yd. would place almost the same amount of concrete per hour. In addition to the high speed cableways, most of the contractors were quoted on a 25-ton conventional cableway for placing forms.

Award of contract for construction was made to Merritt-Chapman & Scott Corp. of New York for about $108,000,000, the largest single contract of record for construction of a dam.

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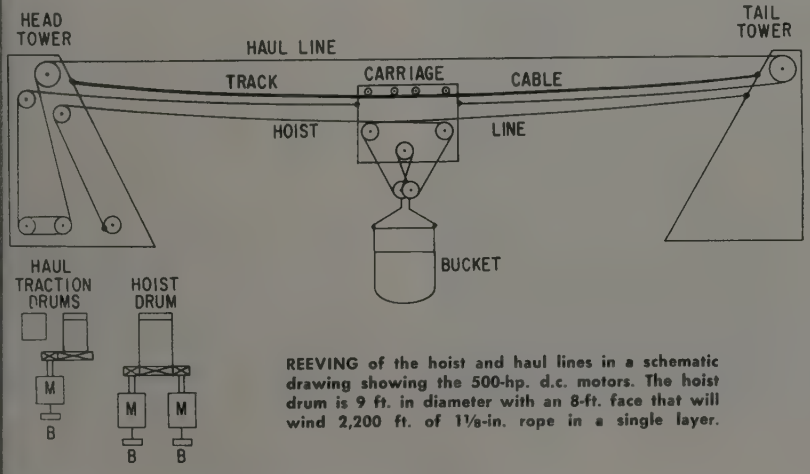


REEVING of the hoist and haul lines in a schematic drawing showing the 500-hp. d.c. motors. The hoist drum is 9 ft. in diameter with an 8-ft. face that will wind 2,200 ft. of 1⅛-in. rope in a single layer.

AIR VIEW of the head towers and trackways at a time when the machinery was being installed. The already famous highway bridge spanning the canyon is shown nearing completion.

The gorge at Glen Canyon is very deep when compared with the width. It was obvious, in order to decrease the time for a duty cycle, it would be of greater benefit to increase the lifting and lowering speed while retaining normal speeds for hauling the carriage across the span.

Basic design features

The cableway machinery actually furnished and installed at Glen Canyon is basically what had been offered to the various contractors for bidding purposes. Except for the rope speed and size of motor on the lifting hoist, the other features were much the same. The original proposal called for a speed of 400/500 ft. per min., whereas the lifting hoist furnished with the dual 500-hp. motors is capable of handling the 12-yd. bucket at much higher speeds. These cableways operate the haul and lifting motions simultaneously. There are separate drives for the hoists and haul, enabling the operator to overlap the hoisting and lowering with the haul movement.

The hoist drum is driven by two motors powered by two generators with the four armatures connected in series. The haul drum is powered by a single motor and generator. The three generators are mounted in a common motor-generator set with a 1,250-hp. a.c. drive motor. All three 500-hp. d.c. motors used to drive the two hoists are identical, also the three generators are identical. This permits standardization of spare parts for the two drives. Each d.c. motor is equipped with a heavy-duty shoe brake, which is used principally for holding, as the drives are essentially at rest when the brakes are set.

Operator's controls

The complete movement of one cableway is handled by a single operator. The ease of control is possible by the d.c. adjustable-voltage electric drives furnished by the General Electric Co. This has many advantages over a.c. control—principally it allows simpler operating controls which permit faster and safer operation without tiring the operator.

One master switch completely controls the hoisting and lowering. The second master switch similarly controls the forward and reverse movement of the cable carriage. Both towers are controlled by a foot-operated five-position master switch. A reversing, plugging, time acceleration, quadruplex control panel is provided for each tower. Each tower is propelled by four 40-hp. motors, one mounted on each 8-wheel truck assembly which supports the tower legs.

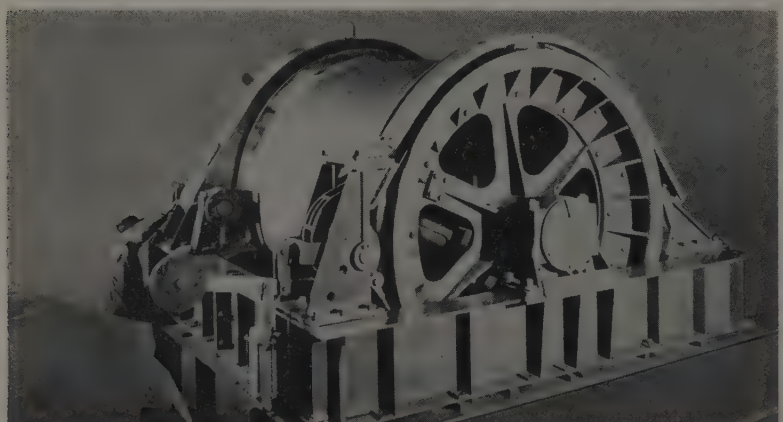
The operator's control house is located on the wall at the west side of the canyon near the loading platform, and with the switch levers and buttons at the control stand, the operator can place the loaded 12-yd. buckets with nearly pin point precision. Since the control panels and machinery are located in the tower on the east bank, a second set of controls is located in the machinery house. This permits the drives to be operated from the tower for servicing and maintenance purposes.

The two 50-ton high-speed Lidgerwood Cableways will be used primarily for placing concrete in the dam proper. These are the first cableways to handle 12-yd. buckets and at faster speeds than 4-and 8-yd. buckets had been handled previously.

The main track cable for these cableways is a single locked coil cable 4 in. in diameter, fabricated by American Steel and Wire Co., Division of U. S. Steel Corp. These cables have a breaking strength in excess of 880 tons and are the largest and strongest of this type ever produced. The normal load consisting of 12 cu. yd. of concrete in bottom-dump buckets with controllable gates will be handled at a speed of 600/700 ft. at the hook.

The main hoist is driven by the two 500-hp. motors through a set of herringbone gears running in oil bath to a drum 9 ft. in diameter and with an 8-ft. face, capable of winding 2,200 ft. of 1⅛-in. rope on a single layer. In addition to the electric brakes on the motor shafts, the unit is equipped with an extremely powerful contracting brake mounted on the drum flange for an emergency.

The haul unit is a double tan-



MAIN HOIST drum powered by two 500-hp. motors and operating at rope speed of 2,000 to 3,000 ft. per min. Note deep, welded design of bedplate and emergency brake on drum flange.

dem drum endless rope type of hoist driven by the 500-hp. motor. The drums are 72 in. in diameter and the rings for the individual wraps are grooved for 1½-in. diameter wire rope which serves as an endless conveying line between the carriage assembly and the towers.

The bucket will be moved horizontally at 1,200 to 1,400 ft. per min. while the companion lifting hoist moves the bucket vertically at 600 to 700 ft. per min. These combined speeds are calculated to make it possible to place in excess of 8 cu. yd. of concrete per minute with the two cableways.

Towers and travel

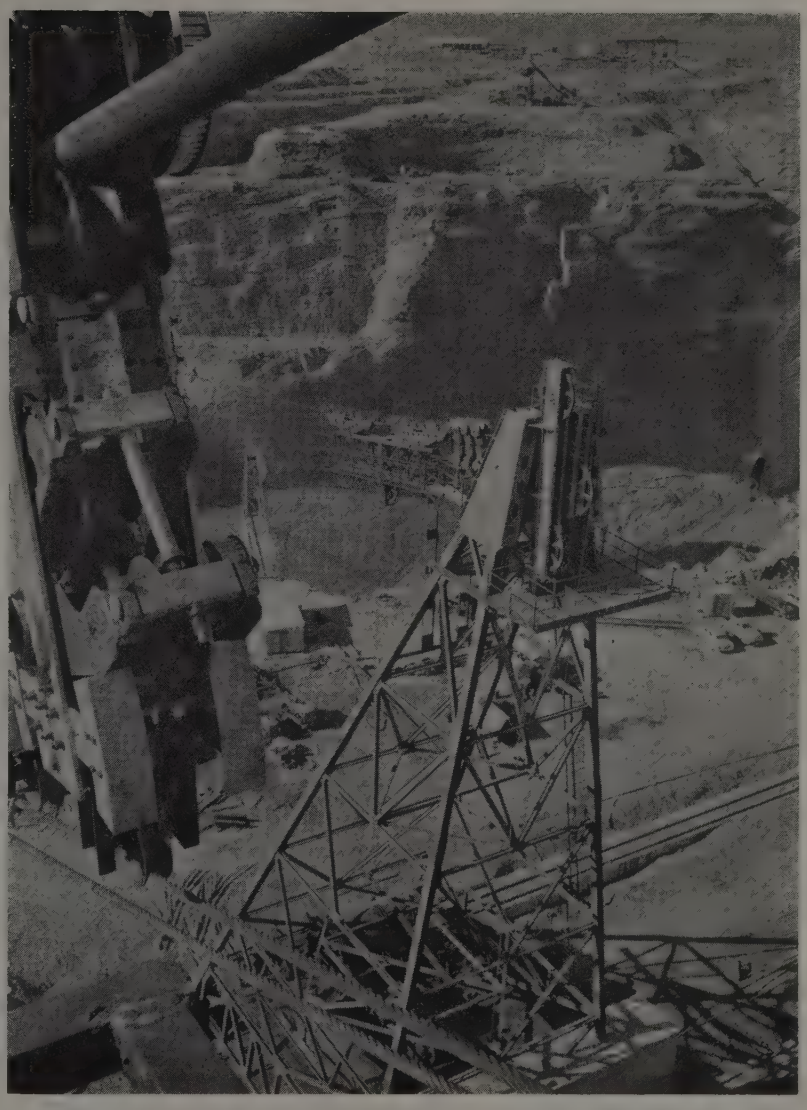
The cableways are the parallel travelling type with movable head and tail towers. Usually the two cableways have the towers located on trackways common to both. In this case the trackways are constructed at different elevations so that one cableway can pass directly over the other. This arrangement has the advantage of handling a single object weighing 100 tons with the two cableways without difficulty.

The higher cableway with 2,050-ft. span has the trackways set back farther from the rim of the gorge with tracks 910 ft. long. The lower unit has a 1,800-ft. span with lateral tracks 810 ft. long. To compensate for the different elevations as found on the opposite sides of the canyon rim, the towers are constructed to varying heights to keep the cable supports level for each cableway. The head tower of the upper cableway, for example, rises 189 ft. from the top of trackway rails, while the tail tower is 139 ft. high.

The hoists and electrical equipments are located on the lower platform of the head towers, which are on the east side of the gorge. To carry power and control wiring to the mobile towers, special flexible cables are mounted on hangers parallel to the tower tracks. When the tower moves away it stretches full, and folds like an accordion on the return.

The carriage assembly has two equalizing frames each with ten main cable track wheels. The main carriage frame has three sheaves set in tandem. The fall block having two sheaves is reeved with four parts of 1⅛-in. rope to the carriage. This is accomplished without any reverse bends in the operating rope.

A third cableway of 25-ton capacity, with mobile towers located on the same trackways that support one 50-ton cableway, will soon be installed. This will have a 1,800-ft. span and the main gut is 3-in. diameter. The unit will handle an 8-cu. yd. bucket for powerhouse concreting and will be used for yarding when necessary, thus permitting the high capacity 12-yd. rigs to place concrete in the dam without interruption. The third cableway except for size and capacity will be similar to the larger 50-ton equipments. This will raise and lower the bucket at about 400 ft. per min. while hauling the carriage at 1,000 ft. per. min.



LOOKING from one head tower to the other, with the canyon in the background. Tower legs are wide-flange beams. Note the plate stiffening and design of the supports for the tower sheaves. The service platforms have adequate guard railing for the safety of personnel.

The speed of Glen Canyon's three cableways and the size of the buckets was calculated to permit the contractor to maintain an average of 9,600 cu. yd. of concrete per day during co creting periods. This of course allows for a slower rate of placing at the start and during the topping-out period. It is estimated the dam and powerhouse concreting will require about 38 months. To achieve this output several alternative methods were considered, but it was finally decided to use 12-cu. yd. single compartment buckets specially designed for this service. The contractor also knew he would need the most modern mechanical and electrical equipment to operate at the fastest practical speeds.

The main batching plant is located on an excavated shelf adjacent to the keyway on the west side. This is about 170 ft. below the canyon rim which affords good

operating characteristics for placing the concrete in the monoliths.

Transfer cars will carry the concrete from the batch plant over a steel trestle constructed across the west keyway. Cars will unload into the cableway buckets on a loading platform at the outboard edge of the trestle.

To maintain the rapid placement of concrete which the aerial cableways are capable of transporting, it is obvious tremendous amounts of material in the form of aggregates, cement, pozzolans, etc., must be made available. Both the batching and refrigeration plants, we believe, are the largest ever utilized for dam construction.

Credit to M-C&S

A lot of credit must be given to the Merritt-Chapman & Scott organization for their vision and understanding to create the largest construction plant ever assembled for this purpose.

Ancestral cableways at Hoover and Shasta Dams

FOR THOSE INTERESTED in the ancestors of the present Glen Canyon cableways, and because the author mentioned them specifically, the following short descriptions are taken from articles that appeared in *Western Construction*.

HOOVER DAM: In September 1933, *Western Construction News* carried an article "Cableways Place Hoover Dam Concrete" by J. Perry Yates, Office Engineer, Six Companies Inc.

The major cableways were of 25-ton rated capacity. Construction of towers for these cableways began in August 1932 and they were placed in operation January 1933. There were two pairs of parallel cableways and one radial cableway. Track carriages traveled between towers at a speed of 1,200 ft. per min., hoisting speed was 300 ft. per min. and lowering speed for the bucket was 420 ft. per min. Hoists, sheaves and carriages were furnished by the Lidgerwood Manufacturing Co. and were identical on each of the five cableways. The main hoist had three tandem drums, each 53 in. in diameter and 70 in. wide. The rear drum carried the endless or conveying rope, the middle drum carried the dump line and the front drum for hoisting.

Each main hoist was driven by a 500-hp., 2,200-volt a.c. motor equipped with magnetic reversing control arranged to give graduated speed in hoisting a load, with regenerative braking in lowering. The operator stationed in the head tower could not see into the canyon and worked entirely by signal.

To distribute the load along the main cable and minimize swing of the buckets, loads were suspended from a carriage divided into two separate units spaced about 40 ft. apart. Handling of the buckets, including the opening and closing was controlled by the hoist operator with the load block and the dump block each suspended by four parts of 7/8-in. steel rope.

A 3-in. diameter locked-coil track cable (manufactured by American Steel & Wire Co.) was used on the five main cableways. It had a braking strength of 550 tons, and was provided with end connections in a swivel socket to permit periodic turning for uniform wear.

Long spans were necessary with two cableways being nearly half a mile in length. Track and towers were a problem in the rugged canyon to provide complete coverage of the site with minimum construction cost. Two of the tail towers operated over a rock fill 150 ft. high while two of the tail towers were located in a cut 100 ft. deep.

Travel of these towers was by winch operated by a 100-hp. motor turning an endless drum located in each tower. A three-part moving line operated by this winch was anchored at both ends of the runway. Travel of the towers was at a speed of 50 ft. per minute.

This cableway system during about two years placed approximately 4,000,000 cu. yd. of concrete. The concrete was placed in 5-ft. lifts in 8-yd. full opening, bottom-dump buckets.

* * *

AT SHASTA DAM the unique radial cableway system with seven units operated from a single headtower was described in the September 1939 issue of *Western Construction News*. This cableway system, radiating from its 460-ft. headtower placed 5,700,000 cu. yd. of concrete in Shasta Dam.

The cableway system developed from studies that determined the shortest distance from the concrete mixing plant to the center-of-mass of the dam. From several cableway schemes the radial system was selected. The headtower contained 2,750 tons of structural steel and the floor for the hoisting equipment was 250 ft. above ground level. Above this level, and near the top of the tower maintenance and service shops for the cableways were installed. At the top of the tower, which was about 21 ft. square, five cableways were fixed rigidly along the side facing the dam and two others were fastened to the downstream side to cover the powerhouse.

The cableways were designed for working loads of 25 tons. Normal travel speed was 1,200 ft. per min. with a hoisting speed of 300 ft. per min. Concrete was handled in 8-yd. buckets. Selection of bucket type and design had not been decided when the article was prepared.

A subsequent article reported that the track cables were of lock coil type of 3-in. diameter, with the endless rope 1 1/8 in. and the load and dump ropes of 7/8 in. Loads handled by these cableways during concreting were calculated at 6 tons for the bucket, 16 tons of concrete and an estimated additional load of about 11 tons for rope and carriage totalling about 33 tons. These loads were handled with the main track cable at a 6% sag. Near the beginning of the job the average time cycle for the complete trip of the bucket was about 4 1/2 min. although time was expected to be cut to about 3 1/2 min. later.

Cableways, hoists, carriages and blocks were supplied by Lidgerwood Manufacturing Co., with track cables and operating ropes by Pacific Wire Rope Co. and American Steel & Wire Co.

* * *

On both the Hoover and Shasta Dam projects the general superintendent for the contractor was Frank T. Crowe, the acknowledged authority on carrying out the construction of large dams by the use of cableway systems.

ARTHMOVING

for dam on

ittle-Wood-River

CONTRACTOR:
Joint venture by Lewis A. Hopkins, Pasco, and A. R. Sime, Kennewick, Wash., for Bureau of Reclamation.

JOB:
Increase height of earth dam by 45′ and build new embankment wing on Little-Wood-River Dam, 11 miles north of Carey, Idaho. Additions to dam will increase reservoir capacity by 18,000 acre ft, providing supplemental irrigation water for 9,550 acres. Yardage: 1.1 million yd.

PROBLEMS:
530,000 yd of borrow material is a hard glacial deposit, mostly clay, silt, and ryolite rock. An extremely tight work schedule during early stages of construction, to insure water supply for irrigation of farm lands.

EQUIPMENT:
Almost all earthmoving is handled by a LeTourneau-Westinghouse fleet, which includes 3 B Tournapulls® with 28-yd Fullpak® scrapers, 2 C Tournapulls with 18-yd Fullpak scrapers, 2 C Tournapulls with 22-ton Rear-Dumps, and a 436-hp Twin-C* pusher. One dragline and shovel, and 5 crawlers are also on the job.

PERFORMANCE:
The easy-loading LW Fullpak scrapers had no difficulty loading tough materials. The 3 "B's" haul 270 to 300 loads per 9-hr shift on 1.5-mile cycles . . . loads average 20 pay-yards. Job progress: "Way ahead of schedule."

COMMENTS:
Owner A. R. Sime, "Fullpaks are the easiest-loading scrapers I've ever seen . . . we have wonderful success with 'em." Superintendent Jim Sime, "Never seen anything work as well as these 'Pulls . . . they climb 40% grades without any sweat. And they're trouble-free."

Fast-loading, 28-yd Fullpak is push-loaded with wet, pre-soaked glacial clay. With exclusive power-transfer differential, 335-hp 'Pulls* maintained power-gripping traction in this slippery pit.

Using finger-tip electric controls, B 'Pull operator accurately spreads load in 5-inch lift. An LW sheep's foot roller provides necessary compaction in 12 passes.

*Trademark BP-2097-DCJ-1

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Constructing Flaming Gorge Dam

Diversion tunnel is complete at Bureau of Reclamation's $67,000,000 project in Utah —contractor starts concentrated work on plant erection and keyway excavation—cableway with 2 tail towers will place nearly 1,000,000 cu. yd. of concrete starting in mid-summer next year.

INSPECTING DAM SITE are the Bureau of Reclamation's chief engineer Grant Bloodgood (right), and project construction engineer Jean R. Walton. Dam axis is near boulder in river.

CONSTRUCTION work at Flaming Gorge Dam is rapidly moving through preliminaries toward the main event. The concrete arch structure is under way for the Bureau of Reclamation on a $29,602,497 contract held by The Arch Dam Constructors, a joint venture consisting of Peter Kiewit Sons' Co., (sponsor), Morrison-Knudsen Co., Inc., Mid-Valley Utility Constructors, Inc., and Coker Construction Co., Inc. Already completed are the main access and haul roads, the construction community of Dutch John, and the 1,090-ft. long, 23 ft. in diameter concrete-lined diversion tunnel.

Preliminaries still under way are a 45-mi. access road being constructed by the Utah State Highway Commission and the Bureau of Public Roads, from Vernal, Utah, the aggregate plant and heavy media separation facilities, the batch plant, and the cableway. Excavation has begun on the keyways and spillway portal. River diversion will come in November. The main event, the placing of concrete, is slated to start in July of 1960.

Background

When completed in 1963 Flaming Gorge will be a thin concrete arch rising 490 ft. above the foundation and having a crest length of 1,180 ft. Volume of concrete is estimated to be 922,000 cu. yd. The Green River, which gets its name from its extraordinary deep green color, will form a reservoir of 3,800,000 ac. ft. behind the dam and will be 91 mi. long. The Flaming Gorge power plant will have an installed capacity of 108,000 kw.

The project is located in the northeast corner of Utah, a region of primitive beauty and rugged canyons.

To the men working on the project the location means excellent hunting, fishing and hiking. To amateur naturalists, geologists and anthropologists, the region is a paradise. Discovery of Indian relics or fossils is commonplace and some workmen boast such prizes as fragments of dinosaur bones.

The nearest railroad is at Green River, Wyo., 65 mi. from the dam site. A gravel and partially paved road from Green River to Vernal, Utah, passed within 16 mi. of the site. The paved portion extended from Green River to the state line, and from Linwood to Manila, Utah.

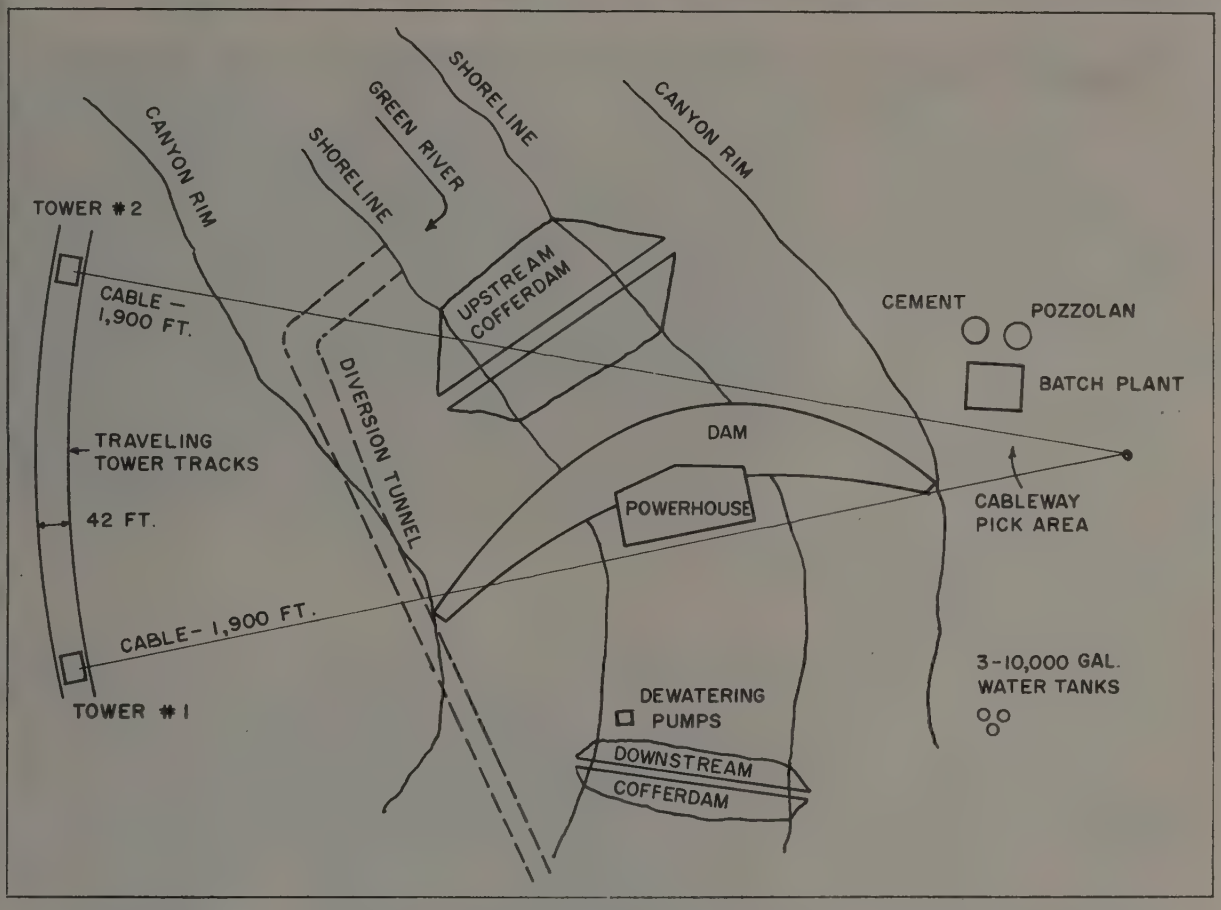
First construction step was building a paved access road from Linwood, Utah, near the aggregate source for the dam, 16 mi. to the proposed community of Dutch John. This principal access road was constructed under four contracts totaling $840,000 by the Wangsgaard Construction Co., Witt Construction Co., and Arch Dam Constructors. The final 2.8 mi. of the access road extending from Dutch John to the dam and a 1.25-mi. service road to the power plant were built by the prime contractor.

The 45-mi. road south from the job site to Vernal (not a rail head), which was not counted on in the planning of the project, is being built independently by contracts let by the Utah Road Commission and BPR and is now nearly complete. It includes a 12½-ton capacity suspension bridge which will have to be removed when the reservoir begins filling because the water is expected to rise several hundred feet above the bridge's present location.

A thorough description of the technical and engineering features of the project was presented in the May 1959 issue of *Western Construction* by Grant Bloodgood, chief engineer of the Bureau of Reclamation.

Dutch John

The new permanent community of Dutch John, named after a pio-



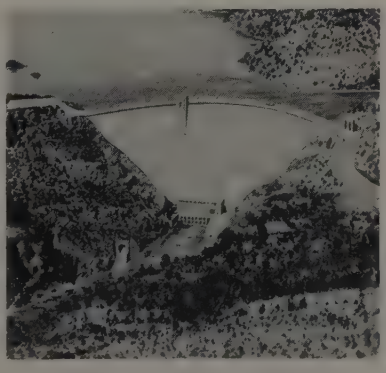
SIMPLIFIED PLAN VIEW SHOWS MAJOR FEATURES OF PROJECT AND CONSTRUCTION PLANT

neer settler of the area, provides housing and utility services for both the contractor's forces and the Bureau's engineering employees. It will be used after completion of the project for operating and maintenance personnel of the Bureau as well as by whatever private businesses have sprung up by then. Maximum population of the town during construction may rise as high as 3,000.

The Witt Construction Co. of Provo, Utah, completed early in 1959 a contract for 50 residences, surfacing of streets and sidewalks, and construction of water and power distribution, sewage collection, and surface drainage systems for the town. Most of the remaining work, including a general store and a gas station, was built by the prime contractor, Arch Dam Constructors.

