

Reconstruction after floods

The big job of rebuilding is under way in Northern California. Here is a field report which takes a look at highways, bridges, railroads and levees.

THE SERIES OF STORMS which struck the Pacific Coast lasted nearly five weeks, bringing a rainfall equal to the normal total for an entire year. Southern Oregon and Northern California took the worst of it, but damage spilled over into surrounding areas as well. From Los Angeles to Seattle rivers surged out of their banks—in most cases the crests far exceeded anything on record. Highways and railroads were cut at a hundred points by slides, slip-outs, log jams, and bridge failures; power and telephone networks were crippled; levees were topped and washed out; whole cities felt the force of flooding water carrying an avalanche of driftwood and mud. Thousands of people were forced to abandon their homes twice—once on Christmas Eve and again three weeks later when another major storm sent the rivers out of their banks for the second time.

Northern California suffered widespread damage. Humboldt County's road system lost 38 bridges—with the total losses estimated to be over \$4,000,000. In this county alone over 500 homes were damaged and over 300 completely destroyed. The approach to the Klamath bridge on U. S. Highway 101 was washed out on December 24, and once more on January 15. A steel truss forming the main span of a bridge over the Trinity River at Hoopa was broken loose and rolled 2,000 ft. downstream. Northwestern Pacific Railroad lost about 700 ft. of trestle at Scotia Bluff and entered into an emergency contract with Morrison-Knudsen to get the line back in use. M-K, working around clock for three weeks

HIGHWAY 101 took a beating along with the town of Klamath, shown here at the height of the December flood. A building reposes on the highway at the top and at the bottom the approach to the bridge over the Klamath River is being washed away. A few hours later the remaining lane went out.



in almost constant rain, finished the job the weekend of January 21. A week later a landslide took out 135 ft. of the newly-built trestle.

Sacramento, California, was saved from heavy flooding by the recently completed Folsom Dam. The dam had an empty reservoir and was able to impound the huge flow of the American River. Without Folsom Dam and without Shasta Dam on the Upper Sacramento River, the city would have been covered by 10 ft. of water. The great flood damage is expected to give added impetus to dams now under construction and in the planning stage. The Army Engineers estimated that if projects now under construction had been completed the savings would have been over \$100,000,000.

On January 4 the Salmon Creek bridge north of Vancouver, Washington, was closed to traffic because the water had dangerously undermined the piers. Less than an hour later a 65-ft. span four lanes wide fell into the stream, cutting the Portland-

Seattle link of U. S. Highway 99. It is estimated that traffic will have to be detoured for at least 60 days.

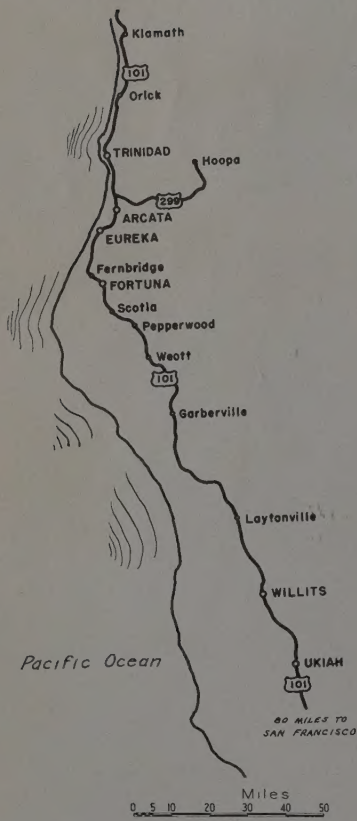
The 14 counties in western Oregon suffered about \$4,000,000 worth of damage, with Jackson and Coos counties the hardest hit.

Until the last week in January, Southern California had been experiencing drought-like weather. But on January 25 a storm hit the Los Angeles area, dumping close to 8 in. of rain in less than 36 hours, and sending 1,500 people out of their homes. So as this issue goes to press the entire Pacific Coast has been struck by floods.

The complete flood story can never be told. Even a rough survey is difficult at this time because damage estimates are being revised daily. The laborious process of reconstruction and rehabilitation will continue for many months—years in some places. On the following pages **Western Construction** takes a closer look at just a few of the obstacles which were faced and how they were overcome.

Highways take beating

District 1 repairs its roads with the biggest construction force ever assembled on a state highway project.



The 100-mi. stretch from Laytonville to Scotia probably suffered more damage than any similar section in the history of the state. The towns of Pepperwood and Weott were completely inundated by the Eel River.

HARDEST HIT highways in the December and January floods were those in California State Highway District No. 1, which reaches from the Oregon border to about 80 mi. north of San Francisco. The nature of the soil and the terrain, plus the heavy rainfall in this area, makes highway construction and maintenance particularly difficult. Nearly every project designed includes considerable study involving drainage structures, embankment stabilization, flattening or benching cut slopes, placing horizontal drains, and embankment protection along streams. But the most modern features and the most conservative designs were unable to cope with the flood conditions of December 2 and 3.

Some of the reports from the field during those days describing water elevations were discounted and charged up to hysteria but a number proved to be essentially correct. For instance, the South Fork Eel River near Miranda was discharging 136,000 cfs., which is about twice the flow as the previous record high.

When the water began to recede reports began coming in by two-way radio and by telephone wherever lines were not down. Although attention was given to every one of the 853 mi. of state highway within the district, 101 was of prime importance—the only major north-south route within 75 mi. of the coast. Assessing damage was difficult because many

sections were still under water and travel by car or truck was for the most part impossible. Men with walkie-talkies were sent out on foot on pioneering trips through key sections to report conditions to the district office in Eureka. Gradually the total picture of the damage came into focus.

Damage exceeded the most extravagant estimates. There were literally hundreds of slides, washouts, and plugged culverts, dozens of bridge failures, and such things as driftwood jams and entire buildings left on the highway by receding water. At one time Eureka, the largest city in the district with a population of 35,000, was entirely isolated. The section of U. S. 101 from Laytonville to Scotia, a distance of about 100 mi., probably incurred the most extensive damage ever inflicted on a similar length of state highway during a single storm.

The communities of Pepperwood, Weott, and Myers Flat were inundated by the rampaging Eel River, and silt was left on the traveled way 2 ft. deep. Similar devastation occurred at Klamath when the Klamath River overflowed and rushed through the town, taking with it the northerly approach to the Douglas Memorial Bridge.

High water and heavy drift jarred loose a pier on the Yager Creek Bridge at Carlotta, closing Sign Route 36. Cooperation of the North-

Before and after . . .

ALL OF THE PICTURES on this page were taken on Route 56 between Fernbridge and Ferndale, which suffered particularly heavy damage. Bridge approaches were washed out, a large box culvert was completely destroyed, and shoulders were washed away, badly undermining the pavement.



RECONSTRUCTION began as soon as the Eel River receded. During the crest the water flowed across the road from right to left, pouring over the left edge in a long, low waterfall—large craters were gouged in the adjoining fields.



HERE A CRAWLER tractor 'dozes fill material across a bad wash-out. In nearly every case it was possible to use material which will not have to be replaced later. Much of the driftwood was removed from the highways with fork lift trucks and other log-handling equipment obtained from the many lumber mills in the area.

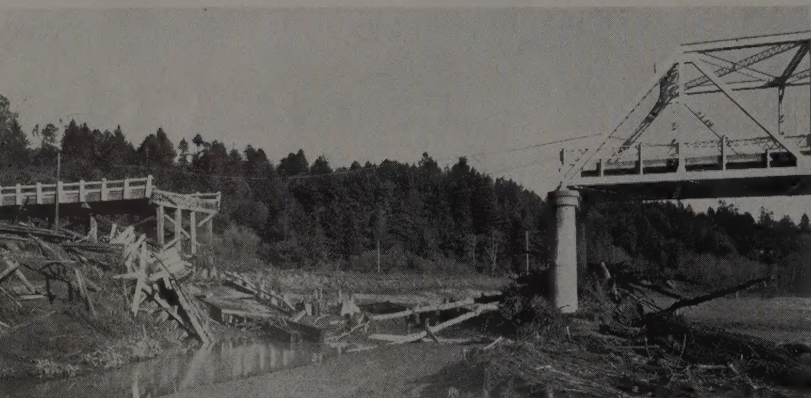


IT'S RAINING again but the road is back in service and new telephone lines are up. This picture was taken on January 17, three weeks after the two at the top of the page. It will take about \$3,000,000 to bring all the roads in District I back to normal.





ABOVE—Houses on the roadway were a problem at Pepperwood, Weott, and Klamath. Some were remarkably intact and were moved to one side on rollers or dollies. Over 300 homes were completely destroyed in Humboldt County.



ABOVE—At this bridge over the Mad River north of Eureka four timber spans were swept away. Many of the new bridges will have to be longer than those that they replace.

BELOW—Timber planking keeps a bridge open until permanent repairs can be made. The Humboldt County road system had 38 bridges knocked out—about 19 to be replaced.



western Pacific Railroad resulted in the temporary planking of a parallel railroad bridge which permitted light traffic to make the Yager Creek crossing.

State field supervisors were authorized to hire men and equipment whenever possible in an all-out effort to restore communications and lines of transportation. Every available piece of construction equipment was put to work. On the worst 100 mi. of U. S. 101 over 150 pieces of equipment and 200 men were put to work, in addition to the district's regular forces. Design offices were practically emptied of engineers in order to get the maximum number of experienced supervisors in the field. Costs had to be kept in mind where possible as there was still more winter ahead.

Permanent repairs

Every effort was made to make repairs in a way that would not require reconstruction later. In most cases washouts were rebuilt with good material that will not have to be replaced. Except in critical situations silt and debris were removed from the pavement by rubber-tired front-end loaders, thus avoiding the damage that would have resulted to the concrete by the use of crawler tractors with grousers. Much of the driftwood, logs, and trees were removed with fork lifts and other log-handling equipment obtained from the many lumber companies in the area.

At some points buildings and houses were left on the highway as the water subsided. Some were remarkably intact and one-lane emergency roads were shooflied around them until professional housemovers could remove them from the right-of-way in a reparable condition. When the buildings were clearly beyond salvation they were bulldozed to one side.

Within four days a road had been pioneered all the way through the district—the result of the largest construction force ever assembled on a state highway project. Just in the section from Scotia to Laytonville there were over 65 different firms and equipment owners represented. As can be imagined, the accounting and office work to keep payroll and cost records accurate was tremendous. A temporary headquarters was set up at Garberville and accountants and secretarial help were brought in from all over the district.

Second flood strikes

In mid-January a new storm hit the coast sending the streams out of their banks again and bringing a new deluge of mud and debris. In an ordinary season this second flood would have been considered a major catastrophe. But coming when it did it was taken right in stride. The land it inundated had been ravaged three

weeks before, and the slides and washouts it caused were attacked immediately by the huge construction force already mobilized.

In the list of 65 equipment owners which the state hired (all on the 100-mi. section of U. S. 101) many well known names appear. Emergency contracts were awarded to Arthur Siri, Inc., Santa Rosa; Ben C. Gerwick, Inc., San Francisco; Mercer Fraser, Eureka; Harold Hastings, Lakeport; J. Ira McNutt, Eureka; Humboldt Constructors, Inc., Eureka; and Lange Brothers of Lakeport, to name just a few.

Key personnel

The personnel of the Division of Highways deserve special credit and the following list is far from complete. Alan S. Hart is district engineer of District 1, assisted by C. A. Shervington; C. P. Sweet, in charge of operations; C. G. Ure, maintenance engineer; and R. Bergroth, office engineer. Among the engineers from the Eureka office who went to the emergency station at Garberville were Claire Buckman, J. D. Pessinger, and Albert Braga. E. J. Reed handled the Ferndale-Fernbridge section, along with J. R. McClary. Alton Kay, who was in Eureka as resident engineer on the Eureka Slough Bridge now under construction (which was not damaged by the floods), and Al Learnhart, from the bridge maintenance department in Sacramento, are in charge of bridge reconstruction. The damage survey was carried out by E. L. Blomquist, district construction engineer, with G. M. Leatherwood and J. A. Giacomini. R. C. Harkness and L. R. Redden, design engineers, were moved to the field to serve as reconstruction supervisors.

Costs mount

Probably \$500,000 has already been spent on road repairs in District I, with the total expected to go over \$4,000,000. The greatest portion of the damage occurred in Humboldt County where about \$2,000,000 will be needed to restore highway facilities. The Division of Highways is assisting Humboldt County restore key bridges and roads by arranging the financing and emergency contracting.

The latest estimate of the damage to both state and county roads throughout California is \$31,000,000. This figure will probably be revised upward again, as the rainy season is not yet over. The division of highways has applied for about \$10,000,000 in federal aid to help restore the roads.

Reconstruction will take at least a year, as plans and specifications have to be prepared for major projects.

G. T. McCoy is state highway engineer, F. W. Panhorst is bridge engineer and Milton Harris is construction engineer.



ABOVE—A row of trees stopped this log jam from inflicting further damage on a section of highway south of Eureka. At many points receding water left a tangle of driftwood and mud on the road.

RIGHT—The box abutment on the Smith Point Bridge on US 101 south of Garberville began sinking in mid-January. When this picture was taken the deck was being held up by two 100-ton jacks and two 60-ton jacks. Holes are being jackhammered through the slabs through which H-piles will be driven. Mercer Fraser of Eureka had an emergency contract for this job. It was necessary to delay traffic for one-hour periods to give crews a chance to work on the bridge.



BELOW—Sacked concrete rip-rap along the Eel River at Greenlaw Bluffs kept this embankment from washing out entirely. When this section was built years ago the rip-rap was placed 5 ft. above the highest recorded stream level. During the Christmas flood the water was over the roadway at the upper left.





WHEN it became too muddy for equipment to move the work had to be carried on by hand. A detachment of men from Beale Air Force Base

was brought in to help place canvases to protect the levee from wave wash. Officers had flares to signal men if levee broke.

Yuba City levee saved

A dramatic around-the-clock fight against the rising Feather River saved the Yuba City-Marysville area from the second heavy flooding in three weeks. Construction crews wore life vests as water came within inches of topping the levee.

THAT WAS THE welcome headline featured nationally on Monday, Jan. 16, 1956. A new mile-long levee of jellied mud draped over from end to end with canvas had thwarted the Feather River's new threat to the 62,000 ac. in and about Yuba City

which had been inundated on Christmas Eve. Newspapers, radio, and television extolled nationally the efforts of the Army Engineer troops and civilians who had won an intense 48-hr. fight against the rising Feather River.

But the drama really began immediately after the Feather River struck at minutes after midnight on Christmas Eve causing an estimated \$80,000,000 damage at Yuba City and taking some three dozen lives. As the river spewed its deluge of mud and destruction, it gouged a 1,660-ft. breach in the levee on the west bank of the Feather River near Gum Tree, several miles below Yuba City. And when the river, like an exhausted giant, fell back into its channel, the bottom of the gaping hole was 80 ft. below the previous crown of the levee.

A city half-destroyed by torrents of mud and water, remained exposed to every whim of the Feather River at the beginning of the winter wet season of Northern California. To effect a closure of the breach in the least possible time was the task that fell to "Short" Elliott, resident engineer for the Corps of Engineers in the Yuba City office.

There was no time for detailed plans and specifications, no time for advertising for bids, no time for any delay. One day might mean the difference between a city saved or a city lost. And on Jan. 16 the nation knew the round-the-clock construction of the new levee had licked the river by inches.

Corps of Engineers employees of the Marysville-Yuba City area spent Christmas Day beginning the construction of a bow-shaped levee to encircle the gaping hole in the levee. This was done in spite of the fact that two engineer employees' homes were totally destroyed and several others damaged to some degree. An equipment rental contract was negotiated immediately with H. Earl Parker, Inc., of Marysville, who promptly mobilized his equipment and men. It was going to be a 24-hour-a-day, 7-days-a-week operation until the climax of Sunday, Jan. 15, when the new levee, only inches above the threatening Feather River, was draped with olive drab canvas



AT LOW spots on the levee 3-ft. high wooden walls were thrown up and filled with soil—to hold back the Feather River. Men and machines worked day and night for three weeks.



THE mile-long new levee bowed out around the break to avoid the deep channel the water scoured when pouring through the gap. This

also made material from the original dike available for building up the new levee. About 62,000 ac. were flooded when the levee failed.

awaiting the impending disaster . . . which fortunately did not materialize.

New Year, 1956! But for the men at Gum Tree it was just another 24-hr. on a rain soaked levee crawling with 50 pieces of heavy equipment.

With 62,000 ac. flooded in the vicinity of the break, borrow material was at a premium. The mile-long bow-levee rose slowly out of the mire, reaching the old levee well above and below the break, thus making material from the old levee adjacent to the break available for the construction of the new levee.

By Jan. 6 the levee was 58 ft. above sea level, 9 ft. above natural ground, and closure was effected. The continuing rains and the wet fill material made proper moisture control impossible. The only compaction was obtained from the weight of the heavy equipment working like ants on an anthill. The levee had a crown of about 25 ft. and the slopes were much steeper than the desired 3 to 1 on the riverward side or the 2 to 1 on the landward side usually required by specifications on the Feather River.

With a river stage of 55 ft. and a levee height of 63 ft., widening of the base of the levee was begun in earnest on Jan. 9. Some 42 Cats and

scrapers, with capacities ranging from 12 to 30 cu. yd. wormed their way along the top of the levee, dumping their loads. A dredge poured sand and silt on the riverward toe of the levee. Three dozen bulldozers groaned behind the levee, pushing walls of sand and dirt to back up the landward side. Five draglines were in operation.

The river had been "behaving" nicely, being at 52 ft. when the closure was made at the 58-ft. elevation. Then came the first scare. Rains in the watershed . . . river rise expected.

Signals changed immediately. The attempts to broaden the base of the levee were abandoned and "go for height" was the by-word. The crown became progressively narrower as the battle for elevation continued. Unknown to the world a dramatic battle against the river was being fought by men whose homes were destroyed or damaged and who still hadn't taken the time to inventory their personal losses. They were fighting for the life of a city. The levee rose 2 ft. that day and men breathed a little easier.

But there was no room for complacency. A severe Pacific storm was reported moving towards the coast. That could mean only one thing:

trouble. It was Friday the 13th, literally.

Saturday was a dreary drizzling day as men and machines tried to gain a couple of feet more in the race against the river rise. A tabulation of the equipment and hours worked for the 24 hr. of Jan. 14, 1956, is impressive:

	Equipment-Hours
42 Caterpillars and Scrapers (12 to 30 yd.)	979
35 Bulldozers	694
4 Motor Graders	90
5 Draglines (¾ to 2 cu. yd.)	114
10 Light Plants	140
4 Service Trucks	96
1 Fuel Truck	24
16 Pickup Trucks	384
1 Water Truck	24
2 Boom Trucks	48
3 Welding Trucks	72
2 Jeeps	24
1 Power Wagon	24
8 Pull Scrapers (32 cu. yd.)	160
Total Equipment-Hours	2,873

The levee was at elevation 70. A peak of 67 ft. was predicted by the weather bureau for Jan. 15. Continuous rain had made the levee crown a sea of mud and heavy equipment could no longer move in the muck.

Yuba City was evacuated once more. From now on the river would have to be fought by hand.

To get these hands, Colonel A. D. Wilder, District Engineer of the Sacramento District, Corps of Engineers, requested Army Engineer Troops of 6th Army. The 136th Engineer Brigade with its 828 Engineer Aviation Battalion from Beale Air Force Base, with a detachment from the 839th Transportation Company at Oakland were dispatched to Yuba City. In a dramatic battle which began Saturday and lasted over the weekend, Army Engineers Troops under the direction of "Short" Elliott and his men placed 4,000 ft. of canvas revetment on the riverward side of the levee and weighed down the canvas with sandbags.

The Feather River crested at 68.35 ft. at about noon Sunday. It was a touch-and-go situation. The water-softened levee quivered at every mud covered step. The men on the levee wore life-vests. Their officers had flares. At the first sign of a major break flares would be fired and the men would run away from the break. Colonel John Livingston, commanding the 136th Engineer Brigade, decided that if the water rose another tenth of a foot he would call the men off the levee. But the river held its peak, then began slowly dropping. The "abandon levee" order was never given, the life vests were never needed.

The water came within a foot of the levee crown in one area. Canvassing the levee prevented wave-

wash and certainly without it the soft top section of the levee would have given, and three weeks of round-the-clock work would have been lost. One day's delay or one day lost in rebuilding the levee and it would have been topped by the river and gone. Twenty-one days and nights of mud churning on the rain-soaked levee by civilian personnel of the Corps of Engineers and H. Earl Parker's men had not been in vain.

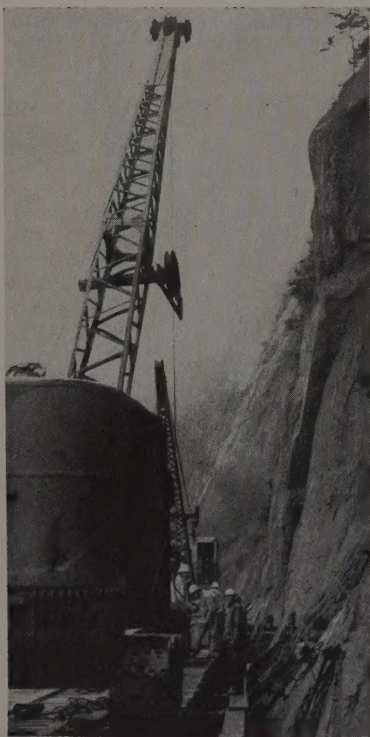
The sun was shining at Yuba City on Jan. 17, 1956. The river was dropping and the levee crown was drying. But there was no respite for "Short" Elliott and his men or for H. Earl Parker's outfit. The 24-hour-a-day grind was still on to raise the levee 15 ft. and bring it to the grade of the existing levee—85 ft. above sea level.

Morrison-Knudsen takes an emergency contract as—

Flood wrecks railroad trestle

It took three weeks, 20 hr. per day, to rebuild 700 ft. of trestle washed out in the flood at Scotia Bluff. M-K beat

steady rain and a second flood to get the job done. And then a landslide took it out again.



ON ONE side of the 40-ft. high trestle was the river, on the other this steep bluff. This meant no room to store material and it had to be brought in a little at a time.

AFTER SIX WEEKS of fighting slides, sinks, and washouts, Northwestern Pacific Railroad opened its entire line from San Rafael to Eureka, Calif., on February 3. The heavy rains and high water had caused almost daily damage since the first closure occurred on December 19. Cost of restoring the line will be somewhere around \$2,000,000 and the loss of revenues probably went over \$500,000. Two months of rain brought two major floods to the 330-mi. railroad. But it looks like the trouble is over as February has begun with clear skies and the forecast is for more of the same.

500 men at work

The northern half of the line, from Willits to Eureka, had the most difficulties. Over 500 men were at work attempting to keep up with slides and washouts as they occurred. Flood waters of the Eel during the Christmas weekend swirled 8 ft. over the track at Scotia, 28 mi. south of Eureka, and more than 7 ft. above the track at South Fork, 20 mi. farther south. All housing of railroad employees at South Fork was swept away, but nobody was injured. It will probably take three or four months to bring the railroad up to the condition it was before the storm.

Ben C. Gerwick, Inc., accepted an emergency contract for the repair of a bridge over the Mad River Slough

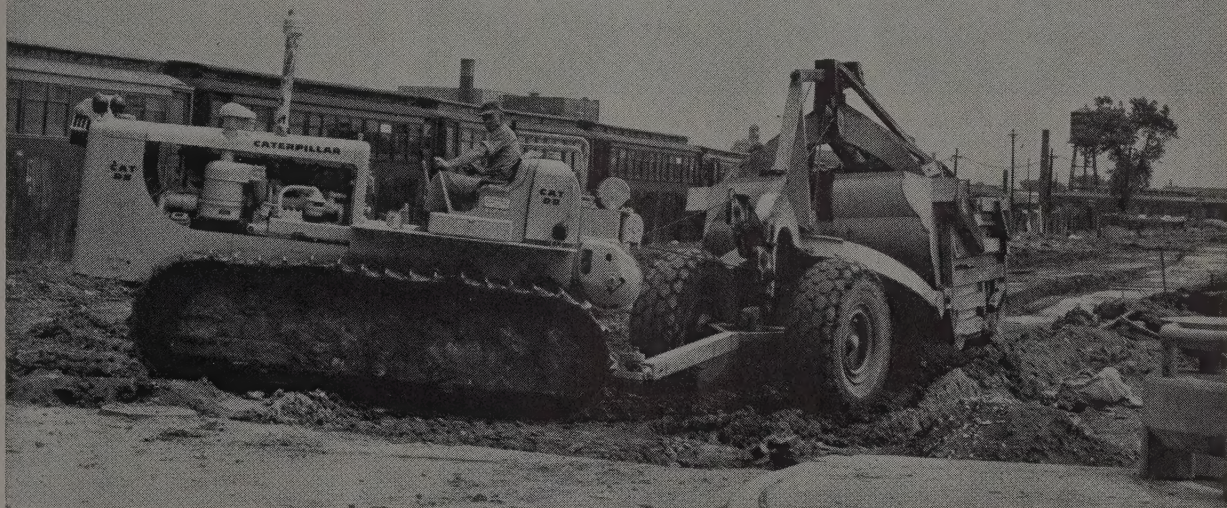
between Eureka and Samoa. The high water had carried a log jam into the railroad's bridge, knocking it 9 ft. out of line. About 14 piles were broken and had to be replaced and 30 others straightened. Bill Goss supervised the work for Gerwick, using part of his crew from the Eureka Slough Bridge which Gerwick is building a few miles away.

Trestle along bluff

Worst spot on the line was Scotia Bluff, about 30 mi. south of Eureka, where the trains run close to the bluff on trestles about 40 ft. high. The accompanying pictures best show the situation there. The water crested several feet above the tracks—hard to imagine when the Eel River is seen at its normal elevation. Heavy drift took out two sections of trestle, one 315 ft. long, the other 375 ft. long.

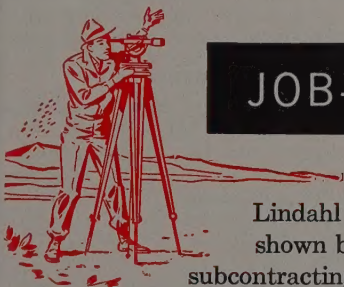
An emergency contract was drawn up with Morrison-Knudsen Co., Inc., and reconstruction began on January 3. The job was a tough one in several respects. The tracks hung in two long sways from the undamaged parts of the trestle, and underneath was a mass of wreckage. There was very little space to store material and nearly all of it had to be brought in as needed. Most of the lumber companies in the area were shut down or crippled and M-K had to go as far as 50 mi. from the site to get enough redwood timbers for the work. Most

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Grading on the Congress Street Superhighway in Chicago

JOB-ENGINEERED FINANCE PLANS



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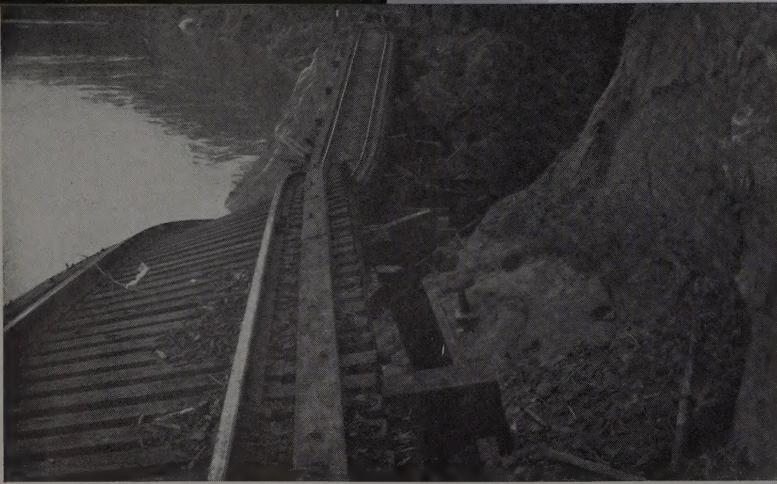
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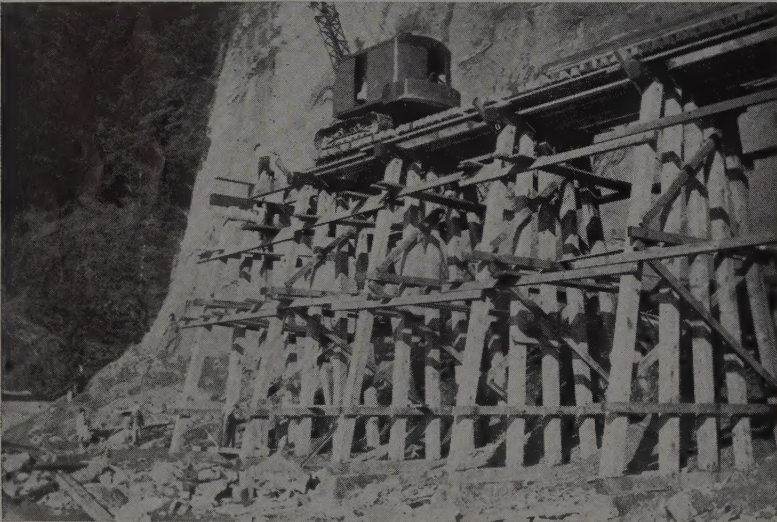
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THIS IS how it looked when Morrison-Knudsen first came on the job. Two 300-ft. sections of track hung suspended over a tangled mass of wreckage. It took a week to clear the debris away.

BELOW—It's hard to believe, but the water was 4½ ft. above the top of the trestle in the December flood. The river climbed halfway up in mid-January, forcing a temporary shut-down. The trestle was lashed with cables and escaped damage. Crews worked two 10-hr. shifts.



GOING INTO place is an 8x18-in. fir stringer to close the gap. Trains were running here a few days later. But on January 27 about 135 ft. was taken out again by a landslide.



of the equipment in the area was tied up in other emergency work and some pieces had to be brought to the job site by truck from Southern California. Movement of men and materials was very difficult because of the surrounding road conditions. And to top it off, it rained day and night for 15 of the first 17 days the job was in progress.

Main equipment

The main pieces of equipment M-K used were a ¾-yd. Unit crane and a Northwest 25 crane, which crawled along the trestle right on the ties, an Onan light plant and a Kohler light plant, a Worthington and an Ingersoll compressor, and two McCulloch chain saws which framed all the material.

The first step was to clear out of the way the debris and damaged sections of trestle and track which could not be salvaged. The suspended track dropped loose only after both the rails and the timber stringers were cut. Clearing took five days and work on the new trestles began on January 8.

Each bent consists of five 12x12-in. redwood timbers about 40 ft. long—the middle one vertical, the next two sloping at 1 to 12, and the outside two at 3 to 12. Across the top of each bent is a 12x14-in. fir member supporting the six 8-18-in. fir stringers. Next are the 9-ft. long ties. The rails are laid down last. Most of the bracing is 4x8-in. redwood, with the longitudinal girts of 6x8-in. redwood.

A bucketful of concrete

Some of the bents rested on 12x12-in. redwood sills 20 ft. long resting directly on the rocky ground; others were anchored to existing concrete stub piers. The only concrete used on the job was a bucketful or two to grout the anchor bolts.

On January 13 the river began rising as the second flood moved in. About 64 men were working on two 10-hr. shifts but the water level forced a shut-down on January 14. The newly built sections were lashed down with cables as securely as possible before the flood crest arrived. A total of four shifts were missed as the water climbed about half way up the trestle 17 ft. above its normal level. When crews returned to the scene on January 16 they found that the new flood had not caused any further damage. It took only five more days to finish the project.

More trouble

Morrison-Knudsen's job was over but there was little rest for the crews of NWP. The day after the trestle was completed a slide 50 mi. further south covered 375 ft. of track with 25 ft. of mud and rocks. And on January 27 about 135 ft. of the new trestle at Scotia Bluff was taken out by another slide. NWP crews finally

(Continued on page 90)

HIGHWAYS:

Fallon Bill for Federal funds

Authorization of a \$30,000,000,000 federal-aid highway program is before Congress—Plan provides for 13 yr. construction and completes the interstate network.

A NEW BILL (H. R. 8836) authorizing a \$30 billion federal-aid highway construction program was introduced January 26 in the House of Representatives by Congressman George H. Fallon, Chairman of the House Subcommittee on Roads of the Committee on Public Works. The Bill authorizes \$24.8 billion in federal funds for completion of the 40,000-mi. Interstate System in 13 years and approximately \$1.5 billion in federal funds for construction on the Primary and Secondary Systems and urban extensions for the next two fiscal years.

The Fallon Bill contains no provision for financing of the vast program. In effect, this means that Congress is faced with a \$25 billion question: How shall this greatest of all public works programs be financed? The understanding is that the revenue-raising problem will be a matter for solution by the House Ways and Means Committee, the only Committee of Congress permitted under the Rules and, in effect, under the Constitution to initiate tax legislation.

Completes interstate network

The most important feature of the Fallon Bill is its authorization of \$24.825 billion in federal funds for completion of the interstate network, to be accomplished over a 13-yr. period beginning in the fiscal year 1957 which starts in July, 1956. This Federal expenditure represents roughly 90% of the estimated cost of building the system; the remaining 10% representing approximately \$2 billion, would be raised by the states. Therefore, the total amount in federal and states monies for the interstate routes would be roughly \$27 billion.

The Fallon Bill provides that expenditures for the Interstate System will be on a gradually accelerated basis, tapering off after the 9th year. The following table explains how the money is to be spent:

INTERSTATE SYSTEM	
Authorization	Fiscal Year
(Matching Basis)	
(90 % Fed.—10 % State)	
\$ 1,025,000,000	1957
(In addition to the \$175 million already authorized for 1957)	
1,700,000,000	1958
2,000,000,000	1959

2,200,000,000	1960
2,200,000,000	1961
2,200,000,000	1962
2,200,000,000	1963
2,300,000,000	1964
2,300,000,000	1965
2,200,000,000	1966
2,000,000,000	1967
1,500,000,000	1968
1,000,000,000	1969
\$24,825,000,000	13 years

Federal funds for the Interstate System, under the Fallon Bill, will be apportioned in accordance with the report of the Bureau of Public Roads to Congress last year, which was based on state estimates of needs as compiled by the Bureau. The funds will be distributed in the ratio which the estimated cost of completing the Interstate System in each state bears to the total cost of completing the system in all the states.

ARBA ideas incorporated

The repeated recommendations of the American Road Builders' Association for provision of a long-range, balanced program which would provide for the equitable improvement of all of the federal-aid system, has been recognized, to a degree, in the Fallon Bill.

While the Bill specifically authorizes funds for 13 yr. for the interstate program, it makes provision only through fiscal year 1959 for the other federal-aid systems. However, it contains a policy statement that all segments of the traditional federal-aid systems (primary, secondary, and urban) be improved to standards adequate for national defense and the economy as soon as practicable. The Secretary of Commerce is directed to include in his Annual Report to Congress a statement on the progress made in obtaining this objective, together with any recommendations he may wish to make for the guidance of Congress.

Authorize through 1959

Actually, although the Fallon Bill envisions a 13-yr. program on an accelerated basis for the primary, secondary, and urban programs until an annual total of federal aid of \$1.025 billion is reached by 1969, authorizations in the Bill only cover the fiscal years 1957 through 1959.

The Federal Aid Highway Act of 1954 has already authorized \$700 million for these systems for fiscal year 1957, beginning next July. The Fallon Bill would increase the 1957 authorization by \$25 million (bringing it to \$725 million) and would authorize \$25 million more for 1958 (\$750 million) and a further increase of \$25 million for 1959 (raising it to \$775 million).

Public-land roads

In addition to the above \$24.825 billion authorized for 13 yr. for the interstate program and the \$1.55 billion for the primary, secondary, and urban programs, the Bill continues, at the present level, authorizations of federal funds for highways and parkways on public lands. These authorizations apply to the fiscal years 1958 and 1959. Exclusive of authorizations for the Inter-American Highway, which has been provided for in separate legislation, federal expenditures for these roads will be per annum as follows:

Forest Highways	\$22,500,000
Forest Roads and Trails	24,000,000
Park Roads and Trails	12,500,000
Parkways	11,000,000
Indian Roads	10,000,000
Public Lands	1,000,000

To recapitulate, the Fallon Bill advocates a 13-yr., \$27 billion road-building program for completion of the Interstate System with the Federal Government assuming 90% of the cost. It provides for a 2-yr. program for the primary and secondary systems and urban projects (with federal-state funds matched on a 50-50 basis) of \$3 billion. In addition, it provides for continuation of federal expenditures for roads on public lands at the present level.

Financing not in bill

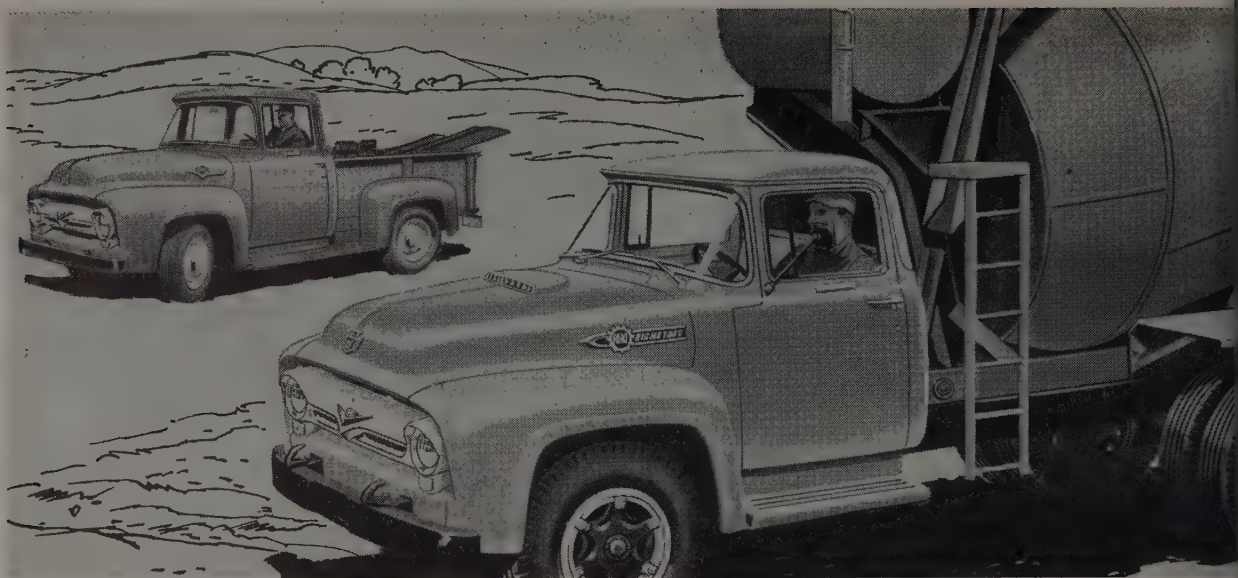
Further, the Fallon Bill makes no provision for financing. This presumably will be left as a responsibility of the House Ways and Means Committee.

In addition, the Fallon Bill, as introduced, contains no wage rate provisions and does not call for application of the Davis-Bacon Act.

With respect to other particulars, the Fallon Bill provides the following:

1. Increases the \$10 million emergency fund authorized in the 1954 Act to \$30 million for repair of highways on the federal-aid systems which are damaged as a result of

(Continued on page 56)



F-100 8-ft. Pickup—GVW 5,000 lbs.

T-800—GVW 42,000 lbs.; GCW 65,000 lbs.

Ford saves you money with

YOU SAVE ON PARTS REPLACEMENTS—*add miles to engine life!*

YOU SAVE ON SHOP LABOR—*cut maintenance to the bone!*

YOU SAVE ON YOUR ORIGINAL INVESTMENT—*get more work done per truck!*

Ford Trucks for '56 save you money right from the start. And, they keep on saving with their extra-sturdy, long-life engine design.

For instance . . . Ford Engineers have now introduced into all heavy-duty engines the greatest valve advancements ever. As an example, see the exhaust valve in diagram on right page. The valve stem is hollow and partially filled with powdered sodium. When the sodium gets hot, it *turns into a liquid*. As it moves up and down, it carries heat away from valve head—*allows it to operate up to 225° cooler!* Result: a cleaner-running, more burn-free, longer-lived valve face.

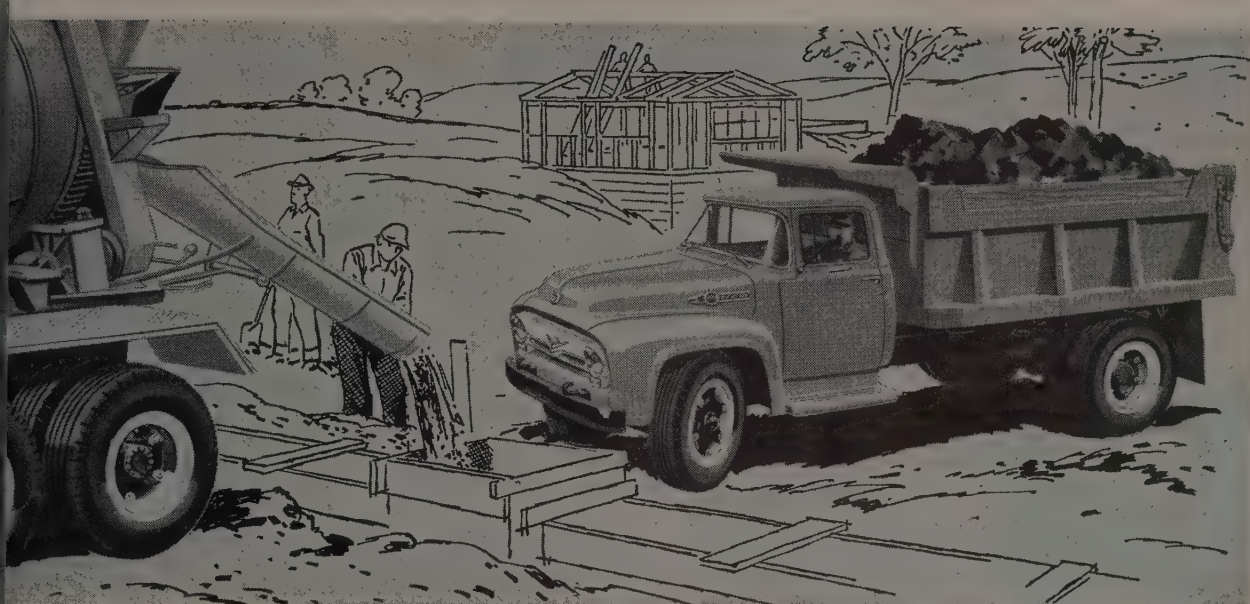
Ford's long-lasting engine design pays off for you in every way. You save money on parts replacements such as piston rings and bearings. You save on shop labor—extend time between preventive maintenance jobs like valve adjustments, valve grindings, compression tests, ring jobs and the like.

And you can save on driver costs if you can keep trucks out of the shop and on the road. Yes, you save in every way when you get more work done per truck!

There's a Ford Truck for every trucking job. Before you buy your next truck, Test Drive a Ford Economy Truck.

FORD TRUCKS LAST LONGER

Certified by independent insurance actuaries for the ninth consecutive year! Studies of over 10,068,600 current license registrations show that Ford Trucks last up to 9.9% longer than any of the other 4 leading truck makes!



F-900—GVW 29,000 lbs.; GCW 60,000 lbs.

new long-life engine design

Hauls up to 3000 lbs. more than other 6-wheelers—New Ford T-800

● New power and hauling capacity of the Ford Tandem BIG JOB cuts hauling time on every run—makes giant cargos seem light-weight. You have a choice of two gas-saving Short Stroke engines. Either the 190-h.p. *Torque King* V-8 or, the 200-h.p. *Torque King Special* V-8.

You have new engine advancements for longer life (some explained and illustrated at the right).

New high-capacity tubeless tires, heavy-duty 5-speed transmission and Power Steering are standard equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-air brakes are available at low extra cost.

New *Driverized* Cabs for driving comfort and convenience have *Lifeguard* Design safety features found in no other truck. Lifeguard steering wheel helps protect driver from steering column; Lifeguard door latches help keep doors from jarring open in case of accident.

Positive valve action is provided by stronger, tubular push rods and new equal-coil valve springs.

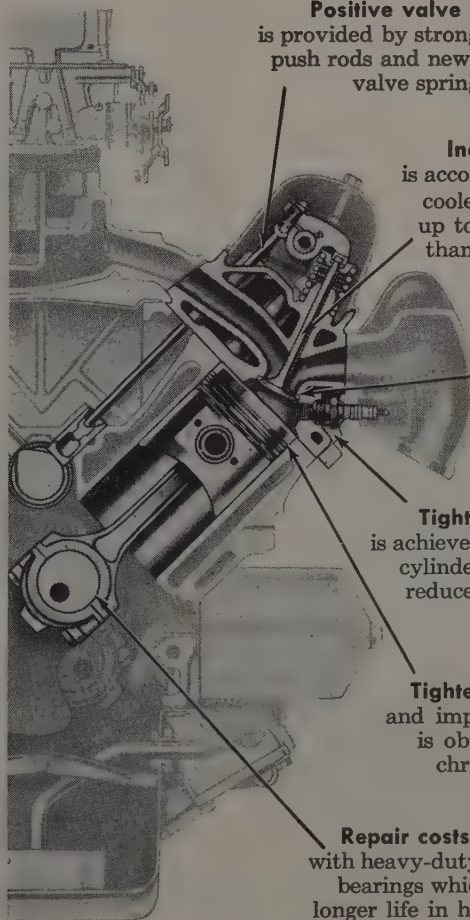
Increased valve life is accomplished with sodium-cooled exhaust valves—up to 225° cooler-running than solid-stem valves.

Longer valve and seat life are the result of solid tungsten-cobalt alloy facings and exhaust valve seat inserts.

Tighter valve closing is achieved with stress-relieved cylinder heads that help reduce valve distortion.

Tighter compression seal and improved ring durability is obtained with thicker chrome-plated rings.

Repair costs are lower with heavy-duty copper-lead bearings which provide longer life in hard service.



THE BEAVERS

First annual awards dinner of the heavy-construction men of the West honors sixteen who have served with distinction.



Wm. A. JOHNSON
First President
of The Beavers
and
Chairman of the Board
American Pipe and Construction Co.

ABOUT 1,000 MEN of the heavy construction industry of this Western region attended the First Annual Award Dinner of the Beavers in Los Angeles, January 27, participating in the recognition of 16 individuals honored for outstanding work in their respective fields. The Beavers, formed about a year ago, represents the heavy-construction men in the Western United States, organized to honor men who have carried forward such engineering miracles as Hoover Dam, Shasta Dam, and Grand Coulee Dam, at the time of an annual award dinner. The meeting on January 27, 1956, was the first such dinner and was presided over by William A. Johnson, the first president of the Beavers, and Chairman of the Board, American Pipe and Construction Co.

In a salute to the Beavers, President Johnson set the keynote of the meeting by stating: "I truly feel that the honors and Oscars being awarded tonight are richly deserved, not only individually but these men typically represent the character and abilities of the men who comprise the heavy engineering construction industry. The nature of construction and its difficulties, especially engineering construction, requires certain basic traits of ability to create success. We also have reason to be proud of the integrity, idealism, and social concern of these men in the construction field. Tonight we are honoring the American contractor who exemplifies the versatility, skill, and venturesome spirit that has made this nation the great and powerful nation it is. In war he helps pave the road to victory—and in peace he builds the foundation for a better world to come."

Philosophy and objectives

Although the annual get-together is primarily a social function at which the awards are presented, the organization has a deeper significance, and one that is symbolic of the heavy-construction industry of the West. The organization states its philosophy and its general objectives as follows:

"The construction fraternity is composed of firms and individuals who, in many cases, have devoted a lifetime

to that industry. It is felt that deserved recognition should be given not only to the principals but generous recognition, likewise, should be given to other individuals who have been an essential and important part of the construction team and who also have contributed generously to the success and honor of the industry . . .

"It is also believed that much goodwill can be directed to the industry by the proper and timely recognition, under 'supply,' of our Associate members in allied firms—not overlooking by any means those Legislators and members of the Press who lend their support to the industry. These same people many times show their belief and faith in the desirability of the contract system and give it their generous support. Our competitive contract system is the cornerstone of the construction industry and has served the public well by developing better construction and improved and more efficient equipment which has resulted in decreased costs.

"While the purpose of this organization is primarily social, yet the Beavers recognize that the slogan, 'Skill, Responsibility and Integrity,' is basic and also that goodwill, friendliness, and consideration in dealing with each other will bring real fellowship and pleasure and will contribute greatly to the success of the Beavers as a club of goodwill.

"The 'good Beaver' learned early that the old adage is true: 'He profits most who serves best.' By observation and practice he also learned that he 'who serves best' practiced ethical principles. He also discovered a long time ago that 'profits most' meant not only dollarwise but also the real inner satisfaction that flows to one because of a job well and honestly done."

Officers

The officers for 1955-56—original group of officers were: President, William A. Johnson, Chairman of the Board, American Pipe and Construction Co.; Senior Vice President, L. E. Dixon, L. E. Dixon Co.; Junior Vice President, George H. Atkinson, Guy F. Atkinson Co.; Secretary-Treasurer, J. C. Maguire, J. C. Maguire Co.; Assistant Secretary-Treasurer, J. P. Shirley, Jr., Gunther and Shirley; Ambassador of Goodwill, James L. Lovell, I. E. du Pont de Nemours and Co.

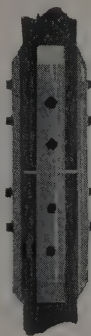
The executive committee included William A. Johnson, L. E. Dixon, E. L. Kier, John McLeod, and J. C. Maguire.

Robert B. Edwards, Vice President, American Pipe and Construction Co. was Chairman of the Awards Day Committee.

Award winners and citations

Awards and appropriate "Oscars" (see front cover) were presented in four classifications: Management, Supervision, Engineering, and Supply. In addition, three posthumous awards were made. The citations follow:

"Trees jest don't grow long enough for this here job," grumbled Paul Bunyan to Babe, the Blue Ox. He was driving piles for his bridge across Lake Michigan. "Now if I could git me one o' them machines✱ the Baxter folks developed, Babe, I could splice me up a piling 900 feet long and get to the bottom o' this pesky pond."



