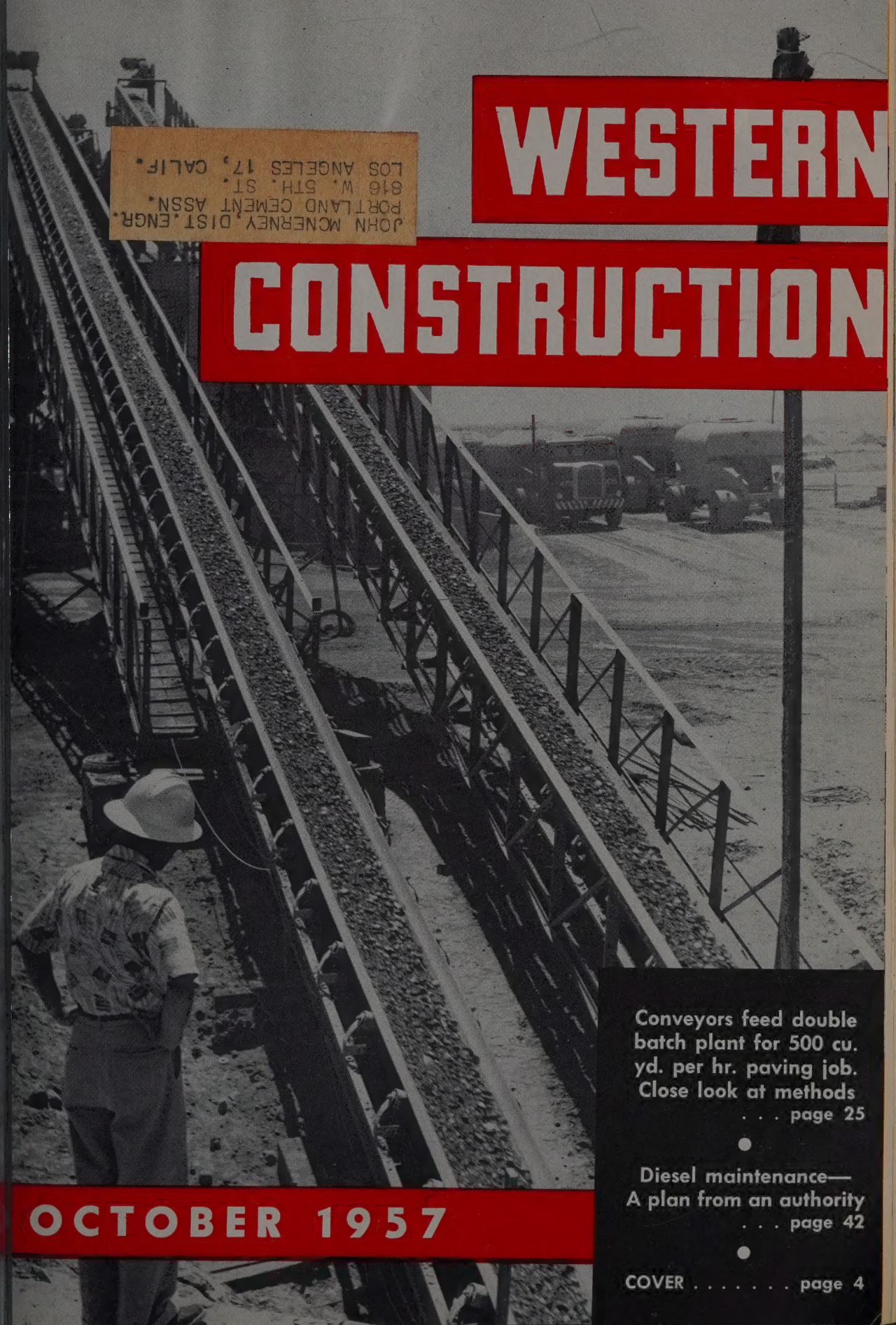




WESTERN

CONSTRUCTION

JOHN MCNERNEY, DIST. ENGR.
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816 W. 5TH. ST.
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Conveyors feed double
batch plant for 500 cu.
yd. per hr. paving job.
Close look at methods
... page 25

Diesel maintenance—
A plan from an authority
... page 42

OCTOBER 1957

COVER page 4

Panoramic photo shows over-all magnitude of the Pittsburgh Disposal Plant Project and the tremendous task force of equipment needed to carry it out. Principal lubricants used are *Texaco Ursa Oil Heavy Duty* for all

engine lubrication; *Texaco Marfak Heavy Duty 2* for wheel bearings; general grease lubrication; *Texaco Regal Oil R & O* for air compressors and *Texaco Meropa Lubricant* for transmissions and differentials.



"We're out to earn a bonus on a \$100,000,000 project..

"and that means every piece of construction equipment must deliver its full share without down-time. That's why we set up a special **Texaco Lubrication Plan** right at the start," says **Maintenance Supervisor J. B. Metz** of **McHugh-Allegheny-Drake Contractors**.

Prior planning has paid off for McHugh-Allegheny-Drake. Maintenance Supervisor Metz reports wonderful results:

"The equipment works in damp, steamy excavations, breathes churning dust, pounds its bearings unmercifully, and still delivers top-rate performance. Down-time is limited to routine maintenance, thanks to the excellent Lube Plan of the **Texaco Lubrication Engineer**."

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Since last year, the construction equipment of the McHugh-Allegheny-Drake contracting company has been digging what amounts to the biggest ever dug.

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Even before it began the job, the firm asked to "see a **Texaco Lubrication Engineer**," who helped draw up a

Lubrication Plan covering the entire job. Not only manufacturers' lubrication charts were considered. Weather, terrain, work loads, garaging were all weighed together before the proper Lubrication Plan was chosen. The Plan lubricants are delivered locally from one of **Texaco's 2,000 Distributing Plants**.

