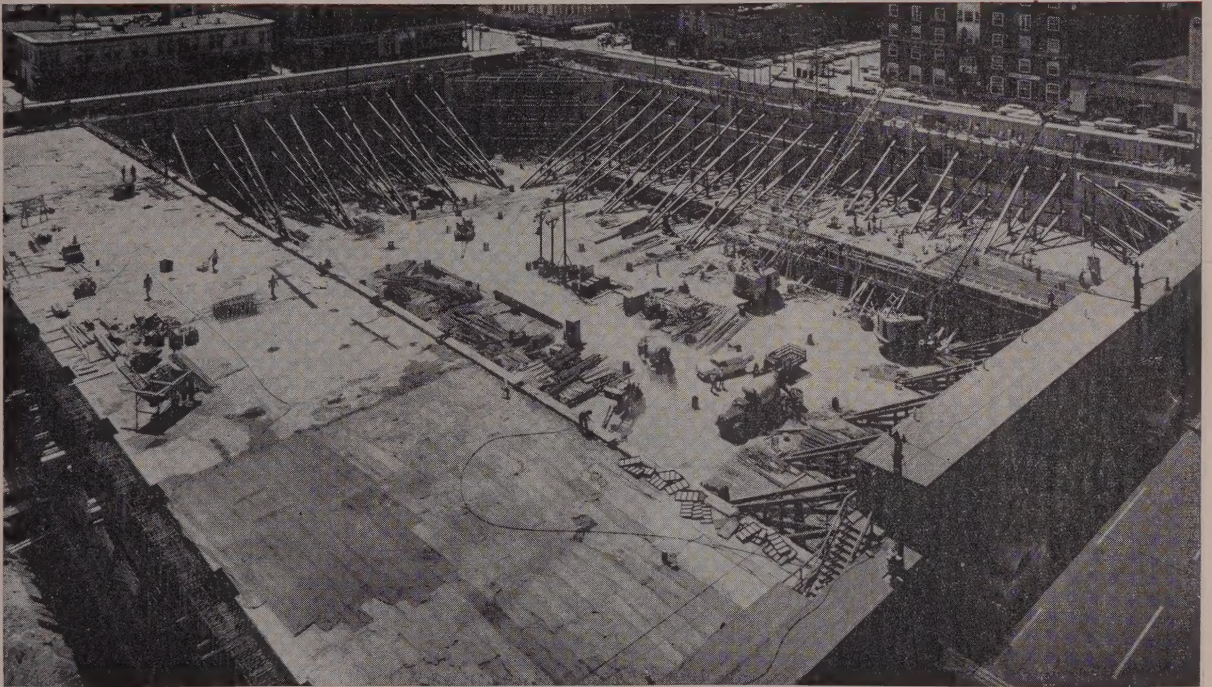




Fast formwork on Denver building

Department store and 700-room hotel project includes four-story basement. Fastening of inside forms for basement walls effectively done by welding studs

to steel piling to support standard coil ties. Slab form design includes use of 2 x 4-ft. modular panels which can be rapidly stripped and moved for reuse.

By **JAMES E. SMITH**

Assistant Project Manager
Webb & Knapp Construction Corp.

COMPLETION of the first phase of William Zeckendorf's \$35,000,000 Court House Square in Denver, Colo., will soon be an accomplished fact.

The project encompasses one and three-quarter city blocks on the surface and the four-story continuous basement includes the subsurface of an 80-ft. wide public street dividing the two city blocks.

On one side Zeckendorf will erect a five-story department store containing over 400,000 sq. ft. of floor space. A unique annex structure of hyperbolic paraboloid thin shell de-

sign will be constructed adjacent to this main building. Within the same area will be provided a sunken garden court and outdoor ice skating rink.

An 18-story, 700-room hotel of reinforced concrete design is slated for the opposite side of the public thoroughfare.

Excavation and foundation work is scheduled in two phases.

Phase I—Foundation work in the area for the department store which includes the 80-ft. street. This phase will be completed in the next few weeks.

Phase II—Foundation work for the hotel area.

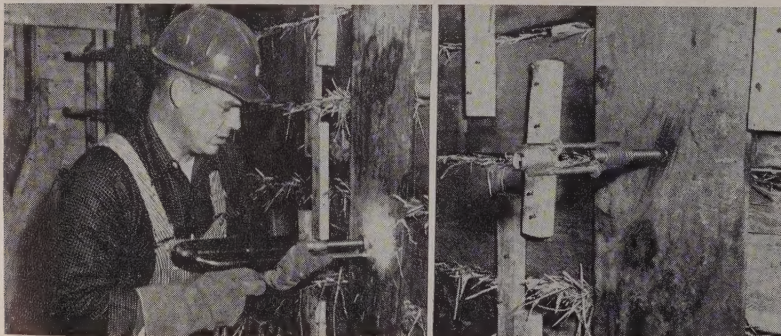
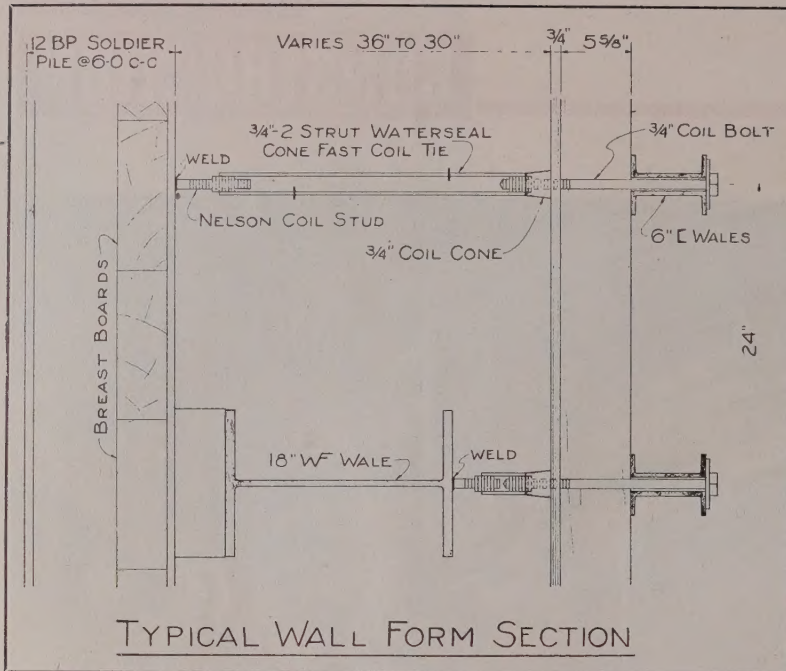
Over 337,000 cu. yd. of material have been removed in Phase I and 32,000 cu. yd. of concrete and 3,200

tons of re-bar are being placed in the foundation walls and basement.

City ordinances required the street structure completed and ready for public use within 220 days after original closing. This necessitated treating the area involved as a separate structure. All four levels including the 20-in. surface slab were poured while excavation and bracing continued in the remainder of the building block. A 14-ft. wide opening was left in the third basement floor slab of the street structure to provide an access tunnel to the rest of the area.

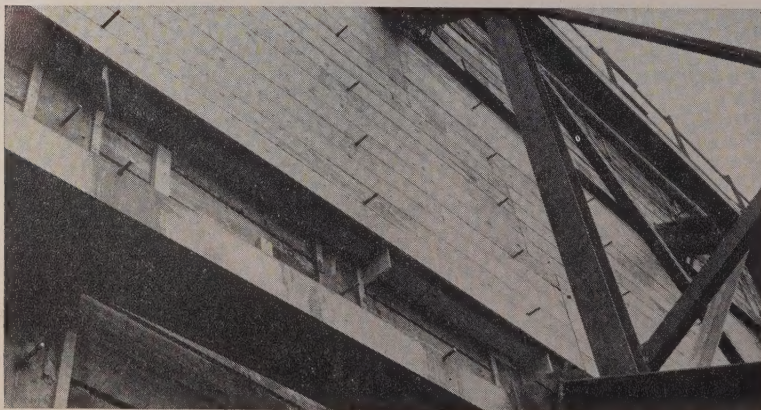
Basement slabs in the department store area are divided by 3-ft. contraction bands into twelve independent sections at each floor level. This allows the slab areas to be formed

Wall forming



END-WELDING $\frac{3}{4}$ -in. studs to steel piling on which coil ties were threaded was key operation in new technique for securing forms during construction of basement walls. Note heavy duty gun especially developed to end-weld studs of $\frac{3}{4}$ -in. diameters.

CLOSE-UP of $\frac{3}{4}$ x 6-in. stud with $\frac{3}{4}$ -in. coil tie threaded in position to secure wall form. Note also here the horizontal breastboards and wheat straw packing. Boards are fitted behind piling flange.



FROM BOTTOM OF EXCAVATION, here's a view of outside forms in place with end-welded studs projecting through boards from the vertical steel piling. Coil form ties are run down next.

and poured in three tier levels, starting at the far side of the block, progressively working toward the street structure and finally out through the construction tunnel. This method also permits full use of cranes for hoisting form material and pouring concrete. Better than 800 cu. yd. have been placed in this fashion in one 8-hr. day.

Wall forming technique

The outside perimeter of the building cofferdams consists of 12 in. x 53-lb. B.P. soldier beam piling, driven 6 ft. on centers. Horizontal breastboard planking was placed between beam flanges as excavation proceeded. This cofferdam wall remains in place, serving as the outside form for concrete wall pours.

Fastening and bracing of inside concrete forms posed an interesting problem. A scheme was devised using a standard $\frac{3}{4}$ -in. coil tie and a standard stud welding procedure for fastening to the piling for anchorage. Nelson Stud Welding manufactured the $\frac{3}{4}$ x 6-in. studs and sized threads to match the $\frac{3}{4}$ -in. coil ties supplied by Superior Concrete Accessories Corp. of Chicago.

The bulk of wall forms were prefabricated sections comprised of $\frac{3}{4}$ -in. Plyform and 2 x 6-in. studs spaced 12 in. on center. Six-in. steel channels, back to back, served as walers.

Sequence for the operation was in four steps:

1—Weld Nelson studs to soldier beams.

2—Thread $\frac{3}{4}$ -in. coil ties onto studs.

3—Place panel sections.

4—Place steel channels, insert lag bolts through panel and thread into $\frac{3}{4}$ -in. coil ties.

On the extreme upper lift, where a double form was required, the form was built in place with the sheathing boards fitted over the studs. Coil form ties were then threaded to the studs and the prefabricated inside form was erected. On the lower three lifts, concrete was placed directly against the cofferdam wall, eliminating the outside form.

Nelson studs were spaced 6 ft. center-to-center on the horizontal plan and 2 ft. on centers vertically. Safe working load on each stud and tie was 12,000 lb.

The two battery units supplying the power were mounted side by side on a single timber platform. Lifting pads were provided and the unit was shifted by crane from one location to another. Battery units were maintained at peak by running a 110-volt a. c. line to the charger on the unit.

Forms for slabs

Reinforced concrete columns in basement areas vary in diameter from 32 in. to 46 in. with column capi-

Slab forming

tals ranging from 72 in. to 102 in. Twelve-gage sheet metal column and column capital forms manufactured by Denform Co. of Denver handle the bulk of the requirements. Where ceiling heights vary, Denform columns are extended by inserting Sonotube fibre board column forms.

Panel forms for flat slab formwork are Uniforms manufactured by Universal Form Clamp Co. of Chicago.

Column, capital and panel forms are all being rented from K. C. Construction Supply Co. of Denver. Requirements call for 4,700 sq. ft. of column forms; 3,400 sq. ft. of capital forms and 50,000 sq. ft. of Uniform panels.

Slab forming design involves a 2 x 4-ft. modular panel one-way framing system. Four x 6-in. girts spaced at approximately 4-ft.-0-in. centers are run on 4 x 4-in. wood shores which in turn are also on 4-ft.-0-in. centers. Every other row of 4 x 6-in. girts has continuous 2 x 4-in. clamps bolted both sides with quick acting Paneloc wedge-action fasteners. Uniform panels rest on these clamps at one end and at the other end butt with adjacent panels on top of intermediate 4 x 6-in. girts. As soon as concrete has reached 50% of design strength (normally three days) the intermediate girt is removed, clamp bolts knocked out, and Uniform panels dropped, cleaned and moved to the next erection point.

Every other shore in the remaining rows is removed for reuse, leaving a continuous girt and shore system 8 ft. on center in both directions. These remain in place until the slab has reached its ultimate design strength of 3,000 lb. This method has insured extremely rapid recovery and reuse of form material without endangering the uncured slabs.

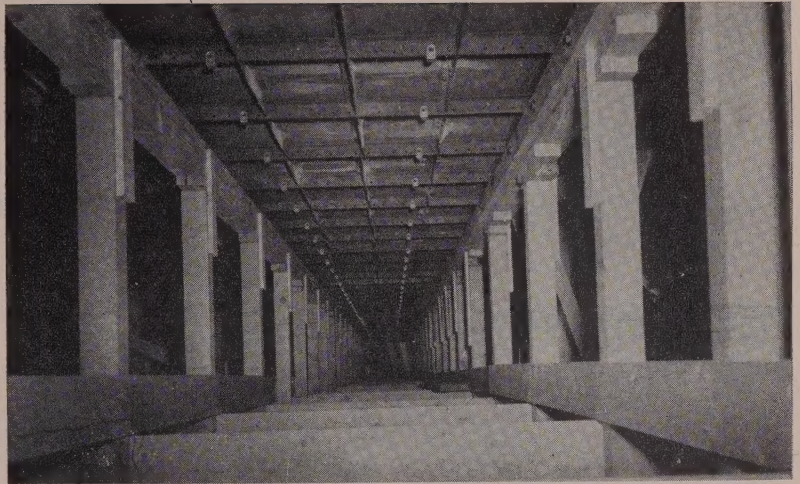
Superstructure

Bethlehem Steel Co. has been awarded the contract for structural steel on the department store. Erection is scheduled to begin Sept. 1, 1956. The department store area is scheduled for completion in 1958 followed by the hotel area in 1959.

The architectural concept and design of this monumental project is being directed by I. M. Pei of the Webb & Knapp, Inc. Architectural Department.

Moran, Proctor, Mueser & Rutledge are the foundation design consultants. Weiskopf & Pickworth are the consultants for structural work. Jaros, Baum & Bowes are the mechanical consultants. All firms are located in New York City.

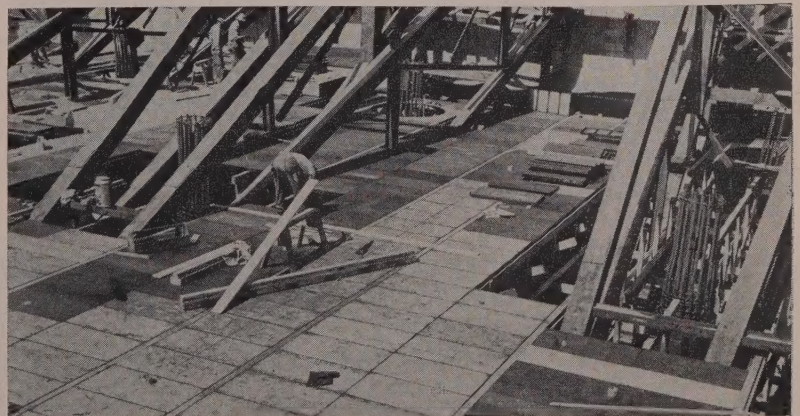
General contractor is Webb & Knapp Construction Corp. Personnel includes T. J. Smith, project manager; James E. Smith, assistant project manager; Ellery Lapham, general superintendent; and J. S. Cohrs, and J. D. Vaughn, assistant superintendents.



BASIC SLAB FORMING DESIGN involves a 2 x 4-ft. modular panel one-way framing system. Here, row of bracing has 2 x 4 clamps bolted on both sides (at right), and panel forms butt on top of 4 x 6 girt (at left). The intermediate girt can be removed after three days.



AFTER INITIAL STRIPPING, slab looks like this. Note that every other shore has been removed in the remaining rows. Panels have been dropped, cleaned, and moved to next erection point.

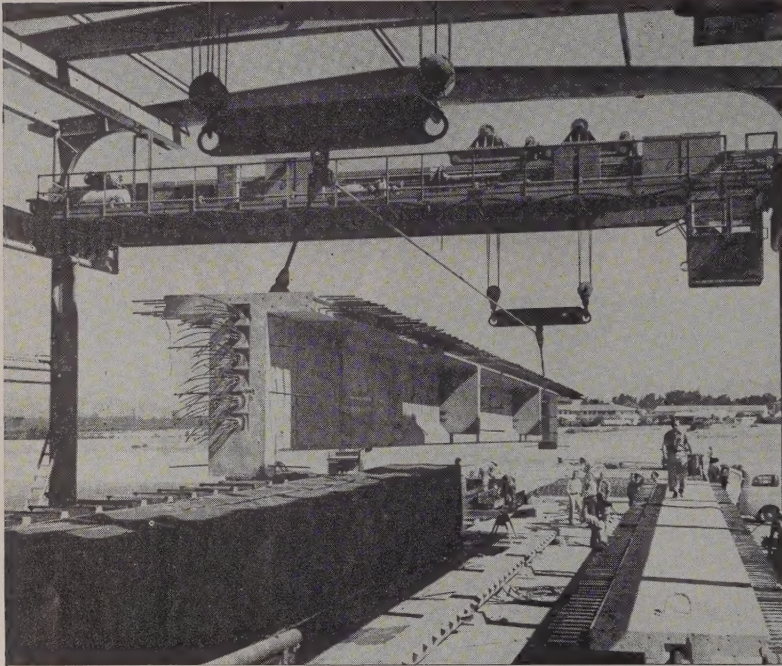


SLAB FORM SYSTEM viewed from above. Note that modular panels are used to good advantage even at locations where raker beams cut through. About 50,000 sq. ft. of panels are in use.

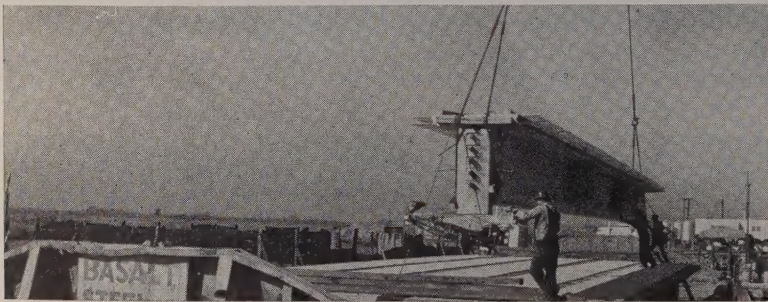
RICHARDSON BAY BRIDGE

... prestressed concrete at its best

Contractor swings into place 270 post-tensioned girders 80 ft. long to wind up one of the largest prestressed concrete bridge jobs to date. Concrete members barged 50 mi. from casting yard to job site.



LIFTING the 40-ton girders out of the forms was no problem at Basalt Rock's well-equipped plant. Basalt turned out 270 of them at only \$41 per cu. yd. in efficient casting operation.



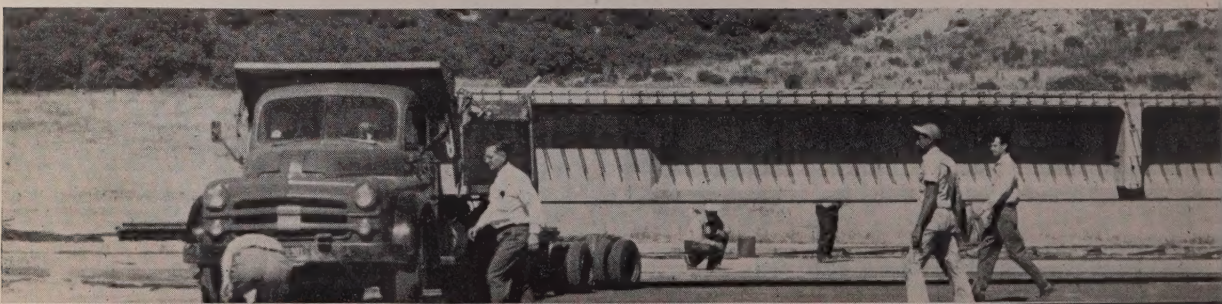
ABOVE—Girders were manufactured at the rate of 10 per week, loaded onto barges near casting yard for 50-mi. trip to site. No damage occurred to the girders en route.

ONE OF THE TOP prestressed bridge jobs in the West is drawing to a close. It's the Richardson Bay Bridge in Marin County, California, where 270 prestressed concrete girders 80 ft. long and weighing 40 tons each have been set in place. The girders were manufactured for the general contractor Duncanson-Harrelson Co., and Pacific Bridge Co., a joint venture, by Basalt Rock Co., Inc., whose plant is located at Napa, 40 miles from the site. The mass production of the girders at the Basalt plant was described in some detail in *Western Construction* Aug. 1955, p. 39. An unusual pile test involving the loading of 450 tons on a 14-in. steel pile was described in Feb. 1955, p. 33.

Basalt turned the girders out for only \$41 per cu. yd. The entire structure will cost about \$12.00 per sq. ft. of usable surface, based on the general contract price of \$3,017,000. It is interesting to note that the old timber bridge which the new structure replaces was built for \$330,000 in 1931, which amounts to about \$3.03 per sq. ft.

The contract was awarded in September 1954 and the new structure is expected to be complete by August 1956. Ben C. Gerwick, Inc., was subcontractor on the foundation, which involved driving 238 14-in. H-piles. Gerwick did the job with a 140-C Vulcan which produces 36,000 ft. lb. per blow. There was a big variation in the tip elevation of the piles. In one area piles in the same bent showed as much as 25 ft. variation in length. This made it tough to deliver the proper length of pile to the driver. Making a field splice in a steel pile that has a cross sectional area of 64.36 sq. in. is very difficult.

BELOW—The 80-ft. girders were brought on trucks and special dollies over a ½-mi. road to the barge side for loading.



The piles in the water are enclosed by a cylinder of concrete 4 ft. in diameter, averaging about 13 ft. high. In order to pour these in the dry the general contractor devised a steel cylinder 8 ft. in diameter with a 6-in. concrete slab bottom bolted to the bottom of the cylinder. Cast into the concrete slab was a 30-in. diam. pipe of varying lengths to suit the water depth closed at the bottom end except that the closure was slotted to fit tightly over the H-pile. This entire assembly was lowered over the pile and the 30-in. pipe buried itself in the mud. The reason for the 30-in. diam. piece of pipe filled with concrete is to protect the steel pile from the action of salt water well into the mud. A small amount of mud and water would seep in around the H-pile but this was easily pumped out and the 30-in. pipe could be filled with concrete as a seal. The 8-ft. steel cylinder, which sometimes had a 20-ft. hydrostatic head on it, acted as a cofferdam well suited to welding, forming and pouring concrete in the dry. This operation was repeated 112 times.

The bridge structure over the land is of box-girder construction. The loads on the falsework were such that the contractor used 36-in. I-beams supported at the ends by timber columns bearing in the permanent foundations.

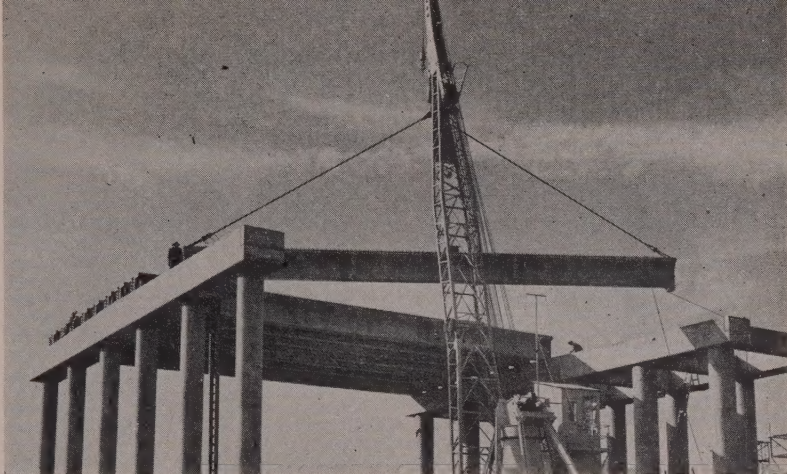
Over the water the load-carrying members are the prestressed concrete girders. They are built in a T-section 4 ft. 6 in. deep, the same width, 80 ft. long, and weigh 40 tons each. Basalt manufactured 10 girders a week working on a 3-shift schedule. The girders were post-tensioned using the Freyssinet system and were transported to the job site on barges.

Dowel bars protrude from the slab section of the girders in such a way that they interlock with the adjoining member after the girders are set in place.

The floating derrick experienced no difficulty in placing the big girders. The girders were picked up directly from the delivery barge by slings placed at each end.

Work will start about Sept. 1 on removing the old bridge which belongs to the contractor and contains about 2,000,000 ft. of structural grade redwood which will be salvaged.

Superintendent for most of the job was George "Buck" Fink. Job engineers are Bob Dashiell and Bill Milot. Resident engineer is Wayne McAuley.



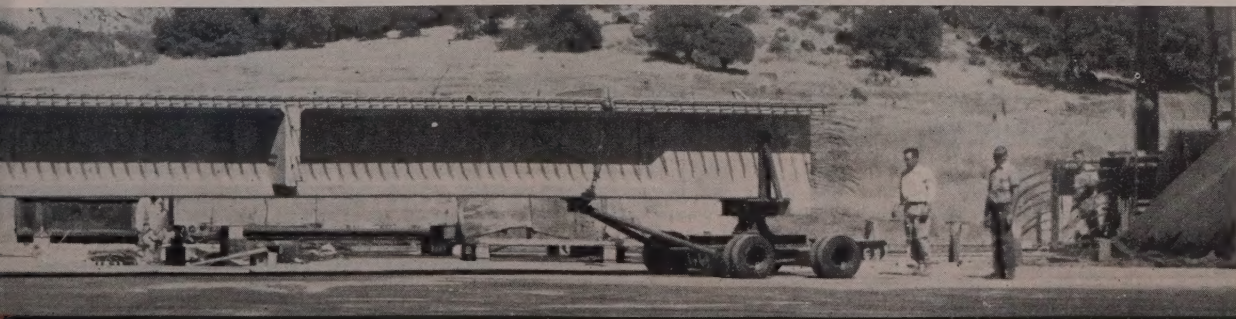
FLOATING DERRICK lifted members into place without difficulty. Girders were picked up with simple slings at each end. Prestressing minimized cracking danger, simplified handling.



POURING THE SPACE between stringers and pouring the diaphragms were completed last month. Dowel steel of adjoining members interlocks for maximum bond between members.



ABOVE—The six-lane structure is almost ready for traffic. Next step for contractor Duncanson-Harrelson Co.-Pacific Bridge Co. (joint venture) is removal of old timber bridge at right.



Asphalt membrane for canal lining

Soils subject to excessive volume change can cause extensive cracking in concrete linings. On a section of the Friant-Kern Canal this situation resulted in the field test of a low-cost remedy to save water. The application of a sprayed coating of "cat-blown" asphalt may prove to be the answer to the problem.

By

F. N. Finn

District Engineer, The Asphalt Institute
Sacramento, Calif.

and

L. H. Kristof

Civil Engineer, Bureau of Reclamation
Sacramento, Calif.

A LOW COST METHOD of reducing leakage through old cracked concrete canal linings may be in the offing for water users faced with the problem of excessive and expensive water losses. The method was originally conceived by engineers of the Lower Cost Canal Lining Program of the Bureau of Reclamation, and the original contracted installation was made on the Friant-Kern Canal in California.

Sealing of the canal was achieved by spraying the entire wetted perimeter of the existing lining with a continuous membrane of asphalt. This asphalt is a specially produced product which has a low temperature susceptibility characteristic and yet is extremely flexible. Referred to as catalytically blown asphalt, or cat-blown" asphalt, it is produced from asphalt (or a crude residue) being blown by air in the presence of a catalyst. Specifications for the "cat-blown" asphalt are provided in the accompanying table.

The initial installation was a 400-ft. reach of the Friant-Kern Canal about

80 mi. south of Friant Dam. This particular section of canal was constructed between 1948 and 1950 and is lined with 3½ in. of unreinforced portland cement concrete on compacted native material. The canal has the following characteristics: bottom width 36 ft., 1¼ to 1 side slopes, design water depth 17.04; design Q of 4,500 cfs.; and velocity of 4.61 fps.

Excessive cracking of the canal lining has occurred in certain reaches, particularly where the native materials exhibit large volume changes with wetting and drying. Magnitude of a crack along the canal bank adjacent to the lining is illustrated.

Four operations

The completed installation was accomplished in four distinct operations: (1) cleaning sides and bottom of canal, (2) applying tack coat, (3) applying "cat-blown" asphalt, and (4) applying aluminum paint.

In order to obtain a bond to the concrete lining it was thought essential that all loose and foreign material should be removed. To do this

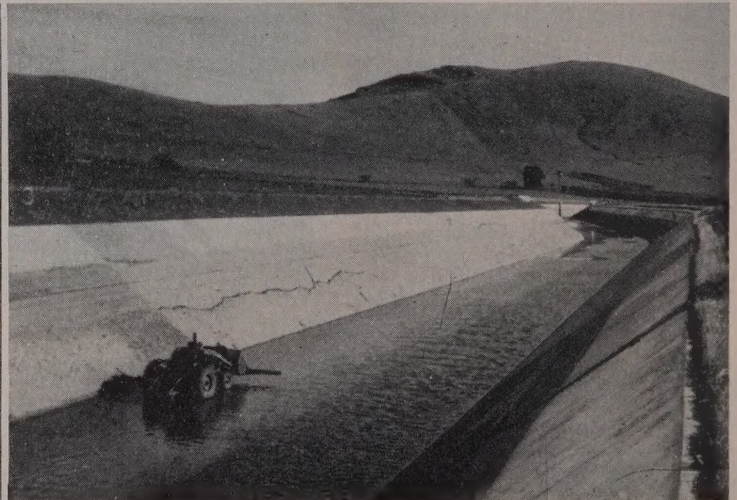
the sides were washed with a high-pressure water spray. The material washed from the sides was then removed from the bottom by means of belting attached to the bucket of a front-end type loader. Particular attention was given to cleaning the cracks along both the sides and the bottom.

Tack coat applied first

After complete cleaning and de-watering of the section to be covered with membrane, the tack coat was applied. At the time the tack coat was applied the concrete surface was not completely dry; probably the most descriptive term would be "surface damp." The tack coat was SS-1 emulsified asphalt diluted 1:1 with water. The application was made with an ordinary weed sprayer and was applied at a total rate of 0.04 gal. per sq. yd. An accompanying picture shows a comparison of an area which has been cleaned and tacked, and an area not included in the project. Because of inclement weather, there was a delay of approximately 7 days



CAUSE—Soils that have this much volume with wetting-and-drying (note camera showing size) will produce a serious effect on the sloping concrete lining of a canal.



EFFECT—Cracks caused by ground movement are shown. After the canal is unwatered the sides are cleaned with a high pressure water spray and bottom is cleaned, using a piece of rubber belting mounted on the bucket of a front-end loader as a squeegee.

between completion of the tack coat and applying the asphalt membrane.

The equipment, used by the contractor for applying the "cat-blown" asphalt membrane to the concrete surface, was an Etnyre distributor consisting of a 1,500-gal. tank mounted on a truck, together with heating equipment, pressure apparatus and attachments such as hose and hand spray. Additional asphalt was delivered to the job site in a 3,000-gal. capacity insulated trailer.

A platform and winching arrangement was used on the canal sides. By this arrangement the platform, on casters, was raised and lowered along the canal while moving away from the freshly sprayed-on material. A three-nozzle hand spray bar and 1-in. rubber hose were used as the supply line.

Recirculating not effective

A second hose, 1/2-in. and metallic covered, may be seen in one of the photos. This smaller hose was intended as a recirculating line to prevent clogging of the supply line during periods when spraying was temporarily discontinued. However, the recirculating line soon became plugged and was eventually removed. It is significant to note that ambient temperatures during the time the membrane was being applied ranged from 34 to 65 deg. The order of application was canal sides first and then the bottom.

Temperature a problem

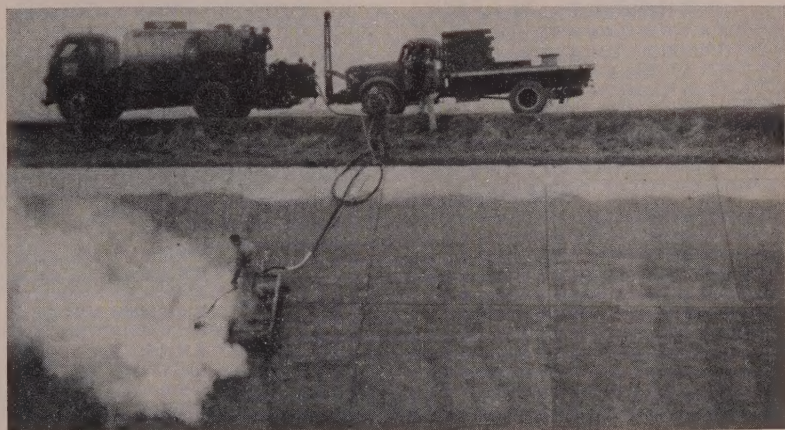
Initially the spraying temperature of the asphalt in the tank was 425 deg., however, at this temperature the viscosity of the asphalt, after being sprayed, was such that it flowed down the sides resulting in a membrane approximately 1/8 in. or less in thickness at the top and about 3/8 in. on the lower portions. Since the specifications required a uniform application of 1/4 in. it was thought that reducing the temperature of the asphalt would enable a more proper distribution. The temperature was, therefore, reduced first to 400 deg. which increased the membrane thickness along the top to somewhat in excess of 1/8 in. and finally to 375 deg. which probably would have provided the required 1/4 in.; however, at this temperature the asphalt did not spray properly. A temperature of approximately 400, plus-or-minus 10 deg., was decided as the best for the given climatic conditions. A double application was made in one area and the full thickness was obtained.

Thickness requirements

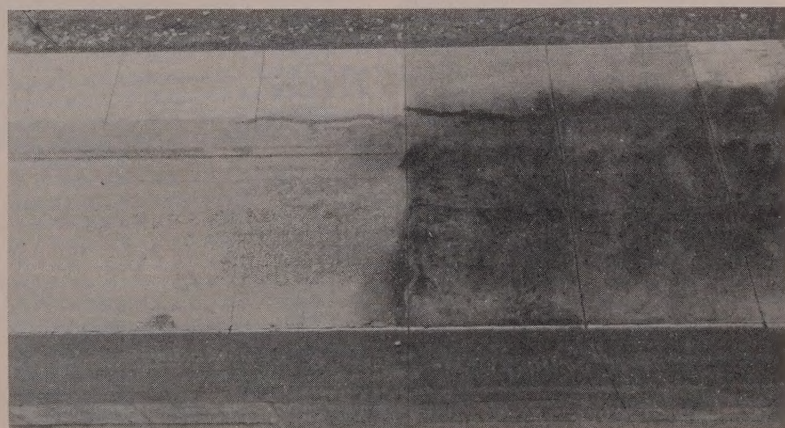
Considerable thought has been given to the thickness requirements and opinion at the present time indicates that, since the asphalt has no structural requirement, the more important requirement is continuity of



PLATFORM for the operator was mounted on casters and handled by a winch on the canal bank. The recirculating line (1/2-in. metallic covered) did not prove successful and was removed.



TEMPERATURE of the asphalt, and the resulting effect on viscosity involved considerable adjustment. Tank temperature was first set at 425 deg. but flow down the sides was excessive. A drop to 375 deg. reduced flow, but spraying became difficult. A compromise of 400 deg. was selected.



A TACK COAT of emulsified asphalt diluted with water was applied after cleaning and watering of the section. Application was done with a weed sprayer while the concrete surface was damp.

the membrane. A visual inspection of the project indicates that continuity was achieved by the procedures employed using one application plus spot covering of "holidays."

Application of the asphalt membrane on the canal bottom was comparatively simple and a uniform thickness of approximately 1/4 in. was obtained. The only difficulty in this

operation occurred when the hose length was increased from 50 ft. used on the sides to the 100 ft. necessary for spraying the bottom. Spraying with 100 ft. of hose at air temperatures ranging between 40 and 50 deg. prevailing during the time the bottom was sprayed caused the hose to plug on two or three instances, thus extending the overall time required to complete the job.

Protective paint used

A total of 19.73 tons of catalytically-blown asphalt was used to cover 3,710 sq. yd. of canal lining surface on the test installation and was applied in 1½ days. Because of the variation in membrane thickness no average is reported; however, for estimating purposes, the total coverage averaged 1.25 gal. per sq. yd.

To minimize the effects of weathering on the asphalt, particularly due to the sun's rays, and to reduce the membrane temperature during the summer months, a coating of asphalt-base aluminum paint was sprayed over the completed asphalt membrane. The paint was applied at a rate of 0.04 gal. per sq. yd. of surfacing or a total of 165 gal.

Initial high costs

In reporting costs for this type of work is it important to point out that this is an experimental installation with a relatively small amount of work and materials. This, coupled with the uncertainty of what difficulties might be encountered, tends to reflect an abnormally high bid by the contractor. The costs as reported were \$0.28 per sq. yd. for labor, equipment, and preparatory work, and \$0.51 per sq. yd. for material.

Evaluation of project

Approximately one year has elapsed since the installation was completed and water was turned back into the Friant-Kern Canal. There is little doubt of the effectiveness of the lining to date; however, it is difficult to evaluate the effectiveness quantitatively. In this regard it is significant to relate that there is a 4 x 4-ft. single-barrel concrete culvert at mid-point of the 400-ft. reach. This culvert was constructed to provide a bypass for storm water runoff. Because of the cracking which has occurred, the culvert has acted as a collecting channel for seepage

through the canal lining. Prior to the application of the asphalt membrane it was reported that a considerable amount of water was flowing in the channel during periods when the canal was operating; subsequent to the application only an extremely small flow is apparent.

Changes in membrane

Three physical changes have occurred to the membrane during the past year. Checking of the aluminum paint surface has appeared on the membrane, forming a variegated pattern. Second, the membrane has acted as a vapor barrier and during the summer vapor bubbles appeared on the membrane surface. With cold weather these bubbles have disappeared. Third, in areas where the membrane was too thick some flow of the asphalt has occurred. The amount of this flow represents an estimated area of less than 1% of the exposed membrane above the water line.

Future installation

A second installation of the same type is being planned for another section of the Friant-Kern Canal in the near future. Two changes will be made for this installation. To reduce the flow tendency the softening point (R and B) will be increased from 175-200 deg. to 200-255 deg. The application of asphalt membrane described herein was bonded to the existing PCC with a tack coat of SS-1 emulsified asphalt. Although there is no evidence to indicate that this tack coat is inadequate there is some evidence that indicates even better tack coat materials are available. Therefore, the second installation will probably use several, such as an asphalt primer meeting Federal Specification SS-A-701, tack coat materials.

Supply and handling

The furnishing, handling and applying of asphalt was performed by the West Coast Asphalt Sales Co., Bakersfield, Calif. The cat-blown asphalt was produced by the Envoy Petroleum Co., Long Beach, Calif. All other work was performed by Government forces under the general supervision of E. F. Sullivan and G. D. Nielsen, Bureau of Reclamation, Fresno.

Personnel

Construction was performed under the supervision of T. R. Meyer, Bureau of Reclamation, Lindsay, Calif. L. H. Kristof, formerly engineer for the Lower Cost Canal Lining Program in Region 2 (Sacramento) of the Bureau, and L. M. Ellsperman, head of the Bureau's Bituminous Laboratory in Denver were responsible for engineering recommendations relative to materials and methods of placement.

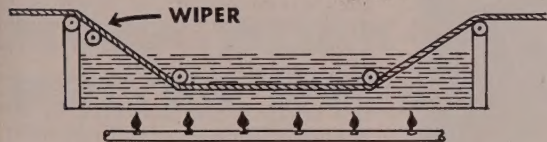
Specifications for catalytically blown asphalt

Penetration grade	50-60
Flash point (c.o.c.), not less than	425°F.
Softening point (R and B)	175°F. to 200°F.
Penetration at 77°F., 100 grams, 5 seconds	50-60
Penetration at 32°F., 200 grams, 60 seconds not less than	30
Penetration at 115°F., 50 grams, 5 seconds, not more than	120
Ductility at 77°F., 5 centimeters per minute, not less than	3.5 centimeters
Loss at 325°F., 5 hours, not more than	1.0%
Penetration of residue at 77°F., 100 grams, 5 seconds, as compared to penetration before heating, not less than	60.0%
Bitumin (soluble in carbon tetrachloride), not less than	97.0%
Asphaltic materials for which ferric chloride or other compounds of iron have been used as catalysts in the blowing operation will not be approved.	



A COATING of asphalt-base aluminum paint covers completed membrane as protection against weathering and to reduce membrane temperature during summer months. 165 gal. of paint were applied and 19.73 tons of "cat-blown" asphalt to cover 3,710 sq. yd. of canal lining surface.

To More Than Break Even In Service Life Give Your WIRE ROPE An Even Break



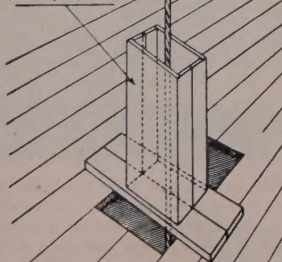
Rope That Is Stored for long periods of time should be lubricated during installation. If it is not possible to lubricate stored rope very often, apply a sealing compound to hold the lubricant that is already present.

Rope In Use can be lubricated most economically without removing it from the equipment on which it is operated. Lubricate rope as often as it needs it—service conditions determine the frequency.

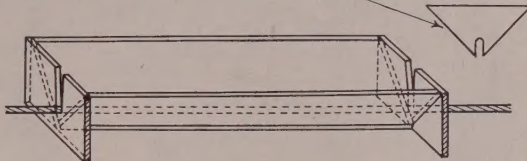
Use Lubricant Hot or Cold, depending on its penetrating qualities. Your local oil company engineer will be able to recommend an oil that will actually penetrate to the working parts of the rope, and not just form a coating that peels off the first time your rope runs through a sheave.



Split Container for Wire Rope Lubricant



END STOP BOARD TO FIT AT EACH END OF BOX OVER ROPE



Specifications? — say Tuffy



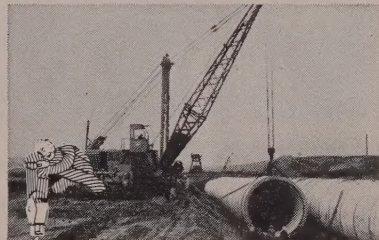
Tuffy Scraper Rope

Mount a reel on your scraper and move more yardage per foot. Flexible to resist sharp bends, stiff enough to resist looping and kinking.



Tuffy Dragline

Rides smooth on drums and hugs the drum when casting. Extra flexible, yet constructed to give maximum abrasive resistance.



Tuffy Slings & Hoist Line

A hoist line that gives you extra service life. Slings of 9-part machine braided wire fabric fight kinking — a matched team of balanced performers.



Tuffy Dozer Rope

Mounted on special 150' reel that lets you use rope you now throw away! Increases service life and reduces down-time. 1/2" and 9/16".

Your Union Wire Rope Distributor Is Good At Solving

Wire Rope Riddles. When you have a wire rope problem, give your Union Wire Rope distributor a call for hurry-up service. Chances are you'll find he has the correct answer at hand—because part of his job is figuring out how your equipment can give you the best operation, at the lowest operating cost! Feel free to call on him anytime.

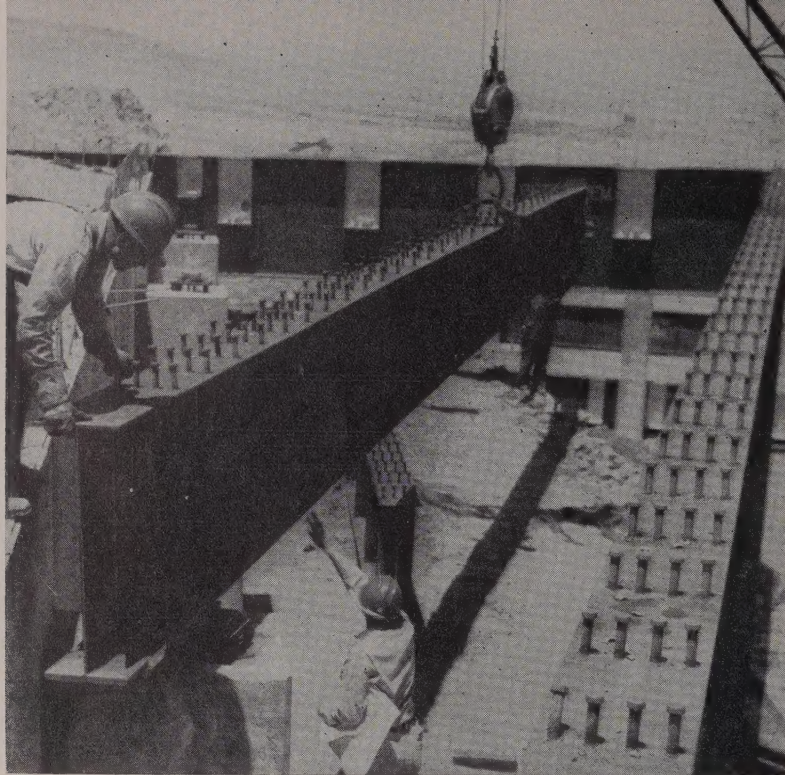
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LAST GIRDERS swing into place on composite concrete-steel bridge. Shown are welded studs being used as shear connectors instead of steel angles usually seen on composite bridges.

WELDED STUDS for shear connectors

ERECTION CREWS of Bethlehem Pacific Coast Steel are swinging into place the last girders on a composite concrete-steel bridge in South San Francisco. The girders are unusual in that welded studs are being used for shear connectors in place of the more conventional steel angles. The structure, which will carry six lanes of traffic over Southern Pacific railroad tracks, is part of a \$2,000,000 contract held by Guy F. Atkinson Co. The contract includes construction of a concrete box-girder off-ramp and the final closure of the Bayshore over-water fill road. For further information on the Bayshore fill road, a 3-mi. long highway being built across shallow water mud flats without dredging, see **Western Construction**—Aug. 1952, p. 81; Aug. 1954, p. 73; and Dec. 1955, p. 51.

The bridge is a divided structure with 7 girders (stringers) carrying three lanes of traffic on each side. The space in the center provides room for adding 4 future girders, which would enable the bridge to carry four lanes of traffic in each direction. There are 129 girders, running up to 104 ft. long, and 12 caps, up to 121 ft. long, to be set in place.

The heaviest single lift will be 28 tons. Bethlehem Pacific is handling the members with a P & H 20-ton crane and an American 50-ton crane.

The use of welded studs for shear connectors is comparatively new but has gained rapid acceptance and is now being shown as an alternate on bridges in 22 states where composite bridges are used. In many instances, studs are welded in fabricating shops but because of the portability of the equipment this can also be done in the field.

One of the principal reasons for using studs instead of steel angles is that concrete can be compacted more satisfactorily assuring a good interaction between the steel and concrete. Also, warping caused by hand welding of other types of connectors is eliminated.

Shop time is decreased for the fabricator because of the speed at which the studs can be attached with a Nelson welding gun. In Bethlehem's Alameda plant, it was found that one welder and one helper using a wooden loading frame that minimized handling of studs could attach the studs at a rate of 4 to 5 a minute. The studs are $\frac{7}{8}$ in. in diameter and 4 in.

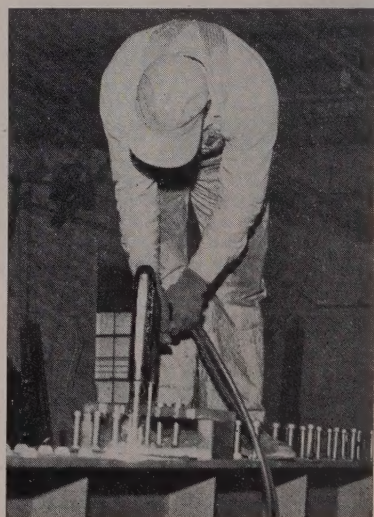
long and are placed four in a row, with a maximum spacing of 2 ft. between rows. Studs were an alternate on the contract to conventional 4-in. x 5.4-lb. channels 10 in. long.

The engineering and design data which led to the acceptance of Nelson flux-filled studs as shear connectors resulted from a test program conducted in 1954 and 1955 by Dr. I. M. Viest of the University of Illinois. The stud dimensions recommended as being the most economical for shear connectors are $\frac{3}{4}$ and $\frac{7}{8}$ in. in diameter and 4 in. in length. Longer studs for special requirements are also available.

Another unusual feature about this bridge is the precasting by the Atkinson Company of collision walls. By pouring the 650 yd. of concrete in a casting yard the contractor can be working on the walls while the steel is going up at the site. The walls will be cast in panels 13 ft. high and to 14.5 ft. long, 8 in. thick. They will be transported to the job by truck and positioned by the tilt-up method.

The project is scheduled for completion in October 1956 and carries a penalty of \$9,000 a day for every day past that date. This is the highest penalty ever specified by the California Division of Highways.

For Bethlehem Pacific Coast Steel, erection superintendent is Jack Skei. Foreman is Chauncey L. Forte. For the Atkinson Company, Henry F. Quade is project superintendent. E. M. "Mickey" Daley is excavation superintendent and Chet Reynolds is structural superintendent. Guy Mancarti is California Bridge Department representative, assisted by Joe Donohue, Frank Heggli, and Bill Fox. "Smokey" Freeman is inspector. H. A. Hart is resident engineer, assisted by Leo Lombas.



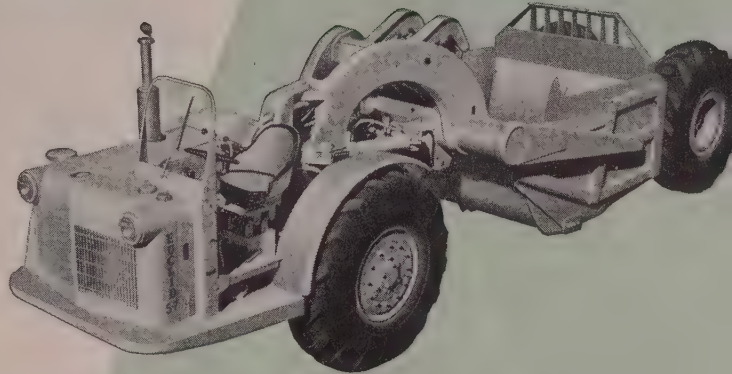
IMPORTANT SAVINGS in shop time are realized when end-welded studs are employed as shear connectors. With the aid of a wooden loading frame, the operator can weld 4 to 5 studs a minute.

5 "Euclid" SCRAPERS . . . 7 to 18 yds. struck

MORE WORK-ABILITY... BETTER ACCESSIBILITY

Ease of operation and maintenance and production performance have made Euclid the fastest selling scraper line in the industry. Advanced design of Euclid's hydraulic lever action provides fast, positive and independent control of bowl, apron and ejector . . . downtime and expense of cable replacement is eliminated. The low, wide scraper bowl, with adjustable 4-section cutting blade, assures fast, easy loading in any material. All major components in every Euclid scraper are readily accessible . . . another reason why *Euclids are your best investment.*

EUCLID DIVISION, General Motors, Cleveland 17, Ohio



S-7

S-12

S-18

These overhung engine models have struck capacities of 7, 12 and 18 yds. . . are powered by 143, 218 and 300 h.p. engines. The S-7 and S-12 have 5 speed transmissions . . . S-18 has 300 h.p. engine and Torqmatic Drive. With full power steering, these scrapers are easy to operate . . . have exceptionally good maneuverability.

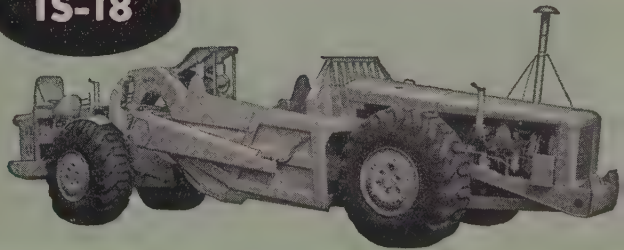


15 1/2

15 1/2 yard Scraper has a 4-wheel tractor for maximum stability on long hauls at fast travel speed. It is powered by a 300 h.p. engine with either a 10-speed transmission or Torqmatic Drive. Heaped capacity at 3:1 slope is 18 yds. . . 21 yds. at 1:1 slope. Drive and scraper tires are 24.00 x 25 with 29.5 x 25 optional.

TS-18 is the newest Euclid Twin-Power Scraper. A one-man earth-moving outfit, it has tremendous power and traction . . . self loads and can work on steep grades and the toughest jobs. Powered by two 218 h.p. engines, each driving through separate Torqmatic Drives. Tractor is available with 300 h.p. engine for work where even more power is needed. Tires are 27.00 x 33 with 33.50 x 33 optional. Heaped capacity at 3:1 slope is 21 yds. and 25 yds. at 1:1. The TS-18 has set new standards of scraper production and low cost yardage.

TS-18

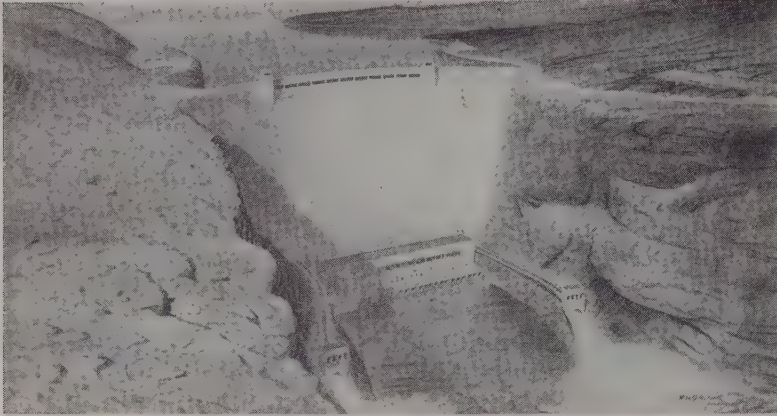


Euclid Equipment

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Action starts at Glen Canyon



ARTIST'S SKETCH of Glen Canyon Dam does not show a high steel arch bridge which will be constructed 850 ft. downstream from the face. It will serve as an aid in constructing the dam and will carry traffic across the canyon when the dam is finished.

FIRST DIRT will fly this month on the Bureau of Reclamation's vast Upper Colorado River Storage Project. The Arizona Highway Department has \$200,000 in newly authorized money with which to improve the pilot road leading into the Glen Canyon Dam site. This work should be under contract by the end of August.

Arizona also has \$200,000 to spend on the main access road which will run from Bitter Springs on U. S. Highway 89 into the site. A 30-ft. asphalt highway would be adequate for construction of the dam but since the road will carry heavy tourist travel the Highway Department is willing to spend whatever is necessary to make it a 34-ft. roadway. This amounts to about 10% of the total construction cost of \$4,438,000. Present plans call for the road to be finished by July 1, 1958.

On July 2, 1956, President Eisenhower signed a Public Works Appropriation Bill which includes \$13,000,000 for the Colorado River Storage Project. The money will be spent on such jobs as excavation of a 50-ft. diameter diversion tunnel on the west side of the river, excavation of service road on the east canyon wall to the powerplant, and for approach road construction and a steel arch bridge at the Glen Canyon site about 850 ft. downstream from the dam. The bridge will be the highest of its kind in the world carrying traffic across the canyon about 800 ft. above the river. Much of the \$3,000,000 cost

can be charged to the cost of the dam because the contractor will utilize the bridge in building the dam. Construction will take about 9 months with erection being carried out from both sides of the canyon.

The Bureau of Reclamation has appointed L. F. Wylie as engineer in charge of the Glen Canyon Project. Within a few weeks he will be established in house trailer facilities on both sides of the river to accommodate engineering personnel at the site.

The location of the construction townsite has not been chosen.

The overall project

Construction of four storage units of the Colorado River storage project and 11 participating projects was authorized by the Congress in legislation which was signed into law by President Eisenhower on April 11, 1956.