At present the Government portion of Dutch John consists of thirty brick veneer, 3-bedroom houses with 1,200-sq. ft. floor area and twenty 2-and 3-bedroom frame houses. Also there are thirty-five 2-and 3-bedroom houses, manufactured by the TransaHomes Corp. of Fullerton, Calif., and transported to the job site by truck. These are prefabricated dwellings, erected quickly by means of special jacks and an unusual technique involving inflation of a balloon which raises the ceiling and pushes the walls into place. About 30 trailer spaces are available for Bureau personnel, and 25 are provided with Government owned trailers.

The Bureau also has an administration building, garage and fire station building, laboratory, two metal warehouses, and 11 metal vehicle garages. The Daggett County School District erected a 4-room school building, presently being enlarged to 8, for the first 6 grades.



ARTIST'S CONCEPT OF STRUCTURE

The prime contractor built, staffs, and operates a 10-bed hospital. For the contractor's employees 268 trailer spaces have been built, of which about one-third are now occupied. Miscellaneous community services, such as street lighting, road maintenance and garbage collection are the responsibility of the prime contractor.

The sewage system consists of an Imhoff tank, filter beds, and an evaporation pond.

Drinking water, furnished to the community by the contractor, passes through Infilco filtration equipment, a 60,000-gal. retention tank, and a 300,000-gal. storage tank, provided by Chicago Bridge & Iron Co. under a sub-contract. To provide electrical power for the town and the contractor's construction plant the Bureau of Reclamation awarded a separate contract to the Moon Lake Electric Assn., Inc. in Vernal. Maximum demand is estimated to be about 7,000 kw. It was necessary to construct 45 mi. of new 69-kv. high tension lines from near

Vernal. A 1,500-kva. sub-station will be built for the cableway hoist house, and another for the compressor house. A 750-kva. sub-station will be required for work on the right abutment and a 300-kva. sub-station for the construction water pumps, which will be two, 500-gpm., Fairbanks-Morse units.

Many of the streets in the community of Dutch John are named after such famous Bureau projects as Hoover, Shasta, Davis and Monticello.

Diversion tunnel

The 1,090-ft. long, 23-ft. diameter circular diversion tunnel is designed to take 18,000 cu. ft. per sec., under 73-ft. head, which is the highest anticipated flow on the Green River. The driving of the tunnel was sub-let to Coker Construction Co. Coker drilled the upper 4/5 of the tunnel first, using a jumbo mounted on a Euclid truck, and followed that by removing the invert with the use of standard wagon drills. Lining the tunnel was carried out by prime contractor using two Pumpcrete machines (1 gas powered, 1 electric powered), with a Rex paver served by dry batch trucks. Heavy media separation of the aggregate for tunnel concrete was not required. Because of limited space at the bottom of the canyon one Pumpcrete machine was placed across the river from the diversion tunnel and the concrete was sent across the river with the pipe line carried by a light suspension bridge.

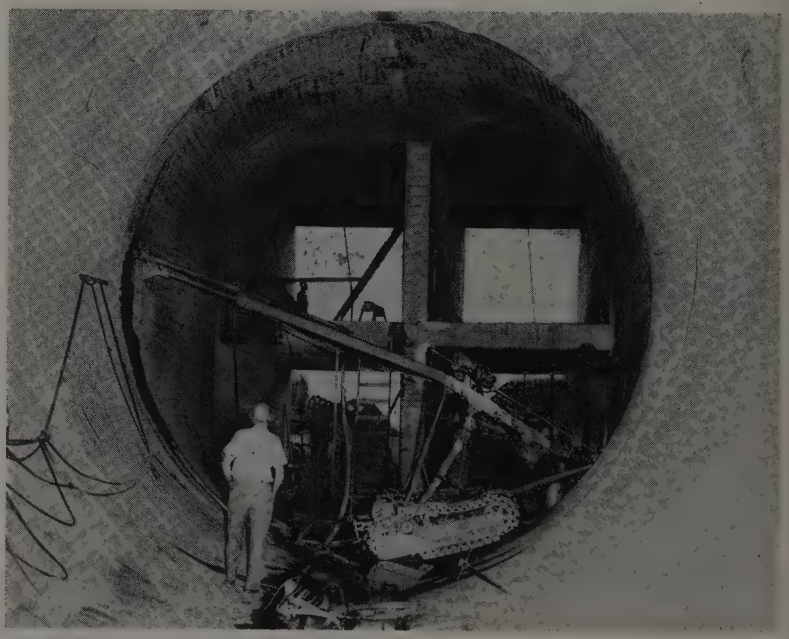
A 30-ft. long steel form made by Dixie Form & Steel Co. covered the upper 300 deg. of the tunnel. Job-made wooden panels were used for the 60 deg. of the invert. The form was collapsible and was pulled ahead on a mud mat with air tuggers.

Grouting of the rock around the tunnel is now being done on a subcontract to Selby Drilling Co. In an unusual operation, Selby is using a Gardner-Denver Air-trac to drill the 30-ft. radial holes through the concrete lining, even when the holes are overhead.

Aggregate plant

The aggregate plant is located at Henry's Fork near Linwood, 15 mi. away from the dam by the primary paved access road. It is expected and hoped that all of the aggregate can come from this one source. The main hopper of the aggregate plant will be fed by scrapers and the finished aggregate will be brought to the batch plant at the dam site by bottom-dump haulers. The plant will furnish aggregate in five sizes: sand, 3/16 to ¾ in., ¾ to 1½, 1½ to 3, and 3 to 6. The plus-8 sand and the ¾- and 1½-in. aggregate must be processed by heavy media separation in order to remove all material which has a specific gravity of less than 2.5, as required by the specifications. The heavy media separation (HMS) equipment is being furnished by the Western Machinery Co. (WEMCO) of San Francisco.

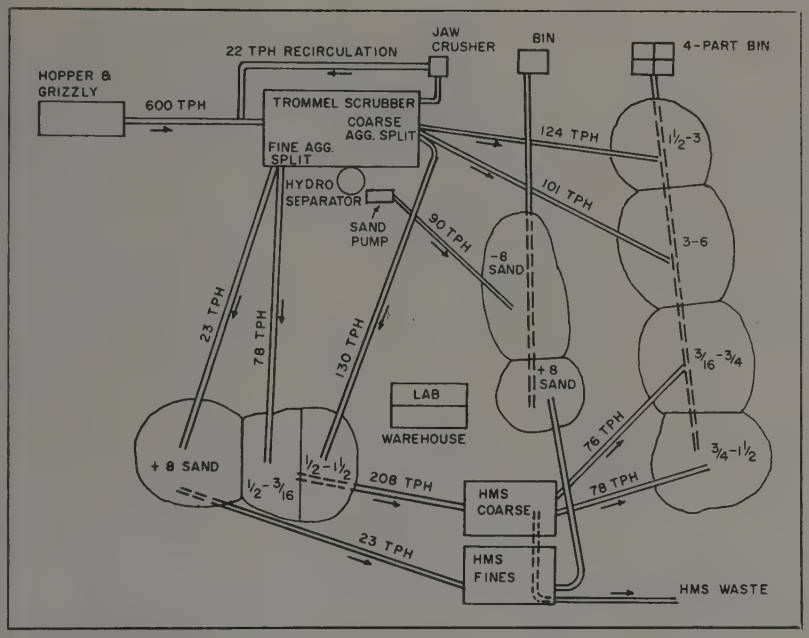
WORKMEN raise side roof of three-bedroom houses manufactured by TransaHomes Corp. with combination of large pneumatic bag and special jacks. Roof will be held in place until sides are folded out. Project community of Dutch John may reach population of 3,000.



GROUTING through concrete lining of diversion tunnel is in progress. Sub-contractor Selby used Gardner-Denver Air Trac to drill holes around entire circumference.

(An article on the HMS technique of upgrading aggregate was presented in our September 1959 issue, in an article by C. E. Golson of WEMCO.)

At the main hopper the aggregate passes through a 12-in. grizzly, is carried on a 36-in. wide conveyor belt to the trommel scrubber which is 45 ft. long and 84 in. in diameter. First to be separated are the plus-8 sand and the 3/16- to 1½-in., the two sizes which go to the HMS section of the aggregate plant. Next out is the minus-8 sand which goes to a stockpile after pass-



SCHEMATIC DRAWING shows flow of materials through aggregate plant. Note heavy media separation facilities. Plant will be fed by scrapers. Bottom-dumps will haul gravel 11 mi.

ing through a sand pump and a fines classifier. At the end of the trommel is a 12x36-in. jaw crusher and a series of screens which produces 3 sizes: 1½ to 3, and 3 to 6, which go directly to stockpiles, and a 3/16 to 1½ size which is returned to the HMS aggregate stockpile.

The HMS equipment is divided into halves, one for the fines (plus-8 sand) and one for the coarse (3/16 to 1½). The fines plant has a 10-ft. cone, and the coarse plant, a 14-ft. cone.

A reclaiming tunnel with a 30-in. wide conveyor will run under the coarse aggregates stockpiles to a group of four 60-ton bins over the loading hopper. A reclaiming tunnel will also pass underneath the sand stockpile to an unloading hopper.

Batch plant and cableway

At the job site storage will be provided for 7,100 bbl. of cement, 5,000 bbl. of pozzolan and enough aggregate for 2,000 yd. of concrete.

Erection will begin soon on a Noble batch plant with four, 4-cu. yd. Telsmith tilting mixers. On top of the plant will be 2 double-deck re-screens. The plant will be charged by a 6-in. air slide for the pozzolan and an 8-in. air slide for the cement.

From the batch plant to the cableway pickup area will be a railway shuttle car system, each car carrying a load of 8 cu. yd. of concrete. The railroad cars will discharge into the cableway bucket.

The cableway system contains elements of the cableway used at Detroit Dam. The head tower will support two 3¼-in. guts, leading to two traveling towers on the opposite side of the river. The total span of each of the two cableways is 1,900 ft. and each will have a capacity of 25 tons.

The track length for the movable tail towers is 763 ft. The tracks weigh 133 lb. per ft. and are spaced 42 ft. apart.

Concrete placement should start next summer. The contractor's present plan is to work only the swing and graveyard shifts on concrete placement, using a day shift for clean-up and setting forms.

The forms have not yet been selected but it is fairly certain that a 7½-ft. lift will be used.

Excavation

The total amount of excavation on the project will run about 300,000 cu. yd. Drilling is done mainly with Gardner-Denver Air Tracs. Blasting agent is both dynamite and ammonium nitrate. Bits are Atlas-Copco carbide inserts.

The rock, a quarzitic sandstone, partially metamorphosed, with shale seams, is highly abrasive.

Material excavated from the keyways will be allowed to drop directly into the river, where it will be used in making the cofferdams. The upstream cofferdam will be about 100 ft. high, and the downstream about 35 ft. high. Material for the impervious cores of the cofferdams has not yet been definitely located, but it is expected that the source will be no more than 2 mi. from the site.

Concreting restrictions

The concrete will be placed in 50-ft. wide blocks extending through the full thickness of the dam. The maximum difference in elevation of the adjacent blocks is required to be less than 30 ft., and the rate of placing concrete in any block is restricted so that no more than one lift can be placed in 72 hours.

It will not be necessary to provide a refrigeration plant for cooling the aggregate. Cooling will be done by circulating river water through a system of 1-in. tubing imbedded in the concrete. A total of about 135 mi. of tubing will be required.

Safety program

C. O. Dannenfelser is safety supervisor for the joint venture. A monthly meeting is held with top job supervision and Bureau of Reclamation representatives. Policies resulting from these meetings are passed on to all job supervision at weekly safety meetings. The safety program and policies are discussed with all crews working on the job at weekly "tool box" meetings. Sug-

Major equipment

- 2 Northwest 80D cranes
- 5 Euclid 22 rear-dumps
- 1 Manitowoc 4500 crane
- 6 Gardner-Denver Air-Tracs
- 1 Lorain 30-ton Moto-Crane
- 14 Chevrolet pick-up trucks
- 3 Chevrolet sedans
- 3 Caterpillar D8 tractors
- 1 Caterpillar No. 12 grader
- 1 Contractor-designed gantry crane
- 1 garbage truck
- 1 fire truck
- 1 ambulance
- 1 Chevrolet 4,500-gal. water truck
- 2 Gardner-Denver 900 compressors
- 1 Chicago Pneumatic 600 compressor
- 1 Gardner-Denver 125 compressor
- 2 Ingersoll-Rand, 2,160-cfm. stationary compressors

a million yds. a month . . .

moved by Euclid "Twins"

At a mining operation in central Wyoming, a fleet of 18 Euclid scrapers is removing overburden from uranium ore at a rate of a million cu. yds. a month . . . nearly 21 million cu. yds. will be moved to uncover the ore body. It's a big, tough job to move that quantity of heavy sand over a mile of adverse grades up to 12%.

Maco Construction Co. of Rawlins, Wyoming, contractor on this stripping project, bought 12 Twin-Power "Euc" Scrapers of 24 yd. struck capacity to maintain high speed production. With two engines and all-wheel drive, these scrapers have the power and traction needed to move big loads up steep grades from pit to dumping area. Twin-Power is paying off in the big performance of Maco's five TC-12 Euclid crawler tractors, too—they're used for push loading this all-Euclid fleet of scrapers.

Wherever big tonnages must be moved on mine, quarry, industrial and heavy construction work, Euclid equipment provides more work-ability and better return on investment. The dealer in your area will be glad to supply facts and figures on Euclid rear-dump and bottom-dump haulers, scrapers, crawler tractors and front-end loaders.

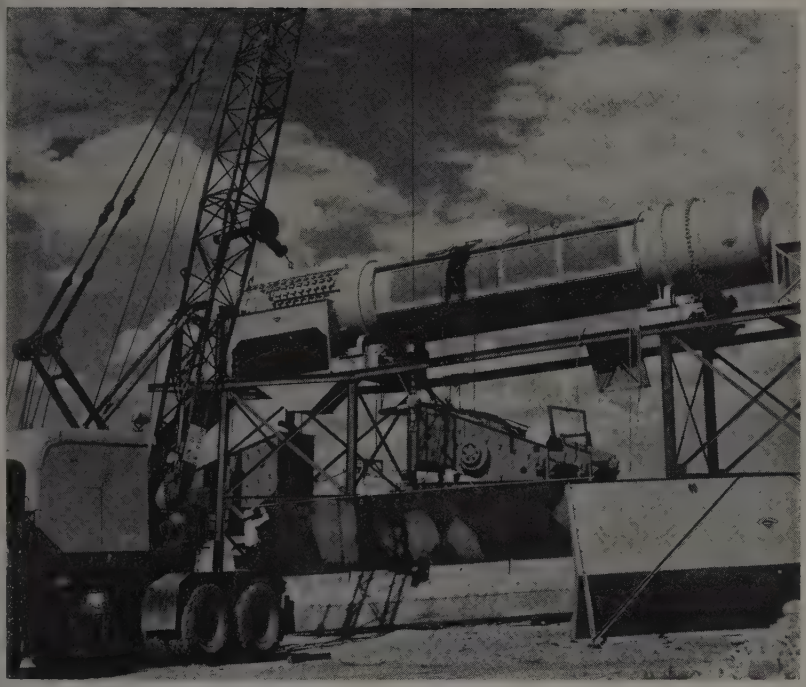
EUCLID Division of General Motors, Cleveland 17, Ohio

Big power and big capacity pay off in big production . . . Euclid TC-12 Crawler Tractor has 2 engines that deliver 425 net h.p. . . . "Twin" Scraper of 24 yd. struck capacity also has 2 engines (563 total h.p.) and all-wheel drive with separate Torqmatic Drives for each axle.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



LORAIN CRANE is shown helping to erect aggregate plant. Long cylinder is trommel screen made by Bodinson Manufacturing Co. Trommel is 45 ft. long and 84 in. in diameter. Concrete production will start next July.

gestions and ideas originating from these meetings, in a form of a weekly report, are turned into the safety supervisor each week. Relative merits of these ideas and suggestions are considered and appropriate action taken.

Each new employee is given an indoctrination on the nature of the project and the job safety program, at the personnel office, prior to going to work. Each foreman also discusses work responsibilities and particular hazards with each new employee and sees that he has the proper safety equipment, before starting him to work.

Through fourteen months of operation, this program has sparked the interest in the crews necessary to any successful safety program. Arch Dam has worked 440,000 manhours. Frequency, to date, is 13.67 and severity, 166.35.

Bur. of Recl. personnel

Jean R. Walton is project construction engineer for the Bureau of Reclamation. Also for the Bureau, Wesley A. Behling is office engineer, J. R. Granger is field engineer, and George Hensley, Jr. is administrative officer. A. R. Martin is head of contract adjustments branch, R. E. Montgomery is head of programs, budgets and reports branch. Russell C. Borden is chief inspector, concrete; Herbert W. Senne is head of the general engineering branch; Hubert Huston is head of the grouting and technical installations branch, and Eugene Boyt is head of the mechanical and electrical branch.

Floyd E. Dominy is Commissioner of Reclamation at Washington, D. C. Grant Bloodgood is Assistant Commissioner and Chief Engineer. W. H. Taylor has recently been appointed chief of the Division of Power Operations and General Engineering at Denver.

Contractor's personnel

For Arch Dam Constructors, Douglas Baker is project manager, and Henry Scott is project engineer. F. W. Bowman is field engineer, Van Smith is office engineer, and John Mulcahy is assistant office engineer. Office manager is O. Fuchs, and purchasing agent is M. Jean.

Party chiefs for the contractor are A. Eames, J. Lawson, and K. Wright. F. Johnson is structure superintendent, R. Locklin is tunnel superintendent, and W. Giroux is equipment supervisor. Excavation superintendent is J. Johnson. Z. Powell and A. Rosling look after the camp.

Bur. of Recl. to sell lots in Page, Ariz.

ABOUT 40 residential lots and 130 commercial lots in the new community of Page, in extreme northern Arizona, will be sold at appraised values, the Department of the Interior has announced. Page is the construction town adjacent to Glen Canyon Dam. Applications for purchase of lots are being received at the office of the Bureau of Reclamation Project Construction Engineer at Page.

Residential lots range in size from 7,000 to 11,000 sq. ft. and are priced from $1,750 to $2,350. There is a wide range of prices for commercial lots, which are available in many different sizes and locations. Lots are fully improved with streets, sidewalks, curb and gutter, and water and sewer systems. Power and telephone services are available. The Government will charge for certain municipal-type services it provides.

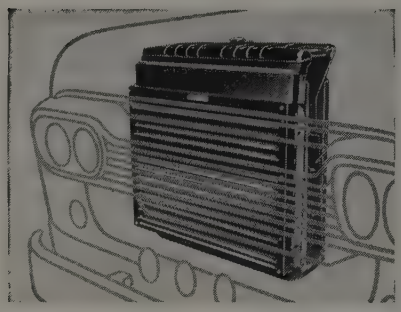
The sale of these lots is part of the effort to encourage private development of Page, which was originally established by the Government to provide for the municipal and residential needs of Bureau employees and construction workers. Page is so situated as to become a center of activity in northern Arizona.

Japanese bidder appears low on hydro generators

HITACHI, LTD., Tokyo, Japan, appears to be low of nine bidders with an offer of $536,110 to the U. S. Army Engineer District, Portland, for the design, manufacture, delivery, installation and test of two 15,789-kva. generators and appurtenances for Hills Creek Dam on the Middle Fork Willamette River. Other bidders were: Legnano Electric Corp., New York, $557,670; American Elin Corp., York, $595,440; Brown Boveri Corp., New York, $664,325; Westinghouse Electric Corp., Portland, $743,541; Elliott Co., Ridgeway, Pa., $765,450; General Electric Co., Portland, $794,927; Allis-Chalmers Manufacturing Co., Portland, $809,887; and Electric Machinery Manufacturing Co., Minneapolis, Minn., $833,437.

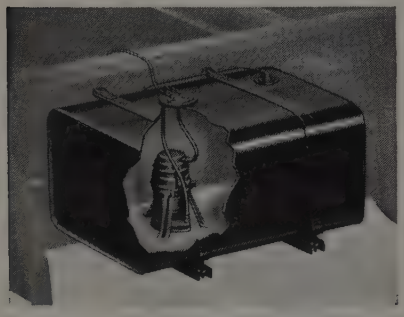
The first generator must be installed and ready for initial start in 690 calendar days and the second in 780 calendar days. Hills Creek Dam is 45 mi. southeast of Eugene.

NOW! Certified Durability



CLOSER TEMPERATURE CONTROL obtained with automatic radiator shutters means longer engine life, more efficient operation. Temperature variation between 167° and 187° with shutters as compared to 102° to 181° without shutters was reported and certified in loaded vehicle road tests.

LONGER WIRING HARNESS LIFE is the direct result of Ford's greatly improved electrical wiring system for 1960. Ford's '60 wiring harness and the 1959 wiring harness were subjected to shaker table tests plus constant exposure to oil and water vapors, and temperatures of 200°. Certified test results show a threefold increase in 1960 wiring harness life.



INCREASED FUEL PUMP RELIABILITY is an added benefit from Ford's submerged-type electric fuel pump. Certified results of dynamometer tests showed no vapor lock with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under same conditions.

It's a fact! Numerous reports from high-mileage operators of Super Duty Trucks attest to Ford's outstanding durability. Studies by an independent research firm provide certified proof that these models are even more durable for 1960.

Ford Super Duty Trucks have earned a reputation for exceptional performance and durability since their introduction two years ago. Shop service records of many leading fleets show Super Duty tractors with mileage readings between 150,000 and 250,000 and no repairs other than normal maintenance. Similar testimony to the dependability of these Big V's by other satisfied users is being added each month. Is it any wonder that '59 sales of these units were more than double those of 1958?

And for 1960, the Ford Super Duties offer additional refinements. Bigger optional axles and increased GVW's to permit greater payloads and more profitable operation. Automatic radiator shutters to keep the engine temperatures within the most efficient operating range, improved submerged-type electric fuel pumps to prevent vapor lock, and redesigned wiring for more reliable operation are typical of the improvements to be found in these units.

The changes offered for 1960 were tested and evaluated by a leading research organization. Certified results of the studies by this impartial firm (name available on request) provide proof that Ford's Super Duty Trucks are even more dependable.

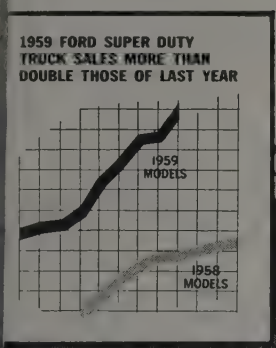
- **Certified Durability through closer temperature control!** Independent research engineers certify that Ford's thermostatically controlled radiator shutters kept water temperature between 167° and 187° in severe mountain grade operation. The test truck with shutters blocked open under same operating conditions had a temperature range from 102° to 181°. The temperature variation of only 20° with shutters means less expansion and contraction in block and heads. Higher, more constant temperatures permit oil to circulate more freely, reducing internal friction. All these factors contribute to longer engine life.

- **Certified Reliability with longer-lived electrical system!** Thicker insulation on wires resists deterioration by heat, oil and gasoline. Asphalt-impregnated loom and plastic-coated mounting clips protect against abrasion. Certified results prove that the 1960 wiring harness has three times longer life.

- **Certified Reliability with Ford's submerged-type electric fuel pump!** Dynamometer tests of engines with submerged-type electric fuel pump and conventional mechanical type showed that vapor lock was non-existent with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical pump resulted in a power loss of 9% at an underhood temperature of 200°.

Endurance tests were run on alternators, two-speed axle speedometer adapters and other related components with similar results. Get all the facts at your Ford Dealer's now!

in Ford Super Duties!



"Our first Ford C-1000 tractor has logged 190,000 trouble-free miles since March of '58,"

says Robey W. Estes, Vice President and General Manager of Estes Express Lines, Richmond, Va. "We haven't had a single road failure and we only bring it into the shop for regular preventive maintenance work once a month.

"We use the 477 engine and find oil consumption is exceedingly low . . . only one or two quarts added between 3000-mile oil changes. Engine compression at 190,000 miles is still high and fairly equal and our drivers say that power and pep are at about the same level as when the truck had been run only 60,000 miles.

"We are grossing between 52 and 56,800 pounds with our Ford Tilts. They are giving about the same gas economy and better oil mileage than other makes in our fleet. We bought our fourth Ford C-1000 tractor last month and hope to add more soon."

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

. . . for more details, circle No. 18 on Reader Service Postcard

CRUSHER plant and receiving hoppers at top of conveyor line. Material is ripped and hauled from 120-acr. borrow area in background.

Belts connect receiving hoppers to crusher structure where material is screened and sized to 8 in. maximum before starting 2-mile trip.

Two-mile conveyor belt speeds world's record earthfill dam

Use of belt line, big equipment fleet, and novel tunnel lining sequence has helped contractor gain a full year in construction schedules for Trinity Dam.

TRINITY DAM, the world's tallest rolled earthfill structure, is rising toward its crest at the rate of 90,000 cu. yd. per day, and is currently a full year ahead of schedule. To set this pace the builders, Trinity Dam Contractors, are working a multi-million dollar equipment fleet 18 hours a day. They are bringing more than 10,000,000 cu. yd. of core material down a 2-mi. belt line and they have moved the river channel around like a garden hose on a hot day.

Trinity Dam is located in northwestern California, near the mountain hamlet of Lewiston on the Trinity River. The combination power and water storage facility is being built under the auspices of the Bureau of Reclamation, as part of the giant Central Valley Project which includes nearby Shasta Dam. Included in the current project are two smaller dams to form regulating reservoirs, a 10.8-mi. tunnel to carry Trinity water to a second power plant, and a further diversion via short tunnel to Keswick Dam and power plant on the Sacramento River.

The main dam will be 539 ft. high from foundation, and 2,440 ft. long at the crest. It will contain more than 30,000,000 cu. yd. of material, and will create a lake of 2,500,000-ac. ft. storage capacity extending some 20 mi. up the Trinity River canyon. When completed the dam will be the world's highest earthfill structure. (This record is destined to be of short duration since the mighty Oroville Dam on the Feather River will eclipse Trinity in size.)

Cost of the dam itself is $49,000,000. Construction of the diversion tunnel, access roads, bridges and camp, done under separate contracts brings the cost to about $54,000,000.

The dam contract is held by Trinity Dam Contractors, Inc., a joint venture composed of Guy F. Atkin-

son Co., sponsor, M. J. Bevanda, Charles L. Harney, Inc., Ostrander Construction Co., A. Teichert & Son, Inc., and Trepte Construction Co.

Diversion

Trinity Dam Contractors moved into the site in 1957, as the diversion tunnel, driven by Gates & Fox Co., was being completed. Here, Trinity forces departed from standard procedure. Instead of installing the permanent concrete lining of the tunnel—which ultimately will feed the power plant penstocks, they placed a shallow invert in the tunnel floor below the A line of the permanent lining and shunted the river, which in summer shrinks to a small trout stream, through the tunnel. This move enabled them to work the entire foundation area in the dry.