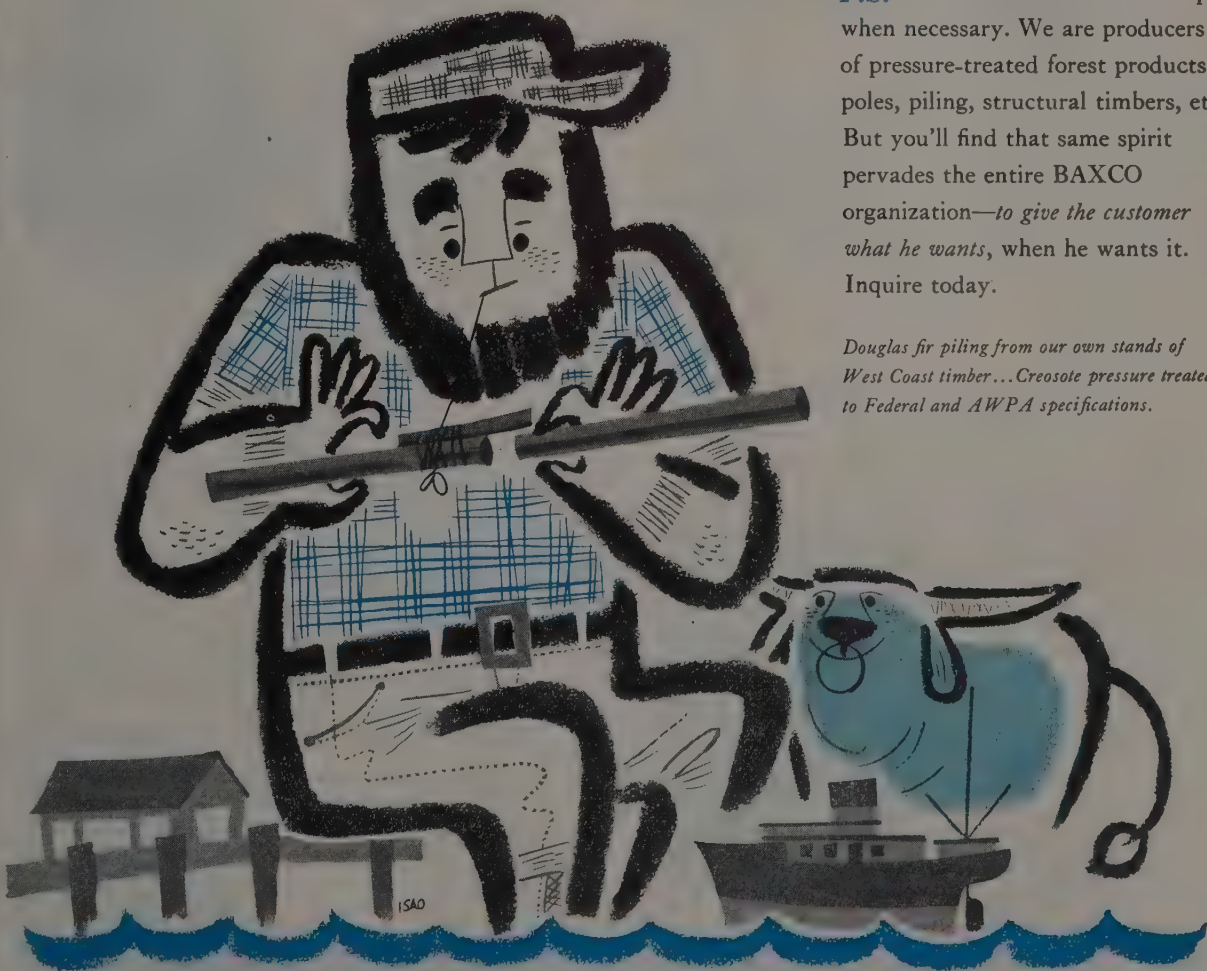
BAXCO PRESSURE TREATED PILING *(spliced or unspliced!)*

✱ As a matter of fact, Paul, we *did* develop a pile-splicing machine—the only one of its kind in the world. It happened this way: engineers found that record length piling—160 feet long—would be required for the pier fender structure on the Richmond-San Rafael bridge in San Francisco. No such lengths existed.

So what to do? So BAXCO engineers got busy with blades and motors and wheels—and came up with the answer...an efficient machine that spliced together 1448 of the longest pilings ever seen. And did the job in record time.

P.S. We are not inventors—except when necessary. We are producers of pressure-treated forest products: poles, piling, structural timbers, etc. But you'll find that same spirit pervades the entire BAXCO organization—to *give the customer what he wants*, when he wants it. Inquire today.

Douglas fir piling from our own stands of West Coast timber...Creosote pressure treated to Federal and AWWA specifications.



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J. H. BAXTER & CO. 120 Montgomery Street, San Francisco 4, California

Harry W. Morrison

Harry W. Morrison, co-founder and present chairman of the board of directors of Morrison-Knudsen Co., Inc., of Idaho, started a partnership with Morris Knudsen in 1912 which now is reported the world's largest heavy construction company.

Today, M-K as it is known, builds everything from giant dams to vast airbases and is the owner of one of the largest diversified stocks of general construction equipment possessed by any one company. As chief executive, Mr. Morrison is not content to conduct business from his modest office in Boise. He spends three-quarters of his time visiting M-K projects, most often by plane and invariably accompanied by his wife.

He was born in 1885 in Illinois and began his career in 1904 as a timekeeper for Bates & Rogers Construction Company on the Minidoka Dam and Powerhouse project in Idaho. Working successively as an axman, chainman, rodman, levelman, foreman, draftsman and superintendent, he obtained the broad experience which was to enable him to build the great corporation he heads today.

Honor and recognition have come to him from many quarters. In 1950 he was awarded an honorary degree of doctor of science by the University of Idaho and Mrs. Morrison was similarly recognized when she received a doctor of laws degree from Pepperdine College in Los Angeles.

Harry Morrison is a great contractor. He has, deserves, and enjoys world-wide recognition as one of the greatest. His achievements have brought great honor to the construction industry.

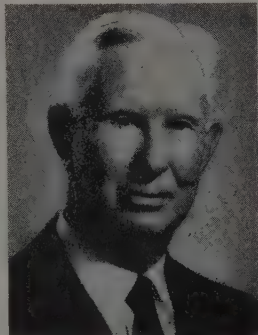


Guy F. Atkinson

The Guy F. Atkinson Company represents three generations of contractors and the organization has been active on engineering projects in many parts of the world. These include many of the best-known projects of the century: Hansen Dam in Los Angeles County; Harlan Dam, Nebraska; Pine Flat Dam, California; the Ross Powerhouse and Rock Island Dam, and all eight contracts on the \$105,000,000 McNary Dam and Powerhouse.

During World War II the company built the Roosevelt Navy Base at Long Beach, California, several large construction projects in Alaska, and now holds \$50,000,000 in contracts on The Dalles Dam and Powerhouse. After the war the company was a partner in building the \$250,000,000 atomic plant at Richland, Washington, and participated in the \$50,000,000 Grecian Highway program and in major Army construction on Okinawa. At present it is supervising the \$65,000,000 Sakuma Dam in Japan and has just completed the \$32,000,000 Ambuklao Dam in the Philippines.

"Uncle Guy," as he is affectionately known in the construction industry, was born in Pennsylvania in 1875,



youngest of six brothers, all of whom became contractors. He is a member of the American Society of Civil Engineers, was national president of the Associated General Contractors of America in 1939, and holds a doctor of science degree from Willamette University. During a record of more than half a century of construction work, well and honestly done, Guy F. Atkinson has indeed achieved much and has brought honor to himself, his company, and the construction industry.

Henry J. Kaiser

Few men have equaled the record of Henry J. Kaiser in their impact upon the nation's economy. Born in New York in 1882, he entered the construction field in 1911 and established his first company three years later when he was 32 years old. During the next dozen years his organization completed several million dollars of highway construction in Washington, Idaho, British Columbia, California, and Cuba.

Henry Kaiser has been a builder of industries. Kaiser-managed companies include Permanente Cement, Kaiser Steel, Kaiser Aluminum & Chemical, Kaiser Gypsum, Kaiser Metal Products, Kaiser Community Homes, Kaiser-Willys automotive and the parent Henry J. Kaiser Company which includes Kaiser Engineers, a sand and gravel division and ownership interests in several other organizations. All told, Kaiser interests filter into 20 types of industries with 116 factories producing 290 products which supply more than a billion dollars worth of goods and services annually.

A genial mixer with a ready chuckle, Henry Kaiser feels a strong bond for his fellow man, an indication of which is his heartfelt interest in the 43 Kaiser Foundation Hospitals and Medical Centers which provide care for more than half a million health plan members—care which might not otherwise be available.

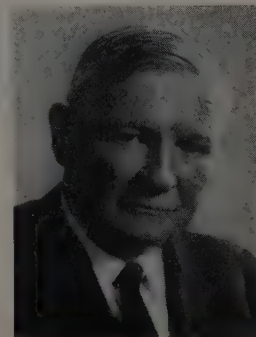
Henry Kaiser has demonstrated his versatility in any number of industries but he is especially proud, and has reason to be, of his record and achievements as a contractor.

Herman Brown

Herman Brown found himself in the construction industry in 1914 as a young Texan just out of school. He was working for a contractor who paid him off with two teams of mules and some worn-out, mortgaged equipment.

From this beginning, he and his brother George succeeded in building one of the world's most successful construction companies, Brown & Root, Inc., the largest and best-known construction organization in the South.

Herman Brown was born in 1892 and attended the University of Texas. During the years in which he has worked to make his company known in most parts of the world, he has found time



OSHKOSH 4-WHEEL DRIVE

"50-50" CONCRETE CARRIER

Really Performs!



Power, 4-wheel traction, stamina — plus easy maneuverability — make the Oshkosh 50-50 your best buy in a ready-mix concrete carrier.



Oshkosh 50-50 hub deep in soft sand at the "Country Club Estates" — a new subdivision adjacent to City of Coronado. Tough going for most rigs — easy for Oshkosh!



It's hard to believe — but the 4-wheel drive Oshkosh 50-50, with 18,000 lb. payload on each axle, pulls through soft sand quickly and easily... spots loads anywhere!

SAYS

**SAN DIEGO
TRANSIT-MIXED CONCRETE CO.**
SAN DIEGO 3, CALIFORNIA

Gentlemen:

Your Oshkosh rig really performed. Our others needed planking to do anything, even on relatively firm sand. The Oshkosh 50-50 needed no planking. While it sank down in the soft sand, it never stopped even once.

JOB: "Country Club Estates", new subdivision, City of Coronado, adjacent to North Island, deep sand everywhere.

GENERAL CONTRACTOR: BOSWELL
CONSTRUCTION CO., SAN DIEGO

CONCRETE CONTRACTOR: HARBOR
CONSTRUCTION CO., SAN DIEGO.

KEN STOCKWELL, SUPT.
CONCRETE: SAN DIEGO TRANSIT-MIXED
CONCRETE CO.

Greater payloads! Better traction! More maneuverability! . . . good reasons to choose Oshkosh

Here's the truck specifically engineered and built for the ready-mix concrete industry — backed by over 39 years' experience in manufacturing 4-wheel drive trucks for on-and-off highway hauling. With 18,000 lbs. payload on each axle, the Oshkosh 50-50 lets you spot load where other concrete carriers can't go . . . to get jobs competition can't handle. Write for full information today!

OSHKOSH

**4 WHEEL
and
6 DRIVE
TRUCKS**

OSHKOSH MOTOR TRUCK, INC.
OSHKOSH WISCONSIN



to engage in many business enterprises including banking, petroleum, mining, and several equipment companies.

From headquarters in Houston, Texas, he maintains close contact with Brown & Root, Inc., activities all over the world. At the present time they include a dam under construction in Haiti, another in Pakistan, a gas re-pressuring plant in Venezuela, airfields in Spain and chemical plants in Canada and Italy.

To the many who know him and especially those associates who know him best, Herman Brown has proved himself an able and great contractor.

M. H. (Harvey) Slocum

During his 57 years in the construction industry, M. H. (Harvey) Slocum has combined skill with a natural zest to overcome difficult challenges which have placed him as one of the industry's top supervisors.

He was born in California in 1887 and when only 12 years old obtained his first construction job, that of driving nails into pilings to prevent teredo destruction. Since that humble beginning his activities have been numerous and complex. In addition to supervising many of the world's important engineering construction projects, he has provided estimates on many major dams including Grand Coulee, Hoover, Bryant, Shasta, Bull Shoals, Pine Flat and many others. The Bhakra and Exchequer projects have also felt his expert touch.

In addition to supervision, Harvey has acted as consultant to the Chinese Republic, the government of India and various contractors. He took time out from his current work on Bhakra Dam on the Sutlej River in Punjab, India, to attend this first annual meeting of the Beavers.

Harvey can walk on a job and get the most out of his men. He has a profound respect for the "construction stiffs" and wrote in a recent letter, "I would be pleased to have them evaluate M. H. Slocum. If they say you are a bum, you are, and contrariwise, if they say you are tops or any degree thereof, you are!"

Actually, Harvey Slocum was never termed a "bum" by any "construction stiffs." They soon recognized him for what he was and is—one of the world's great superintendents and builders.

C. B. (Woody) Williams

Construction has been a part of C. B. (Woody) Williams' life since his birth in 1902 in Minnesota. His father was a heavy construction carpenter-superintendent who covered most of the West and Woody attended 27 different schools before finishing his education.

In 1926 he joined the 14-year-old firm of Morrison-Knudsen Co., Inc., as a labor foreman during the construction of Guernsey Dam in Wyoming. For many years he worked with the late, revered Frank T. Crowe whose triumphs included Hoover and Shasta Dams.



Woody and Frank Crowe were so successful in overcoming problems on the Deadwood Dam project in Idaho that they were emboldened to convince Harry Morrison that M-K could and should build Hoover Dam. The story is well-known. In the end Frank Crowe was general superintendent and Woody was his assistant on the dam that today is considered the masonry model of them all.

Dams built by Woody Williams include Roy Inks, Roza, Kanopolis, Norfolk, Kortess, Boysen, Cabinet Gorge, Waneta, Yale, Lucky Pear, Lookout Point, Menihok, Marguerite and McArthur Falls. He is now building Table Rock Dam in Missouri and Donnell Dam in California and his men are constructing dams as distant as the Seyhan project in Turkey.

Woody Williams has played an important and skillful part in the building of a large number of the West's most massive structures. His ability and achievements have brought honor to the construction industry.

C. W. (Smoky) Wood

C. W. (Smoky) Wood was born at McCook, Nebraska, in 1899. He attended schools at Fort Morgan, Colorado, and graduated from Colorado A & M with a bachelor of science degree in civil engineering, then served as a field artillery second lieutenant during World War I.

For five and one-half years Smoky was employed by the Bureau of Reclamation and served as office engineer on the construction of Guernsey Dam in Wyoming and on the Easton division of the Kittitas project in the State of Washington.

He joined the General Construction Company as engineer in 1928, becoming vice-president in 1946 and a director in 1947. During this period he was active on the following major projects:

Owyhee Dam, San Francisco-Oakland bay bridge piers, Bonneville power house and navigation locks, Hetch Hetchy Dam, Ross Dam, Paine Field Airbase, Destroyer Yard A in Seattle, the Seattle-Tacoma Shipyard at Tacoma, Navy mooring piers at Bremerton, Washington, Hungry Horse Dam in Montana, Capilano Dam in British Columbia, a 4,000-ton concrete floating dry dock for the Navy in Seattle and the First Avenue, South, floating bridge piers in Seattle.

Smoky Wood is a virile, two-fisted leader and superintendent and, as one of his associates said, "He is one of the best."

Lee T. Grider

Born on a farm near Downey, Calif., in 1879, Lee T. Grider has spent 57 years in the construction business, starting as a concrete laborer on bridge and ditch work in Southern California. At the turn of the century he worked as a bridge foreman, concrete foreman, engineer and surveyor, and superintendent, estimator and project manager.

Mr. Grider's life has been devoted to construction. He spent 30 years with Bent Brothers, starting in 1910 as job superintendent on road construction in California and ending with dissolution of the firm at the conclusion of the Conchas Dam project in 1939. He then worked with M. H. Golden and Walter Trepte at San Diego, the L. E. Dixon Company and the West Construction Company and for the U. S. Navy on several airbases during





Clearing and skidding on a logging operation is the full-time job of this HD-11 Tractor. Equipped with a canopy and dozing blade, the unit is working in Deschutes National Forest for Lundgren Lumber Co., Bend, Ore.

Road building and maintenance in Franklin Parish, La., get an assist from a new HD-11 tractor-bulldozer. The unit is at work widening 40 miles of farm-to-market road near Wisner. Later, it will aid with regular maintenance on 1,750 miles of parish road.



Scraping and dirt moving for Don L. Builders, Inc., Kansas City, Mo., this HD-11 Tractor and 7½-yd Allis-Chalmers scraper combination moves 15 yd every sixteen minutes on a 300-yd haul. Operator Ralph Alewel states, "This tractor has plenty of power. I'm running in third gear most of the time. The unit is much more comfortable than any I've been on."



Excavating and stockpiling topsoil for a new athletic field in Bel Air, Md., this HD-11 Tractor with bulldozer is on the job about 50 hours a week. The owners, T. & T., Inc., Whiteford, Md., use the tractor to strip topsoil, grade area, replace topsoil and landscape. About 28,000 yd of excavation will complete the job.



Excavating and dirt moving on a 12,000-yd job for a service station location is speeded by this HD-11G tractor shovel. The new unit is one of a fleet of five Allis-Chalmers tractors owned by Bass Construction Co., Seattle, Wash. A new Allis-Chalmers engine, 105 net engine hp, provides plenty of power and handles hydraulic requirements with ease.



SEE YOUR **ALLIS-CHALMERS** CONSTRUCTION MACHINERY DEALER

ARIZONA

Neil B. McGinnis Equipment Company—Phoenix

NORTHERN CALIFORNIA

Industrial Tractor Sales—Sacramento
Shasta Truck & Equipment Sales—Redding
Buran Equipment Company—Oakland and Santa Clara
Alkins Tractor Co.—Eureka

SOUTHERN CALIFORNIA

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

IDAHO

Southern Idaho Equipment Co.—
Idaho Falls and Twin Falls
Southern Idaho Equipment Co. of Boise, Inc.—Boise

MONTANA

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

NEVADA

A D Machinery Company, Inc.—Elko and Las Vegas
Reno Equipment Sales Co.—Reno

OREGON

Pape Brothers—
Eugene, Roseburg and North Bend
Haupter Tractor Company—
Medford and Klamath Falls

Wood Tractor Company—Portland

UTAH

Cafe Equipment Company, Inc.—Salt Lake City
WASHINGTON

A. H. Cox & Company—Seattle
American Machine Company—Spokane
Mid-State Equipment Company—Wenatchee

WYOMING

Studer Tractor & Equipment Company—Casper

World War II. Mr. Grider has also supervised construction on such well-known projects as the San Dieguito, Devil's Gate, San Dimas, Henshaw, Little Rock, Bullard's Bar, Talent, Exchequer, Pacoima, Bull Run, Calaveras, Morris and Conchas dams. He has also worked on tunnels and reservoirs for the city of Phoenix and in the construction of approximately 40 oil storage reservoirs.

"It takes an 'idea,' a new way of doing things at a lower cost in order to be awarded a contract," Lee said recently and more than half a century's activity has not dampened his enthusiasm for construction work. Lee Grider is still active and is truly one of the West's great superintendents.

Thomas M. Robins

An engineering officer since graduation from West Point in 1904, Major-General Thomas M. Robins (USA Ret.), has seen service throughout the United States and most of its territorial possessions. He served in Cuba in 1908 and from 1909-1912 was engaged in construction of harbor defenses at Manila.

After graduation from the Army War College in 1926, he served in the office of the Chief of Engineers in Washington. In 1929 he became division engineer of the Pacific South division at San Francisco, and later was division engineer of the Pacific division at Portland, Oregon, in 1934 when the Bonneville Dam was built and the Willamette Valley Flood Control Project was authorized.

In 1938 General Robins was placed in command of the Post and Engineer School at Ft. Belvoir, Virginia. In 1939 he was appointed a brigadier-general serving as assistant chief of engineers. Promoted to major-general in 1942, he was then named deputy chief of engineers.

During World War II, General Robins was in direct charge of the \$12,000,000,000 Army construction program, greatest in U. S. Corps of Engineers wartime history. He retired in 1945 and has since been engaged in business as a consulting engineer with headquarters at his home in Portland. General Robins has contributed greatly and brought much credit to both the engineering and construction professions.

Julian Hinds

Julian Hinds was born in Alabama in 1881 and received a degree in civil engineering from the University of Texas in 1908. After a short period of teaching for his alma mater, he joined the Chicago, Milwaukee & St. Paul Railway in Chicago as a designer, then went with the Bu-



reau of Reclamation in 1910 when the Bureau opened an office at Denver. He was with the Bureau until 1926 and obtained extensive experience in the construction of all types of irrigation structures, particularly in the design and construction of dams.

Until 1929 he was in charge of design and construction on the Calles Irrigation Project at Pabellon, Mexico. That year he became associated with the Department of Water & Power in Los Angeles as engineer of hydraulic design followed by a long period of service with the Metropolitan Water District of Southern California, from 1930 until his retirement in 1951, during which time he served as chief designing engineer, assistant chief engineer and at the time of his retirement, general manager and chief engineer.

The United Water Conservation District of Ventura County called him from retirement to plan and build its water conservation system which was completed this year.

Mr. Hinds is a member of the American Water Works Association, a director of the American Society of Civil Engineers, co-author of "Engineering for Dams," author of "Handbook of Hydraulics" and in 1926 he was awarded the Norman Medal of the American Society of Civil Engineers.

Julian Hinds is regarded as one of the West's most distinguished engineers.

Bernhard F. Jakobsen

When Bernhard F. Jakobsen was a lad in his hometown of Hjoering, Denmark, he showed such engineering aptitude that his father, a distinguished Danish attorney, resolved that the boy should receive the necessary technical training to capitalize on the skill demonstrated at such an early age.

He received his education at the University of Dresden and came to the United States where he soon claimed an American bride and started a long career in engineering and heavy construction. During this time he has been associated with many major projects throughout the nation.

Some of the major projects with which he has been associated are the Elephant Butte Dam, Kerckhoff Dam, Pacoima and Big Santa Anita Dams, Hansen Dam, Santa Fe Dam, Whittier Narrows Dam, San Antonio Dam, Salinas Dam, Pine Flat Dam and Folsom Dam.

With the firm of LaRue & Jakobsen during the years 1927-1935 he was a consultant on the Victoria, Michigan and Hamilton and Hoover Dams. He was awarded the Norman Medal of the American Society of Civil Engineers in 1924 and again in 1927. When he returned to Denmark in 1948 to represent the State Department at engineering conferences in Stockholm and Rotterdam, he received a virtual hero's welcome, proof of the esteem and respect he commands both here and abroad. Bernhard Jakobsen is indeed a world-recognized engineering authority on dams.



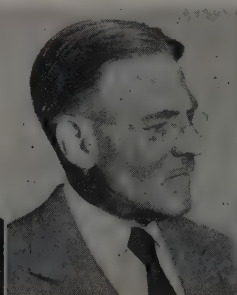
Hinds



Robins



Jakobsen



Foster



Bowers

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J. S. Foster

One of the real "old timers" in the construction business, J. S. Foster was born in New Hampshire in 1867 and received his education at a military school where the head master comprised the entire teaching staff and lectured on academic subjects as well as conducting drills and parades.

After completing his education, Mr. Foster's entry into the construction business was with the Link Belt Machinery Company in Chicago as an understudy on the order desk. In 1888 he became connected with the Lidgerwood Manufacturing Company where he was to remain for 60 years. There he worked closely with the late Spencer Miller in the development of cableways which were to find widespread application in the heavy construction industry. Their first use, Mr. Foster recalls, was in the building of the Austin, Texas, dam. Later, cableways were used extensively by the Bureau of Reclamation in the construction of the Gatun Locks at Panama, and in major construction projects in almost every quarter of the globe.

During his long period with Lidgerwood, Mr. Foster rose to the post of chief engineer and vice president and became a world-recognized authority on cableways. Sixty years with one company brought him the respect and honor of his many friends and his friendly competitors. After this great record Mr. Foster is still 89 years young!

Nathan A. Bowers

Since 1910 when he joined the editorial staff of the Engineering News-Record magazine, Dr. Nathan A. Bowers has followed and written of the progress of heavy construction both here and abroad. He was general manager of the McGraw-Hill Publishing Company in California from 1930 to 1934 but his major activity has been in reporting the develop-

ment of the West. For 40 years he was Pacific Coast Editor of the publication and today remains as a consulting editor.

Dr. Bowers was born in San Francisco in 1886. He received a bachelor of science and a civil engineering degree from Rose Tech, Indiana, and later was awarded the first doctorate in philosophy granted to a civil engineer by Stanford University.

He has served as president of both the Engineers Club of San Francisco and the San Francisco Section of the American Society of Civil Engineers. Dr. Bowers has performed a great service to the construction industry by his clear, factual, and intelligent reporting of construction projects.

John P. Shirley

Son of a Canadian who specialized in grading and commercial building, John P. Shirley, Sr., came to Omaha, Neb., with his parents in 1890. He got his first taste of the construction business by going to work for his father's firm a few years later.

Since those early beginnings, the career of John P. Shirley, Sr., included construction activity in Canada, Alaska, Panama, Hawaii, and many areas in the South Pacific. As Gunther & Shirley Company, established in 1935 with headquarters in Los Angeles, major projects have included, in association with other companies, construction of Alcova Dam in Wyoming; Mormon Flat in Arizona; Prado Dam near Corona, California; the Delaware Aqueduct and Shafts for New York City; John Martin Dam in Colorado; the Shasta Dam in California.

In between projects Mr. Shirley found time to build a 1,300-ac. ranch out of raw desert in Arizona and to help organize the Metropolitan Savings & Loan Association of Los Angeles of which he was chairman of the board at the time of his death, November 17, 1955.

Regardless of other interests, J. P.

Shirley, Sr., first of all was a contractor and one of great courage and integrity.

William R. Ellis

Remembered by scores of friends and associates as a brilliant engineer and administrator, the late William R. Ellis during his lifetime contributed to many practical ways to increase the knowledge of explosives and their usage. Outstanding was his help in the development of the jumbo method of drilling and blasting which made possible the Hoover Dam tunnels.

Mr. Ellis was born in California in 1886, graduated from Stanford University and worked in Western gold and copper mines before joining the Hercules Powder Company in 1915. With Hercules, he served in a variety of sales, service, and administrative capacities on the West Coast culminating in his appointment as general manager of the explosives department in 1936. He was elected a vice president and a member of the executive committee in 1945. He retired in 1954 and passed away a year later in California. Surviving are three sons, Bill, Dick and Tom Ellis.

In the words of those who knew him closely, Mr. Ellis is described as a two-fisted man who was respected by all who knew him for his mastery of whatever job fell his way and who in turn respected all the men who worked in his field. Bill Ellis served the construction industry well by his expert and comprehensive knowledge of his own business.

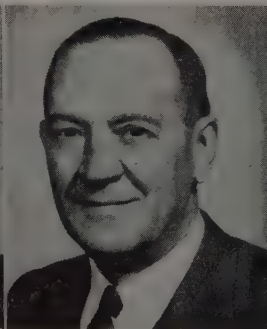
Guy LeRoy Stevick

With the death of Guy LeRoy Stevick last summer, heavy construction men throughout the country lost one of their staunchest supporters and friends. As head of the Fidelity & Deposit Company of Maryland for the Western area, Mr. Stevick was active and prominent in the early stages of most of the important projects in the West for almost half a century. He has contributed much to the construction industry for it was he who fathered the joint-venture feature of bonding—as important and integral a part of contracting as any feature that can be named—essential to great projects such as Hoover Dam.

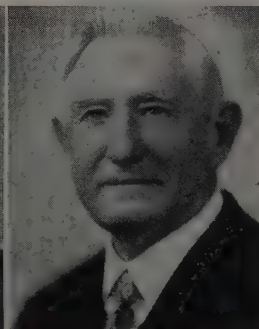
Mr. Stevick was a humble and tolerant man. His amazing ability, combined with his enduring patience, made his help invaluable in any situation involving complex financial and bonding problems.



Shirley



Ellis



Stevick

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cuts earth moving costs!



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for a wide range
of work!

This TS-18 is the most recent development of the Twin-Power principle pioneered by Euclid and job proved in earlier scraper models. Its unequalled power and traction gets more work done...sets a new standard for low cost scraper yardage. Self-loading in practically any material from loose sand to hard shale, the TS-18 is a one-man earthmoving spread. It works on steep grades and under job conditions that stymie other scraper equipment.

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anywhere. The low, wide bowl design and reversible four-section cutting blade make the TS-18 easy to load ...heaped loads up to 24 yds. are picked up fast.

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Three 7 x 7-ft. drifts, one at the arch crown and two at the location of the wall plates, were used by Colorado Constructors, Inc., to start

this 1,470-ft. tunnel. When solid shale was hit at about 40 ft. the headings were ringed out and a 9-segment timber arch set.

Solving a portalling-in problem

At Mesa Verde National Park the landscape restrictions on an open-cut approach started this highway tunnel about 40 ft. out from the rock face.

By JACK S. LACEY

Highway Engineer
U. S. Bureau of Public Roads
Denver, Colorado

WHATEVER GLAMOUR there is in tunnel work always relates to driving speeds on a "full face." All of the articles and the pictures in construction magazines that describe tunnel operations seem to skip over lightly the problems and the methods required to get to this glamour stage. What about the headaches and the non-mechanized work of portalling-in? This tricky job is really a test of a tunnel man's skill and often marks the success of a tunnel contract.

Perhaps the reason for neglecting to discuss the problems of portalling-in is because there usually is no problem; the portal is established in solid rock and normal driving procedures begin at once. However, there are some exceptions and the highway tunnel project in Mesa Verde National Park, Colorado, represents one of them.

In common with almost all construction operations in national parks, the landscaping considerations on this project dictated a minimum of open cut approaches. This required portalling into loose over-

burden for about 40 ft. Beyond that point the material encountered consisted of a weathered sandy shale with a gradual transition into blue Mancos shale.

The tunnel cross-section, at the excavation line, indicates a dimension of 25 ft. 2 in. on centerline from subgrade to tunnel roof. The section is semicircular above the spring line. At the spring line, which is 7 ft. 5 in. above subgrade, the tunnel is 35 ft. 6 in. wide.

When the tunnel is completed there will be a 2-ft. refuge sidewalk on each side and the roadway will be 26 ft. between curbs. Neat lines of the tunnel, with its reinforced concrete lining, indicate the spring line to be 6 ft. 6 in. above the 8-in. portland cement concrete pavement.

To accomplish the difficult task of portalling into this 35-ft. 6-in. diameter tunnel, the contractor elected to use three smaller (7x7 ft.) tunnels or drifts (see illustration) to get to fairly solid shale. The top heading was driven on centerline with the back high enough to accommodate the top or key timber segment of the set. Two lower drifts were excavated and timbered with the floor of each at the elevation of the bottom of 12x12-in. redwood timber wall plates,

running parallel to centerline. The outside ribs or walls were excavated to the same slope as the first 12x12-in. timber segment above spring line (beginning of circular arch).

In each of the small drifts the material was such that pneumatic jackhammers equipped with spaders could be used to excavate for the first two sets of temporary timber and for trimming the backs and ribs. Timber spiling and crown bars were used ahead of each timber set to hold the loose material until the next set could be placed. After driving each drift 8 to 10 ft., the shale became too hard for spading, so holes were drilled, loaded very lightly, and shot. All mucking was done by hand and then hauled in wheelbarrows and dumped at the portals.

After driving the three small tunnels a distance of 41 ft. to a fairly competent brown weathered shale, the engineers set a template of the cap segment to line and grade. Then by fitting other templates to the cap and spading out wide enough to accommodate the segments (9 equal segments, each subtending 18 deg. of arc) plus 3 in. for skintight lagging over back, the three drifts were joined.

The 12 x 12-in. wall plates were then set to line and grade, and the first permanent redwood set installed. The first segments placed were those setting on the wall plates and as succeeding segments were added they were supported with

NEW 360 HALF-YARD

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DIGGER • SHOVEL • CRANE

360° SWING!

FAST CYCLING!

**180°
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LONG REACH—26'

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Here's the completely hydraulic *mobile* shovel that equips you to do more jobs with lower equipment investment... *at greater profit!*

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Interchangeable backhoes and shovel buckets have H and L replaceable teeth and are available in three-eighths and one-half yard sizes. Check **NOW** on the many advantages of owning this work-hungry, mobile digger, shovel, crane!

Write today for complete information on the '360' or any one of six quarter-yard HOPTO Models!

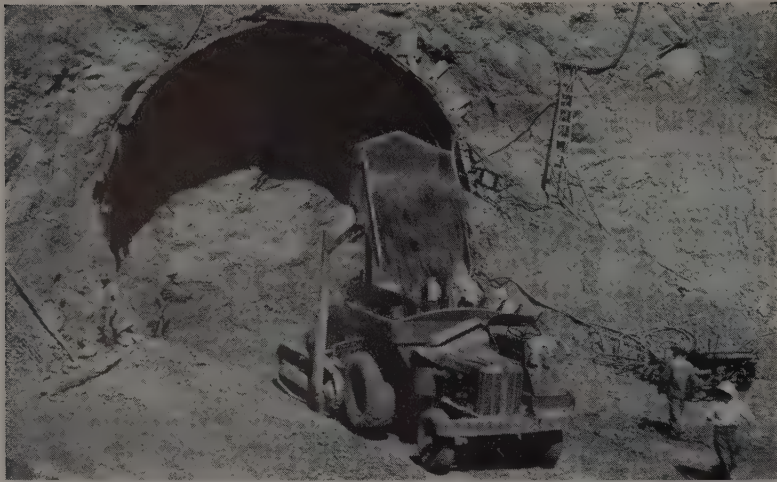


BADGER MACHINE CO.

DEPT. T • WINONA, MINNESOTA



LIFTS HIGH—12'



WITH THE ARCH supported on the wall plates on the floor of the side drifts the excavation of the core started, and the 12 x 12-in. plumb posts were set. The Austin Overshot Loader on a D6 Caterpillar handled material. Finished roadway paving will be 26 ft. wide.



WORKING in from the portal, these 12 x 12-in. plumb posts were set to support the wall plates as excavation advanced. The picture shows one of the many elements of tunneling where mechanization will never replace human skill and plain, old muscle.



WORKING back from the face of the drifts this arch timbering was held with stulls against the core material until the nine segments were in place, making the arch self supporting. Stulls were then knocked out and the process repeated out toward the portal.

stulls braced against the core of the tunnel until the cap was in position. The stulls were then knocked out and the arch was self-supporting.

As the ground near the heading could support itself for a short time, the arch was excavated to take the next set (4 ft. center to center) and lagging placed after the adjacent set was in position. As the arch was spaded out to allow working space, the material dropped down into the wall plate drifts and was hauled to the portals and dumped. This operation was repeated until the arch was timbered back out of the portal; the only variation being the use of spiling and crown bars for the last three timber sets.

Even though this portion of the "portalling in" operation was slow, tedious work it was accomplished very skillfully and at a minimum cost to the contractor.

At this point the tunnel back is

now supported from wall plate to wall plate and the natural question is, "How in the world do you complete the excavation down to grade without it all caving in?"

That task was very easily done by excavating to grade (bottom of plumb posts) with a 1¾-yd. Bay City shovel to the limit of its reach, then an Austin Overshot Loader mounted on a D6 Caterpillar tractor (see illustration). As the excavation progressed, 12x12-in. plumb posts were placed beneath the wall plates thus completing support of the material above the tunnel. All necessary drilling was done with two Gardner-Denver wagon drills and two Ingersoll-Rand jackhammers. Hauling during this phase was brought up to present-day standards by employing two Koehring Dumpsters to replace the afore-mentioned wheelbarrows.

The 41-ft. wall plate section was completed before drill jumbo and

full face tunneling methods were started.

This project, when completed, will be 1,470 ft. long (portal to portal) and will be lined throughout with timber, reinforced concrete and concrete pavement. Portal structures will be of reinforced concrete faced with stone masonry.

Personnel

Contractor for construction of this \$1,000,000 project is A. S. Horner Construction Co., Denver, Colo., with Colorado Constructors Inc., Denver, Colo., as subcontractor for driving and timbering the tunnel. Frank R. "Slim" Merrick is superintendent and John Hicks, walking boss.

Engineering by Bureau of Public Roads is under the direction of the author as project engineer; Richard A. Prosenice as assistant, and the following crew members: Norman L. Spickert and Frank A. Brown. K. S. Chamberlain is division engineer, Division 9, at Denver.

Fallon Bill . . .

(Continued from page 37)

floods or other disasters. These funds would be available for use on any projects approved during the fiscal year 1956.

2. The Bill authorizes any state to transfer up to 20% of its apportionment of federal-aid funds for the primary and secondary systems and urban projects. This transfer provision would not affect the interstate funds. In effect, all that this does is increase the 10% transferability, provided in the 1954 Act, to 20%.

Credit for toll roads

3. The Bill sets up a procedure whereby any state, upon its request and subject to certain conditions, may receive a credit for any existing free highway or toll highway located upon the Interstate System, which measures up to the standards of construction required for said system. The Secretary would determine whether or not the highway meets such standards. Any state receiving such credit would be entitled to use the same for the construction of projects, pursuant to regular federal-aid procedures, on the primary system, provided that all federal-aid highway funds apportioned to the state have been expended and all funds allocated under this Act have been contracted. Any state receiving a credit on account of a toll highway shall have the option of using such credit for the payment of any outstanding debt on the highway, which highway shall then become free of tolls.

4. The Bill permits the Secretary to acquire rights-of-way, including

(Concluded on page 60)

Measure excavators by price per pound of lift capacity

In analyzing shovel operation, you will find that price per pound of lifting capacity on crane rating is also an excellent measurement of excavator value.

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

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205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?



*Figures available on request—ask your Koehring distributor to see them.

ESCO TRENCHER TEETH

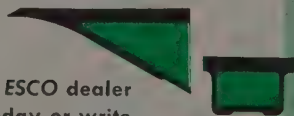


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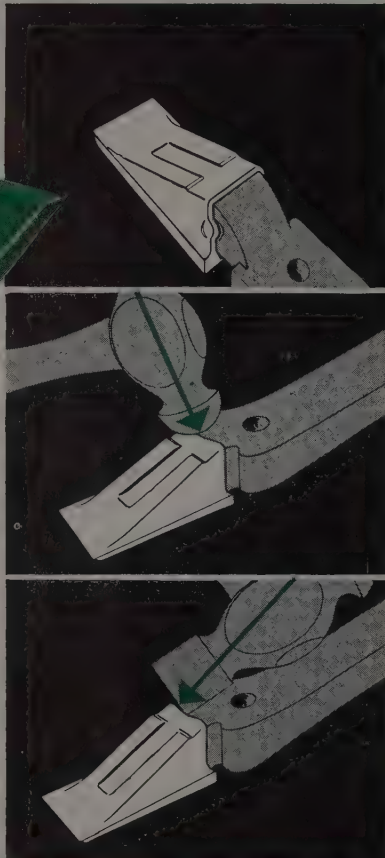
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Let's you take advantage of ESCO longer-lasting trencher teeth without changing your present bases.



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with a hammer blow. Reduce tooth-changing time from hours to minutes. A ball peen hammer is the only tool you need to change an ESCO trencher tooth on an ESCO base.

EXTRA WEAR BUILT IN

at all the wear points. Shellcasting puts the extra metal where you need it most for longer tooth life.

Fallon Bill . . .

(Continued from page 56)

control of access, for the Interstate System, if requested by a state. The power is to be exercised only if a state is unable to promptly acquire the right-of-way and if the state agrees to pay 10% of the cost, or such lesser percentage which represents the state's pro rata share as determined in accordance with section 7. Whenever rights-of-way on the National System are required over public lands of the United States, the Secretary may make necessary arrangements for rights-of-way and control of access.

Advance right-of-way funds

5. To expedite acquisition of rights-of-way, the Secretary of Commerce is authorized to make available to the states 20% of the funds apportioned to the states.

6. The Bill provides that the Federal Government may pay one-half the cost of relocating utility facilities necessitated by construction of a project on the primary and secondary systems and the urban program; further, it provides that the Federal Government shall carry 90% of such costs in connection with construction of the Interstate System.

7. The Bill prohibits apportionment of federal money for the Interstate System to any state which permits use of the system by vehicles having sizes or weights in excess of the maximum permitted by state laws in effect March 1, 1956, or the maximum recommended by the American Association of State Highway Officials in 1946. It directs the Secretary of Commerce to proceed with tests on this question and report to Congress not later than March 1, 1959.

8. A section in the Bill provides that agreements between the Secretary of Commerce and the state highway departments dealing with projects on the Interstate System shall contain a clause providing for no additional points of access to or exit from a project without prior approval of the Secretary of Commerce.

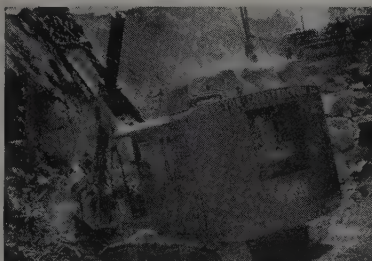
9. In keeping with the recommendations of ARBA, another provision of the Bill softens and relaxes the policy of the Bureau of Public Roads with respect to incorporation of toll facilities as part of the Interstate System. The new Fallon Bill authorizes funds under this Act or prior Acts to be available for expenditure subject to specified conditions on projects approaching any toll road, bridge or tunnel. As stated, this provision applies only to the interstate program.

The foregoing analysis of the Fallon Bill was prepared and released by the American Road Builders Association.



POWER HYDRAULIC CONTROLS and hydraulic-actuated clutches keep even the roughest jobs rolling smoothly. Hydraulic sys-

tem eliminates need for more than 100 mechanical parts. Self-compensating clutches need no close or frequent adjustments.



TOUGH, IMPACT-RESISTANT STRUCTURE with all-welded, stress-relieved lower and upper frame helps rig absorb digging shock . . . handle the worst rock jobs with little need for maintenance and repair.



MORE POWER — Anti-friction bearings, splined shafts, precision machinery alignment help convert more of rated horsepower into usable power. Rugged construction permits use of extra power.



SPECIAL EXCALODER ATTACHMENT for underground loading or general bulk materials handling. The Excaloder features straight line bucket action and unusually low overhead clearance.

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WHATEVER size rock rig you need, there's an advanced-design Link-Belt Speeder that can handle rugged work faster, easier, at less cost per ton or yard. Every Link-Belt Speeder rock shovel offers you Speed-o-Matic—the *true* power hydraulic control system. It's designed to make the operator's job so easy, so non-fatiguing that he'll utilize the machine to its full productive capacity—all shift long. And what a capacity! On-the-job figures show that Speed-o-Matic—even when the machine is wading through shot rock—accounts for output increases of up to 25% or more per shift!

Precision built throughout, a Link-Belt Speeder has an all-welded, stress-relieved upper and lower frame. Its power train features anti-friction bearings, splined shafts and cut spur gears. Quality construction like this pays off in lasting top performance, lower costs for maintenance and service.

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Faster, stronger — from boom tip to treads

- Rugged, all-welded upper and lower frames, plus all-welded boom and dipper sticks for maximum strength-to-weight ratio
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*Optional, extra

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Fast earthmoving for freeway

When you have 8 new dirt wagons on the job, making cuts and fills are the least of your worries. This job is highballing along with an earthmoving yardage measured in millions.

NEW EQUIPMENT is leading the way for contractor Gordon H. Ball on a \$3,052,000 freeway contract near Lafayette, California. Ball is building 2.6 mi. of divided 4-lane freeway to bypass the town of Lafayette. Caterpillar is well represented in the fleet of equipment, most of it new, which Ball has assembled to carry out the 1,500,000 cu. yd. of earthmoving.

Ten DW20s, eight brand new and two nearly new, negotiate the 1:2 slope with ease with heaped loads up to 28 cu. yd. At the top of one of the cuts, which when finished will be 198 ft. deep, the big scrapers are push loaded by new Caterpillar D9 crawlers. At the present the D9s are handling pushing jobs which would require two D8s. Both of the D9s are equipped with Ateco rippers and bulldozer blades which can be con-

trolled hydraulically by the operator. At the bottom of the hill where the fill is being built up two compactors are at work—a new Buffalo-Springfield K-45 Kompactor supplied by Spears Wells Machinery Co., and a LeTourneau-Westinghouse sheepsfoot.

Widening the freeway to six lanes in the future can be done by adding two lanes inside of the lanes to be constructed on this contract. The present embankment is being made wide enough to provide for this eventual widening. In addition to the main embankment, a 150,000-cu. yd. stockpile is being built up which can be used for a ramp to a future interchange project.

The fill is being watched closely so that any future work can be done with fairly good knowledge of the

local soil characteristics. Engineers from the Division of Highways have positioned piezometers throughout the fill to enable the computation of the water pressure beneath the embankment. Platforms were placed on the original ground and as the embankment is built up the distance to the platforms is determined by the extension of vertical shafts from the platforms through the embankment. To determine the settlement of the original ground direct elevations are taken on the shafts.

An unusual aspect of this job is that the Mokelumne Aqueduct cuts directly across the project and must be bridged in two locations by the new freeway. The aqueduct, property of the East Bay Municipal Utility District, is an 11-ft. 8-in. diameter pipe which carries 128,000,000 gal. per day to the communities along the east shore of San Francisco Bay. Since the contractor would be liable for any damage which would be done to the aqueduct by his operations, equipment traffic is being carefully controlled. So far a minimum of equipment has been allowed to pass over the aqueduct, which lies exposed at the surface at some locations. Whenever it is necessary for machines to cross it heavy timber mats are laid down to distribute the load and remove any possibility of damage.

Bridges must be constructed at six points along the 2.6-mi. length. This means a total of 12 bridges, for at each site two separate structures must be built to carry each side of the divided freeway. One of the two aqueduct crossings will be twin parallel bridges 312 ft. long. The bridges' three spans will be carried on concrete bents and abutments on steel piles, concrete filled caissons, and cast-in-place concrete piles cast in drilled holes. The longest of the two crossings will consist of two rein-



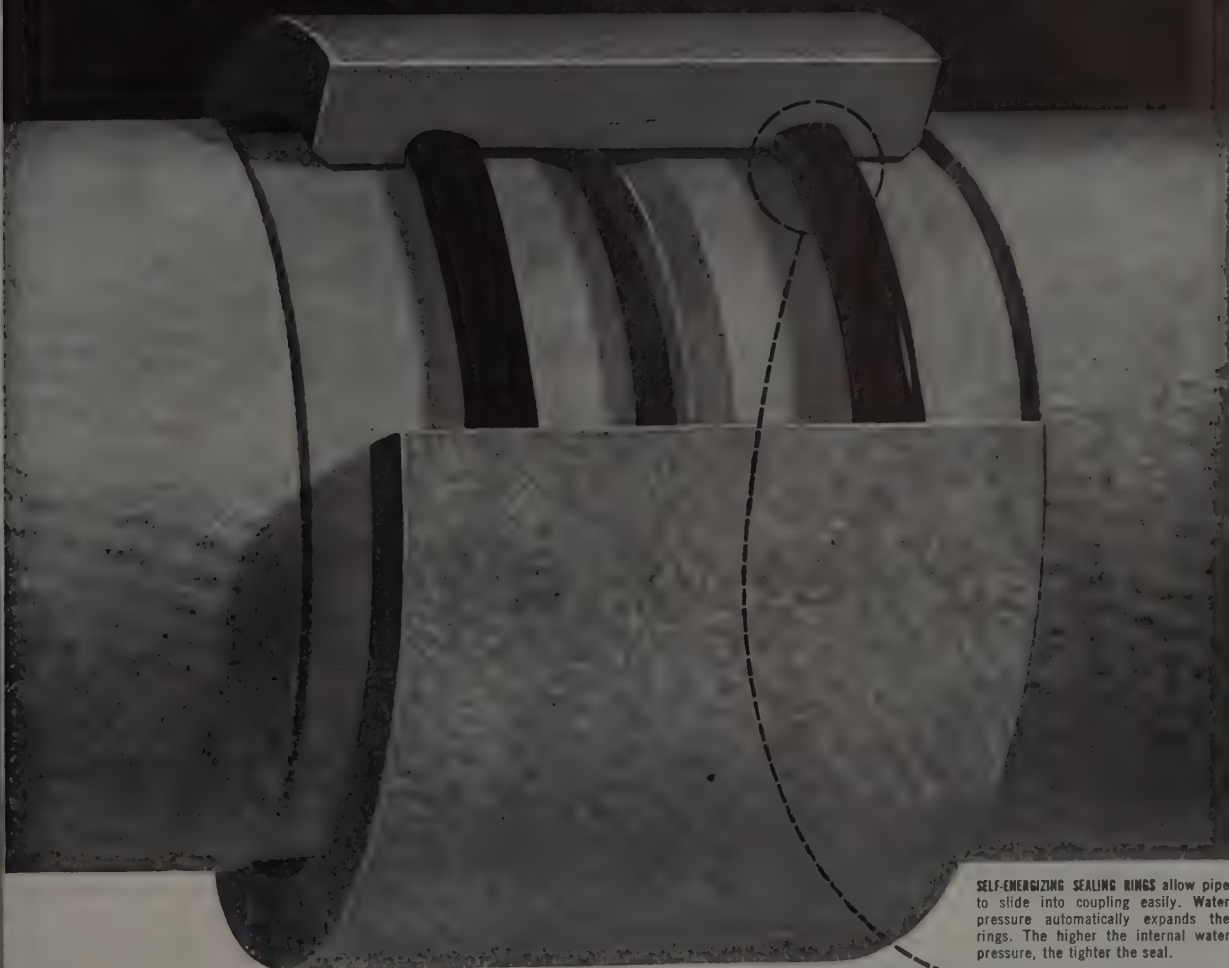
A CATERPILLAR D8 'dozes out a bench for the Lorain crane which will place the pipe. The sections shown are 90 in. in diameter, weigh over 10 tons. Specs call for 576 ft. of this size.