None of the authorized dams or reservoirs will be constructed within any national park or monument. Appropriations, not to exceed \$760,000,000, were authorized to carry out the purposes of the act. This is the largest expenditure ever authorized for a Reclamation development at one time.

The Eden project in Wyoming, which is now largely constructed, would, by terms of its authorizing act of June 28, 1949, become financially related to the Colorado River storage project as a participating project.

Eisenhower authorizes construction of four main storage units and eleven participating projects—largest appropriation ever granted to Bureau of Reclamation—Glen Canyon Dam will have quantities larger than Hoover Dam.

The four authorized storage units will provide about 32,000,000 ac.-ft. of reservoir capacity and about 1,100,000 kilowatts of installed generating capacity. About 80% of both capacities will be provided by the Glen Canyon Unit alone. When completed, Glen Canyon Dam will be the fourth highest dam in the world, and second in height only to Hoover Dam in the United States. The units are described below.

Glen Canyon Unit

Glen Canyon Dam will be on the Colorado River in northern Arizona, about 13 mi. downstream from the Utah-Arizona State line and 16 mi. upstream from Lee Ferry, the dividing point between the Lower and Upper basins. It is the only one of the authorized dams that will be on the Colorado River proper.

Glen Canyon Dam is planned as a concrete arch structure that will extend about 700 ft. above its foundation. It will have a crest length of 1,400 ft. When the 26,000,000-ac. ft. reservoir is full, the water surface area will cover about 153,000 ac. and will extend 186 mi. up the Colorado River, or nearly to the mouth of the Green River, and 71 mi. upstream on the San Juan River. About 6,000,000 ac.-ft. of the reservoir capacity will be below the outlet level. This "inactive" capacity will be useful for sediment accumulation, to protect fish, and to increase the power head at the dam.

During construction, the river will be diverted through two concrete tunnels, each of which will be about 45 ft. in diameter. One will be located

on each side of the canyon. The lower portion of each tunnel will serve as a spillway tunnel when the dam is completed.

The powerplant to be constructed at the toe of the dam will house seven generating units having a total installed capacity of 800,000 kw.

Measures will be taken to protect the Rainbow Bridge national monument at the upper reaches of the reservoir.

Flaming Gorge Unit

The dam for the Flaming Gorge Unit will be at the Ashley site on the Green River, a major tributary of the Colorado, in northeastern Utah about 6 mi. south and 20 mi. west of the corner common to Utah, Wyoming, and Colorado. A concrete arch dam rising about 495 ft. above the foundation and about 450 ft. above the river will be constructed. The reservoir will have a capacity of about 4,400,000 ac.-ft. and an area of about 44,000 ac. It will extend upstream 94 mi., nearly to the town of Green River, Wyo. About 1,000,000 ac.-ft. of the reservoir capacity will be below the outlet level.

A powerplant at the Flaming Gorge Dam will have an installed capacity of 85,000 kw.

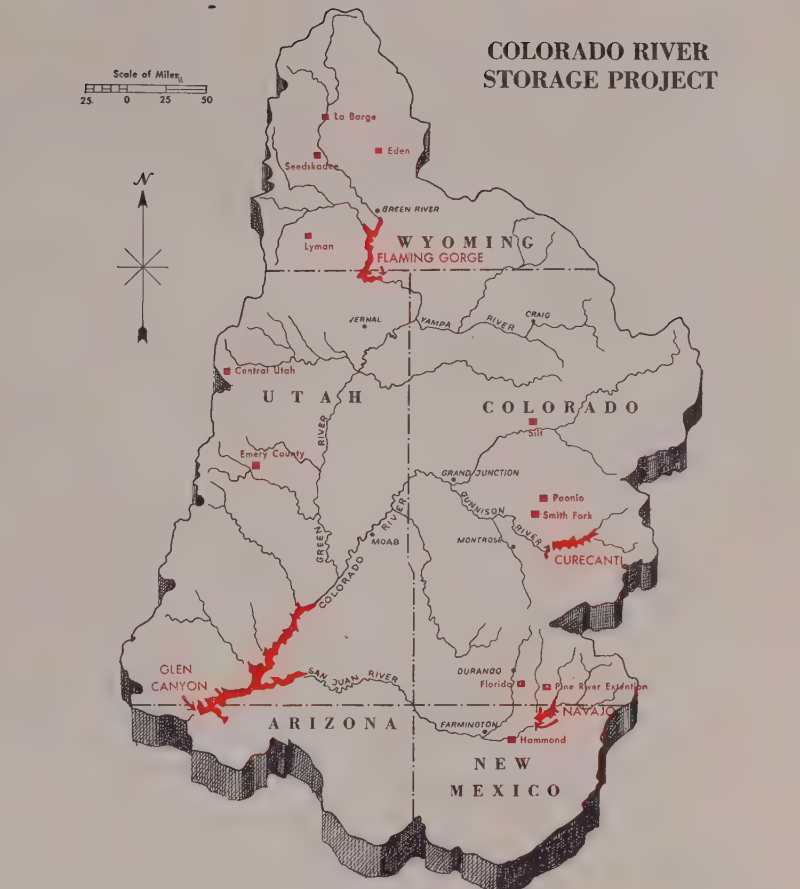
Curecanti Unit

The Curecanti Unit will develop storage and power possibilities along part or all of a 35-mi. stretch of a deep canyon section of the Gunnison River above the Black Canyon and below the town of Gunnison, Colo.

Bureau of Reclamation reconnaissance studies indicate that a favorable plan, consistent with the authorizing act, would include a series of three or four dams, reservoirs, and powerplants along the 35-mi. river section. Collectively these powerplants, with an installed generating capacity of about 152,000 kw., would develop about 970 ft. of static power head in this section of the river.

The Curecanti Reservoir, uppermost of the series, would be formed by the Blue Mesa Dam, located 30 mi. downstream from Gunnison. A dam 350 ft. high above its foundation would create a reservoir with a capacity of about 940,000 ac.-ft. at a high water elevation of 7,250 ft. The reservoir would provide the principal seasonal river regulation for a powerplant at the Blue Mesa Dam and for powerplants at other dams in the 15-mi. section of the river below the Blue Mesa site.

Investigation and planning of the Curecanti Unit will continue in more detailed scope as required by the act.



THE FOUR main storage projects plus the participating projects are shown in red. The four storage units will provide about 1,100,000 kw. installed capacity. About 80% of this will be supplied by Glen Canyon, as well as 80% of the total storage capacity.

Navajo Unit

An earth-filled dam will be constructed on the San Juan River in New Mexico, about 34 mi. east of Farmington. The dam will rise about 370 feet above its foundation and extend about 6,100 feet in length at its crest. It will create the Navajo Reservoir with a total capacity of 1,450,000 acre-feet, of which about 780,000 acre-feet will be active or available for stream regulation. Sediment accumulation in the reservoir will be fairly heavy and is expected to amount to about 330,000 acre-feet over a 100-yr. period, most of the sediment being deposited in the inactive section of the reservoir. The reservoir, when full, will inundate 13,500 ac. and will extend approximately 35 mi. up the San Juan River. No powerplant is planned for the Navajo Unit.

Participating Projects

The eleven participating projects authorized plus the Eden project will be assisted financially by the storage project. Participating projects are

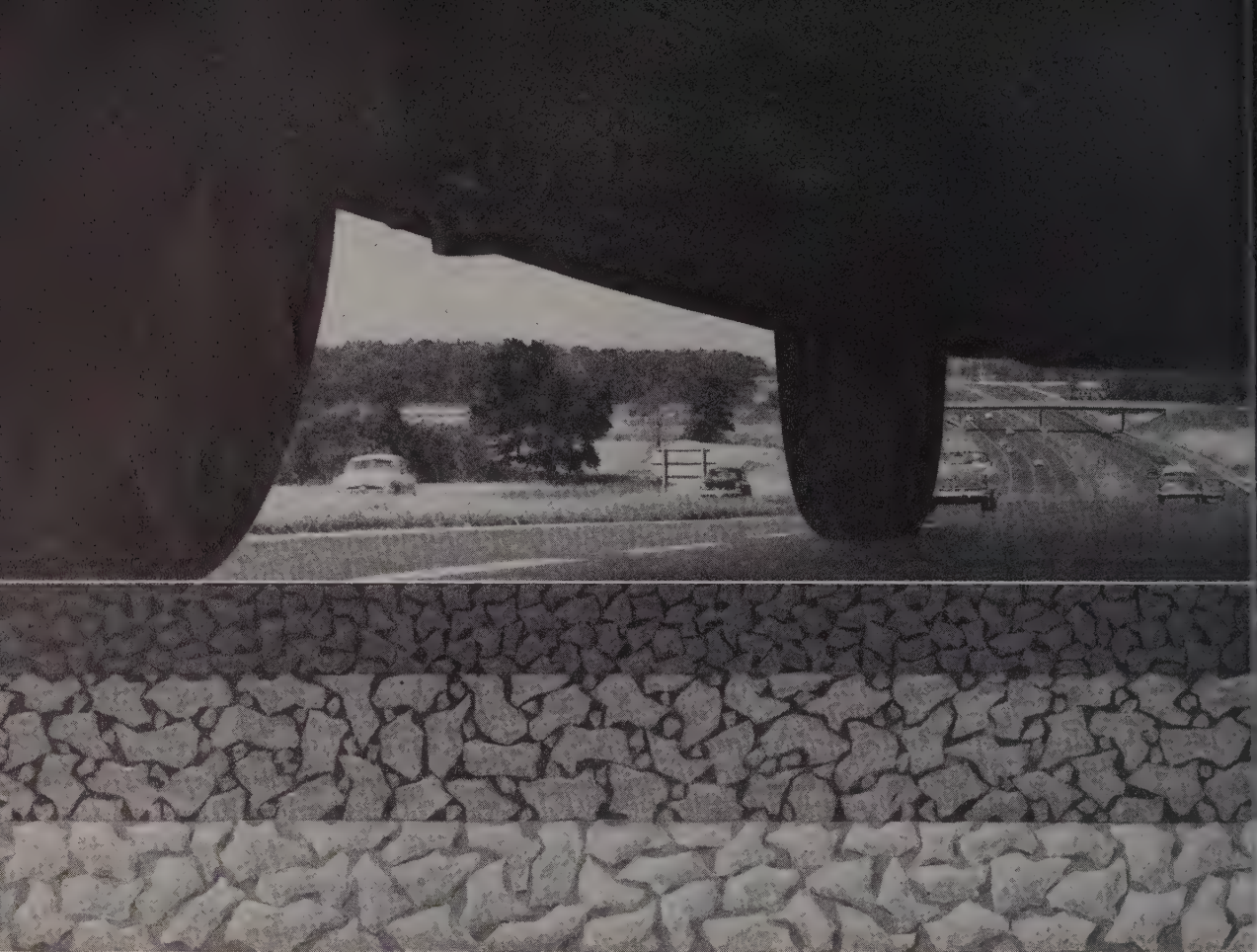
those which will consume water of the Upper Colorado River system for irrigation and other purposes and will require repayment assistance on irrigation costs from power revenues of the storage project.

These participating projects will provide water to irrigate over 130,000 ac. of presently dry land and supply water to about 230,000 ac. of land presently irrigated.

Central Utah

The Central Utah project (initial phase) will be constructed in east-central Utah and in the Uinta River Basin, a tributary of the Colorado in northeastern Utah. This multiple-purpose project will provide irrigation water to about 28,540 ac. of new land, a supplemental supply for about 138,210 ac., and furnish about 49,000 ac.-ft. of municipal water.

Principal features of construction are Strawberry aqueduct, Strawberry Reservoir enlargement by construction of Soldier Creek Dam, four powerplants with combined installed capacity of 61,000 kw., and other regulating reservoirs, aqueducts, ca-



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Hugs earth—spreads load

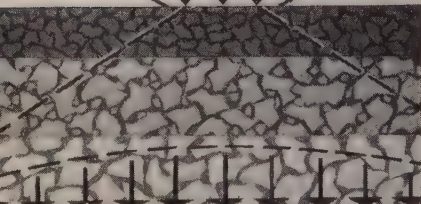
No subgrade stays perfect. Asphaltic concrete adjusts to variations as they develop . . . hugs its foundation . . . distributes loads and impact broadly . . . lowers internal stresses.

Savings pay maintenance

Table below reports Oklahoma's saving on paving Turner Turnpike with Asphalt. It's enough for 65 years maintenance at today's prices.

Capacity easily upped

Many states are planning to modernize in easy stages with Asphaltic concrete . . . adding lanes and extra strength as need develops. They're also renewing older roads with minimum traffic interruption and cost.



BID PRICES BY CONTRACT SECTIONS THE TURNER TURNPIKE — OKLAHOMA CITY TO TULSA

(Awards by the Oklahoma Turnpike Authority)

CONTRACT NUMBER	MILES	ASPHALT	ASPHALT SAVING
#34	4.53	\$ 491,636	\$ 57,529
#39	5.93	615,131	96,241
#40 (A&B)	7.98	941,343	94,070
#41	5.65	608,269	99,545
#42	3.38	351,115	58,098
#31	7.83	883,098	105,545
#32	8.04	902,231	112,027
#37	4.94	548,641	67,563
#38	7.61	848,181	110,956
#17	9.03	957,213	136,890
#18 (A&B)	9.05	1,097,599	131,979
#33	8.61	1,046,907	90,677
TOTAL	82.58	\$9,291,364	\$1,161,120

The Turner Turnpike was designed to carry axle loads of 28,800 Pounds





Pavement on interstate highways



The talk is over. Next step is building your State's sections of the Interstate Highway System.

Question now is *which* paving? Which meets the engineering requirements with the greatest economy?

The facts favor Asphaltic concrete. Take engineering requirements. Findings on the WASHO Road Test show that standard Asphaltic concrete designs provide all-weather roads able to carry the heaviest legal truck axle loads, AND MORE!

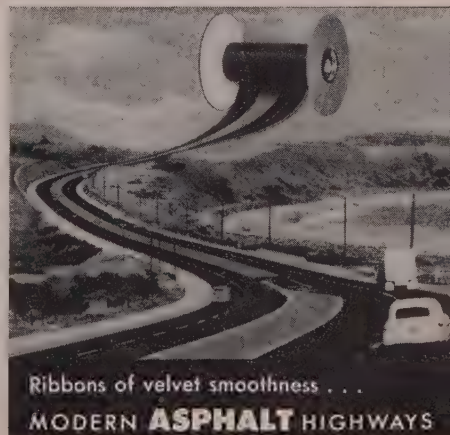
Photo shows why. Asphaltic concrete *spreads* wheel loads, has built-in resilience to take traffic pounding. It withstands temperature changes, conforms to settlements without fracturing. It repels moisture, melts off ice and snow more quickly, isn't harmed by winter-time use of chemicals.

Take first cost. Here are figures showing Asphalt savings based on actual competitive bids. New Jersey Turnpike (118 miles) \$5,457,134 saved. Oklahoma Turnpike (83 miles) — see table at left — \$1,161,120 saved. Savings like these pay for years of maintenance . . . or allow more and wider road for the money.

Take maintenance. It's always low with Asphaltic concrete. It's easier too, and much faster.

And when future loads and traffic volume increase as they inevitably will, just add another course of Asphaltic concrete. This builds up thickness and strength.

Plan for Asphaltic construction. You'll have smooth going . . . during construction . . . on the road . . . with the taxpayers.



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nals, and distribution systems. The initial phase of the comprehensive development of this project will also provide some flood control, recreation and forest resource development.

Emery County

The Emery County project is in the headwaters of the San Rafael River in east central Utah. Its construction will primarily improve irrigation water supply for 20,450 ac. of irrigated land, supply water for about 3,630 ac. of new land, and provide for recreation opportunities. The Joes Valley Dam and Reservoir with total capacity of 57,000 ac.-ft., a diversion dam, canal, laterals and drains, are the principal features of the project.

Florida

In southwestern Colorado on the Florida River, development of the Florida project will include construction of the Lemon Reservoir to a capacity of over 23,000 ac.-ft., a diversion dam and enlargement of an existing canal, and a distribution system. These works will provide supplemental water to about 12,650 ac. and full supply to about 6,300 ac. of land. Operation of the project will also provide flood control and some enhancement in fish and wildlife values in the area.

Hammond

The Hammond project in northwestern New Mexico will divert San Juan River waters for irrigation of about 3,670 ac. of arable land along the rivers in the vicinity of Farmington and Bloomfield. Principal features of this single-purpose development are a diversion dam, main canal, pumping plant, lateral and drainage systems.

LaBarge

Diverting water directly from the Green River, the LaBarge project in southwestern Wyoming will provide irrigation water for about 7,970 ac. of desert land extending 40 mi. along the river above LaBarge. Project works will include a diversion dam, conveyance canal, distribution laterals and drains.

Lyman

The Lyman project in southwestern Wyoming along Black's Fork of the Green River near the Wyoming-Utah boundary will supplement an irrigation water supply for about 40,600 ac. of land having only a partial supply. Bridger Reservoir will be constructed with 43,000 ac.-ft. total capacity on Willow Creek and other

features will include feeder canals to the reservoir, drainage and improvements to the existing irrigation system.

Paonia

The existing authorized Paonia project on the North Fork of Gunnison River in west-central Colorado would be extended by this reauthorization. Irrigation water supply will thus be improved for an additional 4,380 ac. of irrigated land and a full water supply provided for about 1,160 ac. more of arable land. Fish and wildlife values in the area will be enhanced and flood damages will be decreased. Project construction includes Spring Creek Reservoir, canal enlargements and extensions.

Pine River Extension

Extension of the existing Pine River project in southwestern Colorado and northwestern New Mexico on Pine River about 20 mi. east of Durango, Colo., will provide water for irrigation of about 15,150 ac. of arable land, of which about 1,940 ac. are within the Pine River Indian irrigation project. Project extension will involve enlargement and extension of eight major canals and ditches diverting from Pine River, a new diversion dam, and several small distribution laterals.

Seedskadee

The Seedskadee project will be constructed in southwestern Wyoming along the Green River below the authorized LaBarge project. Principal works will include a diversion dam on the river, conveyance canals, pumps, and distribution laterals. Such work will provide an irrigation water supply for about 60,720 ac. of arable land.

Silt

An improved water supply for over 5,400 ac. of partially irrigated land and a full supply for about 2,270 ac. of new land will be provided by construction of the Silt project between Rifle and Elk Creeks in west-central Colorado. Construction features include the Rifle Gap Reservoir of 10,000 ac.-ft. capacity, a pumping plant, diversion dam and feeder canal, rehabilitation of existing works, and construction of laterals and drains.

Smith Fork

The Smith Fork project will be constructed in west-central Colorado along the Smith Fork of Gunnison River near Crawford. A supplemental water supply for more than

8,160 ac. of partially irrigated land and a full irrigation supply for more than 2,270 ac. of new land will be provided by the project. Construction features include the Crawford Reservoir with 14,000 ac.-ft. capacity, diversion dam, feeder canals and laterals. Recreation opportunities will also be provided by the project.

Headaches in Alaska

WHITE ALICE at Indian Mountain, far in the central interior of Alaska, is causing headaches to the Alaska District Corps of Engineers who will supervise construction, to the Air Force for whom it is to be built, and to contractors who bid on construction at the isolated site which can be reached only by air.

Bids opened in June in the Seattle branch of the Alaska District were far higher than the government estimate of \$696,610.

Three of the bids came from contractors nearest to Indian Mountain which is about 200 miles northwest of Fairbanks.

The four bids entered are: Reed & Martin, Inc., Box 568, Fairbanks, \$1,039,950. Gasland Construction Co. of Bellingham, Wash., \$1,162,400. Fairbanks Builders, \$1,279,000. Swalling Construction Co., Anchorage \$1,452,700.

Among problems are a tight rush construction deadline; the fact that all government furnished equipment—more than 91 tons—and all supplies, heavy equipment and machinery required by the contractor must be air lifted to the site.

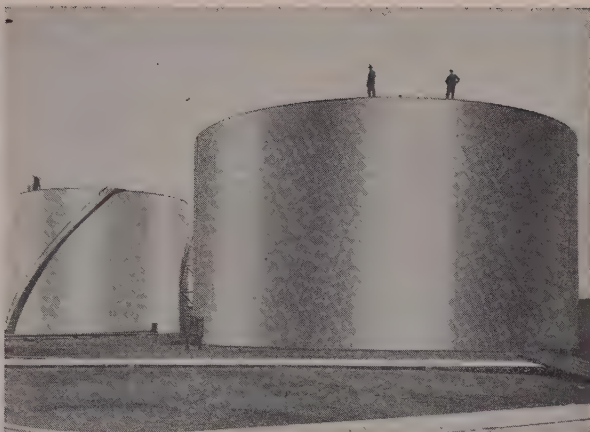
This is the seventh in a White Alice string being built this summer in the micro-wave communication system for the Air Force supporting the DEW line (distant early warning).

Government material is stockpiled at Tacoma and Seattle. Some can be brought up by barge to the nearest port for transshipment by railroad, heavy duty trucks and trailers, or plane.

At Indian Mountain, which is near the little town of Hughes, is a partial Aircraft Control and Warning Station and a steep runway. Gasland, who has other Alaskan contracts, specified that materials and equipment which are "too heavy, too long, or too bulky to airlift by commercial planes are to be airlifted by Air Force planes."

Swalling stipulated that arrangements be made by the Government to airlift from Fairbanks at no cost approximately 93 tons of contractor heavy equipment.

The job requires construction of complete tower foundations; erection of towers and antennae, wave guides and supporting structures.



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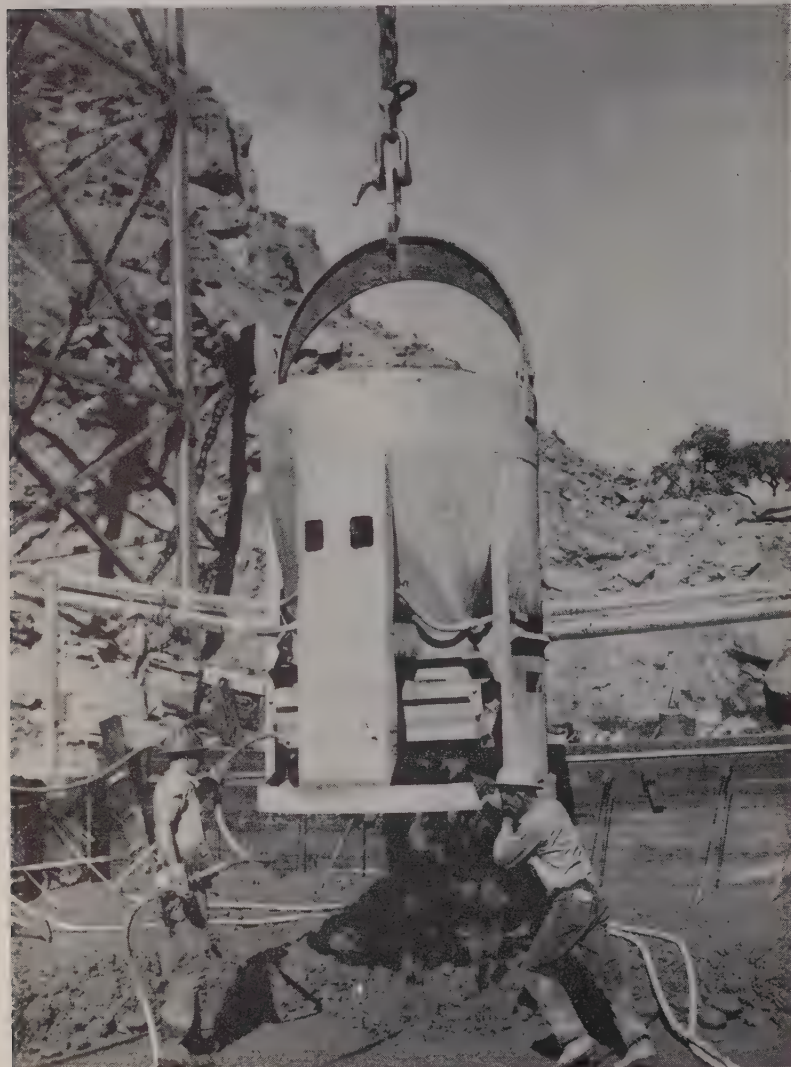


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Concreting resumes at Monticello Dam after winter flood delay

Excavation over-run, record winter floods hinder early progress—contractor

is working around the clock to place concrete for finish in early 1957.



THE MONTICELLO DAM PROJECT, like many other construction jobs on the Pacific Coast, was hit hard by last winter's record floods. The contractor is back in full swing now after a three month delay rebuilding access roads, cofferdams and the 180-ft. high curved trestle which carries the whirley crane.

Monticello Dam is a concrete arch structure 304 ft. high on Putah Creek at the west side of Sacramento Valley in California. It's being built by a joint venture of Peter Kiewit Sons' Co. and Parish Bros. on a \$7,268,991

contract awarded by the Bureau of Reclamation in 1953. **Western Construction** carried a review of the early phases of the job in September of 1954, followed the next month by a description of the rather extensive use of rock bolts.

When the flood hit in December 1955 the stream rose from a nearly dry bed, on Dec. 18, to about 45,000 cfs. in 30 hours. It subsided and again rose even more rapidly to 85,000 cfs. on Dec. 22. The peak flow was 20% higher than anything previously recorded.

Concrete placement was off to a good start in mid-December. With the foundation at elev. 153, the low block had risen to elev. 255 and the high block to about elev. 280. Then the water began to come up. On Dec. 19 it quickly poured over the low block at elev. 255. The water surged over 6 blocks reaching a maximum ponded level of elev. 275. After receding to elev. 250 it rose even higher to elev. 280 on Dec. 22. The mill yard and lumber supplies were washed away, the trestle towers, scaffolds, and forms were severely damaged, and the downstream access road and cofferdam were taken out, as well as the air, water, and refrigerant lines.

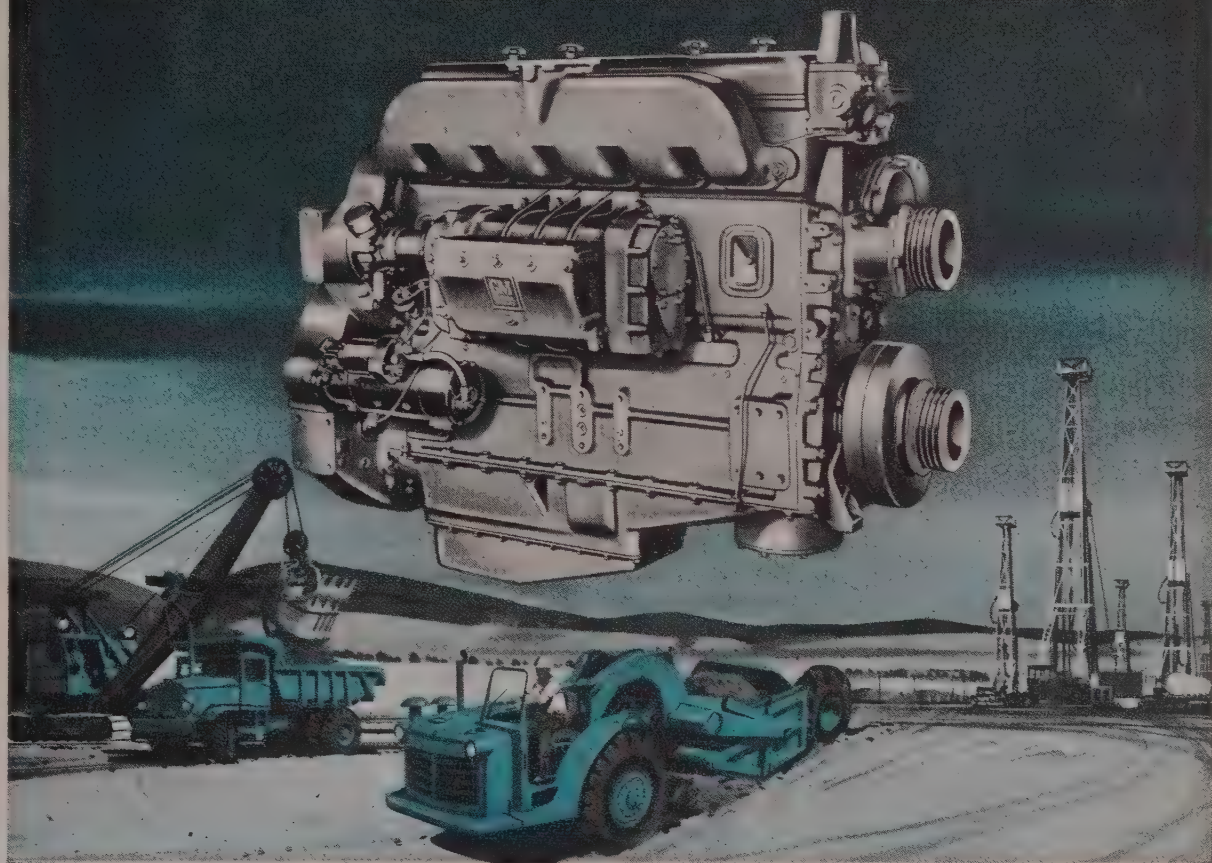
With the access road gone it was impossible to bring heavy equipment in to repair the cofferdam and the trestle. The whirley crane had been placed next to the canyon wall at one end of the trestle and the locomotives and cars had been moved to the other end. Even so, it was feared for a time that the tremendous flow of water would cause the structure to fail completely. It wasn't until March that the danger of further flooding had diminished enough to permit the access road and the cofferdam to be repaired. The next step was to pump out the site and repair the trestle. Several of the main towers had been badly damaged by stream-carried rocks and debris and the deck at the center was sagging over one foot.

Kiewit decided to replace the center tower. New footings were poured outside the old ones and the tower was carried up enclosing the old one. When the proper grade was reached the deck was jacked up from the new tower and the old one was torn down. Concrete pouring resumed on May 15.

The site is characterized by light to heavy bedded sandstone spaced with thin strata of silt stone, poor for making concrete. Aggregates are trucked in 26 mi. over existing state roads from a borrow area near the town of Esparto. The 6-in. size, the largest, is hauled from near Sacramento, 50 miles away. All of the aggregate is river run with no crushing done.

Aggregate is dumped from the bottom-dump trucks into an unloading hopper, which feeds a short 30-in. wide transfer belt. The main 30-in. conveyor takes it from there up to the top of the storage bins where it is deposited through a turnspout in four sizes, $\frac{3}{4}$ in., $1\frac{1}{2}$ in., 3 in., and 6

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Now the best 300-horsepower Diesel is even better than ever—ready to step up production and cut costs in any job you name.

It's the time-proved General Motors Series 110 Diesel, newly equipped with a side-mounted blower similar to the one used on the famous 71 Series. It's a more compact engine. It's shorter. It's lower. It fits more applications than ever before.

You can have this new GM Detroit Diesel Series 110 engine installed in off-highway trucks and move bigger loads faster.

You can use it to increase the power of heavy crawler tractors and scrapers—get more work per day and per dollar.

And, in practically no time at all, you can have this new Series 110 Diesel installed in almost any 3-yard shovel—to move earth faster at less cost.

The new blower makes the Series 110 Diesel engine far more versatile—available with *either* right- or left-hand

rotation, and wider range of accessory-drive outlets—*four* accessory drives on the rear of the engine and *four* fan-mounting positions on the front.

This new Detroit Diesel Series 110 engine takes on all comers in operating efficiency. It's a leader in work output per dollar. Let your local GM Detroit Diesel Distributor or Dealer show you what we mean.

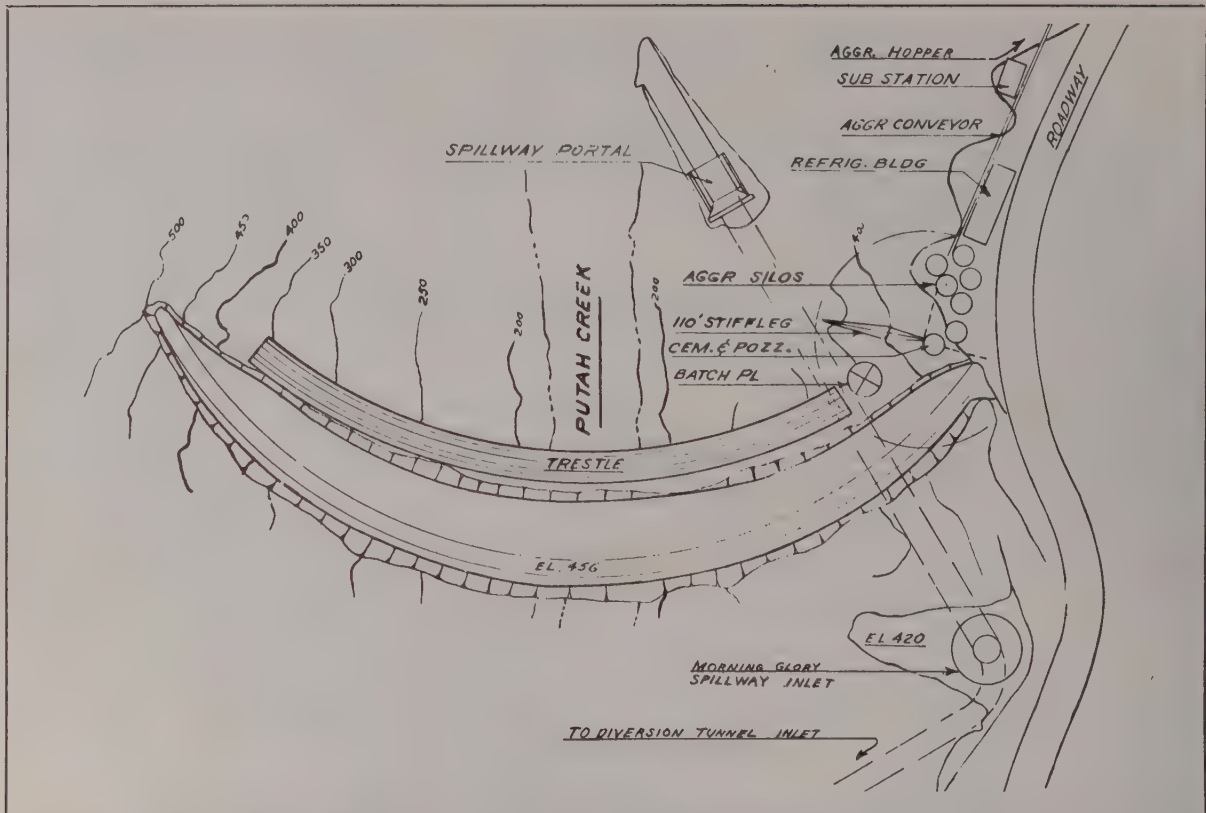
Single Engines . . . 30 to 300 H.P. Multiple Units . . . Up to 895 H.P.



**DETROIT
DIESEL**

Engine Division
of General Motors
Detroit 28, Michigan
In Canada: General Motors Diesel
Limited, London, Ontario

America's Largest Builder of Diesel Engines



THE CURVED trestle from which concrete is placed is almost entirely outside of the dam, permitting maximum salvage when the job is over. The method for excavating the spillway inlet was described in Western

Construction, Sept. 1954. Concrete is carried along the top of the trestle by two 12-ton Davenport diesel electric locomotives. Job will be over in early 1957 if contractor maintains present fast pace.

in. Sand is brought to its bin from the turnspout by a shuttle conveyor. Part of the aggregate conveyor system came from Garrison Dam in North Dakota.

The bins, 42 ft. high and 23 ft. in diameter, are made from steel sheet piling set on concrete founda-

tions. The sand bin is 27 ft. in diameter. The four aggregates are reclaimed by a common belt which carries them to the batch plant. The sand arrives on a separate 24-in. wide belt. All aggregates are re-screened at the top of the batch plant by a Symons 4 x 12 triple deck. The batch

plant is a C. S. Johnson 500-cu. yd. Octobin with three 2-cu. yd. Koehring 2S tilting mixers.

The cement and pozzolan are delivered in bottom-dumps to a common hopper where they are transferred to a bucket elevator by a 10-in. screw conveyor. At the top the cement has a gravity slide to a 5,000-bbl. silo, and the pozzolan has a slide to a 3,750-bbl. silo. They are reclaimed by separate Fuller-Kenyon 6-in. air slides to the batch plant. All materials are batched separately by weight.

Concrete is carried from the batch plant along the top of the trestle to the crane by two 12-ton diesel electric Davenport locomotives. One man located on a walkway on the flat cars controls the locomotives, fills the buckets and hooks them to the crane. Each flat car has openings for four 4-yd. buckets. The flat car carries only three buckets when coming from the batch plant, leaving one space open into which the crane can set its empty.

A trestle is being used for placing concrete rather than a cableway mainly because the cost of excavation of a bench for a movable head-tower would have been excessive. Also the design of the dam permitted a curved trestle to be built completely outside of the dam, permitting



AGGREGATE for the job is being supplied by subcontractor Madison Sand & Gravel Co. at their permanent plant. Most of the 6-in. material is coming from deposits along the American River, north of Sacramento. Trucks haul aggregate to the site from as far away as 50 mi.

are your best investment



Overhung engine type Scrapers of 7, 12 and 18 yds. struck capacity

Powered by engines of 143, 218 and 300 h.p., these scrapers are the fastest selling line in the industry. Advanced design of Euclid's hydraulic lever action, bowl and cutting blade provides fast, easy loading. The 18 yd. model has Torqmatic Drive . . . all have NoSpin differential and Euclid planetary drive axle . . . unequalled accessibility of power train and major components.

Four-wheel Tractor Scrapers

These 12 and 15.5 yd. scrapers have maximum stability for high speed hauls and rough roads. At 3:1 slope heaped capacity is 14 and 18 yds. A 200 or 218 h.p. engine with 5-speed transmission powers the 12 yd. scraper . . . drive tires are 21.00 x 25 standard with 24.00 x 25 optional. The 15.5 yd. scraper has 300 h.p. engine with 10-speed transmission or Torqmatic Drive . . . standard tires are 24.00 x 25 with 29.5 x 25 optional . . . a 17 yd. bottom-dump trailer is interchangeable with this scraper.



TC-12 Twin Crawler

A completely new concept in tractor design and performance, this Euclid tractor has two 194 h.p. engines (388 h.p. total) with a separate Torqmatic Drive for each track. Changing from one speed range to another (top speed of 8.3 mph) or to one of the three reverse speeds can be done under full power. Available drawbar pull is equal to or greater than gross weight. Planetary drives can be serviced without removing track, frame or drive sprocket.



Twin-Power "Euc" Scraper

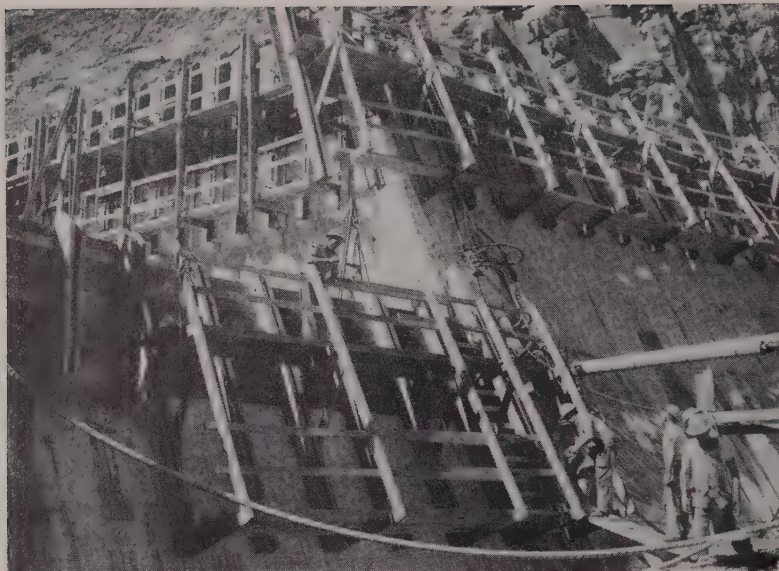
The Model TS-18 is powered by two engines with a total of 436 or 518 h.p. It is a one-man earthmoving crew . . . self-loads and works under conditions that stop other scrapers. Tractor has a 218 h.p. or 300 h.p. engine with Torqmatic Drive . . . scraper wheels are driven through Torqmatic Drive by a 218 h.p. engine. Tires are 27.00 x 33 with 33.5 x 33 optional. Heaped capacity at 3:1 is 21 yds.

Rear-Dumps, Bottom-Dumps, Scrapers, Loaders, Tractors

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



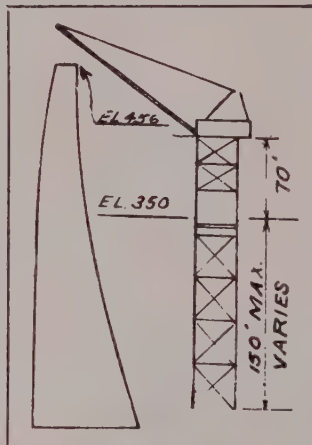


A-FRAMES and come-alongs are used to lift forms, which are job-designed but fabricated off the job. No horizontal walers are used so forms can be adapted to the varying radius of the dam.

RIGHT: The dam is 304 ft. high and 1,000 ft. long at the crest. Bottom width is 90 ft., top width is 12 ft.

BELOW, LEFT: Batch plant clings to canyon wall at one end of trestle. Large insulated pipes supply cool air to aggregate.

BELOW, RIGHT: Top of the gantry cab is about 220 ft. above the ground. Dam crest will be about 25 ft. above gantry.



almost complete salvage when the job is finished. The trestle is 30 ft. wide, 625 ft. long and has a maximum deck height of 180 ft. The major spans are 65 ft., with 6-ft. deep plate girders. The tower spans are 30 ft., with 3-ft. deep plate girders. The structure is built on a radius of 515 ft. The American 10125 revolver crane can handle 11 tons at 135-ft. radius or 50 tons at 45 ft. The whirley gantry is 70 ft. high.

The flood isn't the only thing which has worked against Kiewit's original progress schedule—there was also a large amount of over-run on the original excavation. The first bid schedule called for 74,000 cu. yd. of rock excavation, and 15,000 cu. yd. common. The actual quantities turned out to be 227,000 cu. yd. of rock and 5,000 cu. yd. of common.

All forms are being built on the job, and the contractor has set up a complete millyard for this purpose. Most of the panels are 56 x 5 ft., with double 3 x 10-in. by 14-ft. long studs 3 ft. 9 in. on centers. The upstream and downstream panels are partial cantilevers, tied down at the top with 1/2-in. tie rods at 45 deg. The contraction joint forms are full cantilevers with Blaw-Knox metal keys. All forms are lifted with aluminum and steel A-frames and 3-ton come-alongs. The A-frames are job-designed. The upstream and downstream forms use 2-in. sheeting, and no horizontal walers are used to permit adjusting forms to the varying curve.

Crews are working 24 hours per day on a 5-day week. Concrete is placed on the swing and graveyard shifts and the form raising and yarding is done on the day shift. Specifications call for a concrete placement temperature of 65 deg. This is met by air-cooling aggregates and mix water. After the concrete is placed cold water is circulated through 1-in. tubing 5 ft. on centers at each 5-ft. lift. An initial cooling period of 12 days is required to counteract the heat of hydration. Secondary cooling is performed to bring the mass of concrete down to ambient temperatures at which it will remain permanently.

The cooling will contract the concrete enough to permit high pressure grouting of the contraction joints between the blocks. Grout pipe is placed as the high blocks are carried up. These consist of 1/2-in. risers with outlets 10-ft. vertically and 6-ft. horizontally, fed by 1 1/2-in. grout headers.

The water supply system consists of two 60-hp. vertical turbine Jacuzzi pumps which carry the water to two 10,000-gal. storage tanks. As the water leaves the tanks it passes through a 30-hp. Fairbanks-Morse pump. Pressure is 90 psi. at the top of the dam. Water is distributed through 6-in. and 4-in. lines. Cold water for the cooling coils comes from the refrigeration plant to the dam in 8-in. insulated lines. It is distributed through 4-in. insulated



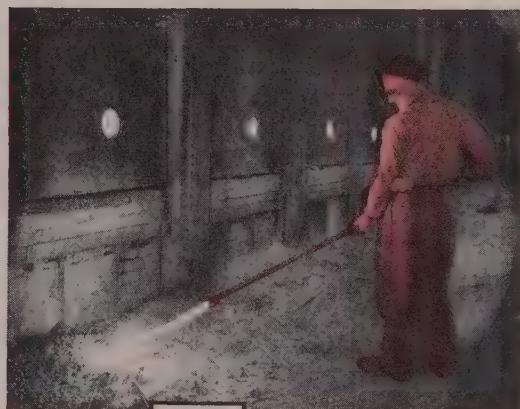


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always at your service**

This steel melter—at Wickwire's open hearths where wire rope steel is made—is with your Wickwire Rope Distributor every time he makes a call.

True, he's physically at the open hearth compounding steel with the sharp eye of an expert. But your Wickwire Distributor makes his call with the full assurance that the steel in Wickwire Rope has the right chemical content and grain size because it's always produced under rigidly controlled conditions by experts.

It's just one more reason why your Wickwire Rope Distributor knows he's got top-quality rope, slings and strand to sell ... and that these products will serve you well.



A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION



STANDING in the mill yard are (left to right): Joe Hassel, day shift superintendent, Ford Johnson, general superintendent, Shorty Schramm, cleanup and sandblasting foreman, and Doug Baker, project manager.

lines with 1-in. hose tap as required. The cold water system is completely closed and all water is reclaimed.

The refrigeration plant is composed of five 100-hp. and two 50-hp. Freon units and a 150-hp. and a

100-hp. ammonia unit, one made by Electrical Machine Co. and one by Ingersoll-Rand.

Air for the job is supplied by two 200-hp. motors driving four 415-cfm. Ingersoll-Rand compressors. Pres-

sure at the compressor house is about 100 psi. A 600-cfm., 100-psi. portable diesel compressor stands by.

Electrical power is supplied by Pacific Gas & Electric over a line using a primary voltage of 12,000 leading to a 3,000-kw. substation at the site.

Monticello Dam is a unit of the Solano Project of the Bureau of Reclamation, and is the only concrete dam the Bureau has under construction at the present time. B. P. Bellport is construction engineer and J. R. Granger is resident engineer. Max R. Johnson is field engineer and H. E. Horton is office engineer. Louis Petzoldt is principal inspector.

For Kiewit and Parish, the prime contractors, Doug Baker is project manager and Ford Johnson is general superintendent. Shift superintendents are Joe Hassel, Wilson Wiggins, and Bob Becker. The plant superintendents are Marshall Eastham, Floyd Sandy, and Bill Eggleston. Henry Scott is project engineer. Office engineers are Clark Hestmark and Bill Bowman. Gill Lowe is office manager, Dave Rigby is safety superintendent, and Jerry Cannon is purchasing agent and warehouse superintendent. Jim Balden is millyard superintendent, and Bill Olund is form design consultant.

The Highway Act of 1956

PRESIDENT EISENHOWER signed "The Highway Act of 1956" on June 29, and according to the American Road Builders Association this authorizes the federal government to contribute \$27.7 billion in federal aid for road-building throughout the nation over the next 13 years. State matching funds added during the long-range program will make possible a \$32.5-billion construction program on federal-aid systems, plus whatever states, counties, and cities spend on other roads and streets.

The new law authorizes \$24.8 billion in federal funds for completion of the National Interstate System—a 41,000-mile superhighway network of the nation's main routes—within the next 13 years. The states will match on a 90-10 formula to finance the \$27-billion project.

For the first three years of the program, apportionment of Interstate Funds to the state highway departments will be on the formula of 2/3 population, 1/6 area, and 1/6 rural road mileage. Thereafter, through-

out the remaining 10 years of the program, apportionment will be on the basis of cost to complete remaining segments of the system within each state. The Bureau of Public Roads, in cooperation with the states, will provide those estimates to Congress.

The sum available to the 48 states for the Interstate System during the first three years totals \$4,700 million, plus \$175 million previously apportioned under the Highway Act of 1954 for fiscal 1957.

The new law also authorizes increasing amounts for the regular federal-aid systems—primary, secondary and urban—on the traditional 50-50 matching basis and for the first three years of the program only. The sum available to all of the states for this period totals \$2,550 million, which includes the \$700 million previously apportioned under the Highway Act of 1954 for fiscal 1957.

In addition, some \$103 million annually has been authorized for both 1958 and 1959 for roads in national parks and forests, Indian lands and other federal domain lands.

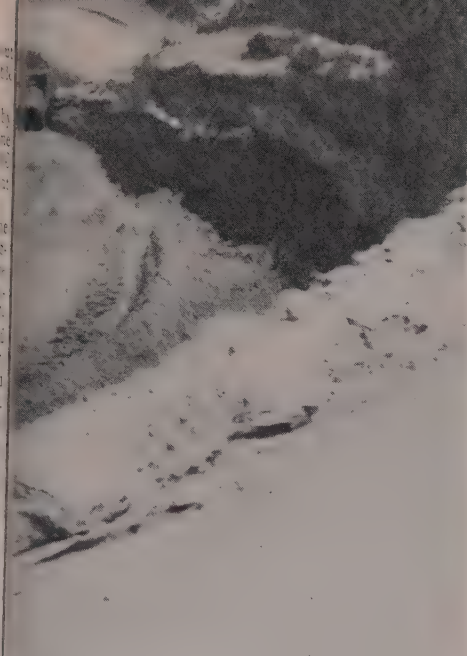
Under the national program, federal aid and state matching money will total about \$3.1 billion in '57, about \$3.6 billion in '58, and about \$4 billion in '59. However, during these years, probably twice those amounts will be spent for construction of roads and streets as a result of additional mileage built by states, counties and cities without federal aid.

FUNDS FOR THE WEST IN THE NEXT 3 YEARS

(from an ARBA tabulation)

	INTERSTATE	PRIMARY	SECONDARY	URBAN	TOTAL
Arizona	\$ 63.2	\$23.3	\$16.0	\$ 3.5	\$106.0
California	314.1	91.4	46.6	97.9	550.0
Colorado	75.1	37.3	24.8	9.6	146.8
Idaho	55.6	23.0	16.2	2.0	96.8
Montana	79.0	40.4	27.9	2.6	149.9
Nevada	57.6	17.6	11.7	.7	87.6
New Mexico	66.5	29.0	20.0	3.3	118.8
Oregon	74.8	31.1	22.0	8.2	136.1
Utah	53.7	17.3	11.6	3.5	86.1
Washington	88.7	35.2	23.5	17.8	165.2
Wyoming	57.0	22.3	14.5	.9	94.7
TOTAL	\$985.3	\$367.9	\$234.8	\$150.0	\$1738.0

All figures in millions



"I can rip up concrete with pry-action break-out—without strain on the crawler," declares J. E. Johnson, Knoxville, Tenn., of his new bonus-powered TD-9 International Drott Skid-Shovel. "Best grading loader I've operated. Has no-strain steering, fine job vision!"



4 new TD-24's. "Work ability and distributor service were major factors when buying 4 new TD-24's," says Tony Petitto, Jr., Byron Construction Co., Clarksburg, W. Va. These tractors replaced 4 competitive crawlers. A fifth TD-24 on this stripping job has worked 7500 hours.



"95% International since 1940—"

"Loose, dead sand—almost impossible to load—yet we average 2500 yards daily where I believe other scrapers would fail miserably," reports Contractor N. V. Lamb, Lusk, Wyo. "The powerful International TD-24 Torque Converter and easy-loading 55 Payscrapers are giving high output in tough material!"



"Since 1948, preferred International engines"

"With only routine care our International machines stand up," state Howard and Dorsey Hall, Hall Sand & Gravel, Denver, Colo. Their new TD-14 (142 Series) is shown stockpiling sand. Their International fleet includes a TD-14 Skid-Shovel, four power units!



Short-haul yardage soars"

**utfits
berating ease"**

manpower moves practically double our former yardage. Loading averages 42 seconds in dry, hard-packed clay. Easy operation and plenty of power make new Payscrapers the operators' favorites."

Why not try a bonus-powered International outfit on your job? See your nearby distributor for a demonstration!

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**INTERNATIONAL
Construction Equipment**

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A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

Prestressed piles look good in tests

The ability of prestressed concrete piles to absorb the energy of the pile-driver hammer is one reason they behave better under heavy driving. Recent tests emphasize advantages of prestressed piles.

steel reinforcement of a pretensioned pile may thermally expand without overcoming the initial compressive prestress in the concrete.

This is not possible with a non-prestressed concrete pile. The compression and elongation of the reinforcing steel after impact of the hammer imposes simultaneous compression and tension stresses in the concrete. In addition any increase in temperature of the reinforcing steel will transmit further tensile stresses to the surrounding concrete.

Tests at Long Beach

Two 14x14-in. prestressed piles designed by the author and manufactured by the Ben C. Gerwick Corporation were driven to refusal at Petaluma, Calif., during July 1954. Both of these piles received 800 blows of a number one Vulcan hammer with less than an inch penetration. In both instances the temperature of the anvil and butts of the pile increased sufficiently to ignite and burn out the cushion blocks. On May 17, 1956, two similar piles manufactured by the same company were driven at Pier B, Long Beach, during a joint research project by the Long Beach Harbor Department and the U. S. Navy. Cushion blocks were again burned out. In each case these piles withstood extremely severe driving conditions with no structural damage.

Piles were driven in 20 ft. of water in Long Beach Harbor with a diver present for sub-surface inspection as required. Hammer used was a Vulcan 80C operating at about 100 blows per minute. The first prestressed pile was driven to a final penetration equal to 352 blows per inch. This pile was not driven continuously as driving was interrupted for intermittent diver inspection. The second pretensioned pile was driven continuously to 100 blows to the inch with a total number of blows of over 1,300. The diver reported no cracks or damage in either pile. Above the water line both piles were also in perfect condition except for minor spalling on the head of the second pile.

Three 18 x 18-in. normally reinforced concrete piles were driven with the same equipment on the same day as part of the Navy-Harbor Department joint research tests. The diver reported cracks, spalling and other damage during various stages of the driving operations.

Energy absorption

Let us consider the energy absorption capacity of an average 18 x 18-in. precast normally reinforced concrete pile. Assume the pile contains 8 No. 10 bars of longitudinal reinforcing. The pile is being driven to a point where the exposed length to the point of fixity is roughly 30 ft. The weight of longitudinal reinforcing steel in this exposed length is approximately 800 lb. The specific heat of the steel in the exposed length is approximately 86 BTU's per degree F.

The pile is being driven with a hammer imparting 12,000 ft. lb. per blow at the rate of 100 blows per minute. This amounts to an energy delivery to the anvil of 1,200,000 ft. lb. per min. or 1,550 BTU's per minute.

Assume this pile is capable of withstanding driving to refusal and withstanding 800 blows for 8 minutes as did the pretensioned pile. The energy input to the pile would amount to about 12,000 BTU's. The average temporary temperature increase in the reinforcing steel in the exposed length would increase approximately 150 deg. F. causing an elongation of the steel of nearly 1/3 of an inch with a tensile stress in the concrete of nearly 5,000 psi.

One reason for high capacity

Obviously a normally reinforced concrete pile could not withstand anywhere near this tension in the concrete. However, the pretensioned pile is capable of absorbing this temperature increase of the steel without relieving the compressive prestress in the concrete. This is one of the reasons for the higher capacity of a prestressed pile to withstand heavy driving.

By **WILLIAM F. REMINGTON**
ASCE, ASME
Associated with
GEORGE F. NICHOLSON
Consulting Engineer

THE ABILITY of a concrete pile to absorb the energy of the pile-driver hammer becomes important during hard driving conditions. Deep penetration skin-friction piles which are lightly driven in soils of poor bearing value are able to conduct most of the energy from the hammer into overcoming the "skin friction" of the bearing material. However, as the penetration per blow becomes less more energy is retained in the pile. When a pile is driven to refusal nearly all the energy of the hammer is absorbed in the pile and very little energy may be transmitted to the bearing material.

Under these conditions the kinetic energy of the pile-driving hammer is transformed into internal heat within the pile. The elastic properties of a pile and its ability to absorb heat are a measure of the ability of the pile to withstand heavy driving.