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**MacDONALD,
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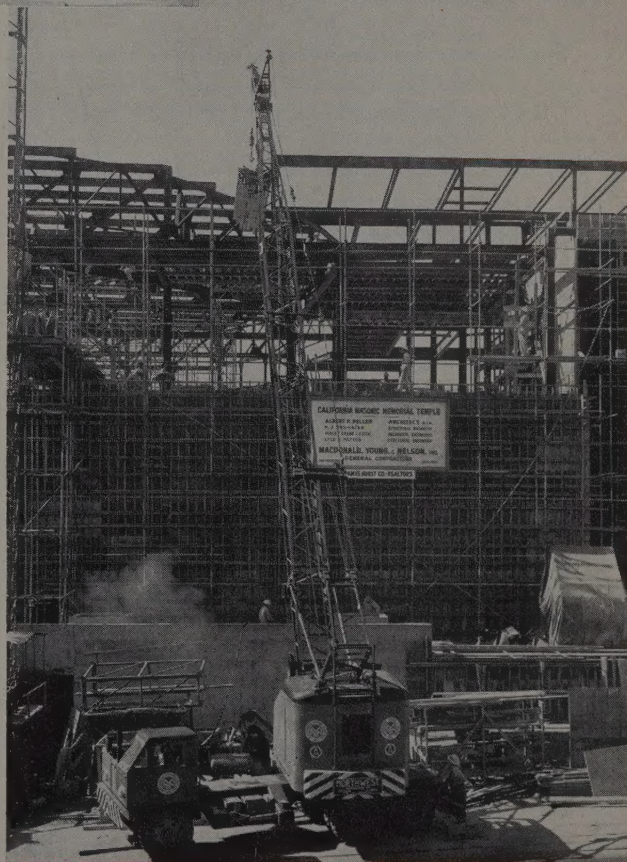
**San Francisco,
California**

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FRONT COVER

TWIN 400-ft. conveyors carry aggregate to a double batch plant with a total capacity of 600 cu. yd. per hr. at Beale Air Force Base. Unusual paving equipment has resulted in rates as high as 500 cu. yd. per hr. poured for B-42 runway. A six-page article begins on page 25.



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Preparing for the Highway Inquiry

NEXT JANUARY Congress will probably take a searching look at progress on the new highway program. This year it has been content to observe developments without meddling. As a result the states and the Bureau of Public Roads have been able to accelerate their operations and synchronize the complex steps in the initial stage of the 13-year program. However, elements of delay and conflicting interests have aroused the usual congressional inquisitiveness and a yearn to ask questions. The result should be anticipated by the administrators of state highway departments throughout the West and plans made to report on the efforts of the current season with proper emphasis on conditions and problems which are strictly Western. Such a preparation could be undertaken separately or through the well established agency of the Western Association of State Highway Officials. Either way, plans should be prepared during the next few months that will enable the West to present a true and graphic picture of its stake in the present highway program. Several foundation facts will tend to orient such statements.

First, there is the premise that the West has built its transportation economy on rubber tires. Commerce, industry and the very circulation of our increasing population are tied to highway transportation and would break down without its constant extension and betterment. Any railroad map of the United States will demonstrate this fact. Highway needs of the West are thus distinctive and should be treated differently in any formula covering the succeeding years of the Federal Highway Program.

Second, the highway requirements of the West must include consideration of the population growth factor. The region has a population increase of two or three times the national average. Advance highway planning should include this higher rate of expanding traffic.

Third, Congress will certainly ask questions and want information on requests for additional mileage. In its present form the Interstate System does provide connections between populated centers of the West, but many of these involve cir-

cuitous routes. In its early stages, the term "defense or strategic network" was frequently applied to the system and this significance continues to have importance for many Western links and locations. The final network to serve this original purpose must be projected to meet ultimate Western defense needs.

Fourth, there is the extent of land ownership and administration by the Federal Government in this region. Recognition has been given to this factor in allocating previous highway funds but population growth, taxation problems and increasing needs for more local control are changing this picture. More consideration should be given to these extensive areas under absentee ownership.

Lastly, there is the problem of securing rights-of-way in areas where land speculation is still common. This is becoming a serious threat to highway costs in the more thinly populated areas. The required system of public hearings and widespread information on plans for all new locations is a proper part of the program. However, it does create an extra Western problem in areas where land values make speculation particularly attractive.

These are some of the major points which make our problems distinctive in the current highway program. They cannot be met with fairness or equity by the application of national formulas. When the program comes up for its rigorous review, as it will next year, the states of this Western region must have these distinctions marshalled and documented. Preferential treatment is not the purpose of such contentions but rather a complete explanation of Western highway problems and needs of today, and particularly those of tomorrow.

Jim Ballard



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OCTOBER 1957



R KOEHRING 34E pavers team up to pour 6 cu. yd. of concrete
42 sec. for a B-52 runway at Beale Air Force Base near Marys-

ville, Calif. Note 5-ft. extensions on the booms of the middle two
pavers, which run about 15 ft. away from the headers.

Runway paving hits 500 yd. an hr.

**An unusual paving train of modified equipment
helping contractors pour up to 5,000 cu. yd. of concrete
in 11½ hr. and still meet tight Air Force smoothness
specifications.**

WAS expected that the con-
tractor on the Beale Air Force Base
runway near Marysville, Calif.,
would come up with a few new ideas.
The runway is 12,000 ft. long, 300 ft.
wide and 20 to 25 in. thick. Con-
structing such a huge slab gives the
contractor plenty of room to use his
imagination and think of ways to
make improvements on existing
methods. But the winning bidders

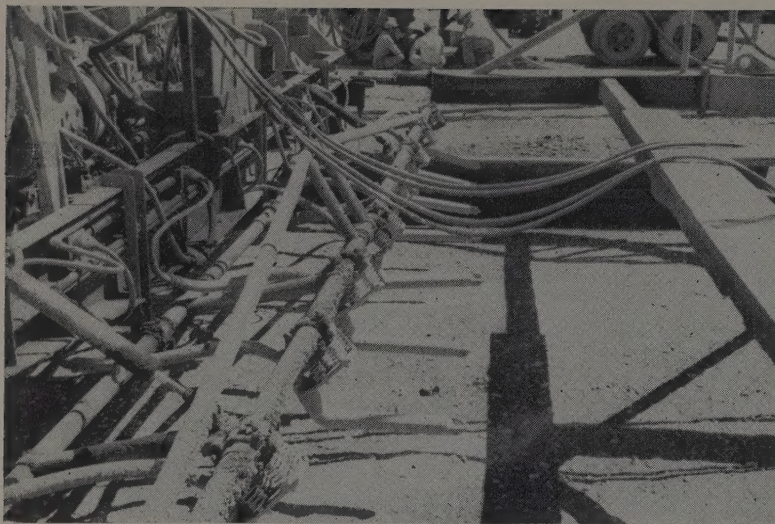
have done more than simply make
improvements; they have practically
rewritten the rule book for jobs of
this type. In late August, just a few
weeks after concrete work began,
they poured the tremendous total of
5,000 cu. yd. in only 11½ hr.