(Continued on page 66)

NEW!

"FLUID-TITE" COUPLING

For "Century" Asbestos-Cement Pressure Pipe



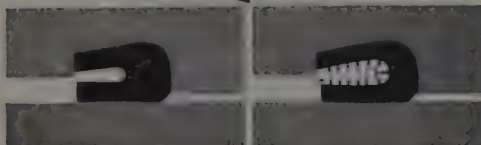
SELF-ENERGIZING SEALING RINGS allow pipe to slide into coupling easily. Water pressure automatically expands the rings. The higher the internal water pressure, the tighter the seal.

- Cuts installation time
- Provides permanent, water-tight seal

Now, using the new "Fluid-Tite" Coupling, crews can lay more "Century" Asbestos-Cement Pressure Pipe per hour than ever before. No cumbersome coupling pullers are needed. "Century" Pipe can be easily connected with standard valves, hydrants and fittings.

Thanks to the speed and simplicity of using "Fluid-Tite" Couplings, there is no need to hold up pipe-laying operations in rain, snow or wet trench conditions. Specify "Fluid-Tite" Couplings with "Century" Asbestos-Cement Pressure Pipe. You'll get more rapid installation, plus full flow and low maintenance. Write today for details.

"Century" Pipe and "Fluid-Tite" Couplings meet A.W.W.A., A.S.T.M., and Federal specifications and are approved by Underwriters' Laboratories, Inc.



New self-energizing "Fluid-Tite" sealing rings have tapered surfaces, and compress, to permit pipe to slide in easily.

When main is filled, rings expand with application of internal water pressure, creating a tighter seal.

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA



*PATENT APPLIED FOR



Splicing 160-ft. timber piles

Machine developed for squaring pile butts to speed this operation.



COMPLETED timber fender is of flexible design to reduce possible damage to ships. About 1,450 spliced piles were required for the piers of the Richmond-San Rafael bridge.

A DIFFICULT ASSIGNMENT handed J. H. Baxter & Co. was to supply 160-ft. timber piles for the Richmond-San Rafael bridge project on San Francisco Bay. This record-length piling was required for the pier fenders. They had to extend through a thick mud layer under 85 ft. of water. Engineering plans called for a length to go through soft mud to a firm bearing. When completed this fall the bridge, being built for the State of California, will provide a direct vehicular crossing from Marin County to the East Bay area.

How to obtain the 160-ft. length was solved by J. H. Baxter engineers who elected to splice two piles together. And as there was no machine in existence for such a splicing operation, Baxter engineers developed one.

This machine was developed for the express purpose of preparing the untreated lead piling for the splice by reducing the size of the 12- and 13-in. butts to a square exactly fitting the tip of the follower pile. The machine itself has four rotating wheels, one at the top and bottom and on each side. Each wheel has a series of four curving blades which operate in the manner of a planer head. Each wheel revolves at 3,600 rpm. and is driven by a 20-hp. motor.

Machine moves

The entire machine is mounted on a track and moves into the end of the pile. This permits the pile to be fixed firmly in position and assures a square-end cut to match the follower pile. The machine was developed principally by Baxter's former chief engineer, the late H. A. Pence.

Success of the new machine is indicated by the fact that it turned out the required 1,448 spliced piles in record time and at a cost well within budget. J. H. Baxter & Co. also sup-

plied all the pressure-treated piling and lumber for the entire bridge, as well as for the fender piling.

The actual splicing was made with four 4x8-in. timbers, bolted to each pile (see illustrations) with $\frac{3}{4}$ -in. black bolts working against annealed washers.

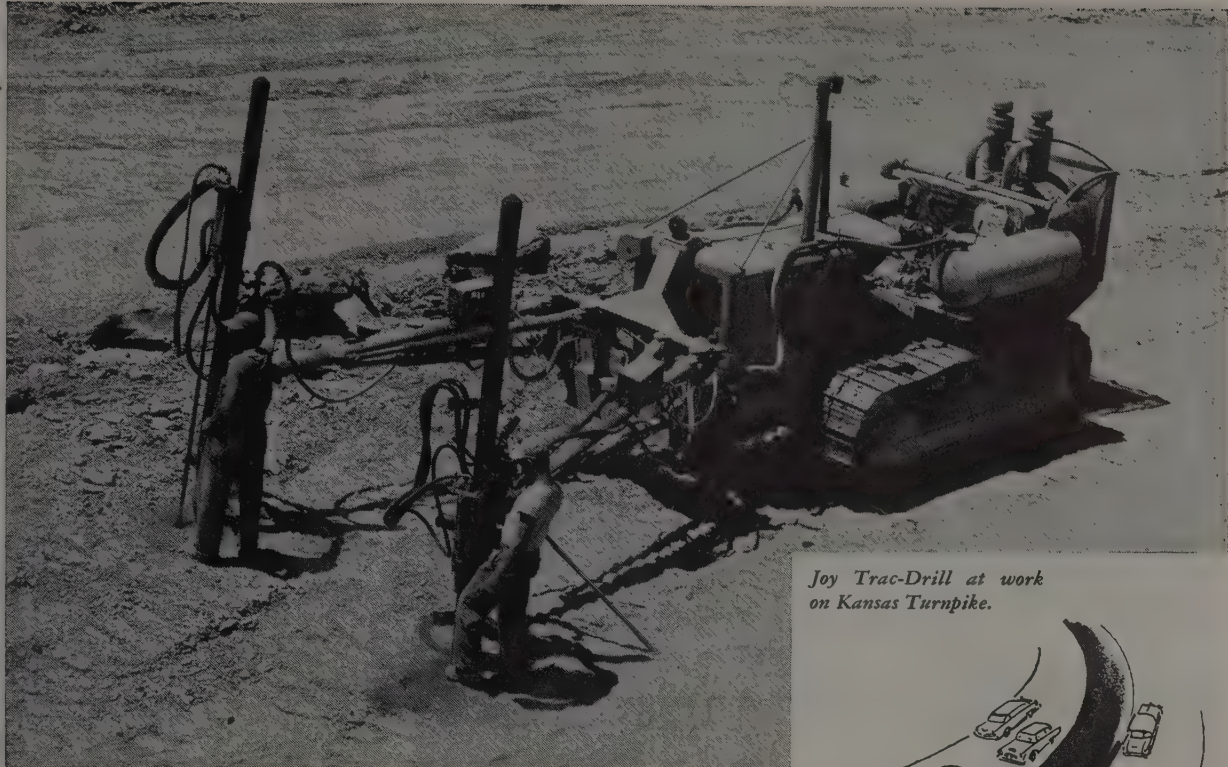
Two locomotive cranes, using a four point pick-up, were necessary to move the piles in the yard in Alameda where the splicing operation was done. The spliced piles then were towed to the bridge location. There the pile drivers picked up the spliced piles.

Eight piers protected

Only the eight piers nearest the navigation channel are being protected with the timber-pile fenders. Wood was the selected material for the fenders, as the design is a flexible one to impose minimum damage to piers and to ships that might hit them.

The fender system is part of the bridge substructure contract held by joint venture of Ben C. Gerwick, Inc., and Peter Kiewit Sons' Co. Two basic sizes of piles were used, 65 ft. and 95 ft. The smaller pile and splice were untreated, as they will be below the mud line. The longer piling was given a 12-lb. pressure-creosoted treatment to protect it from damage by marine borers.

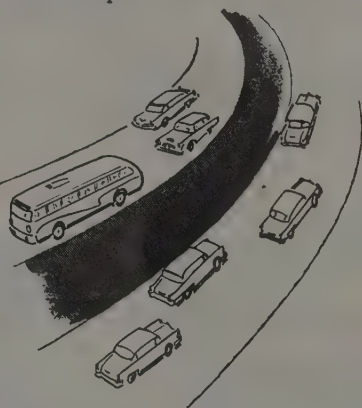
The pressure treating process takes place within large cylindrical retorts, some over 100 ft. long to accommodate the large piles and poles, such as those used on the pier fender structure for the bridge. The piles are secured to tram cars that are moved into the retort. After the retort door has been closed and sealed, the first step is boiling in creosote under vacuum to expand the wood cells and release moisture. While still under



*Joy Trac-Drill at work
on Kansas Turnpike.*

Kansas Turnpike

... another JOY DRILL JOB!



Contrary to popular opinion, Kansas is not completely flat. Evidence: 39.5-million cu. yds. of common excavation and 5.5-million cu. yds. of rock involved on the new Kansas Turnpike job.

... And where you find rock, you find Joy equipment. So far, on this 236-mile super-road, seven contractors are using twenty-one Joy drills—shown is one of the Joy Trac-Drills at work.

A self-contained drilling machine (one vehicle mounts everything), the Trac-Drill carries two Joy drills on twin Joy Hydro Drill Jibs (hydraulically actuated booms with power lift and power swing), and a complete Joy air compressor installation. The

Trac-Drill goes anywhere a tractor goes—there's nothing to tow.

The variety of other Joy drills and mountings on the Kansas Turnpike project points up the versatility and scope of the most complete rock drill line on the market. If there's drilling in *your* contract, better put Joy on the job.

For further information, write Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

Write for FREE Bulletin 38-25

Consult a Joy Engineer

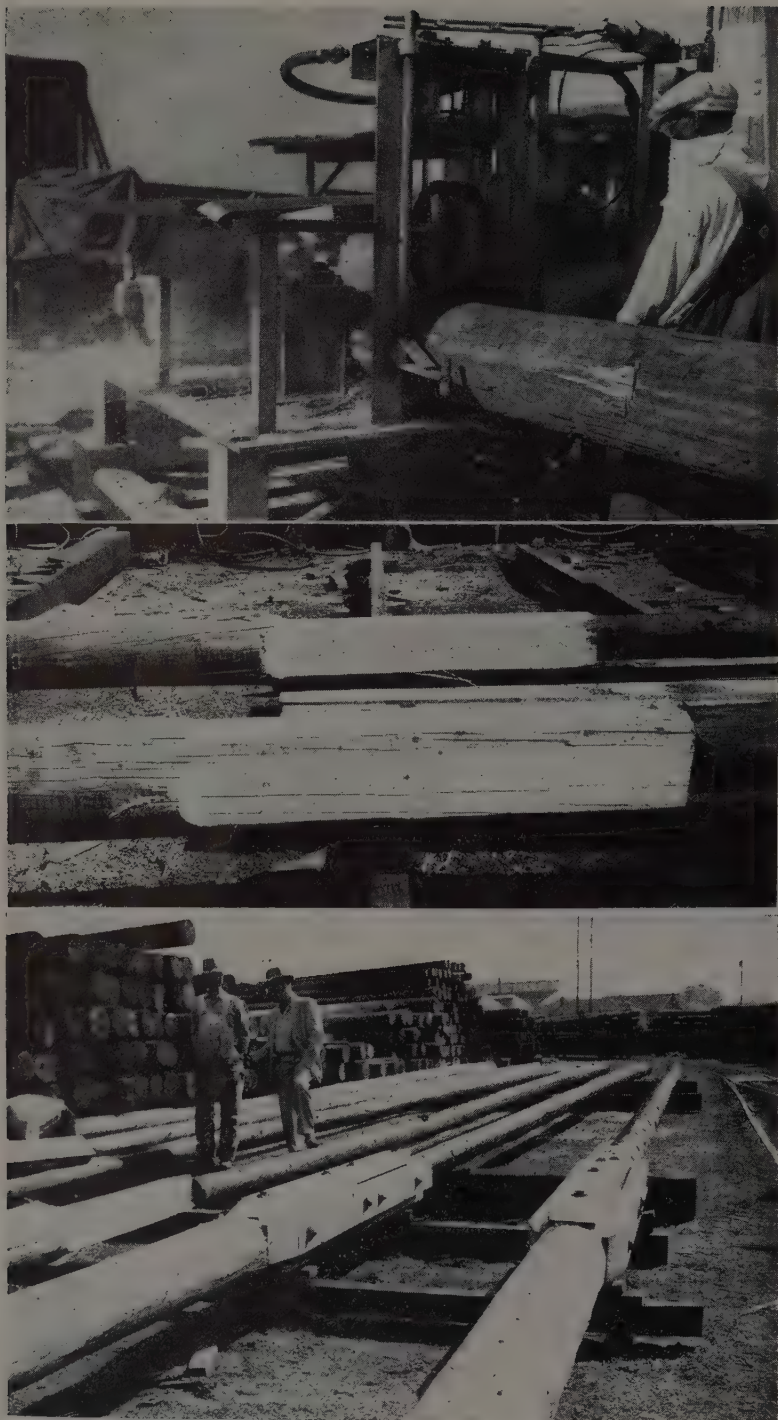
for AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS
CORE DRILLS • BLAST HOLE DRILLS • PORTABLE HOISTS • FANS
BLOWERS • TUNNEL, QUARRY, MINE EQUIPMENT



WSW C5911-38

JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY



MACHINE moves against stationary pile (top) squaring four sides of the butt at the same time. The squared end (center) is then spliced to the end of the follower with 4 x 8-in. timbers (bottom.)

vacuum, the preservative solution is admitted into the retort and forced into the timber under pressure of about 150 psi.

For each wood variety, for each use, and for each preservative there are minimum requirements as to the penetration treatment, as well as the amount of preservative retained by the wood. Specification standards are

set up by agencies of the government, and by the American Wood Preservers Association, as well as by large commercial users.

Founded in the late 1800s by J. H. Baxter, the firm today has yards and treating plants in Alameda and Long Beach, Calif.; The Dalles and Eugene, Ore. Main office of the firm is in San Francisco.

Earthmoving . . .

(Continued from page 62)

forced concrete box girder bridges, 605 ft. long and 578 ft. long. Each will be composed of six spans supported on concrete-filled caissons and steel pile foundations. All bridges will have a clear roadway width of 28 ft. A total of 2,459,000 lb. of bar steel will go into the bridges. At this writing the first pile-driving was expected to begin in late January.

Construction of drainage facilities involves the excavation of about 10,500 cu. yd. A 2½-yd. Lorain crane is handling most of the pipe placement, which includes 576 ft. of 90-in. precast concrete pipe and 1,384 ft. of 84-in. precast concrete pipe. Each section of the 90-in. diameter pipe weighs over 10 tons. The large pipe sizes (36 in. and up) are being supplied by American Pipe and Construction Co., except the 84 in., which comes from Tellyer Concrete Pipe Co.

Supervision

The entire project, scheduled for completion in August of 1957, is under the supervision of Fred Straub. Milt Greenstein is job engineer on the roadway, Larry Wigell is office manager, Alvin Lee is bridge superintendent, and Homer Holmes is bridge engineer. Harry Roberts is office manager for the bridges. Resident engineer for the California Division of Highways is Don M. Young, assisted by Chuck Chappelle and Wilson Schutte, Bridge Department representative.

EQUIPMENT LIST

- 10 Cat DW20s
- 1 Cat motor patrol
- 2 Cat D9s
- 1 Buffalo-Springfield Kompactor
- 1 LeTourneau-Westinghouse sheepfoot
- 1 Gradall
- 2 Northwest model 6 cranes
- 1 P & H truck crane
- 1 Lorain Crane
- 7 Cat D8s
- 1 Cat D4
- 1 Hough loader
- 2 Ford flat-rack trucks

The job described here is just one of three big road jobs under way in the Lafayette-Walnut Creek area. The other two are held by a joint venture of Stoltz, Gallagher & Burk. One is the \$1,300,000 Pleasant Hill interchange and approaches to be completed in the summer of 1956. Resident engineer is I. S. Myer. The other is a \$2,850,000 contract for the construction of 2.8 mi. of freeway scheduled for completion early in 1957. Resident engineer is W. J. Murray. Superintendent on both jobs is Larry Ashworth, with Barney Headberg as structural superintendent.

This Good Roads Spreader Team

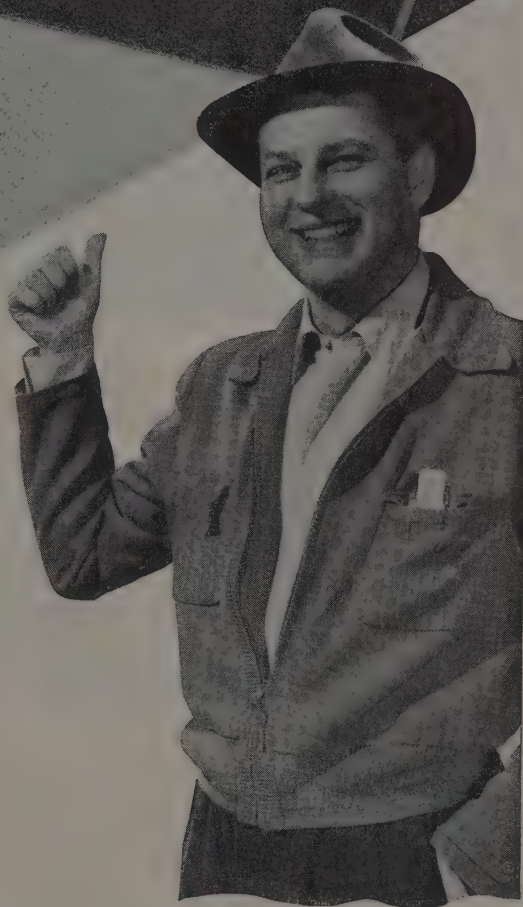
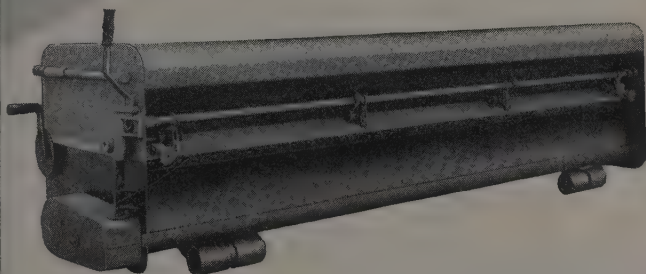
...CUTS PAVING COSTS IN HALF!



The "Odell" Aggregate and Asphalt Spreader—designed with the contractor in mind, features low initial cost and exceptionally fast operation. Greater capacity—faster spreading, with less man-power, results in savings of over 50% in spreading costs.

The many "Odell" features, including positive one-time spread-depth adjustment and smooth, clean spread pattern, eliminates the need for 5 and 6 man crews . . . results in lower operating costs.

The Good Roads Handy Aggregate Spreader—spreads from powder-fine carpet up to 3-inch depth. It completely eliminates the danger of streaks and spotty spread . . . automatic transmission permits forward and reverse operation without shifting or de-clutching. Micrometer spread depth control eliminates constant re-setting. Once set, it remains constant for the entire job.



For complete details and specifications on the Good Roads spreader team and how it can help cut your paving costs, see your nearest Good Roads distributor, or write to:

GOOD ROADS MACHINERY CORPORATION

MINERVA, OHIO



SNOW PLOWS



ICE CONTROL SPREADERS



AGGREGATE AND ASPHALT SPREADERS



LEAF COLLECTOR



SCAVENGER



Photo: Bethlehem Pacific

Big bars for bridges

Equivalent of 2-in. sq., these elliptical bars with hi-bond were approved by the California Division of Highways—1,000 tons used in one freeway contract.

By R. C. RICHARDSON
Manager, Reinforcing Division
Gilmore Fabricators
Oakland, Calif.

THE USE of 2-in. square reinforcing bars in the West dates back over twenty years, but the use of an equivalent round bar is a relatively recent development. In late 1954 the California Department of Public Works consulted several major steel mills to determine the feasibility of rolling a round section with hi-bond characteristics which would be equivalent in cross-sectional area to the 2-in. square bar. After considerable study design sketches were submitted to the State providing for a bar with an elliptical cross-section and an average diameter of $2\frac{3}{8}$ in. The projection and spacing of deformations were determined by increasing the values in proportion to those for standard sizes established by ASTM specifications. The section was assigned bar designation No. 18.

State calls for use

A short time later, in February 1955, the State released plans for bidding on the traffic distribution structure in San Francisco. The design called for over 1,000 tons of the No. 18 bars. Two months later plans for the construction of a fluid coker for Tide Water Associated Oil Co. by Bechtel Corp. called for 800 tons of the new bars. Since that time various state projects have included similar specifications.

The employment of $2\frac{3}{8}$ -in. diameter reinforcing bars in the design of major structures is mainly a matter of economy. Prior to its use, standard

size bars had to be tightly spaced to gain comparable effectiveness. Sometimes members had to be enlarged to afford suitable space for reinforcing bars. Girders and beams were often designed with two or three layers of bars, but this practice has a reducing effect on depth of section. In bridge pier verticals the largest available bars were sometimes bundled together in order to gain suitable cross-sectional area—with the disadvantage of a tendency to decrease the bonding action between steel and concrete.

Simplify beams and columns

With the $2\frac{3}{8}$ -in. diameter bars concrete columns can be designed to carry the same loads with substantial reduction in size. The larger steel area of the individual bars promotes simplicity and economy of beam and girder construction. This provides for less concrete usage, lower form cost, and can mean more usable space in the completed structure.

No. 18 bars are being rolled in several major mills in the West and others either have or are procuring dies for producing them. At the present time this size is rolled on application only. Rolling schedules have been obtained within thirty days from receipt of order, and as much as 600 tons have been produced in a rolling. Transportation problems thus far have been negligible. Large benders have been modified and geared down in the Gilmore fabricating shops for

the cold bending process. Hot bending is prohibitive since the heat would alter the properties of the steel.

The use of manual labor alone to erect the bars is in most cases impossible since they weigh 13.6 lb. per lin. ft. It is therefore necessary to employ cranes or hoists. When structures require lengths too great to transport, the bars must be joined in the field. With smaller bars the usual way to gain continuity is to overlap them, the length of the lap depending on the ratio of the surface area available for bond and the cross-sectional area. But with bars $2\frac{3}{8}$ in. in diameter this is nearly always objectionable because of the limited space allotted to steel. So joints are made by butt-welding, either by conventional methods or by the Thermit process.

For the fluid coker the bars were sawed and flame-cut to length. A $1/32$ -in. tolerance was required for columns, $1/8$ in. for horizontal steel. At the job site bar cages were built up on the ground and hoisted into place. The cages were then positioned and joined together by the Thermit welding process.

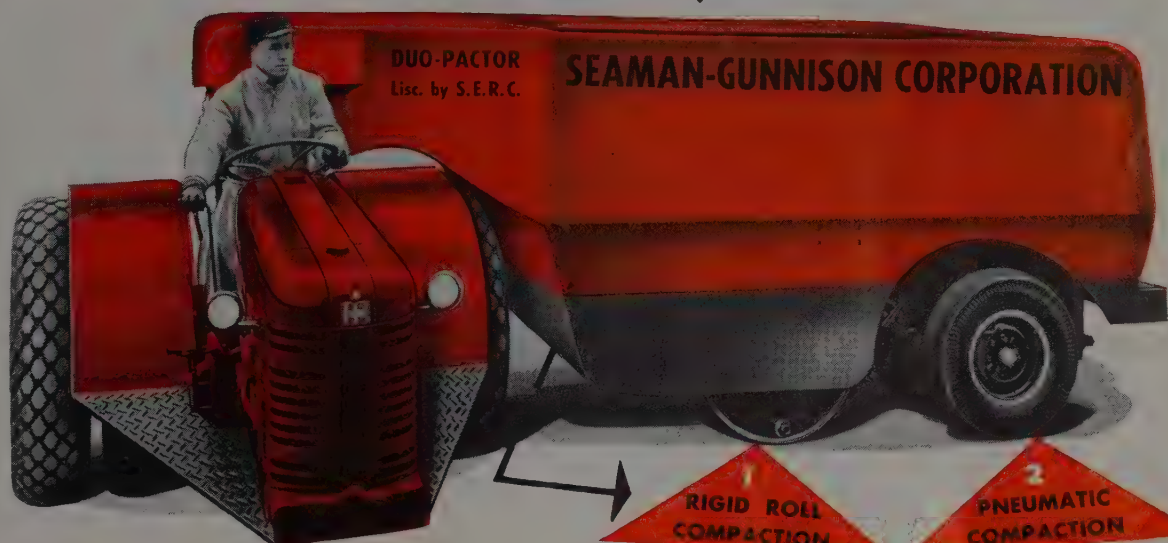
For the Eastshore Freeway now under construction in Oakland, Calif., 1,720 tons of the No. 18 bars are required. Bars are lifted to placement elevation with cranes. They can then be placed individually or, when necessary, can be tied into cages on "column horses." The cages then can be

(Continued on page 72)

NEW CORPORATION

SEAMAN-GUNNISON of BARABOO, WISCONSIN

DUO-PACTOR



Now, two compaction methods in one machine . . . an advantage found *only* in the Seaman-Gunnison Duo-Pactor. Unit offers pneumatic compaction through eight oscillating, spring-mounted wheels and rigid roll compaction to "iron out" the ridges left by rubber-tired rolling. Operator uses either of the two rollers independently or together . . . hydraulically selective.

In addition, the Duo-Pactor offers these advantages:

- 86 in. pneumatic rolling width; steel roller width 72 in.
- Complete turn-arounds, without backing, on 19-ft roads.
- Widest gross weight range of any roller built . . . 6 to 19 tons, sand and liquid ballasting.
- International "300" prime mover; 4 ft dia. drive wheels for maximum traction.
- Full power hydraulic steering through 180°.

Write today for complete specifications and details.



Spring-mounted oscillating wheels knead road surface.

COMPRESSION in lbs per lineal inch

	Empty	Fully Ballasted
Steel	104	425
Rubber	94	400
Both Steel and Rubber	50	200
Drive Roll	150	300

MAIL COUPON *for Details*

SEAMAN-GUNNISON CORPORATION
BARABOO, WISCONSIN

Send complete specifications on Seaman-Gunnison Duo-Pactor to:

Name.....

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City.....State.....

Seaman-Gunnison Corp.
BARABOO, WISCONSIN



Portable electric power for the smaller jobs

When commercial electric power is not available to the small contractor the modern generating plant will run tools and provide lighting.



**By
FRANK GERNAND**
West Coast Zone
Manager
D. W. Onan & Sons,
Inc.

OUT IN THE FIELD the small contractor frequently finds himself beyond the economic reach of commercial electric power for his equipment, portable tools, and lights. He is faced with two possible solutions: (1) resort to muscle-power for tools, and forget any idea of night work, or (2) develop his own power on the job. Every year these contractors are finding more and more economy in the use of electric energy and the resulting speed in construction operations. Costs can be reduced as the use of electricity is expanded on any construction job. How does the modern, progressive contractor lick this problem?

The only solution to this "powerless" dilemma is to somehow bring in power. The contractor can, in some cases, have high-lines brought into the site. This may become expensive and when the project is completed

and he moves on to his next job he is still faced with the same problem.

The idea of bringing in power by means of a highline is usually ruled out because of the cost incurred at each job area; plus the inconvenience and awkwardness of stringing long cords from the pole to any power equipment. In addition, the time delay and negotiation required in setting up such a power line creates another obstacle, all of which forces the contractor to find a sounder solution to his problem of power on the construction job. Some try borrowing electricity from an established user in the neighborhood already hooked up to the power lines, but this too meets with difficulties. People or firms aren't always willing to allow this power tapping, more negotiation is involved in reaching a financial figure (usually a small sum). Time delays and the stringing of lines again create confusion and waste. Generally this is feasible where the job is extremely small, such as a one-or-two house building project.

The quickening building tempo and the large-scale residential plot developments demanded a prompt and adequate answer. Previously, electric plant manufacturers had developed extremely mobile and portable electric generating plants for the Armed

Forces in World War II. Quick to meet a large and growing market, these small generating plants were redesigned for the construction industry and offered for that use. These electric light plants were light weight, some small enough to be carried by one man. Mounted on a rubber tire dolly the plants could be wheeled around the job site and easily loaded onto a truck.

Mobile plants are versatile

They were packed with power, a plant of 2,500 watts is capable of supplying enough electricity to run several electrical tools or floodlights simultaneously. These small portable or mobile type plants had to be versatile, able to run in all types of weather. The engines, usually gasoline, had to be of simple design, easy to maintain and service. Further, these engines had to accept standard grades of oil and fuel. Starting methods simplified on the smaller models to a rope starter, larger models operating from a push button starter.

The sudden demand for this equipment created a competitive market for the several manufacturers already in the business of producing other types of electrical generating equipment. So today the contractor can choose from any one of about one dozen reputable makes of electric plants. For the contractor about to buy an electric plant, a pitfall often encountered is the selection of a plant too small for actual and expansion requirements. Motivated by a price consciousness, or by underestimating his power needs, an undersized plant is purchased only to be regretted later.

Choosing the right size

To choose the right size plant which will generate sufficient power to meet your requirements, follow this simple procedure:

1. Make a list of all lights and motors to be used. After each item write the number of watts required to operate it (if watts aren't shown on the item, volts times amps will equal watts).

2. Make separate lists of several combinations of lights, appliances, and motors which you know must operate all at the same time. Add up the watts for each list. The largest sum of watts for any combination is the maximum load you must carry.

3. Choose a plant with a wattage rating at least 25% larger than your figured maximum load. This will give you a fair margin of watts to take care of additional equipment and emergency loads as well as the higher starting requirements of motorized equipment.

The contractor will almost invariably choose an alternating current plant, since the a.c. will operate all universal and a.c. motors, while the direct current plant will power hand tools only.

One small contractor in the West

HOW THE CAT* No. 12 MOTOR GRADER HELPED CUT COSTS

on the Garden State Parkway



Last year New Jersey's fine four-lane Garden State Parkway went in from Cape May to Paramus. Along one section of this big job the haul roads ran a mile and a half from borrow pit to fill—and the fill was 100% sand. It took continuous grading to keep the fill compacted, and Public Constructors, Inc., of Pleasantville, N. J., relied on four Cat No. 12 Motor Graders to do the job, as well as to keep the haul roads in shape.

"What would a contractor do without Caterpillar when there's an earthmoving job to be done?" wonders Supt. John W. Franks. Mr. Franks likes lots of things about the No. 12—mostly its low-cost features. And the *new improved* No. 12 offers greater low-cost advantages than ever.

Costs less to maintain. There's extra life built into every part of the Cat No. 12. The new exclusive Caterpillar Oil Clutch, for example, practically eliminates disc replacement and reduces down time considerably.

Costs less to operate. Just one reason among many: the heavy-duty 115 HP engine delivers efficient power on low-cost non-premium fuels.

Produces more. Positive controls; easy, natural steering that maintains "feel of the road"; clear visibility; fast, accurate blade positioning—features like these add up to maximum operator comfort and convenience, higher production on any job.

AND NOW, ANOTHER NEW COST-SAVING FEATURE:

New tubeless tires do away with expensive tube and flap trouble, eliminate costly tube replacement and can cut over-all tire down time *by 80%!*

No wonder Supt. Franks says, "To us, Caterpillar is the old reliable, always out in front with new designs that assure you not only the latest, but the best."

See *your* Caterpillar Dealer for full details on the high-producing, cost-cutting Cat No. 12 Motor Grader. There's nothing else like it available—anywhere.

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

CATERPILLAR*

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

**99% OF ALL CAT
MOTOR GRADERS EVER
BUILT ARE STILL AT WORK**



POPULAR SIZE of 2,500 watts will handle four electric hand saws, or a table saw and assorted hand drills. For jobs with heavier demands for power, this 10,000-watt, high-speed generating unit mounted on 2-wheel trailer will handle correspondingly bigger loads and is extremely mobile.

TYPICAL RUNNING-CURRENT REQUIREMENTS OF MOTORS

Horse Power	115 V		230 V		230 V		115 V D.C.		230 V D.C.	
	1 Phase A.C.		1 Phase A.C.		3 Phase A.C.		C W		C W	
	C	W	C	W	C	W	C	W	C	W
1/8	2.6	14	1.3	14	..	..	..	..	..	..
1/6	3.2	14	1.6	14	..	..	..	..	..	..
1/4	4.6	14	2.3	14	..	..	3.0	14	..	..
1/3	6.0	14	3.0	14	..	..	3.8	14	..	..
1/2	7.4	14	3.7	14	2.0	14	4.6	14	2.3	14
3/4	10.2	14	5.1	14	2.8	14	6.6	14	3.3	14
1	13.0	12	6.5	14	3.5	14	8.6	14	4.3	14
1-1/2	18.4	10	9.2	14	5.0	14	12.6	12	6.3	14
2	24.0	10	12.0	14	6.5	14	16.4	10	8.2	14
3	34.0	6	17.0	10	9.0	14	24.0	10	12.0	14
5	56.0	4	28.0	8	15.0	12	40.0	6	20.0	10
7-1/2	..	..	..	..	22.0	10	58.0	3	29.0	8
10	..	..	..	..	27.0	8	76.0	2	38.0	6

C — Full rated load current in amperes (Amperes while starting are much higher).
W — Minimum wire size permitted by code; larger sizes often required—Check distance for voltage drop.

found that he could use four electric hand saws (115 volts, 11 amps.) with cords from 15 to 100 ft. long to rip-cut through 2 x 6's. Experimenting further he found a plumber's die-threader and cutter with 11 amps. used at the same time with 3 saws on 100-ft. cords worked to his satisfaction. Other variations tried included a 115-volt table saw and assorted hand drills used from a 2,500-watt plant without an undue drag on the engine.

Individual use of the equipment dictates the proper size of plant to use. However, it is a wise rule to overestimate your needs in selecting the capacity of the plant. The electric plant on the job site receives rugged use, consequently requires proper care and servicing. The high concentration of dust in the air sometimes fouls the air cleaner causing the engine to labor. Some attention should be given to placing the plant in an elevated position away from the dust as it settles to the ground, and to periodic maintenance. The engine should be run regularly to "exercise" its parts, keeping the unit in a "ready" condition.

About 100-running-hours time on a generating plant is equivalent, in

total revolutions per minute, to approximately 4,100 running miles on an automobile. However, the wear on the generating plant engine and wear on the automobile engine aren't the same. The generating plant engine is built ruggedly for its heavy duty service, having a larger main bearing, bigger oil capacity, and a heavier crankshaft proportionately per horsepower than most automobile engines. Given the proper care and periodic servicing the generating plant engines will continue to give many more hours of efficient service than an automobile engine will after being run the equivalent number of running miles.

Oil in the plant should be checked every 6 to 8 running hours, and changed every 50 to 100 operating hours. Every 120 to 250 operating hours a thorough checking should be done—checking ignition points, replacing spark plugs, condensers, etc. The electric plant can "take it" and will give many hours of efficient performance provided it is serviced regularly.

Equipment such as this, built to exacting quality standards is actually priced lower than you might expect. A 2,500-watt plant, large enough to

fit the needs of most small contractors, costs about \$400. Give a contractor a pencil and a sheet of paper and he will justify his purchase this way:

Experience shows that on an average building project a workman spends half his time on jobs which power tools can do faster. For the sake of our discussion here, say only 1/5 faster. On this premise you save 75% of one man-hour each working day. This 75% of an hour x 240 working days = 180 hours saved in a year. And 180 hours saved x \$2.00 per hour (a probable low labor rate) = \$360 per year saved. Assume that your electric plant will burn \$80 worth of fuel and \$7 in oil during this period. And maintenance—say about \$20. Add to this \$160 amortization under the new declining balance method of depreciation.

\$ 87.00 fuel	\$360.00 saved
20.00 maintenance	267.00 expenses
160.00 depreciation	
\$267.00 expenses	\$ 93.00 in the pocket

The above figures are for one man. Put two and three men operating tools from the same plant and your savings multiply. Plus the fact that more work can be done per day, adding much more to the profit picture.

Small construction projects of most types today demand an independent source of power. The wide range of electric plants available will speed up the contractor's operation, when he makes the right plant selection.

Big re-bars . . .

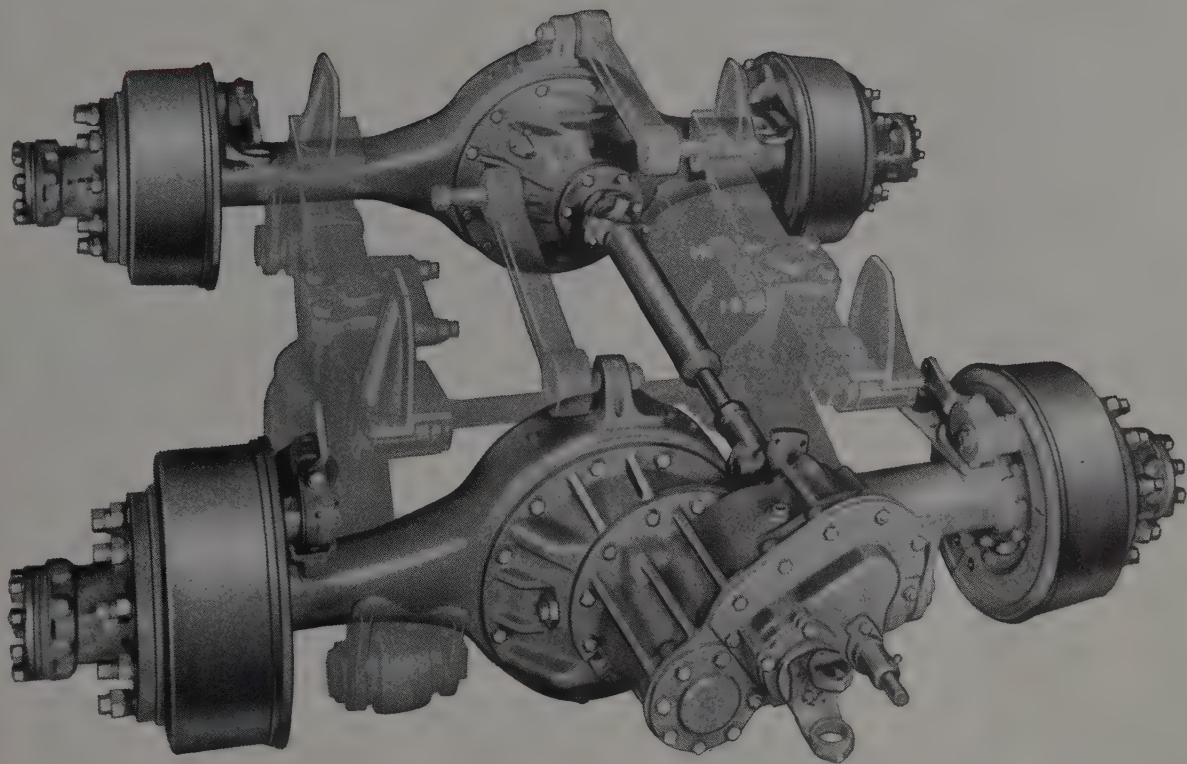
(Continued from page 68)

hoisted to the forms as a unit and secured into place. The "column horse" is a manual hoisting (and bolstoring) implement, consisting of pipe frame construction and hoisting tackle. By adding travelers to the tackle cages can be conveyed manually to the area of emplacement. Bars up to 93 ft. 6 in. in length will be used. It is necessary to cut the steel for transporting in Gilmore Fabricators' shops. At the site bars will be beveled and positioned for welding. The ends to be joined are pre-heated to 400 deg. F. The thermal intensity is measured with a "Tempilstik," which melts at this temperature. The bars are then butt-welded with low-hydrogen electrodes.

The No. 18 bar is now being used in refinery construction, schools, state highway bridges, overpasses, underpasses, separation, and distribution structures. Its use is unlimited, and is applicable to dam, commercial building and most other types of heavy construction. The majority of this size of steel is now being employed in highway structures of box-girder construction. So as the California state highway program accelerates, the demand for this section will become greater.

EATON TANDEM DRIVE AXLES

**Give Trucks Greater Load Capacity—
Reduce Tire and Operating Costs**



Eaton Tandems are the most practical units available for increasing payload in proportion to gross weight. Eaton Axles—the load-carrying and driving components—are performance-proved by thousands of units and millions of miles of service. They are installed to operate in the position for which they were designed and, therefore, are not subject to abnormal stresses or to unnatural lubricating problems.

Exclusive Eaton features, simplicity of design, and rugged construction assure maximum performance with minimum maintenance.

Eaton Tandem Axle Features Provide Superior Performance

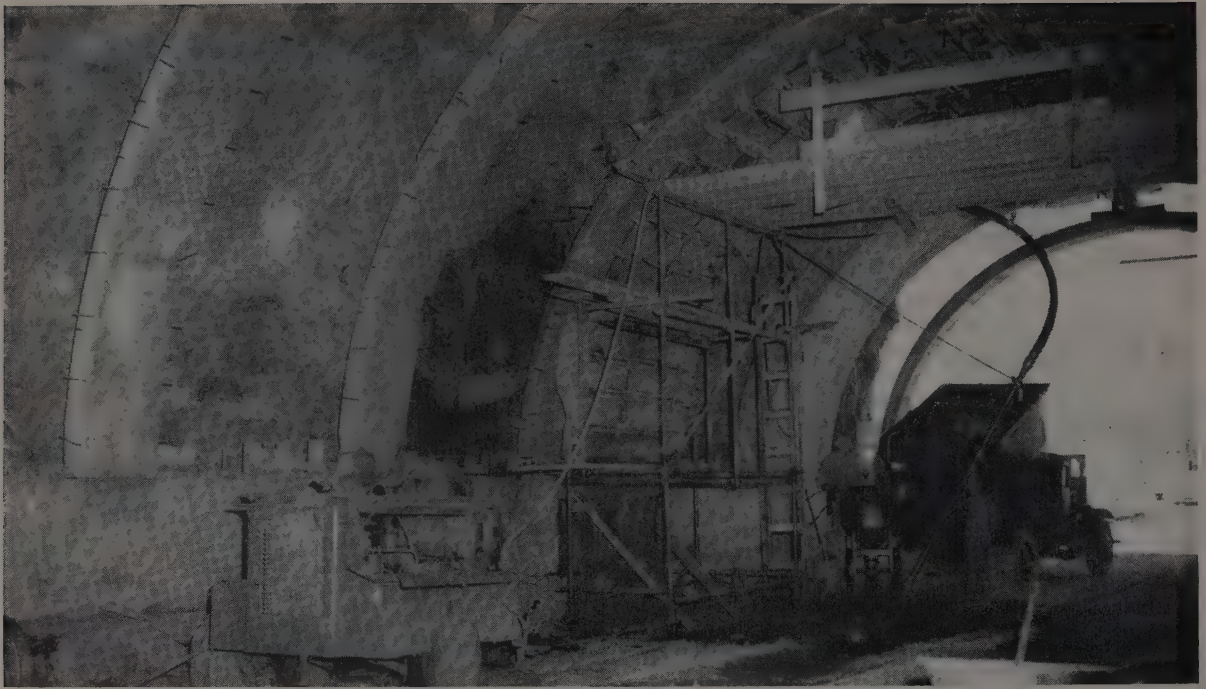
- Engineered specifically for tandem operation
- Rugged power divider transmits power equally to both axles
- Inter-axle differential compensates for variation in wheel speed and eliminates the need for tire matching
- Differential lock-out provides positive drive to each axle when needed
- Designed to give maximum strength with minimum weight

EATON

AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO



PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



Precast concrete ribs speed tunnel lining

PRECAST CONCRETE rings are the unusual feature used in lining a 250-ft. highway tunnel in Mt. Rainier National Park. These two-segment arch ribs were 7 ft. 8 in. apart and were used to support the forms for cast-in-place intermediate sections. Under the direction of the Bureau of Public Roads, this 18.5-mi. highway contract was held by J. A. Terteling and Sons, Inc., who sublet the tunnel lining and paving to Young and Smith of Salt Lake City. Referred to as the Stevens Canyon Highway, the project provides a new and scenic route connecting between two points on Washington State Highway No. 5, all located in the National Park.

Original design and alternate

Although driven entirely through rock, the formation is seamed and faulted making lining necessary to protect against falling rock fragments and dripping water. Original plans called for a rather conventional cast-in-place reinforced concrete lining supported below the springline on a cast-in-place sidewall. The other design called for precast reinforced concrete segments 10 in. in thickness with provisions for bolting together to form a solid semi-circular lining. The width of these rings was made optional with a 6-in. minimum specified. A two-segment design was se-

lected because it would be self-supporting immediately upon erection.

Contractors were required to bid the concrete tunnel lining on the unit of linear feet, and the bidder was not required to indicate which type of lining he proposed to use.

Contractor's proposal

Sometime after the contract was awarded and the subcontractor was actively engaged in studying plans for lining procedure, a formal request was submitted to include the precasting and erection of 2-ft. wide concrete rings to be spaced 7 ft. 8 in. apart (in the clear) and this space to be filled with cast-in-place concrete. This proposal of the contractor was considered to have two principal advantages: (1) the precast rings would support the entire dead load of the cast-in-place concrete eliminating all interior falsework and (2) the ribs would form a template making it easy to form the interior and exterior surfaces of the cast-in-place lining by attaching forms to the front and back of the precast rings. This design was approved.

A further request was to cast the rings at the yard of the Empire Building Material Co. of Portland, Ore., using lightweight (Lite-Rock) aggregate. Use of the light-weight aggregate produced concrete weigh-

ing about 100 lb. per cu. ft. and reduced hauling costs for the 175 mi. from casting yard to site. This further proposal was also accepted. The mix called for 8 sacks of cement per cubic yard using the lightweight aggregate, and strengths of 3,500 psi. were obtained at 28 days. About $1\frac{1}{2}$ cu. yd. of concrete was required for each of the quarter circle rings which weighed approximately 4,000 lb.

Erection of the ribs

Walls of the tunnel below springline are of regular cast-in-place type and were poured by usual methods.

Erection of the two segments of the precast rings was carried forward as a joint operation using a front-end loader and a small shovel for handling. First the shovel was used to place the segment on the bucket of the loader and this machine would then lift it into position. This first lift would place the end of the rib into a notched joint at the top of the wall. Finally, the shovel would be used to lift the other end of the ring to the roof of the tunnel where it would be supported temporarily while the other ring was being placed. Fitting the top ends together closed the curved joint at the top.

In a few cases, the clearance above the top of the ring did not allow the halves to be lowered in position as described and this made it necessary for one section to be moved horizontally along the wall to final position.

As soon as they were in position each ring became self-supporting and the tunnel was clear of falsework. A few timber wedges were set between



W. "Slim" Ransdell, equipment engineer, Fredericksen & Kasler, contractors, Edwards Air Force Base, California

"Under severe desert conditions Guardol holds up..."

"We work our equipment hard 10 hours a day here at Edwards Air Force Base where our earthmoving equipment moved 2,400,000 yards in a recent six months' period, building taxiways and aprons capable of handling some of the world's heaviest and fastest aircraft.

"And because we demand a lot from our equipment... working it every day in the heavy dust and highly-elevated temperatures of the Mojave Desert... we service it with *the finest* lubricants we can buy. In our book, those are Union Oil products.

"In the crankcases of our 'Eucs', DW20s and D8s we are using Guardol, Union's Supplement 2 oil, with good results. Under severe desert conditions Guardol Motor Oil holds up where others won't, and has extended the overhaul intervals on our 'Eucs' and other machines."

Guardol Motor Oil, as Mr. Ransdell says, holds up under operating conditions where ordinary heavy duty oils fail. If you're operating under unusually severe conditions such as F&K have at Edwards A.F.B., it will pay you to order Guardol Motor Oil for *your* equipment, too.



UNION OIL COMPANY
OF CALIFORNIA



Los Angeles: Union Oil Bldg. • New York: 45 Rockefeller Plaza • Chicago: 1612 Bankers Bldg. • Philadelphia: Eastwick Ave. & Edgewood St.
Dallas: 313 Fidelity Union Life Bldg. • Kansas City, Mo.: 612 W. 47th St.
New Orleans: 644 National Bank of Commerce Bldg.

the ring and the rock to prevent any movement.

The main purpose of the precast ribs was put into use as soon as they were in place. Bolts extended from each side of the precast rings and to these were fastened C-bolts which, in turn, held 6-in. timber walers supporting plywood forms. The spacing of the precast ribs at 7 ft. 8 in. permitted the use of two widths of plywood with a 2-in. overlap onto the adjacent ribs. The plywood forms were precurved and were $\frac{5}{8}$ in. thick.

The backside of the cast-in-place section was formed by placing 1-in. lumber, spanned between the precast rings and held to the inside form by wire ties. No attempt was made to salvage or reuse this form lumber on the backside of the concrete.

Because the contractor elected to use the pneumatic method of placing this concrete, he was permitted to use $\frac{3}{4}$ -in. maximum size aggregate in place of the $1\frac{1}{2}$ -in. size normally used for such concrete. In addition, the contractor increased the cement content from the normal 6.5 bags to 7 per cu. yd. making possible an increase in the water allowance and a higher slump for easier handling.

Concrete was batched and mixed on the job using regular equipment and transported in 1-yd. dump trucks to point of placement. The dump truck filled the $\frac{3}{4}$ -yd. bowl of the pneumatic machine and the concrete was then moved by air pressure through a 3-in. steel pipe into the forms.

Each of the cast-in-place sections contained 11.1 cu. yd. of concrete and required about $2\frac{1}{2}$ hr. for placing. Doors were placed in the forms at about 60 deg. above springline on both sides of the tunnel. Through the first opening, concrete was placed to crown elevation and then the discharge pipe was moved to the opposite door and the remaining section filled.

General advantages

Saving in time appears to be the outstanding advantage in this particular method. In fact, because no supporting obstructions are required, the lining could be carried on during the time the tunnel was being excavated. The method was new and economy would probably be improved by further use.

Bid prices for the concrete tunnel lining, above springline, as extracted from the four bids received for the entire project vary from a low of \$240 per lin. ft. to a high of \$350 with an average of \$285. The actual contract price, based on the low bid for the overall project was \$250 per lin. ft.

The foregoing was based on material supplied by D. M. Goodall, senior highway bridge engineer, Bureau of Public Roads, Division 8, Portland, Ore.