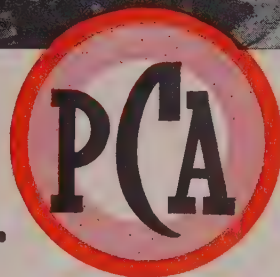
Prestressing the answer

Because of their elastic properties, pretensioned concrete piles are better able to shorten and elongate under heavy driving than normally reinforced piles without subjecting the concrete to tensile stresses. Also the



A PCA "Engine-Take-Off" mixer truck—one of 42 IH FC-402-L Trucks with T. L. Smith Integral Mixers and Fuller 5-C-650 Transmissions.

FULLER *Transmissions* *all the way for*



"We've learned from experience that Fuller Transmissions are by far the most dependable we've ever used," says R. O. Lippi, Manager of San Francisco's Pacific Coast Aggregates, Inc. That's why PCA always specifies Fuller Transmissions on its new mobile equipment.

PCA, one of the largest and most successful aggregates producers in the country, operates 13 producing and 18 batching plants in Northern Cali-

fornia; is a wholesale distributor of building materials.

Fuller 5-C-650 Transmissions are used in PCA's entire fleet of 42 new International "E.T.O." trucks . . . the unique and highly practical "Engine Take-Off" mixer trucks that eliminate the mixer engine and make it possible to carry 6½ cu. yd. payloads within California state weight laws.

Its fleet of 16 diesel powered Wooldridge Terra Cobra wagons, used in the harvesting operation to produce rock, sand and gravel, is equipped with 200 hp HBIS Cummins engines and Fuller 4-speed 4-A-112

heavy-duty transmissions.

In addition, the entire PCA fleet of 200 trucks is equipped throughout with dependable Fuller heavy-duty transmissions.

On job after job, where loads are the biggest and the going is the toughest, you'll find Fuller Transmissions putting horsepower to work efficiently. Next time you order heavy-duty construction equipment, specify Fuller Transmissions.

From over 110 models available for rubber-tired equipment, you will find a Fuller Transmission designed to do *your* job.

One of PCA's fleet of Wooldridge Terra Cobra wagons equipped with Fuller 4-speed 4-A-112 Transmissions.

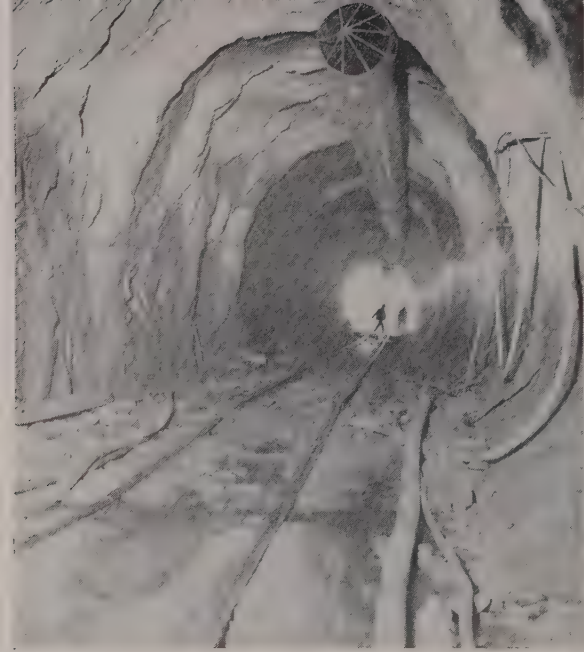


FULLER MANUFACTURING COMPANY
Transmission Division, Kalamazoo, Michigan

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

Drilling seven miles through solid granite

Power tunnel at Donnell's Dam, part of the Tri-Dam project, is 7.2 mi. long, has a section 27,180 ft. long without an adit. Booster fans every 2,500 ft. aid ventilation.



SOLID GRANITE means a steady routine of drill-shoot-and-muck in tunneling. Crews of Tri-Dam Constructors working from two faces are now closing the 5.2-mi. section between two adits on the 7.2-mi. tunnel which will deliver water from the Donnell's Dam to the power plant. The project is located on the middle fork of the Stanislaus River in central California. Progress on the dam and a general review of the project, including its extended financial history, appeared in the last issue.

Access and situation

Most important power producing feature of the Tri-Dam Project is a drop of 1,200 ft. in the stream below Donnell's Dam. By conveying the water a distance of 7.2 mi. through the granite wall of the canyon, or almost 10 mi. along the contour from the base of the dam, the 1,200-ft. head can be secured for developing 54,000 kw. This delivers the water into the upstream end of the reservoir formed by Beardsley Dam, the next lower of the three. Granite cliffs and maintenance problems at a 4,700-ft. elevation made a surface conduit impracticable and the obvious layout was to drive the tunnel all the way from the dam to the location of the penstock.

Next decision was a number of headings which could be developed with economy. Tied in with this decision was the time required for construction of the dam so that power generation could start without delay.

By pulling the tunnel line out toward the surface it would be possible to develop several adits and reduce driving time. However, there was no reason to get the tunnel completed ahead of the dam, and rock

conditions for driving would be better in the depth of the granite canyon wall. As a result the alignment provides for two relatively short adits. The upstream one is 280 ft. in to the tunnel line and 1,600 ft. below the tunnel portal in the reservoir. The downstream adit is 890 ft. long and 9,280 ft. up from the downstream portal at the penstock. This leaves a major section of 27,180 ft. between the two adits and represents the key to the completion date and the length where driving methods and procedure reach their top efficiency.

The section between upstream portal and Adit I was holed through Mar. 2, 1956, and the section from

Adit II to the downstream portal was holed through May 20 of this year.

Dimensions and flow

Since no lining was required for supporting the rock (minor exceptions) the size of the tunnel could be balanced against hydraulic requirements and dimensions that would provide for economy of driving.

These considerations resulted in a horseshoe shape 12 x 13 ft. and this will provide a water velocity of about 5 ft. per sec. when the power plant is operating at full capacity.

To improve low flow conditions through the tunnel, as well as to fa-



SPECIAL pipe-carrying car greatly speeded handling of large diameter ventilation pipes. Air is supplied by a Roots-Connorsville blower. Compressed air is supplied by two stationary 1,100 cfm. compressors, and is carried to the face in aluminum pipe. Water is also carried in aluminum pipe, and about 50,000 ft. will be used before the job is through.



8,000 yards loaded a day at 3 1/2¢ per yard*

On the mammoth Los Angeles Freeway Project the new P&H Sierra Loader combined with a single diesel tractor to average over 8,000 cubic yards every 8-hour shift!

In other projects, up to 2,000 yards per hour have been handled and costs have dropped to as little as 1.4¢ a yard!

This is the kind of P&H performance that

makes for speed—the kind of speed that makes lower operating costs and more profit on every project.

Get the full story on the new, modern, continuous one-man operation loading system made possible by P&H Sierra Loaders. The coupon will bring you quick facts.

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GENTLEMEN:

Please send me full information on actual performance and specifications of the P&H Sierra Loader.

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DRILLING CONDITIONS were similar at all headings. Work is progressing at two headings on the last remaining section 13,000 ft. long. The usual drilling pattern calls for 56 to 60 holes per round which are drilled to a depth of about 11 ft. Since the tunnel will not be lined, overbreak, which has been small, is not a serious problem.



MUCKING is handled by an Eimco mucker loading into cars of 5-yd. capacity made by Century Steel. The usual train of seven cars is hauled by a Goodman 10-ton battery locomotive. A California switch near the face is carried forward about every 10 days to keep it close to the heading.

cilitate inspection and maintenance work during future years the full length of the invert will be paved with concrete and full lining used only near the portals, or where required for stability. Plans call for a minimum coverage of 6 in., and the total yardage is estimated at 9,000 cu. yd.

Drilling

At present the two headings are advancing in the 5-mi. section between adits with about 13,000 ft. to go. Rock is consistently similar in the two headings and as a result equipment procedures and crews are identical.

Each heading has a job-built jumbo operating on the 36-in. track. Six Ingersoll-Rand drifter drills operate from the two levels of the jumbo. Each drill is supported and operated on an I-R Hydro boom.

Bits are 1 $\frac{5}{8}$ -in. Ingersoll-Rand equipped with carbide inserts. Drill steel is 1 $\frac{3}{4}$ -in. round. Two changes are used for a 9-ft. round, and 3 for a 11-ft. round. Lengths are 5, 9 and 11 ft.

With some minor exceptions the pattern of drilling calls for 56 to 60 holes per round which are drilled to a depth of about 11 ft. to pull the 10-ft. round. This pattern results in a consistently small amount of overbreak. Since the tunnel will not be lined the problem of overbreak and resulting volume of concrete does not represent any difficulty in modifying the drilling that is effective in producing maximum driving speed.

Loading is done from the jumbo. 60% powder is normal and the amount used per foot of tunnel varies under normal conditions from about 35 to 45-lb.

The crew at the face during drilling and loading operations usually involves the following: 1 shifter, 6 miners, 6 chuck tenders, and 1 nipper.

Ventilation

Following usual procedure the air is reversed to exhaust for approximately 10 minutes following the firing of the round. This air is supplied by a Roots-Connorsville blower and moves through 24 or 26-in. ventilating pipe supported on the roof of the tunnel. Because of the long distance from the heading to the portal of the adit, the air supply is boosted by Joy Axivane fans at about 2,500 ft. spacing in the line.

Compressed air is supplied by two 1,100-cfm. compressors of the stationary type located at the adit. An unusual feature of the job is the use of aluminum pipe (6-in.) to carry compressed air to the face. Water is carried in aluminum pipe and a total of more than 50,000 ft. will be used in this tunnel project. Ease of handling is the economic factor



"a Huber-Warco Maintainer is our most versatile piece of equipment"



A 9' power sliding mold-board picks up loads smoothly.

All hydraulic controls are within easy reach of the operator.

The hydraulically controlled bulldozer attachment is ideal for filling in low spots before final grading.



Calling their Huber-Warco M-52 Maintainer their most versatile piece of equipment is a statement echoed by many contractors engaged in landscaping, light excavation, parking lots and driveway work.

As a grader, the Maintainer with torque converter, permits more load capacity without stalling or wheel slippage. Power and weight are matched for highest working efficiency.

Hydraulically controlled attachments such as a bulldozer, lift-loader, or back-hoe, add to the usefulness of the Maintainer for the contractor.

Other attachments available for use on the Huber-Warco Maintainer include a mower, broom, side dozer, snow plow, patch roller and berm leveler. These attachments are designed for highway maintenance work.

The M-52 Maintainer will outperform many machines that are larger, heavier, more costly, slower, more expensive to operate, and more limited in use. You owe it to yourself to investigate the unmatched versatility of the Huber-Warco Maintainer.



Huber-Warco Company
Will See You At The
ROAD SHOW
Chicago—Jan. 28—Feb. 2, 1957

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

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Santa Fe Equipment Company, Inc.....3000 Santa Fe Avenue
P. O. Box 58007, Vernon Station, Los Angeles 58, California
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Totem Equipment Company.....3706 Airport Way, Seattle, Washington
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Caird Engineering Works.....Billings, Montana
General Equipment Company.....1501 East 2nd Street
P. O. Box 2524, Reno, Nevada
Western Traction Company.....2230 Third Street, San Francisco 7, California
Western Traction Company.....16th and American River, Sacramento California
Equipment Sales Company.....720 South 19th Avenue
P. O. Box 6245, Phoenix, Arizona
Graham Road Equipment Company, Inc.....3325 Brighton Boulevard
Denver 5, Colorado
Leonard Motor Company.....1211 Fourth Street, N.W.
P. O. Box 1658, Albuquerque, New Mexico

which balances the higher cost per foot.

Ventilation pipe is handled on a special car which provides a frame supporting the section of pipe at the proper level. This arrangement reduces the labor involved in getting the pipe to position at the end of the line.

Mucking and hauling

The average round breaks out about 70 cu. yd. of rock. This is handled by an Eimco 40H mucker loading into cars of 5-yd. capacity made by Century Steel. The usual train of 7 cars is hauled by a Goodman 10-ton battery locomotive. Switching at the face is carried out by means of a California Switch. This switch is moved forward about every 10 days so as to keep it close to the heading.

Most of the muck is wasted into the canyon outside the portal of the adit, but much of this well broken granite has been used for servicing and maintaining the access roads on the project.

Equipment List

- 1 P&H 655B crane
- 1 NW 80D crane
- 1 Bucyrus-Erie B33 crane
- 1 Bay City truck crane
- 1 Lorain truck crane
- 1 Link Belt Speeder crane
- 2 Allis-Chalmers HD5 loaders
- 1 Allis-Chalmers HD6 loader
- 1 Mandt truck crane

Crews and progress

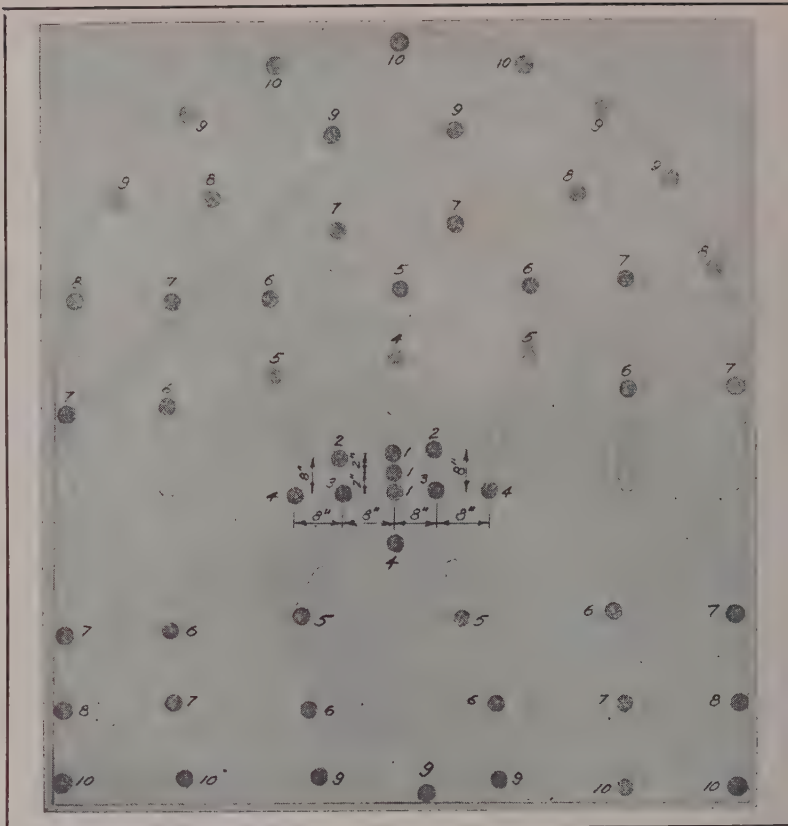
Three 7-hr. shifts are worked. In addition to the men at the face the crew at each adit includes: 1 mucker operator, 3 motormen, 1 brakeman, 1 electrician, 1 mechanic, 1 dumpman and 1 compressor operator. There are also 15 men in the compressor house, drill shop and the outside gang on day shift only.

Average time per round varies from 3 to 4 hr. and breaks down into 1½ hr. for mucking and cleanup, 1¼ hr. for drilling and ¾ hr. for getting ready to shoot and the delay following shooting.

Progress in the headings has been steady based on the time schedule of completing the driving and placing of the invert in time for the start of power production. With no need for high speed the work has been going forward on the 3-shift basis with a 6-day week. During some of the better weeks the advance in a heading might average between 55 and 60 ft. a day. Average weekly progress to date is about 285 ft. per heading.

Personnel

The Tri-Dam Project is being carried out by the Oakdale and South San Joaquin Irrigation Districts. Engineering supervision of the entire project is handled by Tudor-



THIS DRILL PATTERN is typical and is based on an 11-ft. round. Depths are as follows: (1) 2 ft., (2) 2 ft., (3) 2 ft., (4) 4 ft., (5) 5 ft., (6) 8 ft., (7) 10 ft., (8) 6 ft., (9) 9 ft., (10) 7 ft. All holes except lifters are loaded 2 ft. from collar. Lifters (bottom row) are loaded to collar.



EACH HEADING has a job-built jumbo operating on the 36-in. track. Six Ingersoll-Rand drifter drills operate from the two levels of the jumbo, supported and operated by I-R Hydro booms.

Goodenough Engineers with B. W. Goodenough, project engineer, and Ray Overholser, assistant project engineer, and Ted Grover, resident engineer at Donnells.

Tri-Dam Constructors, on the Donnells Dam and tunnel work is

under the direction of Ed Shipp, administrator. Palmer Lee is general tunnel superintendent and Stan Stearns is project engineer.

An extensive review of additional personnel on the project appeared in the July issue.



RESULTS OF FLORIDA TURNPIKE JOB TEST

JOB AND LOCATION: Building 3.8 miles of new road on Florida Turnpike, near Hollywood. The job involves moving about 1,000,000 cu. yd. of sand. The contractor: Troup Bros., Inc., Miami. **CONDITIONS:** *Material*—very fine, loose white sand with an estimated shrinkage of 25%, borrow to compacted. *Loading*—D9 (Series D) Tractor with torque converter used for pusher. *Haul distance*—3250 feet over loose to damp, compacted sand, maintained by a No. 12 Motor Grader. *Rolling resistance*, 100 lb./ton. *Return distance*—3650 feet. *Grades on haul*—400 feet of 1°-3° adverse and 600 feet of 1°-2.2° adverse.

TIME STUDIES

AVERAGE	DW21-No. 470 LOWBOWL Scraper
Load time	.44 min.
Haul time	3.33 min.
Haul speed	11.14 MPH
Spread and turn time (180°)	.38 min.
Return time	3.37 min.
Return speed	12.31 MPH
Wait time	.39 min.
Total cycle time	7.91 min.
Trips per hour	7.59
Pay yd./trip	16.8
Production pay yd./hr.	128

REMARKS: The loose, fine sand was difficult material to load. In spite of this, average loading time was excellent, due to the fast-loading characteristics of the new No. 470 LOWBOWL Scraper. Average cycle time was excellent, too—a reflection of the new DW21's Turbocharged power and wide-base tires!



The new two-wheel Cat DW21-No. 470 LOWBOWL Scraper

A new four-wheel DW20-No. 456 LOWBOWL Scraper is also available. Both units have a capacity of 25 cu. yd. heaped and 18 cu. yd. struck. Both feature the new Turbocharged, 6-cylinder Caterpillar Engine which delivers 300 HP (maximum output) and 10% more rimpull. New LOWBOWL design loads more material with less resistance clear to the end of the loading cycle. And wide-base tubeless tires, now standard equipment, eliminate the major portion of down time caused by tires. All these and other new features add up to bigger, faster loads for you with Cat LOWBOWL Scrapers!

Structural design charts

By

THOMAS HARAN
Civil Engineer



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

BECAUSE the "ACI Building Code" (ACI 318-51) is a building code, it is much more inclusive than is necessary or convenient for the structural designer's purpose. Many of the Code's requirements on such subjects as the quality of materials, details of construction, etc., are quite important to a designer's background, but once he has developed his philosophy of design he seldom refers to these parts of the Code.

Many designers have had the experience of accidentally ignoring a minor code requirement only to have it brought to his attention by one of his colleagues or perhaps slip by unnoticed. Often a designer will remember that there is a certain stipulation somewhere in the Code but is unable to remember its location or wording (or perhaps it is a coefficient) and he finds it necessary to search for it. Sometimes these almost-forgotten requirements are not easily found and an unproductive interval is spent searching, which breaks into the continuity of the engineer's work and thought.

Charts for convenience

In an attempt to eliminate this nuisance, the writer has prepared twelve illustrative data sheets, which have been arranged for the convenience of the structural designer. These sheets are quite condensed, in many places using only key words and symbols. Words and phrases have been omitted that would be redundant to the experienced engineer who is only looking for a certain number or limited dimension that he wishes to verify.

With the exception of such data as allowable stresses and basic design formulas, which most designers have memorized or use from design handbooks, these sheets represent all of the structural analysis and design requirements of the ACI Code with some supplementary information that has been derived from the Code for the convenience of the designer who may decide to use these sheets as an aid.

The sheets will be presented in the following sequence:

The first four of these sheets cover the analysis of floor members in frames or other continuous construction, two-way slabs supported on four sides, and flat slabs. There follow three sheets which give the details and information used in the design of floors. Due to the fact that the ACI Code makes very few direct references to roofs, concerning itself with floors, these sheets have been prepared with the general reference to floors in the titles. However, specific references to roofs on such requirements as shrinkage and temperature steel will be found included in these sheets as they appear in the Code.

Sheet 8 presents the analysis and design requirements on columns.

Sheet 9 represents the requirements on walls and is intended to be used in conjunction with Sheet 10 on the design of walls with minimum steel ratios.

Sheet 11 illustrates the requirements set forth in the Code on isolated footings (there are no specific recommendations at the present time on combined footings).

Sheet 12 will be a general sheet of illustrations and graphs, which supplements the first eleven sheets and completes the set. It covers such miscellaneous subjects as pipes in concrete, reinforcing bar bends, concrete covering of reinforcing bars, and lap splices of reinforcing bars.

Arranged for speed

These sheets are felt to be especially convenient for the designer not only because they omit superfluous information, but also because of the rearrangement and illustration of the Code requirements. The result is a quick picture of many details which are sometimes rather widely separated and duplicated in the Code.

The sheet on the opposite page presents the requirements and permissible assumptions of three methods of analysis of one-way reinforced floor members of continuous construction, such as beams and one-way slabs. Under Method No. 1 a frame is shown with a continuous floor beam (or slab) that has various conditions at its supports, and the permissible and sometimes mandatory assumptions are indicated. The permissible assumption pertaining to slabs with clear spans that do not exceed 10 ft. is also illustrated.

Method No. 2 is merely a condensed presentation of a more complete statement appearing in the Code. Under Method No. 3 the exterior ends of the members are shown as being freely supported. For the case of exterior ends that are continuous with their supports, moment coefficients for the exterior ends of the members may be found by either Method 1 or 2 and the other coefficients may be taken as remaining the same as they appear in Method 3.

A word of caution

The reader should note that some of the structural members shown are of nonuniform thickness or have sloping surfaces, to remind the designer that no specific requirements of uniform cross-section appear in the Code in reference to the analysis to these members. Of course, every designer is responsible for using such freedom of design only so far as the limits of prudent judgment and good practice permit. Above all, it should be remembered that he must place his reinforcing steel in a manner that will permit the member to act in accordance with assumptions made during analysis.

The Author

Thomas Haran is a licensed professional engineer with a Master of Science degree in Civil Engineering. He is a member of the American Concrete Institute, American Society of Civil Engineers, and International Association for Bridge and Structural Engineering. In February 1954, the magazine "Surgery" published an article entitled "Rib Fractures from Muscular Effort with Particular Reference to Cough" in which Haran presented a rigorous mathematical analysis of the problem as co-author with Vincent J. Derbes, M.D. of New Orleans, La.

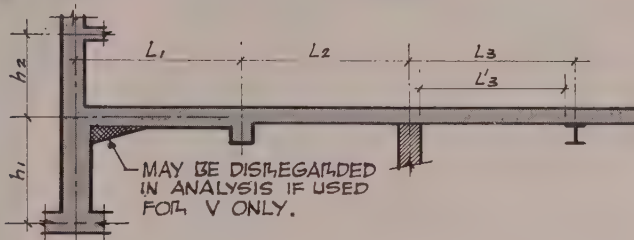
Next month **Western Construction** will present the second of this author's interpretations of the ACI Building Code—"Structural Analysis of Two-way Reinforced Floor Slabs."

The author wishes to express his appreciation to Marelo Eclevia of Brown-Pacific-Maxon Co. of Guam for his drafting of these data sheets.

A.C.I. STRUCTURAL ANALYSIS OF FLOORS

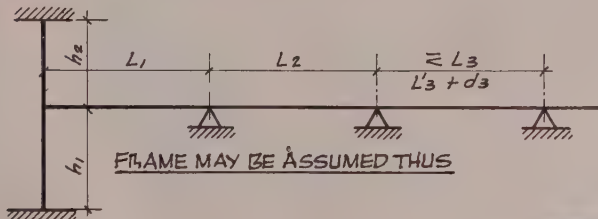
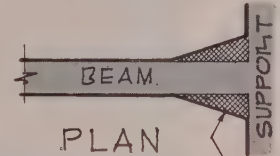
Ⓐ CONTINUOUS BEAMS & CONTINUOUS 1-WAY SLABS SHALL BE ANALYZED BY 1 OF THE FOLLOWING METHODS:

① THEORY OF ELASTIC FLAMES.

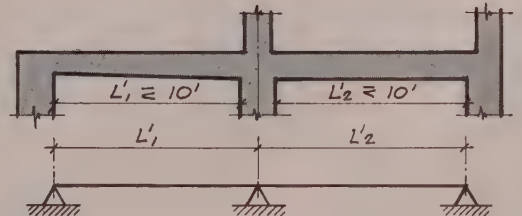


RELATIVE K'S MAY BE ASSUMED OR FIGURED FROM X-SECTIONS.

M'S ARE REDUCIBLE TO FACES OF SUPPORTS.



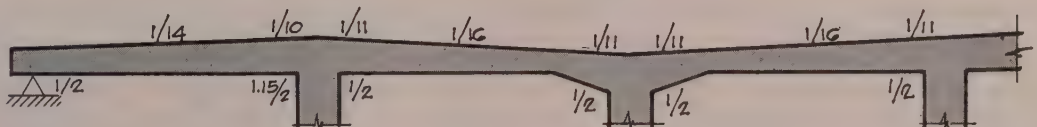
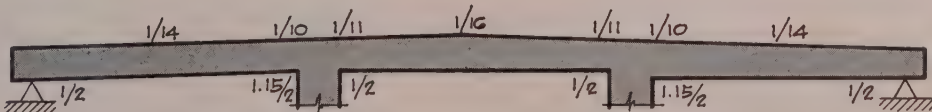
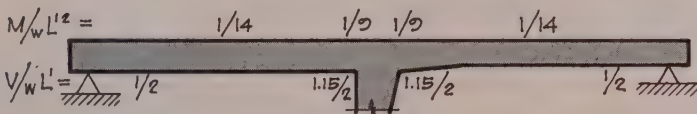
SOLID OR THIBBED SLABS WITH $L' \approx 10'$:



② APPROXIMATE METHODS OF FLAME ANALYSIS OK FOR BUILDINGS OF USUAL CONSTRUCTION.

③ COEFFICIENTS

FOR BUILDINGS OF USUAL CONSTRUCTION IF LARGER OF 2 ADJACENT SPANS ≈ 1.2 SHORTER, & LL/DL ≈ 3 , COEFFICIENTS @ FACES OF SUPPORTS & ϕ OF SPANS ARE AS SHOWN BELOW. FOR SLABS OF $L \approx 10'$ & BEAMS OF $K < 1/8$ ΣK col USE $1/2$ @ FACE OF SUPPORT FOR M.



Ⓑ 2-WAY SLABS SUPPORTED ON 4 SIDES INCLUDING SOLID, THIBBED & WAFFLE SLABS (WITH OR WITHOUT TOP SLABS) SHALL BE ANALYZED BY 1 OF THE FOLLOWING METHODS:

① FIND r & r_1 BY ELASTIC ANALYSIS WITH TL ON PANEL UNDER CONSIDERATION ONLY, OR IF L OR $L_1 \geq 2/3$ & $\leq 3/2$ ADJACENT CONTINUOUS SPANS FIND r & r_1 FROM CASES (1) TO (C).

T. HARAN



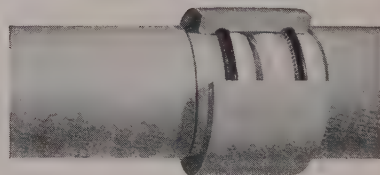
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K&M "Century"® Asbestos-Cement Pressure Pipe slashes maintenance costs

Over the years, pumping costs are stabilized, maintenance is minimized with K&M "Century" Pressure Pipe. It is non-tuberculating, non-corrosive, non-electrolytic—its bore remains smooth and clean. "Century" Pipe is made of asbestos fiber and portland cement... two practically indestructible materials which assure long life.

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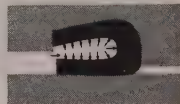
NEW K&M "FLUID-TITE"® COUPLING*

Crews can lay more pipe per hour in any kind of weather with K&M "Fluid-Tite" couplings.

*Patent applied for



Rubber rings compress to allow easy, quick entrance for pipe.



Pressure expands rings. Higher pressure means tighter seal.

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IN CONCRETE FORMING, your success depends on **MEN, MINUTES** and **MONEY**.
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Conserve Manpower—put your **MEN** to work with ready to use, lighter weight panels when you need them.

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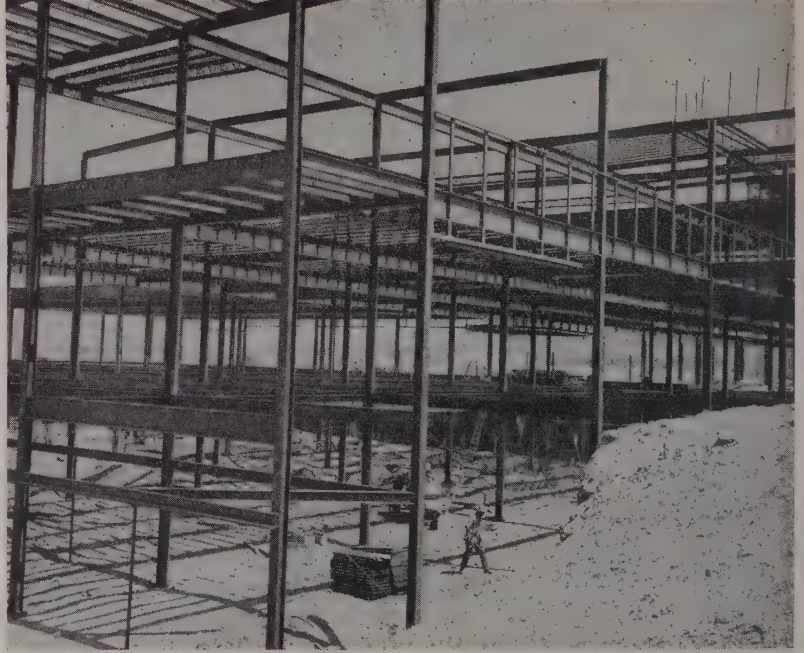
683 THORNTON STREET • SAN LEANDRO, CALIFORNIA • LOCKHAVEN 9-9159



ARIZONA

THE ARIZONA STATE HIGHWAY COMMISSION has awarded a \$917,248 contract to Homes and Sons Construction Co., Phoenix, for building the new Highway Department's Administration & Engineering Building. Homes was low of nine bidders. Work on the project will start immediately and the new building will be completed by March 31, 1957.

RECENT MAJOR CONTRACT AWARDS and low bids in Arizona include a \$354,591 award to **Isbell Construction Co.** of Phoenix for 1¾ mi. of grading and surfacing near Peach Springs, 5 mi. west of the Mohave-Coconino County Line. **Heiskell Construction Co.** of Phoenix submitted a low bid of \$96,513 for grading and surfacing 40th Street, Tempe City in Maricopa County. **Bentson Contracting Co., Inc.** of Phoenix submitted a low bid of \$429,271 for 11.7 mi. of grading and surfacing in Maricopa County. A low bid of \$285,342 was submitted by **Phoenix-Tempe Stone Co.** of Phoenix for grading and surfacing the Rainbow Valley Road in Maricopa County. **San Xavier Rock & Sand Co.** of Tucson submitted a low bid of \$111,043 for grading, surfacing and draining 2.7 mi. of the Sonoita-Mountain View Highway in Pima County.



PROGRESS CONTINUES ON SALT RIVER PROJECT

With much of the structural steel work installed and concrete in place, Salt River Project officials estimate that the new \$1,000,000 headquarters office building is 13% complete. The building located near the intersection of East Van Buren and East Washington Streets on a 29-acre site near Tempe, Ariz., will house the general offices and related administrative and technical departments of the Salt River Project, comprising the Salt River Power District and the Salt River Valley Water Users' Association. Structural steel work furnished by Allison Steel Manufacturing Co. is about 60% complete. A total of 450 tons will be used. Concrete laying is about 22% complete. About 2,000 cu. yd. of concrete will be used for job.

CALIFORNIA

ALLOCATION OF ALMOST \$2,000,000 of Federal funds for improvement of 15 airport facilities in Northern California was announced by the San Francisco Field Office of the U. S. Department of Commerce for the 1957 fiscal year beginning July 1 of this year. This allocation is part of a 4-year program for airport construction and improvement, the largest Federal Aid airport program in history, which includes 28 airports in California.

GROUND HAS BEEN BROKEN for an \$8,000,000 sports arena in Exposition Park in Los Angeles. The arena will have a 34,000 seat capacity and will be equipped for all types of athletic contests as well as trade shows, conventions and other com-

munity affairs. The project, which is scheduled for completion in the late fall of 1957, is being constructed by Guy F. Atkinson Co. An area of approximately three and a half acres will be excavated to a depth of 30 ft. for the arena, some 160,000 yd. of dirt being removed. It was originally estimated that the excavation would cost about \$200,000, but Atkinson Co., also doing work on the nearby Harbor Freeway, has signed to pay \$23,500 for the dirt to use for fill purposes consequently saving the Coliseum Commission an estimated \$223,500.

A \$113,000,000 EXPANSION of Kaiser Steel Corp.'s Fontana, Calif., steel mill will begin at once, according to Jack L. Ashby, vice president and general manager. Production of finished steel products will be increased from 1,084,000 tons to 1,528,000 tons per year with the addition of

the new facilities. Design and construction of the new facilities is being handled by Kaiser Engineers of Oakland. It is estimated that construction will be completed in about two years, although individual facilities will go into operation as they are completed.

WORK HAS BEGUN on a \$10,000,000 addition to Pacific Gas and Electric Co.'s gas main to increase out-of-state supplies. The general pipeline contract has been awarded to the joint venture firm of Midwestern-Johnson-Dixon. It calls for the installation of three sections of 340-in. steel pipe for a total of 85 mi. These will parallel portions of the 502-mi. main which extends from the California-Arizona border near Topock to the Milpitas Metering Station at the southern end of San Francisco Bay. The work will be completed late this year.

To celebrate its first birthday

THE D9 GETS INCREASED HP

—more power for your operation!

320 HP

(FLYWHEEL)

formerly 286 HP

260 HP

(DRAWBAR)

formerly 230 HP



The giant Turbocharged CAT* D9 Tractor, which since its introduction last year has set new performance standards in the field, now packs more power than ever to handle even bigger jobs. Its drawbar capacity has been increased from 230 HP to 260 HP—its flywheel horsepower from 286 to 320!

This increase in power reflects Caterpillar's policy of leadership in action. Combining research with practical field experience, there's constant product improvement to meet your needs for bigger production at lower cost. This policy applies to *every* product in the Caterpillar line—Diesel Engines, Tractors, Motor Graders and Earthmoving Equipment.

Now, with its increased horsepower, you can give the D9 tougher jobs than ever before. To match your requirements, it's available with torque converter or direct drive with oil clutch. For complete details about the more powerful D9, see your Caterpillar Dealer. Name the date—he'll be glad to demonstrate!

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

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**D9—MORE POWERFUL
FOR BIGGER PRODUCTION**

THE BUREAU OF RECLAMATION has awarded a \$6,179,639 contract to the Mitty Construction Co. of Los Angeles, the lowest of eight bidders, to initiate construction of Vaquero Dam and access road of the Santa Maria Project, near Santa Maria. The Santa Maria Project is an irrigation and flood control development designed to provide supplemental irrigation water to 35,700 acres and a full supply to an additional 3,000 acres. The project is unique in that no surface delivery of irrigation water is contemplated. Stored water will be released to percolate into gravel beds of the river channel and to recharge the natural underground reservoir which has been seriously depleted by heavy irrigation pumping. The underground water serves lands some ten miles below the dam. Vaquero Dam, a 216-ft. high earth-fill structure on the Guyama River, is the sole physical feature of the water development. The dam and reservoir are designed primarily for irrigation but will also retain flood peaks of the Guyama and alleviate the flood hazard of the Santa Maria Valley.

A \$50,000,000 CIVIC AUDITORIUM and music center in Los Angeles on a site bounded by Olympic Blvd., Flower, 8th and Hill Sts. has been recommended by Arthur D. Little, Inc., Cambridge, Mass., research concern. The company's 200-page report culminates a nine-month study under a \$185,000 contract with the Board of Supervisors. Retained by Arthur D. Little, Inc. as members of the research project team were Shepley, Bulfinch, Richardson & Abbott, architects; George A. Fuller Co., general contractors.

RECENT MAJOR CONTRACT AWARDS and low bids in California include a \$1,500,000 award to **Hilp & Rhodes** of San Francisco for construction of the San Antonio Road shopping center in Mountain View. **Barrett Construction Co.** of San Francisco received an \$8,000,000 contract for construction of a 500-home subdivision, College Highlands tract in Richmond. **R. V. Lloyd & Co.**, Coachella, submitted a low bid of \$2,809,103 for laterals and sublaterals, Shafter-Wasco Irrigation District, Friant-Kern Canal Distribution System, Central Valley Project. **Gates & Fox Co.** of Burlingame submitted a low bid of \$1,348,000 for construction of diversion tunnel, Trinity Dam, Central Valley Project. **Norman I. Fadel, Inc.**, North Hollywood, submitted a low bid of \$886,663 for 4.6 mi. of grading, surfacing and bridge construction near Fernbridge in Humboldt County. **Granite Construction Co.** of Watsonville submitted a low bid of \$359,598 for 1.8 mi. of grading, surfacing and construction of a bridge in Yolo County. **A. Teichert & Son, Inc.**, Sacramento,

submitted a low bid of \$2,784,349 for construction of 7 mi. of freeway, 12 structures, an underpass and six bridges over various creeks and slough, San Joaquin and Sacramento Counties. **Scheumann & Johnson**, Seattle, Wash., submitted a low bid of \$879,799 for 8.3 mi. of grading and surfacing in Trinity County. **Fredrickson & Watson Construction Co. and Ransome Co.** of Oakland submitted a low bid of \$1,785,555 for 1.2 mi. of grading, surfacing and construction of an undercrossing and one bridge to be widened, Solano County.

COLORADO

AIR FORCE ACADEMY Construction Agency, Colorado Springs, Colo., will open bids Sept. 11 for the Cadet Quarters of the Air Force Academy. The project was reviewed in the July issue of *Western Construction* on pages 34-42.

RECENT MAJOR CONTRACT AWARDS and low bids in Colorado include a low bid of \$273,769 submitted by **Schmidt Construction, Inc.** of Arvada for grading, surfacing and structures on 12.8 mi. in Baca and Las Animas Counties. **Floyd A. Harrison & Associates** of Oklahoma City, Okla., submitted a low bid of \$2,302,700 for construction of Armed Services Housing Project at Ft. Carson. **Harrison Engineering & Construction Corp.** of Kansas City, Mo., submitted a low bid of \$493,146 for grading, surfacing and structures on State Highway #3 in Weld County. **Peter Kiewit Sons' Co.** of Denver submitted a low bid of \$191,190 for 6.3 mi. of grading and surfacing in Jefferson and Arapahoe Counties. A low bid of \$107,649 was submitted by **Gardner Construction Co.** of Greenwood Springs for bridge construction in Denver County. **Brannan Sand & Gravel Co.**, Denver, submitted a low bid of \$115,913 for street improvements in the city and county of Denver. **E. J. Rippey & Sons** of New Castle submitted a low bid of \$178,563 for grading, surfacing and structures in La Plata County. **Western Paving Construction Co.** of Denver submitted a low bid of \$146,425 for street improvement in the city and county of Denver. **Peter Kiewit Sons' Co.**, Denver, submitted a low bid of \$141,456 for street improvement in the city and county of Denver.

IDAHO

U. S. ATOMIC ENERGY COMMISSION, Idaho Operations office,

has entered into a contract with the **Ralph M. Parsons Co.** of Los Angeles, Calif., for architect-engineering of new test facilities to be built in the Aircraft Nuclear Propulsion Area of the National Reactor Testing Station. The contract calls for designing and supervising construction of a test building, shielded control and equipment building, and supporting facilities. Design work under the contract is expected to be completed in about ten months with construction expected to start in the spring of 1957. Construction is estimated to cost approximately \$12,000,000. It is expected that as many as 600 workers will be employed during the construction period.

RECENT MAJOR CONTRACT AWARDS and low bids in Idaho include a \$170,420 award to **Carl E. Nelson Construction Co.** of Logan for grading, surfacing and bridge extension in Madison and Bonneville Counties. **James Crick & Sons**, Spokane, Wash., received a \$592,715 award for 4.3 mi. of grading and surfacing U. S. Highway in Idaho County. **Aslett Construction Co.** of Twin Falls was awarded a \$204,576 contract for grading, surfacing and bridge construction on 7 mi. of U. S. Highway 30 in Elmore County. **Morrison-Knudsen Co.** of Boise received a \$392,729 award for grading, surfacing and bridge construction on U. S. Highways 20 and 26 in Ada County. **Twin Falls Construction Co.** of Twin Falls received an \$89,230 award for grading and surfacing in Bonneville, Bingham and Butte Counties. **Sorenson Construction Co.**, Murray, Utah, received a \$188,932 award for grading and surfacing 24½ mi. of roadway at the National Reactor Testing Station. **Duffy Reed** of Twin Falls received a \$253,843 award for 5.3 mi. of grading and surfacing in Butte County. **Carl E. Nelson**, contractor of Logan, Utah, received a \$156,967 award for 3.1 mi. of grading and surfacing in Madison and Fremont Counties. **W. R. Cahoon Construction Co.** of Pocatello submitted a low bid of \$579,890 for construction of American Falls pumping plant and discharge line, Michaud Flats Project. **Golden Wadsworth and W. E. Arrington**, General Contractors, Idaho Falls, submitted a low bid of \$208,384 for construction of buildings, utilities, services and roadways at the Organic Moderated Reactor Experiment site at the National Reactor Testing Station.

MONTANA

THE NEW GARRISON DISTRICT of the Corps of Engineers which resulted from the consolidation of the Garrison and Fort Peck

"Nothing like them for hauling 26-ton loads through busy Miami streets!"

—says Kent Kelley of Kimco Concrete, Inc., Miami, Florida,
about his new GMC Hydra-Matic* tandems



TRIP TIME—AND DRIVER'S TIME—REALLY SHRANK when Kimco's new GMC Hydra-Matic's went into service. Kelley reports: "I've driven one myself—over a highway with lights synchronized for 30 m.p.h. Starting off side-by-side with a competitive truck, I lost him—bogged down in all that shifting—within half a mile." Kimco's operating costs have shrunk, too—with no clutch troubles, no axle failures, no drive-shaft breaks—despite plenty of off-the-road work in thick sand and muck. And that's where Safety Power Steering—optional at extra cost—pays off.



HAULING 52,900 LBS. GROSS AT A CLIP, these GMC MW554's haul more mix per load within legal limits. That's due to the new weight-saving chassis design that eliminates every ounce of excess truck weight—yet makes these GMC's the ruggedest ever built. "You can't hurt those trucks," says Kelley.



"I GET MORE OF WHAT I WANT IN GMC's—no matter how you compare them with competition," Kelley claims. "There's more power from that 210 h.p. V8—better load capacity—easier driving—and all with much lower operating costs. I predict that most every truck in the country will be a Hydra-Matic within the next five years."

*Hydra-Matic standard on some models; optional at extra cost on others

GMC TRUCK & COACH—A General Motors Division

Districts became effective July 1. With the merger, the new Garrison District embraces approximately 197,125 sq. mi. of territory in North Dakota, Montana and Wyoming. Garrison District Engineer now has jurisdiction over about 1,170 miles of the main stem of the upper Missouri River, from the southern boundary of North Dakota to the Continental Divide.

FIELD WORK IS UNDER WAY on the feasibility study of a potential \$40,000,000 storage and trans-mountain diversion project in northwestern Montana. The U. S. Geological Survey has undertaken the task of establishing triangulation stations and benchmarks in the wilderness south of Glacier National Park and immediately west of the Continental Divide. A survey party of seven men with their equipment is being transported from place to place on the job by chartered helicopter. The USGS is doing the work for the Bureau of Reclamation preparatory to contour mapping, and the present phase of the work is to be completed by June 30. Soon after July 1, a ground survey party and a Bureau geologist are expected to begin foundation exploration in the area for what is known as the Flathead River Project. If found feasible, the project will involve construction of an earthfill dam about 350 ft. high on the Middle Fork of the Flathead River and the boring of a diversion tunnel about 7 miles long through a mountain range to the South Fork of the Flathead above Hungry Horse.

A hydroelectric plant would be built at the 650-ft. drop into Hungry Horse Reservoir. In addition to developing about 21,000 kw. of power at the site, the diverted water would add some 87,000 kw. of firm power at plants downstream on the Flathead, Clark Fork, Pend Oreille, and Columbia Rivers, according to estimates of Marcus Hilden, Bureau engineer in charge of the investigation. Storage on the Middle Fork is essential to success of the project because about 60% of the annual runoff of that stream normally occurs in May and June, Hilden explains. Only the flood waters would be stored and diverted; flow of the Middle Fork along the southwestern boundary of Glacier Park during the rest of the year would not be diminished, the engineer said. Four possible tunnel routes have been plotted on maps but the present survey work represents the beginning of field studies. The most promising dam site is known as "Spruce Park"—about 5 miles south of U. S. 2 and Glacier National Park—in the Flathead National Forest and almost at the boundary of the Bob Marshall Primitive Area. A dam at this site would store about 360,000 acre-feet of water, the Bureau estimates.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include a \$138,868 award to **F. L. Flynn & Co.** of Billings for construction of two bridges in Big Horn County. **Long Construction Co.**, Billings, received a \$225,834 contract for 1.3 mi. of grading and surfacing in Yellowstone County. **Summit Construction Co.** of Rapid City, South Dakota, received a \$473,766 contract for 11.2 mi. of grading and surfacing in Phillips County. A \$541,169 contract was received by **Richardson Construction Co.** of Miles City for 10.7 mi. of grading and surfacing in Richland County. **O'Neil Construction Co.** of Havre received a \$113,275 award for 7.6 mi. of grading and surfacing in Liberty County. **Francis Tindall**, Lewistown, received a \$123,632 award for 4.8 mi. of grading and surfacing in Wheatland County. **Charles J. Shannon** of Butte was awarded a \$101,552 contract for crushing and stockpiling 81,000 tons of 5/5 in. crushed gravel surfacing in Flathead and Lincoln Counties. **O'Neil Construction Co.**, Havre, submitted a low bid of \$143,105 for 10.4 mi. of grading and surfacing in Toole County.

NEVADA

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include a \$364,592 award to **Gibbons & Reed Co.** of Salt Lake City, Utah, for 15.9 mi. of grading and surfacing west of Carlin in Eureka and Elko Counties. **J. C. Compton Co.** of McMinnville, Oregon, was awarded a \$201,855 contract for 9.2 mi. of grading and surfacing in Carson City, Washoe County.

NEW MEXICO

AN \$832,547 BUREAU OF RECLAMATION contract for additional channelization of the Rio Grande near Socorro has just been awarded to **McGinnes Bros., Inc.**, Houston, Texas. Channelization work includes clearing all vegetation from the broad flood plain of the river and excavation of a relatively straight and narrow channel. This keeps low water flows (as opposed to heavy flows of flood season) from spreading out and evaporating. Water salvaged by channelization helps meet the critical supply needs of the water users served by the Middle Rio Grande Project.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include two contract awards to **Armstrong & Armstrong** of Roswell. A \$217,797 award for 2 mi.

of grading and surfacing the Angus-Southerly road in Lincoln County and a \$664,888 award for 2.4 mi. of grading and surfacing the Organ-East road in Dona Ana County. **Jack Adams** of Santa Fe received a \$273,718 contract for 8.4 mi. of grading and surfacing in Eddy County. **D. D. Skousen** of Albuquerque was awarded a \$744,060 contract for 7.7 mi. of grading and surfacing in Rio Arriba County. A \$326,357 contract was received by **Daniels Construction Co.** of Albuquerque for 12.3 mi. of grading and surfacing in Rio Arriba and San Juan Counties.

OREGON

A LOW BID of \$6,446,404 was submitted by **Donald M. Drake Co.**, Portland, to the Seattle District, Corps of Engineers, for construction of ten enlisted men's barracks at Fort Lewis, Wash. In a second bid opening, **S. M. Gilbert & Co.**, Seattle, was low bidder at \$366,624 for construction of a heating plant at Fort Lewis. Government estimates were \$6,090,327 for the barracks and \$322,089 for the heating plant.

JOINT LOW BIDDERS for construction of a natural gas distribution system in Grant and Adams counties in and adjacent to Moses Lake are U. S. Pipeline and Duncan Construction, of Houston, Texas, at \$1,195,033. Other bids submitted were **BEH Pipeline Co.** of Tacoma, \$1,313,451; **Peter Kiewit Sons' Co.**, Seattle, \$1,332,688; **Hood Construction Co.**, Lynwood, Calif., and **Lester M. Johnson**, \$1,411,214; **Harbert Construction Co.**, Birmingham, Ala., \$1,479,700; **Montin-Benson**, Seattle, \$1,583,200; **George, Consolidated**, Houston, \$1,585,615, and **Valley M-K Co.**, Seattle, \$1,699,282.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include a low bid of \$571,636 submitted by **Northwood, Inc.** of Portland for construction of a diversion tunnel and clearing 34 acres at Cougar Reservoir Dam site on the South Fork McKenzie River in Lane County. **Inland Construction Co.** of Milwaukie submitted a low bid of \$125,223 for grading, paving and structure in Multnomah County. A low bid of \$89,079 was submitted by **Arthur Simonsen** of Baker for pavement sealing and rock production on the Old Oregon Trail, Union and Baker Counties. **Schrader Construction Co.**, Portland, submitted a low bid of \$166,920 for bridge construction on Fishhawk Falls Highway in Clatsop County. **United Builders, Inc.**, Beaverton, submitted a low bid of \$84,947 for widening a bridge in Washington County. **Vernie Jarl** of Gresham submitted a low bid of

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\$174,722 for grading and oiling the Heliz-Van Sycle Road in Umatilla County. A low bid of \$130,652 was submitted by **Pearce & Pearce**, Toppenish, Wash., for clearing 178 acres at Cougar Dam Reservoir on the South Fork McKenzie River in Lane County. **General Construction Co.**, Portland, submitted a low bid of \$372,000 for dredging the channel in Coos Bay. **Babler Bros., Inc.**, Portland, received a \$122,548 award for 7.6 mi. of grading and surfacing in Harney County. **Warren Northwest, Inc.**, of Portland received a \$169,927 award for grading and paving in Marion County. **Rogers Construction, Inc.**, of Portland received a \$381,365 award for 5.1 mi. of grading and paving in Umatilla County. **C. E. Leseberg, Nyssa**, received a \$115,999 award for 5.2 mi. of grading and oiling in Malheur County.

UTAH

RECENT MAJOR CONTRACT AWARDS and low bids in Utah include a low bid of \$262,099 submitted by **W. W. & W. B. Gardner and Rex F. Moss** of Salt Lake City for grading and surfacing in Salt Lake City and County. **W. W. Clyde & Co.** of Springville received a \$894,576 award for construction of irrigation pipelines as part of the Weber Basin Project near Ogden. **L. A. Young Construction Co. and Vernal Sand & Gravel Co.**, Richfield, received a \$285,978 contract for grading and surfacing in Sanpete County.

WASHINGTON

THE FEDERAL POWER COMMISSION has issued a 50-yr. license to Puget Sound Power & Light Co. of Seattle, Wash., for its proposed Upper Baker River development and its existing Lower Baker River development, including a new generating unit to be installed in the Lower Baker powerhouse, on the Baker River in Whatcom and Skagit Counties, Wash. The proposed Upper Baker River development will include a concrete gravity dam forming a reservoir about 9 mi. long, and a powerhouse containing two generating units with a total capacity of 85,000 kw. Estimated cost of the Upper development is \$27,150,000.

A \$750 SCHOLARSHIP in Civil Engineering has been established by Peter Kiewit Sons' Co. at Washington State College to begin next fall. The scholarship will be made to a senior civil engineering student interested in heavy construction or highway work. This is one of the largest one-year scholarships avail-



SWIFT CREEK DAM SITE EXPLORED BY REFRACTION SEISMIC METHOD

Preliminary engineering investigations for Pacific Power & Light Company's 265,500-kw. Swift hydroelectric project on the Lewis River in Skamania County, Washington, included intensive research like these refraction seismology tests used to determine the depth to bedrock at the site of the \$58,700,000 project. Under a canvas shelter laboratory at the site, **George MacLeod**, geophysicist for Fisher Research Laboratory of Palo Alto, Calif., operates portable refraction seismic equipment. These delicate instruments record shock waves refracted by underlying rock from carefully controlled dynamite blasts.

Approximately 15,000 ft. of traverse were surveyed by the refraction seismic method covering the immediate dam site as well as the adjacent abutment areas. The objective of this work was to determine the depth and generalized form of the buried topography of the bedrock surface. In spite of difficult field conditions and inclement weather, seismic field work was completed in 19 work days.

The seismic work was completed by Fisher Research Laboratory, Inc., as part of the overall dam site exploration program undertaken by Bechtel Corp. for Pacific Power and Light Co. of Portland, Ore. The field crew of five men was under the direction of MacLeod. **J. L. Soske**, Professor of Geophysics of Stanford University served as special geophysical consultant.

able in engineering at Washington State College. The winner of the scholarship will be selected from a group of civil engineering students who will work for Peter Kiewit Co. this summer. This group was recommended for summer employment by the Civil Engineering Department at WSC. The scholarship will be presented through the Vancouver, Wash., office of the company.

RECENT MAJOR CONTRACT AWARDS and low bids in Washington include a \$2,019,256 contract award to **H. George & Sons** of Spokane for construction of the Shadle Park High School, Spokane. A \$342,614 award was received by **Pacific Sand & Gravel Co.** of Centralia for 3.9 mi. of grading and surfacing in Lewis County. **Max J. Kuney Co.** of Spokane received a \$186,380 award for 10 mi. of grading and surfacing in Asotin County. **Donald M. Drake Co., Inc.** of Portland, Oregon, submitted a low bid of \$415,977 for earth-

work and structures, part 1, block 18, east low canal lateral, Columbia Basin Project. A \$704,099 award was received by **Goodfellow Bros. Inc.**, of Wenatchee for 4.1 mi. of grading and surfacing in Klickitat County. **K. C. Dack Construction Co.** of Milton Freewater, Oregon, received a \$278,110 contract for 7.9 mi. of grading and surfacing the PSH No. 8, Benton County. **Cherf Bros. Inc. and Sandkay Contractors, Inc.** of Ephrata received an \$830,000 award for concrete lining of a 100-million-gallon water storage facility at McMillin, Pierce County. A \$131,638 award was received by **J. C. Compton** of McMinnville, Oregon, for 7.5 mi. of grading and surfacing in Clark County. **Columbia Asphalt Paving Co.** of Yakima received a \$125,844 award for 7.4 mi. of grading and surfacing in Yakima County. **Murphy Bros.** of Spokane received a \$137,059 award for construction of a bridge in Chelan County. **Smith Bros., Inc.** of Vancouver received a \$160,989 award for 5.7

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Difficult Specification Problems Solved by Contractor Ingenuity and CEDARAPIDS Versatility

Meeting the toughest turnpike specs was complicated by extremely difficult crushing conditions. Some native limestone, with 8% moisture content, tends to pack rather than crush. In some quarries, clay topsoil in the material makes it difficult to meet specified PI limits. A common problem is getting rid of the high percentages of dirt and objectional fines encountered.

To lick these problems, many con-

tractors turned to *breaking*, instead of crushing, the saturated, rubbery rock with Cedarapids Double Impeller Impact Breakers . . . wasting contaminating fines before primary crushing by use of Cedarapids vibrating grizzlies discharging onto waste conveyors . . . using Cedarapids Portable Screening Units or Screens ahead of secondary crushers to scalp off objectionable fines . . . combining flexible Cedarapids washing equipment to produce clean aggregate.