The most interesting reason why
such a high production rate is being
recorded is the train of screeds and
floats which spreads, smooths and

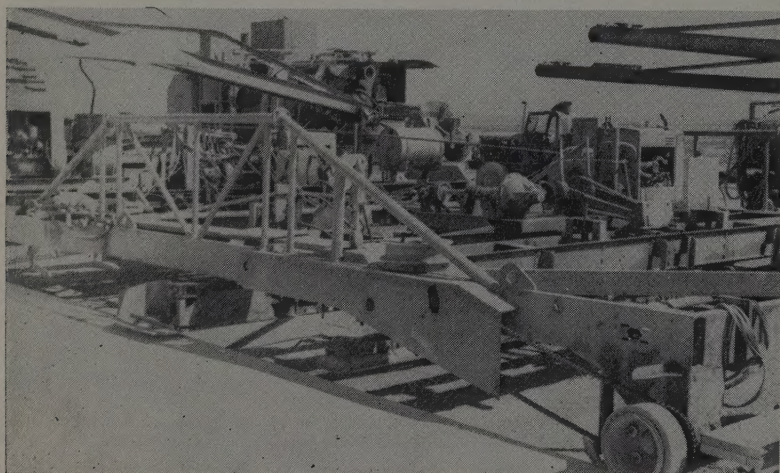
finishes the concrete between the
headers. The equipment for this
phase of the operation is so unortho-
dox it is almost unrecognizable.

There are other reasons, of course.
Every task is being done by a ma-
chine of the right size, kept in effi-
cient running order, and operated by
men with plenty of experience and
skill, and every phase of the project,
especially the movements of the
trucks, is under careful supervision
to prevent imbalances and slow-ups.

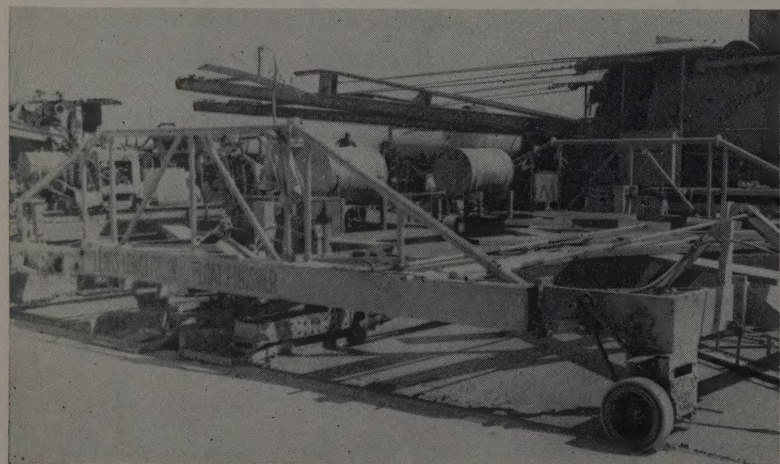
The contract was awarded in
March of 1957 to a joint venture
consisting of R. A. Westbrook, Inc.,
(sponsor), Morrison-Knudsen Co.,
Inc., and H. Earl Parker, Inc., on
their low bid of \$10,261,636. The



LEADING the parade is a Blaw-Knox spreader which mounts 8 internal vibrators. The machine is shown in advance of the concrete, where it is placed during lunch breaks.



THE SPREADER pulls this Lewis leveling attachment, also shown in advance of the concrete. The rig has a 30-ft. wheelbase, carries a strike-off screed and a pan vibrator.



NEXT IN LINE is this unorthodox rig, a Lewis Longitudinal Float Finisher, also with a 30-ft. wheelbase. It carries a tamper bar, two strike-off screeds, and a V-shaped float.

project includes 486,000 cu. yd. of concrete and about 4,400,000 cu. yd. of excavation. The main features of the 165 bid items are given in a table which accompanies this article.

The middle 10,000 ft. of the runway is 20 in. thick, with 1,000 ft. at each end partly 22 and 25 in. thick. The contractor is paving the north 6,000 ft. while earthwork proceeds on the other half. About 12,000 ft. of Rex steel headers were purchased for the job. The headers have legs of 20 in. and 22 in. to handle two of the slab thicknesses. The 25-in. section will be formed by resting the headers on 3-in. planks. Paving the 25-ft. lanes is done in a circular pattern, that is, the paving train proceeds up the east side of the runway while the headers are being set on the west side. A Tournacrine lifts the paving equipment to the other side at the end of the runway and the equipment proceeds in a southerly direction on the west side of the runway while the headers on the east side are being removed and reset. It takes about two to three days for a 6,000-ft. long strip 25 ft. wide to be paved.

Unorthodox paving train

Leading the paving train are four 34E Koehring dual drum Twinbatch pavers. Mixing time in each drum is 42 sec. which means that when the four pavers are working steadily 6 cu. yd. of concrete is dumped in front of the screeds every 42 seconds, or 1 cu. yd. every 7 seconds.

Water is furnished to pavers by two 5,000-gal Euclid water trucks, one of which stays with the pavers while the other refills it. Cement, sand, and aggregate are fed to the pavers by a fleet of 18 to 22 batch trucks owned and operated by the trucking subcontractor, Miles & Sons of Merced, Calif., which also handles transport of bulk cement to the batch plants. Each batch truck has four partitions which enable it to carry five 1½-yd. batches.

To give the batch trucks access to all four pavers, the pavers are placed and operated in an unusual way. The first and fourth pavers run next to the headers, and the second and third pavers run about 15 ft. away from the headers. The first and second pavers are operated backwards enabling them to be loaded without interference with the trucks loading the last two pavers.

Operating the first two pavers in reverse means that the operators are "driving blind" but this is not serious so long as you have skilled operators.

which definitely is the case on this project. In fact, each man on the paving crew probably has more than 10 years of experience on this type of work.