The Trinity area is subject to heavy winter rain and snow, with about 75% of the annual runoff concentrated in the period of February to June. Normally, the construction season runs only 150 to 170 days. This brief season coupled with sizable overhead expenses covering complete maintenance shop, permanent administrative offices, and upwards of 250 pieces of major earthmoving equipment, places a premium on speed to take advantage of every rainless working day.

This more or less dictates the general strategy of the dam building operation. The earthmoving spreads work two full shifts, 18 hr. per day. The river is shifted around to permit downstream excavations in the dry, and hillside cuts are made in stages to keep pace with the rising level of the fill.

Most of the foundation work was completed the first full season, despite the fact that excavation uncovered a deep, narrow channel cut by a geologic ancestor of the Trinity River through what was shown in earlier drill tests to be solid rock. With the advent of the winter rains, the flooding river surged through a shallow gap in the upstream dike and flowed over the foundation fill. The contractor then shut off the diversion tunnel, allowing the entire river to flow over the fill while concrete crews placed the permanent tunnel lining. The following spring the river was returned to its bypass tunnel, now a concrete tube 28 ft. in diameter.

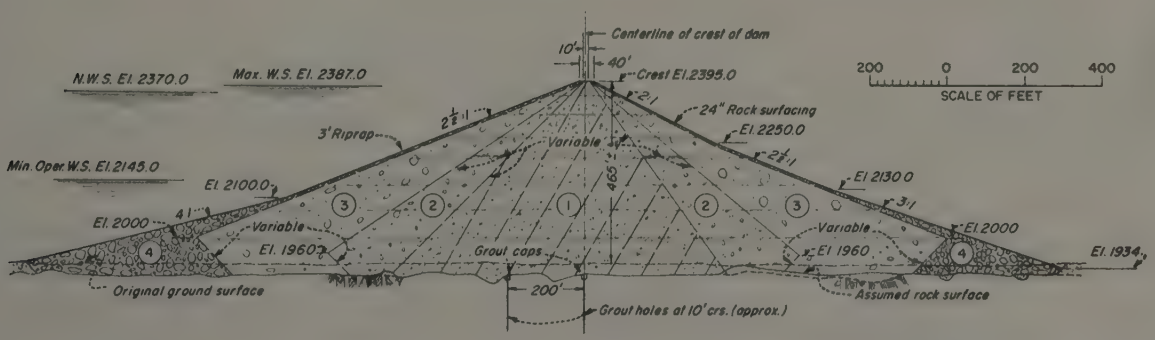
Earthmoving

With completion of the greater part of the foundation, earthmoving phases began in earnest. As shown in the accompanying diagram, the dam was designed with a relatively thick impervious core (Zone 1) composed of clay and rock, flanked by bands of similar material (Zone 2). Pervious material (Zone 3) is made up of dredger tailings, sand, gravel and cobbles; the outer layers of the dam are composed of rock fill (Zone 4).

Bulk of these materials, in sufficient quantities, occurred in a radius of about 4 mi. from the dam site. Zone 1 core material was lo-

TRANSFER station on belt line. Short belt section, center, connects two main flights.

TERMINAL structure includes 3 bins of 400-ton capacity, each with automatic hopper scale below. Shuttle belt controlled by operator in tower fills bins. Scrapers are shown loading at center bin.



CROSS SECTION of dam will contain about 30,000,000 cu. yd. Zone 1, core material, clay and rock, will total 10,000,000 cu yd. Zone 2 will be of similar material. Zone 3 will be alternate layer of dredger tailings, gravel and cobbles. Zone 4 is rock fill.

RIVER BED excavation is done with electric-powered draglines and shovels. Material for Zone 3 is hauled in fleet of 30-yd. bottom-dumps. Note light tower on skids. River directed to ditch.

AUTOMATIC truck wash cleans sticky mud from bottom-dump fleet. Water jets are operated by electric eye, permitting driver to wash rig without leaving cab. Washing done in 2 minutes.

cated atop a nearby mountain, about 1,400 ft. above the dam. Zone 2 source was a slide area immediately below the dam; Zone 3 area was the broad river bed above and below the dam. Zone 4 rock source was located in a side canyon above the dam, and 95% of the rockfill material came from this source. The site has since been abandoned in favor of a quarry about 1 mi. upstream, from which about 200,000 cu. yd. of riprap will come.

Conveyor belt

To bring core material, which would comprise about one-third of the embankment volume, down from the mountain top source, the contractor installed a 2-mi. conveyor belt. This conveyor system is a key to the entire earthfill operation.

The conveyor line is made up of nine flights ranging in length from 670 to 2,000 ft. Each flight uses a 42-in. belt running over troughing idler rolls. Transfer from one flight to the next is accomplished with short belt sections leading from one flight to the next. The belt originally was designed with steep chutes between flights, but these proved unsatisfactory. The short belts are of standard construction, and can be replaced with a standby unit for major overhaul or repair.

Four of the flights run with continuous power, the other five need power only for starting and stopping and are otherwise run by gravity. On these flights two types of retarders are used to govern belt speeds. Electric motors of various ratings are turned by the belts, generating current which is put back into the system. Additionally, on some flights retarder fans are installed to dissipate part of the surplus energy.

The conveyor was planned for a speed of 650 fpm. Operating experience showed higher speeds are possible; it now runs at 725 fpm, and may be increased.

At the top of the conveyor are two receiving bunkers and a crusher unit which receives core material from a 260-ac. borrow area fanning out over the crown of the mountain. Material is made up of clay and decomposed greenstone, the latter in chunks up to 2 ft. Material is ripped and hauled to the receiving bins by a fleet of DW20 scraper units. Because of its remote location this spread operates more or less independently, with its own maintenance and service crews, and with a portable shop set up for field repairs. The spread operates on two 9-hr. shifts daily, moving material about half a mile into the receiving hoppers.

Each receiving hopper discharges onto a 60-in. belt, via pan feeders at the bottom of the hopper. The crusher structure includes two Greundler rotary coal crushers which have been beefed up with teeth and plates of T-1 steel, as well as stronger springs to handle the rock. Rock is sized to 8 in. maximum.

Terminal

At the lower end of the conveyor is a terminal structure made up of 3 bins of 400-ton capacity, each with an automatic scale hopper over a driveway. The terminal bins are filled by a traveling shuttle belt which can be moved back and forth over the top of the structures by the operator. The installation includes a long overhead stacker belt which can pile material beside the terminal in emergencies. The terminal operator also adds moisture to the material as it is dumped in the bins through a series of water nozzles which ring the top of the bin, uniformly moistening the material as it falls from the belt.

The system handles about 25,000 cu. yd. per day, and has delivered about 5,600,000 cu. yd. to date. The conveyor ultimately will handle upwards of 10,000,000 cu. yd. of core material.

Two main control points for the belt line are at the crusher station, where an operator on top of the structure can watch both loading stations, and control both feeder belts as well as crusher operations; and at the terminal where operators fill the storage bins and direct traffic for the stream of DW20's which haul material from the terminal to the fill. These control points as well as the intermediate transfer stations are linked by an intercom system as well as the project's radio network which provides contact at all points from the fill to the borrow area.

The belt line is started from the bottom up, and stopped from the

ALL NEW INSLEY Ⓜ TRUCK CRANE

20-ton capacity yet lightweight for travel

● The all new Insley Type M gets to the job and on the job *fast* with a minimum of preparation time.

Such features as simplified back-hitch gantry (requiring only minutes to raise or lower), independent boom hoist, pendant type suspension with floating bridle connections to boom for quick change of sections, hammer-head type boom point with three wide flange sheaves, and a modern wide-vision cab are but a few of the reasons why contractors are calling the Insley M the best all-round truck crane on the market.

Unmatched flexibility of job handling is available with such optional features as: power load lowering, third drum, remote control and shifting base for upper works.

There are many new design features inside the M's eye-pleasing, wide-vision cab. Ask your Insley Distributor about them today.

Insley owner Smith & Johnson, Inc., Indianapolis, Indiana, setting 8 ton 80' 7" bridge beams for highway overpass.

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INSLEY MANUFACTURING CORPORATION
General Offices • Indianapolis 6, Indiana

TWO PAIRS of 6x6 ft. sheepsfoot rollers are hooked to crawler. Hydraulic cylinders connecting front and back pairs enable rig to move backward as well as forward. Six passes required.

top down in sequence. Warning horns from each transfer point are sounded before starting. The system can be started from either control point, and emergency stops, which cut off the whole system, are provided at all transfer points.

Terminal is located at the gravity center elevation of the dam on the right abutment, and about half a mile downstream from the axis. The three storage bins jut out in a line like a toll plaza, with a driveway beneath each one. Red or green lights above the driveways tell the driver which slot to take. As he drives under the scale hopper, a small plate welded to the gooseneck of the rig interrupts an electric eye to energize the air gates of the overhead hopper. The driver pulls a rope to drop 80,000 lb. of material into his scraper bowl; the gates are closed and he is on his way. The hopper scale automatically fills itself with another charge for the next driver. The electric eye is a safety device to prevent accidental drop of the material. Loads are limited to 80,000 lb. as the maximum the rigs can handle without excessive mechanical wear.

The contractor elected to set up the conveyor after considering several methods. As one alternative, a spread of forty 20-yd. earthmovers would have been required to move the same material, using a 3-mi. haul road on an 8% grade. While costs of moving the dirt by conveyors are not appreciably cheaper than the alternative method, the conveyor operation is much smoother and more dependable.

River bed excavation

Scraper units moving off the terminal apron join the main haul road at the top of a long ramp where they join a long line of tractor units pulling 30-yd. bottom-dumps loaded with material from the river bed. The haul road is wide enough for a sand lot ball game, but it is no place for the children to play. The bottom-dumps are slowly cresting the rise, while the scrapers on a slight down grade are doing 15 to 20 mph. and are permitted to pass the slower trucks. These two streams plus the string of empties high-balling back from the fill give an observer a quick picture of what several million dollars worth of equipment looks like when it is at work and in a hurry.

Bottom-dumps are bringing intermediate zone material, mostly cobbles and gravel, from downstream excavations which extend along the river bed for about 5 mi. Similar excavation is carried on for an equal distance upstream but on a less extensive scale. Channel excavation is carried on in two stages, the first one being to scalp off the big piles of cobbles left by the gold dredges which worked the river many years ago, and the second to excavate the river bed to a depth of about 20 ft. The scooping is done with three Bucyrus-Erie 150B electric shovels, and the hauling with 20 to 30 bottom-dumps. (There are 38 on the job). Power for the shovels is supplied with "portable" transmission lines. Poles topped by cross arms are mounted in sockets on steel skids for movement where needed.

Rigged as shovels, the units take a 7-yd. bite, and with dragline attachment they handle a 6-yd. bucket. Shovel rigs were used on the cobble piles which were up to 40 ft. high, and channel excavation was done with draglines. During these operations, the river is shunted back and forth into new channels as required. During the current season the stream flow dropped to a point where it could be contained in a narrow ditch cut along the right side of the valley floor, leaving virtually the entire river bed open for excavation.

Much of the material handled in this area is wet and sticky, and tends to cling to the equipment, clogging dump doors and sticking to the inside walls of the haul units. To combat this situation the contractor has installed a jiffy car wash, king size, at one side of the haul road where it crosses the equipment yard. Automatically operated by electric eye, the wash rack is made up of a pipe frame cage with high pressure nozzles along the top and both sides. A truck driver can wash his rig in a few seconds without getting out of the cab.

Slide area cut

On the left abutment, Zone 2 semi-pervious material is brought to the fill from an old slide area just below the dam on the side of the mountain. Here a ripper-scraper operation is under way, developing the cut from the bottom up.

The lower portion of the area was cut away first, on a somewhat steeper angle than the permanent slope, and the material went into the fill at the lower levels. As the embankment rose, the cut was trimmed back to its permanent grade, leaving 20-ft. berms every 50 ft. in elevation. These terraces became convenient haul roads, to keep the material moving at a slightly down grade. Upper areas are being taken off in similar fashion, like slicing a ham.

Two main haul roads, one moving upstream the other downstream on the right hand side of the canyon, carry the bulk of the material to the fill. This enables the contractor to concentrate his road maintenance efforts to produce broad, smooth highways for the equipment fleet.

Compaction methods

On the fill itself, material is deposited in lifts of varying thicknesses. Core material is laid down in 8-in. loose layers, Zone 2 is 15 in. and Zone 3, gravel and random rock, goes on in 18- and 12-in. lifts, depending on the type of material. Bureau specifications call for 12 passes with a sheepsfoot roller for each lift. This is accomplished in 6 passes using tandem 6 x 6 sheepsfoot drums pulled two abreast by a D9 tractor. The entire rig weighs 47 tons, and delivers 4,700 lb. per foot compaction. The front and back pairs are joined by hydraulic

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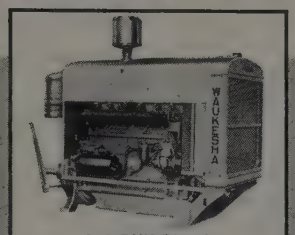
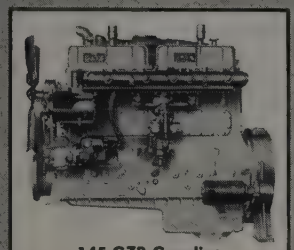
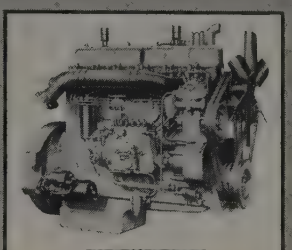


135-DKU Diesel
6-cyl., 4¼ x 5-in.,
426 cu. in. displ.



145-GZB Gasoline
6-cyl., 5⅜ x 6-in.,
817 cu. in. displ.



148-DKB Diesel
6-cyl., 5¼ x 6-in.,
779 cu. in. displ.

N

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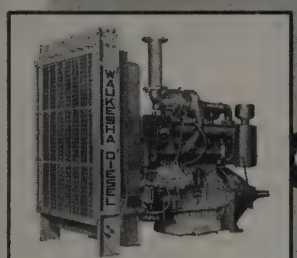
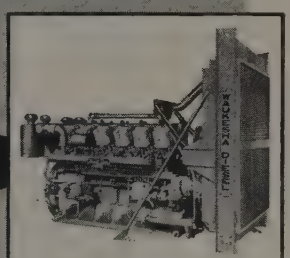
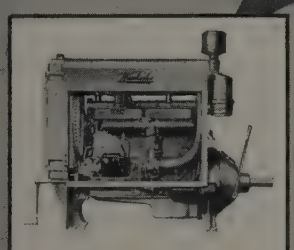


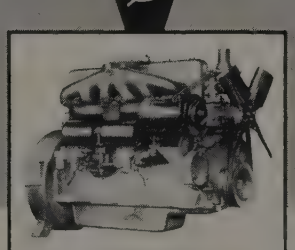
WAKDBSU Diesel
6-cyl., turbosupercharged
6¼ x 6½-in., 1197 cu. in.



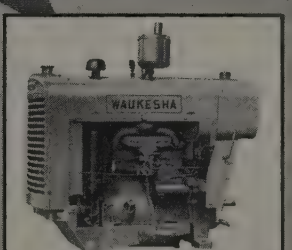
VLRDBU Diesel
V-12, 8½ x 8½-in.,
5788 cu. in. displ.



140-GKBU Gasoline
6-cyl., 4½ x 5½-in.,
525 cu. in. displ.



195-DLC Diesel
6-cyl., 4 x 4-in.,
302 cu. in. displ.



180-GKBU Gasoline
4-cyl., 3⅜ x 3¾-in.,
155 cu. in. displ.

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SPILLWAY form built on tapered curve used to pour 40-deg. bend by adding extra ribs and skin, shown in foreground. Spillway shaft shown at right. Guy derrick is used to place form.

cylinders mounted on either side of the frames. Use of these steering cylinders enables the operator to shuttle back and forth over the lift without turning around.

Concrete work

During the winter months emphasis is shifted to concrete work in the intake tower, gate shaft, spillway and auxiliary tunnel located in the left abutment. All these operations make use of novel forming and concrete placement techniques.

The intake tower is built with a steel ring form which produces both the columns and beams which make up the open part of the tower. The form, built by Blaw-Knox, was nicknamed "Disneyland" by builders. Steel and concrete for the tower are placed with a whirler crane on a trestle built out from the dam abutment. Like all other equipment at the construction site, this giant rig was trucked to the job from the railroad about 40 mi. away. It first was set up at the base of the tower, and later hoisted on to its trestle by other cranes.

At the spillway, a tapered 40-deg. elbow is being poured at the bottom of the morninglory shaft. Placement is made in three sections using one form for all three pours. Basic form is a tapered, curved trunk extending one third the distance of the complete bend. It is built of steel and timber framework with a plywood skin reinforced by timber ribs. The form fits the bottom segment of the arc. When this section is placed the form is removed and re-covered with a second rib and plywood skin of uniform thickness equal to the amount of taper. The enlarged form is then lowered into the spillway shaft for the second pour. The process is repeated, adding still a third skin to the basic form for the top segment of the bend.

A few yards down hill from the spillway tunnel, the vertical gate shaft emerges from the abutment, and will be extended upwards through the top of the fill. Or, rather, the fill will be placed around the gate shaft, for the shaft will be finished first, using a circular slip form reminiscent of the type used in pouring concrete grain elevators —with refinements. The shaft form will receive concrete in a central hopper above the form, and will spout it into the walls through a revolving distributor spout swung beneath the hopper. The gate shaft "tower" will be 20 ft. in diameter, and about 100 ft. high.

Tunnel lining

In horizontal sections of the spillway tunnel, the concrete lining is being placed in a full ring, using a 5-panel, 40-ft. form carried on a needle beam. The form is a Blaw-Knox circular unit made up of a top, two side panels, and two invert panels hinged to fold inward.

The needle beam on which the form is carried rides on rail-mounted trucks. Job-built from an old bridge girder, it has a clear span of 80 ft. In operation the form is moved along the needle beam to cover previously placed re-steel in the next section ahead. In position, panels are folded out and down, and braced. Then track in pre-fabbed sections with ties curved to fit the contour of the tunnel is laid in the section of the tunnel vacated by the form, and the needle beam rolled forward.

A conventional concrete placing train is used in the tunnel, including high car, Pumpcrete car, wet belt and receiving hopper. However, ahead of the receiving hopper is a special surge hopper made up of a Dumpcrete body with an agitator mounted inside. Dumpcrete trucks delivering concrete from the batch plant dump into this surge body which in turn dumps into the receiving hopper as it empties. A timber ramp is placed at the head of the paving train to enable trucks to get the necessary height to dump into the surge body.

Maintenance of the huge equipment spread engaged in building

(Continued on page 78)

MAJOR EQUIPMENT AT TRINITY DAM

- 1 22B Bucyrus-Erie dragline-backhoe combination
- 1 38B combination
- 2 54B combinations
- 1 71B combination
- 1 120B combination
- 3 150B shovel-draglines
- 1 125 ton Bay City truck crane
- 1 Austin-Western hydraulic crane
- 2 Hyster fork lifts (shop and equipment yard)
- 17 Caterpillar D9 tractors
- 21 Caterpillar D8 tractors
- 1 Caterpillar D4 with backhoe and auger
- 2 Eimco loaders (tunnel)
- 32 Caterpillar DW20 scrapers
- 2 Euclid 33LDT tractor-scrapers
- 10 Caterpillar DW20 tractors with bottom dump Athey wagons (30-yd. struck)
- 8 Mack tractors with Euclid bottom dumps (30-yd. struck)
- 10 Euclid 34LDT tractors with Euclid bottom dumps (30-yd. struck)
- 10 International PH95 Payhauler tractors with Athey bottom dumps (30-yd. struck)
- 4 Ateco hydraulic rippers
- 5 Caterpillar hydraulic rippers
- 9 6x6 double drum sheepsfoot tampers
- 9 Caterpillar No. 12 motor patrols (haul roads)
- 3 Gardner-Denver Airtrac drills (quarry)
- 5 Joy tower drills (quarry)
- 13 Gardner-Denver WBJ stationary compressors
- 2 Gardner-Denver 125 cfm portable compressors
- 1 Gardner-Denver 600 cfm portable compressors
- 1 American 200-ton guy derrick
- 1 American 25-ton guy derrick
- 4 Rex model 200 Pumpcrete machines
- 5 Marlow 6-in. centrifugal pumps
- 21 Euclid 22-ton end dump trucks (quarry rock)
- 4 Euclid 6,000-gal. water wagons
- 1 Kenworth 3,400-gal. water wagon
- 2 International 3,400-gal. water wagons
- 5 International trucks with Maxon Pumpcrete bodies
- 2 Caterpillar D8800 generating units (lighting Zone 1 borrow pit)
- 4 Koehring WD60 Dumptors (tunnel)
- 1 Model 240 Colby whirler crane
- 1 Michigan 175 loader
- 35 2-way radios with central transmitter

FINISHING the 860 ft. of 41-ft. tunnel with the crew dismantling the platform used to help install the steel sets. Diesel equipment was all equipped with gas scrubbers.

Completing the tunnel at Tacoma's Mayfield Dam

After a legal lapse of about 4 years the same contractor is completing the power tunnel on this Cowlitz River project. Pilot bore punched through for ventilating economy, and supporting steel set from the surface through drilled holes.

STARTED four years ago during preliminary construction for Tacoma's Mayfield Dam, a power tunnel is being finished by the Yardley Construction Co., Yardley, Wash. The firm has used some interesting procedures with the renewal of work.

Activity on the dam was stopped by court order in the spring of 1956 when the Washington State Supreme Court ruled that Tacoma City Light, the builder, could not condemn a state owned trout hatchery without express permission of the state legislature. This ruling, however, later was overturned unanimously by the United States Supreme Court.

The Yardley organization moved equipment to the Mayfield site along the Cowlitz River in western Washington shortly before July 1. The firm is the same company which had worked on the tunnel in 1955 and 1956, finishing work which represented $1,075,000.

When construction was halted, work on the bore had progressed approximately 800 of the total length of 860 ft. William Roberts, head of the contracting firm which won the contract for the remaining job, at $133,000, decided to drive a small 7x8-ft. hole through the remaining 60 ft. This pilot hole would eliminate the necessity for long expensive ventilating pipes to the open portal. Once the pilot hole was bored through, a Joy fan was set up at the small opening, blowing 40,000 cfm. through the tunnel.

As in the original driving, the bore for the pilot drift and the rest of the tunnel was completed through mostly blocky basalt rock. Powder of 60% strength was used. About ½ lb. was required per yard of rock.

The contractor is using a novel system of placing the arch steel. There is an existing powerhouse access road that runs about 50 ft. above the outlet portal. From this road he drilled a line of holes down to the center line of the tunnel roof. Then he moved a Bucyrus-Erie truck crane over the holes and lowered its hoist line down into the tunnel. The haunch pieces were first placed by an Allis-Chalmers H-D9 front-end loader and then the truck crane, lifting through the hole, picked up the crown pieces, completing the set.

The unlined tunnel ultimately will be 41 ft. in diameter and will carry about 13,000 cfs. to four penstocks 18 ft. in diameter.

The tunnel was driven from the intake structure toward the forebay structure. Excavation was carried out in two stages, the arch section followed by the bench. The arch section of the 41-ft. tunnel was drilled with a truck-mounted 3-deck jumbo. It was equipped with six drifters mounted on hydraulic booms. Rounds for this part of the tunnel generally consisted of an 80-hole pattern in sound massive basalt with 16-ft. holes. In weaker sandstone 8-ft. or even 4-ft. holes were used. Holes were drilled with 1½-in. steel with tungsten carbide bits. In the massive basalt, the maximum advance per day was 15 ft.

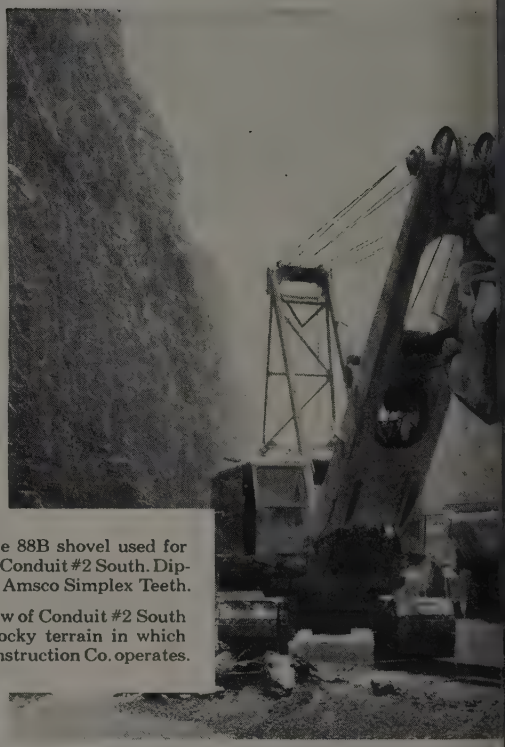
The bench section of the tunnel was taken out by drilling vertical holes with wagon drills down to grade. Powder requirement was 2½ lb. per yd.

Excavation for the early work was carried out with a 22-B Bucyrus electric shovel loading into 10-yd. Euclid dump-trucks and two 6-yd. Koehring Dumptors. All die-

(Continued on page 78)

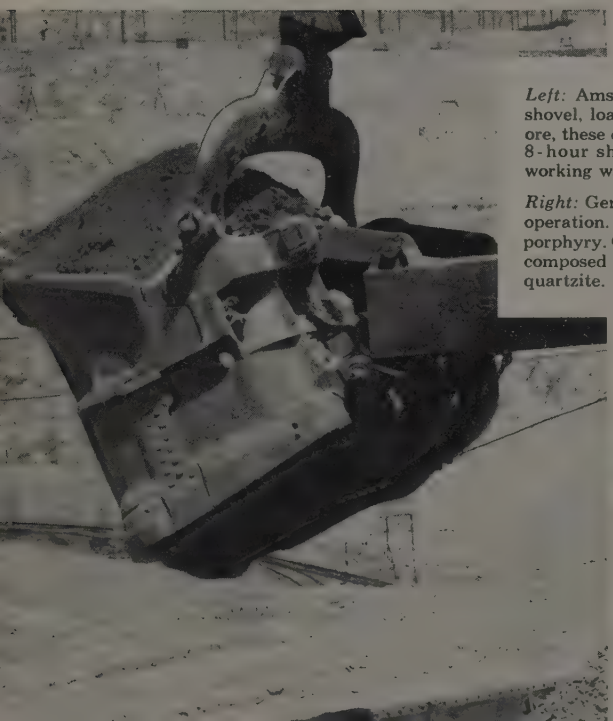
HARD TO BELIEVE, but this crane operator is helping to set supporting steel in the tunnel. With a line extending down through a drilled hole, the arch sections of the sets were lifted into position.

How AMSCO helps you MOV



Left: Bucyrus Erie 88B shovel used for rock excavation at Conduit #2 South. Dipper equipped with Amsco Simplex Teeth.

Right: General view of Conduit #2 South project showing rocky terrain in which Gull & Defelice Construction Co. operates.