Kansas Turnpike Aggregate Specifications

Screen	Sub-Base Rock (% Passing)	Base-Course Rock (% Passing)
2 in.	100	100
1½ in.	100-75	100-70
1 in.	100-60	100-60
½ in.	95-45	
¾ in.		95-39
No. 4	80-25	75-25
No. 10	65-17	55-17
No. 40	40-8	30-8
No. 200	10-0	10-0

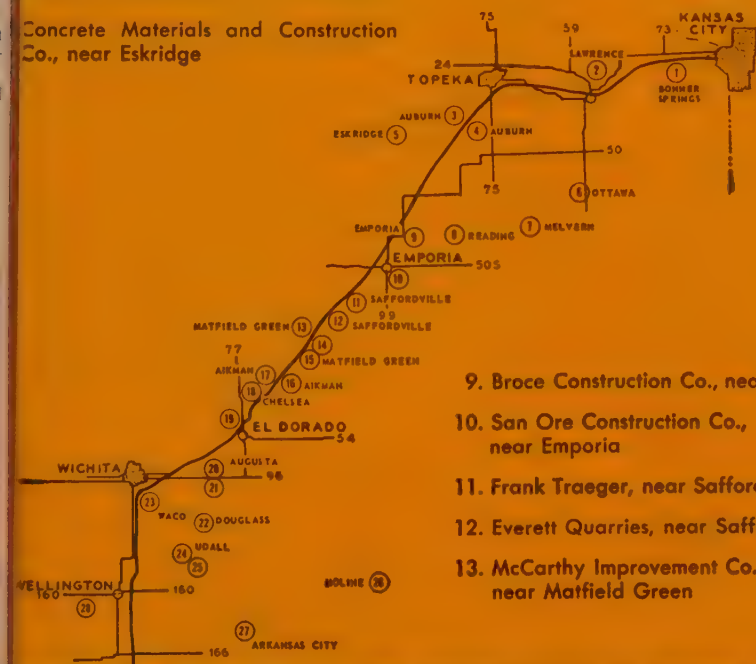
CEDARAPIDS OWNERS ON THE KANSAS TURNPIKE

Quarrying Quarries, near Bonner Springs
 B. L. Anderson, Inc., near Lawrence
 Weaver Construction Co., near Auburn
 Patton Crushed Stone Co., near Auburn
 Concrete Materials and Construction Co., near Eskridge

6. Concrete Materials and Construction Co., near Ottawa
 7. Dusenbury Quarries, near Melvern
 8. Nelson Brothers, near Reading

14. McCarthy Improvement Co., near Matfield Green
 15. Dillon Stone Company, near Matfield Green
 16. Reno Construction Co., near Aikman
 17. Reno Construction Co., near Aikman
 18. Reno Construction Co., near Chelsea
 19. George Meyers Inc., near El Dorado
 20. Badger Material Co., near Augusta
 21. Amis Construction Co., near Augusta
 22. Carr Rock Products Co., near Douglas
 23. Imperial Paving Co., near Waco
 24. H. D. Youngman Construction Co., near Udall
 25. Anderson Oxandale Crushed Stone Co., near Udall
 26. Concrete Materials and Construction Co., near Moline
 27. San Ore Construction Co., Arkansas City
 28. Peter Kiewit Sons' Co., near Wellington

9. Broce Construction Co., near Emporia
 10. San Ore Construction Co., near Emporia
 11. Frank Traeger, near Saffordville
 12. Everett Quarries, near Saffordville
 13. McCarthy Improvement Co., near Matfield Green



IOWA MANUFACTURING COMPANY

mi. of grading and surfacing in Lewis and Cowlitz Counties. A \$115,605 contract was received by **K. F. Jacobson & Co., Inc.** of Portland, Oregon, for 1.7 mi. of grading and surfacing in Thurston County.

WYOMING

RECENT MAJOR CONTRACT AWARDS and low bids in Wyoming include a \$628,759 contract received by **Big Horn Construction Co.** of Sheridan for grading, surfacing, and culverts on the Torrington-Cheyenne Road in Laramie County. **Eagle Construction Corp.**, Loveland, Colo., received a \$96,092 contract for construction of a highway separation structure of 3-continuous girder spans in Laramie County. A \$625,194 contract award was received by **Inland Construction Co.** of Omaha, Nebr., for grading, surfacing, and bridge construction on 3.9 mi. of the Newcastle Road in Weston County. **Knisely-Moore Co.** of Douglas was awarded a \$184,517 contract for grading, surfacing, and miscellaneous work on 1.3 mi. of the Lingle-Torrington Road in Goshen County. **Studer Construction Co.**, Billings, Mont., was awarded a \$419,646 contract for grading, surfacing, and miscellaneous work on 13 mi. of the Pinedale-Rock Springs Road in Sublette County. **Lichty Construction Co.** of Casper received a \$91,133 award for grading and surfacing on 7.8 mi. of the Deer Creek Road in Converse County. **W. E. Barling, Inc.**, Meeteetse, received a \$67,580 contract for grading and surfacing 6.9 mi. of the Greybull River Road in Park County. **D. M. Manning** of Hysham, Montana, received a \$501,895 contract for construction of 23 mi. of canals, laterals, earthwork, bridges and other work, Hanover-Bluff Unit, Missouri River Basin Project near Worland. **Guy H. James Construction Co.** of Oklahoma City, Okla., submitted a low bid of \$393,700 for access road tunnel, Fremont Canyon Power Plant, Glendo Unit, Wyoming, Missouri River Basin Project. **J. F. England's Sons, Inc.** and **Robert A. Millard** of Rapid City, South Dakota, received a \$235,000 award for grading and surfacing in Fremont County.

ALASKA

BRIGADIER GENERAL Stanley T. Wray, officer in charge of the design and construction of the Distant Early Warning System (DEW-Line) said in San Francisco recently that the \$400,000,000, 3,000-mi. long radar line will be completed within two years. The DEW-Line is from

400 to 800 mi. north of the generally considered limit of normal construction activities. It roughly follows the 70th Parallel, along the northernmost limits of the land mass of the North American Continent from Alaska to Baffin Island. The route and site surveys were made during temperatures as low as 65 deg. below zero over terrain which was alternately deeply covered with snow or swept by icy winds. The crews traveled approximately 600,000 passenger mi. by air, 3,000 mi. by sea and hundreds of miles by vehicle and dog sled. Much of the construction is on permafrost which must be left permanently frozen. In order to keep heat from buildings from penetrating the permafrost, thus permitting settlement because of subsequent melting, a gravel pad of 6 ft. or more is placed under buildings. In the tundra-like area of northern Canada where snow drifts heavily against foundations, even this pad is not enough. Here, in addition to the pad, piling is placed by either driving the piles into position in a small area thawed by steam jets or by drilling holes for the piling in through the frozen ground with earth augers. (For more details on construction problems in permafrost, see **Western Construction**, Feb. 1956, pages 24-26.)

BID OPENINGS FOR NIKE PROJECTS in Alaska have been deferred indefinitely, according to the office of the Alaska District, Corps of Engineers in Anchorage. Col. L. L. Haseman, the Acting District Engineer, said that the Nike bid opening deferrals were directed by higher authority but that design work for the projects would be continued in order to have complete designs readily available at any time the program is reinstated.

THE CITY OF SEWARD has filed an application with the Federal Power Commission for a license for its proposed hydroelectric project on Crescent and Carter Lakes, Kenai Peninsula. The project, to be located 40 mi. north of Seward, would consist of an earthfill dam 20 ft. high across the outlet of Crescent Lake which would raise and back up water into Carter Lake creating 21,000 acre-feet of usable power storage; a 5,000-ft. equalizing channel between Crescent and Carter Lakes; an intake channel 1,500 ft. long at the outlet of Carter Lake; 1,500 ft. of steel penstock; reinforced concrete powerhouse with initial installation of one 5,400-hp. impulse turbine connected to a 3,500-kw. generator; 2,400-ft. tailrace channel; and a substation. The estimated cost of project is \$2,400,000.

CONSTRUCTION of buildings at Kenai and nearby Wildwood Station brought bids from two Anchorage firms on all seven schedules and a Palmer firm who bid on five, the Alaska District Corps of Engineers

recently announced. Maynard R. Smith of Anchorage who bid on "all awarded" offered the apparent low total of \$952,581. Total for Pacific-Alaska of Anchorage was \$1,121,959. Total government estimate was \$834,150. Roark Construction Co. of Palmer was the other bidder. The contracts on any or all schedules will be awarded in the best interest of the government.

RECENT MAJOR CONTRACT AWARDS and low bids in Alaska include several awards and low bids submitted by various contractors for work on the White Alice Projects. The White Alice projects are part of the micro-wave communication system being constructed for the Air Force to support the DEW Line. **Morrison-Knudsen** and **Peter Kiewit Sons'** of Anchorage submitted a low bid of \$1,603,280 for schedule A, White Alice communications stations at Bethel. **United Builders and Modern Electric** of Anchorage submitted a low bid of \$863,552 for White Alice stations, Kodiak. **American Service** of Spenard submitted a low bid of \$367,906 for schedule C, White Alice communication stations for Middleton Island. **Manson-Osberg** of Seattle, Wash., submitted a low bid of \$1,706,500 for construction of White Alice communications facilities for Fort Yukon and Kotzebue. **E. M. Peterson Construction Co.** of Spenard received a \$798,900 award for construction of a tower, equipment building, area grading and access road, White Alice facilities, Homer. **Premier Gear & Machine Works** of Portland, Oregon, submitted a low bid of \$1,690,150 for schedule A, design, manufacture, preparation and delivery of missile carriage assemblies and antenna covers for the northern defense network. **Schmidt & Lewis** of Seattle, Wash., submitted a low bid of \$1,056,745 for construction of the community center Fort Richardson. A low bid of \$1,163,610 was submitted by **McLaughlin, Inc.** of Great Falls, Mont., for grading and surfacing 40.9 mi. of the Richardson Highway, Paxson to Black Rapids. **G. Doughty Construction Co.** of Anchorage submitted a low bid of \$216,298 for grading and paving driveways and parking areas, Ladd Air Force Base.

Here and There

WESTERN BRIDGE and Steel Fabricators Ltd. are fabricating over 2,000 tons of steel to be used as frame work for the 19-story Burrard Building being erected at Burrard and Georgia Sts. in Vancouver, B. C. The structure is being built by the Burrard Building Operations Ltd., composed of Canadian interests and the Utah Construction Co. of San Francisco and Salt Lake City.

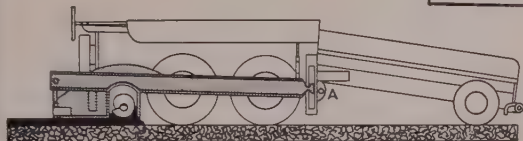
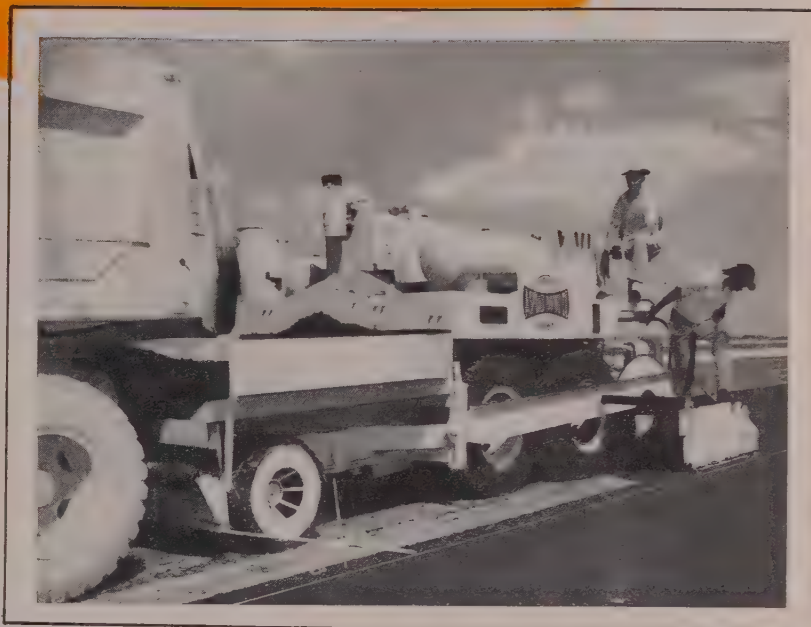
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For top quality work, such as this rigidly specified airport job, the power steering allows fine maneuvering to maintain a tight longitudinal joint. Hydraulic controls combined with rubber-tired mounting provide the ultimate in steering to give the most accurate control. Compare this with crawler-mounted rigs that can only be steered by pivoting the entire machine.

Flow control gates and extra large diameter augers assure better distribution of material for the high paving speed of the PF-90. Vibrating bar tucks material under screed to a uniform density.



Automatic Leveling on Long Wheelbase

The combination of long wheelbase that spans subgrade irregularities and the screed with a floating pivot point, A, above, in front of the driving wheels, assures a constantly level course of the proper minimum thickness.

Easiest Widening of Vibrator and Screed

In a matter of minutes, screed, tamper and auger can be set at any desired width from 8 feet up to 13 feet. Auger extensions merely slide into recessed end of existing auger and are pinned. Screen and tamper section fasten face-to-face and are held by a minimum number of bolts in each. In addition to ease of width change the PF-90's 8-foot basic width, 2 feet narrower than any other paver, allows it to pave driveways and alleys and facilitates transporting.



50th Anniversary



BLAW-KNOX COMPANY

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Construction Equipment Division

45 Charleston Avenue • Mattoon, Illinois

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

SURVEYOR'S PARADISE—Nowhere in the world is so much untamed, untried and unmapped wilderness waiting for the "invasion" of surveyors. Vast—and from the standpoint of the job to be done, frighteningly vast—areas of land in Alaska remain to be surveyed, charted, explored and finally converted into frontier status. Into this unsurveyed, wild-animal infested void, a small army of bearded "s.i.'s"—civil engineers, party chiefs, axemen, rodmen and chainmen are pouring. Because the job to be done is more adventuresome and exciting than it is lucrative, most of the work is being done by engineering school undergraduates. They are getting a taste of Alaska's ruggedness, gaining experience at their professional calling and, in the process, salting away a few shekels to pay for continued education. A young survey gang member must be rugged and ready to cope with more obstacles than he's ever heard of—obstacles of terrain and obstacles of wilderness living. It is not unheard of for a bear to pop into a tent filled with sleeping men and knock it to shambles. Not long ago, one huge bear wrecked an entire Eskimo village while the inhabitants were away on a trip—a bear hunting trip.

GEOLOGICAL SURVEY—Forty men of the Alaskan geology branch of the U. S. Geological Survey have taken to the twisting Alaskan roads for mineral mapping and geological investigations throughout the Territory. During this summer season, parties will be scattered all the way from Platinum to Chitina, from Ketchikan to Koyukuk. Geochemical investigations are scheduled for the Anchorage, Fairbanks and Juneau areas until Sept. 29. This first Alaskan work, under the new national minerals policy, will launch a regional mapping project in southeast Alaska. Placer investigations in the Eureka districts and other spots in the interior will also be carried out by a survey team working between Tofty and Manley Hot Springs. Railbelt coal explorations will be conducted at Healy and reports of high-grade bituminous coal in the Knob creek district near Palmer will also be investigated. Work will also be done in Chitina Valley, Kodiak, Kendrick Bay, Bokan Mountains, Big Delta and along the Yukon.

YUKON SURVEY—One of the most difficult surveying tasks faces a party of four men who left Circle City recently on an 800-mi. engineering reconnaissance of the Yukon River. The party, working from the Anchorage office of the Alaska Dis-

trict Engineers, is conducting surveys and gathering data for a development study being carried out by the engineers along the mightiest river in the North. One official said the trip would be "nothing less than rugged."

RIVERBOAT LIFE—The Yukon survey group will spend three weeks aboard a 42-ft. motor-driven freight barge and travel as far as the village of Kaltag, evaluating stream characteristics and collecting detailed information at sites for potential river development. While the group is concerned with navigational and flood control development along the river, it will also study the vast hydroelectric potential of the stream. Engineering investigations to date indicate there are a number of sites along the stream where economical power may be developed. The group will make studies at Rampart, Woodchopper and Kaltag, which sites are believed to be suitable for development of nearly 8,000,000 kw. of reasonably-priced industrial power. Rampart, 80 air miles northwest of Fairbanks, can put out approximately 4,000,000 kw. if developed, one study indicated. Kaltag and Woodchopper, according to appraisals, can each put out well over 1,000,000 kw. Information collected by the group will complete the final portion of a study of Alaska's water resources. The study began in 1948 and is expected to end next year with a report on the Yukon and Kuskokwim rivers.

USE OF "SWAMP-BUGGIES"—Alaska's lake-dotted and river-laced terrain has been a headache to surveyors throughout the Territory's history, but it now appears that this rugged terrain problem is about to be whipped for good. Swamp buggies which can travel on land and in the water are being utilized for surveys in Alaska to an increasing extent—and for this purpose are worth their weight in American dollars. One hitch: Operation of a swamp buggy can be tricky—and is not the same as driving a car. Recently, one of the buggies carrying six members of an Alaska Road Commission survey party overturned near Valdez and two of the surveyors were injured.

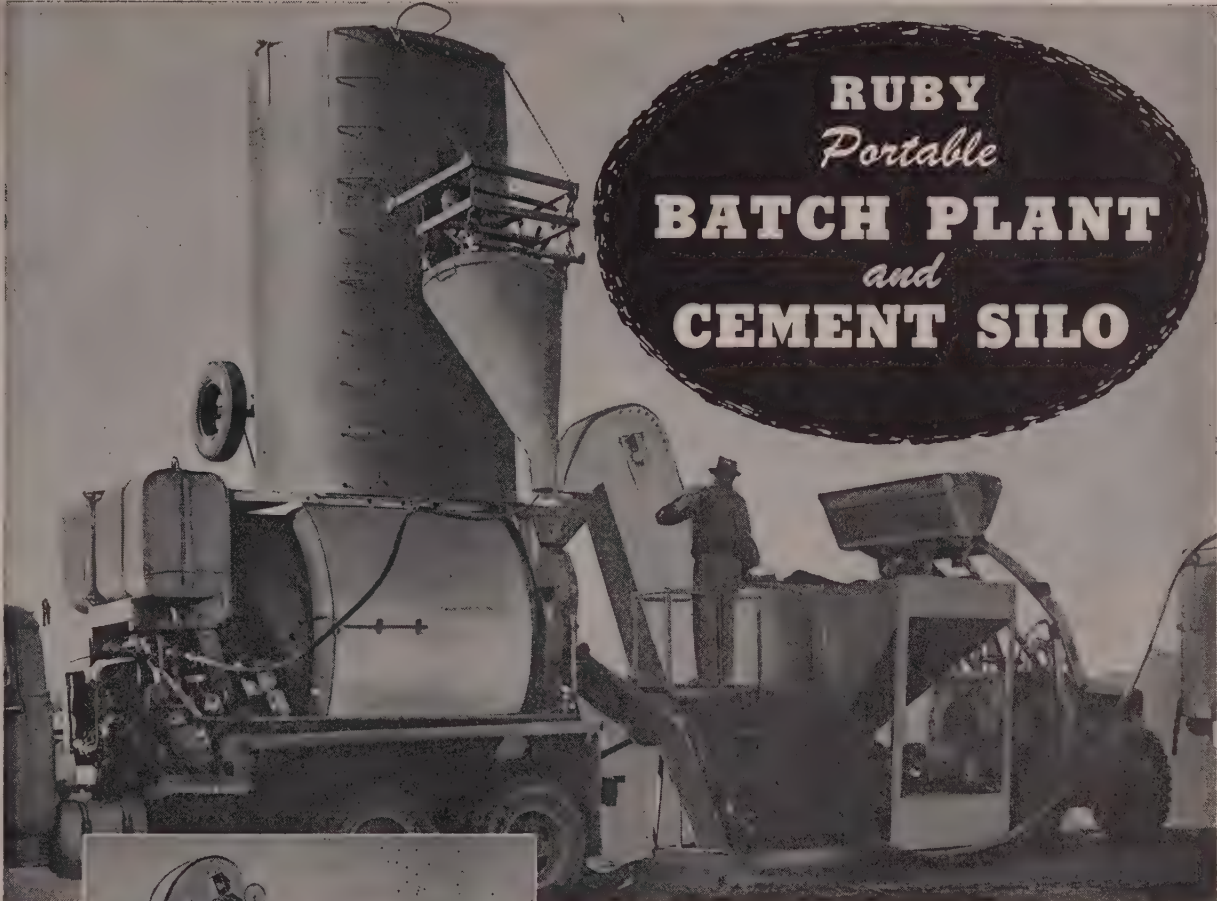
ROAD PROGRAM—Latest plans on Alaska's road program were outlined recently by A. F. Ghiglione, director of the Alaska Road Commission. Ghiglione said the Richardson Highway, the main traffic artery in the Territory, will be completely paved by the fall of 1957. Final work on the Denali highway, which con-

nects the Richardson road to McKinley Park, should be completed within three years, he said. By this fall, a tote road should be through in that section, and next year the road will be gravelled and graded. By 1958, final work should be completed on the Denali stretch. A bridge probably will be built over the Copper River at Chitina in the near future, Ghiglione revealed, and added that the Copper River highway will be completed to Mile 38 by this fall. ARC's paving program is running into difficulties this year, Ghiglione said, because contractors' bids are exceeding estimated costs by 25 to 50%. He said that contractors blame it on the pressure of military contracts, particularly White Alice and similar defense installations.

END OF ROAD COMMISSION—Enactment of the \$33 billion highway bill recently passed by Congress signals the end of the Alaska Road Commission. An amendment to the bill stipulates that the Alaska Road Commission, which for the past 51 years has supervised the bulk of all road construction in the Territory, must transfer its functions to the Bureau of Public Roads. Despite this change in the organizational setup, no significant change in the tempo of road construction is anticipated for the present. However, within a year, an accelerated pace to road-building is anticipated because of the new highway program. The entire road program in Alaska will for the first time in history be pushed by one centralized agency.

RAILROAD TO ALASKA—Two possible routes through Canada are being surveyed to determine whether a railway to Alaska along these routes would be feasible. The two routes being checked are along the Rocky Mountain trench and north from Fort St. John. In 1942, the U. S. Corps of Engineers surveyed a route for a railroad through the Rocky Mountain trench from Prince George, B. C., to Kobe, Alaska. The survey, made for military purposes only, indicated a railroad along such a route was feasible and would cost about \$112,000,000. Under the stress of war, the project was abandoned and the Alaska Highway further inland was built instead. In 1949, Congress authorized the president to enter into an agreement with Canada for a location survey for a railroad connecting Prince George and Fairbanks. The Korean war intervened, however, and again military aspects of the project received major emphasis. A joint U. S.-Canada defense board in March 1951, reported that "for military reasons alone, further route surveys, economic surveys and similar investigations of the proposed railroad to Alaska would not be warranted at this time. However, current Canadian interest in the project has brought the entire oproject out of mothballs.

The Ruby "Team" that saves batching Dollars!



RUBY *Portable* BATCH PLANT *and* CEMENT SILO



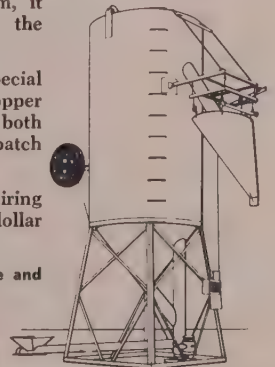
When you find complete portability of both Batch Plant and Silo . . . "one-man" economy of operation . . . and quick, efficient production, all combined in one LOW COST team, it's NEWS! . . . REAL NEWS for the transit mix operator, AND his pocketbook!

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

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

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

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



Sketch of Ruby Cement Silo showing loading hopper

CLARK'S WELDING WORKS

PERKINS, CALIFORNIA (SUBURB OF SACRAMENTO)

ENGINEERS on the move



GOING UP on schedule, is the \$26,000,000, 200,000-kw. Agua Fria steam power plant of the Salt River Power District, located between Glendale and Peoria, Ariz. The above trio of on-the-job leaders of construction are (l. to r.) **Ken Wells**, job engineer, Bechtel Corporation; **John Dingle**, resident engineer for the power district, and **K. Haig**, project engineer for Bechtel, the builder and designer.

At the annual convention of the Prestressed Concrete Institute held recently in Florida, three leaders in the prestressed concrete industry in the West were elected to national office. **Ben C. Gerwick, Jr.**, president of Ben C. Gerwick, Inc., was elected vice president of the Institute; and **Harold A. Price**, manager of the Structural Concrete Division of Basalt Rock Co., and **Professor T. Y. Lin** of the University of California, were both elected to the Board of Directors.

Further recognition was given to the West when San Francisco was chosen as the site of the 1957 convention.

* * *

Leland R. True, formerly with Columbia River Constructors at Chief Joseph powerhouse, is now project engineer for Morrison-Knudsen Co., Inc., on construction of Noxon Rapids hydroelectric development in Montana.

* * *

Marvin J. Webster, chief of the hydraulic section of the Portland District, Corps of Engineers, has accepted appointment to a task force on hydraulic aspects of design and operation of spillways and crest gates serving with the design committee of the American Society of Civil Engineers.

* * *

Thomas B. Sears has been given a dual assignment as assistant project engineer and chief of operations and

maintenance at The Dalles Project. During the construction period Sears also is chief of the mechanical and electrical section of The Dalles Dam residency.

* * *

At pre-construction season safety conferences called by the Alaska District Corps of Engineers in Anchorage and Fairbanks the names of 24 contracting firms were presented on the honor roll for construction in Alaska in 1955 "without a lost time injury." Special awards were made to the two construction companies with the largest number of man-hours with a flawless no-accident record: J. C. Boespflug Construction Co., and Grove, Shepherd, Wilson & Kruge.

* * *

The following personnel changes in the engineering department of the Arizona Highway Department are announced by **William E. Willey**, State Highway Engineer: **Charles I. Smith** becomes administrative officer in Willey's office. **Bradford W. Miller**, traffic supervisor, succeeds Smith as manager of the Economics and Statistics Division. And **Ardin Fry** is assigned as technical personnel officer in the office of **H. H. Brown**, assistant deputy state engineer of construction.

* * *

A new unit has been set up, according to **G. T. McCoy**, California State Highway Engineer, to expand and improve the Highway Division's statewide photogrammetry program.

Under the general direction of Principal Highway Engineer **F. M. Reynolds**, the new unit is to be headed by **L. L. Funk**, who has been assistant district engineer-planning at San Luis Obispo. **R. H. Fulton** will be his assistant. Fulton's former post of senior highway engineer is to be filled by **Ralph Lejonhud**.

* * *

The Tucson, Ariz., office of **Johanssen and Girand**, consulting engineers, has been moved to The Fiber Building, 15 E. Alameda. This office is managed by **Russell D. Taylor**.

* * *

Hersey Inspection Bureau, Oakland, Calif., announces the addition to its engineering staff of **Ben J. Lennert**, civil engineer. Lennert was formerly associated with The California Division of Bay Toll Crossings and **Charles H. Lee**, Consulting Engineer. The Hersey organization specializes in soil mechanics and foundation engineering as well as physical, chemical, and metallurgical testing.

* * *

As a part of a general reorganization plan on the part of the Wyoming Highway Department to gear itself for the greatly expanded road program, several administrative changes of key personnel are announced. **Thurman D. Sherard**, formerly administrative engineer, has been advanced to the position of deputy state highway engineer. Sherard has been with the Department since 1936. Since 1950 he has held the positions of secretary to the highway commission, public relations engineer, and administrative engineer. In his present position he will continue as commission secretary. **Ross G. Stapp**, with the department for 29 years, has been appointed state construction engineer. The post of maintenance engineer is being taken over by **W. E. Sutton**.

Other promotions in the Cheyenne headquarters include **Robert C. O'Connell**, from traffic engineer to traffic and planning engineer; **Thomas E. Kilty**, from administrative supervisor to personnel and public relations director.

* * *

Otto C. Hartman, assistant chief of construction of the Portland District, Corps of Engineers, recently retired after serving the government for more than 24 years.

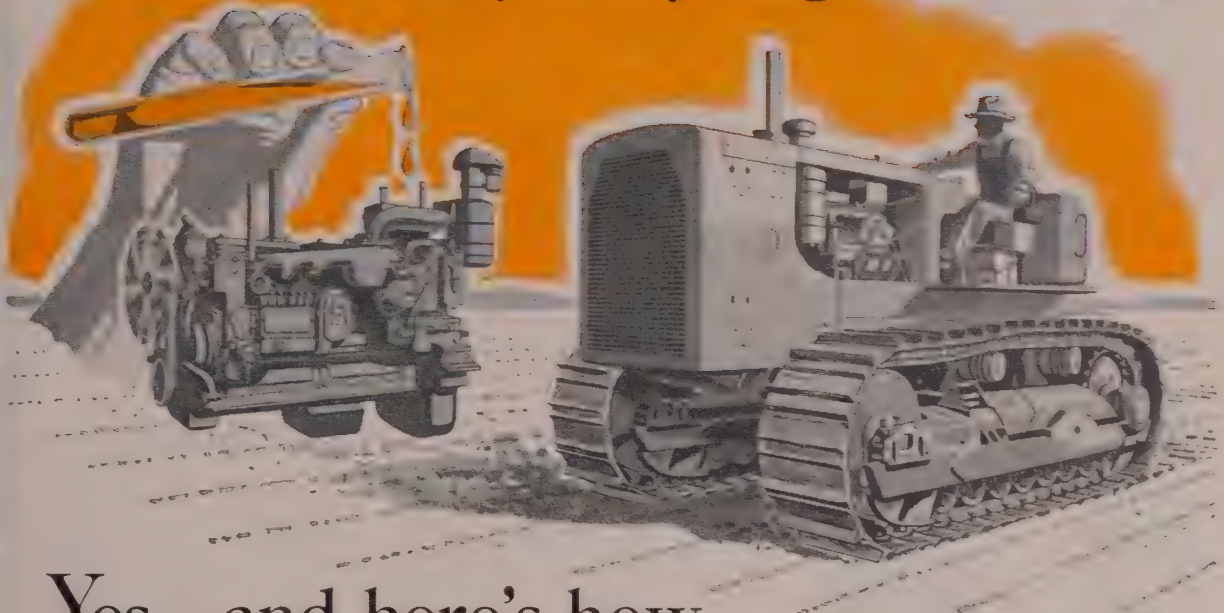
* * *

Harry J. Bernat was recently appointed a division manager of Kaiser Engineers Division of Henry J. Kaiser Co. For the past two years Bernat has served as chief project engineer supervising such undertakings as design and construction of a Seattle wallboard plant; recent 60% expansion of Kaiser Gypsum's plant at Long Beach, and other projects.

* * *

J. York Welborn, assistant head, bituminous material laboratory, Bureau of Public Roads, on July 1 be-

Can the wear rate on heavy-duty engines be cut?



Yes...and here's how Shell men and techniques do it with an oil



Engineers knew *friction* caused engine wear. But Shell scientists suspected there was a hidden villain—even more destructive.

Years of research proved the hidden villain was *acid action*, result of harmful acids formed during the combustion cycle. Attacking piston rings and cylinder walls, acid action was destroying engines *faster than friction*.

Shell Research men set out to develop an oil which could neutralize these harmful acids. The result—after extensive testing—was SHELL RIMULA OIL, the amazing alkaline oil which stops acid action, extends trouble free engine operation, greatly reduces wear rates in heavy duty engine service.

Shell Rimula Oil is the standard of quality in its field—the only oil of its type to fully meet year-after-year requirements for America's leading diesel engines. It is just one of many fine products developed by Shell's 1500-man research team—a team with 25 years' experience in gasoline and lubrication problems.

A phone call can put this team to work solving your problems. Call your Shell representative today.

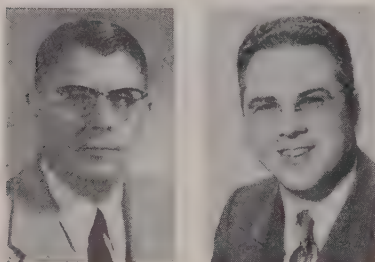


SHELL RIMULA OIL

came Director, Natural Rubber Bureau Research Laboratory, Washington, D. C., heading the expanding research program on rubber roads. Welborn had been with Public Roads for 25 years.

* * *

Harvey O. Banks of Sacramento and **Mercel J. Shelton**, La Mesa, have been appointed director and deputy director respectively of the newly formed California Department of Water Resources. A graduate civil engineer, Banks served three years as an instructor at Stanford University, and at one time was associated with the Soil Conservation Service. His first experience with the Division of Water Resources began in 1938; and except for three years of military service continued until July 1946, when he entered private practice as a partner in a consulting firm. Banks rejoined the Division of Water Re-



Banks

Shelton

sources in 1950, progressing through several important positions to become state engineer last January. With the establishment of the new Department, this office has now been abolished.

Shelton spent several years pursuing his profession in the East and in the West immediately following his graduation in civil engineering in 1930. In 1936 he entered private practice in San Diego. Later he became city engineer of El Centro. He was called to active duty with the Corps of Engineers in 1942, and since 1946 he has been associated with the La Mesa, Lemon Grove and Spring Valley Irrigation District, becoming its general manager and chief engineer in 1948.

Distinguished members of the civil engineering profession, both men are prominently identified with several professional organizations, including the American Society of Civil Engineers.

* * *

Bishop, Younger, Bradley Co. and **Peter O. Mattei Construction** announce the joining of their organizations as **Bishop-Mattei Construction Co.**, San Francisco. Mattei joins the management team as vice president. **Frank C. Bishop** is president and **J. Paul Oppenheim**, vice president and general manager. The firm now combines two well known contracting companies, both of which have been active in commercial and industrial building.

Gellert, Griffin, Harrigan & Associates, Seattle engineering organization, announces its affiliation with the Harrisburg, Pa., firm of **Gannett, Fleming Corrdry & Carpenter, Inc.** **H. Henry Gellert**, executive partner of the Seattle firm states that this move makes available the services of one of America's largest engineering organizations.

THE 1956 EDITION of the American Road Builders' Association's directory of "Highway Officials and Engineers" is available for distribution.

This popular pocket-sized handbook contains more than 1,500 names, titles and addresses of administrative engineers and officials in the 48 State highway departments and the District of Columbia. A listing of the administrative personnel of the Bureau of Public Roads, including heads of its division offices, is also given. It also lists engineers and administrative personnel of toll road authorities; officers and directors of ARBA, its seven organized divisions, and its headquarters staff. A tabulation by states showing highway funds expended during 1955 as well as an estimate of expenditures for highway construction and maintenance during 1956 is included, as well as a report on states having legislative authority to construct toll roads. Directory sells for \$1.00 per copy and can be procured from the **American Road Builders' Association**, 600 World Center Bldg., Washington 6, D. C.

Wm. E. Willey, State Highway Engineer for Arizona, recently announced the appointment of **A. J. Medford** to the new post of federal aid engineer for the Department, working directly under **Cecil Browning**, Deputy State Engineer. A registered civil engineer, Medford has been with the Arizona District, U. S. Bureau of Public Roads, as planning and programming engineer.

A rearrangement of the engineering districts of the highway department under which the five districts become identical with the commission districts, was also recently announced by Willey. Simultaneously, an assistant district engineer was named for each district, with the following staff personnel assignments: District 1: Engineer—**J. B. Robinson**, Phoenix; assistant—**Owen Layton**, Yuma. District 2: Engineer—**Wm. N. Price**, Tucson; assistant—**Milem Livesay**, Coolidge. Price was formerly traffic engineer for the Department, which latter post is taken over by **F. A. Berg** who was district engineer at Phoenix. District 3: Engineer—**J. R. Van Horn**, Doug-

las; assistant—**Oscar Lyons**, Safford. Van Horn was formerly district engineer at Tucson. District 4: Engineer—**R. J. Holland**, Globe. District 5: Engineer—**Angus Chadwick**, Flagstaff; assistants—**J. B. Foster**, Prescott, and **Don Speer**, Kingman.

Other engineering personnel changes approved by the Commission follow: **Grant Heidecker**, assistant plans engineer, has been promoted to plans engineer. **Edwin E. Carey**, assistant chief location engineer, has been promoted to assistant location engineer. **Lloyd Martin** has been transferred from assistant bridge engineer to assistant plans engineer; and **Larry Thompson**, formerly City of Phoenix assistant traffic engineer, becomes assistant traffic civil engineer. All these assignments are at the Phoenix headquarters office.

DEATHS

William H. Nalder, 71, former chief designing engineer of the Bureau of Reclamation and one of the nation's leading authorities in the design of irrigation and power structures, died recently. He retired in 1952, closing a professional career of 43 yr. with the USBR. He was a life member of the American Society of Civil Engineers and a member of the Colorado Society of Engineers.

* * *

C. Glen Smith, former King County Engineer and City Engineer of Puyallup, died recently in a Seattle, Wash., hospital.

* * *

Hugh C. Rogers, 76, founder of Rogers Construction Co., died recently following a heart attack at his home in Portland, Ore.

* * *

Donald L. Metz, 37, partner in the firm of Aldon Construction Co., Norwalk, Calif., died by suicide recently.

CALENDAR

Sept. 25-28—Institute of Traffic Engineers, annual meeting, Mark Hopkins Hotel, San Francisco, Calif.

Oct. 15-19—American Society of Civil Engineers, annual convention, William Penn Hotel, Pittsburgh, Pa.

Nov. 27-30—American Association of State Highway Officials, annual meeting, Traymore Hotel, Atlantic City, N. J.

Apr. 28-May 5, 1957—International Commission on Irrigation and Drainage, third congress, Sheraton-Palace Hotel, San Francisco, Calif.

Power-Dome more than a name

... proves real gas saver, reduces upkeep, too ...

How Chrysler Engineering Cuts Truck Operating Costs



by
**Jim
Byers**

When a new truck engine that promises more MPG and lower upkeep comes along, that's *news*.

But, naturally enough, fleet operators prefer not to go overboard in their praise of such new developments until they've proved them in actual operation.

That's the story of Chrysler Corporation's radically different Power-Dome V-8 combustion chamber, introduced in the 1954 Dodge C-1 series.

From the start, fleet men were agreed it looked great "on paper", but had to wait for a *factual* answer to the all-important question, "Will Power-Dome actually increase gas mileage, actually reduce maintenance costs?"

The answer to that question, after well over two years of service in fleets of all types the country over, seems to be an unqualified "Yes".

Owners of Series C-1, and the current C-3 Dodge V-8 trucks report remarkable gas savings and unusually low maintenance costs. They say they not only get more MPG (on regular fuel), but find engines maintain power and efficiency far longer than those of standard design.

In layman's language, here is how Chrysler engineers were able to give Dodge short-stroke V-8's these cost-cutting characteristics:

First, let's study the diagram below.

You'll notice, among other things, that the standard, wedge-shaped combustion chamber (Fig. 1) has corners where carbon can easily collect, whereas the Dodge Power-Dome chamber (Fig. 2) eliminates such power-stealing carbon hot spots.

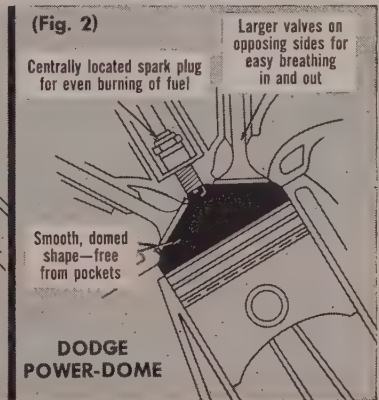
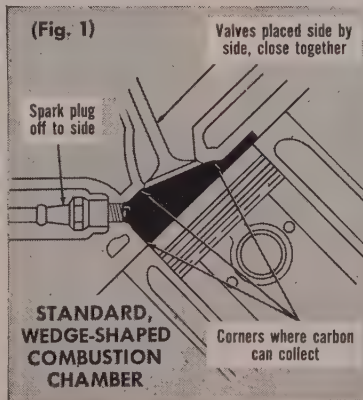
Next, notice the spark-plug location. In the Power-Dome design, it is centrally located, instead of off to one side. Flame travel, therefore, is uniform to all parts of the chamber; thus the fuel mixture is burned faster, more evenly, and more completely.

Valve placement, too, is unusual. In the Dodge Chrysler-engineered power plant, intake

and exhaust valves are located on opposing sides. This permits use of larger valves for easier engine breathing, elimination of fuel waste.

In addition to Power-Dome, Chrysler engineers have incorporated other features in Dodge truck engines that contribute to their unusual operating economy. Among a number of such advancements not found in most competitive makes are floating oil intake, ceramic fuel filter, positive exhaust valve rotators and dual exhaust system as standard equipment.

In fact, Chrysler engineers have made "fleet economy" their theme throughout the designing of today's Dodge Job-Rated Trucks. The result is a full line of trucks any cost-conscious fleet operator would be wise to investigate before investing in a replacement or adding to his fleet.



An advertisement for DODGE TRUCKS—the make with the Forward Look

SUPERVISING the jobs



Keller

Hoffman

Drinkard



Chadwell

Parker

Snider



Goodier

Anderson

Grantham



Nelson Archer

Leno

Stanley

A. H. Steiner, project manager, and R. A. Hoffman, general superintendent, head the construction force on Guy F. Atkinson Co.'s Pelton Dam job near Madras, Ore. Pat Mitchell is business manager. J. Goodier, Jr. is project engineer; Kenneth Grantham, office engineer, and A. P. Ketchen, field engineer. Other key men are Jerry Snider, office manager; Kirk Parker, accountant;

R. W. O'Banion, paymaster; P. P. Chadwell, chief storekeeper; A. C. Anderson, M. A. Meidinger, party chiefs; J. H. Keller, master mechanic; H. G. Germain, G. L. Terry, W. L. Reid and R. G. Roper, superintendents; G. F. Welton, B. E. Drinkard, W. F. Hendricks, general foremen. Work on this project is being constructed for Pacific Gas & Electric at a cost of \$6,500,000.

Leonard Runkle is project manager; H. R. Nelson, general superintendent, and J. R. Ringsmyer, assistant superintendent for Fred H. Slate Co. and T. C. Hall Co., holders of the \$173,000 contract for 4-mi. grading of the Pelton Dam access road at Madras, Ore. Master mechanic is Lynn Stanley with W. D. Archer, heavy duty mechanic and Floyd Leno, oiler.

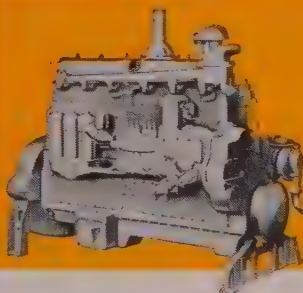
PROOF OF PERFORMANCE!

After 8 years' experience with a D13000, "nothing but another Caterpillar Engine" was considered by the Wenonah Sand & Gravel Co. for its second dredge



This CAT* D13000 Engine drives a 6" pump in a hydraulic sand dredge, operated by the Wenonah Sand & Gravel Co., Wenonah, N. J. There's a 70-foot lift through 600 feet of pipe to the wash tower. The engine, purchased several years ago, is the company's second D13000. According to Earl T. Kroll, Chief Mechanic, here's why: "Having used a duplicate of this engine in another dredge since 1946 with unquestioned economy and reliability, when we wanted to put another dredge into service, there was nothing but another Caterpillar Engine for us, a choice we haven't regretted."

This is just one of thousands of cases where the performance of one Caterpillar Diesel has sold another. There's a reason. These rugged units, available up to 650 HP (maximum), pay off in dollars and cents on the job. Simple to operate, they need a minimum of attention and maintenance. And they're sturdily built for a long life of low-cost use in every type of construction equipment. What's more, your Caterpillar Dealer stands back of them with prompt, capable service whenever and wherever it's needed!



**NOW IN THE CAT
POWER LINE-UP:
THE NEW D342,
AN EVEN MORE
EFFICIENT UNIT!**

Replacing the D13000, the more powerful, more compact 6-cylinder D342 delivers 210 HP (maximum). And with Caterpillar 4-cycle design, the fuel system requires no adjustment and there are no air boxes or cylinder ports to clean. Your maintenance is reduced to a few minutes a month for oil and filter changes. For complete information about this and other modern heavy-duty engines, see your Caterpillar Dealer.

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

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**MODERN HEAVY-DUTY
DIESEL POWER**



Carscallen Clark Cline Finlay Chomistek
Bates Mabery Glenn

C. T. Glenn is project superintendent, and Joe Mabery is assistant superintendent for Guy F. Atkinson Co. in driving a concrete reinforced pile wharf at Berth 12, Pier B, Long Beach Harbor, Calif. Elevation is being raised 12 ft. above existing wharf by putting in 353,000 tons of dirt fill. Precast piles are being made at the site. There are 508 piles, 80 ft. long, 18 ft. sq.

Other contractor men on this \$1,000,000 job are L. G. Marsh, job engineer; R. J. Finlay, job office manager; (In the office with him is Paul Chomistek, trainee); R. F. Carscallen, pile driving superintendent; W. H. Bates, carpenter superintendent, assisted by Gordon Cline; Hardy Clark, concrete foreman; J. A. Wilson, Jr., and Lafe Peterson, pile driver foreman; A. W. Anderson, labor foreman. Dominick Billi is master mechanic and Bob Evenlen is safety manager. Work is scheduled for completion early in 1957.

Job inspector for the Long Beach Harbor Department is Palmer Wermayer.

* * *

Larry Mahan, superintendent for S. Birch & Sons, is directing a \$520,-853 grading and surfacing job on the Basin-Manderson road in Big Horn County, Wyo. Other important men on the project, scheduled for completion in October, are Ed Kiinen and Jim White, foremen; Austin Tayer, mechanic; John Nykalayou, serviceman, and Arnold Eidam, timekeeper.

* * *

R. W. Richardson is superintending a job under contract to John E. Alexander for construction of a bridge in Thurston County, Wash. Bridge is of box girder type, 3-level interchange on PSH 1, PSH 9. This \$272,317 construction started Feb. 1 and will probably end about October.

C. E. Givens is superintending a \$122,370 contract held by Givens Construction Co. covering a 4-span continuous steel, 4-girder overpass structure over Southern Pacific railway near Peridot, Ariz. Foreman on this job, which has been going since January, is William Robbins. Work is expected to be finished in August. These two men are now finishing up on a \$352,476 similar job near San Carlos.

Elmo E. Skuce is project manager, and E. C. "Bob" Myers is general superintendent for Eichleay Corp. which is handling the installation of machinery at paper mill being erected at Antioch, Calif. for Crown-Zellerbach Corp. Donald Little is assistant superintendent, and Robert W. Bushnell is job engineer. Sub-contractors are Scott Co., piping; Fishback & Moore, Inc. and Charles Farrow, Inc., a joint venture, doing the electrical work.

* * *

Bill Kimble is superintending John Delphia's job covering grading and surfacing on relocation of highway in Marin County, Calif. Other key men on this \$270,106 job, which started in May and is expected to end about October, are: "Woody" LeCount, engineer; George Shoemaker, grading foreman, and Joe Kohles, concrete foreman.

* * *

Paul Cross is supervising 4.3 mi. of grading, surfacing, and structure on US 285 in Eddy County, N. Mex., for Henry Thygessen & Co., a \$272,528 job just completing.

* * *

Burt Crowe is project superintendent on 3.6 mi. to be graded and surfaced with plant-mix surfacing on imported base material on imported subbase. This \$111,625 contract located in San Luis Obispo County, Calif. got under way last May.

Down-time By Domagalski



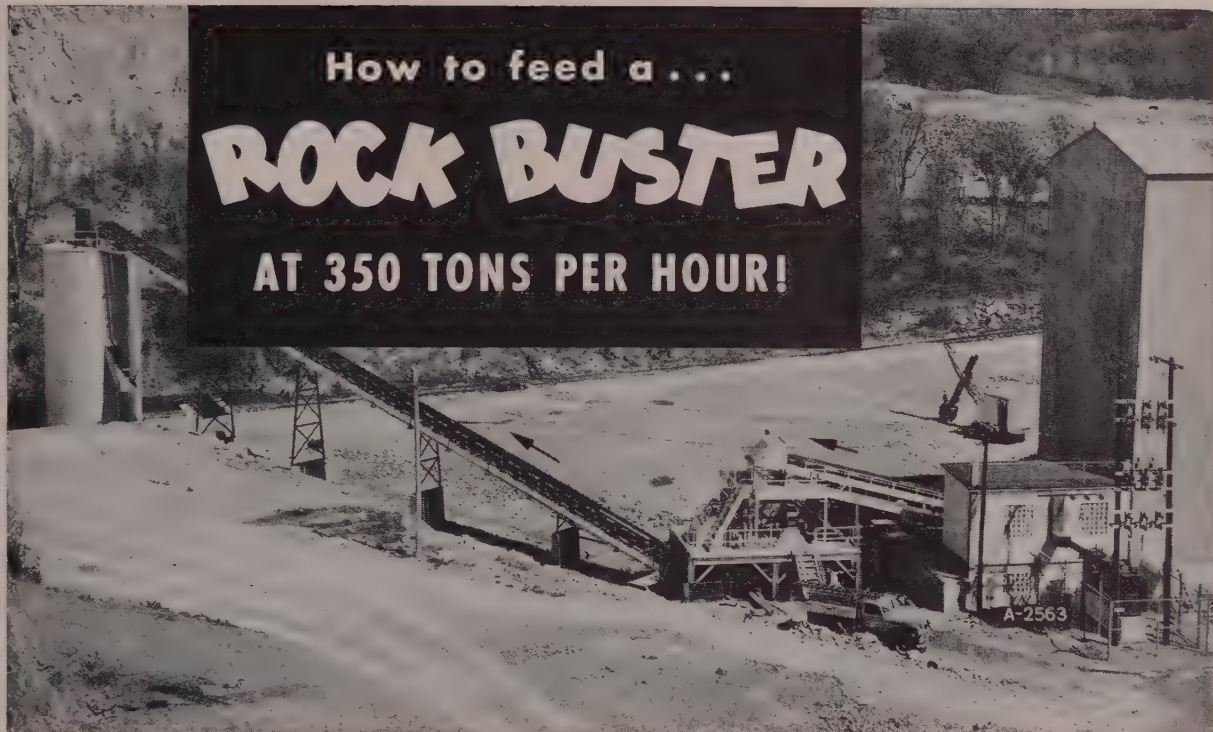
"I guess we'll just have to start stocking rubber in other sizes than medium."

Western Construction

How to feed a . . .

ROCK BUSTER

AT 350 TONS PER HOUR!



HARBISON-WALKER PLANT, BARABOO, WIS.

STEPHENS-ADAMSON CONVEYOR SYSTEM GETS A RUGGED TEST WITH GANISTER ROCK

Ganister rock is one of the toughest, most abrasive materials a conveying system can be exposed to. Processed into refractory brick by the Harbison-Walker Refractories Company, it is shown here being quarried at Baraboo, Wisconsin. This Stephens-Adamson installation takes continuous brutal punishment yet delivers steady, economical service with minimum maintenance.

An S-A Amsco manganese steel pan feeder supplying a primary crusher absorbs the jarring impact delivered by thousands of tons of rock ranging in size from 18 inches to 30 inches. Belt conveyors carry sharp, jagged lumps.

Designing heavy duty conveyor equipment that can take it and dish it out is nothing new for S-A engineers. Their tremendous experience plus a full line of S-A conveyor products can always be counted on to provide the most economical method of bulk material movement.



Head end of picking belt. Long center rollers distribute load.



Amsco manganese steel feeder actually toughens with usage.



48 inch belt conveyor runs under complete length of manganese steel feeder.

Designers and manufacturers of conveyors, elevators, screens, and transmission equipment.



STEPHENS-ADAMSON MFG. CO.

88 Ridgeway Avenue, Aurora, Ill.—Los Angeles, Calif.—Belleville, Ontario

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Designers and manufacturers of all types of bulk materials conveying systems.

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A complete line of conveyor accessories—centrifugal loaders—car pullers—bin level controls, etc.

SEALMASTER DIVISION

A full line of industrial ball bearing units available in both standard and special housings.



F. Jones Wilson Lichtenstern



S. Jones Bozarth



Blinn Whitelaw

Forrest H. Jones as project manager heads the list of important supervisors working on the \$14,735,000 Gorge High Dam contract being executed by Merritt-Chapman & Scott Corp. and The Savin Construction Co. (See *Western Construction*—July 1956, p. 42.) Engineers are J. R. Blinn, project; J. A. Whitelaw, office, and Dwight Crowe, field. "Stan" Jones is dam superintendent, assisted by D. Jones, M. Ness and Cecil Bozarth. Fred Arp is road superintendent. Master mechanic is Jack Kielgass, and the following are superintendents; John Gately, electrical; Otto Hansen, carpenter; Ernie Fritz, rigging; "Chic" Alexander, aggregate plant; Fred Lichtenstern, pipefitter; Earl P. Brown, tunnel. Floyd Fowler is camp manager. Jim Forrest and Russ Krause are walkers—road. Foremen are: Blackwell and Leslie Pierce, tunnel; "Buck" Chambers, C. A. Bond,

George Fleury, D. C. Robbins, Bob Elison, Leonard Scott, and Mulhoney, labor; C. Clifton and Al Busse, carpenter; H. C. "Shorty" Wilson, pipefitter; Owen Straubough and Roy English, mechanic; Jack Kier, diamond drill.

* * *

Milton Gracia, project engineer, Dick Chafin, superintendent, Les Johnson, structures superintendent, Chester Bolen, his assistant, and Jess Delgodillo, paving superintendent, comprise the top supervisory personnel on a recent award to Madonna Construction Co. covering grading, paving and construction of three bridges in San Luis Obispo County, Calif. This is a 4-lane concrete highway, with 800,000 yd. of roadway excavation, scheduled for completion in December, and costing \$1,777,164.

* * *

Leon D. Stoddard, project manager for Morrison-Knudsen Co., Inc., is handling the \$3,000,000 addition to cement plant going up at Lime, Ore., for Oregon Portland Cement Co. George W. Dana is office manager. Office engineer is L. O. Clements, and Matt Hally is chief of party. Carpenter superintendent is W. R. Willis; steel superintendent is Marvin Kohler. Master mechanic is Frank L. Hedberg. Assisting as foremen are: Matt Carter, millwright; James Fullbright and Blaine Shaffer, carpenter; Porter Hughes, excavation; Charles "Chuck" Shipley, concrete, and Thomas Armitage, ironworker.

A. R. Moore is project engineer for Oregon Portland Cement Co.



Dana Clements Moore



Stoddard Willis Kohler

Bert Kunkle, superintendent, is in charge of construction for Price-McNemar Construction Co. which has a contract from the Corps of Engineers for NIKE rocket site construction at Travis AFB, Calif. Assistant superintendent is Carl H. Anderson. Jan Weddell is engineer. Clarence Moss is labor foreman. In charge of electrical work for Newbery Electric Corp. is Sydney Hudson.

* * *

Everett Wentworth is supervising a \$134,385 job Thomas Construction Co. is doing in Kern County, Calif., covering construction of detours, removal of four existing bridges, and erection of three pretensioned bridges and approaches. Concrete superintendent is Bob Pierce; Chris Kinzel is master mechanic. Job has been going since May and will probably end in September.

* * *

Harold Carpenter, superintendent, with Ray Richey, crusher superintendent, heads the crew working a \$124,970 job for Quinn Brothers & Robbins in Gem County, Idaho. This job, which is for 1.2 mi. of grading and surfacing near Squaw Creek, is now in the completion stage.

* * *

Kenneth A. Ethridge, superintendent, with the aid of Ray Cox, equipment superintendent, and Charles Hughes, grade foreman, is directing rehabilitation of old roadway by placing of culverts in dip and resurfacing 8½ mi. near Tucson, Ariz. Contract was awarded at \$64,899 to Tucson Pavers, which has the job about finished.