The booms of the second and third pavers are 5 ft. longer than the booms of the first and fourth pavers which results in good coverage of the lane without interference of booms.

The operator of the fourth paver, which runs adjacent to the spreader, has the toughest job, for every time he runs the discharge bucket out along the boom he must swing the boom to keep the bucket from hitting the comb of the spreader. He has thoroughly mastered this maneuver and it is a pleasure to watch him work. He also must follow closely the movement of the spreader.

Although there are only four pavers on the job now, a fifth will be brought in to serve as a standby unit. On a high speed closely integrated job like this a breakdown of an irreplaceable unit can be very costly.

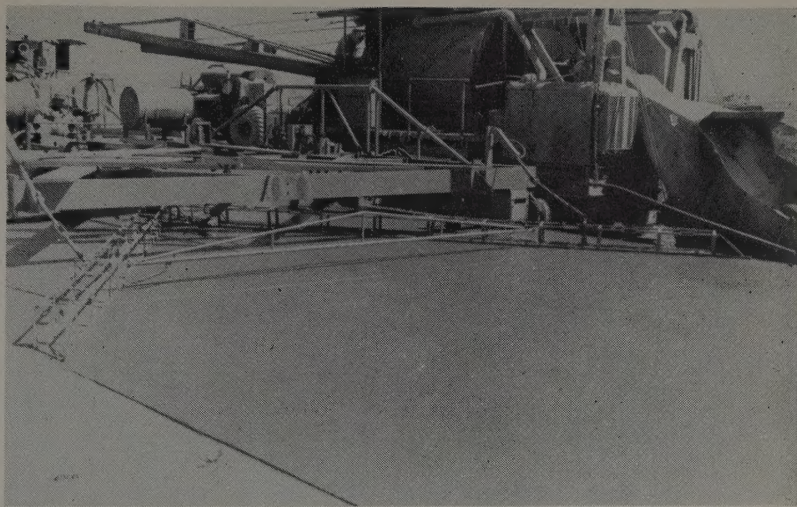
Special finishing equipment

The concrete spreader is a 25-ft. Law-Knox which carries a row of internal vibrators. The spreader pulls a Lewis leveling attachment which has a 30-ft. wheel base. A strike-off screed is suspended in the center of the frame giving a planing effect across the full 25 ft. width. A shoveling device keeps a uniform load on the screed. Just behind the screed is a mechanical pan-type vibrator.

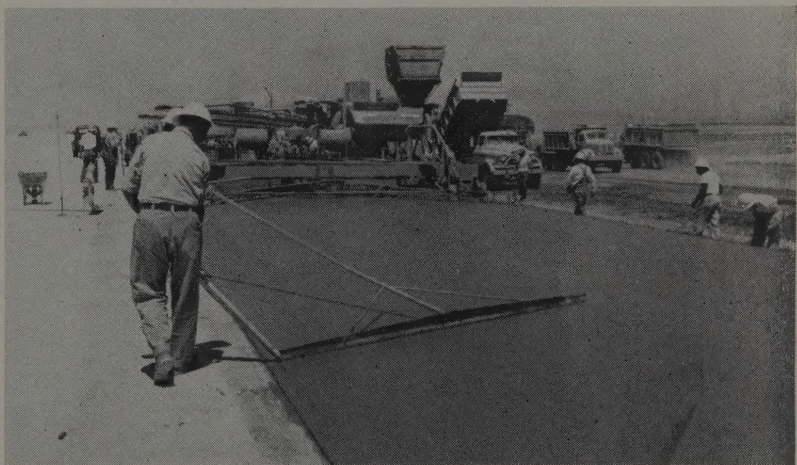
The next machine is a key reason why the contractors have been able to maintain such a fast paving rate and yet meet the smoothness specifications of $\frac{1}{8}$ in. in 12 ft. longitudinally and $\frac{3}{16}$ in. in 12 ft. transversely. The rig is a self-propelled Lewis float finisher, modified to give a 30-ft. wheel base. At the front it carries a mechanical tamper, and in the middle it carries two strike-off screeds which span the full 25-ft. width. In the rear is a V-shaped float with arm lengths of 18 ft. It is trailed with a 3-point suspension, resulting in mechanical straight edging. After this machine makes a pass, the tamper, the two screeds, and the V-float can be lifted off the surface of the concrete, enabling the machine to back up. Usually two passes are made.

Final finishing

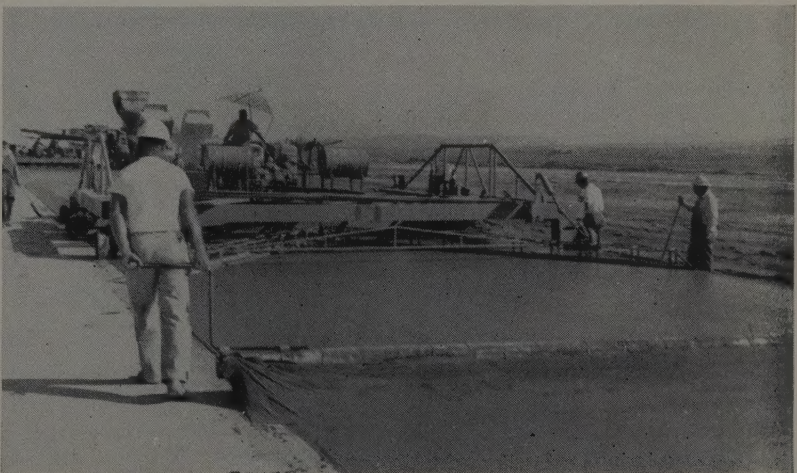
This unorthodox train of equipment is working to perfection and it looks as if there will be extremely