Left: Amsco Dipper on Marion 5-yard shovel, loading cars at mine. In loading ore, these dippers average 6,300 tons per 8-hour shift . . . 5,000 tons per shift in working waste material.

Right: General view of the huge mining operation. The ore mined is generally porphyry. Overburden is highly silicious, composed of silicified limestone and quartzite.

MORE TONS PER DOLLAR

Read these user reports on how AMSCO Dippers and Teeth perform in rugged digging service

ON THE NIAGARA POWER PROJECT

40,000 YARDS OF ROCK HANDLED BEFORE AMSCO 2-PART TEETH NEED REPLACING

Gull & Defelice Construction Co. is working on Section 3 of the powerhouse conduit project — excavating 140 feet deep, almost entirely in rock. All five power shovel dippers on the job are now equipped with Amsco Simplex 2-Part Reversible Teeth.

These dippers work *16 hours a day, 6 days a week for 2 weeks—handle approximately 40,000 yards of rock*—before tooth replacement is required.

Says Mike Cazzolla, Equipment Superintendent, in talking about the Amsco teeth: "They're built rugged and take a lot of punishment from the rock. We get longer wear out of them because we can turn them over." He's referring, of course, to the reversible tip feature.

John Cazzolla, Master Mechanic, adds the important fact that *they can replace these teeth in ten minutes with no trouble.* This feature, together with the longer wear, means important savings in downtime.

AT ONE OF WORLD'S LARGEST COPPER MINES

THEY USE AMSCO DIPPERS ...FOR HIGH-SHOCK, HIGHLY ABRASIVE DIGGING

This huge copper mine operates the largest collection of big power shovels (5 yards and up) in the world. For this rugged service they use Amsco dippers to strip off extremely abrasive overburden ... handle waste material ... and load copper ore. These are cast manganese steel dippers — built for toughness, high abrasion resistance and long service life.

For rugged digging anywhere

... wherever high impact and abrasion are problems, you'll "move more tons per dollar" with Amsco Manganese Steel Dippers and Simplex 2-Part Reversible Teeth. See your power shovel equipment dealer for sizes and types available. Or write us direct for technical bulletins on Amsco Dippers and Simplex 2-Part Teeth.

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Modern surveying for a future dam

Mapping of the reservoir above the Bruces Eddy Dam site on the North Fork of the Clearwater in Idaho is by Tellurometer crews in helicopters. The $117,000,000 project will be built by the Corps of Engineers, and is in the planning stage.

TIME WAS in this wild West when a field survey party going into action resembled a small army on maneuvers. In addition to a chief of party, instrument man, recorder, flagman, rodman and stakeman, the party included as many additional axemen and brush whackers as deemed necessary to cut a straight line through timber. Added to this were the packers and horseranglers necessary to pack food and equipment into remote areas.

How time has changed that picture. Today a survey party assigned to a rough timber terrain consists of a helicopter and pilot, two instrument men and a recorder, along with several thousand dollars worth of modern-day electronic Tellurometers. This modern method of surveying mountainous terrain is the way the Walla Walla District Office of the Corps of Engineers it attacking its job of mapping the Bruces Eddy Reservoir on the North Fork of the Clearwater River.

Bruces Eddy Dam, now in its second year of planning and with a reasonably assured 1960 budget allowance capable of progressing that planning into the detailed design stage, is tentatively identified as an approximate $117,000,000 multipurpose project that will be capable of producing some 240,000 kw. of power as well as furnishing approximately 1,500,000 ac. ft. of usable water storage.

The pool behind Bruces Eddy will have a normal area of 10,800 ac. and will extend upstream from the dam site some 50 mi. It is the survey work necessary to establishing and mapping the pool shoreline contour that is now under way in this North Fork area.

In actual survey operations, the helicopter picks up one instrument man plus a Tellurometer and sets them down on some remote ridge or peak overlooking the reservoir contour line. A second instrument and instrument man, plus a recorder, is then flown in and set down at a second exposed position, perhaps a mile or more away. The crews then complete the observations in a few minutes, and at about one tenth the former cost.

The dam site itself is located at a sharp elbow bend in the North Fork of the Clearwater approximately 10 mi. upstream from Orofino, Idaho. The U. S. Coast and Geodetic Survey under the field direction of O. S. Risvold is making the initial study of the reservoir site. Included in this helicopter-Tellurometer study are several inaccessible spots within the reservoir. The Geodetic Survey helicopter crew is utilizing Orofino's airstrip as their base of operations. Flights are being made and instrument setdowns accomplished the entire 50-mi. length of the proposed pool. Mapping of the actual reservoir area will be accomplished by aerial survey methods using the latest photogrammetic equipment.

(Continued on page 93)

WESTERN CONSTRUCTION NEWS

California's new highway budget

THE California Highway Commission has adopted a $569,243,867 budget for the 1960-61 fiscal year. The budget contains $452,784,507 for state highway construction purposes including rights-of-way.

The current fiscal year budget adopted by the commission October 1958, was for a gross total of $610,711,852, of which $497,000,000 was for construction and rights-of-way.

State Director of Public Works Robert B. Bradford, chairman of the commission, said that the decrease from the 1959-60 budget totals is due to a reduction in the Federal highway apportionment for 1960-61. The total federal highway apportionment to California for 1960-61 is $227,708,867, of which $181,086,840 is for work on routes included in the Interstate system.

"Although our Federal share is about $74,000,000 less than for 1959-60," Bradford said, "the estimated revenue from state sources is up approximately $33,000,000 from the current year's budget estimates, as a result of constantly increasing motor vehicle registration and use.

"This increasing traffic makes the stretchout of the Federal highway program particularly hard on our state. It was simply not possible to include in this budget many urgent projects which are badly needed right now for safety and relief from congestion.

"We don't like to have to trim our sails on this vital program of highway improvement, but since the Federal financing problem has made it necessary I think we have the best budget currently possible. It is based on sound, orderly long-range planning to meet future as well as current needs."

The budget contains $53,299,360 for functions other than state highway work. The largest item is $34,257,000 for major city streets other than state highways based on five-eighths cent per gallon of the state gasoline tax. Other non-state highway items are: Federal aid for county roads on the Federal Aid Secondary System, $8,388,160; state funds to counties for use in matching these Federal funds, $4,254,200; state funds for matching city and county funds for elimination of railroad grade crossings on local streets and roads (not state highways), $5,000,000; and engineering funds for cities, $1,400,000.

The $452,784,507 in the budget for highway construction purposes includes:

Major construction and improvement (contracts plus engineering), $317,519,000; rights-of-way, $121,787,304; contingencies (normally available for construction purposes), $6,178,203; resurfacing program, $5,000,000; signs and striping, $1,500,000; and minor improvements, $800,000.

Proposed expenditures for state highway purposes other than construction include: Maintenance, $37,200,000; buildings and plants, $8,000,000; administration, $10,300,000; statewide highway planning survey, $3,000,000; maintenance of state toll bridges, $2,800,000; and honor camps, $1,750,000.

Los Angeles region

The 1960-61 highway budget provides for $84,886,000 in highway construction in Los Angeles, Orange and Ventura counties.

(Continued on page 67)

Washington will sell bonds to maintain freeway program

IN THE FACE of curtailed Federal funds which are important to continue work on the Seattle-Tacoma freeway, Washington may sell bonds from a $75,000,000 authorization made by the 1957 legislature. Some work on the freeway is already being delayed for lack of funds, and cannot be undertaken until the bond money becomes available.

Extensive railroad work required at Ice Harbor

A construction feature common to all major dam projects is the removal of highway and railroad facilities which are usually located near stream level at these storage sites. A typical operation is the work now getting under way under the direction of Peter Kiewit Sons' Co., at the Ice Harbor Dam project. The railroad is on the line from Portland to Spokane originally built in 1910 by the Union Pacific. At the present time about 30 mi. of the railroad must be moved to higher ground to get it out of the reservoir area. The first contract is for a 13-mi. section, and job headquarters have been located near the abandoned station of Pate.

Price guide published for used construction equipment

THE nation's first complete guide to new and used construction equipment values—the 1960 "Green Guide," published by Pacific Appraisal Co. of San Carlos, Calif.—contains nearly 20 thousand separate appraisals on 800 models of construction equipment. The 325-page, pocket-sized handbook was developed over a five-year period by appraisers working with an advisory council of contractors, machinery dealers, bankers and insurance brokers.

All types of construction equipment are priced by make, model, series and special attachments. Information on each model includes the new replacement cost, average wholesale and retail value by age. A continuing sample of wholesale and retail markets will be taken, passing new information on to subscribers in periodic bulletins. The master price book will be issued annually.

Subscriptions range from a single-copy price of $24 a year to $20 for more than 20 copies. Subscription price includes a master price book, supplementary bulletins and individual reports on any item not included in the guide.

50′ x 36″ Model 101 Conveyor Screen Plant with 8′ x 48″ Model SB-80 screen loading selected base material in the Santa Susanna mountains of California.

KOLMAN Loads 15-Ton Trucks with Base Material in 45 Seconds

More than 100,000 tons of selected base material have been screened and loaded by a Kolman 36″ Conveyor-Screen Plant without a cent of repair costs for the Santa Maria Materials Co. and I. J. Santa Maria & Son, grading engineers and contractors, Canoga Park, California.

Quite by accident, I. J. Santa Maria, Sr., came across a good source for base material greatly in demand in the San Fernando Valley area . On a deer hunting trip in a rugged canyon in the Santa Susanna mountains, where many western movies are filmed, he happened upon a deposit of rock and quartz sand without a trace of clay in it. It made ideal selected base material for structural backfills and roadbeds, without crushing, if it could be loaded and screened economically. He figured a Kolman was the answer — and his experience with it has proved him right.

The 58-year-old head of the firm has been working with construction equipment since he was 16. He reports:

"Our only cost on the Kolman has been the wages of one operator and fuel for the diesel engine — about 40 gallons a week. We load 15-ton trucks in an average of 45 seconds. On a busy day it takes three bulldozers to feed the Kolman, which handles the material without effort."

Available in 18″ to 48″ belt widths and lengths up to 60 feet, the Kolman is capable of carrying single, double or triple-deck screens without additional support. Single-deck screens fold under into towing position, making the complete plant portable with no disassembly. A wide choice of feeding accessories facilitate charging with most any type of equipment. Write for literature and prices.

I. J. Santa Maria, Sr. I. J. Santa Maria, Jr.

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OAKLAND—Spears-Wells Machinery Co.

COLORADO
DENVER—Faris-Moritz Equipment Co.

IDAHO
BOISE, POCATELLO — Intermountain Equip. Co.

MONTANA
BILLINGS, GREAT FALLS, MISSOULA—Miller Machinery Co.

NEVADA
LAS VEGAS—Clark County Wholesale Mercantile Co.

NEW MEXICO
ALBUQUERQUE—Construction Machinery Co.

OREGON
PORTLAND—Balzer Machinery Co.

UTAH
SALT LAKE — Rasmussen Equipment & Supply Co.

WASHINGTON
SEATTLE—Sahlberg Equip., Inc.
SPOKANE—Intermountain Equip. Co.

WYOMING
CHEYENNE, CASPER, ROCK SPRINGS and SHERIDAN—Wortham Machinery Co.

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Western Representatives—S. A. MADRID, 2910 Lawton St., San Francisco 22

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

. . . for more details, circle No. 23 on Reader Service Postcard

Federal highways in urban areas

E. E. Halmos, Jr.
Washington, D. C.

DISCOUNT REPORTS that the Administration will recommend cutting the urban portions out of Interstate Highway financing, despite the flood of stories to that effect coming out of Washington recently.

Presidential public works adviser John Bragdon flatly denies that such a recommendation will result from his own study of the highway program. He says that an eight-man team of engineers working under him will look over the huge highway program in order to make a progress report to the President, and will concentrate on such matters as standards, criteria, compliance and cooperation between the states and the Federal government, and the like.

This investigation is in addition, by the way, to the two already authorized by the House of Representatives (see November column).

But the rumors about Administration dissatisfaction with the costs of urban highway work are hard to kill, and they've occasioned some sharp comment by members of Congress—mostly those from urban areas that would suffer heavily by any curtailment. It is obvious, of course, that urban-area Congressmen wouldn't permit any such a cut, even if the Administration should propose it.

To many who are not familiar with highway economics, of course, there seems to be a good argument in favor of cutting out urban-area mileage from Federal financing. Such mileage accounts for only about 12% of the total 41,000-mi. Interstate system, but it will eat up about 42% of the total cost of the system, on the basis of current figures.

However, urban area highway users are also providing an estimated 45% of the total revenues coming into the highway trust fund. How large a share—moneywise—goes into urban highway segment construction, even in less-populous Western states, can be read from these figures:

Arizona, for instance will need a total of about $439.1 million of Federal and state money to complete its share of the Interstate system. Of this total, $65 million will go for work in urban areas.

California has estimated its total need for Interstate at $3.3 billion. Of this amount, $2.1 billion—nearly 65%—will be used for urban area work.

Other Western state figures run this way:

Colorado, total need $249 million, urban share, $59 million; Idaho, need $221.6 million, urban share, $17.5 million; Montana, need $365.4 million, urban share, $21 million; Nevada, need $168 million, urban share, $38 million; New Mexico, need $385 million, urban share, $48 million; Oregon, need $557.1 million, urban share, $227 million; Texas, need $1.5 billion, urban share, $712 million; Utah, need $300.5 million, urban share, $67 million; Washington, need $581.9 million, urban share, $394 million; Wyoming, need $334 million, urban share, $18.5 million.

AED publishes manual on equipment rental prices

SLIGHT increases in rental rates for over 1,500 items of construction equipment are reported in the 1959 Compilation of Rental Rates, published by the Associated Equipment Distributors. The newly issued compilation sets forth national average rates, based on a nation-wide survey conducted this summer among some 850 distributor members.

AED's Rental Committee stated that lower rates reported for particular sizes of compressors, truck mounted cranes, power shovels, scrapers, and torque converter drive tractors — as examples — are not surprising in the face of stiffer competition in some areas for rental business. Another influencing factor, they said, was growing inventories of used equipment in distributors' yards, which makes more equipmen available for rental purposes. Also, there is reason to believe that the tendency of contractors to rent equipment is becoming more prevalent in some areas than in others, which causes considerable variations in rental rates.

The rates published in AED's Compilation do not represent actual rates for any one part of the country, but, rather, they are merely national averages published for informational purposes.

Copies of the 1959 Compilation of Rental Rates are available at $6.00 per copy from the Associated Equipment Distributors, 30 East Cedar Street, Chicago 11, Illinois.

CALIFORNIA BUDGET

(Continued from page 65)

Construction emphasis in Los Angeles County is centered on the San Diego Freeway, the Golden State Freeway, and on other key routes in the basic metropolitan network.

Two budgeted projects on the San Diego Freeway, estimated to cost $13,700,000, together with an $8,600,000 project for which the commission voted 1959-60 funds, will complete the San Diego Freeway for 9 mi. from the Long Beach Freeway, including the interchange with the Harbor Freeway.

Another San Diego Freeway project will complete freeway development through the Santa Monica Mountains. This $13,950,000 job will connect with completed freeway sections to provide 14.3 mi. of continuous freeway from Jefferson Boulevard in Culver City to Burbank Boulevard, north of the Ventura Freeway.

San Diego area

In the San Diego Area, the budget contains $5,800,000 to provide structures and sections of roadway for a future north-south freeway on U. S. Highway 101 in San Diego. Also budgeted are a project to provide structures and grading on a future U. S. 101 freeway route north of San Diego.

Funds are allocated for 6.9 mi. of freeway on U. S. Highway 80 through the sand hills east of Holtville, Imperial County.

San Francisco Bay area

The budget contains $17,800,000 for three large scale freeway projects in the vicinity of Oakland, and another $10,000,000 for a third two-lane tunnel (Broadway Tunnel) on State Sign Route 24 at the Alameda-Contra Costa County line.

Two of the freeway projects are on MacArthur Freeway (U. S. 50). These projects, together with a previously budgeted job, will complete freeway development from the East Bay Distribution Structure to 14th Avenue. The third freeway job involves widening to eight lanes on a 5.6-mi. section of the Nimitz Freeway (Sign Route 17).

A $6,000,000 project on the Southern Freeway in San Francisco will provide eight-lane freeway for 1.3 mi. between Ocean Avenue and Mission Street.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Fairbanks

NEW JET HANGAR — Construction of a new $2,000,000 jet plane hangar and airlines office building at the Fairbanks International Airport has just been announced by Alaska Airlines. The structure, designed to accommodate three DC6 aircraft or one large jet, will be the largest of its kind in the state. Officials of the airline said they believe the new structure will be the largest privately-financed construction job in Alaska during the coming construction season. Incorporated in plans for the new structure are three floors of office space in tiers situated at each side of the building. A call for bids on construction of the new facilities will be announced "within a short time" according to Robert Giersdorf, district sales manager.

JET RUNWAY PLANS — Extension of the runways at both the Fairbanks and Anchorage International Airports to accommodate jet traffic will be pushed during the 1960 season. In Anchorage, a contract for the first phase of this job —tree clearing, dirt work and installation of a drainage system—has already been let to Morrison-Knudsen. In Fairbanks, although delays have been encountered in acquiring the land, there is every indication that work on the extensions will move ahead on schedule next year. The responsibility for carrying out the extensions of both runways falls under the State's Division of Aviation. However, appraisal and purchase of the land is being handled by the right-of-way section of the Division of Highways.

TROUBLE AT YAKUTAT — A sort of "municipal mutiny" — the resignation of the entire city council, including the mayor—took place at Yakutat recently as a form of protest against what the officials called "lack of state aid on local projects." Yakutat city fathers were asked by state officials to reconsider their action and pointed out there was a "misunderstanding." When the Department of Public Works announced its $38,147,350 Alaska State Highway program, a road which Yakutat wanted was not specifically mentioned. Now, however, residents have been assured that a new road for the area is in the plans for 1960.

HOUSING BOOM—Both Anchorage and Fairbanks seem on the verge of another housing boom during the coming year. Realtors and builders in both cities have predicted a record building year. The carpenters' dispute interfered seriously with the 1959 season and as a consequence some builders plan a "crash program" for 1960. In one Anchorage housing area alone—the Turnagain-by-the-Sea project — more than $2,000,000 went into home construction during 1959. Volume of construction probably will be much greater during 1960 at this and other projects in both Anchorage and Fairbanks.

ALASKA-RUSSIA DAM?—Alaska's governor William A. Egan isn't ignoring the Russian proposal for a huge dam in Bering Strait between Alaska and Siberia—a dam which the Russians say would transform Arctic wastes into fertile fields. Governor Egan has suggested that a joint scientific research venture investigate all aspects of the proposal and that the U. S. State Department should immediately start negotiations with the Soviet government on the matter. However, at the estimated cost of 17 billion dollars for the project, most Alaskans are still skeptical when there are so many projects reflecting an immediate need waiting to be tackled by the state.

CAPITAL AGITATION — There seems to be an increase in agitation aimed at securing the removal of Alaska's capital from Juneau. Most of the agitation—given almost daily coverage in the press—is centered in Anchorage which, presumably, would benefit by the move. The chief objections to the present capital are that it is inaccessible and too far from the geographic center of Alaska and the center of population. A recent proposal in the columns of the Anchorage Daily Times is to the effect that a new capital site be picked in a more convenient location. The paper states: "The state could acquire free of charge a tract of ground of any size it desires in any one of dozens of places. The site could be 10,000 acres or 100,000 acres or more. From that huge tract, a smaller one could be designated as the capital area. It might be 600 or 1,000 acres. Once such an area is selected, values of the real estate around it would soar. The lots could be auctioned off to buyers . . . and the income would be sufficient to build the first several state buildings without tapping the treasury or making demands upon the taxpayers." As a result of this sort of agitation for the capital move, a growing feud seems to be developing between Juneau and Anchorage. At any rate, there's not much likelihood that the Alaska construction industry will be called on to bid on a new Alaska capital. For a good many years, at least, Alaska's present capital will probably stay where it is.

BARTLETT ANNOUNCEMENT — Alaska's Senator E. L. (Bob) Bartlett has announced that the Air Force has released a total of $5,370,000 for its military construction program in Alaska. Of this amount, $1,730,000 is earmarked for Northeast Cape Air Force Station on St. Lawrence Island and $1,260,000 for electric power and utilities at Murphy Dome, near Fairbanks. Other projects are scheduled at Gulkana, King Salmon, Pt. Barrow, Bethel and several smaller communities throughout the state.

BIG SUPPLY PROBLEM — The hardest part of a construction project started in Alaska this summer—building 48 Alaska National Guard Scout armories at Eskimo villages—was getting supplies to the sites. Armory sites were usually so remote that sometimes it was necessary to use dogteams and skinboats to supply them. At one site, Eskimos used sled dogs to tow a cart loaded with supplies from the beach to the building site. At St. Michael, Eskimo workmen were assisted by their wives in carrying supplies up a steep bank. At another village, workmen had to carry supplies from a barge on the mud flats to the shore, about a half-mile distant.

The armory construction project is being carried out by Manson-Osberg Co. of Seattle which has a

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Grab sticky-material loading jobs that stop competitive rigs cold—using exclusive clam-action 4-in-1 bottom dumping! Opening the clam pulls the material from bucket surfaces—gravity pull does the rest—to assure positive dumping, even where ordinary "roll-forward" buckets are worse than useless!

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$1,050,600 contract. It is one of the most popular projects in the North because it provides villages with a community center as well as an armory.

CONSTRUCTION NEWS NUGGETS — Capt. Douglas Pelton, assistant chief of the U. S. Army Engineer District, Alaska engineering division, is transferring from Anchorage to the Seattle District of the Corps of Engineers where he will be Chief of the Military Projects Section. His area will cover Oregon, Montana and parts of Washington. . . . Golden Valley Electric Assn. of Fairbanks has received approval from the Rural Electrification Assn. of a $2,386,000 loan for construction of power distribution and transmission lines to Big Delta.... The Bureau of Public Roads plans reconstruction of a 60-mi. section of the Sterling Highway from Anchor River to Soldotna in 1960. Paving of the road will begin in 1961 and be completed in 1962. Paving northward from Homer may be possible in late 1960 if necessary rights-of-way are acquired.... Alaska in general has been having a "late fall" with some construction projects finding it possible to operate longer than usual.

HAWAII Report

By ALAN GOODFADER, Honolulu

STILL CLIMBING — With more than $1,000,000,000 in construction projects on the drawing boards or recently started, Hawaii's construction boom continues to draw new life even as it smashes old records. The Bank of Hawaii, in its latest appraisal of the industry, says construction completed in the first seven months of 1959 amounted to $121,000,000 or $8,000,000 more than in all of 1956 and 29% more than in the first seven months of 1958. July's figure set a new postwar month's record with a total of $21,200,000 or 14% more than in the same month last year. The bank notes that bid opening totals of $143,000,000 in the first eight months of this year were 18% below the same period last year, but reports that bids from June through August went to $49,000,000 as against $38,000,000 in the same period a year ago. Much of the increase came from construction of new housing developments. That billion-dollar figure includes projects that are expected to produce — among other things — more than 16,000 dwellings, three large conventional apartment houses, eight cooperative apartment houses, about 1,300 hotel rooms and two community area developments.

SHARE THE WEALTH — The bank goes on to note that construction's share of personal income here jumped 28% between 1957 and 1958. In the latter year, the bank says, the industry produced $73,000,000 worth of personal income here out of a total of $1,154,000,000.

PRIVATE ENTERPRISE — Two huge private developments have been announced for construction in the near future. On one, work is to start next year; in Oahu's Heeia

district, the first phases of a $100,000,000 development will blossom into about 5,000 residences, 200 apartment buildings and a $5,000,000 shopping center in the next 10 years. The second development is to be on the Island of Maui. P. Chris Engel of Calgary, Canada, is to build the first of 10 hotels in a $40,000,000 "second Waikiki" beach resort development. Engel's hotel is slated to cost more than $2,000,000, to include 200 rooms, and to be under construction in January. The entire project will include about 2,000 hotel rooms, a residential section, a golf course, a road net and waterworks. The development is expected to take 10 to 15 years for completion. Plans also include a marina, a shopping center, and a large auditorium for conventions.

MORE HOTELS – The Sheraton chain expects to start foundation work soon on a new 1,000-room hotel in Waikiki. Meanwhile, piles are being driven for a 9-story addition to Sheraton's Royal Hawaiian Hotel, and work will begin on a $400,000 shop building project in the near future.

IN THE WORKS – Three other private construction projects are in the works for construction soon. Construction is scheduled to start in January for a $1,100,000 5-story multi-deck garage and airline terminal bus facility in Waikiki. It will be Honolulu's second multi-deck garage. Also scheduled to start soon is work on a $950,000 medical building of concrete and steel with gold-anodized aluminum for decoration and sun shades. And the cooperative apartment boom, confined until now to Honolulu, will soon move to the Island of Kauai. A Spokane, Wash., financial group plans to build a $225,000 18-unit co-op at Kukuiula Bay.

GOVERNMENT ACTION – The State Department of Public Works may grant the largest contract in its history when it opens bids for construction of passenger buildings at Honolulu's new jet-age airport Dec. 17. Job estimates range from $5,000,000 to $7,000,000, depending on what deductible items are included. The buildings will be in a crescent dominated by an 11-story building topped by the airport's control cab. The contractor will have 510 calendar days for completion of all the units except the inter-island passenger terminal.

Meanwhile, Hawaiian Dredging & Construction Co. was low bidder with an offer of $482,000 on a contract for rough-grading plane taxiways and approach aprons at the airport. The job includes excavations, fills, and drainage. Site preparation work has been under way for several months.

ROAD FUNDS—Hawaii has been allotted $4,095,000 in Federal funds for road construction during this fiscal year. The state must match the money fifty-fifty. Hawaii still is struggling to get itself included in the National Defense Highway Act. Hopes are high—now that the state has congressional voting representation—that the goal will be reached in the next session of Congress.

STRIKE INTERVENTION—Hawaii's Governor William Quinn may be asked to intervene in a Maui Island construction strike that has lasted 12 weeks at this writing. The State House of Representatives has passed and sent to the Senate a resolution asking Quinn to use his good offices to try to end the strike.

ALASKA TAKE NOTE—Police arrested three men recently as they prepared to bed down in the bandstand at Iolani Palace, Hawaii's seat of state government. The three were job-hunting construction workers from Alaska who thought that sort of thing was permitted here as well as in the 49th state. They slept instead in the Honolulu jail. They were released with a warning the next morning.