* * *

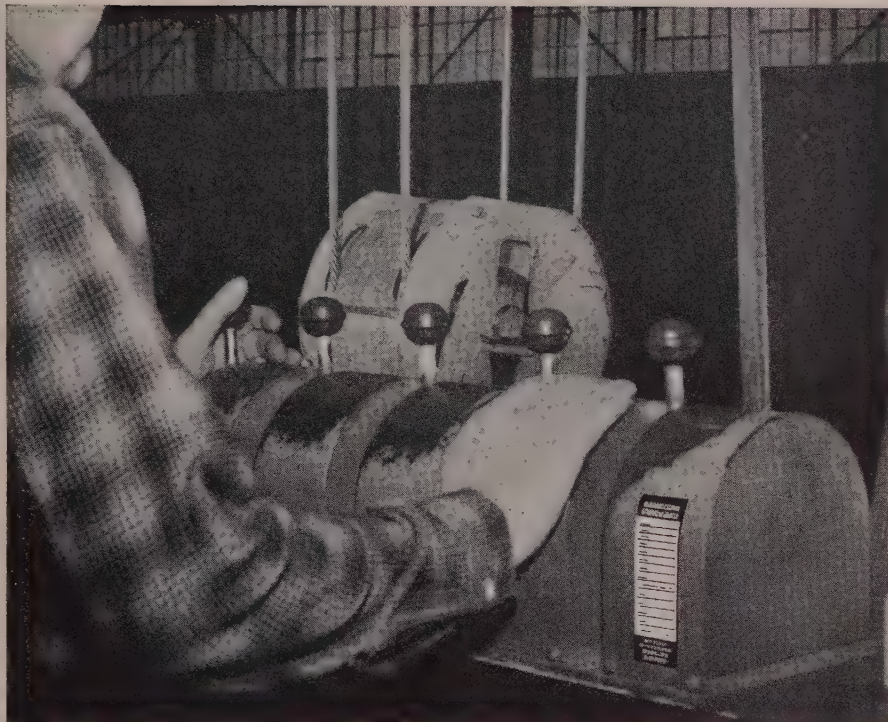
N. W. Axline, project manager, G. M. Cossitt, superintendent, and A. C. Simson, equipment superintendent, are key men for Tiffany Construction Co., working on new alignment, grading, draining and surfacing approximately 7.3 mi. of the Yuma-Casa Grande highway in Arizona. Work on this \$311,004 contract began in May and is slated for October completion.

* * *

Ray Glore is project manager for a \$2,815,000 contract being executed by R. J. Daum Construction Co. in Los Angeles. Designated as a branch Juvenile Hall facility, project consists of 12 buildings with appurtenant facilities. Other important men on the job, which started in April and is expected to be complete in mid-1957, are Edward W. Hauser, superintendent, and W. J. Penrose, expeditor.

* * *

V. E. McChargue, superintendent, with the assistance of E. A. Erickson, carpenter foreman, and E. E. Demaine, labor foreman, is in charge of The William Simpson Construction Co.'s recent award for an office building going up at El Segundo for North American Aviation, Inc. This structure has been under way since last December.



SERVICE-SCORE STICKERS provide valuable wire rope facts

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For efficient wire rope operation you must have wire rope facts—brief, handy, accurate facts. You need them for safety (when did that line go on?). You need them for reordering (what size is the hoist line?). And you need them most of all for figuring cost (how long did it last?).

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Leschen's Service-Score Stickers provide such a system. The facts are always at hand—on the machine while the wire rope

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Service-Score Stickers make it easy to compare the service you get from various rope constructions, types, and brands, so you *know which one is best* for you.

With the Service-Score System you prove to yourself that Red-Strand wire rope consistently exceeds industry standards for strength and safety.

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H. K. PORTER COMPANY, INC.**

St. Louis 12, Missouri





Nicholson

Golec

Northcutt

J. J. Nicholson is project manager, and William Northcutt is general superintendent working for the Scott Co., subcontractor for process piping under Eichleay Corporation at the Crown-Zellerbach plant at Antioch, Calif. Office engineer is G. Clapper, and office manager is J. Golec. Foremen on Scott's \$700,000 contract, which is expected to be finished about Oct. 1, are: Floyd Coffman, S. "Pinky" Macey, L. Vinn, Sam Lomba, I. Torrechina, V. Lucido, J. Craven, L. McMillen, and Bob Bittenbender. Joe Mathias is chief operator on the job.

the city. The Highway Department is pushing a heavy work-load of new projects all across the State, and Kiewit has been low bidder on several of the contracts.

Eugene C. Hill, general superintendent for L. W. Vail Co., is in charge of 14.3 mi. of grading and surfacing in Adams County, Wash., which is now completing. Plant superintendent on this \$277,849 award is H. Gene Haney; laying superintendent, Oral A. Chaney.

Thomas N. Beall, project manager, Robert D. Taylor, site manager, Lyman L. Monson, superintendent, and John Casto, field engineer, are top personnel working on Arrington Construction Co.'s recent award for construction at the AEC National Reactor Testing Station in Idaho. Work covers buildings, utilities and miscellaneous. This \$1,858,000 job got under way in April; will be finished probably May 1957.

R. S. Brown, area manager for S. S. Mullen, Inc., is directing contract currently under way for construction of communications facilities building and utilities at Kodiak Naval Station, Alaska. Involved are three reinforced concrete buildings and a 5-mi. road. General superintendent D. W. Moen is supervising the work. Other key superintendents are S. V. Olson, carpenter; John Tryon, equipment, and Harry Claterbos, excavation. This contract will probably run to May 1957.

Shirley Craig is superintending a \$547,049 contract which Gibbons & Reed has had under way since April and expects to have finished in September. This is a grading and surfacing job.

Clark Cornell, superintendent, and M. B. McDonald, field engineer, are key men on Marshall & Haas' recent award for earthwork, lining and structures at the Ralph Mill Area, Wellton-Mohawk Division of the

Gila Project, Arizona. Contract price was \$1,164,494. Started in May, work will probably be in progress through February 1957.

K. J. "Mickey" Erickson, superintendent, is top man on a grading job in the vicinity of Tumwater and Olympia and undercrossing structure on Capitol Way in Olympia, Wash. This is a \$578,858 award to Erickson Paving Co. Other key men on the job are Martin Diesburg, shop superintendent; A. T. "Smokey" Perry, rock foreman, and B. W. Rutledge, truck foreman. Completion date is set for December.

J. C. Henson, superintendent for W. J. Henson, is in charge of a \$615,627 contract for reshaping and surfacing a portion of highway in Gila and Graham counties, Arizona. Work covers select base course, aggregate base course, bituminous plant-mix and seal coat. General foreman is Bud Cleveland. Ruth Smith is timekeeper. Work started here in March and will probably be finished in September.

Hal M. Clyde is superintending for W. W. Clyde & Co. a \$728,300 contract for grading, graveling and black top, concrete bridge with concrete box culverts in Uintah County, Utah. Carpenter foreman is Ivan Nielson; grade foremen, Ruel Jensen and George M. Olsen. Job started in March and will probably run through December.

H. C. Olson, with the help of E. L. Davis, carpenter foreman, is superintending a \$196,000 recent award to Reed & Martin, Inc. for construction of addition to existing operations building and erection of Tower D at air base near Fairbanks, Alaska. Work has been under way since mid-April and will probably end by Oct. 1.

C. D. Bisordi, area manager, and Joe Hall, area engineer, are in charge of improvement work for the University of Alaska. S. S. Mullen, Inc., got the contract covering roads, curbs and sidewalks on a bid of \$288,315 and started on the job in June. September will probably see the finish of the work.

Jack Connelly, general superintendent, assisted by Chris Einarsson, is handling Barrett Construction Co.'s \$600,000 contract from the Fiberboard Products Co. for a corrugating plant at Antioch, Calif. Work started here in March and will probably run till November. Structure is of tilt-up construction, with roof and trusses by Timber Structures. H. H. Ross is superintending for Scott Co., plumbing subcontractor, and Hood Root for Berkeley Plywood Co., another sub. Electrical work is by Collins Electrical Co.

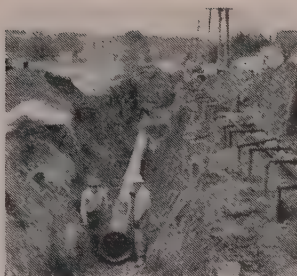


Cassell Booth

Ralph Cassell, general superintendent for Peter Kiewit Sons' Co., heads the construction crew now winding up a \$233,939 award to Kiewit from the Colorado Department of Highways. The job office is in charge of Richard "Dick" Mosier. Other key personnel are Richard "Dick" Porter, curb and gutter foreman; "Red" Botts, grading foreman; Roland "Smitty" Smith, foreman; and John Booth, master mechanic. The work consists of excavation, grading, concrete curb and gutters, asphaltic pavement and storm sewers, with related structures. Part of Colorado's highway expansion program, the 18-block project lies to the south of Denver in the city of Englewood where cross-town traffic had become a problem. It has four lanes with traffic dividers and is designed to bypass the busy downtown section of

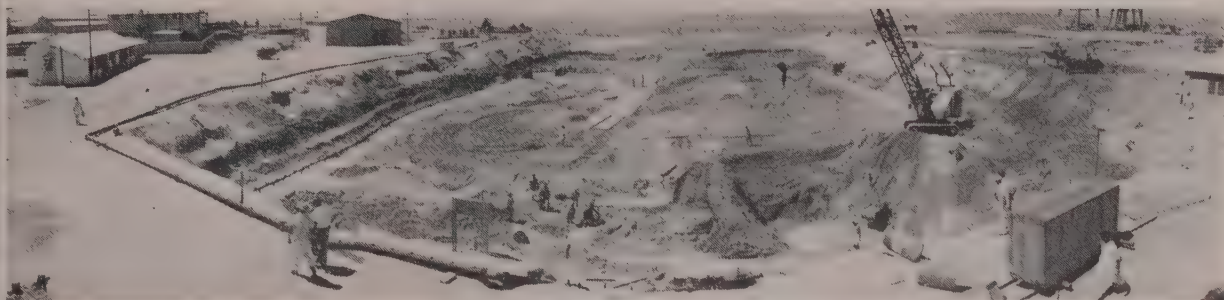


In the State of Washington heavy rainfall maintains a very high water table yet the Stang wellpoint installation and supervision kept a 6½-foot x 9-foot nearly vertical walled trench completely dry.



FROM PUYALLUP*

TO PAKISTAN...



STANG KEEPS WET JOBS DRY!

Water is where you find it...but, in the construction business, all too often you find water where you don't want it. That's when the Stang dewatering services and equipment can help you—whether your water problem is in Puyallup, Pakistan, or on your own job.

Whatever your water handling job calls for—call Stang. Nationwide depots and an experienced foreign service are on constant standby to put your job on a sound, dry footing.

Don't risk delay on your job; choose the right method the first time—call in our Representative. He will supply you with a thorough and accurate analysis of your problem and the Stang recommendation for a speedy, economical solution.



This 150-foot by 400-foot drydock in Karachi, Pakistan, being built for the Pakistan Industrial Development Corp. (Swiss-boring Overseas Corp., Ltd., Contractor) called for an excavation 40 feet deep with a 32-foot water table—only 50 feet from the water's edge! Dewatering of the job was quickly and efficiently accomplished by a specially engineered installation of Stang wellpoints, supervised by a Stang field engineer. Just one more example of Stang's outstanding water handling services to contractors the world over.

Write for bulletin 100D

Putting water
in its place



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TRICKS of the TRADES



RUNWAY BRACKETS EASY TO ASSEMBLE, DISASSEMBLE

Considerable interest has been shown in a runway bracket developed on the Union Oil Company job in Los Angeles by Neil Drinkward, job superintendent for Del E. Webb Co., and Bob Squire of the Superior Scaffold Co.

Neil reports that the brackets are rack-free, simple to assemble, and may be easily knocked down when not in use. In addition, it is a simple matter to exchange legs depending on whether the job calls for long or short ones.

The photo shows the bracket in use with two short legs on top of the pans, and two longer legs dropped between the pans.

Information on the new runway bracket may be obtained by writing Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif.

An article on this project, which involves 400,000 cu. yd. of excavation, appeared in **WESTERN CONSTRUCTION**, April 1956, pp. 32, 34.

Mobile power unit uses diesel engine

THE USE of a high output diesel engine for driving an electric generator provides two basic advantages of importance in mobile power service. It concentrates more power in a smaller package, and it delivers power with an unusual dependability and with lower maintenance than conventional engines.

The advantages of the high output diesel are illustrated by the service record of a mobile power unit now in use by the Rogers Construction Company of Portland, Ore.

Rogers Construction's mobile generator unit supplies the field power to drive its portable rock crushers. The mobile generator is a 385 kw. unit, 480 volt, 3 phase, 60 cycle. The generator is driven by a supercharged Cooper-Bessemer Type FW-6T diesel engine rated 550 hp. at 900 rpm.

The combination of supercharging and the use of a relatively slow speed engine gains the basic advantages afforded by this type of unit. Supercharging develops higher cylinder pressures to net more horsepower per cubic inch of engine displacement. Slower engines require less maintenance than do conventional high speed automotive-type engines.

On one skid are the engine, generator and radiator units. Hauled on a rubber-tired trailer, the power plant can be hauled to any location where electric power is needed.

On Rogers Construction's particular operations in powering rock crushers, the mobile engine-generator runs throughout the day at full 550 hp. load. The field operation is crushing stone for road building and fill.

Reduce sand on soil tests

THE COLORADO DEPARTMENT OF HIGHWAYS is using a small aluminum cylinder to reduce the amount of sand needed for making soil density tests in the field. Instead of filling the entire hole with calibrated sand just a thin layer is placed on the bottom. Then the cylinder, or "bomb," the volume of which is known, is placed in and sand is poured around it until the hole is full. The Colorado Dept. of Highways Materials Laboratory has aided in construction of four sizes of "bomb," ranging from 0.0193 to 0.3886 cu. ft. The new method saves 44 to 70% of sand used.



NEW TECHNIQUE FOR POURING POCKETS

Universal Form Clamp Co. engineers have developed a new technique for providing clean-out and pouring pockets. The technique permits easy removal of panels to provide for clean-out and pouring pocket requirements. Standard elements of the Uni-Form System are used, permitting uninterrupted tie placement and form erection. To provide for such openings a combination of standard Uni-Form Panels and pouring pocket channels are used. Pouring pocket channels are erected in the identical manner as Uni-Form Panels. The use of standard Panel Loc Clamps for locking pouring pocket panel to channels permits fast removal and replacement. For more information, write the Universal Form Clamp Co., 1238 N. Kostner Avenue, Chicago 51, Ill.

AT LEAST McNERNY'S SURE OF GETTIN' HIMSELF BACK HERE!! THOSE SUBSTITUTE PARTS LEFT HIM STRANDED AGAIN YESTERDAY!



Ever get fooled on "look-alikes"?

Take a part like your lube oil filter element. There may be substitutes that *look* like Caterpillar originals. But remember: CAT* elements filter every drop of oil before it reaches moving parts. They remove harmful particles, but they do *not* remove beneficial oil additives. And their special plastic-impregnated filtering material (accordion pleated to increase working surface) functions effectively through an entire oil change period. You're sure of longer engine life—less down time.

With substitute parts, can you be sure of anything?

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

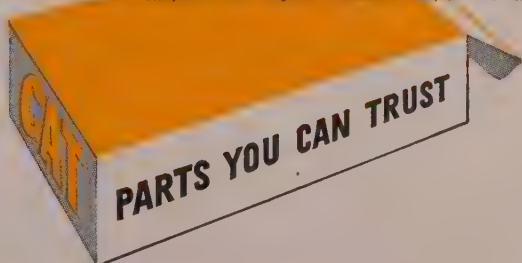
Caterpillar Tractor Co., San Francisco, Calif.; Peoria, Illinois, U.S.A.



Cat lube oil filter elements are specifically matched to the requirements of Caterpillar Engines. Don't buy trouble — buy factory-tested, job-proven Cat filters. They really protect your engine.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.





Curbs like toothpaste from a tube

OVER 150 contractors watched a newly-developed machine automatically lay 100 ft. of curb and gutter without the use of forms recently in Santa Rosa, Calif.

The Smithfield automatic curb and gutter machine used power-operated pressure screws to extrude concrete through a curb-and-gutter shaped mold. The action of extruding the concrete also propels the machine forward on easily installed tracks made of pine two-by-fours.

The mix used in the automatic device contains much less water than ordinary concrete. This factor, plus the compacting action of the machine's screws, results in quick hardening and greater strength.

Southern California tests earlier this year credited the machine with three major points of superiority

over conventional curb and gutter technique:

1. Improved product because of lower water-cement ratio (in appearance, less shrinkage and checking; in flexure and compression, as strong after seven days as conventional concrete after 28 days).

2. Lower material cost, since less cement can be used to obtain equivalent strength.

3. Increased material availability because the Smithfield achieves good results with the finer sizes of aggregates which are in plentiful supply.

The device will be available in the near future to both dealers and contractors. Details on dealerships and footage rental cost to contractors may be obtained from Automatic Curbing Co., Inc., P. O. Box 668, Lancaster, Calif.

Coupler aids jetting with aluminum pipe

EDWARD KEEBLE, contractor of San Jose, Calif., compacts his ditches by jetting with 1-in. streams of water.

Two workmen can compact about 500 ft. of ditch running as deep as 16 ft. per day.

Each man handles a length of 1-in. pipe about 12 ft. long which is connected by a 1-in. hose to faucets on a portable aluminum four-inch pipeline.

By having 1,000 ft. of the 4-in. portable aluminum pipe it is possible to use the line continuously without having to stop when moving to another location.

The 20-ft. long pipes in the pipeline are quickly connected and disconnected from the central carrying point of the pipe. One man carries two or three lengths.

When Keeble first bought a port-

able aluminum-pipeline, he got one with a coupler that was actuated by a spring. Sand and dirt got into the spring with the result that latching was not complete and when the water was turned on, the pipeline flew apart under the surge of hundreds of gallons of water at 80 psi. By looking around, he found a type of coupler in which the latch is positively forced closed by the force of inserting the pipe. Since then, he has had no trouble.

Keeble uses the pipeline on all ditch and compacting jobs, either jetting or, by adding risers and sprinkler heads every 20 to 40 feet, as a sprinkler system to soak down the ground. Flexibility of the pipe at the couplers permits a bend of about seventeen degrees at each coupler, thus allowing the laying of the pipe over uneven or hilly terrain.

West's largest truck crane

RECENTLY the Owl Truck and Construction Co., Compton, Calif., purchased the largest truck crane in the West from the Cook Brothers Construction Machinery Co. of Los Angeles, Calif.

This 50 ton crane with an American Hoist and Derrick Upper 795 is mounted on a Cook Brothers Crane Carrier. The carrier is the joint product of Cook Brothers Equipment Co. and Owl Truck and Construction



Company engineers who designed it to do specialized work.

Shown is a job which involved placing refrigeration machinery on top of the 12-story Roosevelt Building in downtown Los Angeles. It took less than two hours to set up the 160-ft. boom and 30-ft. jib. The crane is capable of lifting this 190 feet by itself as it did on this job.



How to clean an irrigation canal

A NEW STYLE of irrigation canal which is built above ground level to provide the system with gravity flow of water from the canals and laterals into the fields is being employed by the Wellton-Mohawk Irrigation District, now under construction between Yuma and Phoenix, Ariz.

At present the district has about 75,000 acres under irrigation. Water is supplied from the Imperial Dam on the Colorado River.

The irrigation district uses a Gra-

dall machine with telescopic boom, a unit manufactured by Warner & Swasey Co. of Cleveland, which has proved uniquely adaptable to the job of cleaning the canals. On extra wide canals, a 4-ft. boom extension is used with a gooseneck to give the machine added depth down to the bottom of canal.

The photograph shows the Gradall machine in operation as it digs silt from the bottom of a canal and piles it along the levees.

Gradall marches on

WHAT WOULD YOU DO if you had to dig a trench 6 ft. deep on the edge of an embankment? One way would be to build a platform along

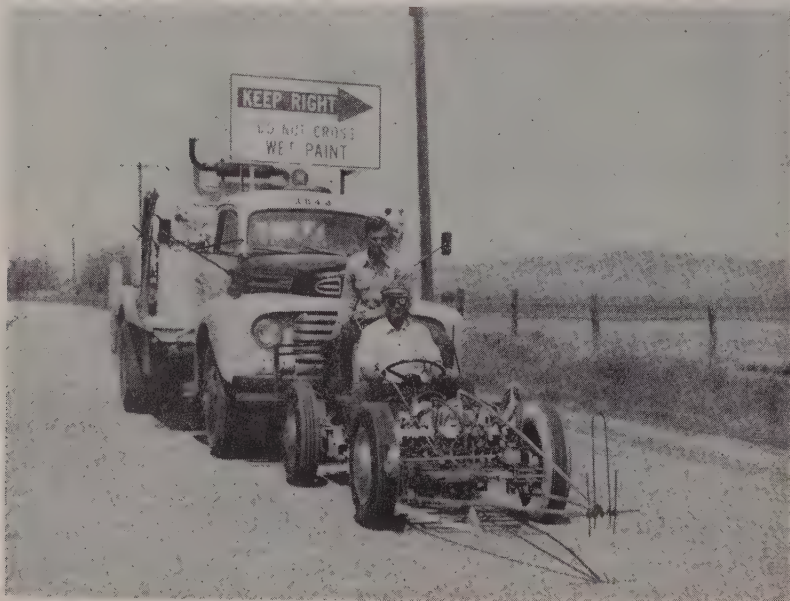


the top of the embankment to support one side of your ditching machine or backhoe permitting it to straddle the trench. But one contractor had a better idea—an offset on his Gradall. It worked fine. He used the same arrangement to place the 13-ft. sections of pipe, averaging one section installed every 12 min.

Make your own screed beam

THERE IS A PROBLEM in getting beams for vibratory screeds that has plagued many contractors. Since these beams vary in length, dealers cannot stock them, and they must be ordered from the factory, resulting in freight charges and delays because of shipment.

To solve this problem, Stow Manufacturing Co. of Binghamton, N. Y., designed a screed package assembly that could be mounted to any beam. The screed package consists of a 2½-hp. engine and a vibrating unit called the "power pak," mounting brackets, and rollers and handles. Just bolting to any beam, though, was not satisfactory for some jobs for there is apt to be a slight sag in the beam due to



NEW RIG FOR PAINTING SNAKE STRIPES

The Idaho Department of Highways has developed a new unit for painting snake stripes on highways in advance of stop signs. Constructed largely of aluminum the unit is driven by one of the front wheels of the regular paint cart and applies a sine curve which is uniform for its entire length. All that is needed is a centerline location, a mark for the starting point, and a target at the far end. Layout prints and details can be obtained from the Maintenance Engineer, Idaho Department of Highways, P. O. Box 879, Boise, Idaho.

FOR COMPLETE INFORMATION
on the construction unit of
your choice, call any of these
Fruehauf Branches:

Billings, Mont. Branch

1518 1st Avenue North
Phone: 5-5169

Denver, Colo. Branch

4780 Vasquez Boulevard
Phone: Alpine 5-1793

Fresno, Cal. Branch

2550 Church Street
Phone: 4-6551

Los Angeles, Cal. Branch

1444 So. Alameda Street
Phone: Richmond 7-6181

Oakland, Cal. Branch

850 Ninety-second Avenue
Phone: Lockhaven 9-3333

Phoenix, Ariz. Branch

902 South 7th Street
Phone: Alpine 8-6621

Portland, Ore. Branch

16700 S.E. McLoughlin Boulevard
Phone: Olive 4-5461

W. Sacramento, Cal. Branch

3600 West Capitol Avenue
Phone: Gilbert 3-3906

Salt Lake City, Ut. Branch

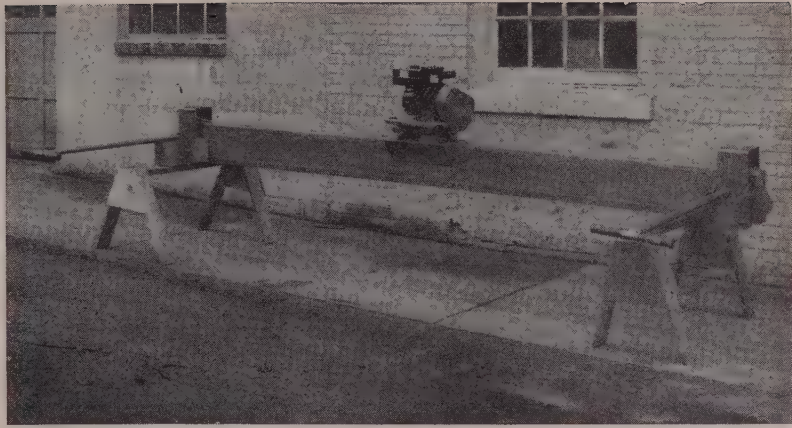
1082 South 2nd Street West
Phone: Elgin 9-3721

Seattle, Wash. Branch

2411 Sixth Avenue South
Phone: Mutual 0487

Spokane, Wash. Branch

West 1107 Third Avenue
Phone: Madison 9151



the weight of the engine. To help contractors, Stow has now eliminated this problem by designing a prestressed screed beam that can be built by any contractor. Stow furnishes drawings and complete instructions on the back of their concrete equipment catalog.

Essentially, the new screed beam consists of a wooden beam with a piece of steel channel bolted to the bottom of it. Before the channel is attached, a slight crown is cut in the bottom of the beam. Then when the channel is tightened up against this crown the beam is prestressed. The weight of the "power pak" is just enough to cause the beam to give a little, making the bottom edge perfectly straight. The steel channel gives a smoother surface and of course adds greatly to the life of the beam.

Shown here step by step is how a contractor built his own beam for a 12-ft. span screed.

Step 1—The beam length should be 1 ft. longer than the span; so a 13-ft. beam, 3 in. x 10 in. of vertical grain "D" select O. G. Douglas Fir was used. Since the crown on the bottom of the beam should be $1/64$ in. per ft. of beam length the total crown at the center would be $13/64$ in. A nail was driven in at the $13/64$ in. mark, and the line to be cut on was marked with a chalked string. A portable saw was then used to cut along this crown line.

Step 2—The bottom edge of the beam was then beveled with a plane so that the channel would fit snugly on the bottom.

Step 3—The spacing of the holes for the vertical bolts was then obtained from the formula: Bolt spacing $S = \text{beam length in ft.} \times 12 \div 70$ in. $\div$ the even number which results in spacing not over 25 in., so $S = 13 \times 12 = 156, -70 \text{ in.} = 86 \text{ in.} \div 4 = 21\frac{1}{2} \text{ in.}$ The holes were then laid out on the channel. Using an electric drill, the holes were drilled in the channel and counter sunk to fit the heads of the bolts.

Step 4—Then the channel was clamped to the beam and the vertical holes were drilled through the

wooden beam.

Step 5—The special flat head bolts furnished by Stow were inserted in the holes and drawn up tightly against the crown of the beam prestressing the channel.

Notice that a special clip is used underneath the nuts on half of the beam for holding the throttle control which runs from the engine to one end of the beam. The beam itself is now complete.

Step 6—The brackets for the engine mounting were centered in the middle of the beam so that their top surfaces were flush with the top edge of the beam. After clamping in place, one hole was drilled, and the bracket was mounted and bolted in place to properly locate the other 4 holes. Then the other holes were drilled. The remaining bolts for the bracket were inserted and tightened securely.

Step 7—Holes were drilled for mounting the rubber mounts on each end (rollers can be moved along the beam for shorter spans). Bolt heads on the end roller assemblies can slide easily into the slots in these mounts and then be tightened in place.

Step 8—The "power pak" was bolted to the brackets. Then they mounted the roller-and-handle assemblies on the screed beam so that the handles extended to the left when looking at the pulley end of the "power pak." The vibrator tends to propel the screed ahead and this will assist the operators if mounted in this manner. Before they tightened the mounting bolts that engage the vertical slots in the Chan-L-Mounts, they put a $1/4$ -in. shim under each end of the beam. After tightening the bolts and removing the shim, the rubber mounts let the beam down slightly so that there was about $1/8$ in. clearance above the form. The throttle control was threaded through the clips and fastened to the throttle at one end and at the other end to the side of the end roller assembly. The screed was then complete and ready to be put on the job.

For more details on Stow's screeds, write the Stow Manufacturing Co., 56 Shear Street, Binghamton, N. Y.



IN THE WEST, SOMETIMES IT'S HARD TO GET TO THE JOB

Working at a 7,000-foot elevation in 20 below zero weather is hard on both man and machines. To reach such an elevation can be a project in itself, especially when your objective is located in the Rocky Mountains and it happens to be the top of a canyon wall which has sheer 1,500-ft. cliffs.

One way to ascend the canyon wall is by helicopter. That's exactly what happened to a Le Roi 105 cfm. portable air compressor near Hidden Splendor, Utah, recently.

When the Atlas Corporation decided to test drill for uranium in the Hidden Splendor area, they were faced with the problem of putting an air compressor on top of the Wingate formation, a sheer 1,500-ft. canyon wall. It was decided that a helicopter could do the job. The compressor was dismantled, flown to the top piece by piece, and reassembled.

The compressor operated in temperatures as low as 20 deg. below zero and at an elevation of over 7,000 ft. At times, the drilling was a half-mile from the compressor.

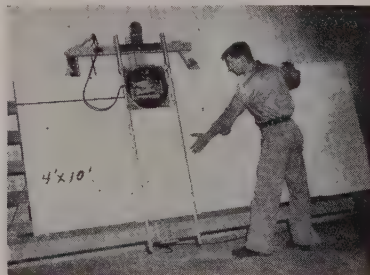
TOOLS of the TRADES

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

COLLINS MACHINERY CORP., 5474 Alhambra Ave., Los Angeles 32, Calif., has introduced a saw designed exclusively for cutting copper without a burr on either the inside or the outside, so that reaming is unnecessary. Operation of the saw requires no special skill. It will cut from seven

is supplied by any 110-volt electrical outlet, no special wiring is required and no set-up time is necessary. The unit is of aluminum construction and weighs about 90 lb. Available for immediate delivery.

A PANEL SAW for cutting large panels of plywood, masonite, and plastics into smaller sections has



been announced by **Richard C. Bennett Manufacturing Co.,** Laceyville, Pa. Called the Bennett 2-Way panel saw, the machine features a saw mounted on a turntable which permits either ripping or crosscutting. The saw runs between tubular steel tracks mounted on a wooden frame. The complete unit measures 12 ft. long, 6 ft. 7 in. high, 24 in. wide, and weighs 140 lb.

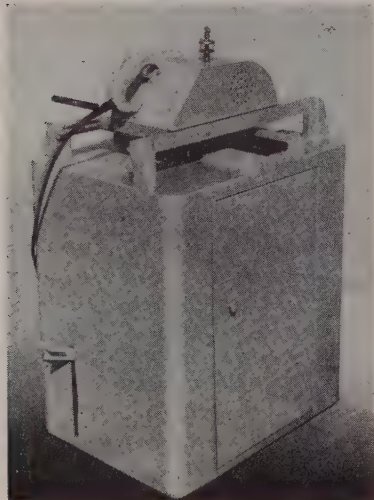
A COMPLETE LINE of folding steel legs designed to produce a reciprocal gripping lever action on a standard 2 x 4 when legs are opened or spread at the bottom has been designed by **Weldon Products, 1451**



E. Nine Mile Rd., Hazel Park (Detroit), Mich. The legs are fabricated of $\frac{3}{8}$ -in. angle iron with all moving parts riveted and are available in pairs in 14-, 25-, 30-, 36-, 42-, and 48-in. heights. They will support from 500 to 2,000 lb. in pairs, depending on their height.

AN 11-LB., 6 $\frac{1}{2}$ -in. portable electric saw has been introduced by **Porter-Cable Machine Co.,** 74 Exchange St., Syracuse 8, N. Y. The tool is powered by a 9-amp. AC-DC 115 V motor with 1 $\frac{1}{2}$ -hp. capacity which drives the blade at 3,670 rpm. under load. It features a calibrated depth gage adjustable to $\frac{1}{32}$ - to $2\frac{3}{32}$ -in. cutting depth, telescopic guard with safety lip on the leading edge to prevent jamming when the blade enters stock on any cut, and a kick-proof clutch which puts the blade into neutral if it jams or pinches. The machine will cut dressed 2 x 4s at 45 deg. as well as compositions, ferrous and non-ferrous metals, stone, and plastics. Standard equipment includes 6 $\frac{1}{2}$ -in. combination blade, 10-ft. cord and double end wrench. The tool, which sells for \$69.50, is currently available at a \$12 saving in kit form to include a rip guide, protractor gage, and steel carrying case.

AN EXPANDABLE tool holster which clips on to belt, pocket, or nail apron and keeps tools and flashlights secure and accessible is being manufactured by **Vanish Products, 1810 S. Allport St., Chicago 8, Ill.** It will hold all types of hammers, tin snips, wrenches, hatchets, hammer tacks, garden tools, and flashlights and is fully guaranteed. Price: \$1.00.



to eight pieces of $\frac{3}{4}$ - and $\frac{1}{2}$ -in. copper tubing at one time and several thousand cuts can be made before the wheel requires sharpening. Power

CLINTON WELDED WIRE FABRIC

...for fast, sound reinforced concrete construction

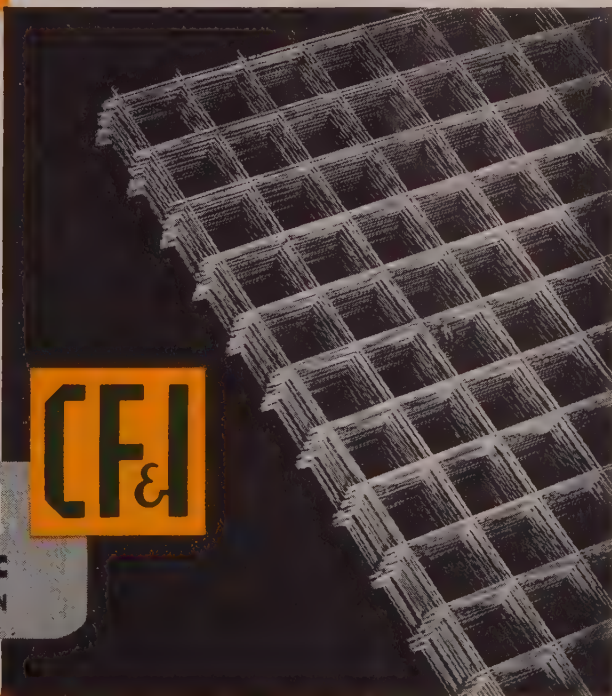
- • • in reinforced concrete storm drains, pipes, culverts
- • • in reinforced concrete strips and slabs
- • • in reinforced concrete bridges, tunnels, dams
- • • in reinforced concrete structures, housing projects



Are you planning any reinforced concrete construction? Then it will pay you to investigate Clinton Welded Wire Fabric. Here's why:

Clinton Welded Wire Fabric can save time. In constructing flat reinforced concrete surfaces, this wire fabric can be placed quickly and easily... the fabric itself lays flat. Yet it can be readily cut and molded on the job site where curved or irregular contours are required. What's more, the use of Clinton Welded Wire Fabric minimizes cracking and helps assure sound, long-lasting concrete structures.

Clinton Welded Wire Fabric is made from cold-drawn wire conforming to ASTM specifications. It is produced from ore to fabric by CF&I. This undivided responsibility assures you of outstanding quality. Use Clinton Welded Wire Fabric for concrete reinforcing on your next project. We will be glad to discuss your requirements with you.



CLINTON
WELDED WIRE FABRIC
THE COLORADO FUEL AND IRON CORPORATION

3178

Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles
Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita
CANADIAN OFFICES AT: Calgary • Edmonton • Vancouver • Winnipeg

NEW LITERATURE

Highway signs and railroad crossbucks

Now available upon request is a 12-page illustrated booklet containing information on Kaiser Aluminum highway signs and railroad crossbucks. The publication lists sizes and availabilities of various types of sign blanks, including octagon, round, rectangular, square, and diamond shapes. Detailed information on methods of finishing aluminum sign panels by applying reflective sheeting, paint, baked enamel, and porcelain enamel included. Request booklet "Kaiser Aluminum Signs and Railroad Crossbucks." **Kaiser Aluminum & Chemical Corp.**, Consumer Service Division, PR-856, 1924 Broadway, Oakland 12, Calif.

Model 101 Utility spray tanks

An 8-page catalog describing and illustrating Littleford's Model 101 Utility spray tanks truck mounted and on 2- and 4-wheel trailers, has been announced. The tanks combine three operations in one unit: bar spraying, hand spraying, and pouring for patching and crack filling. 10-ft. tubular type or 8-ft. mechanically operated full circulating spray bars are available. Both bars can be equipped with extensions for maximum spray width of 12 ft. Request Bulletin No. GG-5, **Littleford Bros., Inc.**, Box 100, 502 E. Pearl St., Cincinnati 2, Ohio.

Wheeler-Economy centrifugal pumps

Wheeler-Economy double-suction single-stage centrifugal pumps are described and illustrated in a new 8-page bulletin. The pumps are recommended for general service wherever liquids of low viscosity are to be moved, and features case design split on a horizontal center line so that rotating parts can be removed for maintenance without disturbing piping. Bulletin includes cross section drawings and construction details for standard sizes up to 10-in. discharge. Write for Catalog A-156. **C. H. Wheeler Manufacturing Co.**, 19th and Lehigh, Philadelphia 32, Pa.

New portable "Handy Mixer" for plaster and mortar

Action photos of a new portable electric tub mixer for plaster and mortar, claimed to turn out twice as much mix as conventional one-bag models, are highlighted in a descriptive catalog (No. A-156) published by the **Master Vibrator Co.**, 1752 Stanley Ave., Dayton 1, Ohio. The "Handy Mixer" can be operated by

one man right at the job site, either inside or outside. If two tubs are used, capacity is doubled and various colors and grades—even brown coat and finish coat—can be mixed simultaneously. The mixer can be set up in less than a minute wherever there is a 110-115 volt outlet, is only 21 in. wide. Complete specifications included.

Forney's offers pocket psi. calculator

Engineers, contractors, and manufacturers of concrete products will find a useful instrument in the new pocket size slide rule calculator being offered by **Forney's Inc.**, Tester Division, Box 310, New Castle, Pa. The rule is designed to convert instantly the pressure applied to concrete cylinders and blocks into psi. Its range is from 0 to 175 tons, covering cylinders 3 x 6 in. to 8 x 16 in. and 13 standard modular size blocks. Requests should include company name and individual's title. Forney's markets a line of compression and flexure testers for concrete blocks, cylinders, cubes, pipe and beams and lintels.

Lumber in the American economy

Publication of a revised and illustrated edition of "Lumber from Forest to You," a 32-page booklet of background information on the U. S. lumber industry, has been announced by the **National Lumber Manufacturers Assn.**, 1319 Eighteenth St., N. W., Washington 6, D. C. The publication traces growth of lumber manufacturing and provides a detailed account of sawmill operations and lumber distribution practices. It includes information on sources of raw material, products manufactured, problems involved, and consumption trends, with a look at the industry's future. Single copies available at no charge. Additional copies: 25 cents each.

Caterpillar D337 and D326 engines

In a broadside, "Two New Engines," Caterpillar describes the turbocharged 310-hp. D337 and the 200-hp. D326 engines, both of which contain many recent engineering developments and allow a number of possible engine arrangements. Request Form No. 31914 from **Caterpillar Tractor Co.**, Peoria, Ill.

Flaherty power spreader

Flaherty Manufacturing Inc., P. O. Box 1042, Pocatello, Idaho, has a brochure highlighting performance features of the self-propelled "Spread-Master" power spreader for chip and sand-sealing, applying armour coat or surface treatment materials, and for spreading fines on water-bound macadam. Sprayed surface is covered in one operation, as a straight line, and uniform application makes further movement of material unnecessary.

Western Concrete Pipe Assn. Directory

Western Concrete Pipe Assn., P. O. Box 152, Fresno, Calif., has published a 1956 directory of its members and associates, together with a brief outline of specifications used for all types of concrete pipe.

Galion steel platform bodies

The Galion line of steel platform bodies is described in a 2-page catalog (LL-2945) released by **Galion Allsteel Body Co.**, Galion, Ohio. Catalog describes and illustrates, both in action and detail, Models 4N-3, 4-N4, and 4N-5 12- to 16-ft. bodies. Construction details, capacities, sizes, condensed specification, and recommended matching hoists are included.

Barber-Greene booklet on loaders

"The Mystery of the Missing Profits (or You Can't Hardly Get Them No More)" is the title of an entertaining booklet stressing the use of Barber-Greene loaders to cut operation costs. **Barber-Greene**, Aurora, Ill.

Moisture-proofing emulsion

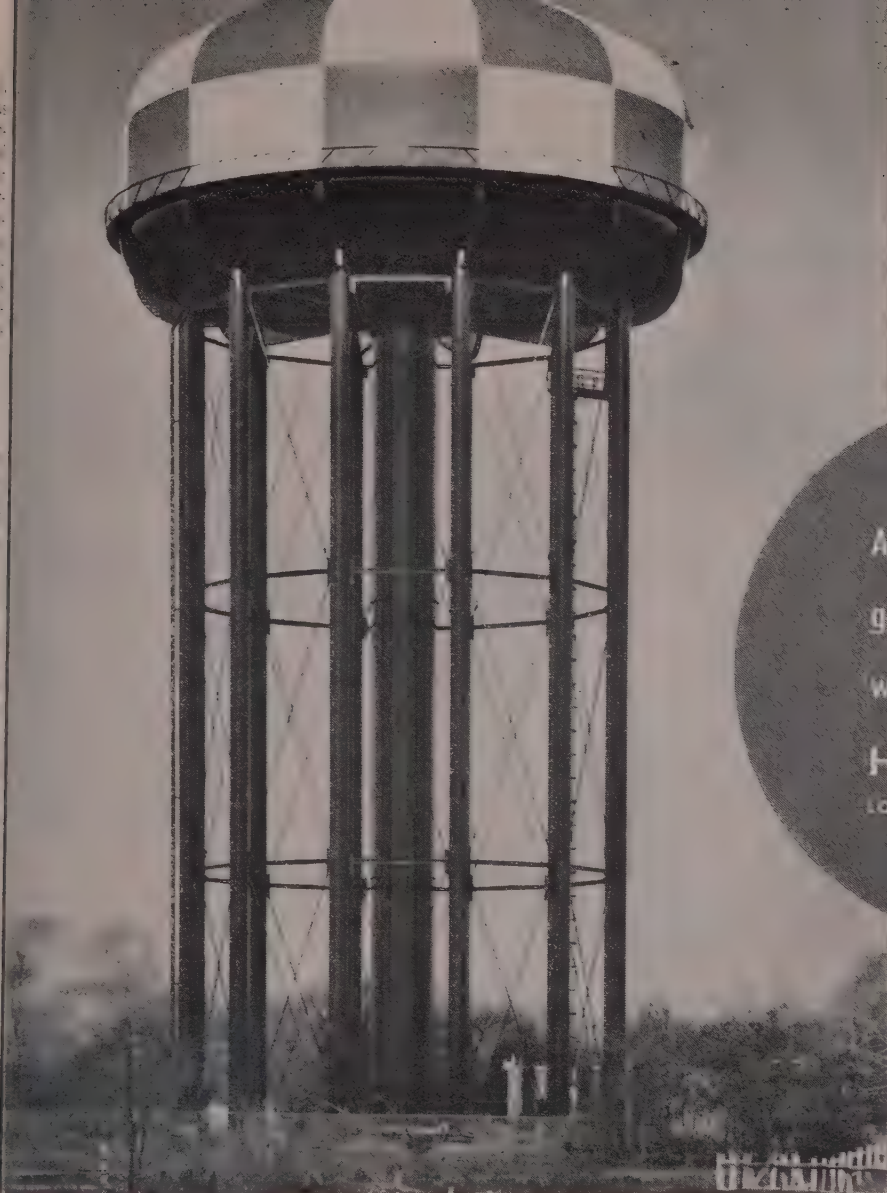
Losorb, an additive for moisture-proofing concrete and cement materials, is described in a Picco bulletin page which names characteristics and applications and points out advantages of using the emulsion in concrete blocks, mortar and plaster, stucco, concrete farm silos, and in industry. **Pennsylvania Industrial Chemical Corp.**, Clairton, Pa.

Time saving Symons System for panel handling

Symons Clamp & Mfg. Co., 683 Thornton St., San Leandro, Calif., offers a booklet explaining the Symons System for panel handling, erecting, stripping, and finishing to save manpower, time and money.

Garrett tractor brochure

The Garrett All-Drive Model 60 rubber tired tractor with International TD-6 motor and transmission is the subject of a four-page brochure which emphasizes power, traction, and economy. **Garrett Distributors**, 800 Stevenson Ave., Enumclaw, Wash.



Another 1,500,000
gallons of "certain-sure"
water service for
HEMPSTEAD
LONG ISLAND, N. Y.

1951

Elevated Steel Tanks by **PITTSBURGH-DES MOINES**

Latest of the many PDM Elevated Steel Tanks towering over Long Island's level terrain is this 1,500,000-gallon Radial Cone installation for Hempstead. 88 ft in diameter, the tank has a headrange of 35 ft and is on a tower 135 ft to bottom of capacity. Shown at right is an earlier million-gallon PDM tank of the same design, built for Hempstead in 1951.

● Write for our new Modern Water Storage Catalog.



PITTSBURGH • DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES, SANTA CLARA, FRESNO, and CADIZ, SPAIN

Sales Offices at:

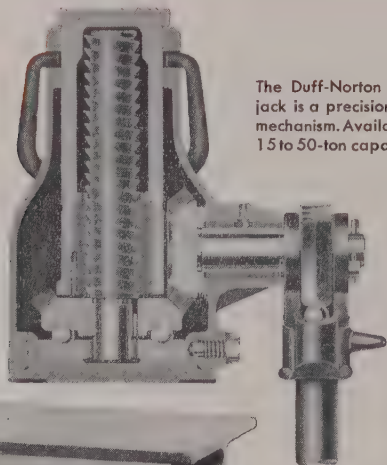
PITTSBURGH (25) 3420 Neville Island	DES MOINES (8) 921 Tuttle Street
NEWARK (2) 219 Industrial Office Bldg.	DALLAS (1) 1225 Praetorian Bldg.
CHICAGO (3) 1224 First National Bank Bldg.	SEATTLE 528 Lane Street
LOS ANGELES (48) 6399 Wilshire Blvd.	SANTA CLARA, CAL. 627 Alviso Road
MADRID, SPAIN Diego De Leon, 60	



Duff-Norton

Ball Bearing Screw Jacks can't creep or drop— will hold loads indefinitely

Standard of the world for over 70 years



The Duff-Norton screw jack is a precision built mechanism. Available in 15 to 50-ton capacities.



Can be used upright or on side with equal efficiency—no fluids to leak, no air to "lock."

Duff-Norton Ball Bearing Screw Jacks, employing the basic inverted nut and screw principle, are locked in position when under tension, can't move up or down unless you insert the jack handle and apply hand power to ball bearing actuated gears in base that turn the nut. They are safe, foolproof, dependable, fully enclosed, rugged—seldom need lubrication or servicing.

Ask your Duff-Norton distributor or write the world's oldest and largest manufacturer of lifting jacks, the Duff-Norton Co., P. O. Box 1889, Pittsburgh 30, Pa. Ask for bulletin AD-12-A.

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

DUFF-NORTON

"Giving Industry A Lift Since 1883"

Directory of Western pressure-treating plants

Complete manufacturing facilities of 19 pressure-treating plants located in the Western states are described in a directory available from the Western Wood Preserving Operators' Assn., 1410 S. W. Morrison St., Portland 5, Ore. The booklet is issued to assist users and purchasers of chemically-alloyed forest products. Points covered include types of preservative and fire-retardant treatments available at each plant, fabricating equipment, kiln drying, and maximum length of poles and piling treated. Plant and sales office locations are listed.

Barco Vibra-Tamp

Barco Manufacturing Co., 500 N. Hough St., Barrington, Ill., has published Bulletin 630 to introduce the new Vibra-Tamp, a portable, gasoline powered compaction tool for granular base materials and bituminous surfacing. The tool features a 27-in. tamping shoe, will tamp up to 750 sq. yd. per hr. It operates in the coldest weather, works flush against curbs, foundations and other obstructions in hard-to-reach areas even on big jobs. All moving parts are enclosed. Bulletin includes complete specifications list.

Welded chain catalog

A new 62-page catalog of latest specifications on welded chain, welded chain assemblies and accessories has been published by the Bolt & Chain Division of Republic Steel Corp. The two-color catalog is laid out for fast, ready reference. An introductory section sets forth general information on care and maintenance, correct measuring and ordering of welded chain. The booklet lists such standard and special chain types as Proof Coil, BBB, Republic Alloy, High Test, and a variety of others. Copies may be obtained by writing Advertising Division, Republic Steel Corp., 3100 E. 45th St., Cleveland 27, Ohio. Ask for form number ADV-701.

Remington stud drivers for bituminous resurfacing

A data sheet explaining the use of Remington stud drivers in fixing welded wire fabric to concrete in bituminous resurfacing of roads is available from the Industrial Sales Division of Remington Arms Co., Inc., Bridgeport 2, Conn.

Movalls and end-dump trucks

Relative profit advantages of Movalls and end-dump trucks are discussed in a four-page leaflet published by C & D Division of Yuba Manufacturing Co., Perkins, Calif.

International diesel crawler tractors

Information on the new International TD-6, TD-9, TD-14 and TD-18 diesel crawler tractors is contained in an 8-page mailing folder now available from Consumer Relations Dept., **International Harvester Co.**, 180 North Michigan Ave., Chicago 1, Ill. Booklet CR-491-F emphasizes the increased power, improved visibility and easier steering of the new models.

Flasher safety lights

Publication of a new 4-page catalog, describing Flasher Safety Lights and Barricades, is announced by **R. D. Pageol Co.**, Kent, Ohio. Catalog LL-3143 describes and illustrates the Flasher Safety Light line of battery-powered hazard warning lights, batteries and accessories. Companion steel and wooden barricades are also included.

Crawler tractor parts

In a new 8-page booklet, "Your Profit Insurance" (Form 32015-DE-626), **Caterpillar Tractor Co.**, Peoria, Ill., describes the manufacture of Caterpillar track-type tractor parts. The illustrated brochure deals specifically with sprockets, final drive seals, idlers and idler seals.

"Uni-Form Panels at Work"

This is the title of a 24-page pocket size brochure showing the use of Uni-Form panels on a wide variety of concrete forming jobs. On-the-job photos illustrate residential forming, light industrial, sewage treatment plants, bridges, culverts, schools, slabs, architectural concrete columns, Y walls and prison cells. **Universal Form Clamp Co.**, 1238 N. Kostner Ave., Chicago 31, Ill.

Gar Wood-Buckeye ditchers

A new 16-page catalog covering the recently introduced Gar Wood-Buckeye 305, 307 and 308 pipeline and utility ditchers is now available from **Gar Wood Industries**, Wayne, Mich. Fully illustrated, the catalog describes the Gar Wood-Buckeye hydraulic conveyor drive, live hydraulic wheel hoist controls, traction and digging transmissions and other new features incorporated in the Buckeye 305, 307 and 308 models.

New First Aid Catalog

A new 6-page First Aid Catalog is available from **E. D. Bullard Co.**, 275 Eighth St., San Francisco 3, and their distributors. With each First Aid Catalog there is included an "Instant Guide to First Aid" card. The card contains the latest information on first aid treatments and folds into wallet or purse. The illustrated catalog contains a listing of over 100 Unit Packs, with complete descriptions of Kits and Units.

**This hoist is the most efficient
lightest, safest hoist in its
capacity class available today!**

The Coffing Super Power



It's an exclusive Coffing-designed coil chain hoist using patented, compound hardened alloy steel levers instead of bulky, heavy gears. It's more efficient (85%), more compact, with the greatest power-to-weight ratio and the highest safety factor (5) of any ratchet lever hoist yet invented. Available in 6 models from $\frac{3}{4}$ to 5 ton capacities. Model RG coil chain hoist available in $\frac{3}{4}$ ton.

"Safety valve handle" bends at point of maximum safe overload—may be adjusted for length and operated from either side of the hoist—can't spin out of control should operator's hand slip from handle. Every hoist must withstand the shock of its capacity load dropped in increments of 1" thru 4", an impact load of well over 5 to 1. Ask your Coffing salesman for literature or write for bulletin SP, Coffing Hoist Division, Duff-Norton Co., 811 Walter Street, Danville, Ill.

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

COFFING HOISTS

IH folders available

Now available from the Consumer Relations Dept., **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill., are 2 two-color mailing folders describing IH equipment.

Booklet CR-553-F discusses mechanical features of the complete line of new International diesel crawler tractors, including the TD-24, TD-18, TD-14, TD-9, and TD-6 models, with job photos and close-ups.

Versatility advantages of the International Drott Skid-Shovel are the subject of the 8-page booklet CR-407-F. Also described are a variety of attachments, including the rock fork, bullangledozer blade, log and pulpwood rack, scarifier and buckets. Skid-Shovels available in sizes 1 to 2¼-yd. capacity.

OTC Sprocket Puller Bulletin

Of interest to users of track type industrial tractors is the new Sprocket Puller Bulletin No. HYS55-1, which describes both 50- and 100-ton sprocket pulling and installing sets designed for Caterpillar, International Harvester, and Allis-Chalmers crawler tractors. It lists and illustrates all component parts of each set and shows various pullers in operation. Available from **Owatonna Tool Co.**, 389 Cedar St., Owatonna, Minn.

Kerosene lantern care

An illustrated instruction sheet showing proper maintenance and operation of kerosene lanterns is now available from **R. E. Ditez Co.**, 225 Wilkinson St., Syracuse, N. Y.

End sections for culverts

Use of end sections to improve culverts and cut costs is the subject of a 4-page bulletin available from Product Information Service of **Armco Drainage & Metal Products, Inc.**, Middletown, Ohio. Bulletin (ES-12255) discusses and illustrates appearance, safety, erosion resistance, and low-cost installation.

New Gar Wood winch catalog

Gar Wood Industries' new winch catalog describes applications and ratings for both truck-mounted and stationary winches. Single and double-drum winches, ranging in capacity from 7,000 to 100,000 lb. are fully illustrated and described. Drawings and specifications for possible shaft combinations with standard power take-offs are also included. Free copies are available from **Gar Wood Industries**, Customer Service Dept., Wayne, Mich.

Euclid rear dump truck folder

Model R-15 Euclid rear dump truck is described in an 8-page brochure offered by the **Euclid Division, General Motors Corp.**, Cleveland 17,

Ohio. The three-color folder, No. 119, describes in detail the 15-ton truck and its component parts.

Diesel engines for lift trucks

Fact sheets and descriptive literature are now available on the use of diesel engines on certain lift trucks manufactured by **Hyster Co.**, 2902 N.E. Clackamas St., Portland 8, Ore. The Perkins 4 cylinder unit is available for Hyster trucks of 6,000 and 8,000 lb. capacity and Hyster 15,000, 16,000, 18,000 and 20,000 lb. capacity lift trucks can be factory equipped with the Perkins 6 cylinder model.

Concrete reinforcing bar chart available

A handy new Reinforcing Bar Wall Chart, which outlines in convenient form most of the essential information referred to when working with the design, fabrication and placing of deformed concrete reinforcing bars, has just been released by **Bethlehem Pacific** and is now available free of charge at any of its sales offices in Seattle, Portland, Spokane, San Francisco, Los Angeles and Phoenix. The new chart lists weight per foot, diameter in inches, bar number, cross-sectional area in square inches and perimeter in inches. Tensile requirements and bend test requirements also are shown.

Truck servicing

Heavy-duty truck transmissions, their operation, lubrication, maintenance, parts inspection and trouble shooting is the subject of a new 24-page booklet published by **Fuller Manufacturing Co.**, Kalamazoo, Mich. The bulletin, Form No. 102, gives helpful tips on operational and lubricational points and is illustrated with 74 photographs.

Euclid scraper catalogs

Euclid Division of General Motors, Cleveland 17, Ohio, has just published three catalogs describing the overhung engine line of "Euc" Scrapers, Models S-7, S-12 and S-18. Each of the catalogs contain 8 pages of cut-a-way views of major components and photographs. Condensed specifications are included to provide data on engines, transmissions, tires, scraper controls, weights and dimensions. These also show a performance table showing speeds and grade ability.