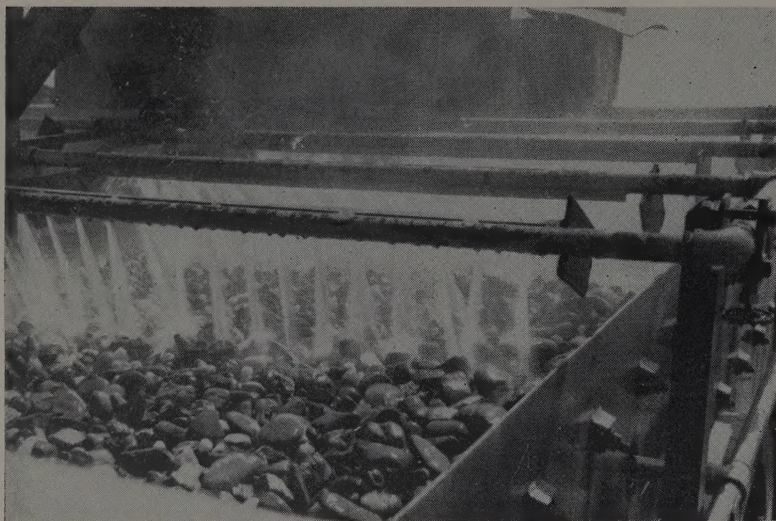
REAR VIEW of the Lewis finisher shows the V-shaped float, consisting of two 16-ft. arms. The float is trailed with 3-point suspension, resulting in mechanical straight-edging.



CEMENT FINISHERS check the surface with 12-ft. straight edges. Irregularities may call for another pass by the mechanical finisher, which is self-propelled.



MECHANICAL FINISHER returns to make another pass. The floats and screeds are raised when the machine is backing up. Final surface is imparted by burlap drag as shown.



CRUSHING PLANT is producing about 15,000 tons every 24 hr. Washing (above) and sizing is done on two three-deck Eljay screens. About 1,500 gal. of water per min. is used.

little grinding necessary when the paving is finished to make the runway surface conform to the smoothness specifications.

Behind the V-float, finishers, watched by inspectors of the Army Engineers, check the surface with 12-ft. straight edges.

Next, the finishers move two or three burlap drags over the surface of the concrete. This looks easy but it takes an experienced man to do the job right. The proper roughness will be imparted to the concrete surface only when the concrete is at exactly the right consistency, a quality which varies with slight changes in the composition of the concrete, temperature and humidity. Only years of experience can give a man the ability to judge this quality.

Curing procedure

Curing a slab of this thickness can be troublesome because of the temperature differential between the surface and the interior. A membrane cure was first tried but proved to be inadequate as some uncontrolled hair checking on the edges was observed. A new curing procedure was adopted which was found to work perfectly. After the burlap drags, a fog spray is applied with a water truck equipped with an outrigger spray pipe.

Next, 30 x 30-ft. burlap sheets, doubled, are placed over the concrete as soon as possible and kept wet. Here again there is no substitute for experience in determining when the burlap can be placed.

The burlap is removed after 24 hours and a Rex automatic curing machine applies Techkote Sealtech to the surface as the final curing operation. The distance between the pavers and the burlap cover varies widely depending on the temperature, humidity, and condition of the concrete.

Major Equipment

Earthmoving

- 20 Caterpillar DW21s
- 2 Cat D9s
- 17 Cat D8s
- 4 Cat No. 12 graders
- 6 Procter 15-ton sheepfoot rollers
- 2 Southwest 50-ton pneumatic rollers
- 2 Rome 20-ft. disc harrows
- 8 Euclid 5,000-gal. water trucks
- 8 Light towers, 4,000 watts, skid-mounted

Aggregate production

- 1 Northwest 4-yd. dragline
- 1 Lima 4-yd. dragline
- 8 Euclid 25-yd. bottom-dumps
- 1 Cedarapids feeder
- 2 Eljay 5 x 14 screens
- 1 Symons 5½-ft. cone crusher
- 2 Eljay 5 x 14 screens
- 2 Eagle 7 x 22 sand classifiers

Concrete batching

- 1 Conveyco 325 cu. yd. per hr. batch plant
- 1 Conveyco 275 cu. yd. per hr. batch plant
- 10 GMC batch trucks
- 10 Cook Bros. batch trucks

Concrete paving

- 4 Koehring 34E pavers
- 3 Euclid 5,000-gal. water trucks
- 1 Blaw-Knox spreader
- 1 Lewis leveling attachment
- 1 Lewis float finisher

Slump of the concrete used in the runway varies from 1¼ in. to 1¾ in., with an average of 1½ in.

A standby float finisher and a standby spreader are kept in readiness in case a breakdown should occur to these vital pieces of equipment.

The membrane cure and the sawing and sealing of the contraction joints is done by subcontractor Ne Mulleneaux.

Beale Air Force Base, now inactive, is being rebuilt to meet the requirements of the Strategic Air Command. The main runway is designed to carry SAC's huge B-52s. It's almost certain that there will be a lot of construction going on at Beale in the next few years. Future contracts will cover such things as hangars, warehouses, roads, administrative buildings, housing, water supply, and sewerage. It was partly with a view to future construction that Westbrook-M.-K.—Parker bought 12 ac. of land on which to construct the batch plant for the present runway contract. The plant is located 2½ mi. from the center of gravity of the runway, and about 2½ mi. from the source of the aggregate, the stream bed of the Yuba River.

Aggregate production

The crushing plant works around the clock, devoting one shift to producing base course and two shifts to concrete aggregate. The batch plant and the paving spread works one 10-hr. shift during the daylight hours.

Working in the stream-bed borrow pit are one Caterpillar D7 and two 4-yd. draglines, a Lima and a Northwest. The material varies from sand up to cobbles as large as 12 in. in diameter, with larger material nearer the surface. About 2% of clay by weight is present.

The dragline operators can meet the specified gradation rather closely by taking two buckets from the surface and one bucket from lower materials. Carrying the material to the crusher are five Euclid bottom-dump 25 yarders.

At the crushing plant the material is carried by a Cedarapids feeder conveyor to two 4 x 12 two-deck Eljay screens for scalping. The oversize cobbles are stockpiled for possible future use as riprap.

The main unit of the plant is a 5½-ft. Symons cone crusher. Other major components of the crushing set-up are two 3-deck 5 x 14 Eljay screens for washing and sizing which

use 1,500 gal. per min. of water under a 100-ft. head, two 7 x 22-ft. Eagle and classifiers, and two sand cone separators with hydraulic pumps. At present the crushing plant is producing about 15,000 tons of material per day.