Low bids and contract awards

ARIZONA

Givens Construction Co., Phoenix, submitted a low bid of $1,486,044 for grading, surfacing and 2 interchange structures on 8.6 mi. southeast of Picacho on State Route 84, southeasterly towards Tucson in Pinal County. **B. L. Gustafson** of Phoenix submitted a low bid of $1,164,358 for grading, surfacing, and related work on 10 mi. of Route 79 toward Flagstaff on the Cordes Junction-Flagstaff highway in Coconino County. A low bid of $937,090 was submitted by **Mohamed Earthmoving Contractor** of Phoenix for 5.7 mi. of grading, draining and surfacing on the Ehrenberg-Phoenix highway in Yuma County. **Western Constructors,** Phoenix, submitted a low bid of $741,481 for grading, draining and surfacing, and the construction of an interchange structure on the Phoenix-Cordes Junction-Flagstaff highway in Yavapai County. **Fredericksen & Kasler** of Sacramento, Calif. submitted a low bid of $670,646 for 7¾ mi. of grading, surfacing and related work on the Yuma-Casa Grande highway towards Gila Bend in Maricopa County. A low bid of $358,172 was submitted by **Givens Construction Co.,** Phoenix, for construction of 2 girder underpass structures in city of Phoenix, Maricopa County. A low bid of $187,225 was submitted by **Heiskell Construction Co.,** Phoenix, for 5.3 mi. of seal-coating on the Sonoita-Mountain View highway near Mountain View in Pima County. **John H. Evans & Co.,** Phoenix, submitted a low bid of $184,513 for grading, draining and surfacing on 8 mi. of Route 666, east of Pearce in Cochise County.

CALIFORNIA

Stolte, Inc. and **Morrison-Knudsen Co., Inc.,** Oakland, received a $8,738,745 contract for construction of a combination highway and railroad bridge across the West branch of the Feather River on U. S. 40, north of Cherokee in Butte County. **Stolte, Inc.** and **Fred J. Early Co., Inc.,** Oakland, as a joint venture, received a $4,933,732 contract for the construction of Lafayette Tunnel No. 2, a 15,000-ft. long water tunnel for East Bay Municipal Utility District, extending 3 mi. to a point just north of the District's filter plant on San Pablo Creek. **Parish Brothers, Inc.,** Benicia, submitted a low bid of $648,183 for grading and surfacing 1.5 mi. to construct 2 lanes of a future 4-lane divided highway near Crockett in Contra Costa County. **Fredrickson & Watson Construction Co.,** Oakland, submitted a low bid of $673,540 for grading and surfacing on 2.8 mi. northwest of Santa Rosa in Sonoma County including structure over Mark West Creek. A low bid of $577,107 was submitted by **Lord & Bishop, Inc.,** Sacramento, for construction of a 4-lane bridge over the American River on FAS County Road 933, 2 mi. east of Sacramento in Sacramento County. **I. L. Croft & Son, Inc.** of Saugus submitted a low bid of $656,768 to grade, surface and realign 4.1 mi. between Picketts in Alpine County and west of Grass Lake in El Dorado County.

COLORADO

Colorado Constructors, Inc. of Denver received a $436,721 contract to improve 5.7 mi. of U.S. 40, near Troublesome in Grand County, and submitted a low bid of $109,240 for grading, surfacing and structures on 1.9 mi. near Longmont in Boulder County. **Dominic Leone Construction Co.,** Trinidad, submitted a low bid of $693,641 to construct 14.4 mi. of highway on a new location past Aguilar on Interstate U.S. 85-87 in Huerfano and Las Animas counties. **Northwestern Engineering Co.** of Denver submitted two low bids for highway work in Dolores, San Miguel, and Montezuma counties: $397,732 for grading, surfacing and structures on 7 mi. north of Dove Creek and south of Slick Rock Hill, Dolores and San Miguel counties, and $183,343 for 4.2 mi. of grading, surfacing and structures northeast of Dolores in Montezuma County. Two low bids were submitted by **Gardner Construction Co.,** Littleton, for highway work in Larimer, Clear Creek and Jefferson counties: $305,463 for 4.8 mi. of grading, structures and surfacing between Fort Collins and Loveland in Larimer County, and $82,491 for 7.3 mi. of asphalt surfacing in Clear Creek and Jefferson counties.

IDAHO

Arrington Construction Co., Inc., Idaho Falls, submitted a low bid of $721,275 for construction of the Boiling Water Reactor No. 5, facility at the National Reactor Testing Station. **James Reed Co.** of Salt Lake City, Utah, received a $444,274 contract for drainage structures and surfacing on U.S. 30N, Bear Lake County.

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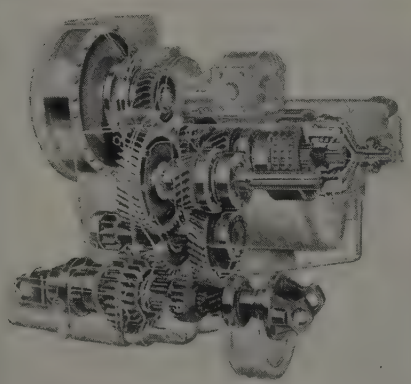
FAST, EASY SHIFT — Operator just flips a lever on the steering column to go forward or reverse. Since the reverse speeds are 30 percent faster than forward, you get the extra back-away speed you want without shifting into a higher gear. To get this higher reverse on most other loaders, two separate levers would have to be moved.



HYDRAULICALLY OPERATED — Note the simple, compact design of the TRACTOMATIC transmission in this cutaway. Two multiple-disc clutches — just outside the transmission — are hydraulically actuated and share the work load. One is for forward, the other reverse. As one works, the other rests and cools — an important contribution to long clutch life. Both are accessible for quick adjustment.

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MONTANA

Baltimore Construction Co., Baltimore, Md., received a $1,972,625 contract for construction of Glasgow Air Force Base Hospital.

NEW MEXICO

Herb Sharpe Construction Co., Trinidad, Colo., received a $530,000 contract for grading and surfacing on 5.4 mi. on the Holman-Taos route in Santa Fe National Forest, Mora County.

OREGON

C. J. Montag & Sons, Portland, submitted a low bid of $386,675 for structures and roadwork on the Columbia River Highway in Multnomah County. A low bid of $315,595 was submitted by **Kuckenberg Construction Co., Inc.** of Portland for grading, surfacing and construction of undercrossing in city of Portland, Multnomah County. **Miller & Hutchins Contractors, Inc.** of Roseburg submitted a low bid of $296,414 for grading and surfacing on the East Unit, Adel-Blizzard Gap, Adel-Nevada State line road in Lake County. **Johnston & Bryant,** Newberg, submitted a low bid of $169,712 for construction of bridge on Pacific Highway on S. W. Hood Ave. in city of Portland, Multnomah County. **C. H. Strong Engineering & Construction Co.,** Eugene, submitted a low bid of $111,000 to reinforce concrete lining inside existing timber lining in Cape Creek Tunnel on Oregon Coast Highway, south of Waldport in Lane County. A low bid of $95,797 was submitted by **Inland Construction Co.,** Milwaukie, for construction of Pudding River Bridge on the Silverton road in Marion County.

UTAH

Tiago Construction Co. and **Schmidt Construction, Inc.** of Salt Lake City submitted a low bid of $1,556,141 for construction of 2 mi. of concrete road and 3 bridges between Beck's Overpass and Cudahy Lane in Salt Lake and Davis counties. A low bid of $1,058,776 was submitted by **W. W. Clyde Co.** of Springville for 3.3 mi. of grading, surfacing, construction of 2 structures and related work between Stoddard and Morgan in Morgan County. **Fife Construction Co., Inc.,** Brigham City, submitted a low bid of $968,507 for 7.4 mi. of grading and surfacing on Interstate 15 between Brigham City and Honeyville in Box Elder County. **Whiting & Haymond Construction Co.** of Springville submitted a low bid of $412,284, for 4.5 mi. of grading, surfacing and construction of a bridge near Kanab in Kane County. A low bid of $312,381 was submitted by **Hansen-Niederhauser, Inc.** of Salt Lake City for earthwork, pipelines and structures, Woods Cross lateral system, part 1, Weber Basin Project. **The Wood Construction Co.,** Salt Lake City, received a $203,000 contract for 3.8 mi. of grading and surfacing the Woodruff-Huntsville route, Cache National Forest, Cache and Weber counties. **D. W. Brimhall Construction Corp.** and **The Johnson Co.** of Murray submitted a low bid of $137,790 for 5.9 mi. of grading and surfacing between Mt. Pleasant and Fairview in Sanpete County.

WASHINGTON

Goodfellow Bros., Inc., Wenatchee, received a $507,136 contract for draining, grading and surfacing on 3.4 mi. of State Highway 10-D near Entiat, Douglas County. **Ray Weist Contractor** of Yakima received a $270,943 contract for 3.9 mi. of grading and surfacing, Buena to Zillah in Yakima County. A $316,385 contract was received by **Carbon Bros.** and **United Paving Co.,** Spokane, for 1.9 mi. of grading and surfacing in the Westlake vicinity, Grant County. **Allen R. Anderson** of Seattle received a $135,066 contract for construction of G. N. Ry. and county road overcrossing, Snohomish County. A $134,984 contract was received by **Thos. Scalzo Co.** of Seattle for 4.7 mi. of grading and surfacing in King County. **Lige Dickson Co.,** Tacoma, received a $1,387,124 contract for clearing, draining, surfacing and paving on 4.4 mi. and construction of bridge, west of Auburn in King County.

WYOMING

Platte Valley Construction Co., Grand Island, Nebr. received a $635,000 contract for 9.6 mi. of grading and surfacing on the Togwetee Pass highway in Shoshone National Forest in Fremont County. **Robert V. Burggraf Co.,** Idaho Falls, Idaho, submitted a low bid of $257,000 for 3.6 mi. of grading and surfacing the west entrance to Yellowstone National Park in Wyoming and Montana.

engine power BY CATERPILLAR

How excavator repowering can be simplified

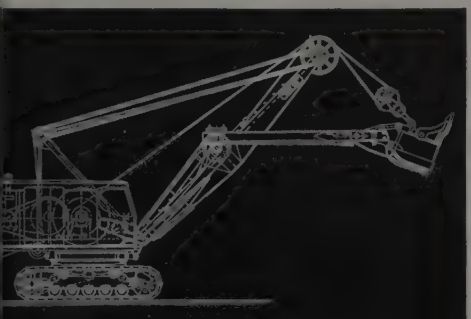
OFTEN a limited engine selection can make the job of repowering an excavator seem complex. It's true that an incorrect choice can make revamping costly. Adapting a poor choice can tie up equipment when it should be working.

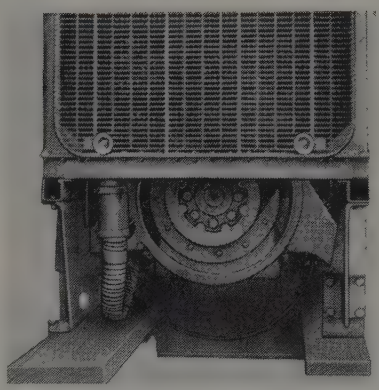
Caterpillar Engines have simplified repowering and have given equipment owners greater profit for over 25 years. Caterpillar makes a complete range of basic engine models from 50 HP to 730 HP requiring no extensive equipment redesign to repower a wide range of machines. Cat Diesels are planned to meet any repowering need . . . mobile . . . stationary . . . mechanical . . . electric . . . 50 or 60 cycle . . . combinations of mechanical and electric . . . natural gas engines in 7.5:1 and 10.5:1 compression ratios. And these engines are available with power transmission for *your* equipment.

When you get a Caterpillar Engine you get fast delivery. Repowering time is kept to a minimum. And you're sure to get the right engine for your machine, hence you're sure of getting improved performance. Repowering returns are high and usually come fast when you choose a Caterpillar Engine.

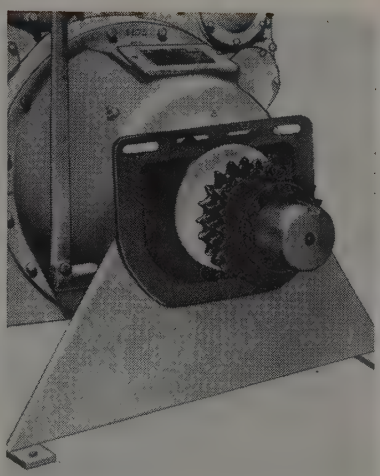
An experienced Caterpillar Dealer Engine Specialist can help you with repowering. He'll analyze your specific power needs. He'll make recommendations that can increase your machine's profitability. And he'll supervise installation.

For more information write for the "Construction Equipment Repowering Packet" which outlines the many avenues of repowering profitability.

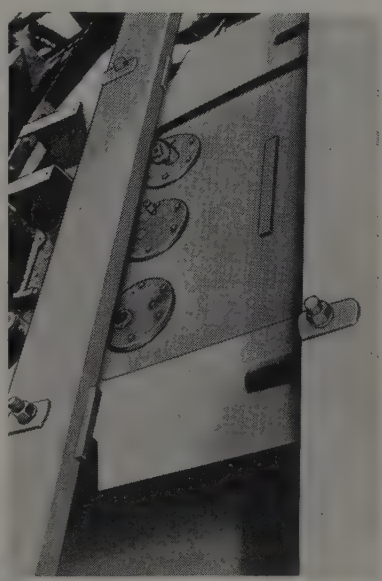




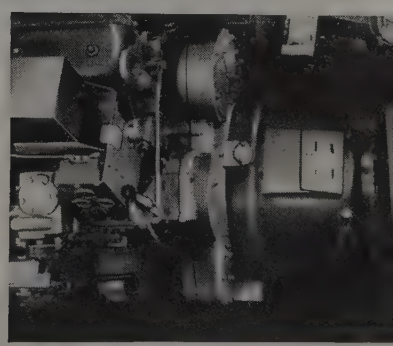
Photos show how easy repowering actually is with Cat Engines. A standard Caterpillar arrangement was selected for this shovel and set at 950 RPM to deliver 263 HP. The engine replaced had produced 215 HP.



This is the clutch with sprocket drive and shaft support plate. Bracket was welded onto chain case to hold engine and case rigid. The radiator is 7" from the side of cab.



Engine was mounted on two 10", 20 lb. channels. Channels were cut to fit, allowing sliding room for clutch removal. Bolt holes were cut for base and engine mounting. Slight modification was done to chain case to clear end of stub shaft. A plug opening was made for greasing the clutch pilot bearing.



Conversion completed. The increased production, minimized downtime convinced owner to repower two additional machines.

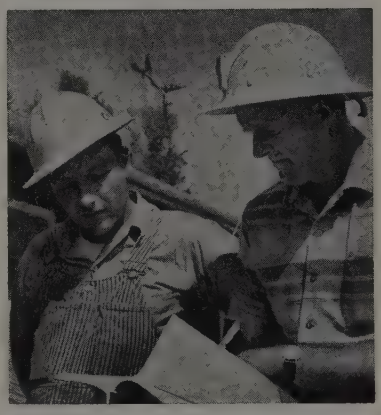
CATERPILLAR

Engine Division, Caterpillar Tractor Co., Peoria. Ill.. U. S. A.

. . . for more details, circle No. 30 on Reader Service Postcard

LOADING holes as the 7 x 8-ft. pilot hole was started from the old face through the remaining 60 ft. to daylight. The paint marking for the drill pattern for the crown section is four years old, dating back to when work stopped on the original job.

HENRY C. COLE, major projects manager (left) has been chief engineer on every dam built by Tacoma since Cushman No. 1 in 1923. Joseph E. Spencer was in direct charge here.



WILLIAM YARDLEY (right) heads the Yardley Construction Co. Wayne Cornett is in charge of the job for the contractor.

TRINITY DAM

(Continued from page 54)

Trinity Dam is the responsibility of Ernie Ford, mechanical superintendent. Of the 900 men employed at the dam, more than 200 are in the maintenance and warehousing section. The mechanical department operates 24 hours a day, 6 days a week, and is in business the year around.

Headquarters for maintenance operations is the huge shop, which includes 10 heavy equipment bays served by two overhead cranes, a complete machine shop, repair bays for pickups and passenger vehicles, and a parts warehouse which stocks some $300,000 in inventory.

Mechanical maintenance program is built around regular 500-hour inspection overhauls on each major piece of equipment. The rig is brought in, steam cleaned, stripped down and any worn units replaced. These inspections become more complex with each successive trip to the shop, and continue up to 5,000 hours, which is considered the maximum life of the equipment.

Shop operations are done on a "unit" basis. Ford defines a unit as anything requiring more than a nut, bolt and washer to take off. Floor men in the big work bays simply exchange units on the rigs. Subsequently units are stripped down and rebuilt in the specialty shops. All work is done at the shop except tires and radiators.

Each machine gets a daily inspection, and extensive records are kept on performance of not only the machines but component parts as well.

Personnel

Contractor operations are directed by A. H. Steiner, project manager. Key men include: Joe McNabb, general superintendent; Hugh Parker, chief engineer; Errol Platt, business manager; E. L. Ford, mechanical superintendent; Jack Maxwell, concrete superintendent; William Rose, conveyor line superintendent; Ralph Gabrielson, electrical superintendent; John Eilers, office engineer; Alec Ketchen, field engineer; and Paul T. Pulley, office manager.

For the Bureau of Reclamation, L. B. Ackerman is project construction engineer; H. E. McInnis, field engineer; Marion Archibald, chief inspector; and Gilbert G. Drake, office engineer.

MAYFIELD DAM

(Continued from page 55)

sel equipment was fitted with exhaust scrubbers approved by the safety branch of the Washington Bureau of Labor and Industries.

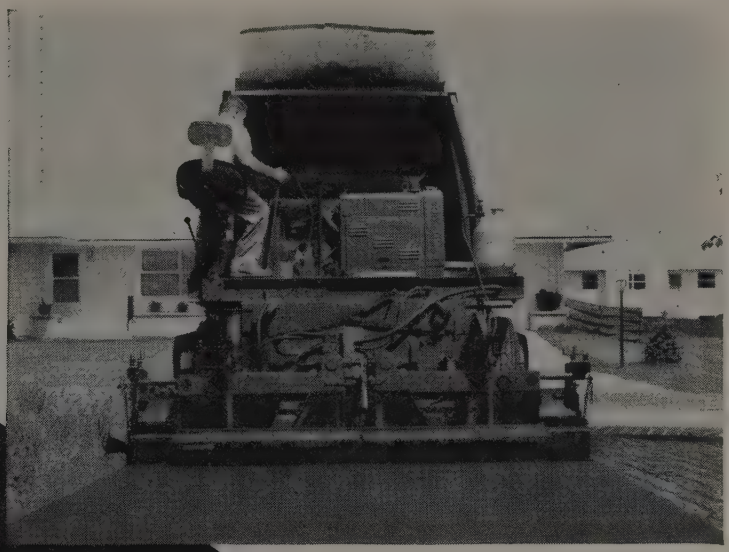
Steel tunnel sets were used principally in the formation of weaker sandstone. They were placed on 4-ft. centers. In the massive basalt, only 6-ft. rock bolts were necessary. Surplus airport landing mats were used between the rock bolts.

The power tunnel will be concrete lined with a minimum thickness of 18 in.

The second tunnel driven for Mayfield Dam is the low level horseshoe shape diversion tunnel. It is 25 ft. in diameter and 600 ft. long. It was driven under the right abutment section of the dam and will be used to divert the swift-flowing Cowlitz River while the arch dam is being built. With construction finished the diversion tunnel will be permanently plugged on the axis line of the dam.

The diversion tunnel also was drilled by the truck-mounted jumbo with six drifters. One heading was used to drive the tunnel. The average round was 52 holes drilled to a depth of about 14 ft. The excellent quality of the massive basalt limited overbreak to bare minimum. No supports or rock bolts of any kind were needed in the diversion tunnel. It will not be lined.

from driveways



to highways . . .

A NEW CONCEPT IN ASPHALT PAVING

Paves on crawlers . . . travels on rubber. Only from Barber-Greene—a new finisher that paves with crawler traction and flotation for the variety of bases encountered in all types of jobs . . . hydraulically lifts itself on pneumatic tires for trailing at truck speeds with its own towing hitch. Here are just two examples of the new 873 Finisher's superior paving performance and unmatched portability for fast job-to-job travel.

Paves 19 driveways in only 3½ hours—including travel time between jobs. Many of the driveways were curved, and locations were scattered.

Paves highway shoulders at record-breaking pace. In only four days, the 873 completed on schedule a highway shoulder job that had 64 different locations.

Paves the way to higher profits. The profit-making ability of this new finisher has been proved on hundreds of jobs such as these. Here are just a few of its exclusive features: the famous Barber-Greene automatic tamping, leveling and thickness control principles . . . new, hydraulically folding hopper . . . simplified controls with single-stick steering. See this new concept in asphalt paving for yourself . . . see your Barber-Greene distributor.

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. . . for more details, circle No. 31 on Reader Service Postcard

ENGINEERS and CONTRACTORS

Arleigh B. West, who has supervised the Bureau of Reclamation's irrigation program in Region 3, Boulder City, Nev., during the past 14 years, has been named acting regional director. West, a 24-year veteran of Federal service, took charge upon departure of Regional Director **W. H. Taylor** for Denver to assume his duties as chief of the Division of Power Operations and General Engineering. West's appointment remains in effect until further notice.

* * *

Earl Imus, following a long and distinguished career as city engineer of Oxnard, Calif., has left his post to devote much of his time to developing a fishing resort in Trinity County, Calif.

* * *

Frank B. Cook, chief, General Engineering Branch, Commissioner's office, Bureau of Reclamation, Denver, Colo., retired recently after 27 years in Government service. He will carry on a general consulting practice in the field of reclamation and power development, with headquarters in Denver.

* * *

Max Bookman, district engineer of the Southern California District, and **R. M. Edmonston,** principal hydraulic engineer in Glendale, Calif., both with the State of California Department of Water Resources for many years, have established themselves in private civil engineering practice in the Security Bank Bldg., Glendale, under the name of Bookman & Edmonston.

* * *

Gerald B. Keesee, well known civil engineer and a water rights specialist who has served with the Bureau of Indian Affairs at Gallup, New Mex., for ten years, has left the West to fill a general engineer post on the Commissioner's staff in Washington, D. C. An active member of the American Society of Civil Engineers, Keesee's assignments over the years have been varied. At one time he served with the Bureau of Reclamation in Montana and Arizona. He also was irrigation engineer for Indian Affairs at Los Angeles and San Francisco.

* * *

Announcement is made by **Alan C. Carter,** Salt Lake City district engineer of the Portland Cement Association, of the appointment of **Walter C. Oram** as district paving engineer. Oram has been a member of PCA's Rocky Mountain Region staff since June 1958.

* * *

John C. Hayes, Washington, D. C., nationally known in the construction industry through his firm's long service as legal counsel for The Associated General Contractors of America, died September 26 following a heart attack.

* * *

R. C. "Dick" Gerke, prominently identified with Western engineering-construction for some time, and a member of the American Society of Civil Engineers, has founded his own firm. With headquarters in Pasadena, Calif., the new organization, called Richard C. Gerke & Associates, is functioning as manufacturers' representatives, construction consultants, and consulting engineers, besides performing other allied services.

* * *

Buell E. Wilcox, an employee of the U. S. Army Engineers since 1935, has been made chief of the engineering division of the Portland District, filling a vacancy left by the retirement of **Ben L. Peterson** last June. Wilcox has been assistant chief for the past four years.

* * *

James R. Libby has joined San Diego Prestressed Concrete Co., Texas St. at Friars Road, Mission Valley, Calif., as sales manager. A registered professional civil engineer in California and several other states including New York, Libby was most recently chief engineer with the Freyssinet Company, Inc. He is a former civil engineering instructor at Oregon State College, and the author of numerous articles in the field of prestressed concrete. A textbook under his authorship is to be published in 1960.

* * *

William Denny, executive vice president in charge of the construction department of Merritt-Chapman & Scott Corp., and **George M. Drake,** president and general manager of Johnson, Drake & Piper, Inc., have been named as the 1960 recipients of the awards given annually by The Moles, an association of leading figures in tunneling, dam building and heavy construction. Denny wins as a member, and Drake was chosen as the nonmember winner. Under Denny's direction are such large Western projects as Glen Canyon Dam in Arizona, and Priest Rapids Dam in Washington. One of the big Western undertakings recently by the JDP firm was its participation as a co-venturer in the low bid of $26,-944, 820 submitted for construction of facilities at Lowry AFB at Denver, Colo.

* * *

Glenn W. Holcomb, head of the Department of Civil Engineering at Oregon State College, has been chosen "Oregon Engineer of the Year" by the Professional Engineers of Oregon.

CALENDAR

Jan. 18-20—American Road Builders Association, annual convention, Netherlands Plaza Hotel, Cincinnati, Ohio.

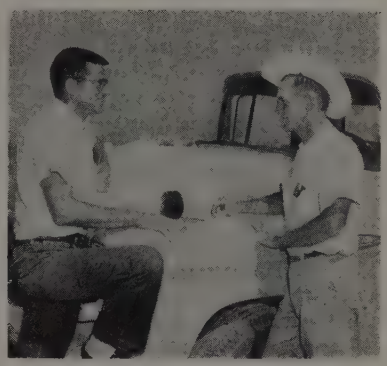
Jan. 21—The Beavers, annual awards dinner, Statler Hotel, Los Angeles, Calif.

Jan. 24-28—Associated Equipment Distributors annual meeting, Conrad Hilton Hotel, Chicago, Ill.

Mar. 14-17, American Concrete Institue, annual convention, Commodore Hotel, New York City.

June 8-11—National Society of Professional Engineers, annual meeting, Statler Hotel, Boston, Mass.

SUPERVISING the jobs



NOW finishing is Fisher Contracting Co. State highway job near Phoenix covering 5.8 mi. of grading, draining and surfacing, and related work costing $493,551. Some of the principal personnel connected with this project are *Dale Sisson*, project manager; *Walt Bauer*, project superintendent; *Bob Sandvick*, purchasing agent; *Walt Eldridge*, field office manager, and *Ralph Kriese*, grade foreman. Representing the Highway Department is *Bob Sherman*, inspector. Above: l. to r.: Sisson, Sandvick, Sherman, Bauer.

J. G. Powers, superintendent for Royden Construction Co., has charge of a $348,822 contract for 2.1 mi. of grading, surfacing and related work on the Cameron-Navajo highway north of Cameron, Ariz. Work includes new alignment, boxes, and replacement of structural steel bridge. Work started in September and will be finished in January.

* * *

Steve Smith, superintendent, is in charge of Fife Construction Co.'s recent award for a grade, drain, gravel and oil contract in the Manti National Forest, Utah. Costing $435,000, work covers a 4.5-mi. stretch on the Fairview-Huntington Canyon route. Principal foremen are: **Joe Farnsworth,** grade; **Robert E. Lee,** powder; **Wendell Fife,** gravel, and **Deloy Johnson,** structure. Scheduled for completion July next year, work started here Oct. 1.

* * *

Fred Adams is superintending a $144,402 recent award to Montana Engineering & Construction Co. for construction of one 153-ft. dual concrete overpass and a 168-ft. concrete bridge in Mineral County, Mont. Work has been under way since mid-September, and according to **E. A. Dalakow,** head of the contracting firm, it will be finished by the end of July 1960.

* * *

Charles Campbell has been named superintendent, and **Ed Tolerton,** building superintendent for the $1,261,790 award to Peter Kiewit Sons' Co. for construction of dormitory and messhall at Fort Greely, Alaska. Work is scheduled to start in May next year, earmarked for completion in October.