Prestressed concrete tanks

A new illustrated technical bulletin (T-12) describing current trends in design and construction of prestressed concrete tanks is offered by **The Preload Company, Inc.**, 211 E. 37th St., New York 16, N.Y.

Get the facts here ABOUT THE NEW 2½ yd. LORAIN-85 SHOVEL

**ANDREWS EQUIPMENT SERVICE
OF WASHINGTON, INC.**

Spokane, Wash.

CENTRAL MACHINERY CO.

Great Falls, Havre and Lewistown, Mont.

COAST EQUIPMENT CO.

San Francisco 3, California

A. H. COX & COMPANY

Seattle 4, Tacoma, Wash.

P. L. CROOKS & CO., INC.

Portland 10, and Eugene, Ore.

GENERAL EQUIPMENT CO.

Reno, Nevada

McCOY COMPANY

Denver 17, Colo. Br.: Durango, Grand Junction, Pueblo & Sterling, Colo.

MOUNTAIN TRACTOR CO.

Missoula and Kalispell, Mont.

NASH-DAVIS MACHINERY CO.

Billings, Montana. Branches at Bozeman, Mont. and Greybull, Wyo.

H. H. NIELSEN COMPANY

Salt Lake City, Utah

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, Mont. Branches: Miles City, Glasgow, Mont.

**WORTHAM MACHINERY
COMPANY**

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

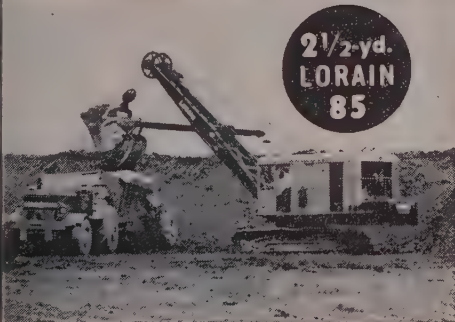
**YUKON EQUIPMENT CO.
(for Alaska)**

Seattle, Wash. Branches at Fairbanks and Anchorage, Alaska

Job Views (2½-yd.) LORAIN-85 SHOVELS at work

Here are a few of the many new 2½-yd. Lorain-85 shovels working today on jobs all over the country... handling all kinds of material, giving owners big hardage day after day with their steady performance. New "Metered-Air" controls for greater operating ease; torque converter power take-off available for most productive digging results; new, huskier 26-ft. shovel boom for greater ranges—these are but a few of the new features that make the "85" a real, heavy-duty machine.

At right, VICTOR A. PYLES CO., Baltimore, Maryland, is using his Lorain-85 on the Patapsco Tunnel job. It's their 6th Lorain, and works 300 hours a day, turning out as much as 300 yds. per hour.



2½-yd.
LORAIN
85

C. J. LANGENFELDER & SONS, INC., Baltimore, Md. own 2 Lorain-85 Shovels. Above, one is working near Auburn, Mass., on their 3,300,000 yd. grading contract on the Massachusetts Toll Road. Below, the other is shown digging and loading borrow in Baltimore. Langenfelder has purchased a total of 26 Lorains.



2½-yd.
LORAIN
85



2½-yd.
LORAIN
85

EMIL ANDERSON CONSTRUCTION CO., LTD. used his 2½-yd. Lorain-85 Shovel to dig a diversion tunnel on the Cheakamus Hydroelectric Development Project for the British Columbia Electric Co., Ltd., Vancouver. This is Anderson's 6th Lorain.

CHAS. CAPONE CONSTRUCTION CO., Dedham, Mass., tackle the Massachusetts Expressway job near Braintree, using their 2½-yd. Lorain-85 Shovel to remove a ledge of rock and dirt. This is their 4th Lorain.



2½-yd.
LORAIN
85

LYCOMING CONSTRUCTION CO., Williamsport, Pa., handle tough digging with their 2½-yd. Lorain-85 Shovel on a curve grade elimination program on Pennsylvania Route 31. Another of Lycoming's 85's works as a crane on a ½-mile long bridge construction on the same job. This is Lycoming's 17th Lorain.

THE THEW SHOVEL CO.
LORAIN, OHIO



2½-yd.
LORAIN
85

THEW LORAIN®

Diesel engine handbook

Cummins Engine Co., Inc., Columbus, Ind., has issued a 24-page booklet entitled "Answers About Diesel Engines." Fully illustrated, the booklet is designed to acquaint the reader with the basic principles of diesel operation. It describes in simple, non-technical terms such operating features as compression ratio, four and two cycle engines, superchargers and turbochargers. Contact company or local distributor.

Landfill waste disposal

Disposal of garbage and waste through sanitary landfill is discussed in a 20-page booklet (Form DE620) just published by Caterpillar Tractor Co., Peoria, Ill. Starting with the basic question of "What is a Sanitary Landfill?" the booklet goes on to compare the various landfill methods, how to approach each and how much land is required for a successful operation. An equipment selection guide for towns up to 60,000 population is included.

Head Pulley Folder by Yuba

A new 4-page folder, describing and picturing Yuba-Schrock internal drive head pulleys, has just been released by Yuba Manufacturing Co., 701 H St., Benicia, Calif. It explains the advantages of "the head pulley with motor inside," pictures the pulley in use by contractors and contains an easy-to-read chart of sizes, dimensions and operating speeds.

Tandem roller spec sheets

Huber-Warco Co. of Marion, Ohio, is announcing comprehensive specification sheets on each of its new medium and large-sized tandem rollers which feature a torque converter and two-speed transmission. The company offers a spec sheet on each of its new tandems—the 5-8, 8-12 and 10-14 ton models. Each two-color sheet lists complete information on design, construction, materials and capacities.

Simplicity releases new screen catalog

Simplicity Engineering Co. of Durand, Mich., manufacturers of sizing, separating and dewatering screens, has announced publication of a new revised illustrated bulletin, No. 67, covering their complete line of woven wire screens for repair and replacement. The catalog describes the methods employed to fabricate wire screening to exact specifications and lists the sizes and types of woven wire screen now available.

Berger convertible transit level

A brochure introducing a Berger convertible transit level with newly designed optical system to provide clarity even in poor light and with 3-ft. short focus is available from C. L. Berger & Sons, Inc., Boston 19, Mass.

Custom trailer units

Specialized Trailers, Inc., 7400 Laurel Canyon Blvd., North Hollywood, Calif., announces a new brochure outlining manufacturing and engineering facilities for the production of custom transportation units. Specialized Trailers, Inc., is a division of Fabricated Steel Service, Inc., and has recently been incorporated to produce trailers designed for specific hauling needs.

U. S. Syncrogear motors

Various types of U. S. Syncrogear motors are described and illustrated in a 16-page bulletin (No. 1880) issued by U. S. Electrical Motors Inc., P. O. Box 2058, Los Angeles 54, Calif. Cross-sectional details of the motors and enlargements of outstanding features are displayed with particular emphasis to the principle of solid shank pinions, integral oil seal and methods of cutting gears specifically for Syncrogear motors.

Axle assemblies described

Contractors and manufacturers of mobile equipment can write to United Manufacturing Co., 3637 West 56th St., Cleveland, Ohio, for a 4-page illustrated catalog describing the company's two and four-wheel Caravan axle assemblies. Photographs show the basic two-wheel designs featuring straight axle and drop axle construction. Also shown is a typical four-wheel assembly employing the company's exclusive automotive-type kingpin-tie rod-center casting assembly which provides short turning radius and caster, camber and toe-in control.

"Maintenance Tips for Unpaved Roads"

The Calcium Chloride Institute has prepared a handy size 36-page maintenance booklet, "Maintenance Tips for Unpaved Roads." It was written to help maintenance supervisors and engineers obtain best results from the use of calcium chloride on unpaved roads. Separate sections of the booklet deal with the various maintenance operations and specific questions and tables are included. A free copy can be obtained by writing to the Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C.

Highway striper catalog

A 34-page illustrated brochure describes the features of Wald Industries, Inc., line of highway striping equipment. Eight types of liners ranging from truck models to rubber-tired units operable by hand are described in detail. A complete list of accessories and easy-to-read specification charts are included.

Huber-Warco tandem roller line

Huber-Warco's new line of medium and large-sized tandem rollers with torque converter, tail-shaft governor and two-speed transmission is graphically presented in a 16-page bulletin by Huber-Warco Co. of Marion, Ohio. Bulletin No. HWT-525 describes in detail the company's 5-8, 8-10, 8-12 and 10-14 ton variable weight models. With cross-sections, cutaways, diagrams and photos the bulletin points out features of the reinforced, all-welded frame and the final drive assembly which is mounted in rather than on the frame.

Electric power hammer

Profusely illustrated with job photographs, an 8-page folder on a new electric power hammer is available from Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. Designated H54U, the new model features a spring-floated piston and a neoprene-mounted, hardened-steel nozzle to cushion the piston blow in case of accidental operation without tool. Write for form 5199.

V-8 power for heavy-duty trucks

In connection with its newly announced line of heavy-duty V-8 powered trucks, International Harvester Co., 180 North Michigan Ave., Chicago, Ill., is offering a 16-page booklet in which design and engineering features of the new International V-8 engines are brought out and graphically explained. Entitled "New Heavy-Duty V-8 Power Where You Need It Most," the brochure emphasizes operating highlights of the new International engines and explains the testing, development and proving program that all models in the "V-Line" were put through. This includes laboratory and road testing and commercial operation. Write to Consumer Relations Dept. for form CR-637-F.

Trencher teeth bulletin

Quick-change trencher teeth are described in a 4-page color brochure, No. 210, issued by Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Ore. The only tool required to change trencher teeth is a ball peen hammer; peening is done at only one place at the bases of the tooth.

New International Model 75 Payscraper

International Harvester's new Model 75 Payscraper is described in an 8-page mailing folder (CR-585-F) available from Consumer Relations Dept., International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill. Highlights of the new member of the 751 series are a lower-draft frame, greater visibility, cerametallic clutch facings, a higher apron lift, bigger push-block and improved ejector. The text is accompanied by 27 illustrations.



HERE'S JUST ONE REASON WHY THE **NEW**

MADSEN HOT ROD

MODEL 391 ASPHALT PLANT

...stands out in the industry for fast, efficient and economical performance—the kind that means consistently more production and greater owner profits.



Here is the new MADSEN HOT ROD Model 391 Asphalt Plant in operation. This is a 5000-lb. plant, producing in excess of 200 T.P.H. of quality mix. The HOT ROD Asphalt Plant is available in capacities of 3000-lbs., 4000-lbs. and 5000-lbs.

THERE'S NOTHING LIKE IT IN THE INDUSTRY!

For the first time in an asphalt plant... a FULLY-ENCLOSED GEAR BOX REDUCTION THAT GOES RIGHT TO THE MIXER SHAFTS! This MADSEN-designed drive accomplishes the huge reduction in speed from the diesel engine or electric motor to the mixer shafts in a simple, free-running, dust-tight manner. It eliminates the exposed mixer timing gears and the pressure injection pump motor.

The gear case receives the in-coming power from a straddle-mounted V-belt driven multiple groove sheave. A simple enclosed chain coupling connects with the in-going side of the gear box. From here on we have the pinion and mating cut tooth bull gear. On the out-going shaft of the latter is another pinion which meshes with the idler gear, and the two mixer timing gears. A power output shaft drives by simple chain through a fully-enclosed clutch to the pressure injection pump. The twin mixer shafts are coupled into out-going stub shafts on the gear box by simple internal-external gear-type couplings. Simple, practical, economical... this drive is an outstanding contribution to the overall efficiency of the MADSEN HOT ROD Asphalt Plant.



MIXER DRIVE TOTALLY ENCLOSED—RUNNING IN OIL
Photo shows interior of MADSEN GEAR BOX REDUCTION. In-coming power enters through shaft at lower left. The cut-tooth gear assembly, on rugged shafting and anti-friction bearing units, is fully enclosed, runs in oil.

For greater profits in the big road-building years ahead... put the outstanding MADSEN HOT ROD to work!

Ask your MADSEN Distributor for Catalog No. 391.



Equipment that Serves



MADSEN WORKS

BALDWIN - LIMA - HAMILTON
CONSTRUCTION EQUIPMENT DIVISION

DIVISIONS: Austin - Western • Eddystone •
Electronics & Instrumentation • Hamilton •
Lima • Loewy-Hydropress • Madsen • Pelton
• Standard Steel Works

ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

NEW EQUIPMENT

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

LD5T 1-yd. Scoopmobile

Four-wheel steering, two-axle oscillation and unimpaired operator visibility are features of the new model LD5T Scoopmobile. The machine is a 1 cu. yd., 5,000-lb. capacity front end loader which will transport a full load with the bucket raised off the ground just enough to clear the terrain, providing clear visibility when the unit is



under way with a load. Four-wheel steering and two-wheel oscillation afford a high degree of maneuverability in tight spots and rough terrain. Standard equipment includes torque converter, planetary drive, power steering, reversing transmission, four-wheel steering, and four wheel brakes. Full information available from **Mixermobile Manufacturers, Inc.**, Portland 20, Ore.

International 600-series wheel tractors

Especially designed to pull heavy loads is the new International 600-series wheel tractor, available with either gasoline or diesel engine. The machine features changed steering gear ratio to provide easier steering, adjustable



foam rubber padded seat, large flat platform with non-skid floor plate, and crown-type fenders to shield operator from dust and dirt. Controls grouped for easy operation. Includes lighted instrument panel. Available as optional equipment are hydraulic power steering, two-valve

Hydra-Touch system to control single, tandem, or multiple hookups, over-center hand clutch and foot decelerator. **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill.

Etnyre has automatic curb-paver

A heavy-duty automatic curb-paver that lays 90% compacted bituminous curbing in one pass and eliminates the need of curbing forms is now in production by **E. D. Etnyre & Co.**, Oregon, Ill. The machine is self-propelled.



It utilizes exhaust from its own engine to preheat and blast-clean the surface on which the curbing is laid, in many cases eliminating the need of a tack coat. Its speed ranges from 4 to 6 ft. of curb a min. Operated by two men, the curb-paver lays straight curbing or short-radius curves. A variety of interchangeable molds are available as standard, others to specification.

1/2-ton or 3/4-ton mobile asphalt plant

A new Standard Steel Corp. portable asphalt plant designated Model TM, is self-contained on a single trailer-type frame and produces from 40 to 60 tons of asphaltic mix every hour. A built-in erection device automatically raises the mixing and gradation section from its traveling to operating position in 30 min. Complete



plant installation can be accomplished in less than a day. The plant is available in batch capacities of either 1/2 or 3/4 tons. It comes as a basic unit only, or furnished complete with accessories such as feeder, asphalt and fuel storage tanks, steam generator and pumps. The portable unit is furnished with individual electric motor drives and a single 80-kw. electric generator is adequate for furnishing all necessary electric power. **Standard Steel Corp.**, 5001 S. Boyle Ave., Los Angeles 58, Calif.

New Trends call for versatility of equipment to insure future profits

Two important trends are building up in the earthmoving business: (1) more small-yardage contractors are taking "big-yardage" jobs; (2) More of the normally "big-yardage" operators are taking only the biggest of the big-yardage jobs.

Profitable handling of big-yardage jobs takes big equipment but doesn't always mean you should lay out all your new equipment investment for big-yardage production machines.

Here's Why:

Almost every big-yardage job breaks down into a number of individual sections, some with heavy cuts and fills, some with light yardage, all including some scattered, odd-lot, small-yardage assignments. These small-yardage operations are done more profitably by flexible small-yardage scrapers designed for quick moves, high-speed performance, and flexibility of fleet size to fit the job.

These smaller units can fit into big machine fleets for production dirt-moving, split into small fleets of 2 or 3 units for smaller production assignments, and self-load on one-man clean-up jobs. They show a profit on each type of operation and give flexibility to handle big-yardage with maximum economy.

Follow the trend

Big-yardage machines can make good profits on the heavy production sections, but these profits can bleed away by having these big machines waste their time on small-yardage cuts or odd-job clean-up. And you can also lose your profits of modernization by using your older, slow, expensive-to-move equipment to do this light-yardage work that calls for modern hit-and-run handling.

To insure *minimum* equipment investment and *maximum* profits in the big road program ahead, it is important to analyze advantages of versatility. You need to consider the insurance value of ability to earn on a wide variety of future big or small jobs. To better understand this problem you'll be interested in the following discussion of the production ability of our D Tournapull.

"D" is big enough (6.6 cu. yds. struck, 7.5 heaped) for profitable operation in pusher fleets. Or units can push-load each other in pairs. Or they can serve as a one-man work crew self-loading on clean-up, and on odd-job assignments.

Speed cuts cost

The "D" with 28 mph travel speed drives anywhere via highway or cross-country to handle scattered jobs... loses no production time in loading, blocking, unloading.

D Tournapull works in tight quarters and around obstructions that seriously interfere with other types of equipment. Turns non-stop in 26'.

The "D" has a larger capacity than the average small dump truck, loads itself, or can be push-loaded, has fast haul speeds... spreads evenly to fit any required lift... does an excellent scraper finishing job. It can also serve as a fast hauling unit.

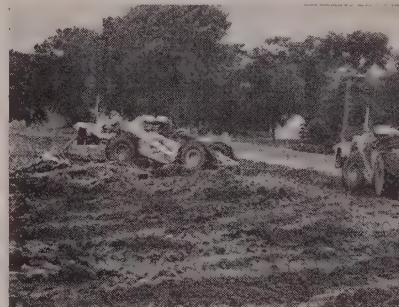
D Tournapull prime-mover can interchange from scraper to rear-dump, side-dump, flatbed, crane, or skidding arch. Any of these hauled units can be purchased at about $\frac{1}{4}$ the cost of original equipment.

Ask your LeTourneau-Westinghouse Distributor for an on-the-job demonstration... see for yourself how Tournapull versatility can insure your future profits.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-925-G-b



Handle clean-up



Work as a team



Work in large fleets



Fine-grade before paving



Drive job-to-job



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

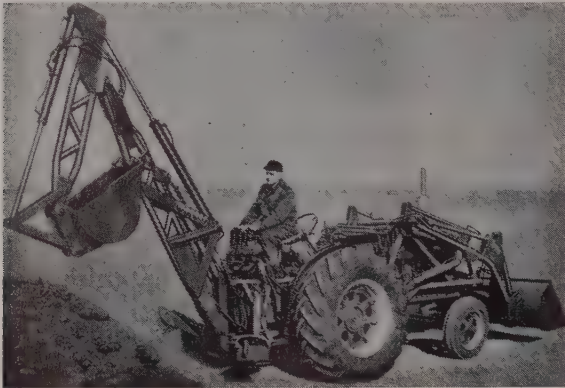
A Subsidiary of Westinghouse Air Brake Company

Cummins Turbodiesel engine

Cummins Engine Co., Inc., Columbus, Ind., announces production of the new 335 hp. NRTO-6 Turbodiesel engine which features an exhaust gas turbocharger. This new turbocharger, model T-590, is used with the Cummins PT Fuel System. The Cummins Turbodiesel is a 6-cylinder, 4-cycle engine with a bore and stroke of $5\frac{1}{8}$ x 6 in. and a piston displacement of 743 cu. in. Compression ratio is 14.5 to 1. The NRTO-6 was designed by Cummins to meet the increasing power requirements without increasing size or weight for all types of equipment.

Wagner tractor loader and backhoe for International "400"

The Wagner W7 tractor loader and W30 backhoe have been approved for use with the International "400" tractor. The loader, designed to match tractor power on tough industrial loading jobs, features "Step-In" frame design



that permits easy side-mounting plus convenient use of other tractor equipment. Down-pressure side cylinders increase lifting and digging power. The W30 backhoe is designed for such excavations as sewer, gas and power lines, foundations, drainage ditches, septic tanks. It digs to a clean depth of 12 ft., lifts full bite up to 9 ft. 3 in. Reaches 16 ft. from the swing axis on a 160-deg. arc. For full information, write Wagner Iron Works, 1905 S. First St., Milwaukee 1, Wis.

Federal 8- and 10-ton crane carriers

Now in production are 8-ton and 10-ton 6 x 6 crane carriers, manufactured by Federal Motor Truck Co., a

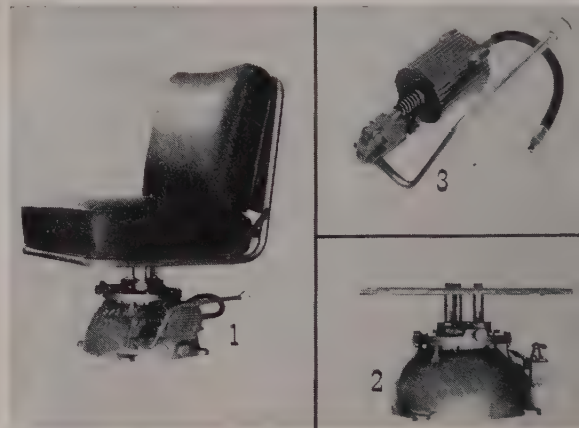


division of Napco Industries, Inc., 834 N. Seventh St., Minneapolis 11, Minn. Cab and sheet metal design of the Federal carrier provide new visibility in both models. Frame rails are heavy duty 8 x 12-in. 45-lb. wide flanged

beams in the 8-ton unit, 12 x 12-in. 65-lb. flanged beams in the 10-ton carrier. This extra frame strength plus 10,000-lb. front driving axle and 28,000-lb. rear bogie give support to heaviest cranes, shovels, or backhoes. Carrier is powered by 265-cu. in. Chrysler gasoline engine. Using 4-speed transmission and dual range transfer case, unit has 8 forward, 2 reverse speeds. Tires are 7.50 x 20, 8-ply. Optional equipment includes front and rear outriggers, rear fenders, power steering, heater and defroster, and 8.25 x 20 or 9.00 x 20 10-ply tires.

Sky-Ride pneumatic seat base

The photograph shows the "Sky-Ride" pneumatic seat base designed to eliminate all shocks, bumps, and jars which often hinder the driving of heavy vehicles or mobile operating equipment. The photo illustrates (1) base attached to truck seat featuring hand-operated pump; (2) base with three-way valve for use with air supply of vehicles, mounted with safety relief valve, and (3) hand-operated pump attachment. The unit weighs 28 lb. and is packed with grease and sealed. A filtering element



filters all air and moisture and the unit needs no servicing under ordinary conditions for 3 to 5 yr. It comes ready to install without top seat. Price \$125, f.o.b. Los Angeles. For further information write Sky-Ride, 601 S. Rampart, Los Angeles 57, Calif.

FormCo concrete form panels

A fast method of building concrete forms using $1\frac{1}{8}$ -in. plywood panels with special fasteners and steel clamps for joining panels is offered by FormCo Inc., Rockford, Ill. The method utilizes 7- or 9-ply panels of $1\frac{1}{8}$ -in. con-



crete form plywood weighing about 3 lb. per sq. ft. Panels are pre-drilled and prefitted with rust-resistant fastener

Adams 660, push-loading a Model D' Tournapull, kept firm footing in this heavy gumbo. Special push-plate was made by contractor.



Excavates and sub-grades streets for Wichita subdivision

At Woodlawn Village, a new residential subdivision east of Wichita, Kansas, Ritchie Bros. Construction Co. of Wichita contracted to excavate streets in a section of this 160-acre residential development by Wheeler-Kelly-Hagney Realty Co.

The Ritchies used 3 self-propelled scrapers and an Adams 660 grader to handle this street excavation work. The "660", with its wide range of speeds—forward and reverse—got around fast to push-load the 3 scrapers and level sub-grade for subsequent paving. Machines worked in heavy gumbo most of the time.

Foreman J. H. Boaz said this about the grader's performance:

"I have had over 20 years' experience in all types of construction, both heavy and light. The 660 is the best all-around grader I have seen."



Operator Dean Wolf used 2nd gear, 3.3 mph, to push-load. "It seems to me," Wolf stated, "that the Adams is the best grader in use today. The machine outperforms any I have used, and visibility of the blade is good."

Wide range of speeds gives Adams the advantage in working any kind of material. Heavy Adams graders have 8 forward speeds, to 26 mph. With optional "creeper" gears, 3 extra-low speeds, from 0.23 to 1.82 mph, may be added. These low speeds move heavier loads, handle rocky material with greater speed and safety, insure more accurate blade control in fine finishing when the main job is done.

The "660" has four reverse speeds, to 13.7 miles per hour, which save time on shuttle-grading in narrow spaces between houses and on short passes, where quick backing enables operator to get more work done in less time. Fast reverse speed is valuable also in quick positioning to push-load scrapers, saves time for both units.

Engine develops power-to-spare

Big 150 hp diesel engine of Adams 660 starts easily in any temperature,

◀ Quick back-up (to 13.7 mph) saves valuable time on shuttle grading. Operator has clear view of work, wide range of speeds to get more work done in less time, with Adams 660.

develops power-to-spare, with lugging ability to move heavy loads in tough going. Engines in Adams heavy graders are rubber-mounted to reduce annoying vibration and promote greater efficiency of operator, with less maintenance on machine.

Heavy, box-construction, one-piece frame of grader resists shocks and stresses. Constant-mesh transmission makes gear-changing easy, lengthens life of gears.

Stops are safe and sure with double-action hydraulic brakes. Pressure on brake pedal stops transmission as well as drive wheels. Hand brake is used for parking.

Use performance yardstick

Buy your next grader on the basis of performance. Let us show you a modern grader at work, help you select the size best suited to your type of work operation.

A size ADAMS for every need

- Model 660—150 hp diesel, 27,730 lbs.
- Model 550—123 hp diesel, 23,500 lbs.
- Model 440—104 hp diesel, 21,500 lbs.
- Model 330—80 hp diesel, 20,500 lbs.
- Model 220—60 hp diesel, 14,865 lbs.

TravelLoader—high-speed, heavy-duty, self-propelled, belt-type loader for all loose materials. 55 hp gasoline or 60 hp diesel engine. Wt. 16,800 lbs.

Tournapull—Trademark Reg. U.S. Pat. Off. AG-26-B-bj



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

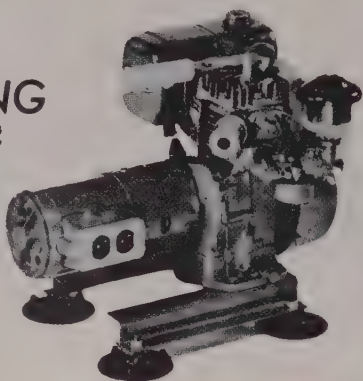
A Subsidiary of Westinghouse Air Brake Company

Galland

TOOL-KING

Power Unit

TO OPERATE
POWER TOOLS
ON EVERY
OUTSIDE
JOBI



Here's electricity in a tough little plant made for running power tools... carry it to the job, put it in the back of a car, it weighs only 65 lbs. and it packs all the power you'll ever need to run a 7" saw, a 1" drill, an impact wrench, or a small vibrator! This is a dependable electric plant that really does the work—at a cost so low you can have several of them—and put a Tool-King on the smallest jobs as well as large! See the Tool-King in action at your equipment dealers or let us send full details on the Tool-King and other plants in sizes to 3000 W.

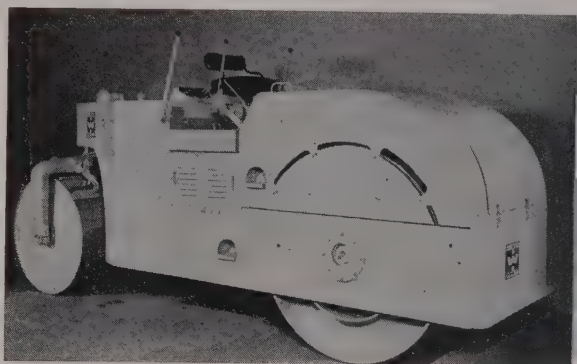
F. J. GALLAND & CO.

544 Market St., San Francisco, Calif.
1200 4th St., Berkeley, Calif.

hardware consisting of a tapped and threaded Phillips Head bolt counterbored into the plywood and held in place by a nut. Formed steel clamps, used in place of walers to hold panels together, are quickly attached to the plywood at job site by means of a bolt which fits into the Phillips Head. All panels are interchangeable, may be removed at any height for easier pouring access or inspection. Entire assembly may be used many times. Available in panel sizes from 8 to 24 in. in width and in heights of 3, 4, 5, 6, and 8 ft. Price: \$1.45 per sq. ft. for plywood, \$1.60 per sq. ft. for overlaid plywood. Hardware included.

Huber-Warco medium, large roller line

A new line of medium and large size variable weight tandem rollers featuring torque converter and two-speed transmission as standard equipment has been announced by Huber-Warco Co., Marion, Ohio. All four models in the new line—the medium sized 5-8 and 8-10 rollers and the large 8-12 and 10-14 ton tandems—are identical in design. Torque converter, which more than doubles available power, combines with special transmission to



make available the correct gear ratio to meet any work load. Tail shaft governor enables machine to maintain speed set by operator automatically, regardless of grade encountered. Adjustable guide roll assembly eliminates road scuff.

Blue Heron: heavy-duty mobile crane

The versatile Cam Blue Heron crane, a mobile crane designed for heavy duty, features a combination two-speed, hand operated rotating winch and a double-acting hand hydraulic pump which can be electrified whenever desired. Crane boom responds smoothly with loads up to 4,000 lb.; hair line release valve lowers load gently. By-



NEW!

IMPROVED PENNZOIL LUBRICANTS

PENNZOIL 811

Here is the finest multi-purpose lubricant ever offered! It adheres to metal surfaces, and will not pound out, gum or cake. Use it for chassis, truck maintenance, all heavy duty equipment, water pumps, U-joints and covered springs. It will not clog spring shackles and forms best protection against wear.

PENNZOIL 832

A customized lubricant of high film strength for better wheel bearing protection. It will withstand severe shock loads and is water resistant. It will not channel, dry out, gum or cake, and affords finest protection regardless of overpacking or other misapplication. Use it for wheel bearings in all heavy duty equipment.

TOUGH when the
shock load is **ROUGH!**





Strong support for Western builders

To support the West's growing building industry, Kaiser Steel produces the most complete line of structural shapes of any mill on the West Coast.

Because of our nearby location, western builders

are assured of shortest carrier delivery time. Also, close at hand, our experienced technical and metallurgical staffs are always ready to give personal attention to your problems.



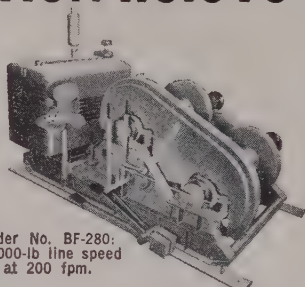
Kaiser Steel

built to serve the West

Steel Mill Products: plates • hot rolled strip and sheet • cold rolled strip and sheet • tin plate • continuous weld pipe • electric weld pipe • alloy and carbon bars • bar shapes • structural shapes • semi-finished steels • pig iron • ingot molds • coke by-products • **Fabricating Division:** steel fabrication for construction, aircraft, missile and other industries • expanded fusion weld pipe • reinforced concrete pipe • tanks • For specifications, write: **KAISER STEEL CORPORATION** • Los Angeles • Oakland • Seattle • Portland • Phoenix • Denver • Tulsa • New York

Electric, Gas or Steam Drive BAND FRICTION HOISTS

- Reversible for wear
- Non-burn lining
- "Face forward"
- friction and break levers
- Anti-friction bearings

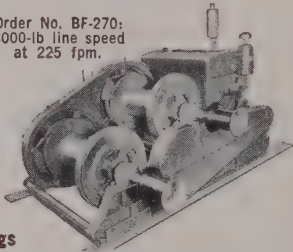


Order No. BF-280:
10,000-lb line speed
at 200 fpm.

LIGHT... COMPACT... RUGGED!

Meet your hoisting needs *precisely* at lowest possible cost. Take advantage of our long experience in modifying and re-combining standard parts to meet individual hoisting requirements.

Order No. BF-270:
8000-lb line speed
at 225 fpm.



➔ Write for Bulletins and Catalogs

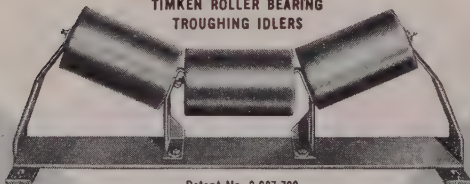
SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works—SUPERIOR, WISCONSIN
New York Office—7 Dey St., New York 7, N. Y.

CONVEYCO
NEW DEPARTURE BALL BEARING
TROUGHING IDLERS



CONVEYCO
TIMKEN ROLLER BEARING
TROUGHING IDLERS



Patent No. 2,687,799

THERE'S A SECRET TO LONGER IDLER LIFE! It's U.S. Patent No. 2,687,799

Whatever your job conditions may be, Conveyco Idlers with sealed-for-life New Departure Bearings or Conveyco Timken Bearing Idlers will give you better performance over a longer period. The secret is in the patented construction... let a Conveyco engineer show you how to reduce Idler maintenance. Note: Conveyco is a convenient source for repair or replacement parts on conveying equipment. Bearings, pulleys, etc.

Call LUdlow 2-8411 or write for Catalog 6B Today!



THE CONVEYOR CO.

3260 E. Slausan Ave., Los Angeles 58, Calif.

pass safety valve prevents overloading. Over-all height of crane from truck bed, with boom in horizontal position, is 5 ft. 6 in. Boom overhang, in collapsed position, is 6 ft., but extends to 9 ft. Tackle block takes 5-part line of ½-in. plow steel wire rope. **Cam Tool Co.**, 11 Randwick Ave., Oakland, Calif.

Stow vibrating screed

Especially adaptable to bridge decks is a new concrete vibrating screed introduced by **Stow Manufacturing Co.**, 443 State St., Binghamton, N. Y. The screed strikes off and shapes the surface as it is pulled along by two men. Vibrating unit, powered by a 2½-hp. engine, is mounted in the center of the beam, will vibrate the whole beam



thoroughly regardless of length. Throttle control regulates speed of vibration from one end of the beam and can be locked in any position so it will not move with vibration of screed. Rubber mounts isolate engine, end roller, and handle assemblies from vibration. Rear roller on each side automatically flips up to support the beam off the concrete when operator lifts the handle.

Four-wheel drive light-duty trucks

Four-wheel-drive trucks that feature a single shift lever have been added to the GMC Truck and Coach Division's line of trucks. Six basic models, including pickups and stake trucks in the half through one-ton weight range, have four-wheel drive as regular factory-installed production options. They are available with 130 hp. 270



cu. in. 6-cylinder gasoline engines or 180 hp., 316 cu. in. V-8's and either four speed manual or Hydra-Matic transmissions. The operator can change between two-wheel and four-wheel drive by shifting a single lever. The four-wheel drive shift lever, separate from the conventional gear shift, has both a high and a low position, the low for regular cross-country travel, the high for difficult driving conditions. Truck and Coach Division, General Motors Corp., Pontiac 11, Mich.

BEHIND **LIMA** QUALITY



LIMA Type 24 Pullshovel with 17' 6" boom, 6' 0" bucket arm and 1/2 cu. yd. bucket.

LIMA Type 24 Jobmaster best all-purpose performer in its class

Here's a rugged, 1/2 yd. all-purpose machine with big machine features. Lima's modern, versatile Type 24 *Jobmaster*, a quality-built specialist in its class, has been designed to fit every one of your job needs.

The *Jobmaster* is available with gasoline, diesel or electric power. It can be equipped as a shovel, 13 ton crane, clamshell, dragline or 1/2 cu. yd. pullshovel with crawler, wagon or truck mountings. The front end equipment can be interchanged easily in the field.

Lima quality guarantees high output, low operating and maintenance costs with the *Jobmaster*. Why not boost your operating profits by putting it to work today. For complete details contact your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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

These quality extras are yours with the Type 24:

1. All gears have machine cut teeth.

2. Heat treated ground shafting.

3. 55 anti-friction bearings.

4. Air for main and auxiliary controls.

5. Independent propel, third drum and power load lowering (optional).

6. Independent combination chain and cable crowd and retract.

7. Differential steering (similar to tractor).

8. Splined shafting.

9. Internal-external tooth jaw clutch for quick engagement and minimum backlash in gear train.

10. Inside dipper handle—square cross section.

11. All-welded steel construction.

12. Independent boom hoist with engine controlled boom lowering.

13. Floating steel disc type dirt seals in tread rollers.

DISTRIBUTORS: Our Seattle Office, 1932 First Avenue South, Seattle 4, Washington; **Feenaughy Machinery Co.**, 112 S.E. Belmont Street, Portland 14, Oregon; **Feenaughy Machinery Co.**, 600 Front Street, Boise, Idaho; **Smith Booth Usher Company**, 2001 Santa Fe Avenue, Los Angeles 54, California; **Modern Machinery Co.**, 4412 Trent Avenue, Spokane 10, Washington; **Acme Iron Works**, 540 Culebra Avenue, San Antonio, Texas; **Cascade Industrial Supply**, 4550 Highway 99 South, Redding, California; **Shriver Machinery Company**, 1756 Grand Avenue, Phoenix, Arizona; **N. C. Ribble Co.**, 1304 North Fourth Street, Albuquerque, New Mexico; **Boy Cities Equipment, Inc.**, 2792 Cypress Street, Oakland 7, California; **Boy Cities Equipment, Inc.**, 1178 West San Carlos Street, San Jose, California; **Faris-Moritz Equipment Company**, 1095 South Jason Street, Denver, Colorado; **McGaraghan Supply Company**, 529 Broadway, Eureka, California; **Heiner Equipment & Supply Co.**, 501 West 7th St., Salt Lake City, Utah; **Hall-Perry Machinery Company**, 902 Central Avenue, Billings, Montana; **Hall-Perry Machinery Company**, 812 East Iron Street, Butte, Montana; **Hall-Perry Machinery Company**, 1116 15th Street North, Great Falls, Montana; **Hall-Perry Machinery Company**, 127 East Main Street, Missoula, Montana; **Evans Engine & Equipment Company**, 1230 Westlake North, Seattle, Washington; **Reno Equipment Sales Company**, 1700 West Street, Reno, Nevada.



LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

BALDWIN-LIMA-HAMILTON

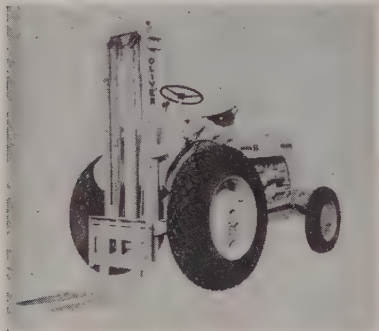
Construction Equipment Division • LIMA • OHIO • U.S.A.

Lincoln Electric announces new motor line

Lincoln Electric Co., Cleveland 17, Ohio, has re-entered the electric motor field with introduction of a line of Linc-Weld motors featuring unique extruded plastic insulation. Available in standard sizes from 1 to 40 hp., the motors are built in open type frame and torque design B. The insulation is molded into and around stator windings to form a rigid, tough mass. The plastic is highly resistive to chemical action, humidity, abrasive dust, lint and oil vapor, and eliminates hot spots by providing a medium for conducting heat uniformly away from every wire. Also holds windings in place, permanently anchored to the stator form.

Super 55 fork lift

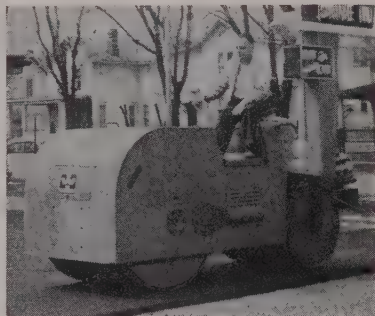
A fork lift with 4,000-lb. lifting capacity, the Super 55, has been announced by **Oliver Corp.**, 400 W. Madison St., Chicago, Ill. Models are



offered with 8- and 10-ft. tilting mast to accommodate attachments including standard forks in four lengths, concrete block fork, 1/2-yd. hydraulic scoop bucket, and dozer blade. Full traction is assured by 12-29 tires. Six forward speeds provide range of 1 1/2 to 14 1/2 mph. in addition to high and low reverse speeds. Unit has turning radius of 10 ft., hydraulic steering. Details available in Bulletin A-1615.

Huber-Warco 3-5 ton tandem for small operations

A 3-5 ton model has been added to the line of variable weight tandem rollers with torque converters manufactured by **Huber-Warco Co.**, Marion, Ohio. Specially designed for smaller rolling operations such as parking lots and driveways, the model features a water cooled 41-hp. engine, a spur-gear final drive, 34-in. (diam.) guide roll, all-welded frame and hydraulic steering with variable



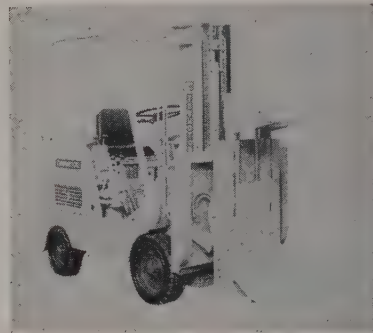
speed valve. Curb roller attachment for the tandem makes it possible to iron out paving right up to edges of walls and obstructions.

Oildex system for Rex Moto-Mixers

The Oildex crankcase ventilation system is now offered in service kits for use on the Chrysler engines of Rex Moto-Mixers, according to the Rex Construction Machinery Division of **Chain Belt Co.**, 4701 W. Greenfield Ave., Milwaukee 1, Wis. Oildex, a product of the Oildex Corp. of Tulsa, Okla., is designed to increase engine life by reducing oil dilution, eliminating crankcase back pressure and extending motor oil and spark plug life. It is particularly recommended in transit mix operations where dust is a serious problem. The device is attached to the crankcase of an engine in a few minutes. For installation on new Moto-Mixers or existing machines in the field.

Towmotor roll clamp for fork lift trucks

A roll clamp for use on Towmotor fork lift trucks enables the operator



to lift, transport, and stack heavy rolls of paper and similar loads, with greater speed and safety. The clamp rotates heavy loads 90 deg. from the horizontal to the vertical position, or vice versa, for transport through narrow aisles and doorways or to deposit them in either position. Curved shoes on the ends of the clamp arms are sand-blasted to provide a firm gripping surface. **Towmotor Corp.**, 1226 E. 152nd St., Cleveland 10, Ohio.

Temporary paint for emergency highway markings

Temline, a paint product which is temporary and completely removable, eliminates the problem of removing paint lines used in emergencies. White or yellow temporary lines can be painted or sprayed with standard equipment and permanent lines painted out with neutral gray Temline, all of which can be completely removed with R-14 remover when the emergency is over. The paint dries in about 15 min., is not affected by water or rain, and will last up to five months under normal traffic on center lines. The original lines will be restored with the application of R-14 remover to Temline.

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SHORING

SIDEWALK BRIDGES HOIST TOWERS

Builders Supply & Equipment Co. 417 Kentucky St., Bakersfield, Calif.
Squires-Belt Material Co. 12th and L Sts., San Diego 12, Calif.
Capitol Scaffolding & Equipment Co. North Sacramento, Calif.
Borchers Brothers. 342 North Second St., San Jose, Calif.
The United Materials. 814 West 14th Ave., Denver, Colo.
Superior Equipment Co. 2221 South 19th Ave., Phoenix, Ariz.



S & M Construction Company, Providence, R. I., uses 12 of these Mack LJSWX diesel dumpers under 2-yard Lorain shovel in excavating peat bog near Atholl, Mass., on a by-pass for U. S. Route 20.

ONLY A SPECIALIST NEED APPLY...

... For only Macks can get in and out of mud like this under their own power!

Axle deep in soft, soupy mire and hauling a full load of heavy peat bog, 80% water, this Mack dumper will pull out of the muck and be on its way . . . and back again on schedule.

It's Mack's famous Balanced Bogie, along with Mack's exclusive Power Divider, that makes seemingly impossible tasks like this everyday assignments for Macks. This wonder-working team delivers torque to each wheel in proportion to its

traction. In addition, it assures uniform tire loading and braking on all four rear wheels, and maximum stability under any terrain or road conditions.

When you add the Balanced Bogie and Power Divider to Mack's rugged construction, ease of maintenance, and economy of operation, you'll see why Macks are the most versatile trucks, the biggest money makers in the construction industries today. See your Mack Branch or Distributor for complete details.

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

Olin Mathieson fastening tool

A new multi-use, manually-powered fastening tool, first of its type to be manufactured in the U. S., will drive a fastener through 1/4-in. steel.



The tool, called Shure-Set, seats a specially constructed fastener into a variety of materials such as concrete, concrete block, cinder block, brick and steel. It eliminates the job of star drilling and the need for such devices as toggle bolts, expansion shields, anchors, and concrete nails. Price: \$27.95. Fasteners include drive pins which sell from \$5.25 to \$12.25 a hundred, and threaded studs, \$7.50 to

\$10.50 a hundred. For further information, write Olin Mathieson Chemical Corp., 460 Park Avenue, New York 22.

Cmetco "cam-tilt" bull float

A new "cam tilt" bull float has been added to the Cmetco line of concrete placing and finishing equipment. The unit gets its name from a cam located in the strong-back. By simply twisting the handle the tilt of the float is instantly altered to give any desired tilt to the float. The adjustment compensates for length of handle being used and for height



most convenient to the workman. Floats of steel or wood, either 4- or 5-ft. lengths, available. For illustrated bulletin, write Creative Metals Corp., 1290 Powell St., Emeryville, Calif.

Miller Spreader features new accessories

An improved towed asphalt and aggregate spreader is now in assembly line production by Miller Spreader Corp., 4020 Simon Rd., Youngstown, Ohio. The new model unit retains the basic design of previous models, but incorporates sev-



eral exclusive new features, including a floating screed mechanism which moves forward on an even plane no matter how irregular the base surface may be. A device has been built into the screed which permits crowns and reverse crowns up to 2 1/2-in. thickness for spreading level, concave or convex surfaces heretofore impossible to lay with a towed spreader. It paves a strip feathered at the edges to meet existing grade. New rubber apron on the forward edge of the spreader eliminates damage or crimping of hopper edges. Details available from manufacturer.



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So look in the Yellow Pages whenever any problem comes up in your business. The chances are you'll find a complete list of qualified people anxious to help you out.

You'll find it fast in the YELLOW PAGES



How to Slash Costs of Gravel Loading and Screening

KOLMAN 'JUNIOR' PORTABLE CONVEYOR



Loading sand and gravel is easy for the City of Yankton, S. D., with their new Model 202 Kolman Junior conveyor-screen plant, 40 feet long with a 24" belt, equipped with a Kolman SB-60 vibrating screen, 6' x 36".



Complete plant is compact unit for big production, convenience of operation, ease of transportation. Rugged enough to carry a loading trap and large vibrating screen without additional support.



Sturdy design permits installation of loading trap on tail section, portable without disassembly.



Single-deck vibrating screen folds into towing position for transportation without dismounting screen or removing any of the drive assembly.

City Saves with KOLMAN 'Junior' Conveyor

Low cost materials handling was the object when the City of Yankton, South Dakota, set out to locate a loading and screening plant. They discovered, as have many city highway departments, contractors and gravel plant operators, that the KOLMAN 'Junior' portable conveyor-screen plant is the ideal solution.

"Box Type" Construction

The rugged "box-type" construction of the Junior gives you unusual strength and rigidity for an amazing low price. The sides are of fabricated 3/16" steel plate with 2" legs. A steel belt cover completely covers the top, giving additional rigidity and completely encasing the return belt to prevent material from working in to cause belt damage.

The under-slung power unit provides easy access for servicing and operation from the ground. This is an ideal feature for the operator who has to stop and start his plant frequently during the day. The V-belt drive assembly assures positive and efficient transmission of power and the motor mount design provides quick and easy adjustments to maintain proper belt tension through a turnbuckle arrangement.

The Junior is available with the Head Pulley Clutch which stops and starts the belt while the screen remains in operation, thus greatly increasing screening efficiency.

Takes Tough Punishment
The KOLMAN 'Junior', or Model 202, will take the kind of punishment

that is dished out to a portable outfit—and will cost you far less money to own and operate. Available in 18" or 24" belt widths, in lengths up to 50".

SEE YOUR NEAREST DEALER

CALIFORNIA

BAKERSFIELD—Inland Equipment Co.
EL MONTE—Warnock-Bancroft Equip. Co.
FRESNO—Allied Equipment Co.
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OAKLAND—Spears-Wells Machinery Co.
SACRAMENTO—Sacramento Valley Tractor Co.

IDAHO

BOISE—The Sawtooth Company

NEVADA

ELKO—A-D Machinery Co.

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1739 32nd Ave., San Francisco 22

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KOLMAN Manufacturing Co.

5562 West 12th St.
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Please send free literature on—

() Model 202 Junior Conveyor
() Model 101 Heavy Duty Conveyor

() Screens () Feeders

Quote..... size or.....capacity

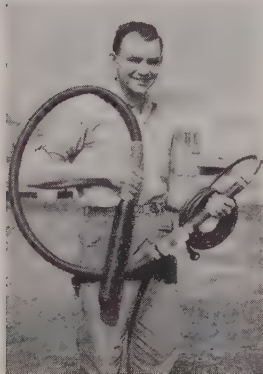
Name

Address

City



NEW MASTER "1-MAN" VIBRATOR CUTS VIBRATING COSTS IN HALF



Only 25 lbs. Easy to handle.

It weighs 25 pounds! It's all in one piece! It plugs into any regular 115 Volt AC or DC electric line . . . and with no heavy engine or motor to drag around, one man handles it easily.

The motor is sealed in the vibrating head, so there's no flexible shaft to get out of whack; no oiling or greasing problems; no kinking troubles.

No field maintenance is necessary: when motor head needs attention, snap it off and snap on a spare.

The vibration actually penetrates farther and leaves fewer voids in the concrete than old-style vibrators.

The price is *low*. The design has eliminated so much cost, and no special power source is required, but the big saving comes in use. Write for folder or ask your Master distributor for a free demonstration. You'll see exactly how the Master "1-Man" can cut your vibrating costs at least 50%.

MASTER VIBRATOR COMPANY
1752 Stanley Ave., Dayton 1, Ohio

MASTER

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ANDREWS EQUIPMENT COMPANY	Spokane, Washington
C. P. CONCRETE EQUIPMENT COMPANY	Inglewood, California Oakland, California
NEW MEXICO EQUIPMENT COMPANY	Albuquerque, New Mexico
OREGON RENTAL & EQUIPMENT SALES CO.	Portland, Oregon
POWER EQUIPMENT COMPANY	Denver, Colorado
SHRIVER MACHINERY COMPANY	Phoenix, Arizona
SIERRA MACHINERY COMPANY	Reno, Nevada
WORTHAM MACHINERY COMPANY	Casper, Cheyenne, Newcastle, Riverton, Rock Springs and Sheridan, Wyoming

Portable rock drill and breaker

A portable, lightweight, high-capacity rock drill and breaker, the Pionjar BRH-50, is now available from Stanco Mfg. & Sales Co., 1931 Pontius St., Los Angeles 25, Calif. The gasoline-powered drill manufactured in Sweden, weighs only 66 lb. when fully equipped for operation, features reduced vibration. It is a smaller model of the Pionjar BRH-65. Drilling capacity in medium-hard



granite is 46 ft. per hr. with 1.06-in. bit; 29.5 ft. per hr. with 1.34-in. bit. Drilling depths range up to 20 ft. in granite. Can be carried by one man. Offered complete with drill chuck, conversion unit for breaking,moil point, maintenance tools, some replacement parts.

Disposable fibre form for concrete

Deltaform, designed for inexpensive and simple forming of piers, short columns, column footings or pads, has been introduced by Delta Company, 333 W. 24th Place, Chicago, Ill. The forms are packed in bundles which require little storage space and can be set in seconds with no bracing necessary. Delivered in precut lengths. Additional information available from manufacturer.

Electric steam cleaner

An electric steam cleaner which converts water to steam inside a coil of copper tubing electrically heated on its outer surface has been announced. The cleaner emits no flame, no fumes, delivers 50% saturated steam mixed with exactly the right amount of detergent for the cleaning job. Requires 30-kw. power supply. Unit is available in 220, 440, and 550 voltages, 2 or 3 phase. For details write Adolph Lindquist, Turbo Machine Co., Lansdale, Pa.

FOR

Steadier Arc

Steadier Voltage

Smoother, Faster Application

USE

VICTOR

Automatic Rods

Victor automatic hardfacing alloys go on 3 to 4 times faster than manually-applied hardfacing, enable you to make big savings in labor costs. And if you're repairing equipment, cutting down time by $\frac{2}{3}$ or $\frac{3}{4}$ likewise is a terrific saving. You get a more uniform deposit, too, from Victor automatic hardfacing alloys, resulting in longer, more even wear. Check this chart — you'll find there's a Victor type for every hardfacing need.

Learn for yourself how hardfacing with Victor automatic rod reduces labor and repair down time. Ask your Victor dealer for Bulletin 358 — or better yet, order a coil of rod NOW and try it on your job.

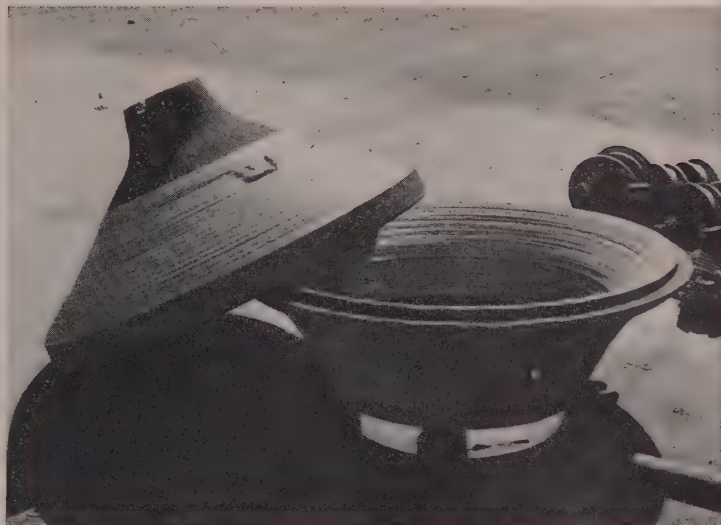
**PROFITABLE
DEALERSHIPS OPEN;
INQUIRE NOW!**

33

VICTOR EQUIPMENT COMPANY

ALLOY ROD AND METAL DIVISION

Los Angeles 59, California • Wakita, Oklahoma



Note even deposit of Victor VA#3 automatic rod on gyrotory crusher cones.

TYPE	USES	PROPERTIES AND APPLICATION
VA#1	Crusher Rolls Gyratory Crushers Crusher Mantels Scraper Blades	Rockwell 'C' 54-57 Impact Resistance—good Abrasion Resistance—high AC-DC submerged arc or DC open arc
VA#2	Pinch Rolls Tractor Idlers Tool Joints Coiler Rolls	Rockwell 'C' 50-52 Impact Resistance—good Abrasion Resistance—good Submerged arc only Suitable for multiple passes
VA#3	Roll Crushers Gyratory Crushers Impellers Mill Guides	Rockwell 'C' 54-57 Impact Resistance—good Abrasion Resistance—high For use where abrasion is severe Submerged arc only
VA#4	Tractor Rollers Sheave Wheels Tractor Idlers	Rockwell 'C' 25-28 Impact Resistance—excellent Abrasion Resistance—good Submerged arc only Suitable for multiple passes Machineable
VA#5	Tractor Rollers Sheave Wheels Tractor Idlers Grader Blades	Rockwell 'C' 34-38 Impact Resistance—high Abrasion Resistance—good Suitable for multiple passes Submerged arc only
VA#6	Crane Wheels Roll Necks Pump Sleeves	Rockwell 'C' 38-41 Impact Resistance—high Abrasion Resistance—fair Suitable for multiple passes Deposit machineable Submerged arc only
VA#7	Excellent base for high alloy application. Mine Car Wheels	Rockwell 'C' 36-42 Impact Resistance—excellent Abrasion Resistance—good Suitable for multiple passes Deposit machineable Submerged arc only
VA#8	Tool Joints Grader Blades Scraper Blades Roll Crushers	Rockwell 'C' 51-54 Impact Resistance—high Abrasion Resistance—high Submerged arc only
VT#60	Tool Joints Grader Blades Scraper Blades	Automatic Tungsten carbide wire Abrasion Resistance—excellent (maximum) Deposits are heterogeneous Open arc—DC reverse only

Rod diameters 1/8", 5/32" and 3/16". Standard coil size, 22-1/2" inside diameter, 4" wide, approximate weight 100 lbs.