Letters...

Factors for successful vibratory compaction

SIR:

Replying to your letter of January 19, it is true that there is no general agreement among manufacturers as to what frequency of vibration is necessary for compaction of soil by surface vibrator. This is exactly the reason why we undertook the research work here at Caltech. Almost any frequency of vibration will aid in the compaction of sand, but our research shows that there is a particular frequency which is most effective, especially in connection with the compaction of cohesive soils. Most of the commercial vibrators that I know about run at speeds varying from 1,400 rpm. to 4,200 rpm. Any vibration in this range may be somewhat effective on relatively clean sand, but I have yet to see any such machines produce more than a thin layer of compacted soil if the material is cohesive.

Resonance is essential

Our experiments show that best results are obtained when the vibrator and the soil are in resonance. This resonant frequency varies with the size of the vibrator and with the character of the soil. The range of frequency for moderately clean sand is liable to be between 900 rpm. and 1,800 rpm. For cohesive soils, the resonant frequencies tend to be lower than this, say between 500 and 1,000 rpm.

But not the whole story

Resonant frequency is not the whole story when it comes to getting maximum results by vibrating equipment. In addition, the unit soil pressures must be about right, or at least adequate. For sand, this may be as low as 3 psi. The more cohesive the soil, the higher the unit soil pressure required; for clay soils, up to 10 or 12 psi. is needed.

The third desirable factor is to have the dynamic force approximately equal to the weight of the vibrator itself. The fourth important factor is to have the moisture in the soil approximately best for the particular type of soil. For sand, this would be either quite dry, or with a moisture content near optimum. For silty and clay soils, the moisture content should be close to or slightly above optimum by standard compaction methods.

FREDERICK J. CONVERSE
*Professor of Soil Mechanics
California Institute of Technology
Pasadena, California*

More compaction comment from highway department

SIR:

For a number of years we have been looking forward to the day when vibratory compaction of soils would become of age and move from the laboratory and controlled test era to the field where engineers and builders could benefit materially from the numerous advantages of this potentially economical method of obtaining desired densities in our highway soils. As each new type of equipment is introduced, we are another step closer to that realization.

The article in the December issue of *Western Construction* on principles of vibratory compaction by F. J. Converse was timely and informative. Other than the specific information it gives regarding principles to be followed for compacting both cohesive and non-cohesive soils, the discussion of the two general classes of compactors, the flat-plate type and the roller type, is of particular interest.

Limited frequency adjustment

It is regrettable that space does not allow a more thorough discussion of soil-vibrator resonance. The importance of having the vibrator operating at the resonant frequency of the soil mass has been recognized for many years, yet manufacturers are still designing equipment with a constant vibration rate, or with a relatively limited range of frequencies that cannot be adjusted easily and accurately by the operator while the equipment is in motion.

Since the resonant frequency changes with changes in soil density and shearing modulus of elasticity, the need for easy vibrator frequency adjustment is basic. For further emphasis of this point, one need only to visit any usual highway project and view the wide range of soil types that must be handled over the length of the job.

Vibrator should fit the job

The statement by Prof. Converse that "In order for the vibrator compactor to be an effective tool for the contractor it must be used under circumstances which bring out its peculiar advantages," cannot only be applied to vibrator compactors in general, as he did in the article, but, also, it can be applied to each of the individual types now being manufactured. In the field, existing types fall into three classes rather than two, based on functionality. These are the flat plate, the pneumatic roller, and the steel drum roller. Each seems best fitted for somewhat separate operations in road construction, with

ANOTHER TEST— ANOTHER WIN FOR NEW **CAT*** **LOWBOWL** **SCRAPERS!**

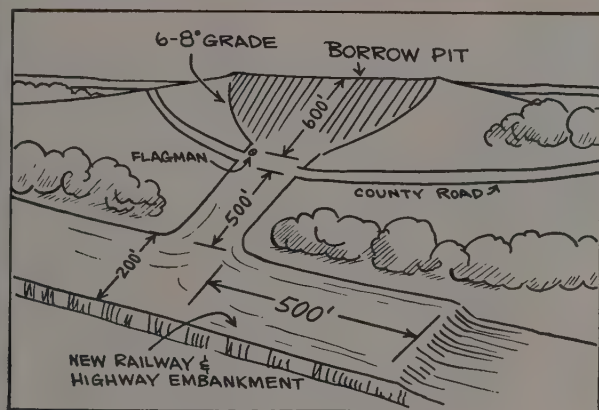
FIRST in loading tests on the Kansas Turnpike against six competing scrapers, including one noncurrent DW21-No. 21, which was runner-up!

FIRST AGAIN, against two DW21-No. 21s, in tests in Iowa!

Test after test in the field proves the ability of the new Cat DW21 (Series C)-No. 470 LOWBOWL Scraper to deliver bigger, faster loads than competing scrapers — including the unit it succeeded, the DW21-No. 21. Here's a recent test made in Iowa. Look it over—see how Caterpillar's exclusive LOWBOWL design pays off in bigger production on the job!

Complete details of this and other on-the-job tests are carried by your Caterpillar Dealer's salesman. Ask him to show them to you.

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



DESCRIPTION OF TEST

JOB AND LOCATION: Highway and railroad relocation near North Liberty, Iowa, involving 600,000 cu. yd. of fill. Contractor: The Stewart and Rank Construction Co., Bettendorf, Iowa.

CONDITIONS: *Material* — wet-damp gumbo and red glacial clay mixed with gravel. *Loading conditions* — borrow area with 6 to 8% favorable grade, Cat D8 Tractor used for pusher. *Haul distance* — 1600 feet. *Return distance* — 1600 feet. *Grade* — 600 feet of 6 to 8% favorable grade out of borrow area, remainder negligible. Return same route.

AVERAGE CYCLE TIME:	DW21-No. 470 LOWBOWL Scraper	DW21- No. 21s
LOAD	1.00 min.	1.02 min.
HAUL	1.40	1.65
DUMP	.69	.60
RETURN	2.51	2.88
Total no-delay cycle time	5.60	6.15
Wait and delay time (average of all units to facilitate comparison)	.70	.70
TOTAL CYCLE TIME	6.30	6.85

COMMENTS: Though the DW21-No. 470 LOWBOWL Scraper carried larger loads, the combination of its turbo-diesel horsepower, highly efficient power train and big, wide-section tires gave the unit a 14% advantage in cycle time.

In the dump area, its power, traction and flotation really paid off. Noncurrent models often had to be pushed while unloading — the new machine seldom required pushing.

RESULTS OF IOWA TEST

	DW21-No. 470 LOWBOWL Scraper	Noncurrent DW21-No. 21s without sideboards
Average load in bank cu. yd.	18.9	15.5
Total average cycle time on 3200-ft. round trip	6.30 min.	6.85 min.
Trips per hour	9.5	8.8
Production in cu. yd. per hour	180	133

LOWBOWL ADVANTAGE in bank cu. yd. per hour: 47



NEW CAT DW21 TRACTOR-NO. 470 LOWBOWL SCRAPER New Turbo-charged 6-cylinder Cat Engine packs 300 HP at 1800 RPM. Scraper capacity is 25 cu. yd. heaped, 18 cu. yd. struck. Exclusive LOWBOWL design loads more material faster because of less loading resistance. And now advance-design, wide-section tires are standard equipment. These tires give better flotation and traction in soft going.

CATERPILLAR*

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

**BIGGER, FASTER
LOADS WITH CAT
LOWBOWL SCRAPERS**

You get **FASTER ACTION** when you **SWING** AN **OWEN BUCKET**

OWEN
CLAMSHELL BUCKETS
INSURE A
BIGGER DAYS
WORK

Yes, an OWEN BUCKET swung from any crane boom will always give you:

FASTER Penetrating ACTION
when handling aggregate and loose materials;

FASTER Digging ACTION
with variable, multiplied closing power for excavation;

FASTER Loading ACTION
by reason of correctly engineered bowl designs with balanced power on each jaw;

FASTER Discharge ACTION
The combination of adjustable reeving and weight concentration in area surrounding lower sheave block exerting a direct pull on the cable, results in quicker opening and faster dumping.

"A mouthful at every bite"

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the steel drum type possibly the most versatile of the three.

In general, the pneumatic type is best fitted for embankment compaction of granular and low-cohesive materials in relatively thick lifts. Our experience indicates that it cannot be used very successfully on cohesive soils, which agrees with Prof. Converse's rule requiring low dead weight pressure. The high unit pressure of 80 to 90 psi. also causes this type to tend to leave the top 4 to 6 in. of many granular materials in a loose condition while compacting material below that depth. The flat plate type, because of its relative deficiency in maneuvering is best used where it will not interfere with other operations, such as for compaction of granular surfacing courses. The steel drum roller appears adaptable to both embankments and surfacing operations, but lift thicknesses are best limited to 8 in. or less in most materials.

Combining two types

From the contractor's standpoint, one important feature of all vibrator compactors that could be turned to his immediate advantage generally has been overlooked. Normally, one pass of a vibrator will achieve the bulk of the compaction desired, and will orient the material so that a relatively few passes of standard pneumatic rollers will achieve a higher density than possible with a large number of passes with standard rollers. From this standpoint, supplementing standard rolling procedures with vibratory rollers in the early phases of compaction should prove quite economical.

More information needed

To encourage the contractor and field engineer to apply the vibration principles to their needs, more realistic articles such as that written by Prof. Converse are needed. The next step would appear to be to interrelate resonant frequency ranges of various soil types with frequency ranges of various types of machines. Some "tools" are needed for recognizing situations especially suited to vibratory compaction, and for selecting the particular equipment best suited to the situation.

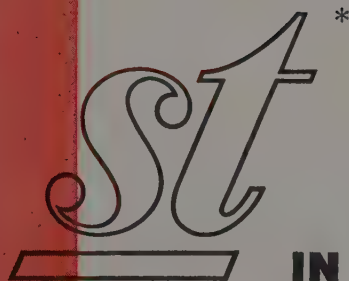
H. W. HUMPHRES,
Senior Materials Engineer,
Washington Department
of Highways,
Olympia, Wash

Note:

Next month another interesting and constructive letter will add to the information which we have published on this new development in the field of earth compaction.

Again in '55...

MACK



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*and by the
biggest margin ever!*

* based on official A.M.A. factory sales figures. Nearest make attained 17.16% of the market.

**42.06% of all diesel trucks
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Operators everywhere, in all kinds of hauling operations, have again made Mack their No. 1 favorite among *all* diesel trucks. And their margin of preference is the biggest so far! Regardless of competitive claims, Mack owners have learned from millions of miles of heavy-duty operation how truly outstanding are Mack trucks powered by the famous Mack Thermodyne Diesel engine. They're *first* in earning power . . . because they're *first* in fuel economy,

first in low-cost maintenance, and *first* in rugged long life. See your Mack branch or distributor for the full story. Mack Trucks—Los Angeles • Denver • San Francisco • Seattle • Portland • Salt Lake City • Albuquerque.

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first name for
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3961-A

Can management methods be applied to contracting?

First conference on the subject, sponsored by engineering department of UCLA, explores this question with more than 200 contractors attending.

CAN THE PRINCIPLES of scientific management, common to the manufacturing industries, be translated into effective use by the construction industry?

This was the general subject studied and discussed by almost 250 contractors and other construction men at the first "Conference on Construction Operations" presented by the Department of Engineering of the University of California, Los Angeles, January 27-28.

Dean L. M. K. Boelter, College of Engineering, UCLA, was the moving force behind the conference and Professor C. Martin Duke, professor of engineering, served as general chairman for the conference.

Original concept and planning

Behind the two days of conference extended a long period of discussion and planning, first to ascertain whether such a meeting would serve a useful purpose to the construction industry, and second, to arrange a program of maximum effectiveness. During this formative period, the purpose of the meeting was stated by Dean Boelter as an effort to place the construction function of industry on an analytical and planned basis, comparable to the design of machines and structures.

Admitting that much progress has been made in the development of construction equipment including the introduction of modern features, there was a belief that advance planning and a proper flow of information from top to bottom in the contracting end of construction was not keeping pace with other technical developments. At least, there was the feeling that it was not receiving the intense interest that it does in other fields, particularly the manufacturing industry. The conference was intended to help the industry study itself along this line of deficiency, and as a by-product to assist professors in engineering schools who are now expressing more and more interest in the teaching of construction as an industry.

The Committee included representatives of the Associated General Contractors, the Construction Division of ASCE, engineering departments of the University of California, federal agencies, and private engineers and contractors.

The program was arranged to begin with general sessions that would

review basic aspects of the general problem and then end with panel sessions which would permit an active exchange of ideas relating to both office and field problems in building and in heavy construction.

Planning the job

The presentation which seemed to set the theme for the conference and to develop interest of the contractors was entitled "Planning and Programming the Project" by Robert L. Cashen, vice president, H. K. Ferguson Co. He stressed the need of planning up to the point where it loses its economic value. Introducing his review of the subject, he admitted that construction problems and projects are individual and non-repetitive, making the application of industrial methods rather difficult.

Overall job planning, according to Cashen, is done at the time of bid preparation which establishes the programmed time and the terminal dates for various features of the job. For example, this program may show that a certain period of time is allotted to the pouring of three floors of reinforced concrete. This information may be of general use to the project manager and for those in charge of the flow of materials, but it is of little direct assistance to the concrete superintendent or particularly the foremen on these elements of the work. As a result, the H. K. Ferguson Co. has evolved a system of preparing "pre-plans" which break down major elements of the project into smaller units that are directed to the foreman level. These pre-plans may take a small concrete pour and present all the necessary information on the work to be carried out by the various crafts, the materials which will be required, and the size of the crews. This is job planning in its ultimate form.

Working backwards to the information which made possible the preparation of these pre-plans, they are based on methods studies. To carry out the particular operation which is the subject of the pre-plan, the planning engineer will study all possible methods of carrying out the work and present the best ones to the general superintendent who will select the procedure to be used. These methods studies are based on facts and not on opinions or habits.

Backing up a further step in this process, the method studies must be

based on some figures of fixed costs and these are provided in a "Bogey Book," which the company has prepared for its own use indicating average costs of carrying out simple operations and the man-hours involved.

All of these operations up to and including the preparation of the pre-plan are carried out by the planning engineer on the project. These men (one for each \$1,000,000 of construction cost) function as members of the general superintendent's staff. They have no authority in directing the work but their efforts are restricted to studying possible methods and preparing the most feasible plan for the consideration of the superintendent or project manager.

This general concept of the planning engineer and his important function on industrial building projects was echoed later in the conference by Gunnar C. Carlson, Associate Chief Engineer, The Procter & Gamble Co. The general concept was echoed again and again by speakers and questioners during other sessions.

One period was devoted to exploring the proper chain of communication from the designer to the field constructor. This chain was reviewed by George E. Brandow, structural engineer, talking on plans and specifications; Theodore R. Tucker, design supervisor of Fluor Corporation, who reviewed the use of models as an aid in communication between designer and the field; and Charles A. McMahon, project superintendent and engineer who described how plans are translated into final structure.

Turning to the field of engineering construction, Grant P. Gordon, assistant general manager, Guy F. Atkinson Co., reviewed step by step the pre-construction planning for a major job, basing his talk on the McNary Dam Project. The organization and the management principles applied by a major sized construction organization were reviewed by Lyman B. Wilbur, vice president, Morrison-Knudsen Co., Inc.

Panel discussions

Panel sessions the second afternoon presented an opportunity for an exchange of ideas in small groups.

One of these, presided over by Charles MacCloskey, discussed the field problems of engineering construction. The panel included authorities on: (1) the contractors' license law, (2) the control exercised by the contracting agency, (3) interest of the union of operating engineers, and (4) the selection and sale of equipment. A peculiarity of the California contractors' licensing act was explained, which requires a new license for every new bidder combination, in spite of the fact each member may be licensed.

HOW'S THIS FOR PROFITABLE AGGREGATE PRODUCTION?

- Output per 10-hour day—
200 T. of-1/8"; 300 T. of-1/2";
500 T. of-1"; 400 T. of-1 1/4";
600 T. of-1 7/8"; 400 T. of-3".
- Total daily production—2400 Tons
- Material—Quarry-run limestone
- Silica content—Approximately 16%

"Our CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKER is doing a real job"

Says Edgar N. Putman, Supt.
NEW HOPE CRUSHED STONE & LIME CO.
New Hope, Pa.

Take it from this quarry operator—producing six sizes of specification material at a steady 240 ton per hour clip is profitable production! "With our 4350H Impact Breaker we're getting good breakage, ample crushing capacity, and operating costs are low," says Edgar Putman.

In addition to the Cedarapids Double Impeller Impact Breaker, the New Hope plant includes a 40'x12' heavy-duty cast steel Apron Feeder and three Horizontal Vibrating Screens—all Cedarapids!



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If you need output of 240 tons per hour, 40 tons per hour, or 800 tons per hour—of finished product ranging from aglime to riprap—there's a Cedarapids portable or stationary aggregate plant built to produce the tonnage you want at the low cost that means extra profit. If you produce bituminous concrete, check the complete line of Cedarapids batch-type and continuous-flow type plants.



IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

REPORTS from the COURTS

By HOWARD S. BURNSIDE, Attorney and Registered Engineer

Competitive bidding by architects not required

"The question here presented is whether a board of education is required to advertise for competitive bids before it may contract with an architect for his professional services to prepare plans for the city's school extension program.

"Appellant urges upon this court that his cause is governed by sections 18051 and 18052 of the Education Code which require (1) respondent to advertise for bids from architects and (2) to award any contract to the lowest bidder. Because such procedure was not followed, appellant contends that the judgment should be reversed and that respondent should be enjoined from expending any public funds on a void contract.

"The contention here made has long since been denied judicially and legislatively. It has been held that because an architect is an artist, that his work requires taste, skill and technical learning and ability of a rare kind, it would be bad judgment to advertise and get many bids when the lowest bidder might be also the least capable and most inexperienced and his bid absolutely unacceptable and therefore 'the employment of a person who is highly and technically skilled in his science or profession is one which may properly be made without competitive bidding.'

"But after the above-cited decisions, the Legislature in 1951 added section 53060 to the Government Code as follows:

"The legislative body of any public or municipal corporation or district may contract with and employ any persons for the furnishing to the corporation or district special services and advice in financial, economic, accounting, engineering, legal, or administrative matters if such persons are specially trained and experienced and competent to perform the special services required."

"That statute removes all question of the necessity of advertising for bids for 'special services' by a person specially trained and experienced and competent to perform the special services required.

"The contention that respondent improperly employed architects who neither reside in Pasadena nor do business there is based on no authority. Neither section 53060 nor any other statute restricts employment by a school district of architects to

those who reside in any particular city or district. Such employment, therefore, lies within the discretion of the board, with which courts will not interfere in the absence of fraud or abuse of discretion in the exercise of its legislative powers."

Cobb v. Pasadena City Bd. of Education
285 P. 2d 41

Attempt to rescind too late

The statutes covering the law of contracts provide for rescission of contracts for various reasons. One ground for rescission is when fraud is discovered to have been employed in securing consent of a party to enter into the contract. If such a discovery is made the party on whom the fraud is practiced may continue with the contract if he believes it will be profitable despite the means by which he was induced to commence upon it. Or he may promptly rescind, restore to the other party everything of value which he has received and get back whatever he has given. But he cannot follow both courses as the plaintiffs attempted to do in this case.

Plaintiffs exchanged land in Los Angeles for mining claims in a rock quarry in Arizona owned by defendants. The written contract was executed July 11, 1951, and the exchange was consummated in August 1951 after plaintiff had visited the quarry several times.

During the fall and winter months plaintiffs attempted to operate the quarry but were unable to meet the quality specifications of stone required by their principal customer. There was evidence that the stone was inferior because it had a soft texture which made it hard to process and it was not possible to obtain pieces large enough to make it marketable. Plaintiffs also spent large sums to replace equipment which they allege was represented to them as new by the defendants.

Operations were discontinued in February 1952. On July 3, 1952, plaintiffs gave defendants notice of rescission of the contract, then brought an action for damages alleging numerous false representations by defendant with respect to the mining claims.

The appellate court held that plaintiffs had not acted with reasonable diligence in giving notice of rescission and that the plaintiffs had sustained no damage.

"A party rescinding must rescind

promptly on discovering the facts which entitle him to rescind. (1) The requirement of prompt rescission is mandatory, and a party may not wait to see whether the contract turns out to be good or bad. . . . Diligence is a condition of the right to rescind, and the right is lost by delay . . . The transaction is ratified by failure to rescind promptly after discovery of the facts which entitle the party to rescind." (2) In other words, you can't have your cake and eat it.

(1) 1691 Calif. Civil Code

(2) *Sogg v. Harvey* 285 P. 2d 104

Disciplinary proceedings terminate with death

Horace Orchard, now deceased, entered a construction agreement which was terminated before completion of the work because of disagreement. It was agreed to arbitrate and the award of the arbitration favoring Mrs. Orchard, executrix of the decedent, was later made and was confirmed by the court.

The owner sought to set aside the confirmation by the court alleging that during the time of entering and performing the contract Orchard and another licensed contractor operated as a partnership or joint venture without having an additional contractor's license as required¹. He alleged further that Orchard had been found guilty of a violation of the cited code section by the State License Board. Orchard died three days before the hearing officer of the State Board made his written decision.

In confirming the judgment and order in favor of the estate of the decedent the court said, "A judgment or order made and entered after the death of a person and which purports to affect only his personal status is void . . . The disciplinary proceeding as against Orchard came to an end upon his death and no valid order could be made against him thereafter."²

¹7029 Calif. Bus. & Prof. Code.

²*Orchard v. Pancoast* 283 Pac. 2d. 309.

Notes

In a condemnation proceeding for acquiring a temporary right to borrow dirt, rock, sand and gravel, and other road building materials from land adjoining the new highway, a rule of damages was adopted from an earlier case in the State of Washington involving damage by the taking of material from land as distinguished from taking the land itself (1). "Where an entire property is taken, the measure of compensation is its fair market value. But where there is a 'damaging' of property . . . the measure of compensation is the difference between the fair market value of the property before and after it was damaged" (2).

(1) *Long v. State* 285 P. 2d 198

(2) *Armstrong v. City of Seattle* 180 Wash. 30.



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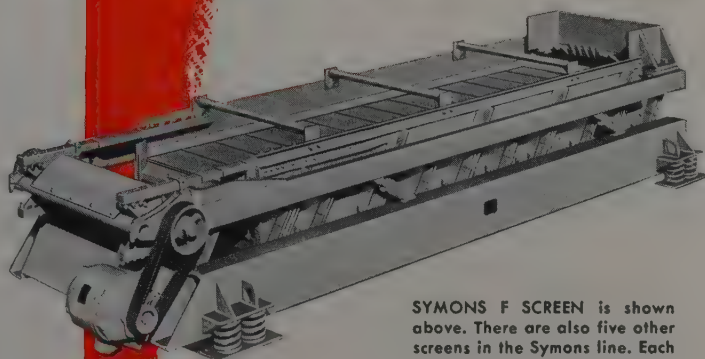
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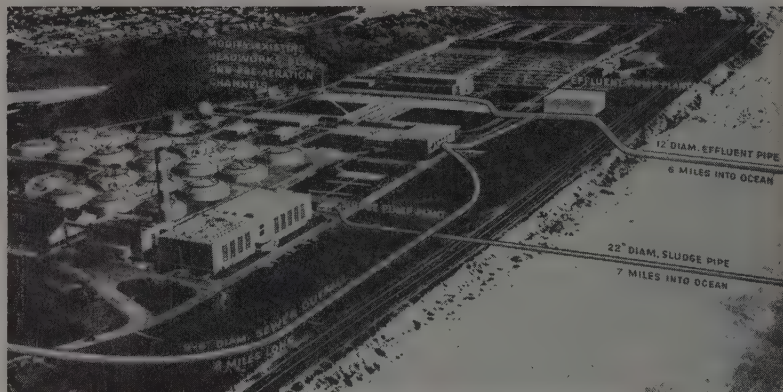


SYMONS F SCREEN is shown above. There are also five other screens in the Symons line. Each is designed for a specific purpose.

ARIZONA

ROAD CONSTRUCTION activity totaled \$10,377,000 on January 15, according to William E. Willey, State Engineer. This was \$3,500,000 over the value of projects under construction on the same date a year ago. More than 225 mi. of new state highways costing \$16,000,000 were built by the Highway Department during 1955. One of the major projects just completed was the linking of Phoenix and Prescott with an all-paved route. Projects now under construction include the Colorado River Bridge at Yuma for a cost of \$1,200,000 to be shared equally by Arizona and California, and the Cutter-Bylas realignment of U. S. 70 to cost \$1,484,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Arizona include a low bid of \$122,370 submitted by Givens Construction Co. of Phoenix for grading, surfacing, and construction of a bridge in Gila County. Tanner Bros. Construction Co., of Phoenix submitted a low bid of \$300,911 for grading and surfacing in Cochise County. A low bid of \$483,473 was submitted by Fisher Contracting Co. of Phoenix for grading and surfacing 14 mi. southeast of Tucson. Tiffany Construction Co. of Phoenix submitted a low bid of \$463,325 for grading and surfacing near Yuma. Wm. S. Porter of Mesa received a \$200,000 contract for a frozen food processing plant, for Rosita Food Products Company, Inc., Mesa.



\$40,000,000 EXTENSION AT HYPERION TREATMENT PLANT

Hyperion Engineers, joint venture firm organized to prepare designs for some \$40,000,000 of modifications and improvements to the Hyperion treatment and disposal plant, has submitted final drawings to the Los Angeles Board of Public Works. Among the completed drawings, to be sent out for construction bids when approved, are those for a new sludge pumping plant and a 7-mi. sludge ocean outfall line. Also included were final designs for the westerly half of an 8-mi. outfall sewer, 9½ ft. in diameter, which will eventually run from Baldwin Hills to the Hyperion plant.

The plant is undergoing expansion which will include modifications to the existing headworks building, pre-aeration channels, new flow channels, drainage systems, and other features, plans for which are due for completion by April of this year. Work on the project began last June when the Board of Public Works awarded the contract to Hyperion Engineers, the firm founded for the purpose. The joint venture is made up of three Los Angeles organizations: Holmes & Narver, Inc., engineers and constructors who are sponsors of the joint venture; Daniel, Mann, Johnson & Mendenhall, architects and engineers; and Koebig and Koebig, consulting engineers.

CALIFORNIA

CONSTRUCTION has been delayed at Monticello Dam on Putah Creek by the high waters in December and January. The access road on the

north side of the creek is being rebuilt, the area between the cofferdam and the main dam is being pumped dry, and some of the footings on the trestle are being repaired.

BECHTEL CORPORATION of San Francisco has been awarded a contract for a 50-ft. hydroelectric dam for the Poe Project of the Pacific Gas & Electric Co. The dam site is about 30 mi. upstream from Oroville on the north fork of the Feather River. The dam will be about 450 ft. long and will divert the river's flow into a 7-mi. tunnel. Work on the tunnel began last summer by the Utah Construction Co. and Bates and Rogers Construction Corp., who have a joint contract on that part of the \$40,000,000 installation. About 2,700 ft. of the upper end of the tunnel were flooded during the recent high waters, causing an estimated \$400,000 worth of damage.

RECENT MAJOR CONTRACT AWARDS and low bids in California include a low bid of \$6,934,486 submitted by McCammon-Wunderlich



SALT RIVER PROJECT HEADQUARTERS BUILDING

Architect's sketch of proposed general office headquarters of the Salt River Project, Phoenix, Ariz. is shown. The new general office building will be located near Tempe. Plans for the modern building were prepared by Kemper Goodwin, Tempe architect. About 400 employees are expected to work in this building.

Wes Meyer Construction Co. of Phoenix will be general contractor on the building, with Valley Sheet Metal Co. low for air conditioning and C & F Equipment Co. for preparation of the site. The contracts awarded totaled \$827,946. This amount, when added to the contract for structural steel erection which was awarded to the Allison Steel Manufacturing Co. several weeks ago, brought the total cost of the new building to \$957,565.



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Co. of Palo Alto for grading, surfacing, and construction of five bridges in Contra Costa County. **Oberg Bros. Construction Co.**, Inglewood, submitted a low bid of \$460,861 for grading, paving, and construction of a bridge in Los Angeles County. A low bid of \$9,489,126 was submitted by **American Bridge Division, U. S. Steel Corp.** of San Francisco for the superstructure for a bridge to be constructed across Carquinez Strait at Crockett in Solano and Contra Costa counties. **Mason & Hanger-Mason-Rolandi**, San Francisco, submitted a low bid of \$5,454,694 on the substructure for a bridge across Carquinez Strait at Crockett in Contra Costa and Solano counties. **Fredrickson & Watson Construction Co.** of Oakland was awarded a \$1,856,248 contract for grading, paving, and construction of five bridges in Alameda County. **A. Teichert & Son, Inc.**, of Sacramento submitted a low bid of \$938,754 for grading, paving, and construction of one bridge in San Joaquin County. **Peter Kiewit Sons' Co.** submitted a low bid of \$4,661,462 for bridge approaches and structures in Crockett and Valona near the Carquinez Strait in Contra Costa County. **E. C. Young Service Construction and Arrieta**, Sun Valley, submitted a low bid of \$1,449,718 for grading, paving, and construction of four bridges in San Diego County. A low bid of \$7,098,690 was submitted by **Ferry Bros and Son**, Los Angeles, and **R. S. Crow** of Glendale for grading, paving, and construction of three bridges in Contra Costa County. **Ukropina, Polich, Steve Kral and John R. Ukropina**, San Gabriel, was awarded a \$3,188,422 contract for two roadbeds to provide 6 lane divided freeway in Los Angeles County.

COLORADO

COLORADO'S STATE Highway Commission has recommended to the State Legislature that it reject all proposals for construction of a tunnel under the Continental Divide. The Commission recommended instead that the State spend \$9,000,000 to improve roads over Berthoud, Loveland, and Rabbit Ears passes. The Commission said that if a tunnel is built, the Straight Creek route on U. S. 6 above Georgetown would be the most logical site. A Los Angeles investment banking firm is considering a highway toll tunnel as a private venture.

BOULDER'S BOOM climbed to new levels during 1955. During the year permits valued at \$10,700,000 were issued for new construction, remodeling, and repair work, topping the previous record year, 1952, when

a total of \$8,500,000 worth of permits were issued. Annexations added 888 homesites to the city. Boulder has increased in physical size by one-third in the past five years and has more than doubled since 1946.

RECENT MAJOR CONTRACT AWARDS and low bids in Colorado include a \$312,646 award for grading and surfacing in Sedgwick County to **Gardner Construction Co.** of Glenwood Springs.

IDAHO

ACCORDING to State Highway Engineer Earle V. Miller restoration of Highway 95 north of New Meadows to a state in which it would not be subject to damage from floods would cost about \$1,000,000. A portion of U. S. 95 was heavily damaged when the Little Salmon River flooded during the Christmas rains. Miller estimated that \$500,000 would be needed to restore the road to its original condition.

IDAHO FALLS has accepted a design for the overpass at the "G" Street subway which would make unnecessary the use of property state officials have been unable to acquire. It is expected that bids will be called on the project this spring as originally scheduled.

RECENT MAJOR CONTRACT AWARDS and low bids in Idaho include a \$132,569 contract award to **Marion J. Hess, Malad**, for grading and surfacing between Lemhi and Leadore in Lemhi County. **Marion J. Hess, Malad**, was awarded a \$501,512 contract for 6.2 mi. of grading, paving, and construction of a bridge in Canyon and Ada counties. **Pickett & Nelson** of Idaho Falls was awarded a \$384,223 contract for grading and surfacing and construction of a railroad underpass in Twin Falls County. **Frank G. Baulne, Yardley, Wash.**, was awarded \$684,759 contract for grading and surfacing in Latah and Benewah counties. **Morrison-Knudsen Company, Inc.**, of Boise, was awarded a \$307,993 contract for construction of vehicle parking area, Gowan Field. A \$458,018 contract was awarded **Babbitt Construction** for construction of an overpass in Caldwell.

MONTANA

FIRST HIGHWAY bidding in 1956 is slated for sometime in March, ac-

TRESTLE REPAIR

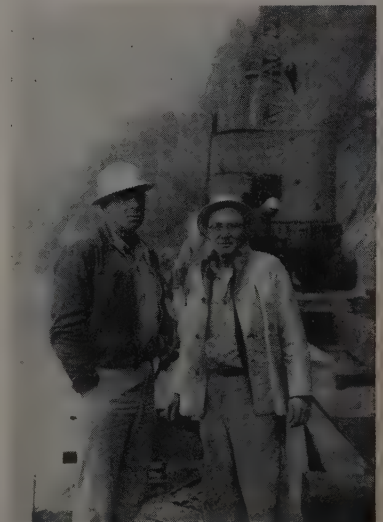
(Continued from page 34)

opened the entire line on February 1.

P. A. Corkins was superintendent for Morrison-Knudsen. Frank Alford was equipment foreman; Harry Lentz and Harold McKnight were day shift foremen; John Laide and Herb Lowe were night shift foremen.

The job was under the direction of Frank Gladwin, bridge and building supervisors; Art Hefte, senior assistant bridge and building supervisor, both of NWP; William M. Jackle, chief engineer, and Shirley White, general bridge and building supervisor, both of the San Francisco headquarters of the parent line, Southern Pacific.

The railroad now is operating two short trains per day in each direction between Willits and Eureka, despite further problems with unstable terrain which continue to delay full restoration of service. A diesel locomotive and two cars of a train moving south from Eureka were derailed Feb. 5, near the site of a sliding mountainside which has been causing line troubles near Spyrock, in the Eel River Canyon. No one was hurt, but clearing the line tied traffic up for nearly 24 hr. Sinks in the roadbed and slides still are occurring in the canyon. Until conditions on the line are better, NWP is running trains through the Eel River Canyon, where the greatest part of the flood and storm damage occurred in December and January, only during daylight hours. Track improvements are being made daily. Four work trains are unloading gravel or assisting crews in restoring river banks. Two are between Spyrock and Fort Seward, one is in the Dos Rios area and the other is working around South Fork, between Shively and Fort Seward.



SUPERINTENDENT for Morrison-Knudsen on this job was P. A. Corkins, shown here with Harold McKnight, day shift foreman.



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22½-TON LORAIN SELF-PROPELLED CRANE

Big, bulky lifts like this one are no problem to Leckenby Structural Steel Co. of Seattle, Washington. Their mobile, 22½-ton Lorain Self-Propelled Crane, model SP-424, with a 50-ft. boom, moves fast all over their yard, handling all sizes and shapes of steel—angles, bars, beams and fabricated steel shapes—loading and unloading from trucks and railroad cars.

Rubber-tire mobility is a big asset where materials must be handled over a wide area. Extreme maneuverability, combined with multiple big-tire flotation and ample tractive effort, makes Lorain Cranes ideal for a wide range of material handling or construction jobs, even on rough or soft-ground operation.

SP-424 & MC-424 MONEY-MAKING FEATURES:

TURNABLE • Hoist drums on anti-friction bearings • Swing Drums on anti-friction bearings • Front Turntable Rollers on anti-friction bearings • Removable Counterweight—to lower total vehicle weight for road travel.

BOOMS • D-7 Boom—square tubular chord design; maximum capacity at minimum weight • Pin-connected crane boom—fast and easy to assemble • 2-piece, 25-ft. tip extension—extensible to 40 ft. • Precision Boom Lowering device for cranes • Tilting mast-type gantry with detachable 6-part floating boom harness • Ability to back-down-the-load • Dual boom stops.

CARRIERS • Thew-designed and built carriers, specifically designed for shovel-crane loading • Moto-Crane travel speeds—10 forward to 27 m.p.h.—2 reverse • Self-Propelled travel speeds—4 in both directions approx. 7.2 m.p.h. • Air brakes • Through drive—provides maximum traction at all times as torque is always transmitted to the axle with tractive ability.

Check the features of the 22½-ton Lorain Cranes listed at the left. Lorain offers both the single-engine Self-Propelled and two-engine Moto-Crane rubber-tire mountings, with lifting capacities up to 30 tons as Self-Propelled—45 tons as Moto-Crane. Crawler-mounted Lorain Cranes are available in capacities up to 61 tons. Ask your Thew-Lorain Distributor for facts about the Lorain best fitted to your job needs.

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WC 13

cording to State Highway Engineer Scott P. Hart. Construction in 1956 is expected to cost about \$24,000,000, a 20% increase over 1955. Another \$6,900,000 will be spent for road and bridge maintenance.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include a \$1,136,000 contract to **Peter Kiewit Sons' Co.** of Omaha, Neb., for construction of piers for the lower crossing railway bridge at the Noxon Rapids Dam project in western Montana. **Naranche & Kinda**, Butte, submitted a low bid of \$109,393 for construction of the Cooper Creek road in the Deerlodge National Forest, Granite County. **Nilsen-Smith Construction Co.** of Great Falls and **Northwestern Engineering Co.** of Rapid City, South Dakota, are low bidders jointly at \$2,296,311 on a contract for paving and utilities at Malmstrom air force base near Great Falls. A low bid of \$1,016,000 was submitted by **Haggerty-Messmer Construction Co.** of Billings for construction of Gallatin County High School. **Harris Construction Co.** of Aberdeen, South Dakota, was awarded a \$437,285 contract for grading and surfacing in Valley County. A \$423,226 contract was awarded **L. A. Woodward Construction Co.** of Missoula for 6.8 mi. grading and surfacing in Powell County. **E. C.**

Powell & Baltrusch Construction Co. of Great Falls was awarded a \$370,976 contract for 11.2 mi. of grading and surfacing in Hill County. **Union Construction Co.** of Missoula was awarded a \$198,646 contract for grading, paving, and structures in Flathead County.

NEVADA

STATE HIGHWAY Engineer Huston Mills has announced a budget calling for an expenditure of \$14,855,000 during 1956. This is \$3,500,000 more than last year. The department also plans to spend another \$4,555,000 on projects which were budgeted last year but which were not placed under contract for various reasons.

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include \$676,603 contract award to **Hoops Construction Co.** of Twin Falls, Idaho, for grading and paving in Clark County. A \$159,152 contract was awarded to **Steward & Hitchcock**, Las Vegas, for 12.4 mi. of grading and paving in Clark County. **Sierra Construction Corp.** of Las Vegas was awarded a \$214,750 contract for construction of maintenance building at East Ely in White Pine

County. A \$658,262 contract was awarded to **Young & Smith Construction Co.** of Salt Lake City, Utah, for 24 mi. of grading and surfacing in Lincoln County.

NEW MEXICO

ABOUT 540 MI. of 4-lane divided highways were completed in New Mexico during 1955. The Highway Department's master plan calls for the eventual construction of 4-lane highway on 66 across the state from the eastern border near Tucumcari to Gallup. Biggest job completed during the year was a 12-mi. stretch on the super highway from Albuquerque to Santa Fe.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include a \$272,528 contract award to **Henry Thygesen & Co.** of Albuquerque for 4.3 mi. of grading and surfacing in Eddy County. **Sproul Construction Co.**, Albuquerque, submitted a low bid of \$167,000 for construction of a new school in Alamogordo. **Modern Construction Co.** of Santa Fe submitted a low bid of \$176,200 for addition to Holloman

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Twelve rear dumps and the two pushers are equipped with Fuller 5-A-920 5-speed Transmissions, and the eight Model 9FDT bottom dumps with Fuller 4-B-86 4-speed Transmissions.

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CHEHALIS BRIDGE OPENED TO TRAFFIC

The Chehalis River Bridge, which gained notoriety (WESTERN CONSTRUCTION, April 1955) during its construction due to the collapse of a cofferdam, was opened to traffic on January 27. The \$5,000,000 double leaf bascule structure crosses the Chehalis River at Aberdeen, Wash., and replaces an old swing bridge built in 1926. It is a link in the expanded state highway construction program and serves as access from Olympia and Grays Harbor communities to the industrial area on Willapa Harbor at Raymond, the commercial and sports fishing area at Westport, and the beaches of southwest Washington. It was built for the Washington State Highway Commission under two contracts; one with Manson Construction and Engineering Co. for the reinforced concrete approaches and the other with MacRae Bros. for the bascule span and the steel plate girder flanking spans. R. W. Finke was construction engineer for MacRae.

Base's elementary school. Robert E. McGee of Albuquerque was low bidder at \$347,300 for the construction of an engine buildup shop at Kirkland Air Force Base.

OREGON

THE PORTLAND DISTRICT, Corps of Engineers, is going to use a helicopter for the first time in its history in order to expedite inspection of damage to revetments resulting from the recent flood in the Willamette River Basin. It is estimated the work will require 40 hr. of flying time as opposed to 30 days by ground reconnaissance.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include a \$130,170 contract award to Pettijohn Engineering Co. of Portland for construction of a bridge on the Nehalem River in Columbia County. R. H. Jones, Hillsboro, was awarded a \$101,535 contract for construction of a steel structure on the Dallas-California Highway in Klamath County. Gibbons & Reed Co. of Portland was awarded a \$616,641 contract for the construction of the Knowles Creek-Turner Tunnel section of the Mapleton-Richardson Road in Lane County. Roy L. Houck

& Sons of Salem was awarded a \$277,333 contract for 4.8 mi. of grading and surfacing in Umatilla County. A \$349,502 contract was awarded to Alum Bros of Eugene for 7 mi. of grading and surfacing in Deschutes County. Warren Northwest, Inc., of Portland was awarded a \$364,241 contract for 7.3 mi. of grading and paving in Klamath County. An \$899,964 contract was awarded Tom Lillebo, Reedsport, for grading and concrete structure in Klamath County. Workman & Wilson, Canby, was awarded a \$124,720 contract for construction of a concrete bridge over the Nehalem River in Tillamook County. George E. Berry of Beaverton submitted a low bid of \$101,500 for construction of undercrossing and 1.1 mi. of grading and surfacing near Hermiston in Umatilla County. Birkemeier Construction Co. of Milwaukee was awarded a \$108,089 contract for separation structure on the Three Mile Lane Highway in Yamhill County.

APPROVAL of a contract with California Oregon Power Co. to continue operation of the Link River Dam, a feature of the Klamath Reclamation Project in southern Oregon, for irrigation and power purposes, has been announced. The contract will assure operation of the dam at all times for irrigation and domestic use on existing and future Federal Reclamation projects in the area, while at the same time clearing the

way for immediate construction by the company of a hydroelectric development on the Klamath River, some 30 mi. downstream from the dam.

BIDS WILL be opened in April for construction of a diversion tunnel at the Hills Creek Dam site. Clearing in the reservoir area behind the proposed dam will get under way and work on the diversion tunnel will probably start in May.

UTAH

PETER KIEWIT Sons' Co., are 30 days ahead of schedule on their \$2,000,000 highway project near the mouth of Parleys Canyon. The gain has been attributed to favorable weather and the use of night shifts. The Kiewit contract includes widening the lower 2.5 mi. of U. S. 40, widening Wasatch Boulevard to 4 lanes down to 33rd South, and construction of an interchange at the mouth of the canyon. Widening the upper part of U. S. 40 is under way by Gibbons & Reed Co. of Salt Lake City.

RECENT MAJOR CONTRACT AWARDS and low bids in Utah include a low bid of \$111,949 submitted by Whiting & Haymond Contractors of Springville for grading and surfacing in Iron County. W. W. Clyde & Company submitted a low bid of \$728,299 for construction of a bridge and 14 mi. of grading and surfacing in Uintah County. A low bid of \$88,729 was submitted by Wilkinson Construction Co. of Morgan for 6 mi. of grading and surfacing in Millard County. Witt Construction Co., Provo, was awarded a \$467,940 contract for construction of a new hospital, Moab.

WASHINGTON

A SPILLWAY study of the Priest Rapids Dam is now under way at the Division of Industrial Research at Washington State Institute of Technology. The spillway model is on a scale of 1:38 and includes only two-spillway gate widths. The study is being made for Harza Engineering Co., consulting firm for the Grant County Public Utility District.

MORE THAN \$22,000,000 has been budgeted by the Washington Water Power Co. for construction in 1956. Biggest item on the schedule is \$15,-



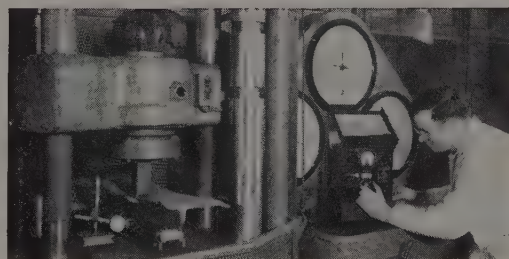
Biggest reason for using only Caterpillar original parts in your machine is a reason you cannot see or feel. It is the *ancestry* of Caterpillar parts.

Behind each and every CAT* replacement part is the experienced engineering, painstaking research, grueling testing, skilled manufacturing and rigid inspecting which make Caterpillar products the standard of the industry. With these truly "pedigreed" parts you can be sure of better all-around performance, less down time.

With substitute parts, can you be sure of anything?

See your dealer's Parts Representative — get Caterpillar original parts every time.

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



Special gauge measures exact amount of strain a track shoe part can endure. Constant testing like this guarantees that all parts are made to the highest Caterpillar standards. Why be satisfied with anything less?

CATERPILLAR*

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



710,000 slated for the Noxon Rapids Dam in western Montana. Another \$1,750,000 is ticketed for the new Ross Park Service Center in Spokane. New substations will be constructed at Wilbur, Othello, and Kettle Falls in Washington and Bovill and Lakeview, Idaho.

MORE THAN \$7,000,000 worth of work was in progress last year on eastern Washington highways, according to the Highway Department. Included in the work were 220 mi. of arterials and construction of several new bridges. In Spokane 17 mi. of new paving was completed bringing the total now paved to 420 mi.

RECENT MAJOR CONTRACT AWARDS and low bids in Washington include a low bid of \$572,763 submitted by **Hall-Atwater, Inc.**, of Seattle for Roza Power Plant, Roza Division of the Yakima Project. **C. E. O'Neal** was awarded a \$370,301 contract for 4.5 mi. of grading and surfacing in Grant County. An \$80,758 contract was awarded to **Grant Construction Co.** of Coeur d'Alene, Idaho, for grading and surfacing in Franklin County. **Levitt, Chandler & Co.**, Bellevue, submitted a low bid of \$2,441,215 for construction of 200 units of family housing at Fort Lewis. **McAtee & Heath** of Spokane submitted a low bid of \$1,922,558 for grading and surfacing a taxiway at Larson Air Force Base. A \$518,466 contract was awarded to **N. Fiorito Co., Inc.**, of Seattle for 5.1 mi. of grading and surfacing in King County. **R. L. Moss & Co.** of Zenith was awarded a \$304,589 contract for construction of a bridge in King County. A \$527,901 contract was awarded to **Wilder Construction Co., Inc.**, of Bellingham for 5.9 mi. of grading and surfacing in Whatcom County.

WYOMING

HIGHWAY Superintendent J. R. Bromley said recently that a pilot tunnel through the mountain at Shoshone Dam west of Cody will be contracted for construction in 1956 if the U. S. Bureau of Public Roads accepts the State Highway Commission's plans for the project. The Highway Commission has put the tunnel on its program for 1956 pending its approval as a Federal Aid Project. The tunnel would be built to study the structure of a proposed traffic tunnel so contract bidders would be aware of the type of rock through which they have to dig. The pilot tunnel would be about 3,000 ft. long and about 8 ft. in diameter.

CONSTRUCTION in Cheyenne totaled \$6,500,000 in 1955. The total in

1954, the record year, was \$7,300,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Wyoming include a low bid of \$277,748 submitted by **Charles M. Smith**, General Contractor of Thermopolis for earthwork and structures on the Big Horn Basin Division, Owl Creek Unit of the Missouri River Basin Project. A \$568,751 contract was awarded to **Northwestern Engineering Co.** of Denver, Colorado, for construction of three bridges over Elk Horn Creek and miscellaneous work on 5.2 mi. in Natrona County. **F. R. Knowlton & Son** of Layton, Utah, was awarded a \$100,449 contract for grading and surfacing and construction of a bridge over Bear River in Uinta County. **Boatright Smith**, Rawlins, was awarded a \$168,736 contract for 5.5 mi. of grading and surfacing.

ALASKA

CONTRACTS to be awarded by the end of the fiscal year next June 30 by the Army and Airforce will total \$75,000,000. The projects are located at widely scattered military installations

in the Pacific Northwest and Alaska, and include airfields and all types of buildings. Construction bids will be invited by the Corps of Engineers District Offices in the areas where the work is located. Twenty-three are in the Seattle District, 19 in the Walla Walla District, and 50 in the Alaska District.

Here and There

TWO BUREAU of Reclamation contracts totaling \$2,582,000 are to be awarded to initiate work on the Palo Verde diversion dam on the Colorado between California and Nevada, and the Roza Power Plant of the Yakima Project in Washington, according to Secretary of the Interior Douglas McKay. A \$2,000,000 contract for the Palo Verde diversion dam goes to **W. E. Kier Construction Co.** on their low bid. The project involves building a diversion dam, and levees, and drainage canals. The contract to start construction on the Roza Power Plant goes to **Hall-Atwater, Inc.**, on their low bid of \$572,764. This job involves a powerhouse, penstocks, and trash rack.

Long tunnel studied in Montana

A FEASIBILITY INVESTIGATION will be undertaken this spring by the Bureau of Reclamation on a potential multi-million-dollar transmountain diversion and storage project in northwestern Montana, it has been announced by Marcus Hilden, engineer in charge of the Bureau's planning studies in the Clark Fork Basin.

Topographic surveys and exploratory drilling are on the summer schedule. The drilling may be done on a contract basis. A report on the feasibility study is expected next year, according to the regional office of the Bureau in Boise, Idaho.

The project would entail construction of a storage-diversion dam on the Middle Fork of Flathead River in the area south of Glacier National Park and a diversion tunnel seven to eight miles long through a mountain range. The tunnel would divert waters of the Middle Fork to the South Fork of the Flathead upstream from Hungry Horse Dam. Firm power could be developed with a hydroelectric plant at the drop into Hungry Horse reservoir, and the increased storage would raise power production at the Hungry Horse plant. In addition, the increase in minimum streamflows would boost power production at 11 other existing plants, public and private, on the Flathead, Clark Fork, Pend Oreille, and Columbia Rivers.