* * *

Frank Muren, project superintendent, has charge of Fredericksen & Kasler's recent award to grade and surface 1.4 mi. of 4-lane divided highway known as the Palmdale Highway in Los Angeles County, Calif. Foremen on the $238,033 job are **Bob Beadles** and **Bill Jones.** Expected to be finished next February, work has been going since September.

* * *

Art Higgins, partner in the firm of Johnson Construction Co., is in over-all charge of earthwork, pipe lines and structures, Ricks Creek laterals, Davis Aqueduct lateral system, Weber Basin Project, Utah. Work on the $100,117 contract started in October and will be finished May 1960.

* * *

Wayne L. Manweiler, project manager, **Dan Moats,** general superintendent, and **Frank Powell,** job superintendent, are Bentson Contracting Co.'s key men on street work contract in Phoenix, Ariz., in the sum of $194,221. Under way since Sept. 16, job covers grading, draining, curbs and related work. It will be finished about Jan. 1.

* * *

John Osberg, A. R. "Buck" Taylor, and **Estell Maynard,** project manager, superintendent, and foreman, respectively, are key men working for Osberg Construction Co., which successfully bid the new highway construction job along the north shore of Willapa Bay in Pacific County, Wash. The job has 5.7 mi. of grading and surfacing, involving clearing, riprap, ballast, etc. Osberg reports the job as being very wet. Contract price was $1,069,758. Job started last June and will be finished sometime the fall of 1960.

* * *

Tony, Mike, and **Jerey Calabrese** of the contracting firm of Calabrese & Sons, are directing clearing, grading and pipe operations on a $166,682 award to their company. About 2 mi. of grading and surfacing are involved, from Dollars Corner north in Clark County, Wash.

* * *

James Stephenson, superintendent, assisted by **Perry Scott** and **Bert Van Dyke** as foremen, is in charge of widening 2 lanes to 4 and 6 lanes on 3.4 mi. of highway in Costa Mesa, Calif. Work on the $498,775 contract, being executed by Oliver W. Scott & Affiliates, started in September, and will finish about March next year.

* * *

Ed Mata, project manager, and **John Moline,** superintendent, are key men on a recent $162,189 award to L. M. White Contracting Co. Located in Pima County, Ariz., the job consists of 2 mi. of grading and surfacing on the East Broadway road east of Tucson. Concrete foreman on this work, which started in September and will run till January 1960, is **M. Stice.**

* * *

A. W. Sabbe is supervising construction of three bridges on the Fampico-Glasgow road in Valley County, Mont. The work is being

done by the contracting firm of W. P. Roscoe Co. at a cost of $298,813. **R. W. Engelhardt** is in the foreman spot. Started last July, the job is scheduled for completion in November 1960.

* * *

C. Ross Petersen, Matt A. Little, Jr., and **Fred Toft,** have been named project engineer, project manager, and general superintendent respectively by Baldwin Contracting Co., Inc., successful bidder for construction of operations area facilities at the Naval Air Station, Lemoore, Calif. The $4,124,900 project will be finished in late November 1960.

* * *

Alvin F. Connerley, job superintendent for Cahoon Construction Co., has charge of construction of two concrete and steel bridges over the Big Hole River near Divide, Mont. Costing $226,504, the work started last August and will probably be finished in August of next year.

* * *

Henry Carder, superintendent for Madonna Construction Co., is in charge of 4.1 mi. of grading and surfacing in Santa Barbara County, Calif. Master mechanic for this $552,181 job is **Dan Borradori,** while **Leonard Koll** is structures superintendent. Scheduled for completion in February, the project is under the direction of Project Manager **Milton Gracia.**

Gracia is also serving as project supervisor together with **Robert Osborne** for a large freeway job which Madonna is doing in Placer County, Calif. Job superintendent on this one is **Orval Beeman.** Contract is in the amount of $4,739,175 and covers 5.1 mi. of 4-laning, with ramps, connections, grading and surfacing and 5 bridges west of Monte Vista. With Borradori and Koll in their usual key spots, other important personnel here are **William Melcher** and **E. B. Harris,** project engineers, **Robert Pate,** another master mechanic, **"Swede" Olson,** powder man, **William Parrott,** foreman, **Chester Bowlin,** also a structural superintendent, and **Otha Luster,** plant superintendent. Under way since September, the job will probably run until October 1960.

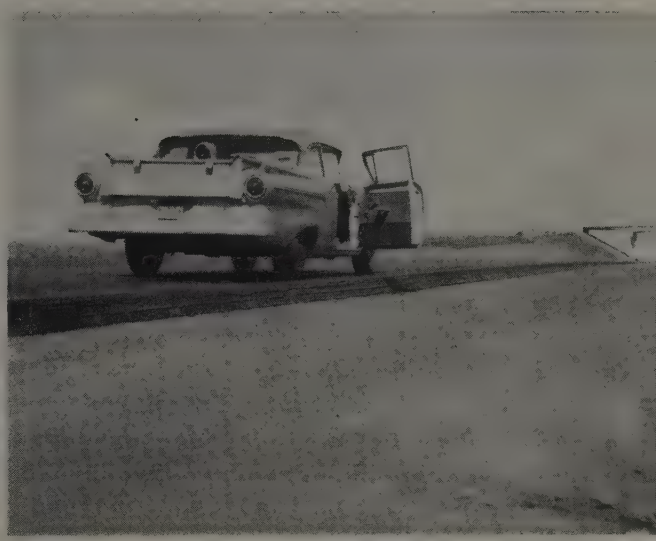
* * *

A. M. "Spec" Willis is supervising a $550,734 contract which recently went to C. H. Elle Construction Co. for grading, draining and miscellaneous work on 2.5 mi. of road in Washakie County, Wyo. **Paul Meeks** is in the foreman spot. Work started in October and will be finished next June.

* * *

Walter P. O'Farrell, general manager, **Donald B. Weaver,** project manager, and **Rudy Buhlman,** general superintendent, are key men on construction of a second tube under the Oakland Estuary between Oakland and Alameda, Calif. Other important men on the $16,641,000 project are **Del G. Pedgrift,** project engineer, **Harry Larsen,** superintendent, **Sam Laughlin,** office manager, and **Gust J. Blomseth,** master mechanic. Successful bidder was the joint venture of J. H. Pomeroy & Co., Bates & Rogers Construction Corp., and Ben C. Gerwick, Inc. Work started in October, scheduled for completion about October 1962.

can carry heaviest traffic for years!



and hot lays...

wo courses (4½ inches total) of Asphalt Concrete were placed to form the traffic lanes. The shoulders were built up with 7 inches of sand-Asphalt base course and given a double surface treatment to provide clear visible demarcation.

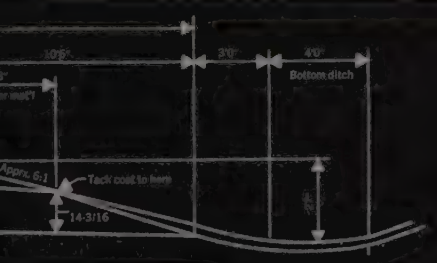
Engineering Advantages

Next time you are in Oklahoma, join the heavy traffic streaming over this pavement and see for yourself how modern Asphalt pavement is engineered for tough,

8-inch Asphalt base

longer-lasting service. You'll find the section (Interstate 40) just west of Clinton. You'll find it wonderfully smooth riding, a pleasure to drive on.

With modern Asphalt construction you can build the finest pavements engineering skill and know-how can provide. Pavements that give taxpayers the most for the money; in lower first costs, lower maintenance costs, longer life, safety and riding comfort. And be sure of this: no material is comparable in design versatility or in ease of construction. Its use **is modern** engineering.



Ribbons of velvet smoothness...
***ASPHALT**-paved Interstate Highways*

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ENGINEERING · RESEARCH · EDUCATION
THE ASPHALT INSTITUTE

CONSTRUCTION BRIEFS

A lift for the Olympics

At Squaw Valley the new lift will reach the summit of the peak for a championship downhill run of 10,154 ft. with a vertical drop of 2,487 ft.

ABOVE the timberline a tractor lumbers up a steep slope pulling a thin line of wire rope, slowly unreeling from a giant spool some 3,000 ft. away. This is the last leg of the rope's upward progress, and within a week the 9,113-ft. length will be spliced and in service. It is the carrying line for the Squaw Peak Double Chair Lift No. 2. Next February, it will serve as the transportation for world championship skiers in the 1960 Winter Olympics. It will take them to the top of Squaw Peak, a 9,100-ft. granite promentory which dominates Squaw Valley. The course will serve as the men's downhill in the international competition. It will be 10,154 ft. in length with a vertical drop of 2,487 ft.

Chair Lift No. 1 carried traffic 8,200 ft., with a vertical rise of 2,000 ft., up the face of Squaw Peak. From its terminus, a tram went another 1,200 ft. with a 450-ft. vertical rise. After extensive study, it was decided to locate another lift which could carry traffic to the crest. In addition to providing 550 more vertical feet to the run, the new lift opened up new terrain north of the summit where the upper valley opens into a shallow bowl.

Riblet Tramway Co. of Spokane, specialists in the manufacture of chair lifts and all types of aerial tramways, were assigned the contract for the new installation. Riblet designed towers for 13 stations along the run. In early summer of 1958, crews of John E. Northrup Construction Co. of La Canada, Calif., under the direction of construction superintendent, Lowell Northrup, had bulldozed roads linking the 13 tower stations.

LOOKING down on Squaw Valley where the Winter Olympics are scheduled.

The Riblet Co. designed plyon-type towers, using a single post of 18-in. outside diameter pipe with a head frame composed of 8-in. channels and 2x2-in. angles. Structural steel was supplied by Bethlehem's Seattle mill. Footings for these towers were blasted out of the solid rock. Seated and leveled into the poured footings was a sleeve of pipe with an inside diameter of 18 1/6 in. Each tower was trucked to its station as a completed unit and fitted inside the projecting pipe sleeves and welded in position.

The main carrying rope is a 9,113-ft. Bethlehem Purple Strand fiber core, 1⅛ in. in diameter 6x19 class Formset rope. Northrup and his crew set the reel of 19,770 lb. of wire rope near the lower terminal motor tower. Using a Chicago grip and tackle, the rope was threaded through a block around

a mobile city is born at FLAMING GORGE DAM

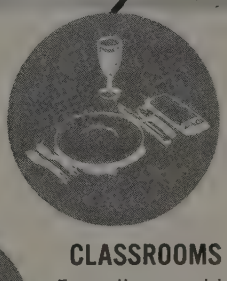
TRANSA HOMES DEMOUNTABLE STRUCTURES
form nucleus for community of DUTCH JOHN, UTAH

Bureau of Reclamation photo by F. B. Sla

No ghost towns to leave behind

Dutch John, Utah, the community ted by the Flaming Gorge Project, was comprised of a nucleus of Transa Homes. The completely factory-built Transa Demountable Housing was ought in and erected before roads had been cut through the hills. This was accomplished by literally winching Transa Homes over the 14 miles of wild nd rugged terrain. Today this community udes many Transa Homes which ultimately ay be folded and sent to other projects leaving no costly ghost towns behind.

Sizes: 580 Sq. Ft. and 1080 Sq. Ft.

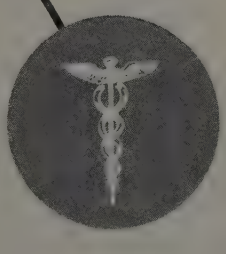


MESS HALL

While Transa Ho were originally signed for hou personnel, they useful as mess with a seating pacity of over The Transa mess may be comple equipped with c ing and serving f ties, sinks, fre and refrigeration.

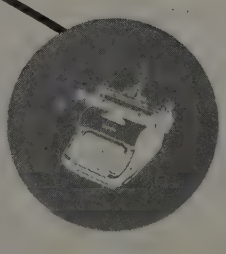
CLASSROOMS

Transa Homes models are adaptable for use as multiple classroom units. The spacious floor arrangement provides functional and compact areas. Window design allows ample lighting and ventilation.



MEDICAL

As a hospital unit a Transa Homes demountable building requires no modification to become a multi-bed infirmary. Adequate area is available for medical offices, laboratory and general dispensary requirements.



OFFICES

The use of Tra Homes as offices been found a tre dous asset to project. Within administrative pe nel is permitted capacity operatio cilities. There lengthy waiting p for completio building constru later to be aband at close of a pr

Transa Homes Demountable Structures may be the difference in securing a contract. For descriptive literature and prices write Dept. 10

Transa Homes Corporation • 130 N. Magnolia • Fullerton, California • LAmbert 5-1158

. . . for more details, circle No. 35 on Reader Service Postcard

the tower. Using snatch blocks and a 1½-ton truck with a ⅜ wire cable, the heavy rope was winched over the sheaves of consecutive towers. The final 600 ft. was too steep, and a tractor was used.

Meanwhile, a crew working from the upper idler terminal tower, lowered a small diameter cable to the bulldozer where it was spliced to the heavier rope. The other end of the cable was threaded through the bullwheel of the terminus and also lowered to the bulldozer. As the tractor made the return trip down the hill, the big carrying rope was reeled off passing over tower 13, and around the bullwheel of the terminus. Installation of the big rope required two days. The splice includes 125 ft. of the 1⅛-in. main carrying rope.

MASTER MECHANIC

CARTOONS TO SELL THE VALUE OF PREVENTIVE MAINTENANCE

A series of clever original cartoons, pointing up the importance of preventive tractor maintenance, is offered free to owners and operators of construction equipment. Printed in four colors on heavy paper, the eye-catching 11x13-in. posters contain no advertising and are suitable for tacking on field shacks, shop walls and bulletin boards. Featuring cartoon characters in typical job situations, the series sells proper tractor maintenance in a humorous, enjoyable manner and is keyed to seasonal problems. You can order as many copies as you need of the cartoon shown here, by sending your name, title, address and company name to: J. I. Case Co., Industrial Advertising Department, Racine, Wisconsin. New cartoons will be mailed to you as released.

SURVEYORS

(Continued from page 58)

The surveying and mapping project in its entirety is estimated to require about nine months to complete. By old-fashioned field party methods it would have required several years to complete.

A Corps of Engineers project

Bruces Eddy Dam and reservoir will be designed, constructed, and operated by the U. S. Army, Corps of Engineers, as a key part of the multipurpose plan for development of the water resources of the Columbia River Basin. With a gross storage of 2,460,000 ac. ft., of which 1,480,000 ac. ft. is usable storage, Bruces Eddy will play a major role in partially eliminating the power shortages recurrently being experienced from hydroelectric power-producing dams downstream during low river flow periods.

Proposed operation of the Bruces Eddy Reservoir contemplates keeping the pool area up to full level during the summer months for later power generation usage. This will create a 50-mi. lake suitable for recreation, summer homes and other aesthetic uses. Water level on the reservoir would not be lowered until the months of low river flow on the Columbia and Snake from November until early spring. The reservoir would then be drawn down to supplement downstream flow and at the same time to provide reservoir space to catch flood water run-offs which normally occur in the spring months. This, it is believed, will further alleviate damage and flood danger within the Columbia, Snake and Clearwater River areas.

1948 flood started study

Inception of the study of the feasibility of a dam on the North Fork of the Clearwater began shortly after the disastrous 1948 flood when it became evident that the run-off of the Clearwater during the spring was a vital factor in the flood hazards downstream on the Columbia and Snake.

The Bruces Eddy project is being designed to give the area it serves the maximum benefits with the least amount of disturbances. Its completion includes road improvements in the present North Fork Canyon area, much of which is now inaccessible.

NEW LITERATURE

To obtain free copies of literature described in this section, circle the corresponding numbers on reply postcard.

FWD service directory

More than 200 parts and service facilities located throughout the world are listed in a new directory published by **FWD Corporation.** In addition to the various locations which service FWD's heavy equipment vehicles, the booklet gives headquarters of 10 field service engineers stationed at strategic spots throughout the United States. FWD field engineers are factory-trained in operation and maintenance service of the company's vehicles.

. . . Circle No. 154

Grouting methods

The most effective methods for grouting heavy equipment installation are explained in a booklet issued by the **Master Builders Company.** Featuring the use of non-shrink Embeco pre-mixed grout the bulletin details methods and techniques of good grouting practice. Diagrams, charts and photos cover preparatory steps, forming, selecting materials, mixing and placing the grout to obtain maximum bearing of machine bedplate.

. . . Circle No. 155

Construction handbook

The 1959 Building Construction and Maintenance Handbook is now available from the **Building Products Division of L. Sonneborn Sons, Inc.** The 128-page booklet contains engineering data and specifications on waterproofing, dampproofing, painting, caulking, roofing and flooring. Included are descriptions of materials, estimating guide, weights and measures and material on paint and concrete work. The handbook is indexed by product and uses for quick reference.

. . . Circle No. 156

Moto-Crane bulletin

A new 8-page, 2-color bulletin describing the 18-ton Lorain Moto-Crane, Model MC-218, has been made available by **The Thew Shovel Company.** Drawings and photos cover the various assemblies including the 6x4 carrier with 2-position turntable mounting, hydraulic power steering, power brakes and integrally welded outrigger boxes. Features covered are 1-piece truss reinforced bed, compact clutch shaft assembly, power load lowering anti-friction bearings.

. . . Circle No. 157

Skid-proof highway surfacing

A new skid-proof surfacing material made of emergy aggregate and epoxy resin is described in a new, 2-page bulletin published by **Walter Maguire Company, Inc.** The bulletin discusses properties of "Seeded Emeri-Epox" and provides instruction for mixing and applying it to highways as well as to indoor services. A sequence of photos shows how the material is applied to toll-booth approaches on a major highway bridge. Another section shows applications for highways and air terminals.

. . . Circle No. 158

Saw catalog

Four completely new and revised catalog sections have been published by **Disston Division of H. K. Porter Company, Inc.** covering its line of industrial saws and cutting tools. Covered in the catalogs are solid and inserted tooth circular saws, mitre saws, trimmers, planers and others. Wide and narrow band saws, metal-cutting saws and machine knives are described. Available singly or in combination.

. . . Circle No. 159

Steel window walls

Use of steel window walls in institutions, office buildings, schools and other applications is described in a lavish 24-page, 4-color booklet issued by **U. S. Steel Corporation.** Included are numerous full-colored photos of steel window walls in new buildings as well as diagrams of wall construction, typical schoolroom layouts, and data on the additional interior space which this type of construction provides.

. . . Circle No. 160

Electric wheel

A new wheel built around a 450-hp. electric motor and designed for use on heavy-duty off-highway construction equipment is described in an 8-page bulletin published by **General Electric Co.** The motor case forms the hub on which the wheel is mounted. An external planetary gear system drives the wheel. Braking is accomplished by utilizing the motors as generators and dissipating their energy through resistors. In addition an aircraft disc type brake is also provided as part of the unit. All parts of the system are force cooled by centrifugal blowers. Wheels are designed to use power either from an engine driven generator or from overhead trolley system. They are available in rim diameters of 37 to 45 in. with optional demountable rims for field tire changing.

. . . Circle No. 161

Paperboard void forms

A wide variety of shapes and sizes of void forms made of corrugated paperboard construction impregnated with asphalt is described in a group of catalogue sheets published by **Construction Divn. of Lawrence Paper Co.** Shapes covered include chamfered tubes, rectangular forms, and waffle pans for forming various types of voids in concrete construction. A feature of the material is its weather proof construction including asphalt and wax impregnated surfaces and use of weather proof glue. Literature includes instructions for field assembly of the forms which are shipped flat. Form construction includes both lattice cores and diagonal bracing.

. . . Circle No. 162

Tree crusher

The G-40 Tree Crusher, a 47-ton machine, designed to knock down forests and splinter the fallen trunks for burning is described in a bulletin issued by **R. G. LeTourneau, Inc.** Illustrations show the two blade-studded rollers which splinter the trees after they have been knocked down by the machine's push beam bumper. General data and operating features stress that the new G-40 is compact enough to be conveniently transported between jobs yet has the weight and power to clear as much as 4.25 acres of scrub forest per hour.

. . . Circle No. 163

MOBIL

Amazing how hard some people work to get where they're going. They flounder in a haze, a daze or a maze! The smart operator knows the shortest distance to more profits is simply to steer clear of dead-enders like accidents, costly repairs, high insurance premiums and other operational pitfalls. If you feel like your fleet is caught up in a maze-break out! Put your drivers on a fresh course... a special 3 or 6 session training course for fleet drivers and mechanics now being offered through MOBIL representatives. The course is designed to teach your drivers and mechanics how to avoid costly errors in safety and equipment upkeep. In short, it will take them out of the maze and head them in the direction of fewer accidents, fewer overhauls, and lower insurance rates. And that adds up to lower operating costs for you. Your MOBIL fleet representative has the details, talk to him. General Petroleum Corporation, 612 S. Flower St., Los Angeles 54, California • Serving the West with Mobilgas, Mobiloil, Mobilfuel Diesel and Mobil Lubricants.

Mobil

2-271

. . . for more details, circle No. 38 on Reader Service Postcard

Compressor, drill catalogue

A 64-page catalogue covering its entire range of construction equipment has been issued by **Chicago Pneumatic Tool Co.** It provides complete specification data on the firm's line of air compressors, rock drill, pneumatic and electric tools and stationary engines. Included are recommendations on air pressure and air hose for air operated construction tools and information on proper selection of compressors.

. . . Circle No. 164

Hydraulic crane folder

Specifications on straight booms and jib boom cranes for trucks are contained in a new bulletin issued by **Daybrook Hydraulic Divn. Young Spring & Wire Corp.** Included are action photos of the Power Loader cranes. Complete operating ranges for the straight boom model with 4,000-lb. capacity and jib boom model of 7,000-lb. capacity are given.

. . . Circle No. 165

Helicopter photo

Construction industry uses of small helicopters are detailed in a folder issued by the **Hiller Aircraft Corp.** Illustrations show the helicopter transporting a load of up to 1,000 lb. landing survey parties in inaccessible locations and even transporting skin divers for underwater work.

. . . Circle No. 166

Drilling accessories

The entire **Brunner & Lay, Inc.** line of drilling tools and accessories is listed in a 12-page illustrated catalogue recently issued by the company. Pictures and specifications are carried for carbide bits, striking bars, extension steel, as well as such demolition tools as moil points, clay spades, asphalt cutters, etc. Included are details on the new line of rope thread blast hole drilling tools.

. . . Circle No. 167

High strength bolt chart

Proper procedure for installing high strength structural steel bolts is shown in a 2-color, illustrated wall chart published by the **Bolt & Nut Divn. of Republic Steel Co.** Measuring 17½ x 22 in. the chart covers installation procedures in 4 principal sets. Identification of high strength bolts is explained, together with the advantages of bolting structural steel members.

. . . Circle No. 168

Outrigger bulletin

Use of the new hydraulically-actuated outriggers on Lorain truck cranes is illustrated in a 4-page circular issued by the **Thew Shovel Co.** The illustrations show the power-set outriggers in various positions and information is provided covering their use on uneven terrain.

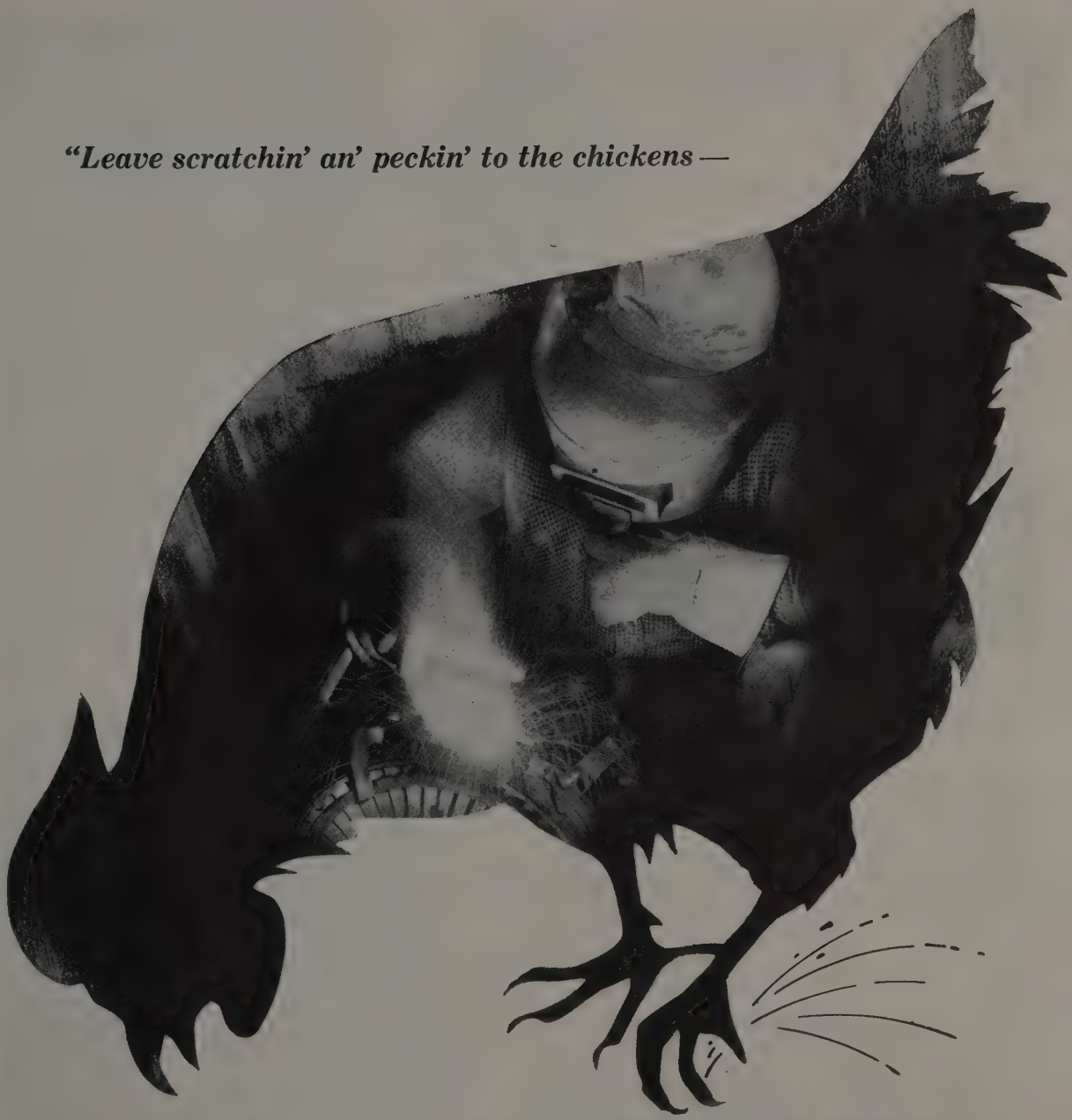
. . . Circle No. 169

Masonry anchor handbook

A new edition of the 48-page, pocket-size "Masonry Anchoring Handbook" has been issued by the **Rawlplug Co. Inc.** The booklet includes tables showing proper anchors to use with each type of fixture and material, dimensions and specifications for each type of anchor and drill as well as descriptions of new anchoring devices.