Muller introduces builders' hoist

Addition of a builders' hoist to its line of contractors' equipment has been announced by **Muller Machinery Co., Inc.**, Metuchen, N. J. Rated at 1,000-lb. capacity, the hoist has



single line pull at 200 ft. per min., with rope capacity of 400 ft. of $\frac{3}{4}$ -in. Manila rope; 1,200 ft. of $\frac{3}{8}$ -in. wire rope and 2,700 ft. of $\frac{1}{4}$ -in. wire rope. The 16-in. brake covers 50% of the circumference and provides spring tension on the free end to hold load when clutch is released. Two 8-in. rubber tired wheels furnish easy mobility.

Ejector automatically cleans intercoolers on air compressors

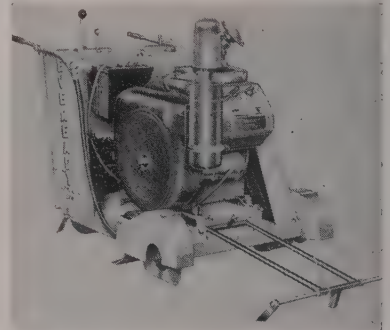
An ejector that automatically blows down and discharges air pressure, water, oil, and sludge from intercoolers on two stage portable air compressors is being manufactured by **George Manufacturing Co.**, 10 Harvey St., Philadelphia 44, Pa. The device is designed to eliminate the need for hand drainage and prevents carry-over of water and oil into high pressure cylinders. It operates from the governor or unloader line to exhaust intercooler pressure every time the governor operates, thus allowing engine to pick up speed under no load.

OTC Power-Twin rams

Faster operation and greater strength have been put into new models of OTC Power-twin center hole rams just announced by **Owatonna Tool Co.**, 389 Cedar St., Owatonna, Minn. Rib-reinforced ram body and solid construction between cylinders strengthen the unit and heavier, low frame bracket permits more flexibility in mounting. New four-spring mechanism provides faster ram retract action. Available in 17 $\frac{1}{2}$ -, 30-, 50-, and 100-ton capacities.

Eveready concrete saw

A new concrete saw designed for production sawing on airfield installations, super highways, and turnpikes is announced by **Eveready Brik-saw Co.**, 1509 S. Michigan Blvd., Chicago 5, Ill. Designated Model E-36 PD, the saw is equipped with a 36-hp. 4-cylinder air cooled engine that drives the machine under full load at speeds up to 25 ft. per min. Two abrasive coated drive wheels in direct contact with rubber tires give posi-



tive traction and promote smooth, continuous forward movement. Other features are instant maneuvering, right or left side cutting, blade depth control. All controls are dashboard mounted in easy reach of operator.

For the protection of CONTRACTORS and OWNERS

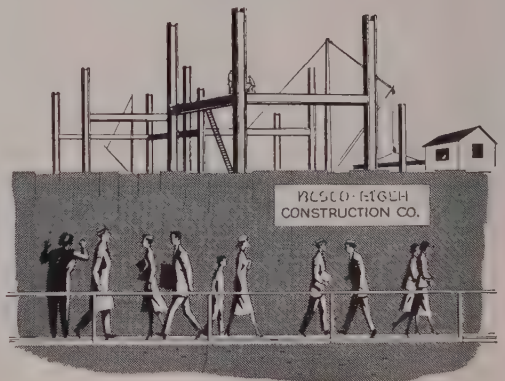
BUILDERS RISK INSURANCE

National Surety's facilities have been broadened to include the issuance of this essential protection throughout construction. This coverage is available nationwide through a network of top independent insurance agents and brokers.



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CORPORATION**

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Ask the man in the iron hat

Truck driver, cat-skinner or crane operator, he knows his engine. Knows when it's purring up-to-par, or when response is slightly off. And who could know it better?

Men like this, throughout the West, will tell you what a difference Richfield CIRCLE C MOTOR OIL makes in their engines. Daily, they *see* and *feel* and *use* the whopping, extra performance this heavy-duty oil develops!

IMPROVES ANY ENGINE

You get this kind of performance...and longer life...from any engine you lubricate with Richfield CIRCLE

C. Diesel, gasoline, natural gas, dual fuel or LPG. Mobile or stationary.

But versatility and extra performance are only *two* of the CIRCLE C virtues! Take base stock, for instance: the very finest Mid-Continent paraffine base oils available. Then additives: new and *special* combinations blended to combat acid corrosion...to resist moisture and foaming...to keep ring grooves, valve stems, oil lines and pump screens clean. All of these rare qualities make Richfield CIRCLE C unquestionably the finest heavy-duty, general-purpose motor oil you can find.

PICK UP YOUR TELEPHONE...

Call the Richfield office nearest you today. The lubrication expert there will show you what the "man in the iron hat" *has proved* about Richfield CIRCLE C MOTOR OIL. Call now!

CONDENSED SPECIFICATIONS

RICHFIELD CIRCLE C

MOTOR OIL

TYPE: Heavy duty, general purpose.

GRADES: SAE 10W, 20, 20W, 30, 40 & 50.

BASE: 95 V.I. Mid-Continent paraffine.

EXCEEDS: Required engine tests for Supplement 1 oils.

FOR API SERVICES MS, DG, DM.

CIRCLE C © MOTOR OIL

FINE INDUSTRIAL LUBRICANTS FOR EVERY NEED

RICHFIELD

GOOD CONCRETE CALLS FOR CLEAN, CLASSIFIED AGGREGATE



AND THAT CALLS FOR
EAGLE
EQUIPMENT

CONCRETE, to endure, must be made of exact percentages of various gradations of clean sand and gravel, and an exact amount of cement and water. Eagle Equipment economically washes, classifies and dehydrates concrete aggregates so that they can meet the most rigid specifications.

Tecon-Grafe-Parsons, Massena, N. Y., a joint venture, is producing approximately 3,500,000 tons of aggregate to specification for concrete to construct three large power and flow control dams on the St. Lawrence Seaway Project. Their Eagle Complete Washing-Classifying-Dehydrating Section enables them to overcome a deficiency in 30-50 mesh sizes. Eagle Equipment has processed aggregate to specification for good concrete in the nation's major dams, airports, toll roads and buildings. Eagle's experience, broad line of equipment and world-wide distributor sales and service organization can help you. Send for Catalog 55.

EXPERIENCE, PROGRESS, SERVICE SINCE 1872

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

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The EAGLE LINE



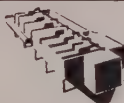
FINE MATERIAL
WASHERS



COARSE MATERIAL
WASHERS



LOG WASHERS



WATER SCALPING—
CLASSIFYING TANKS.



"SWINTEK"
DREDGE LADDERS



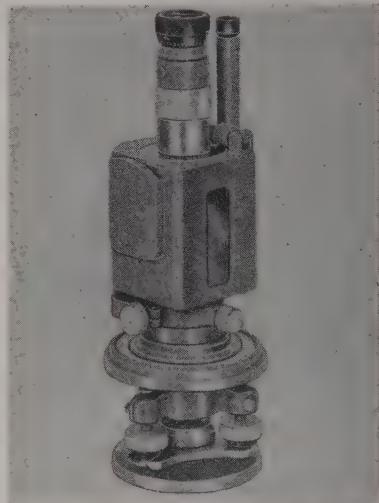
COMPLETE
DREDGES



BREAKER BALLS &
PILE HAMMERS.

Wild "pocket" theodolite

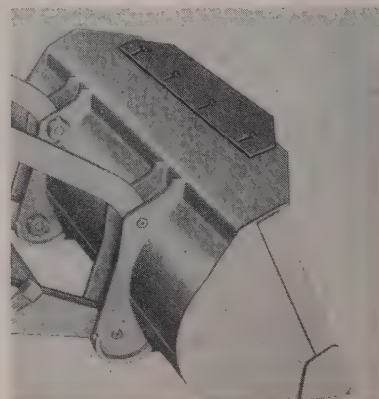
The Wild T-12, a 7-lb. (complete) theodolite, is an efficient instrument for preliminary and smaller survey



work. The instrument has over-all dimension of less than 3 x 8 in., including its metal cylinder container. Presents upright image with 5X magnification and 8-deg. field of view. Horizontal circle reading is to 1 ft. and vertical to 2 ft. Prism gives vertical range of 72 deg. Offered for \$245 complete with extension leg tripod, container and plumb-bob. Wild Heerbrugg Instruments, Inc., Main at Covert Streets, Port Washington, N. Y.

Bucket spill plate for Traxcavators

A bucket spill plate attachment for No. 977, No. 955, and No. 933 Traxcavators has been announced by Caterpillar Tractor Co., Peoria, Ill. De-



signed to make full use of the machines' power and bucket action, the attachment assures heaped loads without excessive spillage even when working in loose, friable material. It is bolted on to the top edge of the bucket, is adjustable and can be extended from 2 1/2 to 5 in. above the bucket spill plate.

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

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

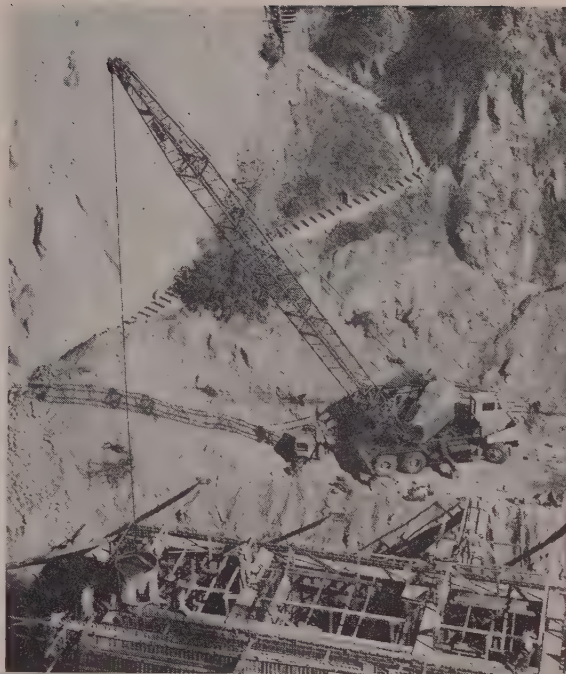
Power controlled lowering for main hoist line on lifting crane permits delicate positioning of loads.

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

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

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

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



Equipped with 85-ft. boom, this Bucyrus-Erie 22-B Transit Crane pours concrete for a bridge near La Canada, Calif. The work was done for the state highway commission by Peterson & Baker of La Canada.

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

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

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

223E56-r

SEE US FOR COMPLETE INFORMATION

The Border Machinery Company.....
.....El Paso, Texas; Carlsbad, N. M.
Clyde Equipment Company.....Portland, Ore.; Seattle, Wash.
The Colorado Builders' Supply Company.....
.....Denver, Colorado; Casper, Wyoming
Crook Company.....Los Angeles & Bakersfield, California
Great Northern Tool & Supply Company.....Billings, Montana
Intermountain Equipment Company.....
.....Boise & Pocatello, Idaho; Spokane, Washington

R. L. Harrison Company, Inc.....Albuquerque, New Mexico
Lang Company, Inc.....Salt Lake City, Utah
Northern Commercial Company
(For Alaska & Yukon Territory).....Seattle, Washington
West Coast Engine & Equipment Company.....Berkeley, California
Westmont Tractor Company.....Missoula & Kalispell, Montana
Tractor Equipment Co.....Reno, Nevada
Road Machinery Company.....Phoenix, Arizona

76th Year of Service

**BUCYRUS
ERIE**

to Men Who Shape the Earth



Model 140 Cleveland Trencher helps get \$14,000,000 sanitary sewer construction program underway in St. Petersburg, Fla.

The Cleveland Trencher Model 140 shown above—one of three Clevelands currently being operated by Richards Constructors of Andalusia, Ala.—is completing a 400-foot run of trench on Snell Isle Blvd. in St. Petersburg. 8-inch cast iron pipe is being installed here for lift pump lines. Richards really had "trench on tap" for this job because of the exclusive wide range of digging speeds provided by his 140. This allowed him to open up just the trench footage needed at any time to meet the pipe gang's require-

ments. When more trench was needed, the speed to produce it "right now" was available in the Cleveland's reservoir of speeds—a reservoir of more than 33 usable combinations of digging wheel and crawler speeds, ranging from 6 inches to over 37 feet per minute.

Richards Constructors know that no matter what the digging conditions may be on their next job—hard or soft, wet or dry, shallow or deep—their Clevelands have what it takes to get the job done with 100% efficiency.

Talk it over with your Cleveland distributor

THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



Gen-A-Matic lightweight generators

Two lightweight generators have been added to the line of 25 portable and standby electric plants manufactured by **Gen-A-Matic Corp.**, 14741 Bessemer St., Van Nuys, Calif. The new plants weigh 78 lb., 30% less than other plants delivering equivalent power, and are available in AC and DC models, both 1,500 watts, 120 volts.

Lock-O-Matic hub adds versatility to 4-wheel drive

A new Warn Lock-O-Matic hub is now available for use on 4-wheel drive vehicles to cut repair costs and assure maximum safety. "Free" position of the device allows vehicle to handle like a passenger car most of the time, but automatically engages in 4-wheel drive as load or road conditions require. Change takes place in any gear, forward or reverse.



When power is not applied at the front end, front wheels turn freely, contributing to longer life of tires and gears, less gas consumption, easy handling. Hubs can be locked to obtain solid 4-wheel drive with full engine braking power for ice or hills. Available for Willys, Dodge, International, and Napco 4-wheel drives from 1/2 to 1 1/2 tons. **Warn Mfg. Co.**, P. O. Box 6064, Riverton Station, Seattle 88, Wash.

National Supply torque converters for construction machinery

National Supply Co.'s full line of hydraulic torque converters are now available for use on excavating, earth-handling, and construction machinery through a new sales unit set up within the company. Previously, the converters were limited to use on oil field machinery and equipment. Single-stage torque converters are now manufactured in 100 to 1,000-hp. range in six basic sizes which include 17 power capacities in closely spaced ranges for exact matching with engines and electric motors. **National Supply Co.**, Two Gateway Center, Pittsburgh, Pa.

Brand New!

SUPERIOR

Speed-Strip

PAT. APPLIED FOR

RE-USABLE

**REDUCES
LABOR TIME**

**CUTS & BUTTS
TO ANY
LENGTH**

**EASY TO
HANDLE**

**STURDY
GALVANIZED
STEEL**

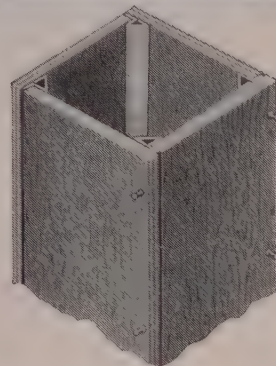
A METAL CHAMFER STRIP THAT PRODUCES NEATER, CLEANER CORNERS AT LESS COST

For better chamfers in concrete construction at less cost, investigate the important advantages of Superior Speed-Strip. Remember—there's only one material cost . . . labor is reduced substantially . . . pays for itself in a few re-uses!

Built for rough contractor usage, Speed-Strip is:

- (a) Easy to handle and quickly nailed to edge of form lumber, plywood, or S4S.
- (b) Reduces damage to forms because of minimum nailing and stripping. As Speed-Strip stays on the form during stripping, the form with chamfer is always ready for re-use. Therefore, only one application to forms is necessary where jobs duplicate column sizes, spandrel beams, pilasters, etc. Where jobs are not typical sizes, Superior Speed-Strip is easily detached from form boards, then cut and butted to desired lengths for many re-uses.
- (c) Reduces time loss in finishing—produces smooth neat corners.

Comes in 8 ft. stock lengths which may be cut or butted to any length. Made of 24 ga. galvanized steel with $1\frac{1}{8}$ " face for concrete contact. Write for sample.



**MINIMUM NAILING AND
MINIMUM WRECKING**



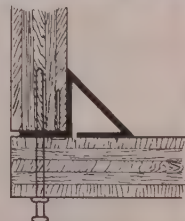
SMOOTH, NEAT CORNERS
*Always a uniform size and
shape chamfer*

HERE'S HOW Speed-Strip WORKS

Tack Speed-Strip through indentations on to edge of form board with lath type nail.



Place companion form board in position as conventionally done. Drive double-headed nail through.



SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office

1775 Broadway, New York 19, N. Y.

Pacific Coast Plant

2100 Williams St., San Leandro, Calif.

"FASTER AND CHEAPER DIGGING EVEN IN WET, STICKY SOIL"



*Says R. K. Nichols
Los Gatos Construction Co.
Los Gatos, California*

"In laying telephone cable for Pacific Tel. & Tel. Co. in Salinas, Calif., we were able to start the job early, even in extremely wet and sticky mud . . . thanks to our 524T Pow-R-Ditcher. It dug very well at 9 feet per minute under tough conditions."



POW-R-DITCHER DIGS 1'-15' PER MINUTE— 8" to 24" WIDE

An ideal, low cost, rugged ditcher for contractors, municipalities, utility companies, etc. One-man operation. 2-way side conveyor. Easy to transport. It's the BIG ditcher with the low price. Smaller models also available.

Some excellent sales territory available

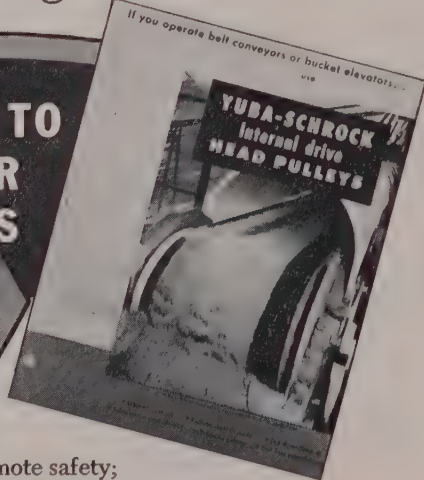
VERMEER MANUFACTURING CO. PELLA, IOWA

Yours for the asking...

ANSWERS TO CONVEYOR PROBLEMS

NEW, 4-page catalog tells and shows how Yuba-Schrock internal drive head pulleys save space, cut downtime, promote safety; liberally illustrated with photos of Western applications. Diagrams and charts give dimensions and speeds for sizes from 1 to 125 hp.

See for yourself how "the head pulley with the motor inside" solves conveyor problems. Write for your **FREE** copy of this Yuba-Schrock folder now.



107



YUBA MANUFACTURING CO.

701 East H Street • Benicia, California

IH announces attachments for U-34 power loader

Changes in design and additional attachments have been announced for the McCormick U-34 power loader, used on the International 300 Utility tractor. The new loader, the U-34A, features a manually operated mechanical trip, with hydraulic bucket control available, and round-back material bucket. Attachments include a crane and 7-ft. 18-in. blade, each of which mounts on the loader



boom in place of the materials bucket. Crane is an open hook with maximum lift height of 14 ft., capable of lifting and transporting 1,000 lb. Blade can be set with either end elevated or to lead on either end. Blade pitch can be set to change cutting angle, is useful for such jobs as local road maintenance. **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill.

Muller expands power trowel line

Two new sizes have been added to the line of power trowels manufactured by **Muller Machinery Co., Inc.**, Metuchen, N. J. One trowel, 24 in. in diameter, is well suited to finishing



basement and garage floors and light enough for one man to carry. The other, 44 in. in diameter, supplements the 34-in. model for heavy work. New models feature stationary guard rings, positive declutching mechanism, controls mounted on top of handle for accessibility.

Winter-Weiss rotary drill

A heavy duty rotary drill, Model 6TA, for vertical blast holes in mining, quarrying, and construction operations has been announced by The Winter-Weiss Co., 2201 Blake St., Denver 5, Colo. Mounted on a Caterpillar D6 diesel prime mover, the drill utilizes compressed air for cuttings removal. Two rotary com-



pressors, operating singly or together, provide a maximum 85-psi. air pressure with normal drilling pressures of 15 psi. Up to 27,000-lb. weight can be applied on the bit, and using standard oil field roller cone rock bits, the drill averages a foot a minute of 9-in. hole in most formations. No auxiliary equipment needed. All controls are located at the rear of the drill where the operator has full view of drilling operations.

Sasgen power pullers

Sasgen power pullers for operating cranes, booms, derricks, material elevators, draglines, and other builders' equipment are now available in 16 models with load capacities from 500 to 2,000 lb. Ratings range from $\frac{3}{4}$ to $7\frac{1}{2}$ hp. Two largest rated are gas engine powered; all others are electric, 115 to 440 volts. All models feature 32 x 12-in. formed steel base which serves as operating platform, 250-ft. drum capacity on $\frac{3}{4}$ -in. steel cable with tested strength of over 5,000-lb. pull. For full information, request illustrated bulletin from Sasgen Derrick Co., Dept. WNS, 3101 W. Grand Ave., Chicago 22, Ill.

Erie Strayer clamshell buckets

Two new groups have been added to the Erie line of clamshell buckets. They are $\frac{3}{8}$ - to 4-yd. light rehandlers and $\frac{3}{8}$ - to 2-yd. heavy duty hard diggers. Through the use of equalizer bar arrangement the complete line

Whatever Your Concrete Gunning Needs

AIRPLACO

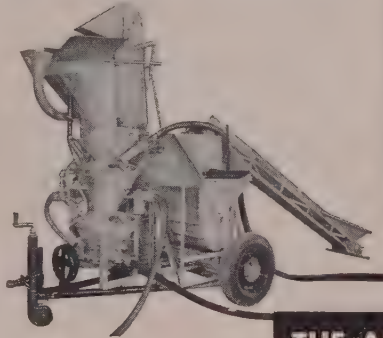
Equipment Will Fill the Bill...



MAINTENANCE



CONSTRUCTION



RESTORATION

THE AIRPLACO PORTABLE RIG

MAKES ANY CONCRETE JOB

EASIER • FASTER • BETTER • MORE PROFITABLE

The AIRPLACO Portable Rig combines speed, efficiency, portability and economy to give you the most profitable operation. The rig consists of a job-proved BONDACITOR* or NUCRETOR* (NUCRETOR shown in photo) for better concrete gunning. The time-saving MIX-ELVATOR for automatic proportioning, continuous mixing, elevating and screening of materials. And the AIRPLACO SAND-LOADER for a big time and labor savings in loading sand into the unit. The rig can be towed easily and quickly from one job site to another with a minimum of set up time required.

AIRPLACO concrete gunning equipment is available in a wide range of sizes to meet your production and job requirements from $\frac{1}{2}$ to 7 cubic yards of aggregate per hour, and using air compressors with 75 to 600 CFM capacity.

*registered trade names

See These Distributors for Free Catalog



EDWARD R. BACON CO.
San Francisco, Fresno,
Oakland, Sacramento

A. H. COX & CO.
Seattle, Tacoma

WESTERN MACHINERY CO.
Phoenix

OREGON RENTAL & EQUIP.
SALES CO.
Portland

SMITH BOOTH USHER CO.
Los Angeles

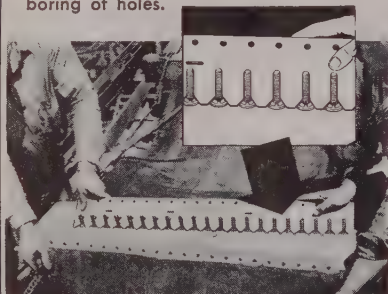
WESTERN MACHINERY CO.
Denver, Grand Junction
WESTERN MACHINERY CO.
Salt Lake City, Idaho Falls

NEW FLEXCO SPEED TOOLS CUT APPLICATION TIME IN HALF

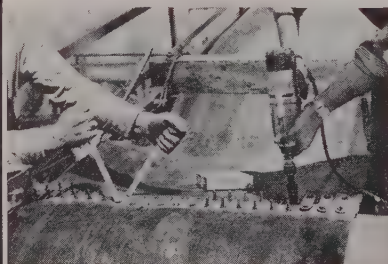
Your two man belt team can now join a belt 30" wide in 15 to 20 minutes . . . using the new FLEXCO Power Tools.



The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.

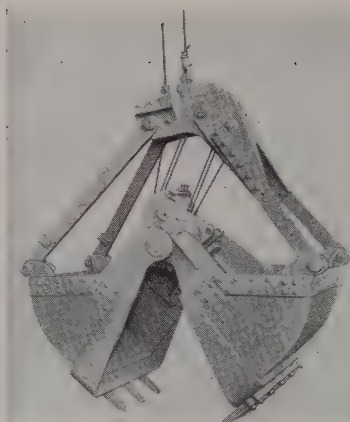


Running down nuts is fast with the new FLEXCO Speed Wrench used with electric or air impact tool. Two Bolt Breakers are used together to complete the joint.

If you are interested in speeding up fastener application, order the new Speed Tools from your local FLEXCO Distributor. Write for Bulletin F-112-A.

FLEXIBLE STEEL LACING CO.

4704 Lexington Street • Chicago 44, Illinois

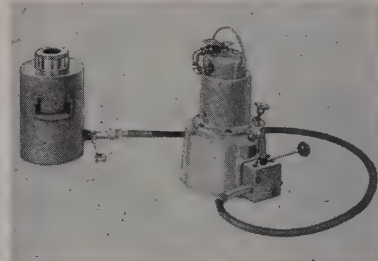


can be adapted to 3- or 4-line application. This brings to six the number of 2-line models offered by Erie Strayer Co., Erie, Pa.

Hydraulic pump for jacks and pullers

An air powered hydraulic pump, known as No. P7A and usable with all single and two-way Simplex Remo-Trol rams, has been announced by Templeton, Kenly & Co., 2525 Gardner Road, Broadview, Ill. The pump lifts seven times faster than a hand model, has displacement of 42 cu. in. of oil per min. and will raise a

60-ton capacity ram 1 in. in 20 sec. The unit weighs 44 lb., oil reservoir has 4-qt. capacity. Selector valve reverses flow of oil to raise or lower ram plunger on two-way rams. For additional information write for bulletin "Hydraulic: 56."



Model 250 HPC cleaner with tricycle mounting

A tricycle mounting to increase portability of its Model 250 HPC (high pressure combination) cleaner is announced by Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif. Mounting will accommodate any standard Model 250, may be purchased separately. Rubber tires on all three wheels are 16 x 24-in. zero pressure. Frame is 1-in. pipe-size tubular steel with 1-in. diameter cold rolled steel axle. Gross weight: 145 lb.

(Advertisement)



Constructing the recently completed Jamaica Bay Crossing of the New York City rapid transit line to Rockaway, Long Island. A McKiernan-Terry 510 Single-Acting Pile Hammer being set in position to drive one of the 900 precast reinforced concrete piles 24-in. square with lengths ranging from 40 to 70 ft. McKiernan-Terry 55 Single-Acting and 1083 Double-Acting Hammers operated from floating rigs were also used to drive 4,100 wooden piles for the approach and bridge piers, fender system and cofferdams. The McKiernan-Terry Corporation, 24A Mercer Street, Dover, N. J.

Angling blade bulldozers for Traxcavators

Three new angling blade bulldozers, designed for use with Caterpillar No. 977, No. 955, and No. 933 Traxcavators, have been introduced by Caterpillar Tractor Co., Peoria, Ill. Designated the No. 977A, No.



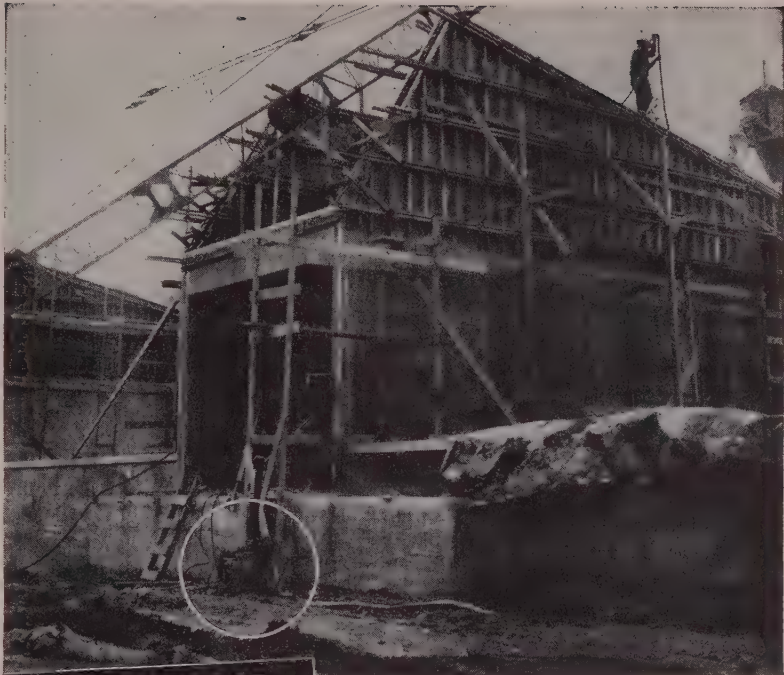
955A, and No. 933A, they provide greater versatility for Traxcavators on such jobs as pioneering, road building, and backfilling and are particularly useful for backfilling trenches after pipe has been laid and for replacing earth around new foundations. With the exception of the No. 933A C-frame group, these bulldozers consist of same blade and C-frame groups as No. 6A, 4A, and 2A bulldozers.

Fleco root cutter

A heavy-duty land clearing tool called the TB-RC-7 root cutter for establishing and maintaining right-of-ways and clearing building and



dam sites of heavy brush has been developed by Fleco Corp., Jacksonville, Fla. The cutter is a V-shaped blade that cuts below the surface of the ground, effectively slicing off brush and small trees up to 4-in. diameter without disturbing grass on the surface. It serves to aerate and subsoil the soil. Blade will undercut from 3 to 26 in. deep, can be set to sever deep roots just below the bud ring, assuring maximum kill. Designed to operate with Cat diesel D7 tractors using the No. 7 Fleco tool bar or with tractors of similar horsepower with 6 x 7½-in. tool beam. Cuts 46 in. singly; takes 92-in. cut mounted in pairs.



ALL-PURPOSE

MAGINNISS CONCRETE VIBRATORS

Cut costs on every job!

Whether you're using plastic or stiff mixes, Maginnis Hi-lectric Vibrators will place concrete faster and produce blemish-free finished surfaces.

Powered by a constant-speed 180 cycle 120 volt induction type motor located in the vibrator head for maximum efficiency, Hi-lectrics produce variable frequencies up to 10,500 V P M and maintain constant speed at all times—they do not slow down and lose vibrating effectiveness even under full load in stiffest low-slump concrete! This means you can use all purpose Hi-lectric Vibrators on any job, no matter what the concrete specifications may be.

Because pours are completed faster, labor expense for the entire crew is reduced. One-man operation cuts vibrating costs, too. The Hi-lectric power unit can be located as much as 200 ft. away from the work site—the vibrator operator is free to move about on the forms unhampered by cumbersome, unwieldy flexible shafts. What's more, with blemish-free surfaces, costly hand finishing is eliminated.

Ask your Maginnis distributor to demonstrate on your present job—he'll show you how Hi-lectric equipment can cut your concrete placing costs. You'll find him listed in the Classified Section of your telephone directory.

AA-1826

Simple, rugged construction of Hi-lectric motor-in-head vibrators keeps maintenance costs at a minimum. There are no brushes, commutators or armature windings to burn out.



**MAGINNISS
POWER TOOL COMPANY**

154 DISTL AVENUE • MANSFIELD, OHIO

Prewitt 4-yd. loader

A tractor pulled industrial loader that digs and loads up to 4 cu. yd. per min. has been introduced by J. R. Prewitt & Sons, Pleasant Hill, Mo. Known as the Willimon Mobil-Loader, the machine hooks on the



draw bar of any tractor having PTO. It handles a windrow up to 48 in. wide, has loading discharge height of about 8 ft. Rotary tiller digs up to 6 in. deep and cuts a swath 24 in. wide. Will load sand, clay, and top soil, level highway shoulders, clean ditches, and remove snow.

Swedish pump to be distributed by Stanco

Flygt, a portable Swedish-manufactured submersible pump which

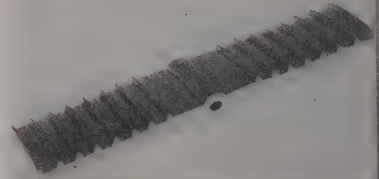
operates partially or wholly submerged and drains to the last inch of water, will be distributed in the U. S. by Stanco Mfg. & Sales Co., 1931 Pontius St., Los Angeles 25, Calif. The machine will pump water containing as much as 40% solids. When submerged, it is self priming and frost proof. It consists of a centrifugal pump with rubber lined diffusers and a suction strainer and is powered by a three-phase motor. Four models available in weights from 70 to 1,250 lb. The smallest discharges 10 gal. per min. at 60 ft. or 40 gal. per min. at 20 ft.

Detroit Diesel expands Series 71 engine line

Three turbopower engines have been added to the Series 71 line of industrial two-cycle diesels manufactured by Detroit Diesel Engine Division of General Motors Corp., Detroit 28, Mich. Presently available are 4- and 6-cyl. fan-to-flywheel engines and a 6-cyl. base-mounted power take-off unit. The models retain all features of the line with addition of a single-shaft, exhaust-driven turbine and air impeller for greater fuel economy and increased horsepower. Exhaust valves in each cylinder have been increased from two to four.

Durajoint for concrete structures

Production of the "Durajoint" waterstop and expansion joint for use in all plain or reinforced concrete structures has been announced by W. R. Meadows Inc., 7 Kimball St., Elgin, Ill. The joint is extruded from a thermo-plastic material and



available in long, flexible coils in widths from 2 1/4 to 9 in. It is designed to be used between adjacent sections of such concrete structures as tanks, channels, tunnels, culverts, and dams and is resistant to acids, alkalis, weather, lubricating oil, and chlorination. Longitudinal ridges on the surface ensure bonding to concrete; central hollow tube increases joint capacity to handle extension and lateral movement without shearing. Tensile strength is 1,900 lb. per sq. in. Will take up to 200% elongation with full recovery.

It takes POWER to move a mountain



and EDWARDS WIRE ROPE is built to handle that power!

Heavy construction equipment is getting bigger, faster and heavier. You need the "built-in" extra performance of Edwards Wire Rope to keep shovels, scrapers and dozers operating profitably.

Call or write today for the address of your nearest Edwards Distributor.



EDWARDS WIRE ROPE

E. H. EDWARDS COMPANY

General Office: SOUTH SAN FRANCISCO, CALIFORNIA
Seattle • Portland • Los Angeles • Houston

Extra strength Leschen wire rope

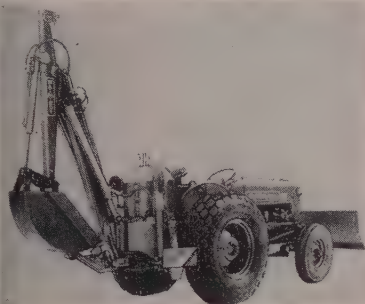
An extra high strength grade of flattened strand wire rope has been introduced by Leschen Wire Rope Division, H. K. Porter Co., Inc., 342 Madison Ave., New York 17. The new grade, 15% stronger than any previously offered, is called Porter Imperial Red-Strand Wire Rope, and is fabricated with steel core. It is claimed to be 25% stronger than top quality round strand rope. In addition to its adaptation to heavy duty jobs, the Imperial grade will handle greater than normal temporary loads without change and meet excess stress without breaking. Information available from manufacturer.

Motorola Private Line radio

A radiophone claimed to provide interference-free mobile communications has been announced by Motorola Communications & Electronics Inc., Technical Information Center, 4501 W. Augusta Blvd., Chicago 51, Ill. Called "Private Line," the radio is designed to maximize efficiency under congested channel conditions. Nuisance noise and undesired transmissions from other systems cannot unlock the speaker, and even normal carrier-off FM hiss is eliminated. The system allows for separate or simultaneous provision of talk-out and talk-back protection, so that mobile operators and dispatcher hear only calls transmitted within their own operation.

Backhoe, backfill blade for International 300

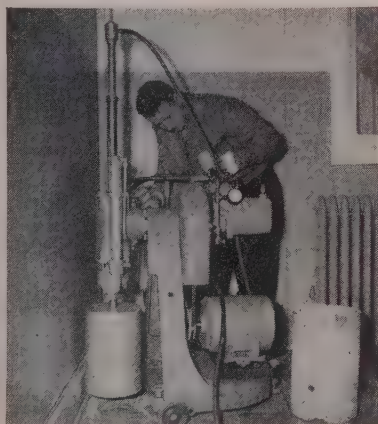
A hydraulically controlled combination backhoe and backfill blade attachment for the International 300 tractor is now available from Wain-Roy Corp., Hubbardston, Mass. The unit attaches to a sub-frame mount-



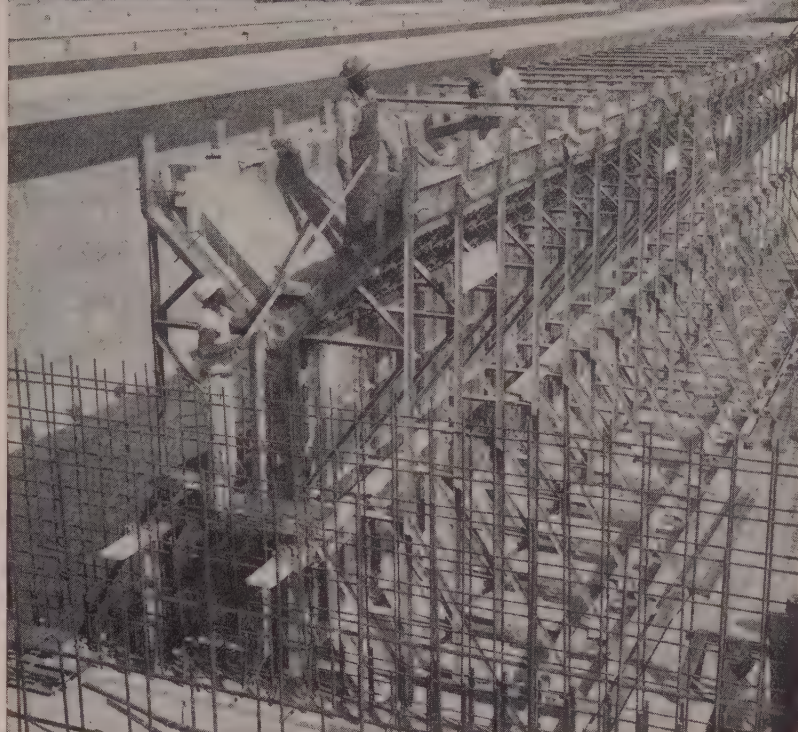
ing and is engineered to handle a number of trenching jobs, bell hole and foundation excavations, backfilling, leveling and grading. The hoe, a self-contained unit which can be removed or attached in less than 30 min., has effective digging depth of 11 ft., will dig and dump in a 190 deg. radius. Backfill blade on forward end of the sub-frame raises and lowers hydraulically 18 in. above to 8 in. below grade and may be angled right or left for backfill as tractor travels parallel to trench.

Molco introduces hydraulically operated concrete drill

A hydraulically operated concrete and masonry drilling machine has been announced by Molco Drilling Machines, Inc., 1100 20th St. N.W., Washington 6, D.C. The machine, designated Model V Mole, incorporates a swivel head that allows holes to be drilled at any angle. Diamond



faceted self-sharpening core bits drill through reinforced concrete, tile, asphalt, and other hard materials at high speed. Hydraulic system feeds drill bit into work surface automatically. Hole from 1 to 14-in. diameter can be cut. Machine driven with either electric motor or gasoline engine.



Special Y wall forming system makes for simplified stripping operation. 100% reusability of all materials. Note complete absence of lumber normally required for shoring and bracing on this type of structure.

CUTS MATERIAL COSTS with Pre-Fab Form System on Sewage Plant Job

In the construction of the Miami Sewage Treatment Plant Job the Paul Smith Construction Co., of Miami, Florida chose to use the Uni-Form Panel System in the forming of one million sq. ft. of contact area. The contractor estimated that the use of the Uni-Form System *saved 40 percent in material costs alone*. In addition, faster form erection with fewer men kept the job moving ahead of schedule and reduced estimated labor costs considerably. These fine results were obtained even though this was the contractor's first experience with the Uni-Form Panel System.

This considerable savings in material and labor was realized in spite of intricate Y wall forming and pipe intersections which causes complicated forming problems with conventional forming systems.

Pre-fabricated, ready to use—completely engineered to handle most forming problems, the Uni-Form Panel System provides such advantages as simple assembly—minimum one side alignment and bracing—automatically accurate wall widths—positive internal spreading—faster stripping and maximum re-usage to give the contractor lowest all around form costs.

Y wall trusses designed to member with

UNIVERSAL FORM CLAMP CO.

1238 N. Kostner Avenue • Chicago 50, Illinois

standard Uni-Form Panels formed a completely automatic system for handling the special forming problems, and were big factors in the economy and speed obtained on the job. Simple assembly of Standard Uni-Form Panels on the trusses eliminated many of the aligning, bracing and spreading problems usually encountered in Y wall construction. In addition to simplified forming the combination system of standard Uni-Form Panels and trusses eliminated many of the problems normally encountered in the stripping of a wall section of this type. The contractor was well pleased with all phases of his forming and stripping operations.

Why not investigate the many advantages the Uni-Form Panel System can bring to you? Write for the Uni-Form Catalog—or better yet, send us a set of plans for an estimate on your next job. Let us prove to you as we did to the Paul Smith Construction Co., that the Uni-Form Panel System can cut your forming costs.

Distributed by:

UNIVERSAL FORM CLAMP CO.
5855 S. Western Ave., Los Angeles, Calif.
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UNIVERSAL EQUIPMENT CO.
1549 Eastlake Ave., Seattle 2, Washington
UNIVERSAL FORM CLAMP CO.
2051-59 Williams St., San Leandro, Calif.

News of DISTRIBUTORS



UNDER A BIG TOP, spectators at Lang Co.'s Construction Equipment "Roundup" watch a demonstration of a Bucyrus-Erie Hydrocrane. All machines were placed in work areas and the public was invited to operate the machines themselves. The one-day show was the first of its kind in the Salt Lake City area. Story at right.



OPENING of Garlinghouse, Fremont & Co.'s new sales headquarters and service center was celebrated by a two-day open house program featuring demonstrations of new equipment. Located at 6046 E. Washington Blvd., Los Angeles, the company distributes twenty lines of construction equipment. *A. F. Garlinghouse* serves as chairman of the board, *Ralph W. Whitaker* is vice president, and *Jack Monson* is secretary-treasurer.



AIR MAC INC. of Oregon's new 10,000-sq. ft. building at 1111 S. E. Grand Ave., Portland. This distributor offers complete sales, service, and parts for both the Towmotor and the Gerlinger fork lift trucks and carriers. Air Mac is also exclusive distributor for many other materials handling lines. *Jack W. Emahiser* is manager.

Construction Equipment Roundup

The Lang Company, Inc., Salt Lake City, Utah, staged a Construction Equipment "Roundup" recently where some \$400,000 worth of equipment was on display and in action. Included in the show were International Harvester crawler tractors and Payscrapers, Drott skid shovels, G. Lion graders and rollers, a Bucyrus Erie shovel and hydrocrane, Hough Payloaders, besides a large array of other equipment.

Refreshments were served during the course of the one-day show, with prize drawings interspersed with the demonstrations of equipment.

This was the first such equipment show in the Salt Lake City area, according to H. A. Christiansen, industrial division manager of Lang. The roundup proved to be of interest to the large crowd in attendance.

Seattle firm adds salesman

George V. Forsyth has joined the Star Machinery Co. organization in Seattle. He is a salesman in the Construction Equipment Division.

Honnen Machinery service

Ken Weyrauch is now service manager at the Honnen Machinery Co. in Blythe, Calif. Former parts manager, he has had 15 years' experience in parts and service and is well qualified to handle the servicing of Caterpillar equipment in the heat and dust of this desert area. Honnen now represents Acme Steel Co. of Phoenix, Ariz., on all types of aluminum and steel fabricated buildings.

Western Wooldridge outlets

Appointment of three Western distributors for Wooldridge Manufacturing Division, Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., is announced. C. H. Grant Co., Oakland, now covers Northern California and northwestern Nevada. Nelson Equipment has the Wooldridge scraper line for all of Oregon and in Washington covers the counties of Clark, Cowlitz, Klickitat, Skamania and Wahkiakum. Lee Redmar Equipment, Phoenix, Ariz., is the distributor for the entire State of Arizona.

New Northwest firm

Bernard B. Willis of Seattle, Wash., recently announced the formation of a new firm, Bernard Willis Co. The new company is located at 622 Western Ave., and will handle pumps and allied equipment, representing Aurora Division of the New York Brake Co. and the Gorman Rupp Co. Willis has had 28 years experience in the pump business. For the past ten years he was with Pacific Pumping Co., four years as Seattle branch manager.

MANUFACTURERS

Bucyrus-Erie appointment

Lewis C. Black has been appointed sales manager—large machines for Bucyrus-Erie Co., South Milwaukee, Wis. He succeeds R. M. Dickey who



Lewis C.
Black

resigned in April. Black will be responsible for all domestic sales of walking draglines, stripping shovels and draglines, quarry and mine machines, etc.

New Seattle plant

All equipment, personnel, and inventories from the former location of E. H. Edwards Co. in Seattle have been transferred from the old location to the new warehouse and office building at 804 West Oregon St. The new building, covering 13,300 sq. ft., about doubles the company's former space, according to Ralph Brown, Seattle district manager.

St. Clair elected Quick-Way prexy

Clinton D. St. Clair, vice president of Penn-Texas Corp., was recently elected president of the Quick-Way



Clinton D.
St. Clair

Truck Shovel Co., subsidiary company. Quick-Way is a pioneer in the manufacture of truck-mounted power shovels and earth-moving equipment.

Merger planned

Announcement is made by Koehring Company, Milwaukee, Wis., of plans to acquire the Hydraulic Press Manufacturing Co. of Mount Gilead, Ohio, for in excess of \$5,000,000.

Lincoln, McNeil merger

Lincoln Engineering Co., St. Louis, Mo., manufacturer of lubricating equipment, has merged with The McNeil Machine & Engineering Co., Akron, Ohio. McNeil is the surviving corporation and the new name of Lincoln is Lincoln Engineering Co., Division of The McNeil Machine & Engineering Co.

Save your tough digging jobs for

ERIE'S NEW EXTRA HEAVY DUTY BUCKET BUILT TO HANDLE SHOT ROCK AND SHALE



Erie's new extra heavy duty bucket is for those really tough jobs—where the going is rugged—materials like shot rock, hard pan and shale. In fact, the new extra heavy duty model will come up with a mouthful of anything it can sink its teeth into. It hasn't been stopped yet.

All Erie clamshells are designed to bite hard and deep. The wide angle drop, the tremendous closing power of lever arm action, the multiple reeving and the big, sharp, manganese teeth—all these make a combination that really penetrates.

If you've a rough job coming up, or if you're tangled with something your present equipment can't handle, then you're talking our language. You need a new Erie Extra Heavy Duty clamshell. Why not learn more about this latest addition to the Erie line? Do it today.

These features make ERIE the bucket experienced operators prefer:

1. Top closing power from block and tackle, plus lever arm construction, plus precision balancing.
2. Manganese steel teeth and high carbon steel lips that bite up full payloads of even toughest clay and gumbo.
3. Rigid, one-piece, welded head that shrugs off bumps and jars. No shimmy. No wobble.
4. Two-line, continuous reeving. Adds up to 50% to cable life. Less down-time for reeving.
5. Low headroom for fast work in tight quarters; low center of gravity for easy positioning.

For catalogs, write Dept WC-86



ERIE STRAYER Co.

3786 GEIST ROAD

• ERIE, PENNSYLVANIA

Makers of Extra Light, Light, Standard and Wide Rehandlers, General Purpose Heavy Duty, Extra Heavy Duty, Electric and Mechanical Hook-on Clamshells.

E. A. Drott dies

founder of Drott Tractor Co., Inc., and Drott Manufacturing Corp., died suddenly at Raleigh, N. C. He was delivering a talk before a group of International Harvester Co. distrib-



E. A.
Drott

utors when he collapsed and died almost immediately. Drott was a pioneer in the field of expanding the usefulness of crawler tractors, beginning his development work shortly after forming Drott Tractor Co. in 1916. At the time of his death he was chairman of the board.

New Western service

Formation of a new company, Specialized Trailers, Inc., 7400 Laurel Canyon Blvd., No. Hollywood, Calif., with complete engineering and manufacturing facilities for the design and production of all mobile hauling equipment, is announced by Edwin

M. Waite, vice president and general manager. The new company, a division of Fabricated Steel Service, Inc., is fully staffed with engineers and designers of years' of experience and is equipped to manufacture to customers' specifications as well as to produce custom designs to fit individual requirements.

District sales rep transferred

W. B. Dickerson has been appointed district sales representative for Euclid Division, General Motors Corp., for California and Nevada (except Elko and White Pine counties.) Dickerson joins M. H. Johnson, Western regional manager, at the new Euclid location in the Latham Square Bldg., Oakland, Calif. Prior to his new assignment Dickerson was district sales representative in Seattle.

Pioneer elevates Rolf

Carl R. Rolf was recently elected executive vice president of Pioneer Engineering Works, Inc., Minneapolis, Minn. During his more than 25 yr. service with Pioneer, Rolf has been salesman, assistant sales manager, and vice president in charge of sales.

Firestone appoints W. L. Hastie

William L. Hastie recently was ap-

pointed assistant truck tire sales manager for the Pacific Coast Division of Firestone Tire & Rubber Co., with headquarters in Los Angeles. In his new position he is responsible for sales of off-the-highway truck tires in nine Western states.

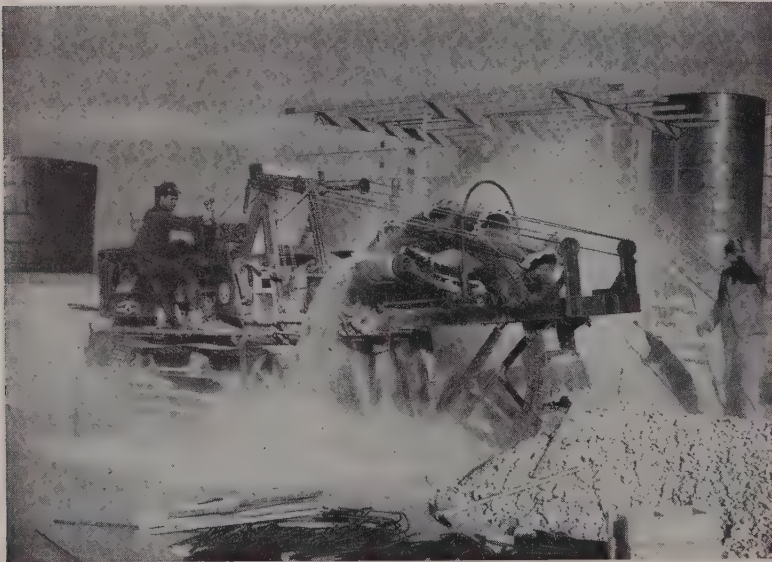
Franklin W. Zimmer dies

Franklin W. Zimmer, 49, sales manager of Manitowoc Engineering Corp., Crane Division, died of a heart attack while golfing at Elks County Club in Manitowoc, Wis., recently.

Four salesmen added

Four new salesmen have been added to the staff of Calaveras Cement Co., San Francisco, as announced recently by Mel J. London, vice president in charge of marketing, who also announced the establishment of an office in the Builders Exchange in San Jose, Calif. This office will be staffed by Philip J. Elmdredge. William J. Gray will be contractor sales representative, and John L. Garvey, Jr., dealer sales representative, stationed in Santa Rosa and covering the territory from Marin County north to the Oregon line. Sherman R. Locke was appointed dealer sales representative in the East San Francisco Bay area with headquarters in the Oakland Builders Exchange.

(Advertisement)



MAKING TOUGH CALICHE FLY, this rugged Cleveland 140 steadily chews out trench for a complex network of feeder lines on Southern Pacific Pipeline Company's new 40-acre tank farm at Tucson, Arizona. Fisher Contracting Co. of Phoenix did the trenching job. In tough digging like this, Cleveland's great reservoir of more than 33 usable digging speeds—each one a different combination of digging wheel and crawler speeds—provides the most effective combination of digging power and speed for every job condition. Get the full story on this and other exclusive Cleveland features—talk it over with your local Cleveland distributor.

THE CLEVELAND TRENCHER CO., 20100 St. Clair Avenue, Cleveland 17, Ohio

New Clipper field representative

Clipper Manufacturing Co. announces the appointment of William Price as its field representative for Nevada. Price joins the staff of Clipper's district office and warehouse in San Francisco and will travel Northern California in addition to the entire state of Nevada.

Concrete pipe companies merge

Hooper Concrete Pipe Co. of Phoenix, Ariz., has been acquired by American Pipe & Construction Co., as announced by Robert V. Edwards, president of the California corporation. No changes of Hooper personnel are contemplated according to Edwards, and O. M. Hooper will continue as operating head of the Phoenix plant. The activities of the plant will be enlarged by manufacturing several other classes of reinforced concrete pipe.

Macwhyte Company names v.p.-sales

Francis D. Holden was recently elected vice president in charge of sales for Macwhyte Company. Formerly sales manager, Holden has had more than 20 yr. experience in Macwhyte's general sales and export division.

Enterprise names J. L. Roberts

J. L. Roberts, sales engineer, is newly assigned to the Los Angeles branch office of Enterprise Engine & Machinery Co., where he joins Roy Hogaboom, branch manager, to

provide special service to contractors and marine diesel needs. With Enterprise since 1946, Roberts enters the Southern California market with a wealth of experience in both sales and service of diesel engines.

Caterpillar executive promotions

Promotions of three Caterpillar Tractor Co. executives were recently announced. Lloyd J. Ely, manager of the Peoria, Ill., plant since 1954, was named director of manufacturing for Caterpillar's seven domestic plants. William L. Naumann, manager of the Joliet, Ill., plant since 1952, was appointed manager of the Peoria plant. Clifford N. Hathway succeeds Naumann as manager at Joliet.

Black & Decker district manager

Ralph J. Rinard has been promoted to Los Angeles Hardware Division district manager for The Black & Decker Mfg. Co., Towson, Md. The post was created recently as a result of the company splitting the outside sales force into two divisions, industrial-automotive and hardware.

Marion names repair sales manager

Promotion of John J. Drollinger to manager of repair sales, and James P. Baker to assistant manager, is announced by Marion Power Shovel Co. Drollinger succeeds William A. Dunning, who resigned to become vice president of Depco Detroit Corp., Detroit.

R. G. LeTourneau management staff

Two specialists in heavy equipment have joined the sales management staff of R. G. LeTourneau, Inc. Rodney A. Kox was appointed to head sales activities of off-road transporters and cross-country freighters, working out of LeTourneau's general offices at Longview, Texas. Thomas W. Miller was named to head sales of logging products. He will work closely with the company's established logging distributors and will maintain headquarters at Portland, Ore.

Mack Trucks merges subsidiaries

Mack Trucks, Inc., announces the merger of several of its wholly-owned subsidiary companies under the parent name. Affiliates merged under the name of Mack Trucks, Inc., include the Brunswick Ordnance Corp., Mack Manufacturing Corp., Mack Motor Truck Corp., Mack Motor Truck Co., Mack Brothers Motor Car Co., and International Plainfield Motor Co. P. O. Peterson, Mack president, said the change was made to provide greater integration of management functions.

Ray Fellows visits West

Ray Fellows, sales manager of Wisconsin Motor Corp., recently completed a visit with E. E. Richter & Son, Inc., Northern California distributor for the Milwaukee manufacturer. Fellows, accompanied by E. E.



Yuba designed this screen for long life, minimum maintenance. Inner and outer screens easily renewed. Can be lubricated from outside.