A map study and hydrologic data

have indicated the project has good possibilities, according to Reclamation engineers. Four possible tunnel routes and as many storage and diversion sites have been located on maps. Storage on the Middle Fork would be necessary for success of the project because over half of the annual runoff normally occurs during May and June.

On paper, the most favorable storage site appears to be one designated as Spruce Park. However, careful investigation of foundation conditions will be necessary because the Roosevelt Fault lies in this general area, which is above Bear Creek in the Flathead National Forest. The project area is at about 4,000-ft. elevation; hence the working season is comparatively short—generally from June through September.

Although the Middle Fork downstream from the sites forms the southwestern boundary of Glacier Park, no opposition from National Park Service officials is anticipated. The project would not infringe upon the park area. In addition to adding much needed power in the Pacific Northwest, the project would have some value for flood control in Montana and possibly for navigation on the Columbia.

Hilden, who headed contract administration for the Bureau during construction of Hungry Horse Dam, has declined to make even a rough cost estimate of the diversion project.



gate, together with curved apron, give best boiling action for fast heap, eliminate spill, help fill corners. Wheels inside cutting edge make precision work possible next to banks and on slopes.

Big 208 hp Model C Tournapull prime-mover with Fullpak Scraper makes 180° turn in 31' 2", rides on 4 big 26.5 x 25, 26-ply rating, low-pressure tires, travels up to 30 mph over highways and cross-country.



Scraper

18 cu. yards heaped

**Loads faster...
boils better...**



You've never seen a scraper that loads as *easy* and heaps as *fast* as this new LeTourneau-Westinghouse Model C Fullpak Scraper.

New Fullpak low, wide bowl, loads up to 18 cubic yards heaped capacity with minimum of loading resistance. Low push-block matches height of tractor push-plates. Direct line application of power from pusher to blade, makes easier, faster loading.

The "low and wide" design of this new Fullpak Scraper helps get more "boiling" action, makes it easy to fill back corners as well as apron, packs in a big load *fast*. Wheels are inside cutting edge, for precision finish work next to banks and on slopes. Positive, forward ejection forces out sticky as well as dry material... wipes bowl clean each load. High apron lift (6'1") permits all material to be quickly and cleanly unloaded. Fullpak Scraper spreads in accurate lifts to meet any construction requirement.

Powerful, improved 208 hp Model C Tournapull prime-mover has the famous power-transfer differential that keeps pulling-traction on both drive wheels at all times... also geared king-pin power steer that can turn 90° and "walk" Tournapull out of mud and loose sand that stalls ordinary prime-movers. You have top speeds to 30 mph, with choice of sliding-gear or constant-mesh transmission.

This new 18-yard, faster-loading Fullpak Scraper means more pay yards for you

Before you buy your next scraper, get full information on this new Fullpak 18-yard C Tournapull. Contact your local Distributor for complete details.

P-1024-G

9 Power-steer on geared king-pin permits 90° turn, swings prime-mover side-to-side in soft going, placing drive-wheels on firm footing to "walk" out of mire.

10 Push-button control makes handling easy. Brushless, all-weather electric motors at point-of-action give instant steer-and-scraper control, minimize cable needs.

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

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ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

CONSTRUCTION SEASON

DAWNING — A little more than three months remains before the 1956 construction season in Alaska gets under way on a full scale basis. Even so, there's considerable activity taking place in the dead of winter here in Alaska. Most of it is in the world's "icebox" north of the Arctic Circle. In that region, the Alaska Freight Lines is busily engaged in transporting cargo for the continent's northernmost radar defense line. Temperatures now range from 40 to 50 below zero in much of northern Alaska and the going is tough for this gigantic cargo movement. Actual construction, however, is at a snail's pace right now. The entire North is now a land of virtual round-the-clock darkness. Construction men can do little under conditions like these except look ahead three or four months hence when wheels can turn again.

MUNICIPAL CONSTRUCTION

—Planning a civic center for Anchorage has been given first priority by the city planning commission. Since the end of the war and the ensuing post war boom, Anchorage city officials have been fighting a losing battle for space to house a rapidly-growing assortment of municipal departments. There is no unified building containing all city departments; instead, city agencies are scattered in various locations. Planners hope to centralize these operations in one large conveniently-located building. The problem now is finding adequate space in the downtown area of Anchorage where land costs are high and vacant lots practically nonexistent.

BUSY SUMMER—The district engineer office has released information confirming a report in this column to the effect that there would be only a very small change in the volume of construction in Alaska this coming summer. This announcement stated that more than \$33,000,000 in additional military construction is scheduled for advertisement to contractors during the final half of the fiscal year ending June 30. The work involves 51 separate projects all over Alaska. Larger jobs are concentrated in the Anchorage and Fairbank areas. The immediate Anchorage area will receive more than \$15,000,000 in newly scheduled projects. Other projects included in the \$33,000,000 figure will be built at Whittier, Kenai, Ladd Air Force Base, Big Delta, Fire Island, and King Salmon.

GUIDED MISSILES—A new type

of construction becoming dominant in Alaska this year is the Nike projects. Already authorized for Alaska is an estimated total of \$20,000,000 in these vital rocket installations. Individual Nike installations, including work at the site, will cost in excess of \$3,000,000 each. Contractors who bid on these sites should remember that erection of a Nike site is a specialized piece of construction not to be compared with run-of-the-mill defense assignments.

JOBLESS PICTURE—Unemployment in Alaska has passed its peak and, as in past years, is beginning a gradual decline. This decline will continue until it reaches a low point in July and August, the months of peak construction. The jobless picture in Alaska's major cities such as Fairbanks and Anchorage is now at its darkest. Large numbers of construction workers who in past years ordinarily would have gone "Outside" have chosen to remain in Alaska. In many instances this has been an unhappy choice because the cost of living is much higher in the territory than anywhere in the states. Unemployment compensation checks offer the jobless worker very little more than a bare existence during this bleak period in the territory's economic cycle.

AMAZING SPENARD—One of the suburbs of Anchorage which, ten years ago was little more than a moose trail through the woods, today is outrivaling the fantastic growth of the city of Anchorage itself. The population in the Spenard area has spurted from a mere handful of homesteaders to more than 15,000 persons in the last decade. Construction-wise, this has presented Spenard officials with a whole Pandora's box of problems. The area needed water and sewer lines but residents were not ready to pay for them. Consequently, they had to build their own cesspools and dig their own wells. Now, however, many residents find that their wells are contaminated and cesspools filled up and agitation is growing for a water and sewer system. It's a multi-million dollar job and the price will be pretty stiff for the average property owner. As the matter stands now everybody in Spenard appears to agree that utilities are needed but the community is sharply divided as to whether the taxpayers are ready to foot the bill.

ROAD EXPENDITURES—About \$25,000,000 has been scheduled for construction and maintenance of Alaska highways this year, about

\$1,000,000 more than last year. The only new highway construction set for 1956 is the first section of the Nenana-Fairbanks highway.

HOT PLATE NOT SO HOT—A

few Anchorage motorists are slightly hot under the collar because of icy conditions on the city's steep hills. Many cars aren't able to make it up the hills and drivers are forced to take other routes. Last summer, as a boon to such harried drivers, the city began construction of a "hot plate" on one major hill in the city. Coils of wire were imbedded in the surface of the paving and heat caused by resistance to electricity surging through them was supposed to keep the surface of the hill warm as toast. In theory, it looked splendid, but so far this winter, the "hot plate" in Anchorage has stubbornly refused to function in the manner in which it's supposed to. So the city's engineers are trying to work out the kinks in the built-in snow removal equipment—with little success so far.

ATOMIC ENERGY—Anchorage power officials are vitally interested in the possibility of installing an automatically-operated power generating plant in that area. City officials have been conferring with a representative of the Nuclear Development Corporation of America with regard to possibilities for installing the plant. If the deal ever goes through, it will mean another big construction job up for bids.

CONSTRUCTION NEWS CAP-

SULES—Late in January, payment of unemployment compensation checks in Alaska was halted when the Employment Security Commission board dismissed the acting executive director; more than a quarter of a million dollars in checks have been held up pending appointment of a new ESC leader . . . Anchorage is facing a severe water shortage—its principal source of supply, a small creek, is extremely low. City officials considered water rationing as a way out but finally decided against it . . . A dispute between the city of Anchorage and the Chugach Electric Association (a power cooperative) over electrical distribution boundaries has been settled to the satisfaction of both parties. Details of the settlement weren't given . . . The Anchorage area is still digging out of the worst snowstorm in its history—the storm occurred early in January . . . Contracts at Elmendorf Air Force totaling \$7,987,210 for all schedules of work for construction of five nose-wing hangars and other buildings have been awarded by the Alaska District, Army Corps of Engineers to Baker & Ford; Lease Co., Inc. and Puget Sound Bridge & Dredging Co.; Kuney-Johnson Co.; S. Birch & Sons and Green Construction Co.; J. B. Warrack Co.

Speed and Mobility

get more work done!



Tournatractor takes the shortest route to job... via highway or cross country... cuts hours from job-to-job moves.



8 hp Tournatractor with PCU on rear can be hooked up to pull scrapers, graders, and rollers.



Rubber tires do not damage rails or ties... it can switch up to 10 fully-loaded road cars at once.

Whenever your application involves scattered job assignments, Tournatractor's 19 mph forward speed and extreme maneuverability cuts moving costs and reduces the non-pay hours of moving time. Big, low-pressure tires let you drive Tournatractor anywhere. For long moves, you save time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Speed on the job

Tournatractor pulls, dozes, pushes at working speeds 2 to 3 times faster than crawler tractors. You have 3.69 mph in second gear, 8.38 mph in third, compared to crawler speeds of around 2 mph in second, and 3 mph in third. Tournatractor travel speed of 19.23 mph compares to the crawlers' top ranges of 4 to 6 mph. You change gears instantly...waste no time shifting.

8 mph reverse speed

High reverse speeds give a very important time-saving advantage to tractor-on-rubber. Nearly 50% of your working cycle on dozing or pushing jobs is usually spent backing up. Tournatractor's reverse speed cuts crawler backing up time by almost 25 to 50%. Crawler highs in reverse range from 3.1 to 6.2 mph. Tournatractor high in reverse is 8 mph.

Instant shifting

Constant-mesh transmission aids high-speed performance by eliminating delays in changing gears...saving vital momentum...gives you any gear ratio instantly. Tournatractor works in higher gear ratios because there is no loss of momentum for shifting. Torque converter increases this advantage by giving you wide automatic over-lapping of gear ratios, without depending on operator to jockey levers to get the most effective ratio of power and speed to load.

Ample flotation and traction

2' wide tires stay on top of soft ground instead of digging in. Lugs bite into underfooting to give traction. Tire pressures as low as 20 lbs. absorb shock. Rolling action compacts loose materials far more effectively than crawlers.

Lower maintenance

There are 4 easy-rolling-wheel-assemblies as compared to more than 500 wearing parts in standard track-assemblies. This means less maintenance. Dollar-wise this reduction in maintenance time can mean a saving of \$3 per hour in operating expenses.

Easier to operate

Fingertip electric controls work at the flick of a switch. Steering, raising and lowering the blade, and operating the power-control-unit are all handled by buttons on dashboard. There are no levers, wheels, or other manual controls to handle. Big, low-pressure tires greatly reduce jars and jolts, stress and strain, on both operator and machine.

Interchangeable equipment

Adding to Tournatractor's versatility are a number of interchangeable attachments... Bulldozer, Angledozer, Root Rake, Snow Plow. This versatile tractor can also be equipped with a Push-Block, Logging-Winch or Tree-Pusher for additional applications. Drawbar and PCU are available for hauled equipment. Electric-control, open-top scrapers are also available for use with Tournatractors.

Find out for yourself how Tournatractor's go-anywhere mobility and 19 mph speeds can help you get more work done. Compare this rubber-tired tractor alongside your present crawlers. Write or call for a demonstration.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-926-G-B

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



ENGINEERS on the move

Theodore E. Mann, recently located at Tiber Dam, Mont., as field engineer for the Bureau of Reclamation, has moved to Thermopolis, Wyo., where he is employed on the Lucerne canal and pumping plants with the title of construction engineer.

* * *

Col. William J. Ely, district engineer for the Corps of Engineers at Sacramento, Calif., has been assigned to the U. S. European Command. Assistant district engineer Lt. Col. Alvin D. Wilder, Jr., is acting in Ely's stead until a successor is named in the summer.

* * *

Harry M. Williamson has been named to succeed R. W. Putnam as engineer of maintenance of way and structures for the Southern Pacific R. R. on Putnam's forthcoming retirement after 43 years of service to the railroad. Williamson's headquarters will be at San Francisco.

* * *

John F. Pearring, formerly district maintenance engineer for the Idaho Department of Highways at Shoshone, has been appointed to succeed the late John Banning as district engineer at Denver, Colo., for The Asphalt Institute.

* * *

F. S. Tandy has joined Pacific Intermountain Express Co., with responsibility for construction and maintenance of all company terminals. Tandy retired with the rank of Colonel in 1954 from the Corps of Engineers after 30 years as an



F. S. Tandy

Army Officer. He was then district engineer of the Walla Walla, Wash., District. Here, among other projects, he supervised the finishing phases of construction of the \$300,000,000 McNary Dam and powerhouse.

* * *

Edward T. Telford has been appointed assistant state highway engineer for District 7 of the California Division of Highways, succeeding

Paul O. Harding, who is retiring. George Langsner is transferring from operations to take over Telford's former duties as district engineer in charge of planning. To fill Langsner's post, Lyman R. Gillis of District 4, San Francisco, has been appointed.

* * *

Vaughn Marker, asphalt paving specialist with the California Division of Highways, has joined The Asphalt Institute field forces as district engineer for the California

Vaughn
Marker



coastal counties, working directly under the supervision of B. A. Valterga, Pacific Coast managing engineer, at San Francisco.

* * *

David H. Redinger, former superintendent on the Big Creek-San Joaquin River Hydroelectric development of the Southern California Edison Co., was recently honored in having a lake named after him. Located in the High Sierra, above the site of the company's sixth Big Creek powerhouse, the 35,000-ac. ft. body of water is hereafter known as Redinger Lake. David Redinger started with Edison as a transitman in 1912. With major construction at Big Creek under way in 1921, he was made resident engineer and continued as such through the huge program, ending up by assuming supervision in 1929 of the operation and maintenance of the Big Creek system. He retired from active service in 1947.

* * *

George E. Brandow is the new president of Los Angeles Section, American Society of Civil Engineers. Other 1956 officers are: Ernest Maag and L. LeRoy Crandall, vice presidents; J. E. McKee, secretary, and Alfred E. "Tom" Waters, treasurer.

* * *

New officers for the San Francisco Section of the American Society of Civil Engineers for 1956 are: R. D. Dewell, president; H. Christo-



JUST ANOTHER MILLION DOLLARS—Col. Carl Y. Farrell, Alaska District Engineer, turns over a check for \$1,077,888 as partial payment on one of the biggest construction jobs now in progress under supervision of the Corps of Engineers. On the receiving end is H. P. Bosworth, general superintendent for Birch-Lytle-Green, contractors handling construction on a \$9,309,894 contract at Elmendorf AFB.

pher Medbery, 1st vice president; William W. Moore, 2nd vice president; Robert M. Kennedy, secretary.

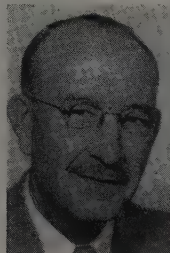
For the San Jose Branch of the Section, Stanley J. Kocal is president; Charles L. Coburn, vice president, and Myron M. Jacobs, secretary-treasurer.

* * *

Three district engineer assignments for the California Division of Highways, effective March 1, are announced. A. M. Nash, District 3, with headquarters at Marysville, is trans-



A. M. Nash



J. W. Trask
(above right)



H. S. Miles

ferred to District 5, San Luis Obispo; J. W. Trask, District 2, Redding, transferred to District 3, Marysville; and H. S. Miles, assistant district engineer in District 4, San Francisco, promoted to district engineer of District 2.

* * *

Chester E. Lintner, employee of the Portland District, Corps of Engineers, retired recently with more than 19 years service. He was a civil engineer in the relocations section of the design branch.

ad mix, land leveling, Adams 660 gives you
he extra power, speed, and stamina to do all
f these jobs faster, better, and at lowest cost.

Here's Why



you should check the ADAMS 660 against your present heavy-duty graders

A lot has happened to the BIG grader field in the last year or two. For instance, if you have one of the 115 hp competitive graders that were "BIG" a few years ago, Adams 660 can now give you...

1. 30% more horsepower for deeper cuts, harder materials, faster cycles.
2. 29% more weight on drive wheels to apply more power, get more work done faster.
3. 35% higher travel speed to cut non-productive time between work assignments.
4. 117% higher reverse speed for more cycles per hour on shuttle grading.
5. 33% extra forward-speed-selection of power to match your load. With optional creeper gears, 83% extra choice in geared speeds ($\frac{1}{4}$ to 26

mph) for increased accuracy and more effective application of power to difficult work.

6. 100% additional backing-speed selection that cuts waste time on return cycles, improves production on back-up grading.
7. 19% more front-axle clearance to work larger windrows and come in and out of ditches without interference.

In addition, all gears in the "660" constant-mesh transmission are on anti-friction bearings for easy operation, less wear, less maintenance cost. Adams rubber-mounting of engine keeps vibration from traveling to machine and operator. Automatic braking of "660" transmission, when applying hydraulic brakes to wheels, gives you safer operation with less wear on brake linings,

and less pedal effort. Because "660" power-box clutches shift on ball bearings, you have less wear...easier, smoother-operating controls.

It's a good time now to review your grader equipment, a good year to make needed replacements before the big rush comes to fill needs of the huge expansion in new federal-financed highway construction. We'll be glad to help you make a fair and realistic analysis of your grader equipment and grader needs. We'll be glad to give you every opportunity to compare the Adams 660...or smaller models...with your present equipment or with any competitive grader.

Wouldn't *now* be a good time to talk it over? We can give you better deliveries and better deals now than we can later on...that is, if we can prove to you that we have the best grader for *your* work, and if you decide that now is the time for *you* to buy.



Multiply the uses of your Adams grader with optional equipment: Scarifier, for ripping old asphalt and hard-packed surfaces; Bulldozer, or pushing debris from grade, backfilling

around culverts, etc.; "V" Snow Plow and Wing, for cleaning highways and country roads of snow and ice; and Elegrader, for plowing and loading, or sidecasting materials.

A size ADAMS for every need

Model 660—150 hp diesel engine, 27,730 lbs.

Model 550—123 hp diesel engine, 23,500 lbs.

Model 440—104 hp diesel engine, 21,500 lbs.

Model 330—80 hp diesel engine, 20,500 lbs.

Traveloader—A high-speed, heavy-duty, self-propelled, belt-type loader for picking up materials and loading into trucks from windrows or stockpiles, 55 hp gasoline or 60 hp diesel engine, 16,800 lbs.

AG-29-G-b

LeTourneau-WESTINGHOUSE Company

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SUPERVISING the jobs

E. C. Shipp is project manager on the \$21,000,000 Donnell's portion of the Tri-Dam Project. Inadvertently in the January issue **O. H. Tucker** was credited as being project manager for this entire project, whereas only the Beardsley unit (\$10,000,000), is under Tucker's direction. Tri-Dam in Central California is being built for the Oakdale and South San Joaquin irrigation districts by Tri-Dam Constructors, a joint venture composed of Morrison-Knudsen Co., Inc., Peter Kiewit Sons' Co.; Stolte, Inc., and the Macco Corporation. In reporting the job personnel in January the name of the latter firm also was omitted in error.

* * *

Charles Nelson, general superintendent, assisted by **Joseph D'Amato**, is just about through on King Construction Co.'s \$1,500,000 contract covering buildings for the Turf Para-

dise Club, a \$4,500,000 project located at Phoenix, Ariz. **Bill Steffen** was in charge of the office. Foremen were **Charles Thurman** and **Jack McKinney**, concrete; **C. D. Greenwood** and **Ben Booth**, labor.

* * *

C. H. Mills, president, and **H. P. Howard**, secretary and general superintendent of United Paving Co., are in charge of all company contracts, including a recent one at Spokane, Wash., on which **A. J. Cozetto** is job superintendent. This is a \$148,698 award for grading and surfacing 1.3 mi. of streets. The 100-day job started Nov. 1, was shut down by bad weather, and is expected to start again about Mar. 1.

* * *

Tom Hawley, project superintendent for Guy F. Atkinson Co., is in charge of grading, surfacing, and construction of six bridges and two

pedestrian undercrossings between College Ave. and Campo Drive in San Diego County, Calif. Others among the key men are **Andy Arnosti**, job engineer; **Clyde Rasor**, job office man; **Jim Dailey**, excavation superintendent, with **Virgil "Slim" Chapman**, foreman; **Carl Schmidt**, drill and shoot foreman, and **"Red" Thompson**, master mechanic. Excavation equipment to move 707,000 cu. yd. of roadway excavation includes 88-B shovel, 5 Euclid 36TD trucks, 2 D9s, 2 DW20s and 4 Euclid scrapers. Under way since Nov. 21, job is estimated to last through September.

* * *

Kenneth Rose is supervising a job of grading and surfacing on the Phoenix-Prescott highway near Mayer in Yavapai County, Ariz., for Isbell Construction Co. General foreman is **Joe Baxter**. **Ralph Kriese** is grade foreman, and **Earl Stock**, labor foreman. **Jim Evans** is timekeeper. Start of the work was Oct. 27 and contractor estimates 249 days for completion.

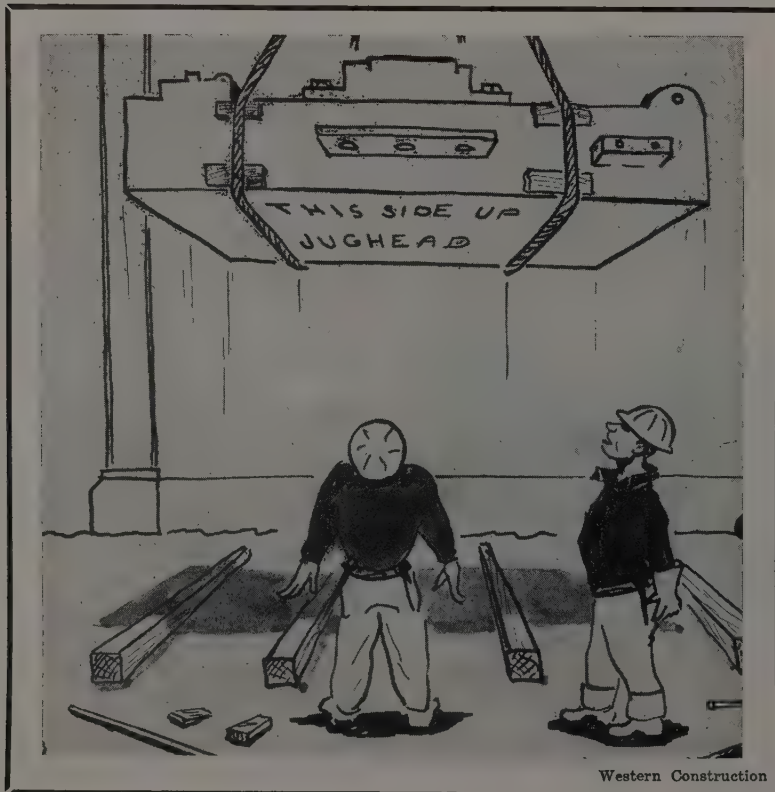
* * *

Jim Foose superintended a recently completed contract of Stolte, Inc., covering bridge construction for Pacific Gas & Electric Co. in



Jim Foose

Down-time By Domagalski



Western Construction

the Feather River Canyon, Calif. **"Whitey" Orr** was chief operator, and **Don Stace**, carpenter foreman.

* * *

Lou Broman, project manager, **Carl Larson**, general superintendent, and **Edwin Santos**, assistant superintendent, are top men on a \$1,079,900 school project at Pittsburg, Calif., soon to be completed. Contractor is California Builders Co., Inc.

* * *

L. L. Sawyer, manager; **P. M. Graves**, general superintendent; **D. E. Ellison**, purchasing agent; **Joe Martinez**, project engineer, and **Mack Stow**, superintendent, head the job personnel working for Brown & Olds Plumbing & Heating Co. which is doing the plumbing and heating work on the state penitentiary under construction at Santa Fe, N. Mex., expected to be complete in May. **Robert E. McKee**, General Contractor, Inc., holds the prime contract.

* * *

Lee Monson, superintendent for Fife Construction Co., heads a highway contract under way at La Sal Junction, San Juan County, Utah. Other key men on this \$253,000 grading and surfacing job are **Dee Hen-**

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E. E. WALSH (left) was resident engineer for Holmes & Narver, Inc., engineers and constructors, who designed and engineered the new \$1,900,000 facility adjacent to the Hughes Aircraft plant in Tucson, Ariz., built specifically for final assembly and checkout of the most recent small guided aircraft rockets. M. M. Sundt Construction Co. was general contractor on construction of the plant. M. M. Sundt (right) superintended the work, while Sam Xavier (center) was excavation foreman.

dry, grade foreman; Wendell Fife, crusher foreman; Robert E. Lee, powder and pipe foreman, and Fred Homer, master mechanic. Work started Dec. 20 and contractor estimates June 15 as the finishing date.

C. D. Bisordi, project manager; Frank Eggers, superintendent, and Walt Coty, foreman, will head the crew when actual construction starts in April on warehouse, ready rocket, and flight simulator buildings at Ladd AFB near Fairbanks, Alaska. S. S. Mullen, Inc., is handling the \$1,357,000 project.

Robert Phillips is Jack B. Parson Construction Co.'s superintendent on a \$765,788 overpass grading and surfacing contract at Becks Hot Springs, Utah. Other contractor personnel are Sid Hendricks, grade foreman; Ronald Hadfield, pipe foreman; Roy Wendt, master mechanic, and Earnest Peck, powder foreman. W. J. Parson is in charge of purchasing.

In the accompanying photograph,

J. B. Parson, head of the contracting firm, stands beside his new D9 with Ateco ripper which is doing the bulk of the ripping. In addition, the new unit is used to push 8 DW20s in conjunction with 2 TD24s. There are 6 D8 Cats on the job used for pulling roller and performing dozer work; also an electric belt loader. A 46-VE Pioneer gravel plant feeds the conveyor. Additional equipment consists of 3 belly dumps; 20-ton truck and 10 R-195, 10-wheel International trucks under the conveyor. Parson is using a D8 Cat with a Worthington compressor mounted with a 12-ft. drift drill for drilling.

Also set up on the job is a Universal gravel plant for crushing the surface material, and a 4,000-lb. Standard hot plant for the bituminous surfacing. Four No. 12 Cat motor patrols are used for the blade work and 6 Internationals, 2 Chevrolets, and 2 Fords are used to haul the hot-mix bituminous material.

About 858,000 cu. yd. excavation are being moved on this job.



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Forrest E. Risken, project manager, is directing the \$3,195,782 recent award to Gunther & Shirley Co. and E. V. Lane Corp. for completion of the powerhouse and appurtenances at The Dalles Dam on the Columbia River. An office has been established at The Dalles dam site and actual work will start in April or May, with completion date set for some time in 1960. A long-time construction manager for the Lane Corporation, Risken has been in charge of all of the work performed by the joint venturers in the Northwest.

The joint venture firm doing this work has executed numerous similar projects. Gunther & Shirley is presently sponsoring a complete hydro-electric powerhouse construction project for the Imperial Irrigation District at its Pilot Knob site on the All American Canal near Yuma, Ariz. E. V. Lane Corp. performed or sponsored the completion of powerhouses at Fort Peck and Hungry Horse dams and is now sponsoring other work for the joint venturers at Chief Joseph Dam and the Palisades Project.

* * *

Frank M. Witherspoon, project manager; R. M. Rigney, project engineer; E. C. Young, job superintendent, with Gregory Martinez, concrete superintendent, are top men working for E. C. Young Service Construction, Young & Arrieta, on a recent \$1,449,718 award for 1.9 mi. of grading and surfacing near La Mesa in San Diego County, Calif. This state highway improvement work started the first of the year and contractor estimates the date of completion as Jan. 1, 1957.

* * *

K. J. Olsen, superintendent, is directing J. E. Barrett & Sons' recent contract for construction of an administration building at the State College in Long Beach, Calif. Foreman on this \$250,000 structure, scheduled for completion in October, is D. W. Barnett.

* * *

William M. Carroll, project manager; Bruce E. Baker, building superintendent, and David M. O'Donnell, field engineer, comprise the chief personnel on the \$591,538 construction of radar facilities for Geiger AFB, Washington. The contract is held by Ward & Green and W. Carroll who started on the job in January and expect to have the work completed in December this year.

* * *

S. A. "Sid" Romine, general superintendent of grading and graveling; J. E. "Stub" Vejtasa, superintendent of graveling and oiling, and Forrest Strand, foreman, are key men for Stanley H. Arkwright, Inc., contractor on a 6-mi. stretch of grading, graveling, and surfacing on the Broadview-Lavina highway in Montana. Arkwright's bid price was \$223,963.



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TRICKS of the TRADES



Green wood can be burned

BURNING PILES of green wood from newly cleared land is now made much easier, faster, and cheaper with a machine developed by the John Bean Division of Food Machinery and Chemical Corporation at San Jose, California. One man handles the whole burning operation and succeeds where many men and much more fuel oil often fail when using ordinary burning methods. The machine, called a No. 75 Rotomist, acts as a huge bellows to force the burning of green wood and when the operator wishes he applies fuel right

with the draft. The Rotomist blows 20,000 cu. ft. of air a minute to a distance of 125 ft. A nozzle arrangement introduces oil droplets throughout this column of air whenever the operator wishes. The Rotomist was originally developed to spray shade trees.

In addition, a high pressure pump, working through a hand line and a triggered flame-thrower, enables the operator to start the fire and circle the wood pile on foot. He applies flame where it is needed while the blower is providing draft to the fire.

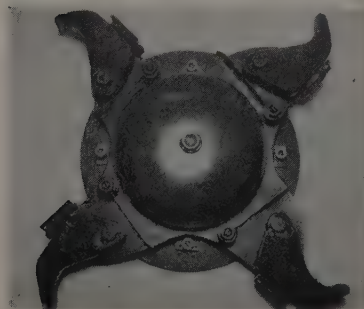
Back-up bell is safety feature

BACK-UP ALARMS have been required on defense construction projects in Alaska and the Northwestern States under the jurisdiction of the Corps of Engineers North Pacific Division since 1951. The safety device

became a necessity on Corps' projects as a means of reducing accidents caused by heavy equipment backing through construction areas.

The Corps has been interested in perfecting a simplified back-up alarm to become standard equipment on mobile construction machinery, and at present are interested in an alarm developed by two Anchorage mechanics.

The new alarm mechanism, a 6-in. metal bell mounted on a steel plate, is installed on the axle hub of wheeled vehicles. Adaptable for tracked equipment, the alarm is sounded by four heavy metal hammers striking the bell with the reverse motion of the vehicle. Bumper springs prevent the hammers from riding on the bell and hammerstops silence the alarm during forward motion. The alarm works automatically



with wheel motion and requires no electrical or mechanical hook-up.

The new back-up alarm was named the B&R Automatic Bell by its inventors, Max von Radics and William Bookwalter, both employed in the heavy duty repair shop of the Miller Construction Co. in Anchorage.

Plastering by machine is regular practice

THE PLASTERING machine has become as much a part of the California construction scene as the sidewalk supervisor.

The state, long considered the cradle of the machine plastering industry, first used the method extensively in school construction and currently is experiencing a commercial building boom in which the plastering machine is playing a large part.

The hopper, hose, nozzle, and compressor are being employed by an increasing number of leading contractors for plastering on jobs in which other forms of wall and ceiling finishes would have replaced the hand-wielded plaster trowel.

A recent survey made by the Zonolite Company, producers of the vermiculite plaster aggregate used extensively by these contractors, indicates that they are turning to the machines for four reasons. These are the evenness of texture, ease of handling, speed of application, and superior fireproofing characteristics of the lightweight mechanically-applied plaster.

The company adds that the machines eliminate one of the oldest bugaboos of the plastering industry—cold joints.

With the machine method joinings are easily made without the usual telltale marks found in other types of application.

Among California plastering contractors using machine plastering on major jobs are Martin Brothers, Jack Brown & Son, and Carroll Duncan & Company, Zonolite reported.

Major projects of these and other contractors in Los Angeles include a 13-story office building to serve as headquarters for the Union Oil Company of California; the California Teachers' Association Building; the Lincoln Savings & Loan Building, and an office building recently constructed on Wilshire Boulevard for the Tishman Realty & Construction Company. All involved use of machine plastering.

A round office building of unique design located in Hollywood also has walls and ceilings of machine-applied plaster. It will soon be occupied by Capitol Records, Inc.

In Beverly Hills, 36,000 bags of machine-placed plaster were used in

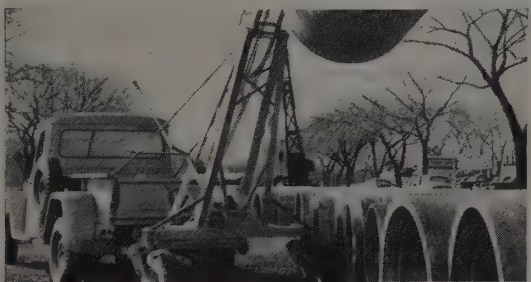


All-wheel traction. With the extra traction of its 4-wheel drive, the 'Jeep' Truck is an all-purpose, performance-proved workhorse for moving men, tools and equipment to or around construction sites. It carries more than a ton of payload, on the road or off—in low-low gear climbs grades as steep as 60°, fully loaded—tows heavily-loaded trailers where other vehicles can't go.

Contractors save time and manpower with 'Jeep' versatility and all-wheel traction!



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These time-tested rugged vehicles provide a mobility and range of performance that is unmatched. The extra traction of their 4-wheel drive provides the go-anywhere power that keeps tough jobs moving. 'Jeep' vehicles go where other vehicles can't in the heavy, rough going of the construction project. Then, on the highway, a flick of the selector lever shifts them into conventional 2-wheel drive for travel at top legal speeds. With power take-off or hydraulic lift, they provide on-the-spot power to operate many types of equipment from dozer blades to back hoes.

Economical 'Jeep' vehicles supplement heavy-duty equipment, spread their cost over a wide variety of jobs, give you additional savings through long life and low maintenance costs. Ask your Willys dealer for a practical, on-the-job demonstration.

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Here's the story: The contractor on this warehouse job purchased the 33' STOW Screed to strike off a warehouse floor of 1" slump concrete. By using the 33' screed instead of the 12' screed he had been using, the contractor estimated that he saved \$500.00 on the 50,000 square feet poured. With a 1" slump concrete, the slab set up so fast that they were able to put a trowel on the job only 1 hour after screeding.



Screeding a Third Lane on a Hill

This job was too small for the contractor to put his big finishing machine on the job, so he used a 14' STOW Vibrating Screed. This screed can be bought as a packaged unit to be mounted on your own beam. For more information on screeds, write for STOW Catalog 560.



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the construction of the new \$15,000,-000 Beverly Hilton Hotel. Hilton's 28th, the hotel radiates in three slender wings from a central service core.

More than 100,000 yd. of walls and ceilings in the structure are of vermiculite aggregate plaster applied by the machines of Carroll Duncan & Company, the plastering contractor.

In addition to the high-speed application of vermiculite plaster to walls and ceilings, machines were also used to spray acoustical plastic directly on selected columns, trusses, and metal roof decking where a high fireproof rating was desired.

Based on its survey, Zonolite predicts use of machine plastering throughout the country will increase even faster as more architects and contractors become aware of the time and labor savings made possible by this method.

Ditching through ice for Alaska pipeline

THE RECENTLY DEDICATED Haines-to-Fairbanks pipeline is primarily a surface-laid pipeline system, but one-quarter of the total length of the line had to be buried. At the northern end of the line pipe burial was required for the first 100 mi. out of Fairbanks to pass under the military maneuver areas—a section almost completely comprised of permafrost.

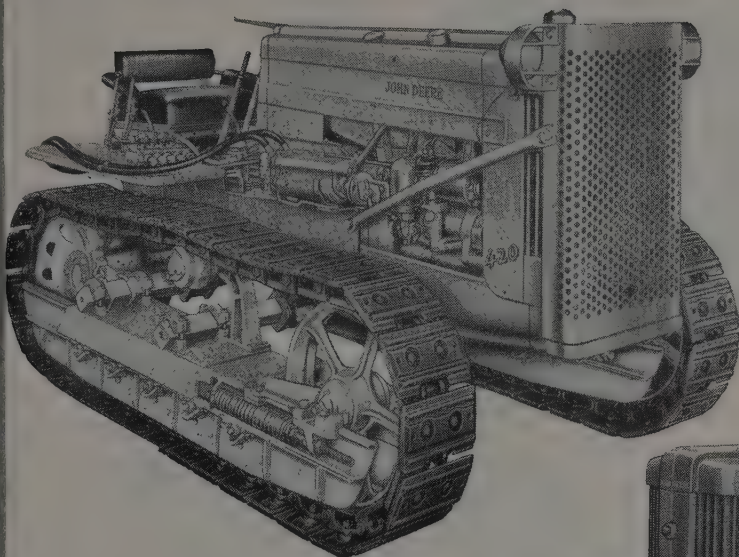
Despite the sub-surface ice condition at the northern end of the line, a ditching machine was used to gouge out the trench. Men familiar with building in the North argued that such a machine could not do the job.

But the pipeline contractors had studied the permafrost condition and came up with an idea. They equipped their ditching machine with a smaller digging wheel and added more buckets. Thus a 12-ft. diameter wheel replaced the conventional 18-ft. wheel; the smaller wheel together with its 14 buckets provided the ditcher with a continuous digging cycle reducing jarring action and wear on the machine despite the difficult ice materials through which it excavated.

Ditching was a slow moving operation averaging only one-mile during a 12-hr. shift. During the height of the construction season when daylight became a perpetual condition in the north, the ditching operation was placed on a 24-hr. a day basis.

The operation through the permafrost was hard on the tough steel teeth of the digging buckets and had to be replaced after each 12-hr. shift. Through the permafrost country the ditcher was given added pull through the heavy gumbo and against the tough icy soil by a tractor up front and towing.

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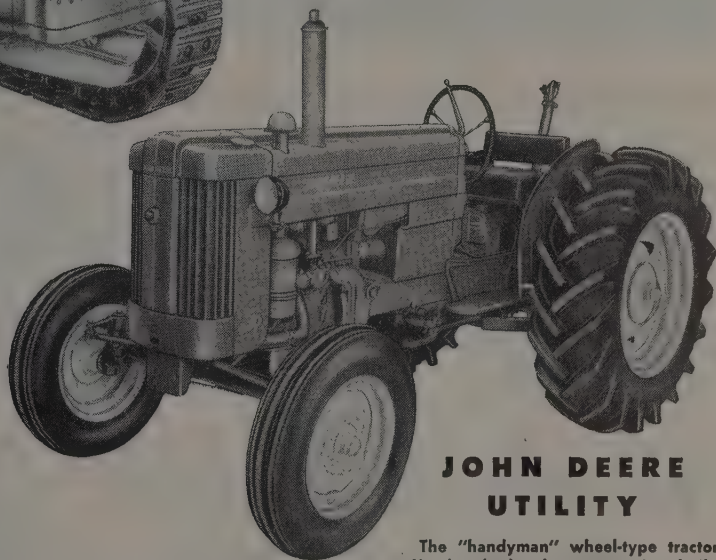
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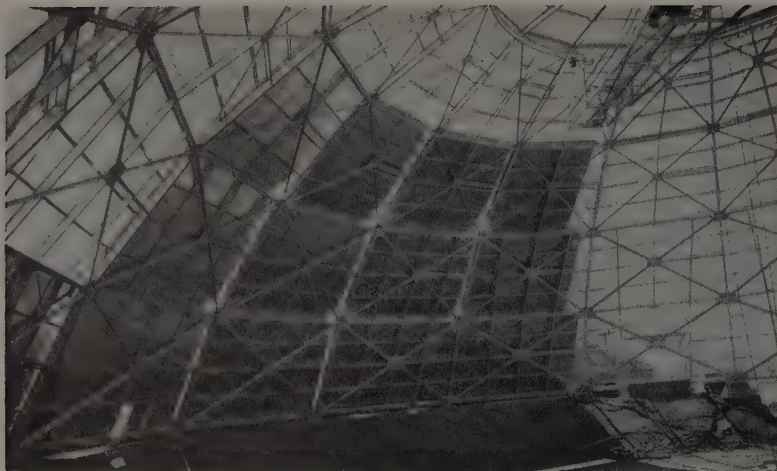
BACKHOE-LOADER



SNOW PLOW



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Aluminum sheets stud-welded to steel

WHEN A NEW type of dome-shaped storage warehouse, without interior bracing, was built recently for the Kaiser Gypsum Co. in Long Beach, Calif., the corrugated aluminum sheathing was secured with end-welded composite aluminum Rivweld studs at an estimated labor cost saving of at least 50%.

Actually, stud welding was the only fastening method considered by the

designers, Kaiser Engineers, Oakland, because of its speed and the fact that it could be accomplished without interior scaffolding. Operators with portable Nelson stud welding guns simply climbed over the steel framework to which the studs were welded. Use of other types of fasteners requiring scaffolding would have doubled labor costs, according to M. M. Walker, superintendent for

Mitchell Steel Inc., Torrance, Calif., who installed the corrugated aluminum sheathing.

Twelve thousand Nelson composite aluminum Rivweld studs were used on the job. Two Nelson stud welding guns were employed, operating off a single Nelwelder battery power unit. Templates established stud locations. The aluminum sheeting was impaled over the studs with rubber hammers and the ends of the studs were then upset.

Since the portions of the composite studs that come in contact with the sheeting are aluminum, there will be no electrolytic action between the sheeting and the steel building framework. Appearance of the building was improved because the studs are almost invisible.

Cracked pump impellers repaired by welding

CRACKS in the world's second largest pump impellers, at the Tracy Pumping Plant in California's Central Valley Irrigation Project, are being repaired by Sigma welding at savings of \$5,000 per pump. During operation, these giant 20-ton, manganese bronze cast impellers occa-

BIG NEWS in maintenance: **COLD-APPLIED** **BITUMULS® Slurry Seal**

THE "HOTTEST" ITEM of current interest among maintenance men is Bitumuls Slurry Sealing for pitted, cracked, "alligatored," or spalled pavements. It is applied cold; goes down fast; and costs are reported to be running in a very low range.

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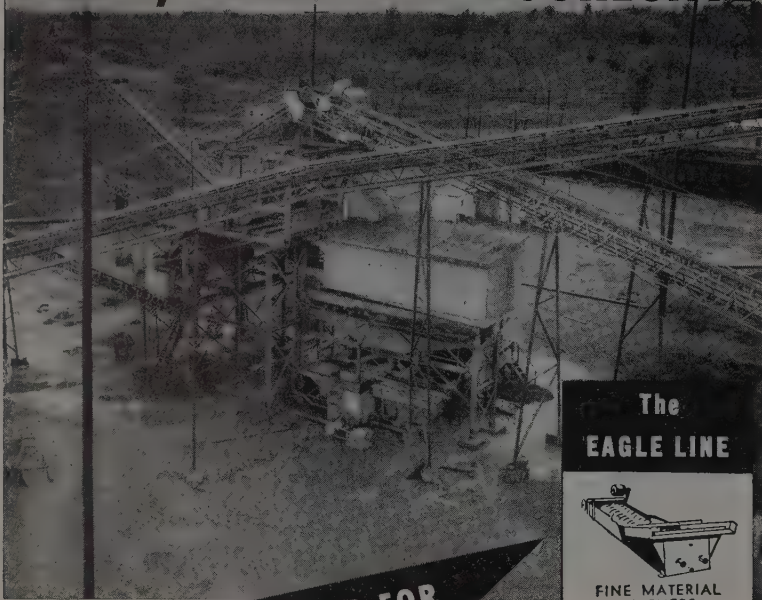
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The EAGLE LINE



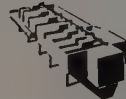
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WATER SCALPING—
CLASSIFYING TANKS.



"SWINTEK"
DREDGE LADDERS

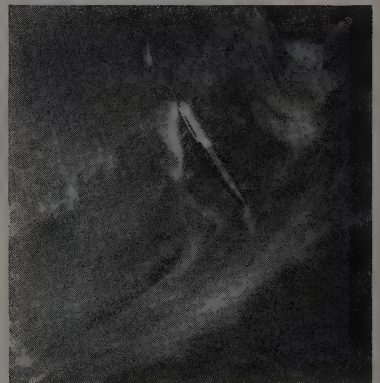


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BREAKER BALLS &
PILE HAMMERS.

sionally suffer cracks in the vane fillets, and in areas adjacent to previous weld and mechanical repairs. Linde's Heliarc and Sigma welding processes enable the U. S. Bureau of Reclamation to make repairs without remov-



ing the \$50,000 impellers. This effects an immediate saving of \$5,000 in removal and replacement costs. In this case bronze aluminum wire was used, and inspection showed these welds to be better than required quality.

The repair operation illustrated here is typical of those performed on the impellers. This crack is 11 in. long, 2½ in. across the face, and 2 in. deep. It has been ground down to sound metal preparatory to beginning the repair weld. The four "pegs" seen adjacent to the crack are strain point checks. They are welded into position and offer a reference point to check distortion during the repair welding operation. Frequent micrometer measurement of distances between the small balls on the pegs determines welding duration, and the peening sequence necessary to control distortion. Less than .005-in. distortion occurred in the operation as a result of this procedure.

The Tracy Pumping Plant has six of these vertical shaft, single suction type pumps. They force water 197 ft. through pipe into a canal located in the foothills just beyond the plant. Each pump is driven by a 22,000-hp. electric motor, and has a rated capacity of 767 ft. per sec. Expressed in gallons, this is a delivery capacity of 345,000 gal. per. min., or 20,070,000 gal. per hour.

They're building Kansas City's new foundations —1,500 to 2,000 yards a day

Red D Mix's new fleet of GMC's helps speed in-a-hurry jobs like the 30,000-yard delivery for K.C.'s new municipal parking garage



THESE RUGGED GMC W624 TANDEM'S are some of the 20 new GMC haulers handling Red D Mix's fast-moving, tightly scheduled jobs throughout the Kansas City, Mo. area. They recently completed

work on Kansas City's municipal parking garage — a multi-floor, block-square structure requiring 30,000 yards of concrete. Red D Mix helped finish this massive job in record time.



SPEEDING THEIR HEFTY 6-YARD LOADS from batch plant to job site, these GMC W624's set a crackling pace. The model is one of 19 new Blue Chip tandems blanketing the 28,000 GVW-90,000 GCW range. They offer a choice of gasoline and 2-cycle Diesel power. And 9 of them are available with cost-cutting Hydra-Matic.*

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



NOT EVEN THE ROUGHEST GOING can stop these GMC's. Their high-torque 190-h.p. engine packs more than ample reserve for off-the-road maneuvering. And the W624 has GMC's new oversized axles — 11,000 lb. front and 34,000 lb. rear. Tires are 9.00/20's. The rig's rated for 42,000 GVW-65,000 GCW truck-work.

GMC TRUCK & COACH — A General Motors Division



Powder tool pins racks to concrete

DOLIN METAL Products, Inc., New York, American manufacturer for a patented mobile storage system which moves on tracks, found that it needed a quick way of fastening the tracks to floors to make possible rapid installation. It solved its prob-

lem by using the Ramset powder-actuated tool and Ramset fasteners.

The tool, used primarily in construction and maintenance work, utilizes the power developed by a specially-constructed cartridge to seat a fastener in a variety of building ma-

terials, particularly concrete and steel. Headquarters for Ramset is in Cleveland. It is affiliated with Olin Mathieson Chemical Corporation.

Within the past year it has been used for a variety of uses. A recent survey by Ramset showed that its fastening tool was being used in 73 different ways.

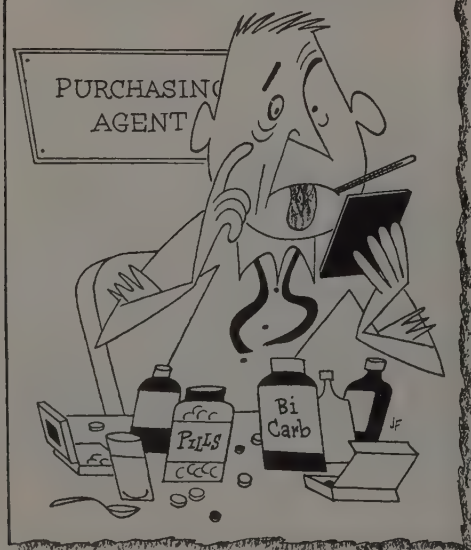
The Dolin mobile storage unit makes it possible to increase storage capacity substantially within a specific area.

TOOLS . . .

A **ONE-PIECE** hand tool for bending conduit and tubing has been introduced by **National Electric Products Corp.**, Gateway Center, Pittsburgh, Pa. It can be used for both rigid conduit and in-wall tubing. The bender is available in 3 sizes weighing up to 8½ lb. It has a peek hole for left-handed electricians. Every tool is loaded at the factory to 16 tons, making a 5-yr. guarantee possible.

A **WISE WEIGHING** 150 lb. has been put on the market by **Athol Machine and Foundry Co.**, Athol, Mass. The vise has a gripping surface of 5x4 in., and a depth of jaw of 6-in. Machined into the jaw facing is a 5 in. long pipe grip which will hold a pipe or rod from ¾ in. to 6 in. in diameter.

Sick and tired of supplier problems?



The answer's in the YELLOW PAGES!