. . . Circle No. 170

"Leave scratchin' an' peckin' to the chickens —



Use AIRCO EASY ARCSTARTS!"

The first time you try Airco's new EASY ARCSTART Electrodes you'll never go back to scratchin' an' peckin' with yesterday's electrodes.

Welding mild or low alloy steel, or hardfacing? Airco EASY ARCSTART Electrodes enable you to *use lower amperage for starting, if desired; strike an arc the first time; and do it easier than ever before.*

The tip coating does the trick. This is the cap at the striking end of EASY ARCSTART Electrodes — a special metallic compound that instantly initiates arc current.

Airco EASY ARCSTART Electrodes are available in diameters from 1/16" to 5/32"... for mild steel, low alloy steel and some hardfacing electrodes.

For samples, write on your letterhead ... or phone your nearby Authorized Airco Dealer. He's listed in the Yellow Pages under "Welding Equipment and Supplies".

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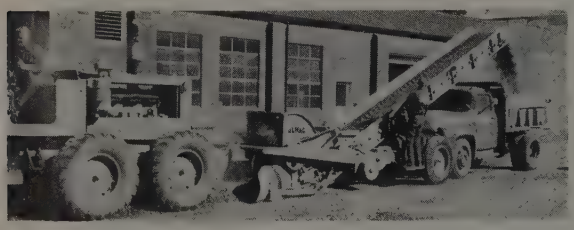
... for more details, circle No. 40 on Reader Service Postcard

NEW EQUIPMENT

Obtain more information on these new developments in construction equipment by circling the corresponding numbers on reply postcard.

Multi-purpose belt loader

A new belt loader which does a variety of jobs including windrow loading of loose material, stripping top soil in place, trenching out for road widening and snow and leaf removal is announced by **Ulmac Equipment Co.** The unit, U300, is designed as an auxiliary attachment for Caterpillar motor graders. A simplified hitch design with hydraulic jack mech-



anism permits hookups to be made in less than a minute. The conveyor is 36 in. wide, powered by a 56-hp. Wisconsin engine, through a positive mechanical drive. Discharge height ranges from 11 ft. 9 in. to 14 ft. 6 in. permitting over-the-cab loading of 10-ton tandem trucks. The relatively low slope of the conveyor provides high capacity operation. Conveyor is loaded by a rotary feeder with self-cleaning blades, flanked by curved gathering wings. Conveyor controls are placed on an operator's platform which provides full visibility of the operation. Literature available.

. . . Circle No. 171

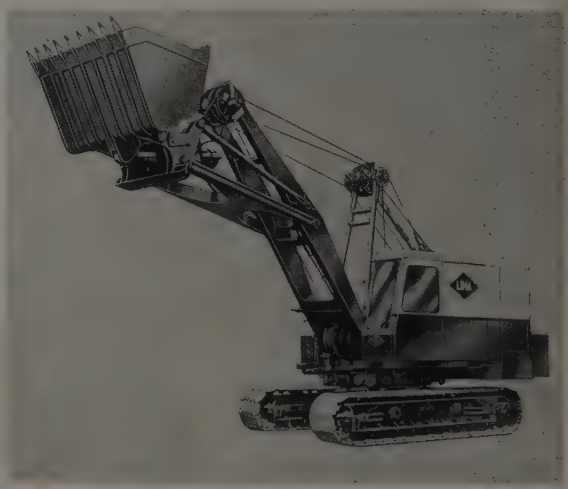
Truck line features wet sleeve engines

Three new 6-cylinder gasoline engines with wet sleeve construction are featured in the new truck line announced by **Diamond T Motor Company.** The new conventional gasoline powered models are designed for service varying from medium-duty to heavy, off-highway use. The engines are rated at 145, 170 and 185 hp. The wet sleeve construction provides a precision engine which has replaceable cylinder sleeves of costly alloys, machined inside and out with an accuracy impossible to obtain in the old fashioned bored-out block. The alloy steel sleeves last longer and have a lower rate of wear than old style cylinder walls. They also provide uniformity of heat transfer, have no porous spots, no thin spots, and no distortion. Rebuilding these engines can be done by simply removing the sleeves, cleaning the block and replacing with new wet type cylinder sleeves and piston assemblies. The block is not rebored and no oversize parts are used. The Diamond T trucks also feature the company's new "R" cab which provides better visibility, improved ventilation and heavier construction. Tandems with various combinations of Eaton-Hendrickson and Timken suspensions are offered. The three truck models are designated 534, 634 and 734 R. Gross vehicle weight ratings for the 6-wheelers go as high as 46,000 lb. All models are now in production.

. . . Circle No. 172

5-yd. loader on crane unit

A basic Lima type 64 crane unit now has a 5-yard loader which enables it to dig and load from the same spot. The new loader version has been introduced by the **Construction Equipment Division** of **Baldwin-Lima-Hamilton Corp.** The two outstanding features of the new machine are a long (9-ft., 10-in.) horizontal movement of the bucket and a 360-deg. swing. These advantages permit the bucket to dig into an embankment or stockpile fill completely and swing to any point of the compass for dumping without moving the crawler chassis. By eliminating the need to maneuver the entire machine for doing digging and loading operations, the Lima loader speeds loading of materials into trucks, reduces travel wear and lowers fuel consumption. The bucket of special design has a maximum dumping height of 16 ft. 10 in. and an 18-ft. radius. It has hydraulic operation and tilts to



simple
tie
installation...

secret of FASTER CONCRETE FORMING

SECONDS
TO INSTALL
UNI-FORM TIE
AND ASSEMBLE PANELS

1. UNI-FORM Tie Loop placed in square tie hole of Panel.

2. Tie Key set into the Tie Loop. Panel and Tie are now locked together into integral unit.

3. Next UNI-FORM Panel is placed in position. Tie Loop automatically enters square tie hole. Key is dropped in—assembly is complete. NO COMING BACK TO "FISH" TIES.

When you can tie and lock two concrete form panels in a few seconds, you're forming concrete fast! This is exactly what you can do with the UNI-FORM Panel System—the fastest system of forming concrete ever developed.

Faster tieing is only one of many UNI-FORM Panel features that makes them *the* pre-fab forms contractors are using on every kind of concrete construction. Write for the UNI-FORM Panel System Catalog and full details . . . or, call your nearby Universal Distributor or Branch Office for personal attention immediately.

UNI-FORM PANELS ERECT INTO A TIGHT, RIGID, AUTOMATICALLY ACCURATE CONCRETE FORM

1. Ties spread, lock UNI-FORMS into a form with automatically accurate wall thickness.
2. Steel frame provides structural strength and rigidity. Minimum alignment and bracing.
3. Best Exterior Grade Plywood face provides nailing surface. Easily turned for further reuses.

"Products from the Gold Tool Room"

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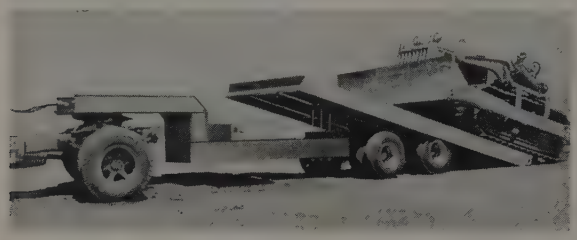
. . . for more details, circle No. 41 on Reader Service Postcard

an angle of 52 deg. from vertical. The basic Lima type 64 machine is quickly convertible to shovel, crane, dragline or pull shovel. A choice of gasoline or diesel powered as well as long or short crawlers can be furnished as required. Main and auxiliary machinery is air controlled for greatest precision. It has a large diameter hoist crown, swing and propel clutches and independent boom hoist with engine controlled boom lowering. A torque convertor is standard equipment on the type 64. Specifications and literature available. ... *Circle No. 173*

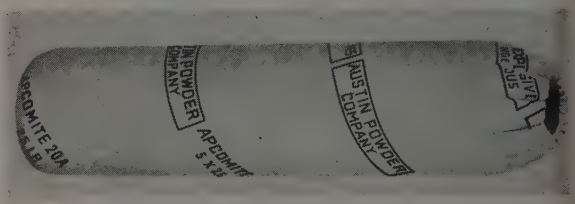
22-ton tilt deck trailer

A tilting platform riding over the wheels of a conventional low bed type trailer is announced by **Miller Tilt-Top Trailer, Inc.,** for handling heavy construction equipment up to 44,000 lb. gross weight. The semi-tilt trailer unit is designated "OTS." It includes an extra low completely flat over-the-wheels platform which eliminates the beaver-tail type of platform with its over-the-hump loading. It incorporates a separate tongue-frame which pivots the platform far back near the rear wheels. The tilting section is available in 8 x 16 ft. size or 8 x 20 ft. The stationary section adds another 4 ft. of length to either side. The company also manufactures 9 other models of tilting trailers in over-the-wheels or between-the-wheels designs. Prices for the 2 new units f.o.b. factory are $4,493.50 for the 16-ft. platform and $4,816.00 for the 20-ft. platform. ... *Circle No. 174*



Ammonium nitrate in tubes

Ammonium nitrate is now offered in ready-to-shoot tubes which need no extra priming. The new material is manufactured by **Austin Powder Co.,** and is known as Apcomite. It incorporates special processed ammonium nitrate with a primer and combines the low initial cost features of processed ammonium nitrate with the handling ease and controlled shooting of regular explosives. The primed material produces greater explosive power per foot of loaded blast hole and eliminates most of the shipping, storage and mixing problems. Apcomite is available in three types that are ready to load and ready to shoot. Apcomite 17 is for all normal usage while No. 20A, with greater density, is for wet holes. Both are furnished in 23G tubes in 5-in. and larger diameters. ... *Circle No. 175*



Dodge trucks have hinged fenders

Front fenders hinged to the radiator housing which swing out 110 deg. highlight the 1960 line of **Dodge** trucks. Among the features of the 140 basic models offered in the new line is a new cab forward design which will permit operators to pull 40-ft. trailers in states permitting 50-ft. overall length. The new cab

with its swing-out fender feature is said to eliminate need for tilt cabs in many applications. Gross vehicle and combination weights have been increased as much as 4,000 lb. and gross combination weights have been boosted as much as 11,800 lb. to a total of 76,800 lb. Five new V-8 gasoline engines are offered in a horsepower range of 217 to 228 and four Cummins diesel engines are now available for high tonnage trucks. Diesels are available with or without turbo charger. The line will offer several heavy-duty transmissions, newer and stronger heat-treated frames, durable new clutches, oil coolers and aluminized mufflers are included.

. . . Circle No. 176

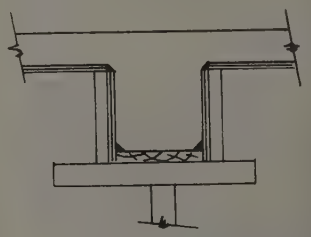
Bridge rails with built-in lights

An aluminum highway railing that contains General Electric fluorescent lamps for roadway lighting is marketed by **Michael Flynn Mfg. Co.** Called Lupton Railight, it provides uniform, low-level lights focused directly on the road and offers savings in the initial cost, operation and maintenance. Rails are made in 6- and 12-ft. lengths. In cross sections they are roughly triangular with the apex down. 42-in. slots, 3 in. deep, are spaced at 2-ft. intervals to permit installation of fluorescent fixtures.

. . . Circle No. 177

Chamfer strip for forms

For fast placement and reducing the problem of grout leakage at champfer corners, **Universal Form Clamp Co.** has introduced a champ-

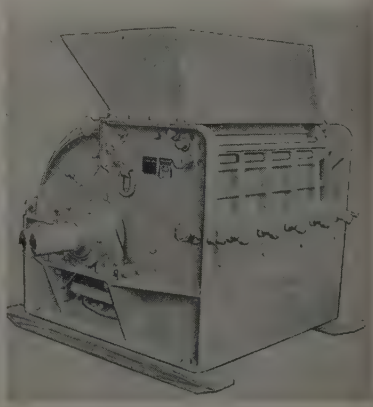


fer strip of special rubber extrusion. The material is of proper consistency and stiffness to provide flexibility and reuse. The use of the new strip as an aid in forming beams and columns is illustrated in the drawing.

. . . Circle No. 178

Giant hammermill

Iowa Mfg. Co. announces its largest hammermill, Cedarapids Model 5040 with a 50 in. wide feed opening and 40-in. hammer arc. It consists of a heavy-duty chrome nickle-steel shaft and bearings, a main frame of heavy rolled steel plate. Breaker plate is a 1-piece manganese casting. It is reversible and can be adjusted to the correct angle. The hammer tips are replaceable. They can be turned for



. . . for more details, adv. opp. pg., circle No. 45 on Reader Service Postcard →

65-ton MC-760 spots 84-ft. long pipe with 78-in. diameter with pinpoint accuracy. Only ¼-in. tolerance is permitted for welding. Moto-Crane moves to new location every hour.

8 LORAINS LAY 7 MILES OF TRIPLE CONDUIT FOR $7½ MILLION ST. LOUIS WATER LINE

Louis will get 240 million gallons of Mississippi water lay—two-thirds of its needs—through this new water line nning south from Chain of Rocks Station. General Con- ctor for the job is Fred Weber Construction Company of Louis—a nine-time Lorain owner.

ading 84 foot sections every 15 minutes. At the lding yard, Moto-Cranes position 78-in. diameter pipe for aning and welding. Lorain's precision boom lowering, oy-Stick" air controls and fast-acting "Power-Set" out- gers make this output possible.

Pipeline moves ahead at rate of 750 feet a day. William Brothers Construction Company of Tulsa is in charge of pipe laying. They use Lorain Moto-Cranes to position three pipe lines to be lined with concrete and encased in a 21-ft. 6-in. by 7-ft. 6-in. concrete envelope. Twenty-nine Lorains have paid off for this outfit.

There are many more modern Lorain advantages that can help you on your jobs. See your Lorain distributor for all the facts.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

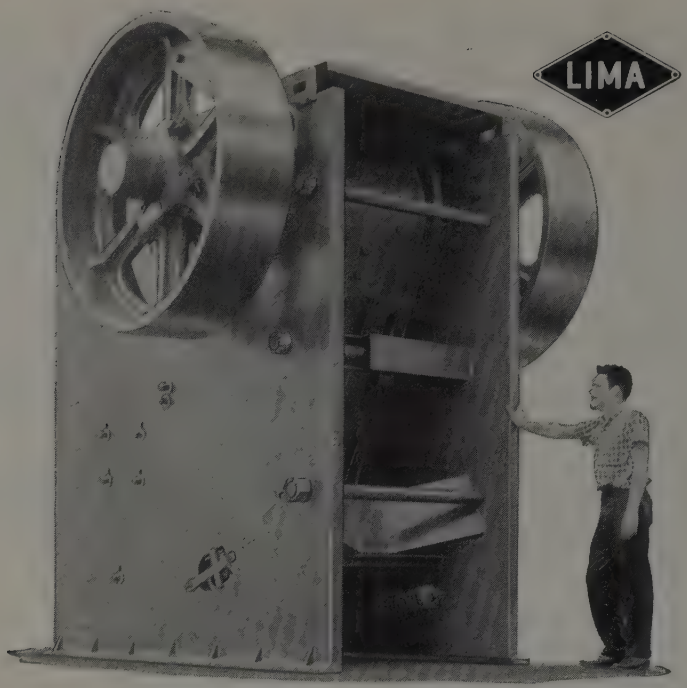
35-ton MC-530W with 70-ft. boom and clamps eases 42-ft. pipe sections onto rack in welding yard where they are welded into 84-ft. lengths. These are loaded out at the rate of 32 a day.

70% increase in production at the cleaning and welding yard is credited to Lorain "Power-Set" outriggers. Less than one minute to set—versus 45 to 60 minutes for conventional outriggers —makes the difference. There are Lorains with "Power-Set" outriggers on this project.

LORAIN®

ON THE MOVE

ANDREWS EQUIPMENT SERVICE
Spokane, Wash.
ATLAS EQUIPMENT COMPANY
Salt Lake City, Utah
CENTRAL MACHINERY CO.
Great Falls, Havre and Lewistown, Mont.
COAST EQUIPMENT CO.
San Francisco 3, California
GENERAL EQUIPMENT CO.
Reno, Nevada
HATTEN MACHINERY COMPANY
Seattle 4, Washington
INTERSTATE TRACTOR & EQUIPMENT CO.
Portland and Eugene, Ore.
MOUNTAIN TRACTOR CO.
Missoula and Kalispell, Mont.
NASH-DAVIS MACHINERY CO.
Billings and Bozeman, Mont.; Greybull, Wyo.
LEE REDMAN EQUIPMENT CO.
Phoenix, Arizona
SANTA FE EQUIPMENT CO., INC.
Los Angeles and San Bernardino, Calif.
SOUTHERN IDAHO EQUIPMENT CO.
Idaho Falls, Boise and Twin Falls, Idaho
TRACTOR & EQUIPMENT CO.
Sidney, Miles City and Glasgow, Mont.
YUKON EQUIPMENT INCORPORATED
(For Alaska) Seattle, Wash.
Fairbanks, Anchorage and Ketchikan, Alaska



Lima Austin-Western Model 4248 overhead eccentric roller bearing Jaw Crusher

Lima A-W 42x48-in. Jaw Crusher produces more rock for less

Speed up crusher output with giant Lima Austin-Western 42 by 48-in. overhead eccentric roller bearing Jaw Crusher. Quality built to outperform! Oversized shafts and roller bearings for extra strength and durability. Extra-deep jaws of tough manganese steel form smaller, sharper and more efficient crushing angle.

main frame is practically unbreakable. Low alloy, high strength 3-in. steel plate gives frame tremendous strength in proportion to its weight.

flywheels are heavy castings, precision machined to proper balance. Split-type hubs simplify flywheel removal. Flywheels are key-locked into place, can't back off in operation.

pitman and shaft assembly can be easily removed through crusher frame top. Cartridge-type housing holds assembly in place, eliminates possibility of loose bearings.

bearings—Both main and pitman bearings are oversized and self-aligning to permit some shaft deflection, and deviation is minimized by locating the bearings close together. Frame absorbs part of shock load as main bearing center lines are within sides of main frame. Bearings are protected by a simple-type steel labyrinth seal which resists entrance of dirt and seals in lubricant. Bearings may be easily removed by use of a hydraulic system furnished with this model.

capacity—What the Model 4248 can do for you may be seen from the fact that it handles 240-360 tons an hour when set at 5-in. discharge opening; estimate based on 2700 lb. per cu. yd.

Lima Austin-Western also produces a complete line of crushing and screening equipment and portable and stationary plants. Other smaller sizes of roller bearing jaw crushers are also available.

Profit from our 73 years' experience manufacturing jaw crushers and equipment for pit and quarry. Engineered and built to *produce more rock at less cost!* See your Lima Austin-Western distributor now or write us for free bulletin.

Edward R. Bacon Company, San Francisco, California; **Columbia Equipment Company,** Portland, Oregon, Seattle, Washington, Spokane, Washington; **N. C. Ribble Company,** Albuquerque, New Mexico; **Western Machinery Company,** Salt Lake City, Utah, Idaho Falls, Idaho, San Francisco, California; **Keremi Tractor & Equipment Company,** Cheyenne, Wyoming, Casper, Wyoming; **A. H. Cox & Company,** Seattle 4, Washington; **Inland Diesel & Machinery Co.,** Spokane, Washington; **Engineering Sales Service, Inc.,** Boise, Idaho; **Macdonald Equipment Company,** Denver, Colorado; **Graid Equipment Company,** Reno, Nevada; **Western Machinery Company,** Phoenix, Arizona, Tucson, Arizona; **Seitz Machinery Company, Inc.,** Billings, Montana, Great Falls, Montana; **Smith Booth Usher Company,** Los Angeles 54, California.

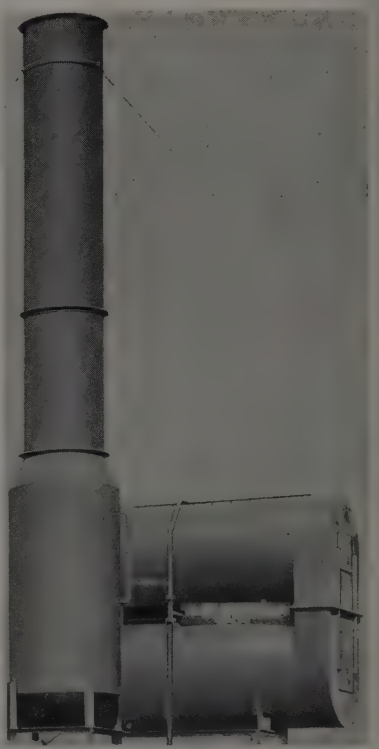
LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment
BALDWIN · LIMA · HAMILTON
CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO
5931

. . . for more details, circle No. 46 on Reader Service Postcard

6 wearing positions to hold gradation control. Grates are sectional manganese steel castings. Size of finished product is easily controlled by moving the breaker plate closer to the hammers for finer products—when additional size reduction is required a grate with narrow openings between the bars is used. The Model 5040 is equipped with the standard 3 rows of hammers. For special conditions where material is abrasive this unit can easily be changed to a 2-row hammermill with or without grates as desired. *. . . Circle No. 179*

Dust control unit

A dust control unit for asphalt plants which cleans exhaust gases within the strictest air pollution limits is announced by **Bollard Asphalt Plant Divn. of Colonial Iron Works Co.** The new Bollard dust washer can be added to any make asphalt plant or used to supplement any dry primary collector. Action of the unit includes baffle, spiralize and scrub. Baffling serves to delay and change exhaust flow direction aiding separation of particles. Sprializing is a forced swirling motion which throws particles to impinge on wet surfaces. Scrubbing is a series of interlaced adjustable water spray patterns to fil-



ter out particles from swirling gas. Continual downward flushing of internal surfaces by scrubbing water renders the unit self cleaning. Three models are available in capacities ranging from 16,000 to 65,000 cfm. The units can be mounted at grade or on elevating support structure and engineered by the manufacturer to adapt to existing plant installations. Water pumps included have an output of 150 to 300 gmp. at 125 psi. with strainers for recirculation of water from reservoir. Units are completely shop assembled for proper fit and minimum field installation time and costs. *. . . Circle No. 180*

Sleeping coach for pickup truck

A light-weight, aluminum coach body which mounts on any pickup truck, provides galley and sleeping quarters for three people, is marketed by **Coons Custom Coach Mfg. Co.** These trailer-like structures are built of kiln dried pine covered

with aircraft aluminum, painted to match the truck color. They are fully insulated for summer or winter. Interiors are finished in birch and include complete galley with self contained water system and ice box plus dining area and sleeping arrangements for three.

. . . Circle No. 181

Two new IH engines

Construction Equipment Division of **International Harvester Co.,** has announced two new 6-cylinder, heavy-duty carbureted engines. The units are the UB-261 with 264-cu. in. displacement and 153 hp. and the U-220 with 220-cu. in. displacement and 112 hp. Both weigh 810 lb. The valve-in-head engines have down-draft carburetion for higher efficiency. Among the features are a fully counterbalanced crank shaft, aluminum alloy pistons, gear-driven camshaft and 12-volt electrical systems. They have ball-bearing, self-feeding, water pumps, thermostatic by-pass temperature controls, easily accessible spark plugs and distributor, convenient overhead valve adjustments. *. . . Circle No. 182*

Blacktop spreader attachment

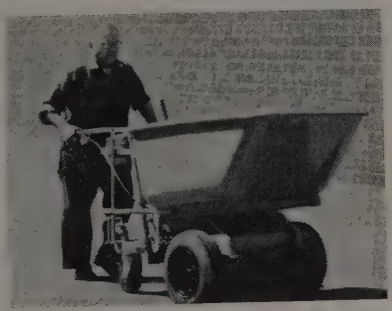
A blacktop spreader attachment has been announced by **Massey-Ferguson, Industrial Divn.** for its Work Bull 1001 tractor shovel. The easily installed spreader can handle hot or cold asphalt or oil mix with aggregate ranging up to a maximum ¾-in. size. It is particularly suitable for patching jobs or paving alleys, driveways or parking

lots. The spreader operates off the tractor's hydraulic system through its own hydraulic motor. It has independent hydraulic controls for each phase of operation. The unit rides on its own automatic tires with hydraulic height adjustments and offers high maneuverability in surfacing congested areas and odd shaped locations. The hopper has a capacity of 2 cu. yd. and can be adjusted to spread any width up to

8 ft. and any thickness to 6 in. Reversible twin augers are employed to clean hopper and assure an even spread. Standard equipment includes a screed ironing pad. A butane heater is available as optional equipment. . . . *Circle No. 183*

Power buggy carries 1,500-lb. load

The BG-10 Power Buggy available with either a 10-cu. ft. bucket or flat pallet has been announced by **Aeroil Products Co. Inc.** The



new model will carry a 1,500 ton payload. It features a dead-man brake, 4-wheel stability and is only 31 in. wide, permitting it to be used on building construction where passage through doorways is necessary. Literature available.

. . . *Circle No. 184*

Concrete hopper for lift truck

Koehring Company's Kwik-Mix Divn. announces a concrete hopper available as an attachment for its Hi-Lifter fork truck. The hopper is available in ½ and ¾-yd. sizes.

The attachment is a fork-entry unit that slips on easily over the forks. Hopper is heavy-duty, all steel welded unit that features fast discharge through its steep, angled body. The door is operated by a lever so that it can be closed for partial discharge. The unit weighs 580 lb. . . . *Circle No. 185*

Trencher teeth

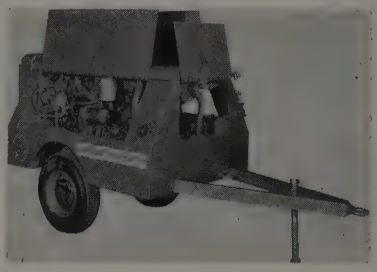
A line of reversible forged steel teeth has been marketed by **Petersen Engineering Co.** under the brand name of Pengo Wisdom Tooth. The quick-change forged steel teeth have long wearing life and abrasion resistance. Shanks are so designed that there is a smooth surface all along the path of the

shank into the bucket avoiding horsepower consuming shoulders. They are available for both small and production size machines.

. . . Circle No. 186

Compressor redesigned

Gardner-Denver Co. announces a new model of its 125 CFM portable rotary air compressor. Horsepower has been boosted 15% and Thrift-



meter Control automatically regulates engine speed to meet air demand for economical operation. The model RP-125 features anti-blowback suction unloading valves and a larger toolbox.

. . . Circle No. 187

Light-weight flatbed trailer

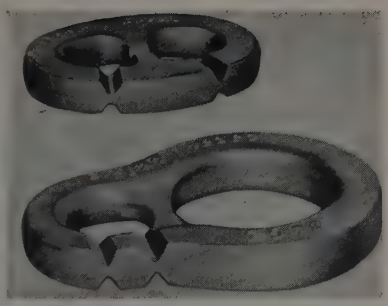
A 35-ft. tandem axle flatbed trailer, weighing only 10,500 lb. is announced by **Talbert Trailers, Inc.** The unit has a payload ca-

pacity of 50,000 lb. and features structural wide flange construction on main frame members. The unit is designated TF25-35.