HEAVY-DUTY SCREENS MADE TO FIT YOUR NEEDS

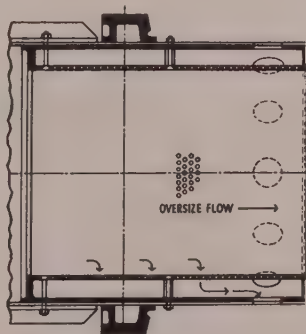
Flat or revolving • long-wearing
non-clogging • competitively priced

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For example — this double-jacketed screen, 35' long and 8' in diameter, washes and screens three sizes of sand simultaneously. Yuba-built screen plates are made from Abrasion Resisting Steel plates with a hardness ranging up to 250 Brinnell. This is a high carbon, high manganese alloy steel produced especially for screening purposes. In many places, screens of this tough, abrasion resisting steel last twice as long as ordinary screens. Naturally, this reduces downtime and replacement costs.

Yuba taper-drills screen holes to prevent clogging (unless you request straight sides). Holes can be as small as 3/16" diameter; closely spaced for screening monazite sands and other rare earths. Thicknesses from 3/16"; length, diameter and other dimensions to suit your needs. Yuba screen plates are rolled true and cut square to close limits — insuring proper fit and fast installation.

Yuba stocks abrasion resisting steel in many thicknesses, usually can make prompt delivery. Try long-wearing, non-clogging Yuba screens now. For estimates, send screen details, hole sizes and spacing. No obligation. Wire, write or phone TODAY.



Yuba-built Olsen trommel increases screen capacity as much as 25%, by converting lower end blank shell plates into screening area... does not increase screen length.

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AGENTS (SIME, DARBY & CO., LTD., SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.
CABLES: YUBAMAN, SAN FRANCISCO • SHAWDARSCO, LONDON

Richter, Jr., and William F. Struble visited the various manufacturers in the Northern California area.

Bus Brown trencher in Northwest

Clyde Equipment Co. has acquired the distribution of the Bus Brown trencher in the Seattle area. This small trencher is made by Brown Manufacturing Co., Inc., Woodbine, Iowa, and is used by contractors and gas companies, as well as municipalities.

Brunner & Lay stocks in No. Calif.

Terry Tools, 2266 Shafter, San Francisco, is now warehousing and stocking the complete Brunner & Lay line of pneumatic accessory tools—moil points, clay spades, etc.—as well as Rok-Bits and Intra-Set drill rods, as a service to customers in Northern California and Nevada.

Johns-Manville looks to new field

Johns-Manville is considering entering the gypsum business, according to an announcement by Leslie M. Cassidy, chairman of the board. The company has an option on a large gypsum deposit in southern Nevada.

Plant expansion

A plant expansion of 50,000 sq. ft. has been announced by Simplicity Engineering Co. of Durand, Mich. This is 50% of its present floor

space. Simplicity was founded 30 yr. ago by its president, George W. Behnke, and manufactures screens, feeders, conveyors, shake-outs, sand conditioners, and similar materials handling equipment.

Merger increases production

Merger of Crane Carrier Corp., Tulsa, Okla., manufacturer of heavy-duty trucks, with Standard Industries, Inc. of Pennsylvania, a large holding company, has been announced by Robert L. Zeligson, president of Crane Carrier. The merger and resulting expansion will allow the corporation to begin production of two new lines of trucks including a complete line of self propelled carriers, and a line of heavy-duty dump trucks ranging from 38,000- to 100,000-lb. capacity.

Higbee heads Surveying Congress

Lester C. Higbee, president of W. & L. E. Gurley, engineering and scientific instrument manufacturer, Troy, N. Y., was recently reelected president of the American Congress on Surveying and Mapping, serving a second term.

Gar Wood appoints two

Appointment of Joseph R. Hager, Jr., as director of manufacturing for Gar Wood Industries, Inc., has been announced by E. R. Leeder, executive vice president. Hager was formerly associated with Baldwin-Lima-Hamilton Corp. In his new position he will direct manufacturing activities at Gar Wood plants in Wayne, Mich.; Findlay, Ohio; Mattoon, Ill., and Richmond, Calif. Appointment of A. S. Wurfel as assistant director of manufacturing was simultaneously announced.

Schild Bantam promotion

Schild Bantam Co., Waverly, Iowa, announces the promotion of Don W. Waack to the position of assistant sales development manager. In his new position he will assist Vernon E. Pray in the direction of advertising and sales promotion activities.

R. J. Bricmont receives promotion

Robert J. Bricmont has been named manager of the engineering service department, A. M. Byers Co., Pittsburgh, Pa. He has been associated with Byers engineering service since joining the organization in 1952.

Gradall film available

A new 21-minute color and sound 16-mm. motion picture "Digging for Profits" has just been produced by the Gradall Division of The Warner & Swasey Co., Cleveland, Ohio. It explains the functions of the Gradall in today's construction activity and shows the machine on a wide variety of applications. The film is available for showings before group through arrangements with Gradall distributors throughout the United States and Canada.

New vice president elected

John C. Smaltz, president of McKiernan-Terry Corp., Dover, N. J., announces the election of G. Robert Compton, Jr., as vice president and director of the company. Compton joined McKiernan-Terry in 1950 as an engineer. In 1951 he was made assistant to the late Earle R. Evans and in 1955 was named manager of the pile hammer division, sales and service, following Evans' death.

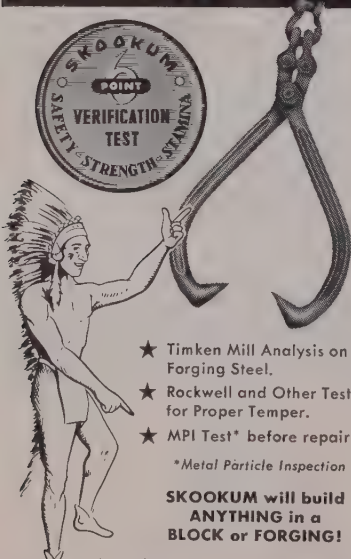
Anson B. Nixon retires

Albert E. Forster was recently elected chairman of the board of directors of Hercules Powder Co. succeeding Anson B. Nixon who retired. Nixon will remain as a member of the board of directors. Forster has been president of the company since April 1953.

Reinhofer named general sales mgr

Appointment of Jack A. Reinhofer as general sales manager of World Industries, Inc., Chicago manufacturer of clear span steel trusses, announced. Reinhofer has been Chicago resident sales engineer for International Steel Corp. for the past year. Prior to that he was Chicago branch manager of Gar Wood Industries.

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Yale's new Western sales manager

A major step in the expansion of Western sales and service coverage has been taken by Yale Materials Handling Division, The Yale & Towne Manufacturing Co., Philadelphia, Pa., with the appointment of Garnett A. Vining as regional sales manager. Vining will make his headquarters in San Francisco, Calif.

Hyster building Peoria addition

Hyster Company, Portland, Ore., tractor equipment and industrial truck manufacturer, will erect a 150,000 factory addition in Peoria, for expansion of its products. Also soon to be constructed is a new plant in Danville, Ill.

Bollard becomes new division mgr.

Arthur W. Bollard, formerly vice president and secretary of F. D. Cummer & Son Co., Cleveland, has joined Colonial Iron Works Co., Cleveland, as general manager of its newly created Bollard Asphalt Plant Division, according to announcement by Allan P. Stern, Colonial president.

New plant to triple production

Construction of a new plant which will triple the production of its SpeedWav Manufacturing Co. division is announced by Neil C. Hurley, president of Thor Power Tool Co., Aurora, Ill. His company has purchased a 15-ac. site at LaGrange Park, a western suburb of Chicago not far from the present SpeedWav plant. Occupancy of the new plant is slated for early 1957.

Brickley heads Western sales

Donald F. Brickley, former regional manager in the field for Motorola Communications & Electronics, Inc., Chicago, was recently appointed vice president and placed in charge of the new Western sales division. One of four geographical divisions recently established, the Western division covers a 10-state area, including Arizona, Colorado, Wyoming, and Montana, through to the West Coast states. Brickley's headquarters are at 811 S. B St., San Mateo, Calif.

Napco sales changes

Robert L. Wicker, sales manager of the Federal Motor Truck Division, Napco Industries, Inc., Minneapolis, has assumed additional duties as sales manager of the Construction Equipment Division. Orv Reynolds will be assistant sales manager of this division. Wicker, formerly sales manager of the Dart Truck Co. in Kansas City, joined Napco last December. Reynolds has been promoted from the post of regional sales manager.

Symons Clamp opens Western plant
Opening of a new plant, bringing

many innovations in concrete forming to West Coast contractors, was recently announced by Symons Clamp & Mfg. Co. Joseph Von Drasek, vice president in charge of the newly established West Coast division, brings 25 yr. of wide experience in the industry to this area. Associated with him is Richard G. Allen, who also has extensive experience in cement problems. The operation will be staffed to meet contractors' needs, with Robert P. Tross as chief engineer, transferred from the Chicago office. The new plant, located at 683 Thornton St., San Leandro, Calif., will be headquarters for all operations of the Symons form

system. In addition, complete stocks of Symons shores and column clamps will be available for prompt shipment to wherever needed in the West.

New program headed by Don Martin

American Hoist & Derrick Co., St. Paul, Minn., announces a new program designed to give its distributors added assistance in sales promotion and market coverage, with the introduction of a new sales development department. Don W. Martin, formerly assistant advertising and sales development manager of Schield Bantam Co. will spearhead the new program.

People, Vehicles
and Goods Move Easily,
Efficiently when Roads are
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Contractors Step Up
Bituminous Paving Material Tonnage,
Increase Profits with Cummer Batch-Type Plants

Rugged, reliable Cummer Batch-Type Plants are engineered and built to turn out big tonnages of specified mix with no variation throughout production. Whatever contractors and engineers want in bituminous paving material, Cummer Plants can be depended on to deliver maximum production at lowest cost.

Here's what Sam Finley, Inc., Oceana, Virginia, whose 100-ton per hour capacity Cummer Stationary Plant is shown above, writes: "To keep ahead of competition today, a contractor has to meet schedules on time with material as ordered—no excuses. We're always sure of complete customer satisfaction and a steady, profitable operation with our Cummer Batch-Type Plant."

All models of Cummer Plants and important exclusive Cummer features are completely described in the free illustrated Cummer catalog. Send for your copy today.

Write now for names of our Western Representatives



THE F. D. CUMMER & SON CO.

Pioneer Builders of Fine Asphalt Plants

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Caterpillar's Decatur plant

Formal dedication ceremonies marked the recent completion of the new Decatur plant of Caterpillar Tractor Co., signaling the start of a five-day open house and tour of the plant. Leading the management talks was Harmon S. Eberhard, Caterpillar president, who said the future of the heavy equipment business is good and that Caterpillar is continuing with its \$200,000,000 expansion plans.

Built to accommodate the company's growing production of wheel-type tractors and motor graders and release facilities at Peoria for added output of crawler tractors and diesel engines, the new plant is situated on a 425-ac. plot and is reported to be the world's largest plant manufacturing wheel-type tractors and motor graders.

Western district representative

Murray heads W.K.E. Western sales

Gilman Y. Murray recently became head of the sales activities for the Western district of Western Knapp Engineering, division of Western



**Gilman Y.
Murray**

Machinery Co., San Francisco. Murray assumes his enlarged responsibilities following two years of intensive development of the company's solid pump division.

Calaveras plant expansion

Recently a giant fifth kiln which is completely automatic and will add 1,000,000 bbls. of cement to the annual production of the Calaveras Cement Co. plant at San Andreas, Calif., was placed in operation.

Quick-Way promotion

Theodore S. Petersen was recently appointed assistant sales manager for the Quick-Way Truck Shovel Co., Denver, Colo., according to Daniel S. Heffron, director of sales. Since June 1955 he has been district sales representative in the states of California, Nevada and Arizona. This position has now been taken over by Douglas Corner, Jr.

J. S. Risley, Jr., joins Nordberg

Nordberg Manufacturing Co. announces the appointment of Jacob S. Risley, Jr., as sales and service representative of the crusher division in the Northwest Pacific area. He will work under the jurisdiction of Nordberg's West Coast branch office at San Francisco and will headquarter at Milwaukie, Ore. Risley had been a partner in the rock crushing firms

of J. S. Risley & Sons and Risley Bros. Contractors prior to the dissolution of the latter firm in November 1955.

New IH service school opens

A modern power service training program housed in 5,000 sq. ft. of floor space at International Harvester Co., Melrose, Ill., was inaugurated recently when H. T. Reishus, vice president of the Industrial Power Division, formally dedicated the program before 24 service managers representing IH distributors from various locations in the United States. The new facilities provide every type of training needed to educate company and distributor personnel.

Napco Industries promotions

Robert L. Wicker, sales manager of the Federal Motor Truck Division, Napco Industries, Inc., Minneapolis, Minn., has assumed additional duties as sales manager of the Construction Equipment Division, according to Max E. Rappaport, president. Orv Reynolds will be assistant sales manager of the Construction Equipment Division.

Holbert succeeds Dobson

Charles L. Holbert has been appointed executive vice president of H. K. Porter Co., Inc., according to announcement by T. M. Evans, Porter's president. Holbert, who will be operating head, succeeds Clarence R. Dobson who has retired but will serve as a consultant to the company.

Fluor expanded facilities

Three precast, tilt-up concrete buildings to house an additional 180 engineers and draftsmen highlight a \$500,000 building program under way at the main offices of The Fluor Corporation, Ltd., in Los Angeles, Calif. Work on these three units of the expansion program is expected to be completed by Dec. 1.

News from L. Sonneborn Sons

First phases of a unique sales seminar series designed to eventually cover all major marketing areas, have been completed with the holding of seminars in Los Angeles, Chicago, and New York, according to a recent announcement by the Building Products Division of L. Sonneborn Sons, Inc., New York City, a leading producer of building maintenance and construction materials. The seminar takes key administrative and technical personnel from Sonneborn's organization into the field, meeting in each area with the division's supervisors and sales engineer.

General manager Alvin S. Baer also announced that Aaron Kaplan has been appointed manager of the Building Products Division.

Clark names parts-service personnel

Alvin E. York has been appointed manager of parts and service, and

Alva L. Arend, parts supervisor of Clark Equipment Co.'s Construction Machinery Division. York was with Link-Belt Speeder Corp. for 14 years, the last ten as service manager. Clark Equipment employee since 1947, Arend was previously service parts buyer and supervisor of service parts inventory control.

Garrett Corp. expands facilities

Garrett Corporation has completed a \$1,300,000 structure housing engineering facilities for its Air Research and Manufacturing Division and its administrative offices, according to J. C. Garrett, board chairman. Located at intersection of Sepulveda and Centurvy Blvd., the new building contains 82,000 sq. ft. of floor space and provides facilities for about 1,000 members of the engineering staff as well as administrative and accounting offices.

Wernsing becomes v.p.-sales mgr.

Phil A. D. Hobbs, president of T. Skookum Company, Inc., Portland, Ore., announces the promotion of Ken Wernsing from sales manager to vice president and general sales manager. Joe Koeneke, vice president in charge of production, with 38 yr. service, will continue to keep an eye on production as consultant.

Fred Gibbs joins Smith-Blair

Smith-Blair, Inc. has tabbed Fred S. Gibbs as a new member of its sales engineering staff. In making this announcement, Luther Smith, executive vice president, states that Gibbs will be stationed at the company's South Gate, (Los Angeles) California, branch.

H. K. Ferguson names chief engineer

Appointment of James R. Fraser as chief engineer of The H. K. Ferguson Co., internationally known firm of industrial designers and builders with headquarters in Cleveland, Ohio, is announced. For several years he has served as a district chief engineer, and in his new capacity he will supervise all Ferguson engineering organizations.

Ochs retires; McGinn chairman

Retirement of Clarence I. Ochs as chairman of the board of Eaton Manufacturing Co., Cleveland, Ohio, and the election of Howard J. McGinn to succeed him as chairman were recently announced. Ochs was elected chairman of the executive committee and will continue as a director. McGinn will continue to serve as president as well as chairman.

W. L. Parcell made v.p.

William L. Parcell was recently named vice president of The Ridge Tool Co., Elyria, Ohio. Parcell, who celebrates his twentieth anniversary with the company in June, served as sales manager prior to his recent

promotion and continues as director of sales.

Jay Corp. appoints Don Masson

Announcement of appointment of Donald Masson as sales manager was recently made by Richard Reedy, president of The Jay Corporation, Columbus, Ohio. Masson comes to Jay from Lincoln Plastics where he was general manager for two years.

Two promoted to district managers

Appointment of two district managers in the California operations of United States Plywood Corp. is announced by Fred B. Smales, West Coast regional manager. Donald L. Braley, manager of the Los Angeles branch, becomes manager of the Southern California district. Donald L. Kesselring, manager of the Oakland branch, takes over management of the Northern California district.

\$500,000 plant expansion

Barnes Manufacturing Co., manufacturer of pumps and water systems, announces a \$500,000 program of expansion at its factory in Mansfield, Ohio. Barnes is one of the pioneers in the pump industry, having built more than 5,000,000 pumps in the company's 60 yr. of business.

Errion made LeT-W asst. sales mgr.

Appointment of Jack G. Errion to assistant to the sales manager was recently announced by John W. Schoen, vice president and general sales manager of LeTourneau-Westinghouse Co. Errion has been serving as sales promotion manager and will now direct the company's sales training program besides assisting W. E. Hendricks, domestic sales manager.

Blaw-Knox ups R. S. Connolly

Richard S. Connolly, formerly sales engineer with the Heavy Steel Forms Department of Blaw-Knox Co., Pittsburgh, Pa., has been named assistant sales manager of that department.

Donald J. Phillips dies

Donald J. Phillips, 50, sales manager of Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Aurora, Ill., died recently at his home in Aurora. He joined Austin-Western in 1943. From 1945 until 1950 he was district manager at Portland, Ore.

New vice president elected

John C. Smaltz, president of McKiernan-Terry Corp., Dover, N. J., announces the election of G. Robert Compton, Jr., as vice president and director of the company. Compton joined McKiernan-Terry in 1950 as an engineer. In 1951 he was made assistant to the late Earle R. Evans, and in 1955 was named manager of the pile hammer division, sales and service, following Evans' death.

Smith Marion-Osgood -

Election of Milton T. Smith as president and general manager of Marion Power Shovel Co. and its subsidiary, The Osgood Company, was recently announced. Smith, a veteran of more than 27 years' service in the power shovel industry, joined Marion and Osgood, which operates as part of the Equipment Department of Merritt-Chapman & Scott, Corp., in 1954. In February 1955, he was elected an executive vice president of M-C&S. Prior to joining Marion, Smith was associated with Bucyrus-Erie Co.

Giff Giffen replaces Cartwright

Homer S. "Giff" Giffen has replaced Andy Cartwright as equipment distributor representative of the Worthington Corporation, working out of the San Francisco office.

Vern Johnson new Chain service mgr.

Vern Johnson is now service manager for the Chain Belt Co. covering the Western states. His headquarters are located in Hillsdale, Calif. The new Chain warehouse and offices at 2940 Seventh St., Berkeley, Calif., are headquarters for the construction machinery division in the West.

Robey leaves Link-Belt

Ralph G. Robey recently discontinued his connection with the Link-Belt Speeder Corp., where he was district representative at Pasadena, Calif.

New president for ACAPA

J. J. Seale was elected president of the American Concrete Agricultural Association at the annual convention held at Denver, Colo. He succeeds A. M. Herman. Both men are with Concrete Conduit Co., Colton, Calif.

Reassignments by Eaton Mfg. Co.

With the transfer of Eaton Manufacturing Co., Axle Division's southwestern field service from Kansas City, Mo., to Dallas, Tex., the reassignment of a field engineer to work out of San Francisco was announced. Transferred to San Francisco from Kansas City is Orin G. Goodrich. Simultaneously announcement was made that George W. Vollmer was promoted to regional field engineer at Dallas.

Top level appointments

Austin J. Paddock has been named to succeed Norman B. Obbard as president of American Bridge Division, United States Steel Corp. Obbard was made an assistant executive vice president—operations of U. S. Steel. Paddock began working with American Bridge upon receiving his degree in civil engineering in 1929. He advanced through various positions to the position in 1954 of vice president in charge of contracting, the post he held till his present appointment.

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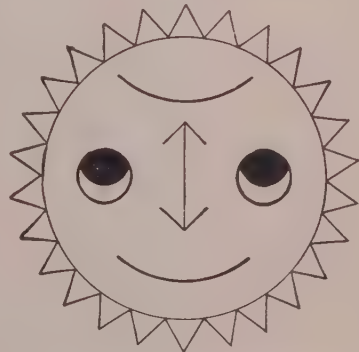
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American Cancer Society



UNIT PRICES

Selected abstracts for Western projects

HIGHWAY—Grading, surfacing, widening of bridge and construction of six bridges for four lane freeway

California—Santa Barbara County—State. Fredrickson & Watson Construction Co. received an award of \$2,272,537 for 3.4 mi. of grading and surfacing, the widening of one bridge and construction of six bridges near Santa Barbara.

(1) Fredrickson & Watson Construction Co.	\$2,272,537
(2) Ukropina-Polich-Kral	2,359,173
Fredrickson & Kasler	2,365,743
Gordon H. Ball and Crowell & Larson	2,370,947

	(1)	(2)
Lump sum	Removing portions of bridge...	\$8,300.00
Lump sum	Clearing and grubbing...	\$9,000.00
Lump sum	Dev. wat. sup. & furn. wat. equip.	87,400.00
60,000 M gal.	Applying water...	.10
7,500 sq. yd.	Compacting orig. ground...	.06
765,000 cu. yd.	Roadway excavation...	.35
13,000 cu. yd.	Structure excavation...	2.25
10,700 cu. yd.	Structure backfill...	4.30
24,000 cu. yd.	Ditch & channel excavation...	.55
5,900,000 sta. yd.	Overhaul...	.004
58,000 ton	Imported subbase material...	1.14
89,000 ton	Imported base material...	1.14
76,000 sq. yd.	Preparing exc. slopes (erosion control)...	.11
73,000 sq. yd.	Preparing roadside areas (rd. side dev.)...	.08
63,000 sq. yd.	Mix., sprdng & compacting cem. tr. subgrade...	.25
230,000 sq. yd.	Mix., sprdng & compacting cem. treated base...	.22
7,675 bbl	Portland cement...	5.05
85 ton	Asph. emulsion (curing sl. pnt. binder & sl. ct.)...	46.00
65 ton	Liquid asph., MC-2 (curing seal)	56.00
240 ton	Liquid asph. SC-2 (prime ct. & pen. treat.)...	33.00
1,725 ton	Paving asph. (P.M.S.)...	5.70
31,350 ton	Mineral aggregate (P.M.S.)...	5.70
1,450 sq. yd.	Placing plant-mix surfacing ditch & spwly dn. drns.	1.70
5,200 lin. ft.	Placing plant-mix surfac. dikes...	.22
60 ton	Screenings...	9.00
14,000 cu. yd.	Class B concrete (pavement)...	17.50
9,500 ea.	Pavement tie assemblies...	.50
900 cu. yd.	Class A concrete (structures)...	65.00
5,360 cu. yd.	Class A concrete (bridges)...	334,000.00
10 ea.	Furn. precast reinf. conc. girders (Junipero St. Ped. O.C.)...	975.00
2 ea.	Furn. precast reinf. conc. girders (Los Positas overhd.)...	1,120.00
4 ea.	Furn. precast, prestressed conc. gdr. (Junipero St. Ped. O.C.)...	2,000.00
16 ea.	Erecting precast concrete gdr. (Rubber wastop)...	210.00
210 lin. ft.	Rubber wastop...	3.00
235 cu. yd.	Air-blown mortar...	60.00
100,000 lb.	Bar reinforcing steel (bridges)...	117,000.00
995,000 lb.	Mesh reinforcement...	.80
2,100 sq. yd.	Furnishing concrete piling...	3.30
1,800 lin. ft.	Driving concrete piles...	135.00
48 ea.	Structural steel...	59,000.00
325,000 lb.	Miscellaneous iron & steel...	.33
35,700 lb.	Steel railing...	8.00
3,242 lin. ft.	Cleaning & painting structural steel...	6,000.00
1,750 cu. yd.	Class B concrete (curbs, gutters, & sidewalks)...	35.00
150 ea.	Right of way monuments...	7.00
12 ea.	Survey monuments...	12.00
7,700 lin. ft.	Metal plate guard railing...	3.65
510 ea.	Guide posts, culv. mkr. (clear. mkr. & horiz. rfr. units)...	7.00
10,150 lin. ft.	New property fence...	.41
1,050 lin. ft.	36 in. Chain link railing...	6.20
31,300 lin. ft.	72 in. Chain link fence...	1.70
3,280 lin. ft.	18 in. reinforced conc. pipe (std. strength)...	4.00
3,268 lin. ft.	24 in. reinforced conc. pipe (std. strength)...	5.75
512 lin. ft.	30 in. reinforced conc. pipe (std. strength)...	8.00
540 lin. ft.	36 in. reinforced conc. pipe (std. strength)...	10.00
200 lin. ft.	42 in. reinforced conc. pipe (std. strength)...	17.00
760 lin. ft.	48 in. reinforced conc. pipe (1600-D)...	21.00
148 lin. ft.	54 in. reinforced conc. pipe (1600-D)...	25.00
280 lin. ft.	78 in. reinforced conc. pipe (std. strength)...	45.00
90 lin. ft.	90 in. reinforced conc. pipe (1000-D)...	65.00
260 lin. ft.	18 in. non-reinforced conc. drainage pipe...	3.00
2,000 lin. ft.	24 in. non-reinforced conc. drainage pipe...	4.30

920 lin. ft.	27 in. non-reinforced conc. drainage pipe...	6.40
284 lin. ft.	18 in. corrugated metal pipe (16 gage)...	5.15
460 lin. ft.	18x11 in. corrugated metal pipe arch (16 gage)...	4.00
10 ea.	Slide headgate & 8 ft. x 12 in. C.M.P. (16 gage)...	70.00
260 lin. ft.	Spillway assemblies...	44.00
6 ea.	8 in. C.M.P. downdrains...	2.70
10 ea.	Downdrain slip joints...	30.00
900 lin. ft.	Downdrain pipe anchors...	24.00
	Finishing roadway...	11,200.00
	Raised traffic bars...	2.25
	Highway lighting systems...	35,000.00
	Removing buildings & improvements...	2,800.00

HIGHWAY—Grading and draining near Phoenix Arizona

Arizona—Yavapai County—State. W. J. Henson was awarded a \$576,289 289 contract for grading and draining of 6.5 mi. near Phoenix. Unit prices follow.

(1) W. J. Henson		\$576,289
(2) Wallace & Wallace		598,066
Flickinger Bros. Construction Co.		603,946
Phoenix-Tempe Stone Co.		605,961
Mardian Construction Co.		608,177
	(1)	(2)
5 ac.	Clearing and grubbing	\$1,000.00
208,750 cu. yd.	Roadway excavation	.44
4,000 cu. yd.	Overbreaking	.33
1,000 cu. yd.	Slides	.22
2,400 cu. yd.	Drainage excavation	.40
20,200 lin. ft.	Grader ditches	.05
2,700 lin. ft.	Crown ditches	.20
1,050 lin. ft.	Placing crown dikes	.25
4,455 cu. yd.	Structural excavation	2.50
5,600 cu. yd. mi.	Overhaul	.30
148,500 cu. yd.	Borrow (CIP)	.34
Lump sum	Provide water supply	500.00
10,550 M. gal.	Apply water	1.30
2,450 hr.	Rolling	8.00
1,050 ton	Select material (CIP)	1.00
470 ton	Aggregate base (CIP)	1.00
35 ton	Blotter material for B.S.T. (Special) (CIP)	10.00
6 ton	Liquid asphalt for B.S.T. (Gr. MC-2,3, or 4) (CIP)	100.00
5 ton	Emulsified asphalt for B.S.T. (Gr. B) (CIP)	100.00
45 sq. yd.	Portland cement concrete pavement (CIP)	9.00
471,900 lb.	Structural steel (CIP)	.16
1,044 lin. ft.	Aluminum handrail (CIP)	11.00
2,251 cu. yd.	Class A concrete	47.00
291,625 lb.	Reinforcing steel (bars) (CIP)	.13
66 lin. ft.	18 in. C.M.P. (CIP except excavation)	4.50
1,352 lin. ft.	24 in. C.M.P. (CIP except excavation)	6.00
598 lin. ft.	30 in. C.M.P. (CIP except excavation)	7.50
1,600 lin. ft.	36 in. C.M.P. (CIP except excavation)	11.00
86 lin. ft.	42 in. C.M.P. (12 Gage) (CIP except excavation)	13.00
206 lin. ft.	42 in. C.M.P. (10 Gage) (CIP except excavation)	17.00
186 lin. ft.	42 in. C.M.P. (8 Gauge) (CIP except excavation)	20.00
400 lin. ft.	48 in. C.M.P. (CIP except excavation)	18.00
100 lin. ft.	54 in. C.M.P. (CIP except excavation)	22.00
120 lin. ft.	Furnishing and driving steel H-Column test piles (12 in.x53 #)	12.00
2,890 lin. ft.	Furnishing and driving steel H-Column piles (12 in.x53 #)	6.50
456 lin. ft.	Steel sheet piling wall (CIP)	80.00
20 ea.	Splicing piles (Steel H-Column)	25.00
4,000 lb.	Cutoff of Steel H-Column piles	.10
Lump sum	Miscellaneous removal and other work (Federal Aid)	600.00
Lump sum	Miscellaneous removal and other work (Non-Federal Aid)	150.00
652 cu. yd.	Pin riprap (wired)	14.00
2 ea.	Cattle guard (4-unit) (Std. C-14) (CIP except excavation & conc.)	1,250.00
4 ea.	Cattle guard (3-unit) (Std. C-14) (CIP except excavation & conc.)	1,000.00
3 ea.	Cattle guard (1-unit) (Std. C-14X) (CIP except excavation & conc.)	500.00
52 ea.	Right of way markers (Std. C-1) (Type B or C) (CIP)	8.00
61,000 lin. ft.	Line fence (Std. C-16) (CIP)	.18
7 ea.	Steel fence gates (Std. C-16) (CIP)	60.00
420 lin. ft.	Bank protection (Std. C-23) (Type A) (Rev. 9-19-55) (CIP)	20.00

HIGHWAY—Grading and paving 3.5 mi. in Washington

Washington—Whitman County—State. Peter Kiewit Sons' Co. received a \$522,731 contract for grading and surfacing between Dry Creek and Step-toe, Washington.

(1) Peter Kiewit Sons' Co.	\$522,731	
(2) Sather & Sons	539,516	
Donald M. Drake Co.	543,717	
Lump sum	(1)	(2)
252,030 cu. yd. Common excavation including haul of 600 ft.	\$ 3,000.00	\$ 2,000.00
3,110 cu. yd. Solid rock excavation including haul of 600 ft.	.23	.30
115 cu. yd. Common trench excavation incl. haul of 600 ft.	1.50	1.40
40,020 unit Overhaul.	1.50	1.00
7,900 cu. yd. Excavation of unsuitable subgrade mat. incl. haul.	.40	.40
2,000 cu. yd. Stripping borrow & surfacing pit incl. haul.	.85	.40
635 cu. yd. Structure excavation.	.45	1.00
1 unit Furnishing smooth wheeled pwr. roller	3.50	2.50
3 unit Furnishing tamping roller.	400.00	150.00
1 unit Furnishing pneumatic tired roller.	400.00	200.00
80 day Operating smooth wheeled power roller	400.00	150.00
178 day Operating tamping roller.	55.00	45.00
80 day Operating pneumatic tired roller.	55.00	30.00
22 day Mechanical tamper.	50.00	45.00
13,000 lin. ft. Slope treatment Class A.	50.00	35.00
203.1 sta. Finishing roadway.	12.00	10.00
3,930 M. gal. Water.	2.50	2.00
6,390 ton Crushed stone filler.	1.60	1.75
50 cu. yd. Gravel backfill for foundations.	8.00	4.00
60 cu. yd. Gravel backfill for drains.	10.00	5.00
32,860 ton Crushed stone surfacing top course.	1.65	1.60
42,470 ton Crushed stone surfacing base course.	1.40	1.50

LIGHT BIT. SURF. TREATMENT METHOD A

3.6 mi. Preparation, construction, finishing.	300.00	220.00
110 ton Asphalt cement MC-3.	50.00	45.00
1,530 ton Crushed cover stone in stockpile.	1.30	1.00
970 cu. yd. Placing crushed cover stone from stockpile.	2.00	1.80

TYPE I-1 ASPH. CONC. PAVEMENT

655 ton Class B.	15.00	14.00
10 ton Class C.	20.00	20.00
4 ton Furnishing mineral filler.	25.00	25.00
45 cu. yd. Furnishing blending sand.	3.00	3.00
1 ton Asphalt cement for tack coat.	60.00	200.00

ONE COURSE CONCRETE PAVEMENT

49,350 sq. yd. Cem. conc. pavement 14 day 6 sack Mix 8 in. sec.	4.30	4.60
270 sq. yd. Cem. conc. pavement 3 day 6 sack mix 8 in. sec.	5.40	5.60
10,030 lb. Pavement Reinforcement Type No. 2.	.16	.14
360 only Dowel bars without caps.	.40	.50
3,720 only Dowel bars with rubber caps.	1.00	.60
8 only Temporary bridges across pavement takedown type.	110.00	200.00
48 lin. ft. Pavement headers.	1.50	2.00

OTHER ITEMS

103 cu. yd. Concrete Class A.	75.00	70.00
20,260 lb. Steel reinforcing bars.	1.16	.14
100 lin. ft. Perf. corr. metal drain pipe 6 in. diam.	1.50	2.00
160 lin. ft. Std. reinf. conc. culv. pipe 12 in. diam.	2.50	3.00
672 lin. ft. Std. reinf. conc. culv. pipe 18 in. diam.	4.00	4.50
728 lin. ft. Std. reinf. conc. culv. pipe 24 in. diam.	6.00	6.50
204 lin. ft. Std. reinf. conc. culv. pipe 30 in. diam.	7.50	9.00
1 only Catch basin.	150.00	150.00
160 lin. ft. Removing & relaying galv. iron water pipe 1½ in. diam.	1.25	1.00
160 lin. ft. Removing & relaying galv. iron water pipe 1½ in. diam.	1.30	1.20
8 only Reinf. conc. R/W markers.	10.00	6.00
12 only Monument cases & covers.	35.00	35.00
1 only Adjusting mon. case & cover to grade.	25.00	15.00
25 only Guide posts.	6.00	10.00
1,620 cu. yd. Removing & replacing top soil.	2.00	1.00
4 only Removing concrete pipe headers.	15.00	25.00
Lump sum Removing timber bridges (2).	500.00	400.00
4,900 sq. yd. Removing cement conc. pavement.	.70	.45
50 cu. yd. Loose riprap Class C.	3.00	4.00
1 only Access control gate.	50.00	65.00
Flagging.	Estm.	1,400.00

HIGHWAY—Construction of 9.7 mi. highway in Nevada

Nevada—Humboldt County—State. Gibbons & Reed, Salt Lake City, submitted a low bid of \$547,049 for the grading and surfacing of 9.7 mi. highway near Winnemucca, Nevada.

(1) Gibbons & Reed Co.	\$547,049	
(2) Dodge Construction, Inc.	549,185	
J. C. Compton Co.	555,412	
Isbell Construction Co.	563,465	
Morrison-Knudsen Co., Inc.	611,088	
Silver State Construction Co.	617,443	

Lump sum	(1)	(2)
4,000 hr. Signs.	\$1,000.00	\$2,000.00
40 hr. Flagman.	2.65	2.50
40 hr. Pilot car.	3.20	5.00
Force Account Maintain special detour.	250.00	250.00
2,663 cu. yd. Selected detour surfacing.	.80	.90
2,141 lin. ft. Remove culvert pipe.	1.00	1.50
84 ea. Remove headwalls.	30.00	15.00

1 ea. Remove inlets.	60.00	50.00
130,069 cu. yd. Roadway excavation, A.	.79	.91
103,776 cu. yd. Roadway excavation, B.	.27	.30
290 cu. yd. Drainage excavation.	1.00	1.00
238 sta. V-type ditches.	7.00	5.00
85 sta. Slope rounding.	7.00	10.00
746,088 yd. sta. Overhaul, yd. sta.	.02	.02
16,641 yd. mi. Overhaul, yd. mile.	.16	.20
750 cu. yd. Structure excavation.	1.50	2.00
2,030 cu. yd. Backfill.	1.75	1.50
12,253 M. gal. Water.	1.80	.75
Lump sum Furnish water equipment.	6,000.00	18,500.00
76 hr. Power roller.	8.00	6.00
9,552 ft. hr. Tamping or pneumatic-tired roller.	.75	.40
79,905 ton Type 1 gravel base.	.96	1.00
32,831 ton Type 2 gravel base, one inch.	1.06	1.08
301 ton Liquid asphalt, type MC-1.	45.00	40.00
39 ton Emulsified asphalt, type MS-1.	44.00	40.00
170 ton Emulsified asphalt, type RS-2.	42.00	40.00
1,376 ton Screenings, three-eighths inch.	4.00	5.00
1,608 ton Asphalt cement, 120-150 penetration.	39.00	32.50
28 sq. yd. Class F-2 plantmix surface.	2.70	2.60
29,242 ton Plantmix paved ditches.	.35	1.00
3,810 lin. ft. Plantmix shoulder dikes.	.60	.35
33 cu. yd. Class "AA" concrete.	100.00	100.00
550 lb. Reinforcing steel.	.20	.20
150 lin. ft. 8" corrugated metal pipe (dipped).	3.00	2.50
950 lin. ft. 24" corrugated metal pipe (dipped).	6.80	6.00
144 lin. ft. 30" corrugated metal pipe (dipped).	8.00	7.50
1,052 lin. ft. 36" corrugated metal pipe (dipped).	12.50	11.50
202 lin. ft. 43" x27" corr. metal arch pipe (dipped).	16.00	15.00
152 lin. ft. Relay culvert pipe.	1.00	1.50
6 ea. Move pipe culvert headwalls.	35.00	25.00
6,550 lin. ft. Standard steel guard rail.	3.15	3.10
380 lin. ft. Remove guard rail.	.60	1.00
215 ea. Culvert markers & guide posts.	7.00	6.00
50 ea. Reference monuments.	7.00	7.50
50 ea. Right-of-way markers.	7.00	7.50
5 ea. Embankment protector (dipped).	50.00	35.00

HIGHWAY—Construction of 3 mi. of roadway approach to Walnut Canyon National Monument, Arizona

Arizona—Bureau of Public Roads. A low bid of \$212,772 was submitted by Peter Kiewit Sons' for grading and road-mix surfacing of 3.06 mi. of roadway approach near Flagstaff, Arizona.

(1) Peter Kiewit Sons'.	\$212,772	
(2) Wallace & Wallace.	233,026	
Royden Construction Co.	236,781	
Rogers Construction Co.	241,489	

Contingent sum	(1)	(2)
Extra and miscellaneous force account work.	\$3,500.00	\$3,500.00
23 acre Clearing and grubbing.	700.00	880.00
42,500 cu. yd. Unclassified excavation.	1.40	1.62
750 cu. yd. Unclassified excavation for structures.	2.00	4.00
1,000 cu. yd. Unclassified excavation for borrow, Case 1.	1.00	.73
21,000 sta. yd. Overhaul (1000 feet free haul).	.03	.02
150 cu. yd. mi. Special overhaul of borrow (1000 feet free haul).	.50	.35
155 hr. Rolling existing ground.	12.00	11.00
1,400 M. gal. Watering of embankment, Item 50.	2.80	3.00
1,300 M. gal. Watering of base course, Items 50 and 52A.	3.50	2.50
Lump sum Providing and maintaining water plant or plants.	4,000.00	2,000.00
24,000 ton Selected borrow base course.	1.00	1.10
9,200 ton Crushed gravel or crushed stone base course, Class 2, Grading, D-1 Revised.	2.00	1.55
500 ton Cover aggregate for Type 2 seal coat.	5.00	5.00
72 ton Rapid curing cutback asphalt, Grade RC-4 or RC-3 for Type 2 coat.	45.00	52.00
2,798 mi. (Class C-1 pavement) road-mix surfacing laid, Case 1 (16 feet width of main road).	900.00	750.00
0.195 mi. (Class C-1 pavement) road-mix surfacing laid, Case 1 (22 feet width on main road).	1,000.00	900.00
4,900 sq. yd. (Class C-1 pavement) road-mix surfacing laid, Case 1 (parking (parking areas, approach roads, walks, etc.).	1.20	.55
4,200 ton (Class C-1 pavement) new road-mix aggregate (Class 2, Grading, D-1 Revised, Item 52A).	1.50	1.85
550 ton Medium curing cutback asphalt, Grade MC-3 or MC-4, for Class C-1.	40.00	49.00
478 lin. ft. 18 in. CGSM culvert pipe.	5.00	5.00
462 lin. ft. 24 in. CGSM culvert pipe.	6.00	7.00
62 lin. ft. 30 in. CGSM culvert pipe.	10.00	8.20
22 lin. ft. 36 in. CGSM culvert pipe.	15.00	11.10
148 lin. ft. 84 in. CGSM culvert pipe (8 gage, beveled ends).	50.00	51.00
22 ea. 18 in. CSM end sections.	50.00	40.00
13 ea. 24 in. CSM end sections.	80.00	50.00
2 ea. 30 in. CSM end sections.	100.00	80.00
2 ea. Drop inlets, 24 in. size, Type 4.	300.00	350.00
2 ea. Welded steel gratings (Type 4).	75.00	80.00
762 lin. ft. Stone masonry curb, 16-in. depth.	2.50	7.40
2 ea. Cattle guards (2-unit, with gate).	1,500.00	1,350.00
30,700 lin. ft. Barbed wire fence (4-wires).	.21	.20
1 ea. Gate, Type 1.	50.00	60.07
2 ea. Gates, Type 2.	30.00	22.00
2 ea. Metal guide posts (Type B).	7.00	6.50
Contingent sum Turi shoulders.	400.00	400.00
Lump sum Highway sign and entrance sign.	2,500.00	4,750.00

HIGHWAY—Grading and surfacing of about 2 mi. in Colorado

Colorado—Boulder County—State. A \$345,151 contract was awarded Schmidt Construction, Inc., for 2.03 mi. of grading and surfacing in Roosevelt National Forest, Colorado.

(1) Schmidt Construction, Inc.	\$345,151	
(2) Colorado Constructors, Inc.	346,338	
Lowdermilk Bros.	387,772	
Inland Construction Co.	421,257	
	(1)	(2)
Lump sum	Clearing and Grubbing	\$5,000.00 \$10,000.00
138,000 cu. yd.	Unclassified Excavation	1.80 1.80
660 cu. yd.	Unclassified excavation for structures	5.00 5.00
16,000 cu. yd.	Unclassified excavation for Borrow, Case 1	.60 .50
420,000 sta. yd.	Overhaul (1,000 ft. free haul)	.02 .02
24,000 yd. mi.	Special overhaul of borrow (1,000 ft. free haul)	.25 .20
Contingent Sum	Oboliteration of old roadway to be paid for as earned	1,000.00 1,000.00
1,550 unit	Watering of embankment	1.00 .50
240 unit	Watering of base course	1.00 1.50
Lump Sum	Providing and maintaining water plant or plants	2,000.00 1,000.00
770 hr.	Rolling of embankment	8.00 7.00
8,100 ton	Crushed gravel or crushed stone base course, Cl. 2, grad. D-1	1.40 1.40
43,000 sq. yd.	Processing bituminized base	.10 .12
50,000 gal.	M.C. cutback asphalt, Grade 0, 1, 2, or 3	.16 .17
5,000 gal.	R.C. cutback asphalt, Grade 0, 1, or 2	.16 .18
142 cu. yd.	Concrete Class A (air-entrained concrete, low-alkali cement)	55.00 60.00
17,500 lb.	Reinforcing steel	.13 .14
76 cu. yd.	Cement rubble masonry	80.00 60.00
1,614 lin. ft.	24-in. C.G.S.M. culvert pipe	6.50 7.00
11 ea.	Concrete maintenance marker posts, timber guide posts with reflector	15.00 15.00

HIGHWAY—Grading and paving in Arizona

Arizona—Yuma County—State. Heuser & Garnett submitted a low bid of \$299,855 for the grading and draining and plant-mix bituminous surfacing of roadway to Yuma Air Force Base.

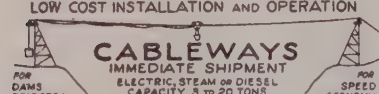
(1) Heuser & Gartt.....	\$299.85	
(2) Tiffany Construction Co.....	307.82	
Arrow Construction Co., Inc.....	314.09	
Royden Construction Co.....	314.74	
	(1)	
19,400 cu. yd. Roadway excavation.....	\$.65	
410 cu. yd. Structural excavation.....	2.00	
7,625 cu. mi. Overhaul.....	.25	
1,100 cu. yd. Borrow (CIP).....	.75	
1 L. S. Provide water supply.....	750.00	7
2,300 M gal. Apply water.....	1.60	
555 hr. Rolling.....	8.50	
18,515 ton Coarse aggregate base (CIP).....	1.50	
9,825 ton Fine aggregate base (CIP).....	1.60	
17,775 ton Bit. mix (Cl. II-Plant Mix) (CIP except cost liquid asphalt).....	3.65	
4,700 ton Plant mixed seal coat (CIP except cost of paving asphalt).....	3.50	
745 ton Liq. asph. for bit. mix. (Gr. SC-6) (CIP).....	31.00	
234 ton Paving asphalt for plant mixed seal coat (Gr. 150-200 penetration (CIP).....	31.00	
206 ton Liquid asphalt for prime & first tack coat (Gr. MC-2 or MC-3) (CIP).....	42.00	
65 ton Emul. asph. for 2nd tack ct. (Gr. A) (CIP).....	80.00	
48 cu. yd. Class "A" concrete (including cement).....	70.00	
3,860 lb. Reinforcing steel (bars) (CIP).....	.15	
3 cu. yd. Removal of structural concrete.....	50.00	
1 L. S. Miscellaneous removal and other work.....	2,500.00	2,500
5 lin. ft. Right-of-way markers (std. C-1) (type B or C) (CIP).....	7.00	
7,290 lin. ft. Reconstruct woven wire fence.....	.25	
6,300 lin. ft. Single curb (std. C-20) (type G) (CIP).....	1.60	
22,860 lin. ft. Single curb (special type G) (CIP).....	1.50	
9,840 lin. ft. Combined curb & gutter (Std. C-20) (Type A) (CIP).....	2.70	
4 ea. Reset manhole covers.....	25.00	2
7 ea. Reset survey monument covers.....	20.00	

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BACKFILL, uncompacted

How to solve the engineering shortage

The Arizona Highway Department has come up with a novel idea for attracting young engineers. They've hired a young lady engineer. According to a news release received recently, F. Walker, 25, is the first woman ever hired by the Highway Department as an engineer. She received her degree in Civil Engineering from the University of Arizona last May. At this point the release goes into a description of the engineer-in-training program, not wishing to rub in the great advantage Arizona now has over other highway departments in bargaining power with engineering graduates. Of course, if this approach to the technical manpower shortage is expanded new problems will arise within the organization, but the problem right now is to get more engineers, and Arizona may have something.

We have feelings, too

Publishing a construction magazine is no picnic. If we print a page like this people say we are silly; if we don't they say we are too stuffy. If we stay in the office all day, we ought to be out visiting jobs; if we go out to jobs looking for things to write about, we ought to be back at the office answering the phone.

If we reject a contribution we don't recognize valuable material and if we accept it the magazine is filled with trash. If we make a correction in a story then we destroy the whole point, if we don't touch it we're asleep.

If we reprint things from other magazines we're too lazy to write them ourselves, if we don't we're stuck with our own stuff.

We will probably be accused of swiping this from some other publication.*

*We did.



IF WE ALL had three arms we might get some work done around here. This fellow has and he's a regular whirlwind on the job. He's working with a sled saddle made by Newco Mfg. Co. of Kansas City which protects wire rope when lifting against sharp corners. If you'll look closely you will see that with his third hand from the right he has the glove on backwards. We're tempted to say that he wears it this way so his friends can recognize him, but he won't.

Three-handed shovel

Contractor J. H. Pomeroy of San Francisco has begun work on an assembly plant on a 200-ac. site at Maywood, Calif. The plant is being built for Mercury Division of Ford Motor Co., and when finished will be the second largest of the division's five plants in the nation. During ground-breaking ceremonies the Ford executives turned over the first earth with a three-handed shovel made for the occasion. We have not been able to learn how long they worked with the new shovel and what their average hourly yardage was, but we're sure their production was less than could be achieved by the young man pictured above. Here is a chance for perfect matching of man and machine.



CONSTRUCTION PHILATELISTS everywhere will be delighted with the romantic issue shown above which can be added to collections of Monaco wedding stamps. According to learned authorities this is the first time a LeTourneau-Westinghouse Tournapull like the one beneath the stamp has been so honored. A fleet of these machines was used in building a road to link Abengourou with Abidjan in the Ivory Coast territory of French West Africa. It sells for 17½ cents in U. S. money (the stamp, not the Tournapull). Address inquiries to 17½ cents, Abengourou.

Twenty-five years ago in Western Construction

If the mountain won't come to Mohammed, Mohammed will build a Link-Belt conveyor system and dump the confounded thing into Puget Sound. That's what happened 25 years ago on the Denny Hill project in Seattle, Wash., when a long conveyor was used to carry 5,000,000 cu. yd. from the downtown area to the bay. The belt was operated 23¼ hr. per day for 300 days carrying dirt at an average rate of 600 cu. yd. per hr. This was the first use of conveyors on a major project and was a milestone in the history of materials handling.

... The Editor

It works both ways

Contractors have been reminded many times in these columns to keep themselves informed on new developments in engineering design that might modify field operations. For example, as designers advanced the techniques of prestressed concrete it was the smart contractor who kept informed on this new method of fabricating buildings and bridges so he could bid intelligently, and know what was to be done if he got a job. Again, soil engineers are continually changing density requirements and other specifications for earth fills. Any contractor who wants to bid smartly must be familiar with these demands to plan his equipment and operations.

The same idea works in the opposite direction, and an excellent example is provided in this issue (front cover and page 25). For the first time in the West, slip forms are being used in building bridge piers. This is a construction technique that has long been used for grain and cement silos, and the basic idea has been adapted to bridge piers more recently in the East.

But now Western bridge designers have available a new field procedure that might be an advantage in constructing tall concrete bridge piers. There are obvious advantages to be studied, and possible disadvantages must be appraised. Such knowledge of a modern construction method is the responsibility of a good designer. Whether the designer decides to use the method on any particular job, or to permit its possible use through adjustment of specifications will be his decision, but he should be able to say that he is familiar with the system, and has given it proper consideration for the job.

Both engineers and contractors must be mutually informed and up to date.

Technicians will save engineers' time

Shortage of engineers is the most serious problem facing the construction industry today. This is particularly true in the highway field, with the accelerating program beginning to place tremendous loads on both field and office staffs of Western highway departments.

A commonly accepted solution, which appears both logical and modern, is to relieve young engineering graduates from years of doing technical chores, which for generations have been considered a normal and proper apprenticeship. From the point of view of the employer—either private or governmental organization—this would tend to move the graduate forward into filling his capabilities with maximum acceleration. For the young engineer the plan is even more advantageous since it puts his education to work at the proper level without the years of apprenticeship that often sap and destroy his interest in the profession. It has been the existing system, which demanded that a young engineer hold a rod, or trace and letter drawings, or sieve gravel samples for X years, that has fostered interest in unionism. So, let engineers be engineers with all possible speed following graduation to help relieve the man-power shortage and to stimulate their professional consciousness.

The next logical consideration must be "Who will do the routine work that apprentice engineers have done for these many years?" The answer comes from another profession, frequently envied by engineers, that long ago established "Doctors" and "Medical Technicians." The technician knows he will probably never be able to cross the barrier to professional standing, but he also knows he is accepted as fulfilling a recognized function in the broad field of medicine, and is assured of a rewarding career. An almost exact parallel can be drawn in civil engineering. There are three functions where technicians could be educated in shortened college courses for positions that would be accepted in proper relation to professional engineering. These are: ordinary surveying including calculations, drafting and routine office work, and standard testing of materials.

Engineering educators, particularly those working in junior colleges, are ready for this modern concept, and two years should be sufficient for fundamental courses in math, surveying, drafting and materials.

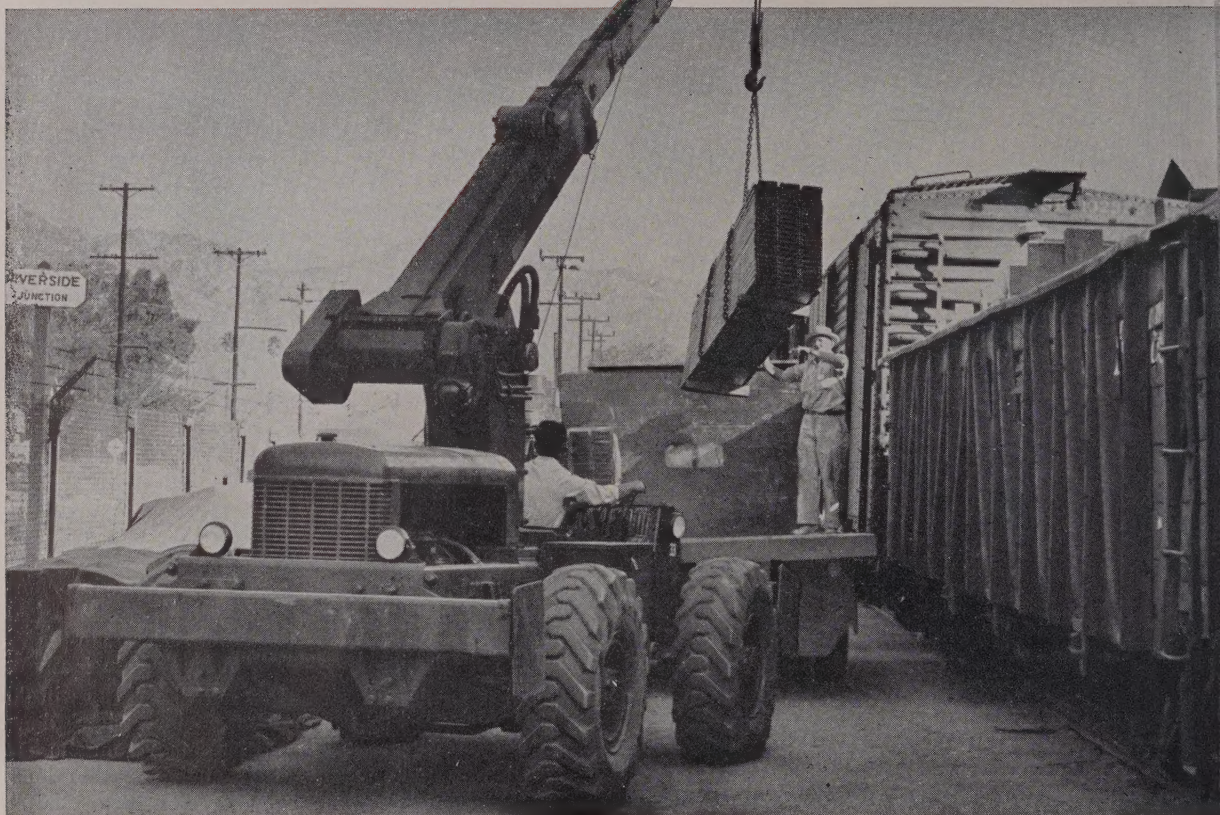
The real problem will be the acceptance of this modern concept at the top levels of the profession, where tradition lies with a heavy hand. A secondary hurdle will be in the changes required in governmental organizations, such as state highway departments. Here personnel officers and civil service departments will be required to establish completely new classifications.

It all represents an important step forward for civil engineers. Possibly the highway branch, under the pressure of the super-highway program, can lead the profession into securing a higher level of public recognition.

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