Suppliers are like doctors—when you need them you usually need them in a hurry. And just about the quickest way to find a local supplier is to flick through the Yellow Pages of your local telephone directory. Is it any wonder then that 9 out of 10 people use the Yellow Pages to find the local folks who serve or sell? So, when you're sick and tired of supplier problems, take this prescription: Check the "Classified".

You'll find it fast in the YELLOW PAGES!



Pacific Telephone

NOW — Make your "CAT"

a 3-Way Profit-Maker with an

ROCK RIPPER



for Caterpillar

D9, D8, D7 and D6 Tractors

1. Turn Former "Shoot & Shovel"

Jobs Into Extra-Profitable Scraper Operations... tractor mounted design applies tractor weight *plus* ripper weight to points for fast penetration in hardest materials. Exclusive curved shank produces underground "quiver" that makes rock-splitting points act like jack-hammers to split and shatter rock into easy-loading condition, fast. Result? You can scraper-load many materials you'd otherwise have to "shoot and shovel"—at handsome savings in cost!



2. Get Extra-Yardage Loads Faster, With Less

Scraper Wear & Tear... rock jobs aren't the only ones where ATECO rippers pay off. Whenever you hit cemented gravel, clay, mixed rock and dirt, packed or other hard-to-load materials, a few passes with an ATECO ripper will give you heaped scraper loads in a hurry, save you plenty on scraper downtime and repair!

SPEEDS TREE FELLING, LAND CLEARING, TOO! Root knives available to cut 12" roots in a single pass—a few passes to cut supporting roots, a push with dozer or stinger, and even biggest trees go down in seconds!



3. Increase Tractor Work-Power... with an ATECO

ripper behind and a dozer in front, your "CAT" is complete master of the cut—ready to rip, bulldoze or push-load, instantly. Ripper weight balances dozer, adds traction, improves handling. Tractor-mounted ripper works wherever the tractor can go, turns in its own length!

Why not get all the workpower you pay for out of your "Cat"? Make it a 3-way profit-maker with an ATECO ripper! See your Caterpillar distributor today to arrange a demonstration on your job, or write us now for literature and specifications.



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NEW LITERATURE

For your convenience in obtaining free copies of literature described, the company address is provided with each review.

The complete Mall tool line

A new 63-page catalog has just been released by **Mall Tool Co.** of Chicago, describing and illustrating its complete line of portable gasoline engine tools. Full details are provided on its line of chain saws, generators, land clearance saws, pumps, augers, concrete vibrators, troweling machines, and all types of accessories. The catalog also provides information on pneumatic chain saws. Catalog No. 32 may be secured from Mall Tool Co., 7725 South Chicago Ave., Chicago 19, Ill.

A new tractor shovel

A new bulletin has been released by **Pettibone Mulliken** describing its new tractor shovel. The unit includes power shift transmission, torque converter, power steering. The shovels are available in three sizes 1¼, 1¾, and 2½ yd. capacity. Copies of bulletins on these units may be secured from Pettibone Mulliken Corp., 4750 West Division St., Chicago 51, Ill.

Flasher lights for barricades

Flasher Safety Light traffic and barricade signals are described in a 2-page leaflet just released by **R. D. Fageol Co.** of Kent, Ohio. The sheet illustrates with action photos, line sketches and drawings the use of these lights by municipalities and contractors. Catalog LL-1677 may be secured from R. D. Fageol Co., P. O. Box 328, Kent, Ohio.

Caterpillar replacement parts

In a new booklet entitled "Just as good . . . ?" **Caterpillar Tractor Co.** compares the parts made available by the manufacturer to those offered by substitute manufacturers. The booklet explains how two typical parts offered by substitute manufacturers are not just as good as parts produced by the machine manufacturer because of manufacturing processes and chemical treatments that make for long and satisfactory part life. Form DE591 is available from any Caterpillar dealer or from the company at Peoria, Ill.

Voids to lighten concrete

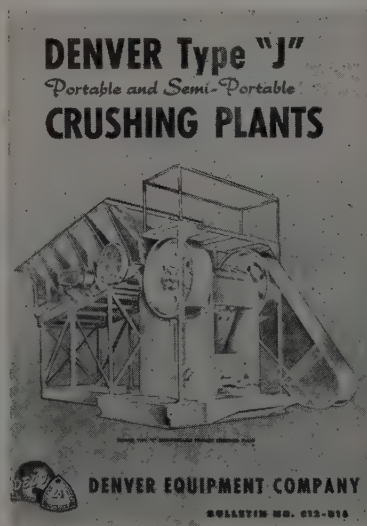
Sonovoids for reducing weight in concrete slabs are described in detail with complete tables of sizes and characteristics in an 8-page folder released by **Sonoco Products Co.**, 5955 S. Western Ave., Los Angeles, Calif. The folder illustrates the use of Sonovoids on various types of concrete construction and provides design data for the structural engineer wishing to use these laminated fibre tubes to reduce cost of concrete construction.

"Grid Roller" for fills

Use of the newly designed **Hyster "Grid Roller,"** including information direct from construction jobs, is reviewed in two booklets released by Hyster. Information is provided on means for compacting fills and embankments, crushing and compacting pit run rock for base courses and salvaging deteriorated bituminous road surfaces. On-the-job photographs and factual information include specifications for the equipment. These booklets, No. 1374 and No. 1375 may be obtained from any Caterpillar-Hyster dealer, or direct from **Hyster Co.**, 2902 N. E. Clackamas St., Portland 8, Ore.

Denver portable crushing plants

Denver Equipment Co. has just released a new bulletin covering the Denver-type J portable and semi-portable crushing plants. These plants are completely self-contained units and the bulletin describes their



features including the welded steel frames and manganese steel wearing parts. Diagrams indicate size, capacity and methods of setting up. The booklet also describes two separate crushing units that are also mobile. Copies of Bulletin No. C12-B16 may be secured from **Denver Equipment Co.**, P. O. Box 5268, Denver 17, Colo.

Gurley Ephemeris for 1956

The 1956 pocket-size edition of the 96-page booklet well known as the **Gurley Ephemeris** is now available. The book includes new charts which simplify the computing of **Polaris** so that it is now possible to determine **Polaris** in a fraction of the time formerly required. The charts are available for the first time in the 1956 edition. The handbook also contains charts for observations on the sun as well as definitions of astronomical terms and sample problems worked out. The Ephemeris will be sent free upon request to practising surveyors, engineers, and instructors in surveying. Write to **W. & L. E. Gurley**, Troy, N. Y.

New torque Impactools

Ingersoll-Rand has just announced, and has literature available on a new development which makes it possible to turn nuts with great speed to a controlled torque. The unit is an air-operated **Torque Control Impactool**. Upon reaching the desired torque there is an automatic shut-off. Complete information on this new development may be secured from **News Service Dept., Ingersoll-Rand**, Phillipsburg, New Jersey.

Wooldridge scraper line

A new series of literature has been made available covering the complete scraper line of **Wooldridge**. The booklets not only illustrate all of the equipment in operation but provide complete details on specifications and mechanical features. These relate to the elements of simplicity, ruggedness, productive capacity, and dependability of these **Wooldridge** units. This literature may be secured from **Wooldridge Manufacturing Div., Continental Copper & Steel Industries, Inc.**, Sunnyvale, Calif.

Additives for asphalt

An 8-page folder has just been released by **Tretolite Co.** presenting information on de-hydro and anti-stripping additives for asphalt. The booklet reviews basic information on these additives, discusses the purposes they serve and presents information determined from actual field tests on results. The booklet may be obtained from **Tretolite Co. of California**, 5515 Telegraph Road, Los Angeles 22.

Handbook on wire rope

A pocket-sized ready reference covering selection, use, and care of wire rope in drilling operations is now available from **Jones & Laughlin Steel Corp.** The book is titled "Wire



Electrified for continuous high speed production... the AUSTIN-WESTERN 61-E crushing and screening plant

Here's a single pass, portable crushing and screening plant that operates continuously at *full production speed* to deliver a constant flow of uniform product at low operating cost. It's the Austin-Western 61-E... *electrified* to make it the perfect plant for contractors, counties or townships... on big jobs or small.

Individual electric motors (powered by a diesel driven generator) operate feeder, conveyors and double deck screen through short-coupled V-belt drives. There's no mechanical loss from inefficient gear boxes and open chain drives. The result is maximum operating efficiency for low-cost, high-volume production.

What's more, the 61-E plant is easy to move, simple to operate and maintain because of design and construction extras like these:

- No jacks are required because the heavy welded frame and dual rear wheels give complete stability.

- Push button electric operation eliminates clutches and clutch control levers.
- Electrical hook-up is simplified by using standard motors and control units, and by the elimination of complex wiring systems.
- The single-jaw crusher operates at high speed because it is supported on a heavy forged chrome-vanadium steel shaft mounted in over-sized self-aligning bearings.
- Positive protection against uncrushable material is assured by machined toggle plates in the crusher.

It will pay you to see this plant for yourself at your nearby Austin-Western Distributor. Or, to get detailed information, send for our new 61-E booklet containing complete specifications. Write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Distributors in Principal Cities
of the world

AUSTIN-WESTERN

CRUSHING, SCREENING & WASHING EQUIPMENT

BALDWIN-LIMA-HAMILTON

Construction Equipment Division

LIMA, OHIO, U.S.A.



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C. D. Roeder Equipment Company.....	Reno, Nevada
Shriver Machinery Company.....	Phoenix, Arizona
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Hall-Perry Machinery Company	
Billings, Montana; Butte, Montana; Great Falls, Montana	
Northwestern Equipment, Inc.	
Fargo, North Dakota; Minot, North Dakota	
Engineering Sales Service, Inc.....	Boise, Idaho



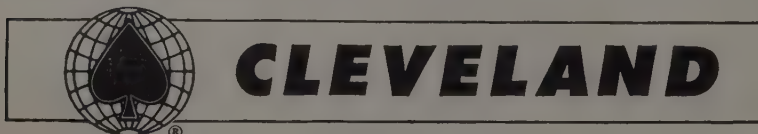
SNUG TO THE WALL of a railroad underpass is the trench being dug by this compact Cleveland "Baby Digger." Its ability to put the edge of a trench within less than two feet of a parallel wall is but one of this Cleveland's many practical operating advantages.



DIGGING CLEAN AND FAST the same Cleveland "Baby Digger" turned out high daily production on this job. With more than 30 usable digging speeds at the operator's command, the Cleveland cut cleanly through pavement and heavy root growth for trench 22 inches wide by 41 inches deep.

Talk it over with your Cleveland distributor

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio



Lines for Drillers" and is designed to cover particularly the application of wire rope in the oil, gas, and water well drilling operations. Numerous drawings and illustrations on the right and wrong ways of using and servicing J & L wire rope. Copies of the handbook may be secured from **Wire Rope Products Division, Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.**

Buffalo-Springfield tandem rollers

All of the heavy duty, 2-axle tandem rollers of the Buffalo-Springfield line are described and illustrated in detail in Bulletin S-70-1155. This 12-page booklet reviews the construction details and the performance features, including available accessories on models KT-16D, KT-17D, KT-24 and KT-25D. Tables provide comparative data on dimensions, specifications, weight, and compression provided by the models to enable selections to be made for work in the field. Bulletin is available from the **Buffalo-Springfield Roller Co. at Springfield, Ohio**, or from any distributor.

Slipform concrete equipment

Methods and equipment for carrying out concrete construction by means of slipforms and continuous pouring is available from **B. M. Heede, Inc., 260 Kearny Street, San Francisco 8, Calif.** The equipment was developed in Sweden but has been introduced into this country and used successfully on many types of concrete structures, particularly the silo-type of grain elevator. Methods are discussed and examples are well illustrated. Literature is also available showing details of the equipment and its method of operation.

Schield Bantam power crane

Features of the new self-propelled Model CR-35 Bantam are described in a 4-page illustrated bulletin just released by **Schield Bantam Co., Waverly, Iowa.** Bulletin No. CR-501, which can be secured from the company, contains detailed information on specifications, features, operating data, and capacities of the new unit which is rated at $\frac{3}{8}$ cu. yd. The features described in the bulletin include the ease of one-man operation, two-speed travel, and the 19-ft. turning radius. Capacity ratings are shown in large charts.

International 6-wheel trucks

Full information on International 6-wheel trucks—both the conventional and the cab-over-engine models—is contained in a new 24-page catalog now available from the

All-Ply Panels Speed Concrete Culvert Project

Thomas Construction Company uses 11/8" Plywood Panels 11 Times in Covering the 336 ft. Length

The use of Superior frameless plywood panels enabled Thomas Construction Co. to cut forming time on its unique concrete culvert job south of San Francisco. The culvert, first of three to be constructed, will enable tide-water to pass through the new Bayshore Freeway as it cuts across a narrow neck of San Francisco Bay on shallow water mud-flats. Thomas is building the 336-ft. reinforced concrete structure on a sub-contract from John Delphia Construction Co., holder of the general contract.

The culvert is box-shaped in cross-section, 10 ft. wide and 16 ft. high on the inside, with 14 in. walls. The floor slab is 17 in. thick and the roof slab is 13 in. thick.

Used on this job were 2 x 8 ft. All-Ply Prefabricated Panels which can be handled easily by two men. Ten metal hooks on each panel are quickly aligned with hooks on the next panel. A tapered fork on the Combination Clamp (the only working part) is inserted into the hooks. Driving the fork home draws the panels tightly together. Very little bracing is needed with the 1 1/2 in. thick plywood. Where walers are required, the clamp has a ledge provided with a wedge for securing them. An outstanding feature of the forms is that bracing is required on only one side of the wall. The clamp grips the snap tie firmly making spreader blocks unnecessary. One side of

the wall is braced and held in place by snap ties. These are of the break-back variety furnished in the proper length for the job. The absence of spreaders speeds up form setting and makes finishing the concrete after stripping easier.

The floor slab is poured in advance. Steel for the walls is placed next and is kept 60 ft. ahead of wall pouring. A 30 ft. long section of walls and roof are poured in one day. The next day a crew of carpenters and laborers strip and reset the forms for pouring another 30 ft. section on the third day. The All-Ply Panels were used 11 times to cover 336 ft. distance.

The Superior ALL-PLY is an entirely new principle in panel form design. Here for the first time is a form panel without a metal or wooden frame, yet providing great strength and rigidity. The simplicity of this system, employing only one working part (the Combination Clamp), assures lowest labor costs in erecting and stripping. With average care, All-Plys have been used for as many as 100 pours. Standard panels are 2' wide by 4', 6', and 8' high. Fillers of proper width can be made on the job quickly and easily of ordinary 2" lumber. Made of 1 1/2" plywood, All-Plys weigh less than 5 lbs. per sq. ft. All-Ply Panels come ready for use with Superior Snap Ties on both residential and general construction.

For complete details write for new 12-page catalog.

SUPERIOR CONCRETE ACCESSORIES, Inc.

Pacific Coast Division Office and Factory

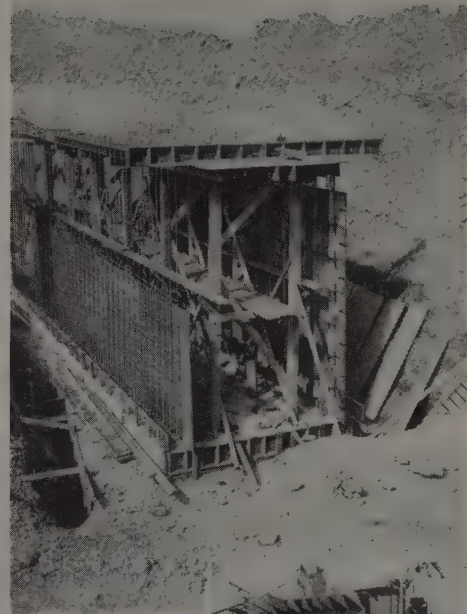
2100 Williams Street, San Leandro, California

Main Office and Factory

4110 Wrightwood Ave., Chicago 39, Illinois

New York Office

1775 Broadway, New York 19, New York



ONE SIDE OF FORMS for first section going into place (shown above). These same forms were used 11 times to cover the culvert's 336 ft. length.



BOTH SIDES OF FORM IN POSITION (Above). Bracing required only on one side of wall.

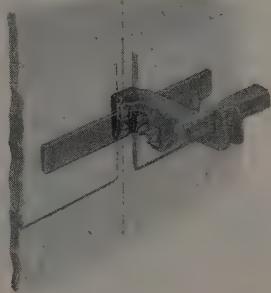


30 FT. SECTION IS STRIPPED and reset in one day for an every-other-day pouring schedule.



STRIPPING OPERATION IS FAST and the concrete surface is smooth. The absence of spreaders speeds-up form setting and makes finishing the concrete after stripping easier.

SIMPLICITY — The Combination Clamp (illus. at right) has only one working part — aligns and locks form, receives tie rod and holds liner.



motor truck division of the company. Colored illustrations are used extensively to illustrate design and operating features of the entire line which is powered by gasoline or diesel or LPG engines. The units range in gross weight from ratings of 22,000 to 60,000 lb. And the "400" Series built particularly for the West at Emeryville, Calif., range up to 90,000 lb. The catalog identified as CR-860-E may be secured from International Harvester Co., 180 No. Michigan Avenue, Chicago 1, Ill.

Natural Resource Consultants

A 12-page brochure reviews the services available from Natural Resource Consultants of Carroll E.

Bradverry & Associates, consulting engineers, Los Altos, Calif. The book indicates that the firm includes qualified specialists for carrying out consultations, investigations, reports, and project coordination for industry, government, or private firms. The organization also has established contact with several similar organizations in foreign countries.

New earthmoving package

"Today's Most Economical Earthmoving Package" is the title of a new 8-page booklet just released by Peterson Tractor and Equipment Co., San Leandro, Calif. The unit described includes the Caterpillar DW20 wheeled tractor with 300-hp. engine

followed by the Caterpillar No. 456 scraper with sides extended to haul 28-heaped yd. and finally the Cat D9 pusher with 286 hp. equipped with a Peterson power tilt and tractor-mounted ripper. This is the unit sponsored in the catalog by Peterson to meet the challenging demands of earthmoving in this Western region. The booklet contains details on the power units, special controls, and complete specifications.

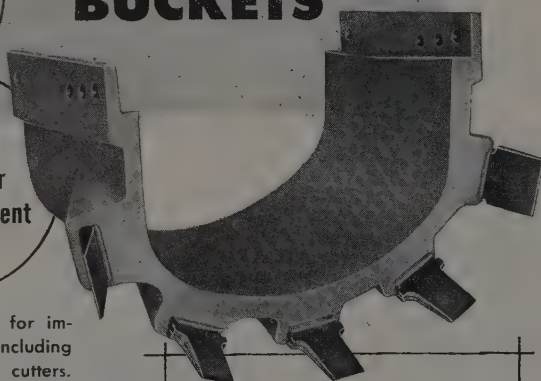
Hoisting towers

Bulletin HT-5, available from Patent Scaffolding Co., Inc., 6931 Stanford Avenue, Los Angeles 1, Calif., describes the use of sectional hoist towers and illustrates the prefabricated frames and other component parts. The 4-page booklet provides complete specifications including the numbers and weights of each part, as well as on-the-job photos.

JETCO JIFFY® TRENCHER BUCKETS

HEAVY
DUTY
READY TO
INSTALL

longer life
better wear
less replacement



- Shipped complete for immediate installation including drilled holes for side cutters.
- No additional welding or hole drilling necessary.
- Jetco weld-on pockets give added strength to bucket.
- Fabricated from high quality steel in $\frac{3}{8}$ ", $\frac{3}{4}$ " and $\frac{7}{8}$ " thicknesses.

Jiffy trencher buckets
are designed for maximum efficiency through greater strength.

BUCKETS FOR ALL TYPES OF TRENCHERS

JETCO JIFFY® TRENCHER TEETH and POCKETS

Check these outstanding features:

- Drop-forged, one piece, weld-on pocket has smooth radius for positive taper fit with Jetco Jiffy Teeth... no bolts.
- Self-sharpening teeth of highest quality steel.
- Quick-change, reversible teeth.
- Minimum leading edge leverage. Teeth designed for digging all types of soil and rock.



...teeth that
sharpen
as they dig

...tested and
proven for every
kind of digging
job



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JETCO INC.

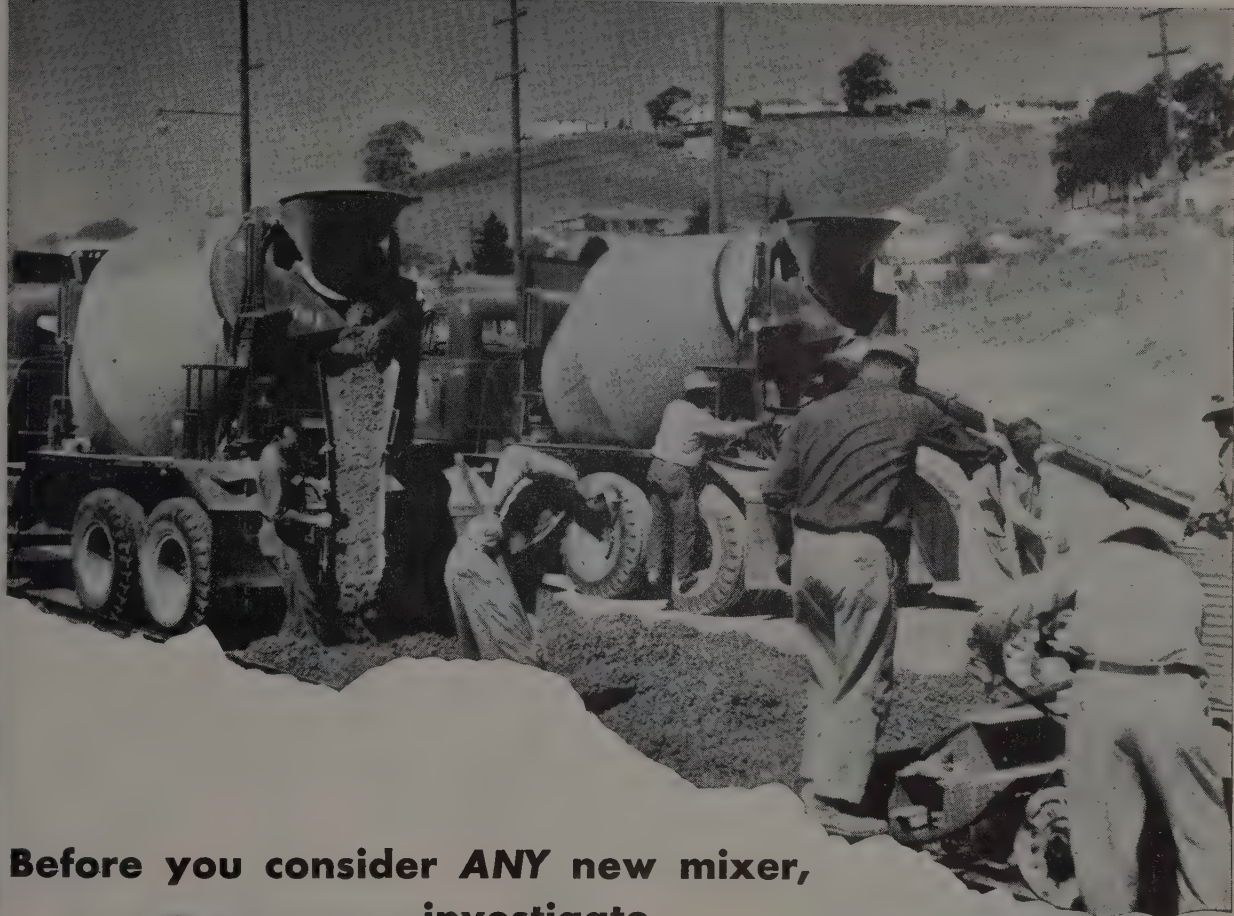
Dept. B, 1100 Westminster Avenue
Alhambra, California

Handbook on treated timber piles

An authoritative 66-page handbook has just been released by the American Wood Preservers Institute entitled "Pressure Treated Timber Foundation Piles." The handbook contains documented case histories and helpful information on pile driving, means of determining safe loads, solutions to problems of uplift and lateral forces, and protective devices for use during driving. Other sections relate to the application of building codes to pile foundations, specifications for selecting timber piles, the present standards for preservative treatment and the handling of test piles and loading. Job histories are presented having to do with design loads and inspection reports on the life of treated timber piles. The book is available to engineers and contractors interested in heavy foundations from the American Wood Preservers Institute, 111 W. Washington St., Chicago 2, Ill.

4-wheel drives for standard trucks

Literature is now available describing the Napco's Powr-Pak 4-wheel drive units for use with GMC and Chevrolet trucks. The two-color illustrated folders describe the full specifications for the units and picture job applications. This supplemental equipment was introduced in 1950 and is sold and installed by GMC and Chevrolet dealers all over the world converting 2-wheel drive into 4-wheel drive trucks. Complete information and copies of the two bulletins may be obtained from W. E. Gorman, Sales Manager, Napco Industries, Inc., Minneapolis 11, Minn., or from any dealer.



Before you consider **ANY** new mixer,
investigate
the revolutionary new



Integral^{*}

ONE FRAME FOR BOTH TRUCK AND MIXER

ONE ENGINE FOR BOTH

Because of its proved, practical features, the new Smith INTEGRAL is providing the ready-mix industry with an entirely new set of standards and advantages.

You have ONE frame for both truck and mixer.

You use ONE engine for both.

Power is taken off the truck engine ahead of the clutch.

The mixer continues to run regardless of clutching or gear shifting. You can select most standard trucks for the Smith INTEGRAL, and forget about the former costly "fight" between mixer frame and truck frame.

This composite of a mixer and a standard truck results in significant savings. Write for details.

^{*}Trademark

THE T. L. SMITH COMPANY, 2835 North 32nd Street, Milwaukee 45, Wis.

Affiliated with Essick Manufacturing Company, Los Angeles, California

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A 8660-1P

Pump maintenance hints

Hints on the proper maintenance of pump efficiency and requirements for selecting the right dredge pump are discussed in a new bulletin describing the dredge pumps produced by Morris Machine Works, Baldwinville, New York. The Bulletin, No. 184-A, discusses the 24 models in this line ranging from 6 to 20 in. in size.

Drilling without air

A folder is available describing the Pinazza rock drilling equipment which operates either from gasoline engine or electric motor drive through a flexible shaft. The folder describes the principle of the drill, or demolition hammer, and also the engines available for its operation. Job pictures show the unit in use and the portable features. Copies of the bulletin may be secured from the Pitnam Industrial Products Co., 608 Fifth Avenue, New York 20, N. Y.

Dandie concrete mixer

An 8-page catalog reviews in detail the construction features of the Model 6-X concrete mixer distributed by the Kwik-Mix Co., which is a subsidiary of the Koehring Co. of Milwaukee. The mixer is designed to feature light weight to provide easy trailing and hand movement on the job. It has exclusive features in the



design of blades and buckets and additional features include V-belt drive, special discharge chute, and a skip shaker. Copies of the 6-S Dandie Mixer catalog may be obtained from Kwik-Mix Co., Port Washington, Wis., or from any distributor.

Lincoln Weldonpower

Weldonpower supplying 200 amp. of a-c current for fast welding, hard facing, soldering, brazing, and cutting is described in a 4-page folder of the Lincoln Electric Co., Cleveland 17,

Ohio. The unit also doubles as an a-c power generator supplying 4 kva. for continuous duty and 5 for intermittent power. This, according to the folder, extends its usefulness on construction work to lighting, operating pumps, and hand tools. Complete specifications and ratings are shown in tables.

Bucyrus-Erie excavator-crane

Illustrated with job photographs and close-ups of all mechanical features, the 40-page booklet just released by Bucyrus-Erie describes the company's 15-B excavator-crane. Complete specifications are included for this unit which operates as a 1/2-yd. shovel, readily convertible to dragline, clamshell, dragshovel, or lifting crane. The bulletin indicates that power is offered from gasoline, diesel, or electric motor source. Write for Bulletin 15-B to Bucyrus-Erie Co., South Milwaukee, Wis.

Tel-O-Aid for telephone

Use of the telephone under noisy conditions, such as construction operations, is aided by a new device discussed in a leaflet just released by Fisher Research Laboratory, Inc., 1961 University Avenue, Palo Alto, Calif. The folder describes the unit which fits over the ordinary telephone receiver and steps up the volume as much as seven times.



VisQueen

**costs less under
slab than any
other permanent
moisture barrier**

Savings on installation often exceed cost of this tough, waterproof plastic film.

VisQueen is a tough, pliable plastic film, used wherever a permanent moisture-proof barrier is required . . . under concrete floor slabs, behind basement walls, etc.

LASTS THE LIFE OF THE BUILDING

VisQueen is permanently waterproof; won't deteriorate, become brittle, or crack with age. Its light weight (standard thickness (.004) weighs 19.2 pounds per 1,000 square feet) and easy conformity to irregular shapes speed installation. It has amazing elongation and is resistant to puncture, difficult to tear or split, yet cuts easily with knife or razor blade. Quickly heat sealed.

Get full information on VisQueen polyethylene film today. It is now available in widths up to 16 feet; various thicknesses.

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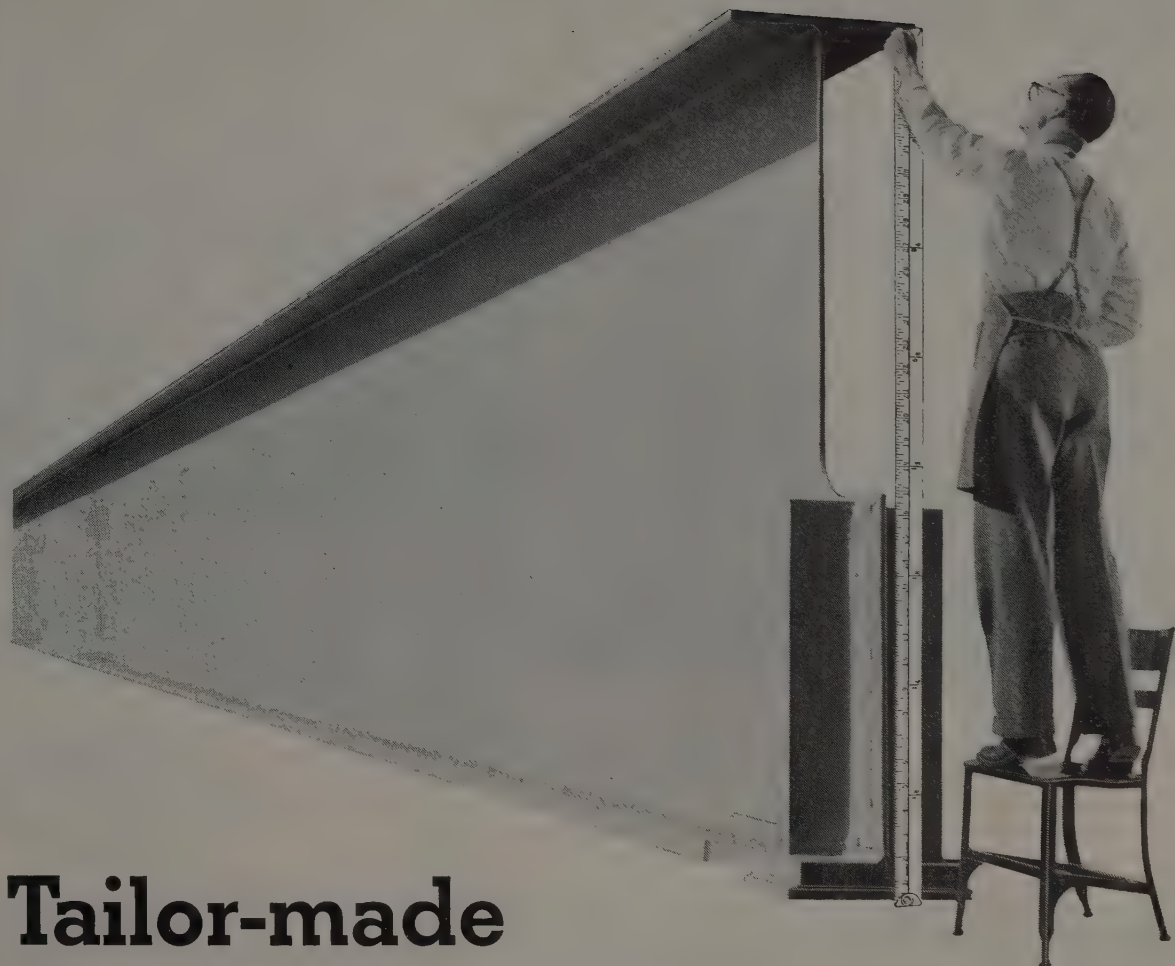
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Tailor-made

Today, Kaiser Steel plates are being welded together to form structural beams—*tailor-made* to fit exacting designs.

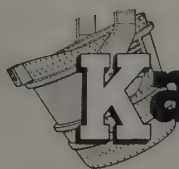
This is a dramatic advance over the old method of tailoring the designs to fit the size ranges of ordinary structural steel.

This new method means: 1) up to 20% less structural weight; 2) substantial dollar savings.

In the West . . . more and more girders built up from

Kaiser Steel plates are being used where larger-than-average structurals can improve construction, including major units of the multi-million dollar construction program currently underway through the California Department of Public Works.

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NEW EQUIPMENT

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

Batching plant can be operated by one man

Automatic concrete batching is announced in a Road-builders' Plant manufactured by Butler Bin Co., Waukegan, Wis. The plant batches sand, cement, two sizes of stone, automatically and simultaneously with such speed that it easily paces two 34E dual drum pavers. Batching



of all materials is controlled by one man stationed at the cement batcher, operating a set of buttons. If desired, the truck driver can operate the sand and aggregate batchers without leaving his cab through buttons mounted on the bin columns. The batcher is shipped as a self-contained package including wiring. The entire unit can be set up in a few hours.

The 300 Utility—International's newest

A rubber-tired 42-hp. wheel tractor, the International 300 Utility, has been announced by International Harvester Co., 180 No. Michigan Ave., Chicago 1, Ill. It is powered by an IH C-169 gasoline engine, and its operating weight is 4,413 lb. It is available either with standard



transmission or Torque Amplifier drive, which gives 10 speeds forward. Specifications of the new tractor include: wheel base—75 in.; length—123 in.; width at narrow tread—59½ in.; clearance at rear axle—19½ in.; clearance front axle—20½ in.; braked turning radius—9 ft. 8 in. Twenty-three attachments are available as special equipment.

Drott announces new 2½-yd. shovel

A 2½-cu. yd. "Four-In-One" Skid-Shovel, companion tool for the 75-hp. International TD-14 crawler tractor, is the latest product announced by Drott Manufacturing Corp., 3841 West Wisconsin Ave., Milwaukee 8, Wis.



The unit, operated hydraulically, can be converted from Skid-Shovel, to bullclam, to clamshell, or to bulldozer merely by the flick of a small lever located within easy reach of the operator. When operated as a Skid-Shovel, it gives a pry-over-shoe break-out action of over 17,000 lb., plus a 42-deg. ground-level bucket roll-back. It will dump with a 9-ft. clearance. On clamshell operations, the rig gives a 30-in. dumping height over ordinary roll-forward bucket dumping—11 ft. in all for loading into hauling units. A hydraulic cylinder enclosed in a coiled spring eliminates more than two-thirds of operating shocks and cuts down on hydraulic hose failures.

New line of heavy trucks by Mack

The most rugged Macks of their size ever built—the new B-80 line—are now in production. The series includes eleven models. All have exposed radiators with bolted top and bottom tanks and extra strength flat top fenders which can be used as working platforms. A choice of gasoline or diesel engines ranging from 170 to 300 hp. is available. There is a broad choice of wheel bases and gear ratios, including transmission from 5 to 20 speeds. Optional equipment includes power steering, air assist clutch arrangement, and the new Mack exhaust brake. Mack Trucks, Inc., 350 Fifth Avenue, New York 1, N. Y.

Attachments for Caterpillar motor graders

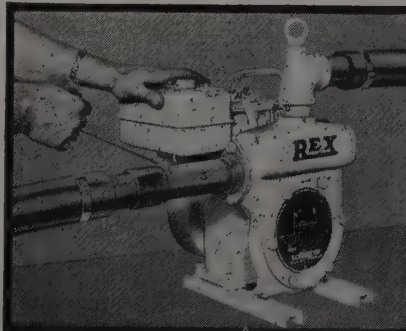
Caterpillar Tractor Co., Peoria, Ill., has announced a new set of hydraulic attachments for its No. 12 and No. 112 motor graders. They are a hydraulically shiftable



mold board, hydraulically operated snow plow and bulldozer mounting and hydraulically actuated snow wing. The mold board is concave to allow for the hydraulic cylinder. The stroke of the cylinder is 48 in. with 27 in. of



The Pump that Never Lets You Down



Easier to Start—A Rex Self-Priming Pump starts working easier, with less effort—in less time. It requires less initial prime water. Suction connection is easier, too. No pipe wrench needed. Just remove bolts. No hose or nipple damage.



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For information, write CHAIN Belt Company, Milwaukee 1, Wis. or to our new Los Angeles plant at 7601 Telegraph Rd., or see your local Rex Distributor.

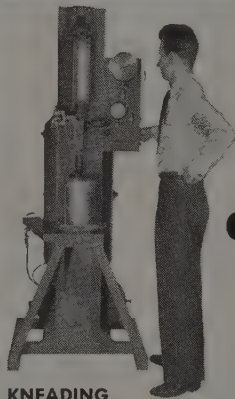


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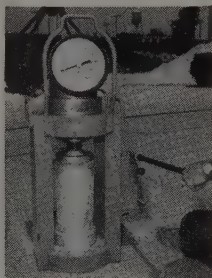
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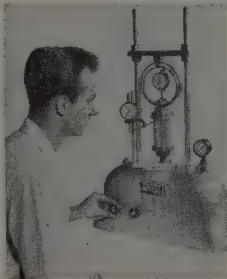
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travel to the right and 21 in. to the left. Standard mold boards will be equipped with a slide bar in place of the cylinder to allow for manual offset of the blade. Power for the attachments is supplied from a new enclosed hydraulic system similar in design to other Caterpillar hydraulic units and mounted on the front of the dashboard between the frame members. Controls are located inside the cab.

Motorola portable radiophone uses transistors

A new line of portable two-way radiophones has been announced by Motorola Communications and Electronics Division, Technical Information Center, 4545 West Augusta Blvd., Chicago. Responsible for the large power output capability and trebled receiver audio out-



put are several recent advances in transistors, plated circuitry and long-life power packs. The line includes models with RF power output ratings from 1 to 8 watts. The lightest and smallest model weighs 7 lb. 9 oz. complete. A full 8-watt transmitter power output is realized from a model weighing only 15½ lb. Complete information is available.

Eagle announces mobile crushing plant

Eagle Crusher Co., Galion, Ohio, has put into service a newly designed 100 to 125-yd. per min. single pass, mobile crushing plant. A 30-in. x 36-ft. feed conveyor which swings in a 150-deg. arc leads from the hopper and discharges onto the scalper screen. Both feed and dis-



charge conveyors are powered independently of crusher for more flexible operation. Push-button control panel and platform are on far side of base frame assembly. The 10-ton jaw crusher has a one-piece electrically welded frame. Jaws can be adjusted to turn out 1- to 5-in. material. Both stationary and movable jaws are reversible for extra wear. For highway travel, discharge conveyor folds back over the crusher. Feed conveyor is hauled by separate truck. Complete unit sells for about \$23,000.

The most important date for the Construction Industry in 1957

JAN 28
1957

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Nothing is being spared to make this 1957 Road Show the greatest indoor exhibit of machinery and materials ever gathered together. At the same time, the A.R.B.A. convention will give you an opportunity to learn about new methods and practices and hear outstanding authorities discuss the solution of problems that are bothering you.

Put it down as the most important date for the construction industry in 1957. Write for data on reservations. Ask to be put on the list to receive future information on the 1957 A.R.B.A. Road Show and Convention.

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Combination steel-and-rubber roller

A new 12-wheel, 6-20-ton roller called the "DUO-FACTOR," which may be operated either as a pneumatic or steel wheel roller, has been introduced by Seaman-Gunnison Corporation, manufacturers of asphalt distrib-

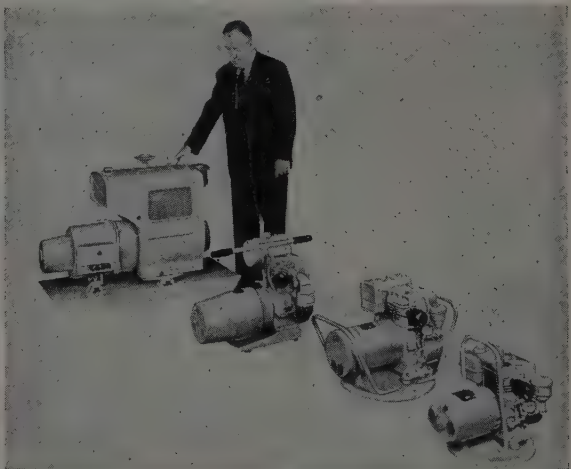


utors and stabilization equipment, 2763 So. 27th St., Milwaukee, Wis. Besides having full power 180-deg. steering for non-stop turn around on 18-ft. roads, the pneumatic tires oscillate through a "torsion control" of the wheel axles.

The larger diameter tires on the drive-roll not only provide more traction for the compaction of loose materials, but also eliminate any tendency for rear tires to track in the path of front tires. Ridge correction is accomplished through the use of the hydraulically-actuated steel wheel. Compaction pressures range from 50 to 425 lb. per lin. in. on either the steel or rubber rolls. The International-300 engine is equipped with a torque amplifier for power shifting and 10 speeds from $\frac{3}{4}$ to 18 mph.

A generator for every use

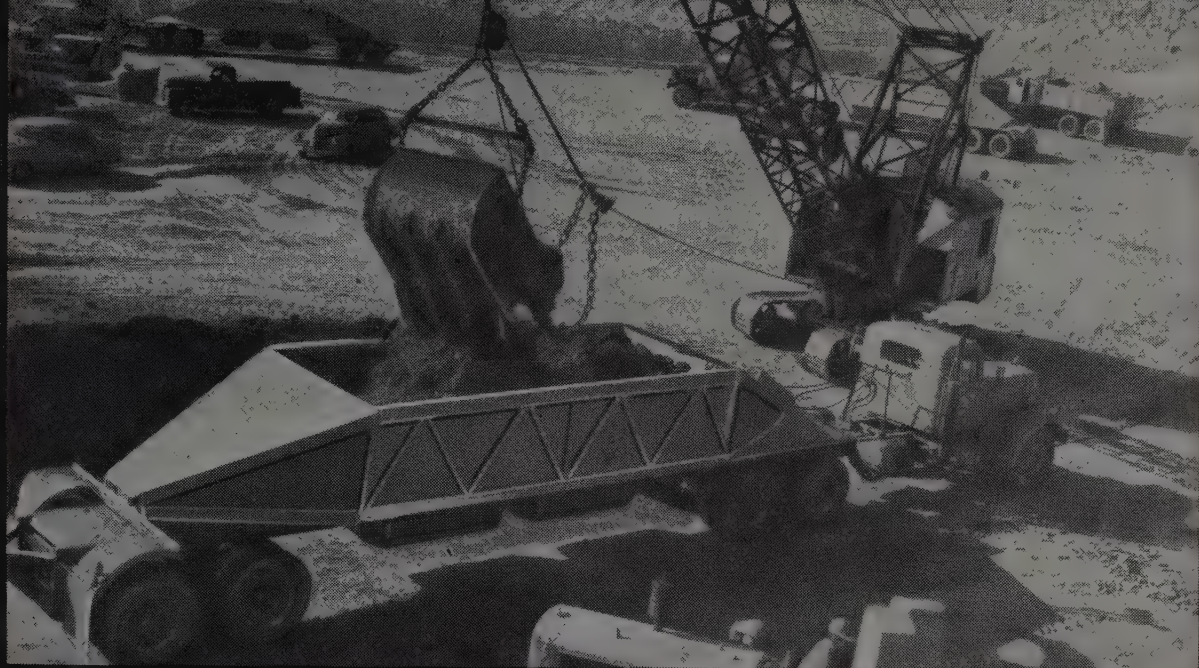
A line of 1956 portable gasoline-driven generators has been introduced by Master Vibrator Co., 264 Stanley Avenue, Dayton 1, Ohio. Eight new a-c and d-c models in 750 watts, 1,500 watts, 3-kw. and 5-kw. capacities, make



it possible to provide the right amount of power for any purpose. All models have direct-connected engine and generator, automatic pilot light, inherent voltage regulation, are shock mounted for minimum vibration, and equipped with air-cooled engines and automatic governors. Radio shielding is available on all models. Further information is available.

Boom will telescope with full load

A boom that will telescope hydraulically with a full-capacity load is one of the improvements in the new model 60 Pitman Hydra-Lift, introduced by Pitman Manufacturing Co., 300 West 79th Terrace, Kansas City,



Move Mountains of Earth with Money-Making Speed!



BOTTOM DUMP TWO-AXLE SEMI-TRAILERS

*The most modern, profit-producing
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- Your choice of various capacity tubular axles!
- Corrugated frame integral with body truss!

CHAMPION HAULING TEAM

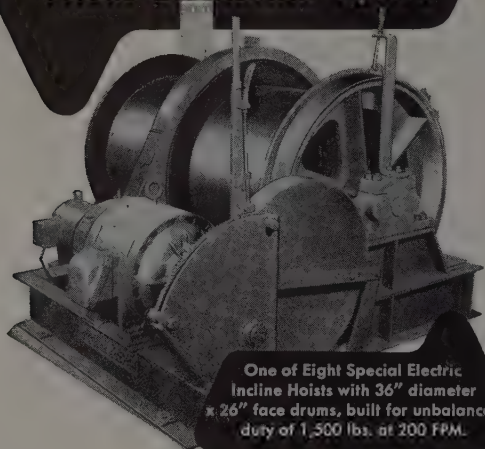
12 C-B Semi-Trailers and "traveling belt loader" recently moved 1962 tons of earth per hour!

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Cook Bros. Equipment Sales, 2300 So. 16th St., Phoenix, Arizona
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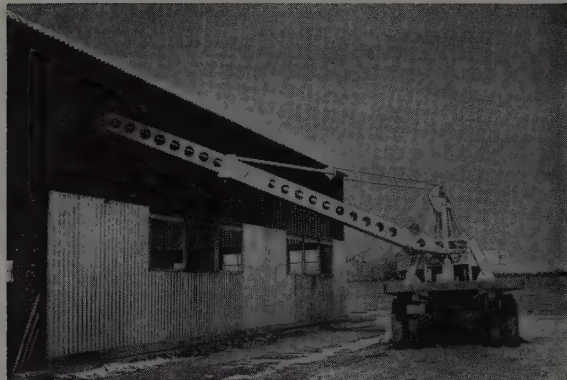
One of Eight Special Electric Incline Hoists with 36" diameter x 26" face drums, built for unbalanced duty of 1,500 lbs. at 200 FPM.

- By modifying and re-combining our standard parts, Superior-Lidgerwood-Mundy can engineer hoists to meet your specific requirements at the lowest possible cost.

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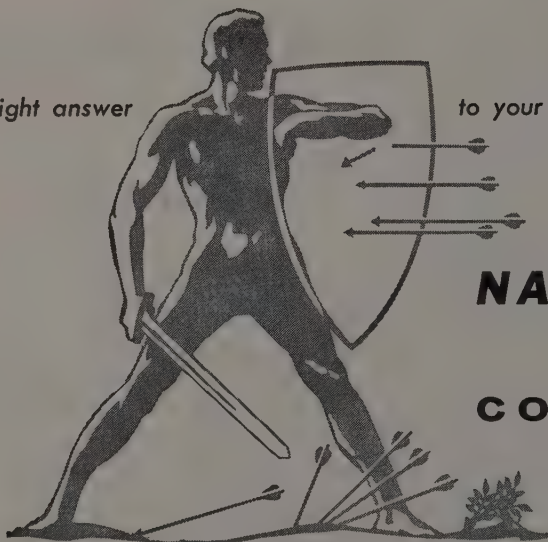
Mo. The model 60 is a complete redesigning of model B Pitman Hydra-Lift, popular 6,400-lb. capacity truck crane requiring only 40 in. of space behind a truck cab. The hydraulic boom telescopes from 17 to 27 ft. The standard tubular boom telescopes manually from 12 to 17 to 22 ft. Full details on the new model are available from the manufacturer.

New line of Caterpillar electric sets

A new line of Caterpillar diesel electric sets has been designed to match the engine powering it. The self-regulated units are engineered to meet the needs of applications now served by self-regulated or externally-regulated generators. Featuring close voltage regulation, they provide steady voltage from no load to full load. The new units can be easily paralleled with most generators now in use. Caterpillar Tractor Co., Peoria 8, Ill.