. . . Circle No. 188

Links speed chain repairs

A line of notched chain links which can easily be cut apart and rewelded to repair dragline chains is offered by **The Page Co.** Called



Kwik-Weld, the units are available in end links, pear shaped end links, ring and center repair links. The thin section of the link is easily cut, removed and hooked into the chain. Placing the lug back into place and welding with a low hydrogen rod provides a permanent chain repair without rivets, bolts or pins. The smooth repair link is as strong if not stronger than the original unit. An AWS class 7018 rod is used. Stainless steel rods are not required.

. . . Circle No. 189

Backhoe loader attachment

A tractor-mounted combination backhoe and front-end loader for use with Ford Industrial and Fordson Power Major wheel tractors is marketed by **Sherman Products, Inc.** The loader and backhoe share a common sub-frame and common hydraulic system which provides enough power to operate both pieces of equipment simultaneously. The Sherman loader has a breakaway capacity at bucket lip of 5,000 lb. and a full lift capacity of 2,500 lb. on one group of Ford and Fordson tractors and a breakaway capacity of 4,000 lb. and lift capacity of 2,000 lb. on a smaller group. The bucket lifts to 10 ft. 8 in. and dumps at a maximum of 8 ft. 10 in. The Sherman powerdigger has a pivot arc of 188 deg. and a reach of 18 ft. at grade and 12 ft. below grade. The digger will detach completely from the tractor

in 2 min. and has an available digging force of 19,250 lb. Both loader and digger utilize the same heavy duty sub-frame. Its channel type construction provides additional rigidity and aids in equalizing digging and loading stresses throughout the tractor. *. . . Circle No. 190*

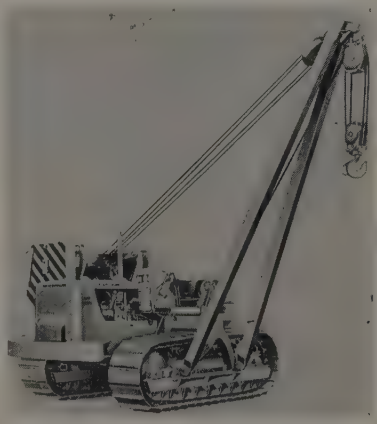
Throw-away drilling bit

A low cost dust collecting drill bit which can be thrown away when dulled has been introduced by **Le Roi Division, Westinghouse Air Brake Co.** Available in three

sizes from 1⅜ to 1⅝ in. the bits are of the cross type 5-hole design. They can be used interchangeably on the same ⅞-in. steel with Le Roi's all-steel one-use bits. A CRD 875 shim, also interchangeable for all 3 bit sizes, is used for easy removal. The new bits can be utilized with any stopper, air leg or hand sinker drill that uses the dust collecting principle. *. . . Circle No. 191*

Pipelayer has turbocharger

A new model of the No. 572 Series D Pipelayer equipped with a turbocharged engine which brings its flywheel horsepower to 140 has been announced by **Caterpillar Tractor Co.** Winch speeds on the

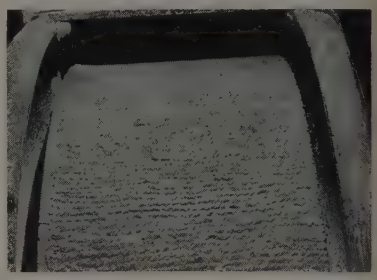


new model have been increased for faster pipelaying. Other new features include pressure lubricated bearings, oil spray gears and full flow filtration. Lifetime lubricated track rollers, carrier rollers and idlers are standard on this model. A dry type oil cleaner replaces the conventional oil bath.

. . . Circle No. 192

Hardfacing electrode

A manual tubed electrode for general purpose hardfacing is announced by **American Manganese**



Steel Divn. of American Brake Shoe Co. The new Amsco 53 rod features a stable, low-spatter arc with smooth running, outstanding speed and excellent build-up. Specially alloyed for use where both impact and abrasion are a problem —it has proven excellent on crusher rolls, hammermills and dipper teeth. *. . . Circle No. 193*

Simplified conveyor erection

Only 8 bolts are required to join each 12-ft. intermediate section of the new **Stephens-Adamson** sectional belt conveyor. In a recent installation a 170-ft. long belt conveyor was quickly installed by bolting three of the 12-ft. sections together on the ground and hoisting them

into place on supporting frames as a unit. The complete conveyor head and tail sections with drive motor, speed reducer, curve crown pulleys, bearings and belt cleaner were installed with the same setup simplicity. The unit is powered by 15-hp. motor, has a 24-in. wide belt and moves approximately 345 tons per hour. *. . . Circle No. 194*

Low cost form hardware

A line of moderately priced hardware for concrete form panel assembly is announced by **Rocform Corp.** Called Rocform Adapt-A-

Clamp, the new hardware eliminates use of walers. Rigid panels are maintained by permanently attached metal reinforcing channels and panels are connected by wedge-shaped clamps which are fastened and locked with a single hammer blow. The system is designed for use with the company's tapered tie-rods but may be modified for use with other types of ties.

. . . Circle No. 195

Small tractor shovel

A small 1-yd. Michigan tractor shovel has joined the five larger models which make up the **Clark Equipment Company's** line of loaders. The new unit has 4-wheel drive

and all other big machine features including the Michigan power train. The model 55A has a 66.5-hp. gasoline engine and a working weight of 10,500 lb.

. . . Circle No. 196

D8 replacement parts

Five new undercarriage components for **Caterpillar** D8 tractors are available as replacement parts which offer as much as 44% greater wear life. Components include new track hardware with 33% greater strength; Boralloy replacement rims with 25-tooth design, using only 13 teeth on each revolution and thereby extending wear life nearly 50%. *. . . Circle No. 197*

News of DISTRIBUTORS

New distributor organized

A new equipment firm, Machinery Supply Inc., has been organized as a subsidiary of H. C. Shaw Co., Stockton, Calif., to serve the construction industry. H. C. Shaw Co. will continue to handle farm equipment and implements while its construction machinery will be channeled through the new firm, with locations in Stockton and Santa Ana, Calif.

Among the lines handled by Machinery Supply is the Seaman-Andwall Corp. Sta-Bilt line of Pulvi-Mixers, compaction equipment and other road construction machines.

Additional accounts and men by Cox

With the addition of eight important construction equipment lines, A. H. Cox & Co. has taken on four new men. E. E. Dionne, president of the Seattle distributorship announces that Charles Kerr has

E. E. Dionne

joined the firm as head of the Asphalt Paving and Crushing Equipment Department, and will be assisted in sales by Don Pepple. Jack Cox is employed in the parts department, and Ed Chandler is in the service department. All four men were with Columbia Equipment Co., which recently liquidated its stock and closed its three offices in the Northwest. Fifty-five years of experience with asphalt paving and crushing equipment are represented by the four men.

The new lines acquired by Cox are: Barber-Greene asphalt equipment; Baldwin-Lima-Hamilton line of Lima-Austin-Western crushers; Clark paving forms; Galion graders and rollers; Miller spreaders, Curbilders and asphalt paving accessories; Racine Hydraulics' Raypak compactors; Simplicity screens, and Tractor Spreader Co.'s Jersey spreaders.

Totem announces two new lines

Distribution of the Gradall and Hopto, two well known units of contractors' equipment manufactured by The Warner & Swasey Co., is now handled by Totem Equipment Co., Seattle. According to Robert E. Vadnais, president of Totem, acquisition of these accounts further implements the company's continuing program aimed at better serving the needs of the construction industry around Seattle.

Phil Sanford joins Hamilton Eng.

Philip Sanford is now representing Hamilton Engine Sales, Inc. as salesman in the eastern Oregon territory. He is stationed in Pendleton. Sanford was for seven years with the former Columbia Equipment Co. in Portland.

Air-Mac adds Ditch Witch trencher

Air-Mac, Inc., Seattle, announces the addition of the "Ditch Witch" line of trenchers manufactured by Charles Machine Works, Perry, Okla.

Personnel changes at Western Construction Equipment

J. Walter Mitchell has been named parts and service manager for the Great Falls, Mont., Division of Western Construction Equipment Co., which is managed by D. W. Doolen. Mitchell had been parts manager at the same location. Leonard J. Albrecht, who has been a service representative out of Great Falls for the past four years, has been assigned to the western Montana territory as a sales representative. He will cover the Missoula-Kalispell area, and will continue to reside in Great Falls.

New man; road machinery added

John C. Burke has been employed by Machinery Supply, Inc., Stockton, Calif., as district manager for Northern California. Previously Burke was selling for West Coast Engineering & Equipment Co. out of the San Jose store.

Machinery Supply was recently appointed exclusive distributor for the Seaman-Andwall line of Sta-Bilt road machinery in California, with outlets located at Stockton and Santa Ana.

Halton housed at new location

Facilities have been completed and business is now being conducted at the new 50,000-sq. ft. plant of Halton Tractor Co., 4421 N. E. Columbia Blvd., Portland, Ore. The new plant replaces smaller facilities occupied by this Caterpillar dealer for the past three years. Halton Tractor Co. also maintains complete sales, parts and service facilities at Salem and Astoria, Ore., and at Longview, Wash.

R. B. George heads Arizona Equipment Distributors Assn.

Robert B. George, Arizona Operations Manager of Western Machinery Co.'s Industrial Sales Division at Phoenix, was recently elected president of the Arizona Equipment Distributors Association. He succeeds Harold R. Bone of Road Machinery Co., Phoenix.

Earl Lane named regional Hy-Hoe rep

Announcement is made by Elmer Mrozek, president of Hydraulic Machinery Co., Waukesha, Wis., of the appointment of Earl W. Lane, Stockton, Calif., as regional representative for Nevada, Arizona, California, Oregon, Washington, Utah and Idaho. The company manufactures the Hy-Hoe, a new type of truck-mounted back-hoe. Lane was formerly assistant general sales manager of the Ferguson Division of Massey-Harris-Ferguson, Inc., and more recently in charge of the Stockton branch.

William Keely ties up with Industrial Vibrator & Mchy. Co.

William E. Keely has joined Industrial Vibrator & Machinery Co., San Francisco, as a company sales representative.

Staff members at Brown-Bevis branch

Employed at the Riverside, Calif., branch of Brown-Bevis-Industrial Equipment Co., under the management of C. D. Chase, are these key men: Glyn McCook, sales manager;

W. B. Wicker, office manager; W. P. Ryan, parts manager, and W. R. Olson, service manager. Headquarters of the company are in Los Angeles.

Bill Nosler elevated to vice presidency

Layton K. "Bill" Nosler of Eugene, Ore., has been elected vice president of Interstate Tractor & Equipment Co., in charge of the Eugene store operations, according to announcement by Collis Johnson, president. Nosler began his career with this heavy equipment firm in 1943 at Portland. He moved into management in Eugene in 1953.

Aztec Equipment gets Curtiss-Wright account in Arizona

Aztec Equipment Co., Inc., Phoenix, Ariz., has been selected as a distributor by the South Bend Division of Curtiss-Wright Corp. for its complete line of construction machinery. The firm will provide complete sales, parts, shop and field facilities for the Curtiss-Wright entire line of construction machinery for the state of Arizona.

Seattle AED headed by Dionne

E. E. Dionne of A. H. Cox & Co., Seattle, took over as president at the first fall meeting of the Associated Equipment Distributors of Seattle. He succeeds Austin Campbell who served as president during the past year.

New account and salesman

Announcement is made by K. P. Heiner, president of Heiner Equipment & Supply Co., Salt Lake City, Utah, of the acquisition of the shovel, crane and back-hoe line manufactured by Little Giant Crane & Shovel, Inc. Also announced is the recent employment of W. Roy Munro as a sales representative.

Harkey and Newell win trip

Guy Harkey, vice president and general manager, and Tilton Newell, sales manager of Pacific Tractor & Implement Co., recently visited London, Paris and Rome, together with their wives, as guests of Ford's Tractor & Implement Division. The men won the trip in a recent Ford national sales contest. With headquarters in Richmond, Calif., Pacific Tractor & Implement Co. is distributor of Ford tractors in Northern California and the western part of Nevada.

Euclid schedules service schools

Announcement of additional dates is made by the Euclid Division of General Motors Corp. for its series of courses covering preventive maintenance, trouble-shooting, repair, and rebuilding of major components used on Euclid earth-moving equipment. Two schools are scheduled to be held in the West early in the new year. The classes are open to all Euclid owners, operators and service personnel.

In the Pacific Northwest, the school will be held at the General Motors Training Center in Portland, Ore. There will be four separate courses. The opening session, Jan. 18-29, will cover overhung scrapers; followed by session on 27-ton rear-dumps, Feb. 1-5; a 1-week course on the new C-6 crawler tractor, Feb. 8-12; with the closing session, Feb. 15-27, devoted to both the C-6 and the TC-12 crawler tractors. Further details may be ob-

tained from Interstate Tractor & Equipment Co., Portland and Eugene, Ore.; Intermountain Equipment Co., Boise and Pocatello, Idaho; and Spokane, Wash.

Later, six separate courses will be held for the Mountain States area. These will be given at GMC Training Center in Denver, Colo., on the following dates: Mar. 7-18, overhung scrapers; Mar. 21-Apr. 1, rear-dumps; and the closing sessions will be four 1-week courses covering the C-6. Detailed schedules and complete information can be had by contacting any of the following Euclid distributors: Archer Tractor & Machinery Co., Salt Lake City, Utah; Colorado Builders Supply Co., Denver, Colo.; Hall-Perry Machinery Co., Butte, Mont.; Intermountain Equipment Co., Boise and Pocatello, Idaho, and Spokane, Wash.; Lively Equipment Co., Albuquerque, N. Mex.; and Min-A-Con Equipment Co., Phoenix, Ariz.

MANUFACTURERS

Important appointments by Allis-Chalmers

Allis-Chalmers Manufacturing Co. announces three key appointments. James A. Scoggin is named to the newly created position of general service manager of the Construction Machinery Division. He was in the engineering department of the Tractomotive Corporation at Deerfield, Ill., when A-C acquired Tractomotive last June and he continued as Deerfield Works sales and service manager. J. T. Skinner is appointed sales manager, Deerfield products, while Francis C. Schessler has been made his assistant. These men also came to A-C with the acquisition of Tractomotive.

Yuba Consolidated Industries, Inc., making his headquarters at Yuba Engineering and Marketing Development Center in Palo Alto, Calif. Gardner was formerly chief engineer of Griscom-Russell Co.

Chapman Valve purchased

Crane Co. of Chicago has purchased all properties and assets of The Chapman Valve Manufacturing Co. at Indian Orchard (Springfield), Mass. Now a wholly-owned subsidiary of Crane, Chapman's present management and executive staff, headed by C. Goodwin Carter, is being retained.

W. W. Mein, Sr., elected to Flintkote Co. board

Wm. Wallace Mein, Sr., chairman of the board of Calaveras Cement Co., San Francisco, was elected to the board of directors of The Flintkote Co. at a special meeting of Flintkote stockholders held in Boston to vote on merger of the two companies. Under terms of the recent merger Calaveras becomes a division of Flintkote. Calaveras has a portland cement plant at San Andreas, Calif., 130 miles northeast of San Francisco with an annual capacity of 4,300,000 bbls.

A THIRTY-YEAR milestone with the Hyster Company was recently marked by *Art Alexander*, district tractor equipment representative for California, Nevada, Utah, southern Oregon, and Hawaii. Here, *Philip S. Hill* (left), executive vice president, affixes Alexander's 30-year pin. The Hyster Company celebrated its thirtieth anniversary earlier this year.

Plant expansion by Yale & Towne

The Yale & Towne Manufacturing Co. is constructing an addition to its Batavia, N. Y., plant, which when completed will increase substantially the rate of production of its Trojan rubber-tired tractor shovel line.

Dave Collins moves to Chicago

H. D. "Dave" Collins, manager of The White Motor Co.'s Portland, Ore., branch since 1953, has been appointed manager of White's Chicago branch. K. P. "Ken" Strother takes over Collins' vacated post at Portland.

Universal forms subsidiary

Formation of a subsidiary company, Universal-Liebherr, Inc., is announced by Universal Manufacturing Corp., Zelienople, Pa., which manufactures Ezebilt tubular steel scaffolding and American tubular towers. Universal's vice president, B. W. Carbeau, has been elected president of the new company formed to handle sales of the giant German-made Towercranes in this country. This type of crane is being introduced to the U. S. construction industry for the first time by the Universal-Liebherr organization.

Executive promotions by Jaeger

James D. "Don" Anderson has been named to the new position of vice president, sales, of The Jaeger Machine Co. In other executive promotions, this Columbus, Ohio, construction machinery firm has named John H. Apel as vice president, engineering, succeeding Arnold S. Milliken, retired; Bruce C. Behmer as treasurer, and Perry D. Schwartz as secretary, succeeding John M. Ulrich, retiring secretary-treasurer.

Dates for Cedarapids Maintenance Conference announced

The annual Cedarapids Maintenance and Operation Conference of the Iowa Manufacturing Co., will be held at Cedar Rapids in January. First initiated in 1946 as an additional service to customers and dealers, the conference offers practical information on all phases of maintenance procedures, preventive maintenance, and correct operating methods. The 1960 conference will be divided into three sessions: Jan. 11-15, aggregate producing equipment, for contractors and producers; Jan. 18-22 on bituminous mixing and paving equipment, for contractors and producers; and Jan. 25-29, service school for Cedarapids dealers and their service personnel.

Barber-Greene opens No. Calif. branch; M. C. Ham is manager

Opening of a branch office and warehouse in the San Francisco Bay Area is announced by Barber-Greene Co., manufacturer of asphalt plants, pavers, belt conveyors, ditchers, loaders, and other construction equipment. The new

Ham

Benson

facilities are located at 320 Victory Ave. in South San Francisco. Marshall C. Ham is branch manager. He has been with the company for many years, and since 1956 has been Western area sales manager. Ham will be assisted by E. L. "Shean" Benson, who will be a belt-conveyor engineering specialist. He has been associated with B-G since 1923. Barber-Greene's area office at San Mateo, Calif., is being closed and Service Manager Harry Jackson will transfer to the new branch building.

Stephen Wilson moves to new post with Atlas Powder

Named to the new position of field sales manager for Atlas Powder Co.'s explosives sales department is Stephen M. Wilson, Jr. Wilson has been a member of the Atlas organization since 1937. Most recently he was manager of its Eastern District in Wilmington, Del.

Personnel appointment by Vulcan

E. R. Evans has been elected vice president in charge of sales for Vulcan Iron Works Inc., Chicago, Ill., manufacturing engineers of pile-driving and extracting equipment.

Pittsburgh-Des Moines and Hammond join forces

Merger negotiations between the Pittsburgh-Des Moines Steel Co. and Hammond Iron Works have been completed. To be known as Pittsburgh-Des Moines Steel Co., the combined company will specialize in metal fabrication and construction, and will continue to manufacture the Hammond products.

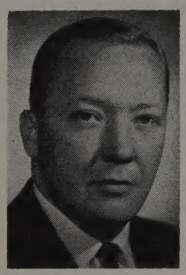
Black & Decker improves West Coast service facilities

The Black & Decker Manufacturing Co., maker of portable electric tools, has opened a new factory service branch at 1107 East 14th St., Oakland, Calif. The new company-operated service branch will supplement the San Francisco Branch and improve the service facilities in the Bay Area. Guy Nelson is service manager at the new branch, and Dan Morris at San Francisco.

Black & Decker also announces the moving of its Spokane, Wash., service branch to new quarters at 3025A East Mission St. Service manager here is Roger Mortimer.

Bros promotes Norgren to territory manager

George Norgren of Bros Incorporated, Minneapolis, Minn., has been appointed district manager for the Rocky Mountain Sales District, R. L. Wicker, general sales manager, announces. He will handle dealer sales training and customer relations for eight Western



George Norgren

states. The Bros line includes pneumatic-tired rollers, bituminous heating and handling equipment, tamping and vibratory rollers, soil stabilizers, and other equipment used in the construction industry.

K&M dedicates new headquarters

Dedication ceremonies marking completion of the first phase of a major expansion program by Keasbey & Mattison Co., manufacturer of asbestos, asphalt, and heat insulating products, were recently held with the formal opening of the company's new headquarters office building and research and development center at Ambler, Pa.

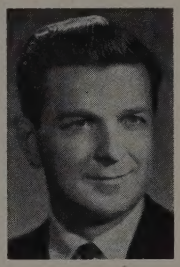
Changes in International Harvester regional sales posts

Concurrent with the appointment of two new regional sales managers in its Construction Equipment Division, International Harvester Co. has expanded its construction equipment sales opera-

tions from four to six regions, and reassigned some regional sales managers. In western United States, J. D. Gladden and P. D. Evans were named managers of the Southwest and Northwest regions respectively. Jack Bess continues as regional sales manager of the Western region.

Metal Forms appoints Bob Sawyer Western factory rep

Robert D. Sawyer has been appointed by Metal Forms Corp. as its direct factory representative for the state of California. He will supervise the sales and service of this company's complete line of



Robert Sawyer

steel forms for concrete construction, including curb, gutter, sidewalk and road paving forms; building, foundation, silo, tank and manhole forms. Sawyer, who has been associated with the construction equipment industry for a number of years, will headquarter his operations at 115 Garden Hill Dr., Los Gatos, Calif.

Aeroquip completes Western plant

Completion of a new plant expansion program at Aeroquip Corporation's Western Division, Burbank, Calif., is announced by Forrest F. Hinkley, vice president and general manager. The new 29,500-sq. ft. addition, part of a $2,400,000

Forest Hinkley

expansion program, brings the division's total plant area to more than 80,000 sq. ft. With company headquarters in Jackson, Mich., the Western Division serves the thirteen states west of the Rockies, specializing in hoses, self-sealing couplings, and a variety of rigid tubing assemblies.

Clark-Brown opens Seattle office; names representative

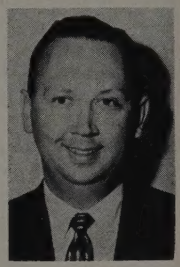
Brown Trailer Division of Clark Equipment Co. has established its seventeenth sales branch office at 831 Airport Way, Seattle, Wash. James Fake, Seattle area sales manager, will supervise branch operations from his office at the Division's Spokane plant. Bruce Worden has been appointed Division sales representative with headquarters in the new office.

Petrolite expands in California

The Pretolite Company of California division of Petrolite Corporation, manufacturer of Dehydro anti-stripping asphalt additives and other products, has started construction on a $2,000,000 plant at Brea, Calif. With completion set for mid-1960, the new facility will include an administration building, three laboratory buildings, and manufacturing facilities.

Sales appointments by ESCO

To meet the industrial growth of the San Francisco Bay Area, Electric Steel Foundry Co., Port-



H. P. Robb

land, Ore., has announced the appointment of Halle P. Robb as sales manager for all ESCO products in Northern California, Nevada, and Utah. W. R. "Bill" Rice was appointed as manager of sales of mill products. Don Erickson, sales representative, has returned as office manager of ESCO-San Francisco. Karl Moore, who has been serving as interim office manager, was named a sales representative.

Essick-Superior cement finishers

Distribution of Superior cement finishers under the new name of "Essick-Superior" was recently announced by Alden Watts, president of Superior Cement Tool Corp., and Bryant Essick, president of Essick Manufacturing Co. Sales headquarters for Essick-Superior are located at the Essick Manufacturing Co., 1950 Santa Fe Ave., Los Angeles, Calif.

Seaman-Andwall names Warner

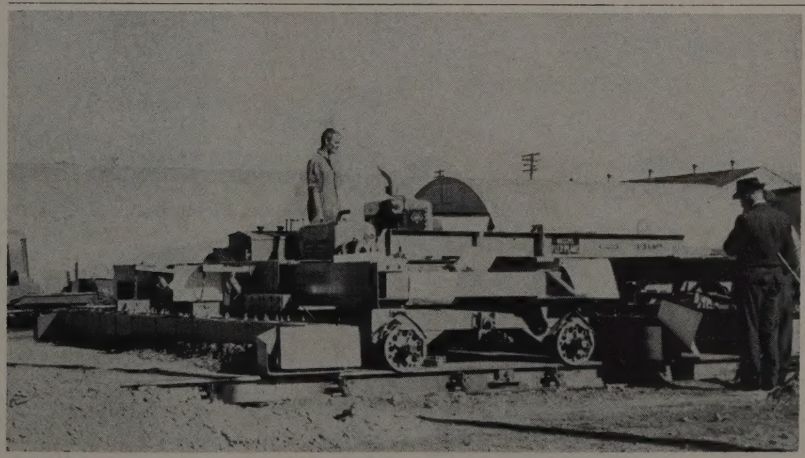
William J. Warner is the new district manager of Seaman-Andwall Corp., division of American Marietta Corp. for California, Oregon, Washington, northern Idaho, Montana, Alaska, and western Canada. His office will be in Menlo Park. Seaman-Andwall manufactures Pulvi-Mixers and other road construction equipment.

Calavar Corporation celebrates

Calavar Corporation, Los Angeles, recently celebrated the dedication of its new Engineering and Manufacturing Center in Santa Fe Springs, Calif., with a Gay Nineties festival. Guests, who represented all industrial markets, came from all parts of the territory served by the dealer and manufacturer of custom-engineered heavy-duty equipment.

New executive sales positions

Announcement is made of the promotion of John S. Hanse to National Trade Sales Manager-Tires of The General Tire & Rubber Co. Hanse, who has been Los Angeles division sales manager since 1955, succeeds L. L. Higbee, who voluntarily left the trade sales post to become the company's Western regional sales manager. Earl H. Schaub succeeds Hanse as Los Angeles division sales manager. In moving into General's Akron headquarters to assume his new duties, Hanse is making his fourth sales executive advancement.



WEST COAST ENGINE CO. DEMONSTRATES FLOAT-FINISHER

Flexplane float finisher paved a 24-ft. "highway" in the equipment yard of West Coast Engine Co., Berkeley, Calif., during a demonstration staged by the distributor for Western contractors and engineers. Operating on Heltzel Cam-Lok forms, the machine is run by one man. Its gas-electric drive has separate motors for traction and screed, and automatic controls. Finisher can be detached and used independently. Machine handles widths from 12 to 26 feet, adjusts easily to crowns and super-elevations.

John King joins Master Builders

John C. King has been named product development engineer for Master Builders Co., Cleveland, Ohio. In announcing the appointment, President Stephen W. Benedict cited King's vast concrete engineering experience and close association with the development of major concepts and techniques in the field of concrete construction.

Polinek heads CIMA bureau

Charles J. Polinek, Bucket Division sales manager of Erie Strayer Co., Erie, Pa., has been elected chairman of the CIMA Bucket Manufacturers Bureau. This bureau is another addition to the growing list of bureaus that have been formed within the framework of the Construction Industry Manufacturers Association.

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