The base course which underlies the main runway is a 6-in. layer consisting of material less than 3 in. in diameter and having a liquid limit of 40 and a plastic index of 8. The gradation of the base course is:

Sieve size	% by weight passing
1 1/2	100
3/4	60-100
1/2	80-65
4	20-50
10	50-40
40	5-25
200	0-10

The sand which the plant produces is part natural and part manufactured. This is the gradation:

CUMULATIVE % BY WEIGHT		
Sieve size	Passing	Retained
4	100	0
8	95-100	0-5
16	80-90	10-20
30	60-80	20-40
50	30-60	40-70
100	12-30	70-88
200	2-10	90-98

The specifications require a fineness modulus for the sand of not less than 2.40 and not more than 2.90. To avoid sudden variations there is the further requirement that the fineness modulus must not vary more than 0.15 within ten samples.

Concrete batching

The aggregate stockpiles are built up over two 7 x 10-ft. concrete, lined, surge tunnels which contain three 24-in. conveyors. The material is carried from the tunnels to the top of the batch plant by two parallel 400-ft. long belt-type conveyors. All the aggregate (but not the sand) is screened at the top of the batch plant before it is deposited into the bins. Batching is done by two Conveyco batch plants side by side with a total capacity of about 600 cu. yd. per hr. One has a capacity of about 325 cu. yd. per hr. and the other about 275 cu. yd. per hr. Both have Minneapolis-Honeywell controls. Cement and aggregate weights are electronically recorded. The only tie-in between the two plants is a shuttle conveyor which is used to direct the sand as it arrives at the top of the plants by a single conveyor (see cover). It is interesting to note that the specifications called for a batch plant



DOUBLE BATCH PLANT, which can produce 600 cu. yd. per hr., loads two trucks at once. The plants are Conveyco, one with a 325 yd. per hr. capacity, the other with 275. The plants are completely separate, each fed by a 400-ft. long conveyor (see cover).

with a capacity of at least 4,000 cu. yd. in 8 hr.

Cement storage is 8,800 bbl. Specs call for two days of aggregate storage. Miles & Sons bring the bulk cement to the job. Ideal Cement is used one week and Permanente is used the next. Both cement plants are located about 140 mi. from the job, south of San Francisco. About half of the cement is first barged to Sacramento, which is about 50 mi. from the job.

The water-cement ratio (by weight) is 0.51. The volumetric ratio of sand to aggregate is 30 to 70. The concrete has about 3 7/8% by volume

of air entrainment, in this case Techkote Durair.

It is not necessary to cool any of the ingredients of the concrete. The temperature of the concrete as it is poured is about 84 deg. Pouring at night was considered but was found to be unnecessary because of the success of the burlap curing method previously described.

Earthmoving

The concrete paving operation on this project is so spectacular that one could easily overlook the earthmoving phase, even though it totals

Selected unit bids—Beale Air Force Base

Main Runway

	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Unclassified excavation	3,308,000	cu. yd.	\$0.30	\$ 992,400
Local borrow excavation	542,000	cu. yd.	0.30	162,600
Embankment, Zone I	1,553,000	cu. yd.	0.09	139,770
Embankment, Zone II	682,000	cu. yd.	0.04	27,280
Embankment, Zone III	979,000	cu. yd.	0.02	19,580
Base course	99,100	cu. yd.	2.09	207,119
Subbase course	27,900	cu. yd.	2.09	58,311
Stabilized aggregate base course	74,000	ton	2.05	151,700
Water	104,000	M. gal.	1.43	148,720
Portland cement concrete pavement	347,000	cu. yd.	7.15	2,481,050
Portland cement	520,500	bbl.	3.05	1,587,525
60-in. reinforced concrete pipe	11,710	lin. ft.	27.50	322,025
66-in. reinforced concrete pipe	5,000	lin. ft.	30.00	150,000
60-in. reinforced concrete pipe, extra strength	4,120	lin. ft.	30.50	125,660

South Warm-up Apron

Base course	7,600	cu. yd.	2.09	15,884
Stabilized aggregate base course	3,100	ton	2.05	6,355
Portland cement concrete pavement	20,700	cu. yd.	7.15	148,005
Portland cement	31,100	bbl.	3.05	94,855

Connecting Taxiways

Base course	13,100	cu. yd.	2.09	27,379
Stabilized aggregate base course	9,500	ton	2.05	19,475
Portland cement concrete pavement	24,100	cu. yd.	7.15	172,315
Portland cement	36,200	bbl.	3.05	110,410

Parking Apron, North 975 ft.

Base course	11,300	cu. yd.	2.09	23,617
Stabilized aggregate base course	7,300	ton	2.05	14,965
Water	3,200	M. gal.	1.43	4,576
Portland cement concrete pavement	46,600	cu. yd.	7.15	333,190
Portland cement	70,000	bbl.	3.05	213,500

Parking Apron, South 1,100 ft.

Unclassified excavation	380,000	cu. yd.	0.30	114,000
Base course	16,200	cu. yd.	2.09	33,858
Stabilized aggregate base course	8,000	ton	2.05	16,400
Water	10,500	M. gal.	1.43	15,015
Portland cement concrete pavement	47,300	cu. yd.	7.15	338,195
Portland cement	71,000	bbl.	3.05	216,550

4,500,000 yd. Like the rest of the job, the earthmoving is characterized by good management and a big fleet of the latest equipment.

An average of 55,000 cu. yd. are being moved every 18-hr. day by 20 Caterpillar DW21 scrapers supported mainly by 17 D8s and 2 D9s.

The 2 D9s do all the necessary ripping for the scrapers. One of the D9s is equipped with the Soil Breaker which, according to superintendent Don Westbrook, shows up best in the toughest material. The Soil Breaker is a triangular horizontal plate which trails behind the ripper tooth, providing an uplifting action which greatly widens the ripping furrow. It was introduced to readers of WESTERN CONSTRUCTION in the April 1957 issue after its first major field tryout at the Carquinez Big Cut.

The compaction specified in the area under the main runway is 90%

of modified AASHO. The material contains quite a lot of expansive clay, so about 2½% above the optimum moisture content is called for to eliminate future expansion. To prevent inclusion of fat (highly plastic) clay specs call for a Plastic Index of not greater than 30 and a liquid limit not greater than 50.