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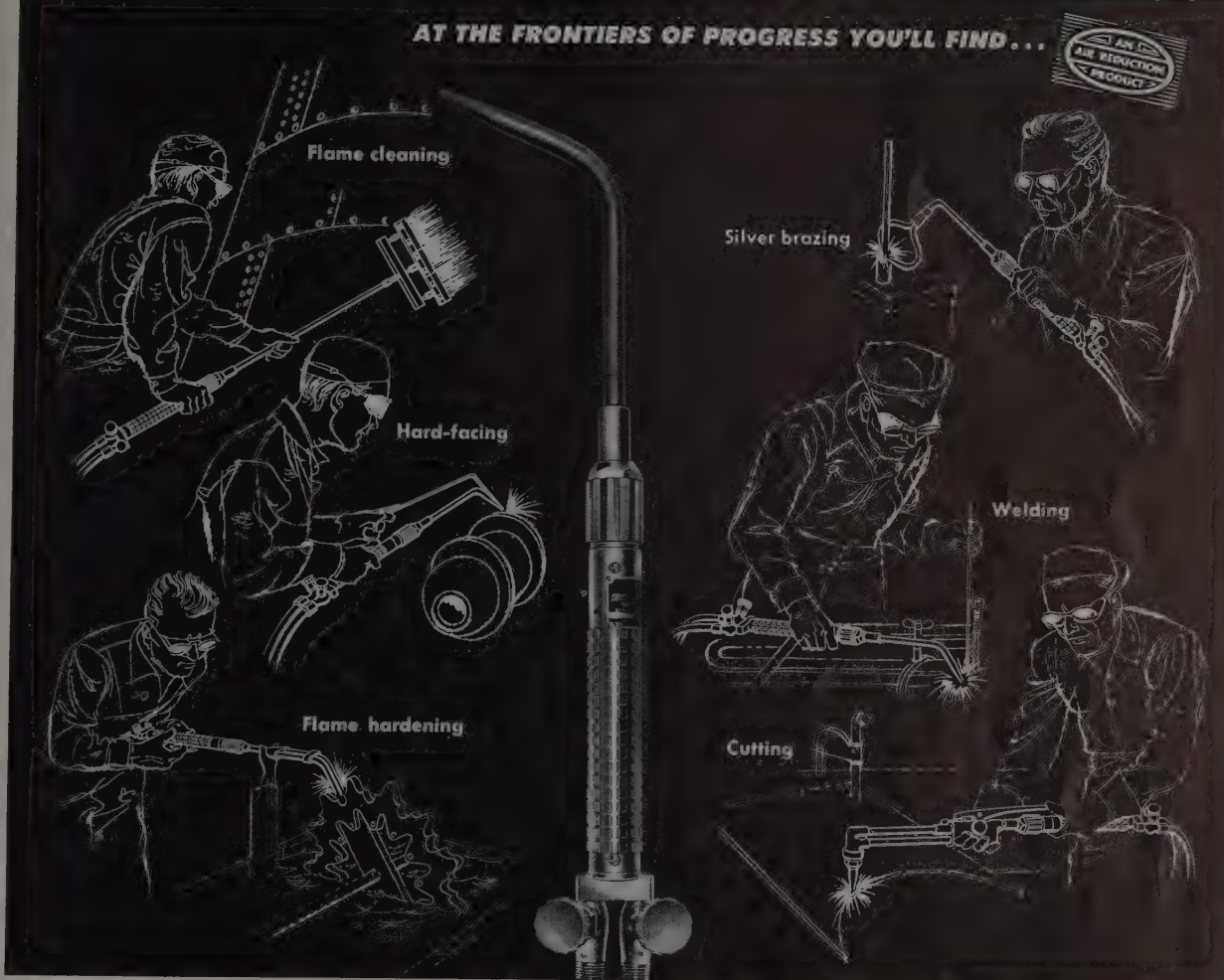
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Air tool has torque control

An air-operated nut-running tool which impacts the nut to a desired pre-set torque for precision tightness, and then automatically shuts itself off, is now available. Called the Torque Controlled Impactool, it utilizes the torsion bar principle to torque control. In place of a 4-man riveting team, the tool requires only a 2-man bolting team—one to run the tool and another to hold the bolt. No training is necessary to run down nuts to the proper torque. The torque setting is simple and remains

constant until the adjustment is changed. Resetting the trigger resets the tool automatically to the same torque for the next nut. The operation is reversible with full power in either direction, and there is no need for pressure regulators. When shipped from the factory, the torque is reset at 320 ft. lb. and can be adjusted through a range of 14 calibrations up to a maximum of 550 ft. lb. Literature and specifications are available from the manufacturer, **Ingersoll-Rand Co., Air Tool Division**, 11 Broadway, New York 4, N. Y.



Step-on industrial loaders

New step-on industrial loaders for Ford and Fordson Major diesel tractors, featuring one-piece box frame construction and high lift with high dumping clearance, have been announced by the Tractor and Implement Division, **Ford Motor Company**, Birmingham, Mich. Operator convenience was a major factor in the development of the new loader line. The operator can step on and off the tractor between the upright member and the rear wheel instead of climbing over rear attached implements. There are many similar features but the new loaders for the two tractors are distinct implements, designed to work to best advantage on each type of tractor. Both are

easily installed. The Ford loader can be equipped with a material bucket of 9-cu. ft. capacity or a light material bucket of 16-cu. ft. capacity. The FMD loader can be equipped with a material bucket of $\frac{1}{2}$ -cu. yd. capacity, or a light material bucket of $\frac{3}{4}$ -cu. yd. capacity. Three additional attachments for both loaders will be available soon, a trend width bucket, crane, and blade.

Alaska augers

In the February issue of **Western Construction** on page 24 an auger was briefly described being used in permafrost in Alaska. This auger features a tapered helix of steel with a series of cutting bits stepped around the edge of the spiral, and

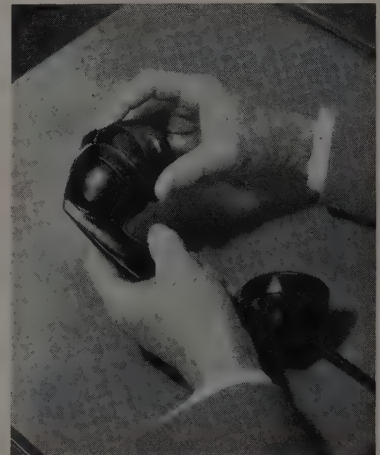
a hollow mill cutting head instead of the conventional piercing point. The capabilities of the tool have been demonstrated in boring solid blocks of cast iron. The thousands of holes required for the Distant Early Warning project in the far north are being dug with Alaskaug augers in various sizes up to 32 in. Further information about this auger can be obtained from **Alaskaug, Inc.**, 620 Keith Building, Cincinnati 2, Ohio.

Diaphragm pump

A diaphragm pump which can handle mud, sand, and sewage has been announced by **Homelite**, Port Chester, New York. It is called the Model 20DP3 and has a capacity of 5,000 gal. per hour. The pump weighs 120 lb. and will run 6 hr. at full capacity pumping on one gallon of fuel. It operates at engine speeds between 1,500 and 2,850 rpm. At full throttle the pump makes approximately 66 strokes per min. Completely self priming, the pump will dry-prime up to 15 ft. and do it in 15 sec. For further information write, the manufacturer at 75 Riverdale Avenue, Port Chester, N. Y.

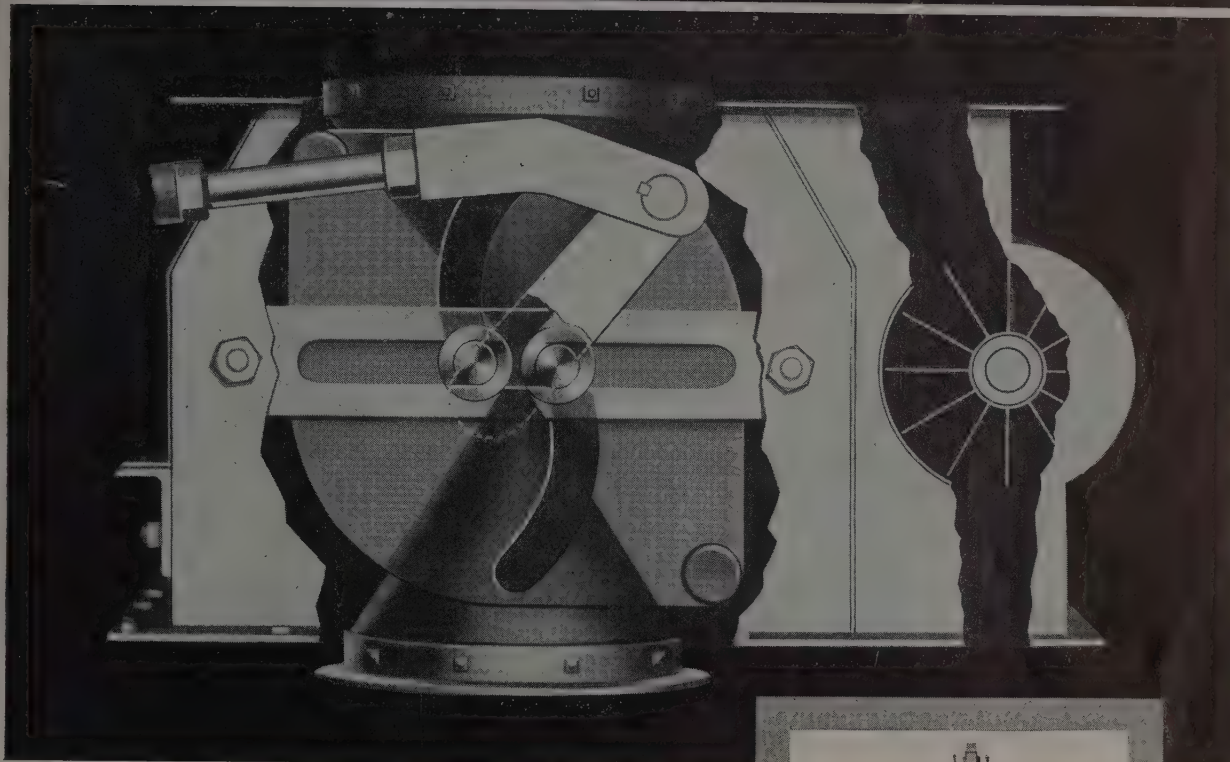
Transistors aid phone listening

Transistors are now used to amplify phone reception. The device is known as the Tel-O-Aid which fits over the receiver of any telephone. Receiver volume is amplified up to 7 times. It is simply slipped over the receiver and held in place by a spring clip. Telephone receiver signals are picked up by magnetic induction, amplified, and then converted into sound. No electrical connections are required. It weighs only about 3 oz. and can be carried in the pocket or



purse for instant use whenever required. The Tel-O-Aid will enable contractors to include the noisy parts of their jobs into their radio network. Retail price has been set at \$32.50 for the standard unit. For further information, contact **Fisher Research Laboratory, Inc.**, Palo Alto, Calif.

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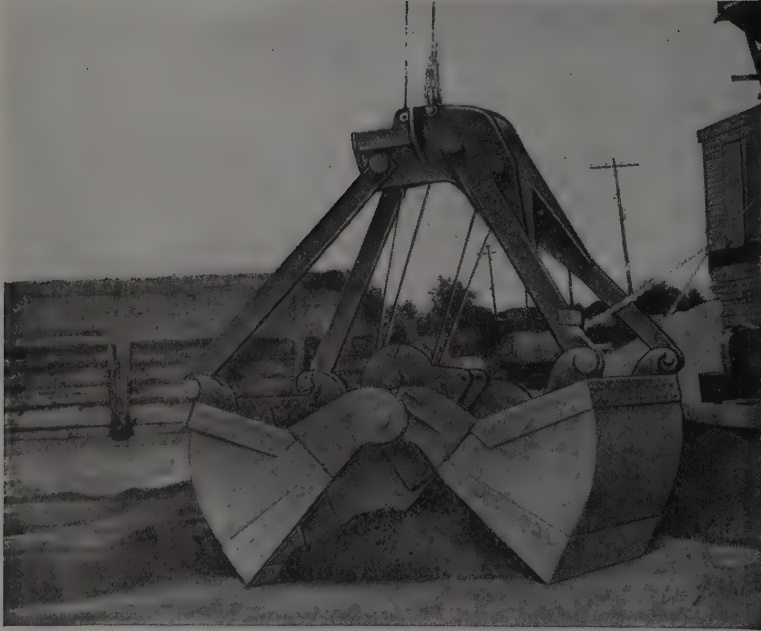
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That is what Mr. R. Vanderbilt, vice-president of Vanbro Construction Corp., Staten Island, New York, has to say about his Erie Strayer 1½ yard bucket.

"Erie's ability to pick up and clean makes it ideal for barge unloading," reports Mr. Vanderbilt.

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4. Two-line, continuous reeving. Adds up to 50% to cable life. Less down-time for reeving.
5. Low head room for fast work in tight quarters; low center of gravity for easy positioning.

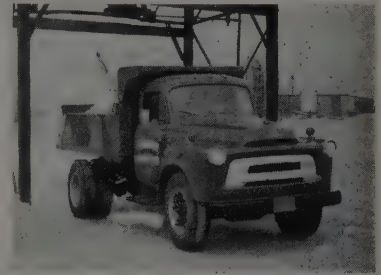


For catalogs, write Dept. WC36

ERIE STRAYER CO.
3736 GEIST ROAD • ERIE, PENNSYLVANIA

International dump body

The Model S-180 dump body with a gross vehicle weight rating of 18,500 lb. is available in 130-, 142-, 154-, 172-in. wheel base. It is powered by 137-hp. International 282 engine. Op-



tional are LPG fuel system, the 150-hp. engine, and power steering. **International Manufacturing Co., 675 Rio Grande Avenue, Littleton, Colo.**

Caterpillar adds to line

The advantages of integral tractor and shovel design has been incorporated in the latest Traxcavator, the No. 977. Utilizing a 2¼-cu. yd.



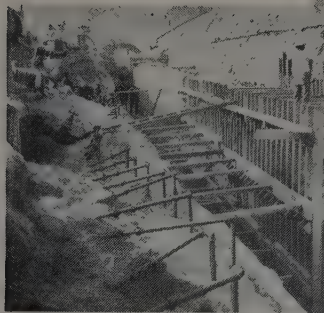
bucket, the machine features a differential lever on each of the lift arms which makes possible the 40-deg. bucket tipback at ground level. Diesel engine and the gasoline starting engine are both started from the operator's seat. Twenty-four volt direct electric starting is available as an attachment. A 60-gal. field tank is used and batteries for either 6 or 24 volts starting systems are located beneath the field tank. **Caterpillar Tractor Co., Peoria, Ill.**

Hydraulic moldboard shift

A hydraulically-controlled moldboard shift to fit any Caterpillar motor grader with a sliding moldboard has been announced by Rivinius, Inc., Eureka, Ill. The control permits the operator to shift the moldboard at the touch of the button inside the cab. It operates from the same pump as the power steering and functions whether the motor grader is moving or stationary. It can move the moldboard through a full 42 in. of travel in less than 30 sec. Literature is available.

Two new power-lift tail-gates

Two new power-lift tail-gates of 2,000 and 3,000-lb. capacity respectively, designed for mounting on 1½-ton and larger trucks and trailers



This time and money-saving use of Stang wellpoints on a pipeline crossing of the Santa Ana River in California, for contractor Ukropina, Polich, & Kraal, provided the ideal solution to an exceptionally tough water handling problem.



See cover picture and story on this Stang dewatering project in the January 26th, 1956 Issue of Engineering News-Record.

Only STANG OFFERS EVERY TYPE OF DEWATERING EQUIPMENT

-ANYWHERE, ANYTIME!

Turbine—Jetting—Wellpoint—
Pumps and Systems. Stang's
Nationwide Depots stand ready to
"bail you out" on a moment's notice

Stang won a race against the Rio Grande River for contractor D. D. Skousen and Son, of Albuquerque, New Mexico, with this deep well turbine installation on the Rio Grande at the Atrisco Syphon jobsite in Albuquerque. With sub-grade 48' below the ground water table, 10 pumps provided 800' of dry sub-grade in a few weeks!



WRITE FOR BULLETIN 100A.

Putting water
in its place



JOHN W. STANG CORPORATION

Engineers and Manufacturers of Unwatering Equipment, Wellpoint and Pumping Systems
Unwatering Planning—Equipment—Service

BELL, CALIFORNIA
8221 Atlantic Avenue
Telephone: Logan 5-7421

OMAHA, NEBRASKA
2123 South 56th Street
Telephone: Walnut 7796

TACOMA, WASHINGTON
2339 Lincoln Avenue
Telephone: Broadway 4362

TULSA, OKLAHOMA
4026 South Urbana Street
Telephone: 7-8929

with stake, platform, and van bodies. have been announced by **Hercules Steel Products Co.**, Galion, Ohio. Designated models H-20 and H-30, the gates offer single lever control of raising and lowering, hydraulic closing and opening, plus compact construction to permit installation on any truck or trailer without frame alteration. Platform sizes are 84x34 in. and 90x34 in., both with a 7-in. ramp. Further information is available.

Pump for abrasive slurries

A suction pump, easily dismantled and designated as type Q, has

been introduced by **Morris Machine Works**, Baldwinsville, N. Y. The low speed, continuous duty pump is designed to handle abrasive slurries of cement, sand, coal, solids, chemical sludges, and other products up to a maximum fluid consistency under suction lift or positive head. It is available in 7 different models from 2 to 6-in. size. For further information, write for Bulletin 186.

Warning light and barricade

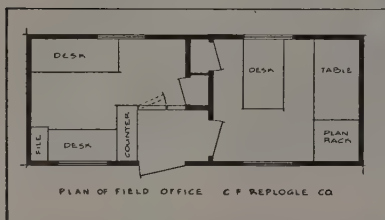
A battery-powered warning light and folding barricade have been announced by **R. D. Fageol Co.**, Kent, Ohio. Known as the Model M-2

Flasher Safety Light, the light produces neon flashes visible for one mile at a rate of 90 flashes per min. Power supplied by a 6-ft. battery through a timer and current booster. Normal battery life is said to exceed 1,000 hr. The barricades are of steel angle iron and 3/4-in. plywood construction. Designed for use with one or two lights, the barricades are painted highway safety yellow or white and black. They are available in three sizes and fold compactly for storage. Literature is available.

Crawler tractor by Oliver

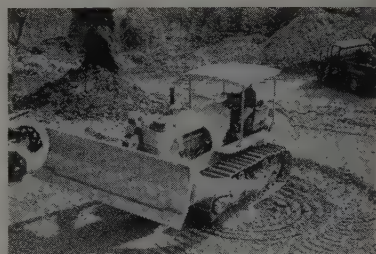
Announcement has been made by the Industrial Sales Division, **Oliver Corporation**, 400 West Madison Street, Chicago 6, Ill., of a model OC-18 crawler tractor. Powered by a diesel engine delivering 161 hp. and weighing 32,500 lb., the new tractor has a full line of matched equipment. The machine's steering mechanism permits spot turns or gradual turns of any angle. The operator can

Armco Buildings



This field office is an Armco Building, 24 ft. long, 9 1/2 ft. wide, 6 3/4 ft. high. It has insulation, varnished walls, closets, partitions, lighting and built-in tables.

This 40-ft.-wide Armco Building was used by the Cook Construction Company, Jackson, Miss., as a repair shop on Ohio Turnpike.



change from direct drive to planetary reduction drive with a reduction in speed and a corresponding increase in drawbar pull. Releasing the levers returns the tractor to its original transmission setting. Literature is available.

The Allis-Chalmers HD-6 tractor

The technical and operating story of the Allis-Chalmers 45-hp. HD-6 diesel-powered tractor is available in a new catalog (MS-461). The booklet reviews the specifications of the unit together with the full line of matched equipment and accessories designed to increase its versatility, efficiency, and economy. The booklet may be obtained directly from the Construction Machinery Division of the Tractor Group, **Allis-Chalmers Mfg. Co.**, Milwaukee, Wis.

Portable power troweling machine

A portable troweler for finishing concrete has been announced by the Construction Equipment Division of **Thor Power Tool Co.**, 175 No. State Street, Aurora, Ill. Total weight of the unit is less than 70 lb. A large adjusting wheel permits easy change of blade pitch by hand or foot. Outside diameter of the new machine is 29 in. A gasoline-powered Briggs & Stratton engine activates the troweler and is started by a pull-cord.

fit

CONTRACTOR NEEDS

Contractors find Armco Steel Buildings offer them many advantages when used for offices, repair shops and warehouses.

For example, the field office above is one of several used by the C. F. Replogle Company, contractors of Circleville, Ohio. It is mounted on pipe skids. Moving is done by truck.

Although designed as permanent structures. Armco Buildings have advantages for contractors at temporary sites. They may be quickly dismantled, moved and re-erected without loss of material. A small crew handles the job.

Wide range of sizes lets you match any space requirement. Write for data.

ARMCO DRAINAGE & METAL PRODUCTS, INC.

CALCO AND NORTH PACIFIC DIVISIONS

Berkeley • Los Angeles

Portland • Seattle • Spokane

ARMCO STEEL BUILDINGS





These two Allis-Chalmers HD-16 Crawler Tractors, one pulling and one pushing a scraper, are both equipped with A-C Torque Converter Drive — which incorporates Twin Disc Torque Converter components.

6 profitable reasons why you need a torque converter in your crawler tractors

For higher work output and longer equipment life, more and more contractors are ordering their new Allis-Chalmers HD-16 Crawler Tractors complete with A-C Torque Converter Drive. (The HD-21 has converter drive as standard equipment.)

Torque converter drive offers six profitable, proved advantages applicable to your crawler tractors.

1. Three-stage design provides the highest engine output torque multiplication available — eliminating harmful, costly engine lugging and stalling.
2. Engines work up in the maximum efficiency range all the time, delivering constant high-horsepower output . . . doing more work than units equipped with mechanical drive.
3. Power is automatically matched to load demands, with gear-

shifting minimized or eliminated — where mechanical transmissions must stay in the starting gear ratio, even after starting load resistance is reduced . . . operator efficiency is boosted.

4. Heavy load pick-up is smooth, even, without clutch slippage . . . better flotation is obtained.
5. Overloads, shock loads and vibrations are cushioned out, through fluid connection . . . providing longer tractor life with less maintenance.
6. Infinite variety of ratios are available to work with, permitting smooth, accurate control of loads and delicate "inching" under power.

Wherever earth and rock are moved, owners are using these six basic advantages to convert their horsepower into more profits. That's why Allis-Chalmers designed torque

converter drive into their HD-16 and HD-21 Crawler Tractors. Since 1940, they have worked closely with Twin Disc Engineers, and have standardized on Twin Disc Torque Converter Components.

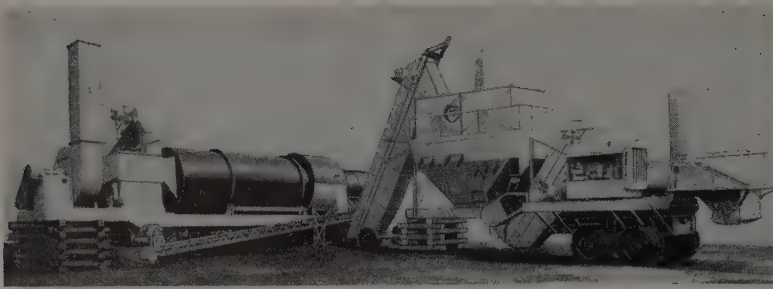
Be sure there's a torque converter in your next Allis-Chalmers HD-16! See your tractor dealer today, for complete information on A-C Torque Converter Drive.



TWIN DISC

Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois



Pioneer redesigns plant

A redesigned field-tested version of its model 102 continuous mix bi-

tuminous plant has been announced by Pioneer Engineering Works, Inc., Minneapolis 13, Minn. Main factor

WISCONSIN ENGINE POWER



at Work on the Ohio Turnpike

In building the Ohio Turnpike, a great variety of Wisconsin-powered construction equipment was employed, including sub-graders, automatic curing machines, compactors, spreaders, pumps, finishers, concrete saws and rugged, portable generators such as the Maginnis Model HG-4B-TF unit shown above, made by Maginnis Power Tool Co., Mansfield, Ohio. This unit is supplying power for two HCV-3 Maginnis Hi-lectric concrete vibrators, at work on a bridge abutment in forms up to 12 ft. deep. The generator is powered by a Wisconsin Model TF 2-cylinder Heavy-Duty Air-Cooled Engine.

On the rough, dirty jobs where heavy-duty serviceability is a "must", you can always depend on Wisconsin Engines to *come through* and keep the job moving. Standard features on all models, from 3 to 36 hp., include: self-cleaning tapered roller bearings at both ends of the crankshaft; impulse coupled high tension rotary *outside* magneto; pump-circulated lubrication and efficient AIR-COOLING at all atmospheric temperatures from sub-zero to 140° F.

More than 2200 Wisconsin approved service stations and distributors are on the job, ready to serve you, throughout the United States and Canada, not counting parts and service distributors and dealers in 82 foreign countries.

You can't do better than to specify "Wisconsin Power" for your equipment. Write for Bulletin S-165.

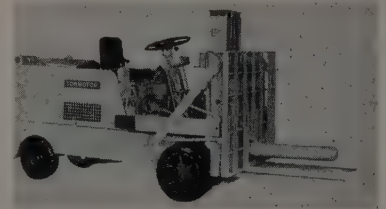
contributing to the increased adaptability is a 4-compartment bin which allows greater flexibility in composition of aggregate fed to the mixer. On jobs where less than 4 sizes of aggregate are sufficient, the bin can easily be converted to production of whatever fewer sizes are needed. Production capacity of the model 102 ranges up to 200 tons per hr., depending on material conditions. It has only two main units—a combination drier-dust collector and a combination gradation-mixer—each assembled in a straight line on a single chassis. Other improvements are a totally enclosed belt-type fines return conveyor replacing a screw type conveyor, and a built-in reject spout to waste fines whenever and to whatever degree desired. Detail specifications can be obtained from Pioneer Engineering Works, Inc., 1515 Central Avenue, Minneapolis 13, Minn. Ask for Form No. SED 26.

Lightweight plastic pipe

A new plastic pipe designed for sewer and drain applications is now available from Carlon Products Corp., 10225 Meech Avenue, Cleveland 5, Ohio. Ten feet of the 4-in. pipe weighs only 14½ lb. One man can install 100 ft. of the pipe in 40 min. with nothing more than a saw and a can of quick-setting cement. The plastic pipe comes in 10-ft. length in 2-in. to 6-in. sizes with a complete line of reducers, adapters, and couplings. For further information write to the manufacturer.

Accessories for lift trucks

Several accessories have been developed to widen the range of uses of fork lift trucks manufactured by Towmotor Corp. 1226 East 52nd Street, Cleveland 10, Ohio. Two of the accessories, the unloader and the ram attachment operate effectively as a team. The ram is a horizontal pole suspended from the fork sup-



port bar which facilitates the entry and withdrawal from open center loads, such as coils of cable. The unloader is a powerful pusher device used for the mechanical unloading of the materials eliminating the need for any manual handling. Thus loads can be packed tightly together assuring maximum use of storage space. Another accessory permits the lift truck carriage to be adjusted laterally to handle heavy loads of varying size and shape, and can be used where different widths of pallet loads are



WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN



In this installation the primary plant feeds a system producing six different sizes of rock and sand. Heart of the system is a PIONEER 174 Primary which has a 48" x 16' PIONEER ORO Feeder and a PIONEER 4248 Jaw Crusher. The feeder is constructed of 3/4" thick cast manganese steel pans with integrally

cast links, which withstand the huge loads dumped by quarry trucks. It correctly positions large, odd-shaped rocks before they enter the crushing chamber of the 4248 Jaw Crusher. It also controls the amount and rate of feed to the crusher so that maximum output is reached and maintained.



Workmen are dwarfed by PIONEER's 4248 Jaw Crusher. Designed to reduce blasting and drilling costs, and to turn out enormous tonnages, this 95,000 lb. giant is owned by General Crushed Stone Co. of Easton, Pa.



This PIONEER 4248 Jaw Crusher is part of the Apex plant of U. S. Lime Products Co., Las Vegas, Nevada. Note hydraulic mechanisms for holding pitman forward when adjusting crusher setting or changing toggle plates.



PIONEER assembles 4248 Jaw Crusher. Here you see the 19,000 lb. pitman arm with the 5200 pound shaft assembly being lowered into the 4 cu. yd. crushing chamber. Length of moving jaw is 104", stationary jaw 90".

For further details write Pioneer Engineering Works, Inc., Minneapolis, Minnesota (subsidiary of Poor & Company, Chicago) or your nearest PIONEER distributor.



Pioneer

Continuflow EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago

Please send information on equipment checked.

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

Name _____
Company _____
Address _____
City _____ Zone _____ State _____

handled. Hydraulic actuation of the clamp provides for quick adjustment of the forks. The double Telescopic Mast consists of a primary and secondary mast which enables the machine to be used in locations which have low head room.

2-way flasher light

A 2-way flasher light that offers 25% greater light intensity for warning motorists or pedestrians on construction projects has been introduced by Gen-A-Matic Corp. of Van Nuys, Calif. The light is 7 x 5 x 8 in. in size and uses a neon tube. The

tube is shock-mounted and rotates easily to any desired position. A standard 6-volt battery will last from 2 to 3 months even under continuous operation. Cost of operation for 24 hr. is less than one cent. The light is weatherproof, and resists salt sprays. For information write Gen-A-Matic Corp., 14741 Bessemer Street, Van Nuys, Calif.

Air-cooled electric plants

Two electric generating plants, in 3,500 and 5,000-watt a.c. size have been announced by D. W. Onan & Sons, Inc., Minneapolis, Minn. Both

models are powered by a 2-cylinder gasoline engine. The remote starting model 305-CCK, is 26 $\frac{3}{4}$ in. long, 21 $\frac{1}{8}$ in. wide and both models are 20 $\frac{3}{4}$ in. high. Both generating plant series are available in 60 or 50 cycle; 115, 230, or 115/230-volt, single phase; and 230-volt, 3-phase, 3-wire. Fuel consumption for model 305-CCK is 0.19 gal. per kilowatt hour at full rated load.

Improved waler jack

A newly improved waler jack known as Model 102-A, designed for use on all types of concrete construction jobs using horizontal walers, has been announced. The unit is all-steel and may be used on 2 x 4- or 2 x 6-in. walers without bolts. If desired, it may be bolted in the wall with a she-bolt. When a she-bolt is used, the hooks swing back out of the way.



GAR-BRO concrete hoppers

SPEED UP CONCRETE PLACING by using a Gar-Bro Portable Hopper. It receives concrete directly from transit mixers and dispenses it to the pouring crew. With a Gar-Bro Hopper you prevent truck delay and keep wheelbarrows and carts on the go. Because of its low height no ramps or jacking up is required. Dual bins of self-cleaning design have a 125 ft. capacity.

Gar-Bro Hoppers are also available in several floor types and in 10 sizes of single and double gate models; large portable and semi-portable hoppers ranging in capacity from 14 to 135 cubic feet. Each has Gar-Bro patented clamshell type, self closing, grout tight gates.

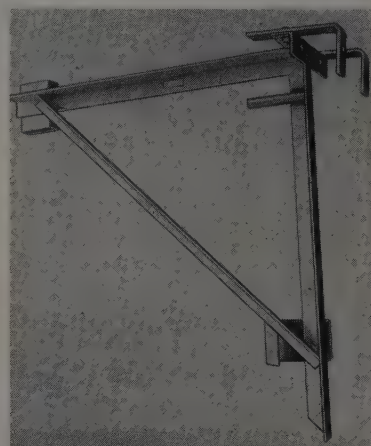
Get the facts; write for information.

GAR-BRO MANUFACTURING COMPANY

2415 East Washington Boulevard, Los Angeles 21, California



for faster concrete handling



The jack features the double-hook construction at the top. This assures a safe grip and distributes the load evenly, making sideways impossible. More information can be obtained by writing Superior Scaffold Co., 5624 Bankfield Avenue, Culver City, Calif.

New Allison transmission

The Allison Powermatic transmission, announced for use in 15 models of Chevrolet two-ton highway trucks, combines a torque converter automatic transmission with six speeds forward and one reverse with an integral hydraulic retarder for braking action. The retarder is operated by a pedal located in the conventional clutch pedal position. The retarder relieves extensive use of service brakes on long downhill runs and controls the descent of the truck. Long grade descents are made faster without the danger of overheating the brakes. The retarder has no wearing parts and its operation is cooled by oil flow. The Powermatic transmission was designed by Allison in cooperation with the Chevrolet Motor Division of General Motors. It is the first automatic transmission

He expects more from his
MARION
and gets it!



WHEN THE GOING GETS TOUGH Haddad Construction brings its MARION on the Job

Haddad Construction Company of Columbus, Ohio, has 2 of 4 contracts for constructing a heavy sewer line through seven suburban areas and a portion of East Cleveland. Total length is 10 miles of which Haddad has about 6 miles or 32,000'.

A MARION 362 with a 2-yard hoe dipper was used to dig the first 1,000'; then was replaced by other excavating equipment. Recently at about the halfway mark, when hard, closely laminated blue rock was encountered, the MARION's ruggedness and performance was again needed to remove 5' of dirt and sandstone and then 10' of hard blue rock.

The choice of machines was simple. Through experience Haddad officials knew their MARION could outperform any of six makes of excavating equipment they owned. They knew it could take more wear and tear when digging in hard blue rock.

It's the reason a Haddad official said, "Whenever we run into a tough job, we bring in our MARION 362. It really handles the work."

**Whatever your job requirement,
there is a Marion machine
of the right size and type for greatest efficiency.**

MACHINE	SHOVEL CAP. CU. YD.	MAX. CRANE RATING IN TONS @ 12' RAD. EXCEPT AS NOTED			HOE CAP. CU. YDS.	ASK FOR BULLETIN NUMBER
		CRAWLER	TRUCK	WAGON		
MARION 32-M	¾	*17½	*25	*25	¾	416
MARION 43-M	1	*27	*35	---	1-1¼	415
MARION 362	1½	37	---	---	1½-2	398-D
MARION 372	---	43	---	---	---	---
MARION 83-M	2	60	---	---	2-2¼	414
MARION 87-M	---	75	---	---	---	---
MARION 93-M	2½	80	---	---	---	397-E
MARION 101-M	3	84	---	---	---	417
MARION 111-M	4	169	---	---	---	402-B

*Rated at 10' Radius in Accordance with General Practice.



MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

Please send bulletin #398D on the Marion 362.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

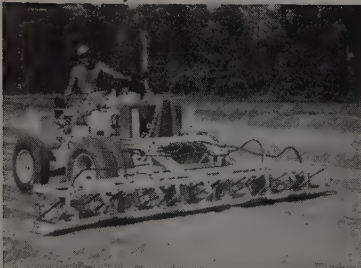
4200
TWO-TON BLOWS
PER MINUTE!



Here's **TREMENDOUS** **COMPACTION**

... for rapidly and most economically achieving or exceeding specified densities in the consolidation of rock, slag, gravel and sand base courses in waterbound and penetration macadam construction. The Jackson does it in just about half the time required with equipment of other types and is equally efficient in filling all the voids from top to bottom of rock and slag courses when sufficient fines have been spread.

Exceptional **ON-THE-JOB ADAPTABILITY!**



Above: a Jackson Multiple (6 units) on 7 mile sub-grade. Below: 2 units equipped with operating handle, self-propelling and easily operated by one man.



Standard width of the Jackson Multiple is 13', 3"; working speeds: up to 60' per minute; reverse: up to 5 MPH. Working width can readily be altered on the job to exactly suit narrower requirements such as widening projects. As many of the 6 compacting units as desired can be subtracted from the workhead, quickly and easily. Furthermore, easily interchangeable bases from 12" to 26" are available and individual compacting units may be fitted with operating handles and used exactly like the standard, highly popular, self-propelling manually guided Jackson Compactor. As a consequence Jackson equipment can be used on a great deal of work other machines cannot reach. If you have any job requiring compaction of granular soil, it will pay you to know specifically what Jackson Vibratory equipment will do. See your Jackson distributor. Literature and name of nearest Distributor on request.

JACKSON
VIBRATORS, INC.
LUDINGTON, MICH.

to be designed specifically for highway trucks. For further information write **Allison, Division of General Motors Corp.**, Indianapolis 6, Ind.

Power steering attachment

A power assist steering development which can be completely installed in two hours is now available for all trucks with existing air supplies. Called Air-O-Steer, the unit does not affect existing air supply and requires only 10 bolts for complete installation. New installation kit comes from the factory complete and ready to install, includes installation instructions. There is no necessity for welding, burning, or any alterations on the truck. Complete information and descriptive literature can be obtained by writing to **Air Applicators, Inc.**, 1522 S. E. Union Avenue, Portland 14, Ore.

For tying masonry walls

A high strength non-rusting tie to connect cavity walls of either brick or masonry-block is described in a folder just released by **Copperweld Steel Co.**, Glassport, Pa. Coated with copper, the ties have a steel core for strength and a special drip loop to prevent moisture traveling along the tie to the inside wall. Sizes and specifications are included.

Direct-reading hour meter

A direct-reading meter has just been added to the Hobbs line of engine hour meters. Black figures show at a glance the total number of hours the engine has been operating, the red figure at the right indicates 10ths of hours. A rotating disk in the upper left segment of the face of the meter acts as an operating indicator, making one revolution a minute. This feature shows plainly that the meter is operating. The meter registers up to 10,000 hr., then returns to zero. It is available in 6-volt, 12-volt, 24-volt, 32-volt, 64-volt, and 110-volt models in three basic types. Complete information is available in catalog DC-580. **John W. Hobbs Corp.**, Springfield, Ill.

Nylon cord for transits

New 50-lb. test yellow nylon cord has been added as a standard accessory on all transits manufactured by **W. & L. E. Gurley**, Troy, N. Y. The cord adds to the visibility of the plumb bob string especially in conditions of poor lighting. A small metal cord adjuster is also being distributed which enables the instrument men to make quick changes in line length while on the job in the field. The cord and adjuster with instructions for their proper use are available for 25¢ in stamps or coin.



they both have a problem of 'skin protection'

Certainly you'll agree that a woman's sensitive skin needs protection. But did you, as a construction man, ever stop to think how important this matter of skin protection is for your scaffolding?

For instance, if your scaffold is rusted (which is normal unless you spend many costly dollars for maintenance) you'll have a tougher time assembling and dismantling it because of the rough pitted surfaces caused by rust. What's more, rusted scaffolding has shorter life . . . because rust means deterioration.

If, then, your rusted scaffold erects slower and has shorter work life, isn't it costing you profits?

The answer lies in the new UNIVERSAL EZEBILT SCAFFOLDING with its *galvanized* protective coating. Now every single part of this quality scaffolding is covered with a lastingly-smooth, lubricative surface of galvanizing - it resists rust, erects faster, lasts longer, and looks better on the job. *At no extra cost*, Universal galvanized answers the most urgent need in the scaffold industry since the no-loose-parts feature of Gravity-Lock. Insist that your scaffold be galvanized - Universal galvanized.

UNIVERSAL ^{*the only*} **GALVANIZED SCAFFOLD**

UNIVERSAL MANUFACTURING CORP. • ZELIENOPLE, PA.

Send for catalog describing the panel types and sizes for all construction, mason, or maintenance applications.

Local Distributors everywhere with Rental or Sale Stocks of Universal galvanized scaffolding and American-Tubular elevating towers

When steel frames can be simplified . . .

Have more useable space . . . better appearance . . .

Yet erected for less cost . .

WHY
shouldn't you design for welding

Ask
THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

*Pioneer in welded structural design
...for lower cost*

News of DISTRIBUTORS

A. H. Cox revamps sales dept.

Ed Hill, traveling serviceman with A. H. Cox & Co., Seattle, Wash., for over eight years, has been promoted to the sales department, selling Allis-Chalmers tractors, graders, and scrapers, also the Thew-Lorain line of cranes and shovels and Moto-Log-Loaders in Lewis County. Also announced is the addition of a new salesman to the King County district: William Gross, who will train under "Chuck" Russell. Promoted to manager of the crane and shovel department is Scott Jamison, who will work out of the Seattle office and will aid and direct those salesmen in the outlying territories.

Equipment house has new owners

Industrial Tractor Sales has taken over the equipment sales franchises formerly held by Moore Equipment Co., Inc., in the territories of Sacramento and Stockton, Calif. Charles H. Seaich, general manager; George Krejci, sales manager, and Forrest Graves, parts and service manager, all former Moore employees, are the new owners. Both the Sacramento and Stockton areas will be served from the store located at 903 Del Paso Blvd., North Sacramento, but resident salesmen and servicemen will operate out of Stockton as a convenience to customers. The original Moore personnel have largely been retained, with W. L. "Bill" Crowe continuing as sales representative in Stockton, and Ed Corriera heading the parts department at Sacramento headquarters.

H. W. Moore personnel changes

Gerald Moore has been made advertising manager for H. W. Moore Equipment Co. He has had experience in all branches of the business.



Moore



Sappington

having worked part time during school vacations over a period of ten years, and since 1954 steadily in the service department. Onslow Sappington replaces John Mains as new power unit salesman. Mains is now general manager.

New building for Seattle firm

When the Seattle firm of Andrews Machinery Co. moves to its new shops, offices, and showroom across the street at 3633 East Marginal Way, it will have nearly 20,000 sq. ft. of under-cover storage, and over 3,000 sq. ft. of showroom, all pre-stressed, precast concrete construction. A prime distributorship which the company recently acquired for the Western states is the "Delmag" self-contained diesel pile hammer, a

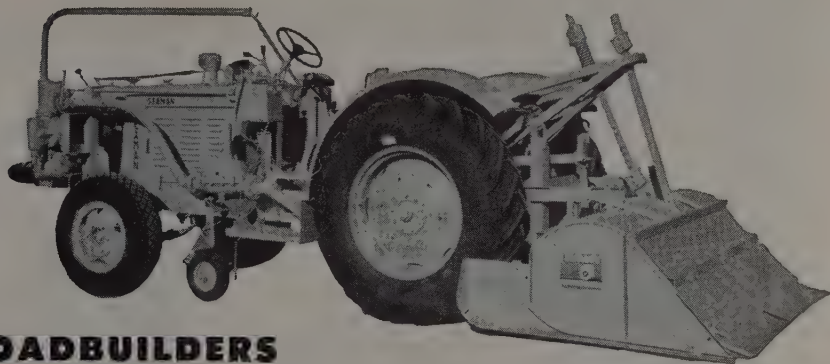


INTERNATIONAL HARVESTER Model RF-230 with Heil 30-ton telescopic hoist before leaving Seattle for Seward, Alaska, en route to Suntrana. Sold by The Carrington Company, Seattle-Alaska distributing firm, this IH dump-truck will be used to haul coal to Fairbanks.



SEAMAN TRAV-L-PLANT

Today's most versatile roadbuilding machine. Equipped with pump, tachometer assemblies, volumetric meter, spray bar to apply bitumen or water with mixing-in-place operations. Also available with new UNDERBODY SCARIFIER, for extra versatility in light scarifying.



HOW ROADBUILDERS BEAT THE CLOCK...

22-Foot Bituminous Road Base Completed at Mile-A-Day Rate with New Seaman-Andwall **TRAV-L-PLANT**



Above — Seaman Self-Propelled TRAV-L-PLANT in bituminous parkway construction, Jacksonville, Fla. Binder is pumped from transport ahead of the Seaman.

Contractors today are building better, more durable bituminous roads at lower cost, with greater strength, higher densities — at a mile-a-day production rate. Principle reason for this speed-up is new versatility built into the Seaman TRAV-L-PLANT.

The new TRAV-L-PLANT is a double-duty and often triple-duty machine that performs "in-place" mixing and binder application, together with light scarification, in one time-saving simultaneous operation — on new roads and reconstruction. Self-propelled, the TRAV-L-PLANT pumps binder into the mix from a transport truck operating at the side or ahead. Full tachometer assemblies and volumetric meter provide precision application through a spray bar positioned in the mixing chamber. There is no time delay between base stabilization and binder application and mixing; bitumen has no time to cool, and run-off or migration is prevented.

The TRAV-L-PLANT leaves the surface partially compacted, ready for final rolling with the Seaman-Andwall Pneumatic Compactor, to final density.

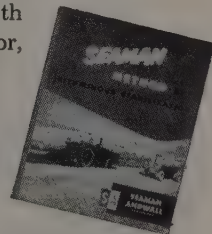
S-A Stā-Bilt
Equipment

- PULVI-MIXERS
- TRAV-L-PLANTS
- MATERIALS, CEMENT SPREADERS
- PNEUMATIC ROLLERS
- STEEL WHEEL ROLLERS
- ROCK-BUSTERS



Get the facts!

Write for bulletin TPS-B-34 "SEAMAN METHOD OF BITUMINOUS STABILIZATION"



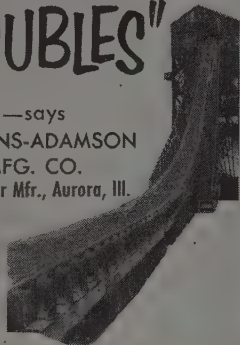
Stabilizing the world

**SEAMAN-ANDWALL
CORPORATION**

285 North 25th Street, Milwaukee 1, Wisconsin

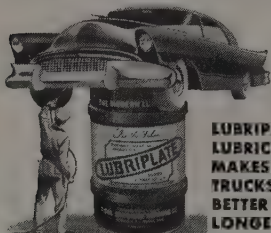
"NO MORE LUBRICATION TROUBLES"

—says
STEPHENS-ADAMSON
MFG. CO.
Conveyor Mfr., Aurora, Ill.



"LUBRIPLATE Lubricants satisfy the 'one-shot' requirements of our conveyor idlers. LUBRIPLATE effectively lubricates each bearing in turn and flows through the hollow shaft to the next bearing. We do not know of a single case of bearing trouble through faulty lubrication where LUBRIPLATE has been used."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE



LUBRIPLATE LUBRICATION MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H. D. S. MOTOR OIL . . . needs no additives

LUBRIPLATE DIVISION, Fiske Brothers Refining Co.
Newark 8, N. J. or Toledo 5, Ohio

DISTRIBUTED BY

Bart-Sayer Co., El Centro, Calif.
Garlinghouse Brothers, Los Angeles, Calif.
Degen-Flege Co., Los Angeles, Calif.
Hudson Equipment Co., San Diego, Calif.
Miller & Stern Supply Co., San Francisco, Calif.
Hendrie & Belthoff Co., Denver, Colo.
Sawtooth Company, Boise, Ida.
Paul Roberts Co., Pocatello, Idaho
Industrial Lubrication Supply Co., Eugene, Ore.
Moty & Van Dyke, Inc., Klamath Falls, Ore.
Goodyear Rubber & Asbestos Co., Portland, Ore.
Industrial Supply Co., Billings, Mont.
Utah Bit & Steel Service Co., Midvale, Utah
Western Sales Engineering Co., Salt Lake City, Utah
Campbell Industrial Supply Co., Seattle, Wash.
Nott-Atwater Company, Spokane, Wash.
Campbell Industrial Supply Co., Tacoma, Wash.
Dodge-Yakima Supply Co., Yakima, Wash.
Fleck Brothers, Ltd., Vancouver, B. C., Canada
Wilkinson & McClean, Ltd., Calgary, Alberta, Can.

LUBRIPLATE
THE MODERN LUBRICANT

tool that eliminates the use of steam or air as a power source, and is made in three sizes which develop 9,100-, 22,500-, and 39,700-ft. lb. blow respectively, and is very light in weight.

Shasta Truck buys Moore branch

Shasta Truck & Equipment Sales has completed acquisition of the Moore Equipment Co., Inc., branch store at Redding, Calif. The new firm will be headed by David J. Craft as president and general manager. Craft served as manager of the former Moore store. Associated with him in



David J.
Craft

the new organization is William L. Junkans and Stuart Fuller, both well known in the construction equipment business.

Many of the lines formerly handled by Moore will continue to be sold by Shasta. These consist of Allis-Chalmers tractors, graders, scrapers, and engines; Tractomotive loaders and rippers; Unit cranes and shovels; Gorman-Rupp pumps; GMC diesel and gas trucks; Ingersoll-Rand compressors and air tools; Hendrix dragline buckets; Buckeye ditchers and Shield Bantam shovels. For the present, Shasta Truck & Equipment Sales is using the same facilities as formerly occupied by Moore but expect to take over larger quarters within a few months.

Glenn Carrington sells out

Announcement of the sale of Glenn Carrington & Co., to a group of employees and business associates was recently announced by Glenn Carrington, founder of the 41-year-old firm. The new organization, The Carrington Company, is headed by Arthur F. Erickson as president. Erickson has been associated with Car-

ington since 1930. G. A. Gustafson is vice president and manager of the branch at Fairbanks, Alaska; and Bert Anderson is vice president and manager of the building materials activities at the company headquarters in Seattle, Wash. Glenn Carrington & Co. will continue as a separate holding corporation for other Carrington enterprises.

Taper-Tye stocked by W. J. Burke

H. J. Krueper Co., Los Angeles, manufacturer of Taper-Tye concrete form clamps, announces the appointment of W. J. Burke & Co. as exclusive stocking distributor in California, Oregon, Washington, and New Mexico.

Throssell succeeds McBride

Rowland Throssell recently joined Wymont Tractor & Equipment Co., Billings, Mont., as advertising and sales promotion manager, a position formerly held by Murray McBride, who is now general sales manager for Eaton Metal Products, Denver, Colo. Throssell brings to his new post considerable and varied experience in the advertising field.

Los Angeles distributor expands

Tractor - Equipment Distributors, Inc., Los Angeles, announces the appointment of George Grumfield as manager of the industrial engine division, and Bill Thomas as his assistant. The company was recently named distributor for Ford engines and power units. Three additional offices and a large conference room have been added to the facilities. The company was recently named distributor for Ford engines and power units.

CORRECTION

An error crept into our January issue. It is on page 34-H of the 1956 Handbook where the name of International Manufacturing Co. appears at the head of the listing of IH products and distributors. The correct name and address should be *International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.*



GARVEY TRUCK SERVICE, Inc., Stockton, Calif., distributor for White Trucks, recently transferred operations into this new ultra-modern building. The new plant, located on a 25-ac. site at the corner of Freeway 99 and Cherokee Road, covers more than 25,000 sq. ft. of floor area. W. Lillie, Garvey's president, is in charge of White sales and service. "Lillie's knowledge of trucking problems qualifies him to serve the needs of an extensive area with dispatch and economy," is what Wilson D. Patterson, White's regional manager, said in making the announcement.

How to Slash Costs of Gravel Loading and Screening

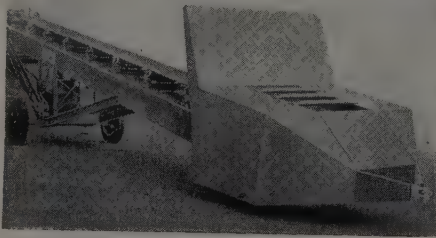
KOLMAN 'JUNIOR' PORTABLE CONVEYOR



Loading sand and gravel is easy for the City of Yankton, S. D., with their new Model 202 Kolman Junior portable conveyor-screen plant.



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 disassembly.

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 highway departments, contractors and gravel plant operators, that the KOLMAN 'Junior' portable conveyor-screen plant is the ideal solution.

Shown above is the outfit they purchased, a 40' conveyor with a 24" belt, equipped with a KOLMAN SB-60 Vibrating Screen, 6' x 36".

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 formed into a channel 16" deep 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.

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

BERKELEY—West Coast Engine & Equip., Co., 1077 East Shore Hwy.
EUREKA—E. W. Pierce Company, 4th and Broadway
MARYSVILLE—Valley Truck & Tractor Co., 100 "D" Street
SACRAMENTO—Sacramento Valley Tractor Co., Broadway and 19th Sts.
SANTA ROSA—Empire Farm Equipment Co., 1470 Santa Rosa Ave.

IDAHO

BOISE—The Sawtooth Company, 1115 Grove St.

NEVADA

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

OREGON

PORTLAND—Western Equipment Co., 2244 N.W. Savier St.
EUGENE—Western Equipment Co., 1360 West First Ave.

UTAH

SALT LAKE—Rasmussen Equip. & Supply, 1960 S. Second, West

WASHINGTON

SEATTLE—Andrews Machinery of Wash., 3640 E. Marginal Way
SPOKANE—Andrews Machinery Service, 126 South Walnut St.

Western Representative

S. A. MADRID
1739 32nd Ave., San Francisco 22

SEND for FREE literature

KOLMAN Manufacturing Co.

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

Please send free literature on—

- ☐ Model 202 Junior Conveyor
- ☐ Model 101 Heavy Duty Conveyor
- ☐ Screens ☐ Feeders
- ☐ Traps

Quote.....size orcapacity

Name

Address

City

versatile

efficient

economical

The Gates systems take care of any job, large or small, and do them at savings in time, labor and other costs!

A case in point is the construction of the Mayflower Congregational Church in Englewood, Colorado.

Here, the Gates forming system uses rod-type ties to do an efficient and economical job of a good-sized project. General Contractor George H. Allen is very pleased with the results.

You can handle all types of construction with Gates systems. Their use assures top quality construction, plus on-the-job savings in time and labor!



WC 3-56

Contact your nearest
Gates Dealer or
write direct

GATES & SONS, INC.

80 South Galapago — Denver 23, Colorado

"The Head Pulley with Motor Inside." Safe, compact, simple—no chains, no belts, no sprockets, no exposed motors.

Built by Yuba for sale in Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington.

Built and sold in other states by Iowa Mfg. Co., Cedar Rapids, Iowa.



**IF YOU USE BELT CONVEYORS OR BUCKET ELEVATORS
SAVE SPACE, CUT DOWNTIME
with YUBA-SCHROCK HEAD PULLEY**

All moving parts fit compactly inside pulley shell, protected against weather and dirt, thus practically eliminating pulley troubles. This pulley with motor inside requires no more

room than an idler pulley; can be installed quickly. Diameters 10½" to 56". ⅓ to 125 hp. for voltages to 2300. Job proved. Write TODAY for folder and name of nearest distributor.



YUBA MANUFACTURING CO.

82

Pulley and Sprocket Dept.

PHONE 628

BENICIA, CALIFORNIA

Thomas Darcey joins welding firm

Thomas R. Darcey recently joined the sales staff of Welding Service Sales Co., San Francisco. Except for his military service with the Corps of Engineers, he has been in the compressed gas industry for the past 20 years. He will specialize in welding product sales in the Bay area.

News from Braman-Dickerson

Wayne C. Bailey, general manager of Braman-Dickerson Co., Riverside, Calif., was recently named president of the company. Al C. Berdin was chosen general manager-secretary and Art Hazlewood placed in charge of industrial sales in Riverside County. Braman-Dickerson recently added the Ingersoll-Rand compressors to its several lines.

F.A.B. sells to Bechtel

V. A. Stout, vice president and sales manager of F.A.B. Manufacturing Co., Oakland, Calif., reports the sale of 12 additional FABCO front wheel drives to the Bechtel Corporation for its pipeline-laying contract on Trans-Canada Pipeline. This is after use of 15 last year on another Bechtel job.

Western Equipment has new line

Western Equipment Co., Boise, Idaho, was recently appointed distributor for Chicago-Pneumatic Tool Co. in Idaho, eastern Oregon, and Teton County, Wyo.

Portland firm takes on new line

Contractors Equipment Corp., Portland, Ore., has added to its lines the American Hoist & Derrick Co.

Name change

The name of Hudson Equipment Co., San Diego, Calif., was recently changed to Kenton Equipment Co. William Kenton, owner of the company, says there is no other change either in management or personnel. The company reports the addition of Ferguson tractors and Briggs-Stratton engines to its equipment lines.

MANUFACTURERS

Executive changes at B-L-H

As of Jan. 1, the Baldwin-Lima-Hamilton Corp. dissolved four wholly-owned subsidiaries heretofore operating as independent companies. Now integrated more closely into the nationwide organization as divisional units are: Austin-Western Co., Aurora, Ill.; Hydropress, Inc., New York City; Pelton Water Wheel Co., San Francisco, and O. S. Peters Co., Washington, D. C. Simultaneously with the above announcement, McClure Kelley, president, disclosed the following executive appointments. Ralph K. Stiles, president of the

former Austin-Western Co., who has retired, is succeeded by Charles M. Lippincott as head of the new operation B-L-H Austin-Western Works. William F. Boyle of San Francisco has been elected West Coast vice president of B-L-H and general manager of the Pelton Division, as well as serving as vice president of the Madsen Works, a B-L-H operation in Los Angeles. C. G. Crawford, formerly sales manager of the Pelton Division in San Francisco, has been made sales manager of B-L-H's entire line of hydraulic turbines and related equipment, making his headquarters in Philadelphia, Pa.

Sonneborn moves to larger site

L. Sonneborn Sons, Inc., Building Products Division, announces the opening of new offices, warehouse, and plant at 4821 South Vermont Ave., Los Angeles 37, Calif.

Portland executive appointments

Three executive appointments are announced at Mixermobile Manufacturers, Portland, Ore., in a program of company reorganization, according to word from G. H. "Gus" Wagner, president. V. C. "Boots" Dirksen has been placed in the position of sales manager; Glen Ede has been named sales promotion manager, and Joe M. Larson is the new controller. Ede and Larson are new with Mixermobile. Dirksen has been with Mixermobile since its first day in business, the past seven years as mid-western representative. The Oregon construction machinery manufacturer is well known for its Mixermobile, Scoopmobile, and Towermobile machines.

Don Anderson becomes sales mgr.

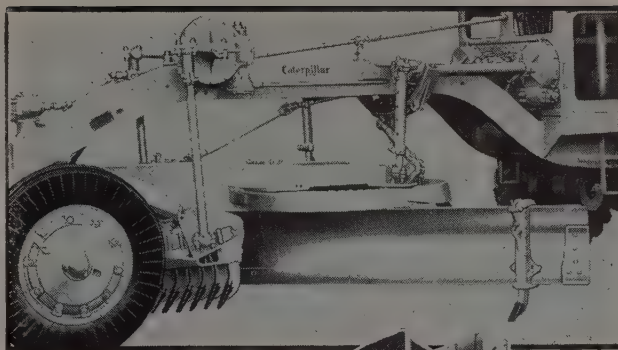
J. D. ("Don") Anderson as of Jan. 1 became general sales manager of the Jaeger Machine Co., Columbus, Ohio, succeeding J. H. Yearling, who assumed the new position of director of market promotion. Yearling has been associated with Jaeger for 28 years, serving as sales manager since 1949. Anderson has been 21 years with the company and was a divisional sales manager prior to becoming general sales manager.

Onan names zone manager

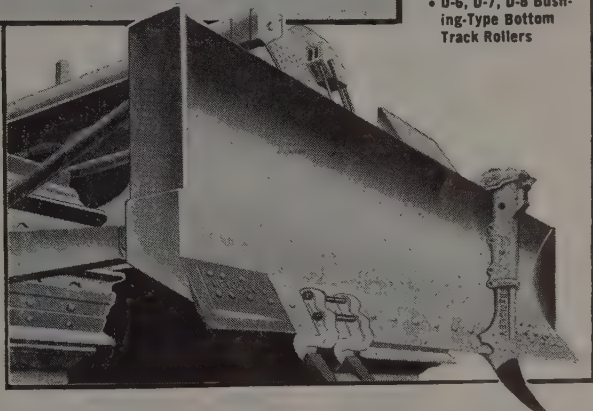
William Haynes has been appointed sales zone manager for Onan Products, covering Oregon, Washington, western Idaho, and Alaska, as well as the provinces of British Columbia and Alberta, Canada. His headquarters will be in Portland, Ore., but he will travel extensively in his zone, working closely with Onan distributors and dealers in the field.

New Pacific N. W. district mgr.

William P. McConnell has been named Pacific Northwest district manager for Smith Engineering Works, Milwaukee, Wis., manufac-



- D-4 D-6, D-7, D-8, HD-9, HD-15, HD-19, HD-20, TD-14, TD-18, TD-24, Bearing-Type Bottom Track Rollers
- D-7, D-8, HD-19 HD-20, TD-24 Heavy-Duty Grouser Shoes
- D-7, D-8, Heavy-duty Rock Guards
- D-8 Sprocket Rims
- Bucket and Shovel Teeth
- Many Other Replacement Parts



- Dozer Rippers
- Dozer Brush Rakes
- Scraper Rippers
- Cutting Edges
- Rock End Bits (Shasta)
- Scarifier Shanks and Teeth
- Hitch Blocks
- Cable Cutters
- D-6, D-7, D-8 Bushing-Type Bottom Track Rollers

When the going is tough . . . SEE YOUR NEAREST HENSLEY DEALER

ARIZONA:

Complete Industrial Supply Co., Phoenix,
Tucson, Mesa, Chandler, Casa Grande,
Coolidge, Douglas, Nogales

CALIFORNIA:

Factory: 800 Peralta Avenue, San Leandro
Chico Auto Parts, Chico
Contractors' Equipment & Supply Co., Fresno
Crock Co., Bakersfield
Emerson-Braden, Colusa
Farmers Hardware & Equipment,
San Luis Obispo
Holz Co., Ukiah
Hust Bros., Marysville
Lowry Equipment Co., Redding
McGaraghan Supply Co., Eureka
Oroville Auto Parts, Oroville
Stockton Iron Works, Stockton
Western Equipment & Supply Co.,
Sacramento
Westside Tractor & Equipment, Willows

COLORADO:

S & M Supply Co., Grand Junction
Joe Smith Machinery, Denver

IDAHO:

Engineering Sales Service, Boise

IOWA:

Iowa Explosives & Supply Co., Des Moines

KANSAS:

Wenzel Mch. Rental & Sales, Kansas City

MICHIGAN:

Bark River Culvert & Equipment, Bark River,
Ironwood

MINNESOTA:

Stevenson's, St. Cloud

MISSOURI:

Cooke Sales & Service, Chillicothe

MONTANA:

Westate Machinery, Billings

NEVADA:

Elko Blacksmith Shop, Elko
Pioneer Equipment Co., Reno

NEW MEXICO:

Lively Equipment Co., Albuquerque

OKLAHOMA:

R. A. Young & Sons, Tulsa

OREGON:

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

TEXAS:

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

UTAH:

Holland Equipment Co., Salt Lake City

WASHINGTON:

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

WISCONSIN:

Bark River Culvert & Equipment, Milwaukee,
Madison, Eau Claire, Green Bay

WYOMING:

Keremi Tractor & Equip. Co., Cheyenne and
Casper

ALASKA:

Western Tractor & Equipment Co.,
Anchorage and Fairbanks

CANADA:

Alberta Tractor Parts, Edmonton, Alberta
Columbia Equipment Ltd., Vancouver, B. C.



EQUIPMENT COMPANY, INC. — MANUFACTURERS
800 PERALTA AVENUE • SAN LEANDRO, CALIF.



EAGLE MOBILE CRUSHING PLANT DELIVERS 100-125 YDS. PER HOUR

Compare that output with ANY portable plant of comparable size and cost! Key unit is 18 x 36 roller bearing Eagle Jaw Crusher. It and the several other motors (more individual control of unit) are powered by a motor generator set or power line. Plan on one of these units to increase your profits in 1956!

Get more information and engineering help through nearest distributor:

- J. D. Coggins Co.
P. O. Box 467
Albuquerque, New Mexico
- Hatten Machinery Company
3433 Fourth Avenue South
Seattle 4, Washington
- Contractors Equipment Company
2727 N. E. Union Street
Portland, Oregon
- LeRoi-Rix Mch. Co.
6403 E. Slauson Ave.
Los Angeles 22, Calif.
- Diesel Construction Equipment Co., Inc.
5050 Market Street
San Diego 2, California
- Williamson Inc.
P. O. Box 2076
Salt Lake City, Utah
- Work Hoist & Body Corp.
2817 Seventh Street
Berkeley 10, California



EAGLE

JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS

CRUSHER CO., Inc. GALION OHIO-U.S.A

McKIERNAN-TERRY SINGLE-ACTING PILE HAMMERS

- The most modern design of single-acting pile hammer on the market, based on more than half a century of specialized experience
- Specially designed for driving into very dense substances such as clay, hard pan, compacted gravel, etc. and for driving heavy mass piles
- Built in a range of 5 sizes.
- All parts completely enclosed for protection against grit, dirt and damage, and for safety
- The only single-acting pile hammers that can perform underwater work
- Many exclusive features for most effective blows, convenient operation and maintenance, and long wear. Write for Catalog

McKIERNAN-TERRY CORPORATION

Manufacturing Engineers

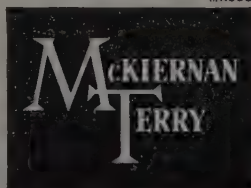
24 MERCER ST., DOVER, NEW JERSEY

Plants at Dover, N. J. and Harrison, N. J.

- Also builders of coal and ore bridges, bulk material unloaders and specially designed machinery.



MK933



turer of "Telsmith" crushers and other construction equipment. Making his headquarters at 1631 N. W. Thurman St., Portland, Ore., McConnell's territory includes Oregon, Washington, and Idaho, and British Columbia and Alberta provinces in Canada.

Wicker heads Federal truck sales

Robert L. Wicker, for the past three years general sales manager for Dart Truck Co. of Kansas City, has been appointed sales manager for the Federal Motor Truck Division of Napco Industries, Inc. In his new position he will concentrate on sales of crane carriers, four-by-fours, six-by-sixes, transit mixer carriers, and other such transport machinery. At one time Wicker was sales promotion manager with the Columbia Steel Division of U. S. Steel in San Francisco, later was sales manager for Bevis Machinery Co., Los Angeles. Just prior to joining Dart Truck, Wicker had his own firm, Wicker-Wood Equipment Co., selling construction equipment throughout the West.

A-C personnel changes

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., announces that Willis G. Scholl, a Tractor Group vice president, has been elected executive vice president of the company, and Boyd S. Oberlink was elected vice president in charge



Scholl



Oberlink

of the Tractor Group, succeeding Scholl. E. J. Mercer was appointed general manager, Construction Machinery Division. Scholl started with A-C in 1936 as a salesman, and Oberlink started in the Tractor Division in 1934. Mercer has been with the company since 1937. His most recent position has been in England where he was managing director of all A-C operations in Great Britain.

Gar Wood-St. Paul combine

Consolidation of two of the country's oldest names in truck equipment, Gar Wood and St. Paul Hydraulic Hoist, is announced by Edward F. Fisher, president of Gar Wood Industries, Inc., Wayne, Mich. This combination of trade-marks has been planned for some time. Its consummation allows the standardization of the truck equipment lines which will now be manufactured at

two separate plants, in Wayne, Mich., and in Richmond, Calif., and also creates a stronger dealer organization offering a more complete line of truck equipment.

Wilker retires from B & B

Henry W. Wilker recently announced his retirement from Broderick & Bascom Rope Co., St. Louis, Mo., after 65 years with the company. As a lad of 14, he started with B&B in 1890, progressing through various

Henry W.
Wilker



jobs to become a sales representative in 1902. When B&B set up sales offices and a manufacturing plant on the West Coast, Wilker was transferred as Pacific Coast manager, and for many years supervised all sales personnel and had charge of the Seattle factory. Up until his retirement, Wilker continued to actively contact the trade in the states of Washington, Idaho, and Montana.

New regional sales manager

M-B Corporation, New Holstein, Wis., manufacturer of M-B packer bodies and other municipal and highway equipment, announces the appointment of Don Farmer as Western regional sales manager. With headquarters in San Mateo, Calif.,



Don
Farmer

Farmer will service all Western states, as well as the Canadian provinces of Vancouver and Alberta. He comes to M-B from Ford Motor Co., where he was Southwest regional sales representative of its tractor and implement division. Previously he was with Allis-Chalmers Mfg. Co., Tractor Division, as a division sales manager.

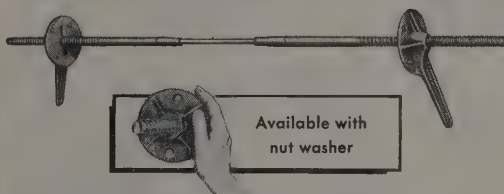
Blaw-Knox advances two

W. Cordes Snyder, Jr., president of Blaw-Knox Co., Pittsburgh, Pa., recently announced the retirement of N. B. Ornitz, vice president, and the advancement of William E. Parfitt

UNIVERSAL FORM TIES

a
*Complete Line
From 1 Source*

SPIROLOC Form Ties



**Faster Erection . . .
Positive Holding . . .
Easier Stripping**

- Greater tie strength for heavy construction
- Fewer ties per sq. ft. of form area. **LOWER MATERIAL and LABOR COSTS**
- Positive breakbacks
- Permanent, re-useable equipment
- **RENTED . . . SOLD**

Available with nut washer

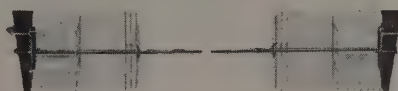
Available with cone nut



The most positive internal spreader and form tie

Positive Spreader Ties for all types of Concrete Construction

TWISTYES



SNAP TIES



Combination wedge and bearing plate . . . easy application . . . won't twist or fall off — ample take-up.



- Low cost ties for job-built or prefabricated forms
- Used with or without walers
- Accurate breakbacks . . . minimum plug required
- Choice of Spreader Washer . . . 7/8" flat is standard
- Rugged Twistye and Snap Tie Clamps have extra bearing surface . . . additional safety factor



Curved ends speed installation and stripping . . . long slope wedge for ample take-up. Extra nail holes permit nailing clamp in any position.

FORM CLAMPS

The Most Versatile Tie . . . At the Lowest Cost



"Sure-Grip" principle means positive locking
SAFE . . . SURE Tying

- 2 Form clamps and a mild steel rod make a tie to handle any condition
- Wide clamp base gives more bearing on waler . . . won't "bite" at maximum loads
- Notched base permits nailing to waler

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UNIVERSAL FORM CLAMP CO. . . .
UNIVERSAL FORM CLAMP CO. . . .
UNIVERSAL EQUIP. CO.
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. . . San Leandro, Calif.
. . . Los Angeles, Calif.
. . . Seattle 2, Wash.
. . . Portland 12, Oregon

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You'll save time, speed-up pile driving operations and better your job schedules when you Rent Your Piling from L. B. Foster Company.



Foster Rental Piling forms cofferdams used in construction of the piers for the
MULLICA RIVER BRIDGE
Garden State Parkway

FOSTER RENTAL PILING

Contractors everywhere save on all their piling needs with prompt, exacting service from L. B. Foster Co., Foster's Rental Plan provides a low, fixed expense—gives you an extra advantage in competitive bidding.

STEEL-SHEET PILING • H-BEARING PILE
H-S LIGHT WEIGHT PILING • PIPE PILES



WRITE FOR
CATALOGS

RAILS • TRACK EQUIPMENT • PIPE • FABRICATION

L.B. FOSTER co.

3460 Wilshire Blvd.

Los Angeles 5, Calif.

and M. N. Ornitz to divisional managers. N. B. Ornitz joined the company in 1929 when Blaw-Knox acquired what is now the National Alloy Division. Parfitt joined the company in 1937 as a construction superintendent and since 1950 has been sales manager of the power piping and sprinkler division. M. N. Ornitz has been with Blaw-Knox since 1942. In 1949 he became assistant superintendent of the National Alloy Division and has been works manager since 1951.

Snow plow companies unite

In joint announcement by William Gledhill, president of Gledhill Road Machinery Co., Galion, Ohio, and Glen L. Seydel, president of Davenport Beesler, Davenport, Iowa, it is revealed that Gledhill has purchased the snow plow business of Davenport Beesler. The latter company has specialized in the manufacture of very heavy-duty "V" plows and Gledhill has pioneered in the "speed" type. In acquiring the Davenport Beesler line Gledhill claims to have the most



NEW DISTRICT SALES offices and warehouse of Macwhyte Company located at 188 King St., San Francisco. These modern facilities include 12,000 sq. ft. of space for sales and service to the Northern California and Nevada area. A complete line of Macwhyte products, including wire rope, wire rope fittings, aircraft cables, slings, stainless steel, and monel-metal rope. The firm has branches also in Seattle, Portland, and Los Angeles.



ASSEMBLED HERE is over \$400,000 worth of earthmoving equipment. The occasion was a distributor showing conducted by Wooldridge Manufacturing Division in Sunnyvale, Calif. Distributors got a chance to examine all the new models in a line of scrapers which ranges from 10.5- to 41-cu. yd. heaped capacity. In the left foreground is the Cobrahaul, a rear-dump hauler interchangeable with Cobra and Cobra Quad tractors.



BACKING UP A slippery 30% grade with a fully loaded truck mixer doesn't happen every day. But this was necessary to deliver concrete to contractor Norman Fredericksen's project near San Rafael, Calif. McPhail's Ready-mix used a new 50-50 model Oshkosh truck—Rex mixer combination to do the job.

complete line of its kind in the world. Gledhill simultaneously announced the appointment of a new sales manager, Floyd Evens, who has served the company in many capacities for several years.

Lou Dierks retires

Louis E. Dierks recently retired from active duty with Sauerman Bros., Inc., after 42 years with the company. He was a vice president and member of the Board of Directors of this Chicago construction equipment manufacturer, a life member of the American Society of Civil Engineers, and the Chicago Engineers Club.

Chandler heads Koehring service

Appointment of K. R. Chandler as service manager for the Koehring Company, Milwaukee, Wis., is announced by John S. Conway, vice president in charge of sales. In his new post, Chandler succeeds G. N. Nelson who retired after 44 years of service. In 1952 Chandler served as Koehring's West Coast district manager.

Managerial realignment

The Oliver Corporation, Chicago, manufacturer of crawler and wheel tractor and allied equipment, has realigned certain management functions with the view of achieving greater sales coordination, according



Schramm Pneumatractor, self-propelled right to the job, is a complete air-compressing plant for auxiliary equipment. Here it is shown with DeLuxe Pneumafed mounted for test drilling.

A CONSTRUCTION SUPERINTENDENT DISCOVERS:

The most convenient, lowest-cost way to bring compressed air to the job.

Putting compressed air to work on the job has never been easier or more economical. The operator merely climbs into the seat of his Schramm Standard Pneumatractor and drives a complete air compressing plant right up to the job. No other equipment or labor is involved.

On arrival, this rugged 125 c.f.m. air compressor with tractor features can push, pull, provide mechanical power and compressed air for operating a variety of auxiliary equipment.

The cost of the Standard Pneumatractor is low; less than many two wheel mounted compressors alone. It's cheaper to operate and maintain, too. Any engine service man can service the Pneumatractor with very little instruction.

Ask your local Schramm dealer for a demonstration of the Standard Pneumatractor. He's listed in the Yellow Pages of your Telephone Directory.

Write for Catalog 5545 and free informative booklet, "Piston vs Rotary Air Compressors."

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS
625 North Garfield Ave. West Chester, Pa.



Equipped with a Rotary Sweeper, the Standard Pneumatractor is ideal for sweeping leaves, dust, snow or light dirt. Rotation of brush is independent of speed of Pneumatractor.



Pneumajack, mounted on a Standard Pneumatractor, does a variety of jobs from drilling for mud jacking to production drilling.

SAVE MONEY

when pouring concrete

RENT ECONOMY STEEL FORMS

•

Easily and quickly assembled

•

Complete supervisory service

•

Adaptable to wide use

•

Save time and material

•

Other forms available on a purchase basis

Write for catalog to

ECONOMY FORMS CORP.

HOME OFFICE • DES MOINES, IOWA

DISTRICT SALES OFFICES: St. Louis, Mo. • Kansas City, Mo. • Lincoln, Neb. • Minneapolis, Minn. • Ft. Wayne, Ind. • Milwaukee, Wisc. • Cincinnati, Ohio • Cleveland, Ohio • Metuchen, N. J. • Rochester, N. Y. • Springfield, Mass. • Washington, D. C. • Decatur, Ga. • Dallas, Texas • Los Angeles, Calif. • Oakland, Calif. • Denver, Colo.

Mall
CONSTRUCTION TOOLS

Mall

YOUR COPY FREE ASK FOR IT

● Here's a catalog with money-saving tool ideas—the NEW MALL Construction Tool Catalog.

It contains hundreds of on-the-job ideas, new tool uses and applications that can save you both time and money. You will also see one of the most complete portable power tool lines manufactured.

Whenever the need for high quality, time saving construction tools arise, select MALL. Get your new MALL Construction Tool Catalog now—it's FREE and it's Valuable.

**MALL TOOL CO. PORTABLE POWER TOOLS
GASOLINE • ELECTRIC • AIR**
7706 S. Chicago Ave., Chicago 19, Illinois
Please send me the new MALL Construction Tool Catalog.

Name _____
Company _____
Address _____

CU-206

to announcement by A. King McCord, president. C. L. Hecker, first vice president, who has been in charge of manufacturing activities, becomes general sales manager in charge of sales and service functions of U. S. and Canadian equipment branches, as well as of several company divisions. L. P. Richie, vice president, is placed in charge of directing the company's manufacturing activities in its Midwestern and Eastern plants.

Copco appoints two

Establishment of a specialized compressor sales division to service the construction industry of the West, and the appointment of Lincoln M. Knight to head the new section, is announced by Copco Pacific,



Knight



Spence

Ltd. Knight joined the Copco sales staff a year ago after previous broad experiences with a major West Coast firm. The appointment of David T. Spence as a sales engineer in the new division was simultaneously announced by Charles Burton, general manager.

Macwhythe officials visit the West

Officers and executives of Macwhythe Company recently visited the principal West Coast cities for the purpose of inspecting new and expanded facilities of the company in this Western region. Included in the group: George C. Wilder, president; Edwin C. Berg, vice president and comptroller; F. D. Holden, general manager of sales.

CYCLONE
PORTABLE • SANDBLASTER

Blast Clean any surface with any abrasive.

We manufacture a complete line of blast-cleaning equipment ranging from small hand tools to Blasting Cabinets, Rooms and dust collectors.

Capable of doing any blast cleaning job with any abrasive. Our latest Model DL-200 (Illustrated) is the convertible shop sand blaster and highway Traffic Line Remover.

This profit-making line now available to Distributors in both the Domestic and Export Fields. Write for particulars.

SAFETEE PRODUCTS COMPANY
173 14th Street San Francisco 3, Calif.

NEW! FLEXTRIP WATERSTOP

THE LATEST VINYL PLASTIC WATERSTOP

for "wall-floor" and "between-pour" horizontal concrete construction joints

Water just can't get through joints protected by FLEXTRIP, the all-new, strip-type waterstop. Unique concave shape plus ribbed edges give FLEXTRIP a never ending grip in the concrete . . . is flexible enough to withstand extreme joint-separation (more than 3 inches) yet rigid enough to stand up to the battering effect of pouring concrete. Here's lasting joint-protection unmatched by any other waterstop. What's more, FLEXTRIP will never rust, rot, check or crack and is unaffected by acid, alkalis, petroleum products, chemicals or the most adverse atmospheric conditions . . . lasts as long as the concrete. Write for additional information on FLEXTRIP and other vinyl waterstops.

.....

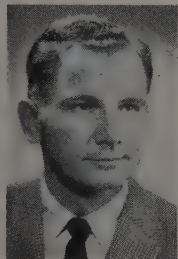
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300 S. Twelfth St.
Phoenix, Ariz.
W. J. BERK & CO.
2344 N.W. 21st St.
Portland 9, Ore.

Kiddy directs Davey divisions

Appointment of J. W. Kiddy as manager of the rotary drill and air tool divisions of Davey Compressor Co., Kent, Ohio, is announced by Vice President J. T. Myers. Kiddy has been associated with the company for the past six years, first as a district manager and later as assistant sales manager of the portable compressor division.

Kelty named Ramset manager

William R. Kelty, Jr., has been named to the newly created position of manager of the Ramset Fastening



William
R. Kelty, Jr.

System, Cleveland, Ohio. A part of Olin Mathieson Chemical Corp., Ramset manufactures powder-actuated fastening tools and fasteners.

Construction Machinery Co.

Construction Machinery Co. announces the sale of its interest in Construction Machinery Sales Co. Both companies are located in Waterloo, Iowa, and Construction Machinery Sales Co. has been an affiliate of the first named firm. The name of Construction Machinery Sales Co. is being changed to Engineered Equipment, Inc., and this company will operate under separate ownership and management. Headed by Warren Holden, Construction Machinery Co. will continue to manufacture and sell a broad line of contractors equipment under the trade-mark of "CMC."

New district office opened

K S M Products, Inc., Stud Welding Division, Merchantville, N. J., announces the opening of a new district office at 1615 Polk St., San Francisco. F. G. Kern has been assigned to this office and represents the company as district engineer in California. He also supervises stud welding distributors in Washington, Oregon, Nevada, Idaho, Utah, Colorado, Wyoming, and Montana.

Caterpillar transfers ad rep

Harold C. Fleming, Jr., has been named dealer advertising representative of the Northwest sales division of Caterpillar Tractor Co. He has been assigned to the company's new office in San Francisco, Calif., located at 120 Montgomery St. Fleming comes from the Peoria office where he had five years' experience in the advertising field.

GOODALL *Waterproof* CLOTHING • FOOTWEAR

*For Reliable,
Economical
Head-to-Toe
Protection*



SUITS—

Style 80 Jacket with Style 81 Overall makes the ideal shaft suit. Other jacket-and-overall suit combinations to meet every preference or job requirement.

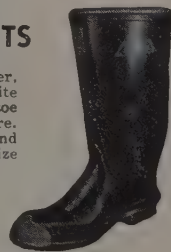
SAFETY HATS

"Hardboiled" Safety Hats in fibreglass or aluminum. Light weight and comfortable, yet providing greatest possible head protection. Exceed highest established requirements for strength, heat and moisture resistance, and dielectric tests.

"TOE-SAVER" (R) BOOTS

Smooth, tough, flexible black rubber, heavy duck lined. Cushion insole. White cap over reinforced steel safety toe tested to withstand 2,000 lbs. pressure. Tread soles. Hip, Storm King and Short. All with permanently marked size numbers.

The "Toe-Saver" feature is also available on a variety of work shoes, and on our "Contractors" Mucker Boot.



"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870



HOSE • BELTING • FOOTWEAR • CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches and Distributors Throughout the United States and in Canada

BRIDGE—Construction of bridge and approaches in New Mexico

New Mexico—Chaves County—State. A contract of \$129,435 was awarded to E. M. Silver for the building of Hagerman Bridges and approaches totaling 1.3 mi. Unit prices follow.

(1) E. M. Silver.....	\$129,435
(2) Armstrong & Armstrong.....	132,878
Henry Thygesen & Co.....	136,255
J. H. Ryan & Son, Inc.....	143,799

	(1)	(2)
Lump Sum		
5,225 cu. yd.	Removal of old structures.....	\$.....
80 cu. yd.	Excavation-unclassified.....	.30
30,442 cu. yd.	Excavation for pipe culverts.....	1.50
2,360 M. gal.	Selected Borrow.....	.30
250 hr.	Watering.....	1.50
225 hr.	Rolling (tamping roller).....	10.00
30 hr.	Rolling (pneumatic tired).....	4.50
114 hr.	Rolling (steel tired).....	8.00
68,934 sta. yd.	Mechanical tamping.....	5.00
50,115 1/4 mi. yd.	Station yard overhaul.....	.02
.7 mi.	Quarter mile yard haul.....	.07
13,350 lin. ft.	Obliterating old road.....	500.00
7 ea.	Galvanized barbed wire fence.....	.20
30 ea.	Gates-Texas type.....	10.00
12 ea.	Bracing.....	8.00
1 ea.	Right-of-way markers.....	6.00
48 ea.	Stand. Fed. aid project markers, type I.....	75.00
3,530 ton	Treated tmbr. warn. posts, refl. 6 in. diameter.....	6.00
3,060 ton	Controlled graduation sub-base.....	.95
175 bbl.	Base course.....	1.20
525 bbl.	Bituminous material, type MC-1.....	5.95
1,630 ton	Bituminous material, type MC-3 (road mix).....	5.95
1,272 mi.	Mineral aggregate (road mix).....	1.40
60 bbl.	Mixing bituminous mat. & aggregate.....	600.00
234 lin. ft.	Bituminous mat., type MC-3 (fog coat).....	6.25
178 lin. ft.	Pipe culverts—24 in. diameter.....	6.00
124 lin. ft.	Pipe culverts—30 in. diameter.....	7.30
1 ea.	Pipe culverts—48 in. diameter.....	13.75
54 cu. yd.	Concrete headgates.....	225.00
194.18 cu. yd.	Excavation for structures (bridges).....	5.00
160.96 cu. yd.	Class "A" conc. bridge superstructure.....	68.00
35,697 lb.	Class "A" conc. bridge substructure.....	68.00
152,508 lb.	Reinforcement for concrete structures.....	.15
2,484 lin. ft.	Structural steel.....	.19
	Structural steel piles in place.....	9.00

HIGHWAY—Construction of 9 mi. of state highway in Nevada

Nevada—Washoe County—State—Dodge Construction, Inc., submitted a low bid of \$218,975 and was awarded the contract for the construction of 9 mi. of highway in Washoe County.

(1) Dodge Construction, Inc.....	\$218,975
(2) Young & Smith Construction Co.....	225,472
Silver State Construction Co.....	228,214
Isbell Construction Co.....	251,078

	(1)	(2)
Lump Sum		
235 lin. ft.	Signs.....	
77,950 cu. yd.	Remove culvert pipe.....	\$ 1.50
840 cu. yd.	Roadway excavation.....	.27
217 sta.	Drainage excavation.....	.27
144,364 cu. yd.	V-type ditches.....	5.00
834,621 yd. sta.	Borrow.....	.20
204,350 yd. mi.	Overhaul, yd. sta.....	.01
200 cu. yd.	Overhaul, yd. mile.....	.12
1,060 cu. yd.	Structure excavation.....	1.50
10,164 M gal.	Backfill.....	1.50
Lump Sum	Water.....	1.00
56 hr.	Furnish water equipment.....	6.00
8,419 ft. hr.	Power roller.....	7.00
30,274 ton	Tamping or pneumatic-tired roller.....	.40
41,876 ton	Type 1 gravel base.....	.70
70 ton	Gravel surface.....	.80
345 ton	Liquid asphalt, Type MC-2.....	35.00
981 ton	Sand blotter.....	2.00
9.02 mi.	Liquid asphalt, Type SC-3 or SC-4.....	29.50
590 sq. yd.	Roadmix.....	650.00
930 lin. ft.	Roadmix intersections.....	.20
438 lin. ft.	24" C.M.P. (dipped).....	6.00
136 lin. ft.	36" C.M.P. (dipped).....	10.75
580 lin. ft.	48" C.M.P. (dipped).....	15.00
60 lin. ft.	24" reinforced concrete pipe.....	6.75
72 lin. ft.	36" reinforced concrete pipe.....	10.75
244 ea.	Relay culvert pipe.....	1.50
48 ea.	Culvert markers and guide posts.....	6.00
62 ea.	Reference monuments.....	10.00
Force Account	Right of way markers.....	6.00
	Miscellaneous work.....	8.00

Space is sold as advertisers' inches. All advertisements in this section are 1/2 in. short of contracted space to allow for borders and composition.

CLASSIFIED

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

POSITIONS

ENGINEERS WANTED

Resident Engineer or Inspector
Structural Engineer

Send full particulars to

HARRISON & WOOLLEY
Consulting Engineers
308 West Fifth Street
Santa Ana, California

Engineers — Foremen — Office Men

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

Geo. E. Deatherage & Son
CONSTRUCTION CONSULTANTS

P. O. Box 921 Lake Worth, Florida

ENGINEERS WANTED

Professional and Sub-Professional
for Highway and Flood Control work

PAID

Vacations — Sick Leave — Holidays

PART PAID

Health Insurance — Retirement
Excellent Working Conditions
Progressive California County
Civil Service Status

FIELD POSITIONS

Project Engineer Instrument Man
Resident Engineer Inspectors
Chief of Party

OFFICE POSITIONS

Design Engineer Draftsman Plans Engineer
WRITE ...

SAN BERNARDINO COUNTY CIVIL SERVICE
236 Third Street, San Bernardino, Calif.

"AGENTS WANTED"

Representatives now contacting construction equipment dealers, to appoint dealers for job proven specialty pump with broader market applications than usual specialty item. Product nationally advertised in magazines and by direct mail.

BOX 3-A

c/o WESTERN CONSTRUCTION
609 Mission St. San Francisco 5, Calif.

RENT STEEL PILING



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

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

LL FOSTER Co.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

LET CLASSIFIEDS WORK FOR YOU

SOLD RENTED REPAIRED

Transits • Levels
Steel Tapes • Compasses

Portland Instrument Co.
334 S.W. 5th St. Stark
PORTLAND 4, ORE., AT 3598



LOW COST INSTALLATION AND OPERATION

FOR DAMS
BRIDGES
BREAKWATERS
FILTRATION AND
SEWERAGE PLANTS

CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY
AMBURSEN DAM CO INC
295 MADISON AVE NEW YORK

FOR SPEED
ECONOMY
EFFICIENCY
FLOOD SAFETY
LABOR REDUCTION

DIESEL ENGINES — DIESEL ELECTRIC SETS ALL TYPES OF HEAVY DUTY CONSTRUCTION EQUIPMENT

MINING EQUIPMENT - SAND & GRAVEL PLANTS

R. R. EQUIPMENT - INDUSTRIAL EQUIPMENT

PARTS FOR DIESEL ENGINES - YOUR INQUIRIES APPRECIATED

"We Have It — You Ask For It"

DIESEL CONSTRUCTION EQUIPMENT CO.

5050 Market St., San Diego 2, California — CO 4-3149

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Johnston Stainless Welding Rods

Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

Strong—
Low in cracking

A. P. JOHNSTON CO., INC.
1845 E. 57th St., Los Angeles 58

BACKFILL, uncompacted

Watch your smog!

Contractors operating in the Los Angeles metropolitan area are having some difficulty with the Air Pollution Control laws and regulations when it comes to operating batching plants for concrete aggregates. Recently, according to the Bulletin of the Southern California Chapter AGC, a contractor was charged with a misdemeanor for failing to secure a permit to operate his batching plant. The contractor contended that it was "mobile" and not within the restrictions of the law. The contractor was able to show that the plant was portable, having been dismantled and transported by truck several times during recent years. The Court held in favor of the contractor. The case did not actually involve violation of the law with respect to the emission of an illegal quantity of air contaminants, being restricted to the matter of securing proper permit. Thus, the point in regard to dust from batching plants was not decided.

Not so half-witted

According to Ed Hanna, road commissioner of San Benito County, California, there once was a smart half-wit: An election was being held in the county and the village half-wit got out and electioneered strenuously for a set of county commissioners. They were elected, and asked him what reward he expected for his

services. He startled them with the reply that he wished to be county road engineer. They remonstrated, reminding him that he was not too smart and actually was not able to read or write. Whereupon he became quite incensed and told them that he did not ask to be assistant road engineer, but the road engineer.

No outside engineering work in Oregon

The Oregon State Highway Department has a definite and logical regulation concerning its engi-

neers performing outside engineering work. This policy provides that they do no such outside engineering work, including periods of vacation or exchange time. Explanation of the rule presents the sound reason that the profession of engineering has definite standards to maintain, and those engineers already working full time would be able to perform professional services on a part-time basis at less than a reasonable cost; and also there is the possibility of a highway engineer being employed outside his regular work to utilize special knowledge he may have of special projects; or in an effort to influence him or to use his influence. In concluding, the department indicates that this policy is in the interest of professional integrity and ethics—and the best performance of highway functions.

Twenty-five years ago in *Western Construction*

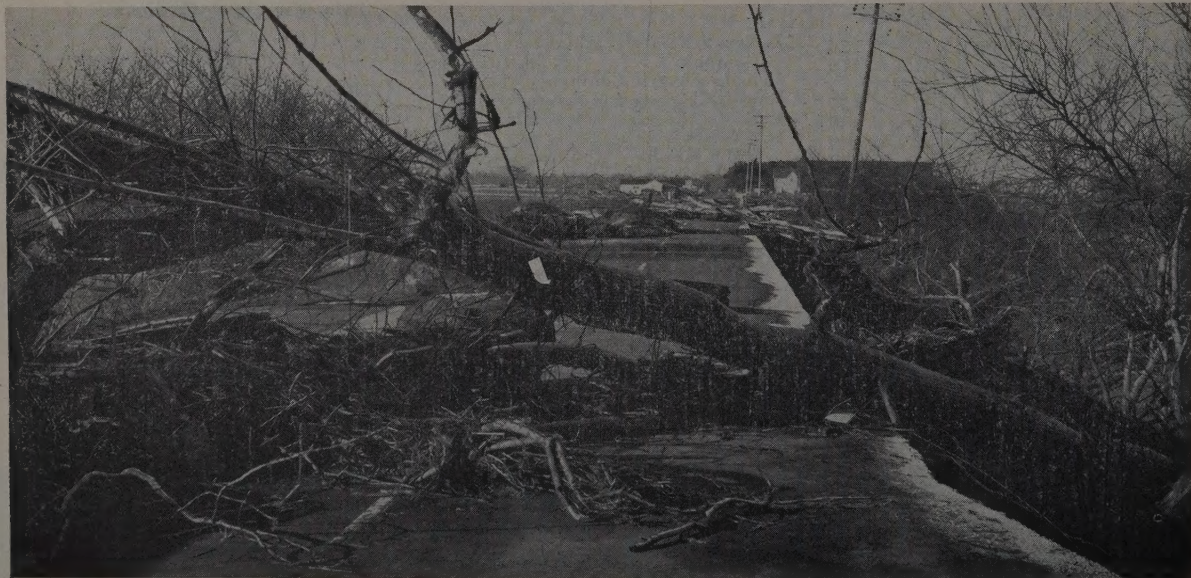
"The successful bidding firm on Hoover Dam faces the tremendous financial and construction task represented by a dam twice as high as any other in the world, and located on a turbulent river in a remote, desert region. The Six Companies Inc., has 7 years in which to erect a monument to the engineering-construction industry, on a project which holds the key to future prosperity in the great Southwest. It is only proper that such a monument to the far West should be built by far Western contractors.

"Three bids were received

when they were opened March 4 at Denver for the building of Hoover Dam: The Six Companies, Inc., was low at \$48,890,995; The Arundel Corp., Baltimore, Md., at \$53,893,878; and Woods Brothers Corp., Lincoln, Neb., at \$58,653,107."

* * *

"Philip Schuyler, editor of *Western Construction News*, attended the Hoover Dam bid opening and continued on to visit and report on operations at the dam site and adjacent town of Boulder City now being built. Complete unit bids appear in the March 25, 1931, issue."



WHILE TRAFFIC ENGINEERS present learned papers on the probable hourly capacity of two-lane highways, others in state highway departments face more realistic problems. This is a California state route after the December flood.

...The Editors

Upswing in the Bureau of Reclamation

Politics being what it is, the Bureau of Reclamation was bound to feel the curtailment imposed by an administration dedicated to economy and budget balancing. But the growth of the West being what it is, it was equally sure of returning to a high level of activity. For the Bureau of Reclamation is one of the agencies that must match strides with the West if this region is to fulfill its part in national destiny.

The multi-purpose project of today is a far cry from the concept of reclamation in 1902. The irrigator in those days was to pay the bill to get the water; and on simple, low-cost projects such a direct cost-benefit ratio was not impossible. But that type of location is gone, and has been for a generation. And, during the following years as costs of storage mounted, so has the need for power to serve Western homes and industry. Power becomes the financial key to water conservation. This made possible the irrigating of more acres, raising more food for the growing population of the region, and the millions on their way West. Of course, some of the resulting products move to the East, but California lettuce, Arizona melons, and Washington apples do not take markets away from Illinois corn or Minnesota wheat.

Curtailment in the engineering staff and construction activity of the Bureau probably hit bottom during last year. Prospects for construction starts and acceleration of existing projects in the current year may represent a 5% upturn, and 1957 will see a greater increase. Further, the current year and 1957 should produce starts on long-range river programs that will continue for years into the future. In the meantime Western growth and resulting demand for more water conservation and power output will assure Bureau activity at an increasing rate.

The year 1956 will mark the return of the Bureau to a level of activities that will begin to catch up with the needs of the West. The greatest natural resource of this region must be conserved in its entirety, and progress toward that end cannot wait. The future of the West needs the full scale activity of the Bureau of Reclamation for healthy and continuing growth.

Keep highway taxation simple

When Oregon initiated the gas-tax it was as perfect as a tax could be; it was simple in principle, it was equitable in its idea of balancing service with assessment, and it was easy to collect. The principle is as sound today.

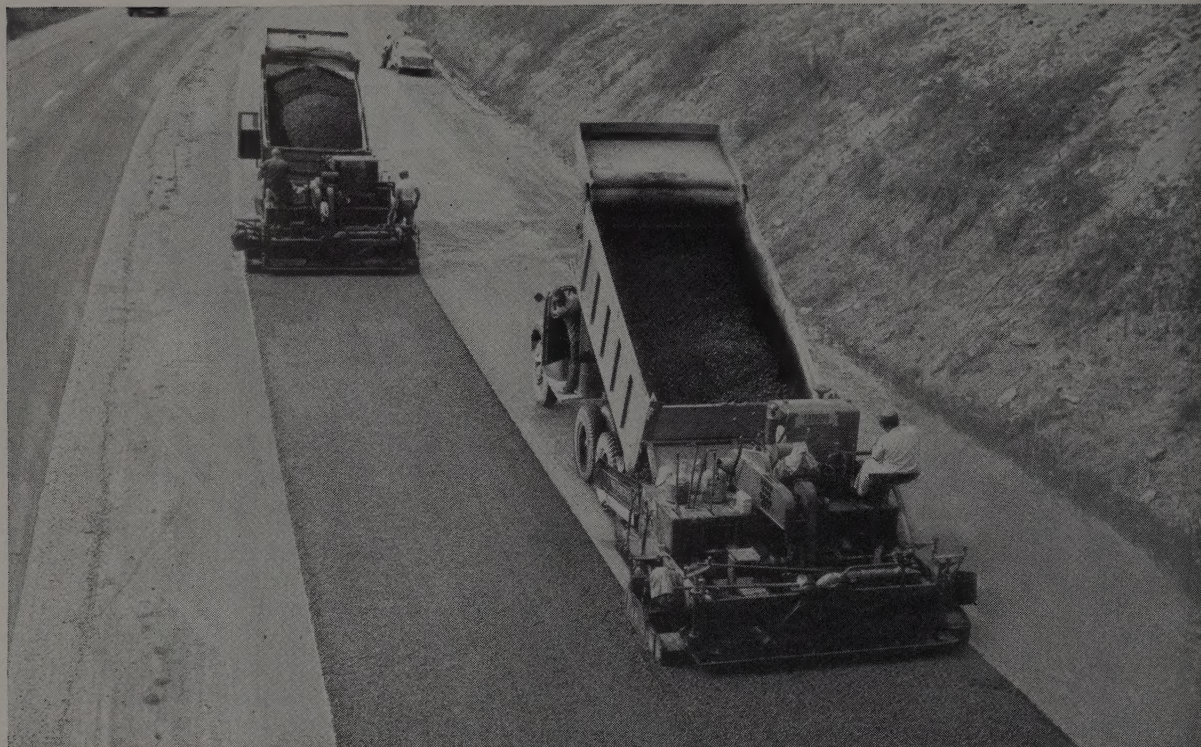
The first purpose of the levy is to maintain the roads and streets used by the vehicles paying the impost. Surplus, naturally, is available to improve and add new facilities. Undreamed of increase in cars and trucks, combined with modern speeds that demand wider and straighter routes, has piled up demands that far exceed the accumulations from any reasonable service charge. The resulting pressure to speed highway improvements has led to ideas and proposals that have some merit, but tend to confuse and complicate the simple relation of assessment and benefit.

One rather common discussion leads in the direction of levying taxes for indirect benefits, since it is obvious that roads and streets provide services even to those who pay no direct gas-tax. This proposal represents a theory susceptible to reasonable argument. How to assess it with justice and collect it with fairness makes the proposition a nightmare.

More recently the same general objective has been approached with a new twist, in a rather reverse philosophy. This is a proposal to use gas-tax funds in metropolitan areas to help subsidize mass transportation. According to this plan, the resulting improvement in public transit facilities would cause many who now drive private cars to switch to public routes and thereby relieve highways and streets of the lane-jamming traffic. This relief, and the resulting improvement in driving conditions, the proposers argue, would compensate the remaining drivers for the diversion of funds intended for highways.

In the first plan, the motoring public is to be aided by adding to the tax fund from levies on those indirectly benefited, while in the second proposal the same effect is to be secured by taking away some of the existing funds to build mass transportation to take cars off the roads.

Either plan confuses and complicates a simple and direct plan of taxation for direct service. They would take the gas-tax out of the realm of direct benefit and compensate by procedures that are either too complex for practical use, or too uncertain of results. The motives behind the proposals are worthy, and in the interest of highway users—private or commercial. However, the user of these highways has never been unwilling to pay a proper and reasonable levy for benefits, if it is designed with equity and reserved for this exclusive purpose. The gas-tax should not be allowed to become mixed up with divergent plans to secure marginal benefits. It should be kept direct and simple.



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