Variable material

All the material is extremely variable, running all the way from lean clay to sandy gravel. Sometimes two passes with a sheepfoot roller and a blanket roll with a 50-ton pneumatic is sufficient, while in silty or clayey materials four passes with the sheepfoot and four passes with the pneumatic may be required.

Densities run from 103 to 148 lb. per cu. ft. dry weight. The Corps of Engineers has two 2-man crews tak-

ing soil samples constantly. Five point tests are run on 80% of the sample. (This procedure was described last month in the article on Coyo Dam.)

The base course is placed on the finished embankment by rear-dump trucks and spread by Caterpillar motor patrols. Subgrade between headers is made with a Lewis subgrade planer.

The scheduled completion date for the runway project is June of 1958 but if the weather holds the contractor should beat that by several months.

Key personnel

Colonel A. E. McCollam is District Engineer in the Sacramento District of the Army Corps of Engineers. Lt. Col. Paul A. Loop is assistant district engineer for operations, and Lt. Col. L. J. Hamerly is assistant district engineer for administration. Horace A. Johnson is chief, construction operations division. Arden F. Kull is area engineer in the Western area office, and Donald D. Fenton is district office consultant.

At the job site Don Hitchcock is project engineer, assisted by Chester Anderson. H. S. Gibson is project paving engineer. The Army Engineers also has seven field inspectors on the job, and eight men in the field labs.

For Westbrook, Morrison-Knudsen & Parker, Oliver Pope is project manager, Don Westbrook is general superintendent, Tom Hopper is the Sacramento office manager and Betsy Pitman is project office manager. John West is project engineer with Lee Miles as office engineer. Don Hoyt is excavation superintendent. Bill Southworth is concrete superintendent, Don Jensen is batch plant superintendent and Dallas Matthews is master mechanic.

(Personnel photos appear on p. 84.)

Harlan Thompson is in charge for Miles & Sons.

Carl Miller is superintendent for Marin Rock & Sand Company, subcontractors on the crushing.

Melvin Kelso is superintendent for Lefever Trucking Co., subcontractors for furnishing water and finishing the sub-grade.

Setting the headers is PBA Corp. supervised by Tom Salisbury. Underground utilities, electrical work and storm drains are installed by Action Contractors of San Francisco under the supervision of Herb Hendershot and Cecil Roberts.

Drilling a pilot tunnel in Wyoming

Toughest problem was access to east portal, 90 ft. above canyon floor. Aerial tramway was set up after a path was blasted along face of cliff.

CHMIDT CONSTRUCTION Co., Arvada, Colorado, has successfully completed a pilot tunnel for the Wyoming Highway Department, after solving a full share of problems. In order to reach the east portal, located 90 ft. above the canyon floor, it was necessary to blast a path along the rocky face of the cliff, handling supplies and equipment by hand. After the portal was established and the crews were underground an aerial tramway was set up, powered by a Minneapolis-Moline gasoline hoist.

The pilot tunnel is 8 ft. in diameter and 3,440 ft. long, located at the town of a proposed 32-ft. diameter highway tunnel which will eliminate a hazardous section of the Shoshone Canyon route leading to Yellowstone Park. The project, called the Rattle-snake Mountain Pilot Tunnel, is located opposite the Buffalo Bill Reservoir on U. S. Highways 20 and 10, west of Cody, Wyoming.

Purpose of the \$268,000 job was to determine the type of material which will be encountered. It turned out to be primarily granite with quartzite stringers with short sections of schist. Governor M. L. Simpson touched off the final blast, ending the operation 15 days ahead of schedule.

Total excavation for the tunnel line was 8,190 cu. yd. An additional excavation of approximately 80 cu. yd. of rock was required for car passes and the path to the east portal. A 150-ft. ventilation adit of the same diameter was driven at a plus grade from the main tunnel level at a distance of 1,423 ft. from the east portal. Every 250-ft. room was drilled for a roll-over car pass for catching shuttle cars. Moving time for the car pass from one station to the next was 20 min.

Weight of the rock ran 2.4 tons to one cubic yard. Thirteen sets of timber structure on the west portal and eight sets at the ventilation adit were the only support required. Plans



DRILLING CREWS used Atlas Copco airleg rock drills with Sandvik Coromant drill steels. Left to right are Carl Saueruiem, Billy D. Moore, and Charles H. Moore starting a round.



CREWS lay shuttle car line under supervision of tunnel foreman Jess Bingel, right. The 4-ton shuttle car was homemade. Mucking was done with an I-R slusher.

specify that the finished highway tunnel will not be lined.

Work was carried on simultaneously from both ends. Main operation was from the west portal where three-man crews worked on a three-shift, 24-hr. basis. These drilling

EQUIPMENT LIST

- 6 Atlas Copco BBC-22 rock drills
- 1 Atlas Copco LSB-62 automatic grinder
- 1 Eimco 21 loader
- 1 Gardner-Denver 14 loader
- 1 Plymouth diesel locomotive model DDT 8-ton type
- 1 Whitcomb diesel locomotive model 8-ton type
- 1 Ingersoll-Rand air slusher
- 1 Steel portable slusher ramp
- 6 40-cu. ft. rocker dump cars
- 1 Michigan front end loader
- 1 Sturdevant 4600 cfm. blower
- 1 Coppus TM-9 4600 cfm. blower
- 1 Ingersoll-Rand 600 gyroflow portable compressor
- 1 Gardner-Denver 500 portable compressor
- 1 Minneapolis-Moline gasoline hoist
- 1 F-8 Ford Dump truck
- Sandvik Coromant drill steels

teams used two Atlas Copco BBC-22 rock drills with Sandvik Coromant drill steels of 5-ft. 3-in. and 7-ft. 10-in. lengths. Mucking was done with an Eimco 21 and Gardner-Denver 14 loaders. The average footage for a heading crew was 2 ft. per man per shift. Steels were sharpened after 15 ft. of drilling at a central jobsite grinding station on an Atlas Copco LSB-62 automatic grinder.

On the east portal a crew of three men and a foreman, on a one shift



PLYMOUTH diesel engine has pulled two rocker dump cars into position for dumping out west portal. Rock is then reloaded into trucks and hauled to waste site.

per day basis, were maintained. This crew also used two Atlas Copco BBC-22 rock drills with Sandvik Coromant drill steels. Mucking was with an Ingersoll-Rand air slusher using a steel portable ramp and a homemade shuttle car of 4-ton capacity, powered by an Oliver diesel engine.

Blast holes were drilled to a depth of 8 ft. with an average of 39 holes per round. DuPont 1 x 8-in. dynamite sticks and blasting caps were used exclusively, detonated with the new DuPont No. 75 blasting machine.

Broken rock from the west portal was transported in 40-cu. ft. rocker dump cars. The capacity of these

cars was extended to 55 cu. ft. building up the height of the side. Because of the existing highway, rock dumped at the west portal entrance was loaded into trucks with a Michigan front end loader, and hauled short distance for dumping.

Key personnel

For the Wyoming State Highway Department, William Loper was project engineer, and Gailand Mon was tunnel engineer.

William S. Gianetto was tunnel superintendent for Schmidt Construction Co., with Jess Bingel foreman.

License granted for Snake River project

THE FEDERAL Power Commission presiding examiner Edward B. Marsh has filed a decision, subject to review by the Commission, granting a 50-year license to Pacific Northwest Power Co., of Portland, Ore., for its proposed Mountain Sheep-Pleasant Valley hydroelectric project on the Snake River in Idaho and Oregon. The proposed development has been opposed by the National Hells Canyon Association, Inc., and other farm and labor organizations which have supported construction of a federal dam in this stretch of the Snake River. The project would have a combined installed capacity of 1,002,000 kw. initially with an ultimate installation of 1,240,000 kw. Estimated cost ranges from \$167,000,000 to \$173,000,000.

The Mountain Sheep development would include a 250-ft. high concrete gravity dam creating a reservoir extending 20 mi. to the proposed Pleasant Valley development. The Pleasant Valley project would feature a concrete arch

dam about 534 ft. high creating a reservoir 34 mi. upstream to the tailwater of the Hells Canyon dam site of the Idaho Power Co.

Pacific Northwest Power Co. is controlled by four utility companies: The Montana Power Co., The Washington Water Power Co., Pacific Power & Light Co., and Portland General Electric Co.

Vega Dam contract awarded

A \$1,707,145 Bureau of Reclamation contract for the construction of Vega Dam in west-central Colorado has been authorized for award.

Award of the contract for Vega Dam will initiate construction on the Collbran Project. The dam is the principal feature of the project, which will provide a full irrigation water supply to 2,310 ac. and a supplemental supply to 18,340 ac. now irrigated. Last spring the water users completed a repayment contract to return to the Government their share of the costs of the dam.

The project is east of Grand Junction,

near the town of Collbran. Project plans call for the future construction of two small hydroelectric plants with total installed capacity of 13,000 kw.

Commissioner of Reclamation W. Dexheimer said that the contract for the 150-ft. high, 2,035-ft. long earth dam goes to the C. F. Lytle Co., Sioux City, Iowa, on that firm's low bid. Eight bids were received, ranging upwards to a high bid of \$3,206,023.

Pacific Northwest to construct gas lines

THE FEDERAL Power Commission has authorized Pacific Northwest Pipeline Corp. of Salt Lake City, Utah, to construct and operate natural gas facilities in Washington, Colorado and Idaho at an estimated cost of \$2,376,692. Pacific Northwest is authorized to construct 34.5 mi. of 4- and 6-lateral pipeline from its 26-in. line in Snohomish County, Wash., to Grotto, Wash. Also to be constructed is 4.5 mi. 3½-in. lateral line in San Miguel County, Colo. In northern Idaho, 41 mi. of 6½-in. line will be built.

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LONGER
PAVEMENT
LIFE with**

DEHYDRO*

ANTI-STRIPPING ASPHALT ADDITIVE



**HERE ARE
10 REASONS
WHY DEHYDRO
IS USED BY THE
MAJORITY OF
WEST COAST
REFINERS**



*specializing in
chemicals and services
for industry*

Dehydro was used as an anti-stripping additive in the asphalt for this secondary highway built by Los Angeles County. Osborn Paving Company — Contractors.

1
DEHYDRO successfully passes state, county and city tests.

2
DEHYDRO passes rigid military usage specifications.

3
DEHYDRO is manufactured on the West Coast, assuring a dependable supply source, with second morning delivery to the most distant West Coast area.

4
DEHYDRO is safe and easy to handle. It does not cause foaming when added to asphalt.

5
DEHYDRO is heat-stable; it retains its characteristics and properties in the mix at the temperatures required for shipping, handling and storing.

6
DEHYDRO maintains fluidity at temperatures as low as 0° F.

7
DEHYDRO-treated asphalt aggregates rake easily and maintain a "bright" appearance in the mix.

***8**
DEHYDRO is manufactured by the Tretolite Company of California, a reputable Western firm, with many years experience in the manufacture of hydrocarbon treating compounds.

9
DEHYDRO service engineers are always available for customer assistance and consultation.

10
DEHYDRO information, test data and prices are yours for the asking. Just write or call

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Alaska is tough for Nike building

Conditions at Site Summit location on barren Chugach peaks provide a construction battle from surveys to final structures—Helicopter blows stakes out of frozen ground—Wild animals are “sidewalk supers.”



Cernick

Lyon

By **GORDON M. LYON, PROJECT ENGINEER**

U. S. Engineer District, Alaska

As told to

CLIFFORD S. CERNICK

"Alaska Newsletter"

PRESENT NIKE construction in Alaska under supervision of the U. S. Army Engineer District, Alaska, totals more than \$21,000,000. Nike installations are going up at Site Summit, at Site Point and Site Bay in the Anchorage area and at other guided missile sites near Eielson Air Force Base in the Fairbanks region of interior Alaska.

These massive guided missile launching sites, with all the array of buildings and equipment needed to supply and maintain them and their garrisons, will bring additional defense capacity to the continent's northernmost rim. Construction of these sites, already deployed throughout the United States as a defense for industrial, highly-populated and strategic areas, presented special problems when the sites are in Alaska.

These problems can be understood more clearly in discussing construction experience at a specific Alaska site rather than reviewing, in a general way, the difficulties encountered at all such sites in the territory.

One of the basic problems confronting engineers at the Site Summit Nike location in the Chugach Mountains was the necessity of carrying out extensive preliminary studies under adverse conditions.

Location conditions

Site Summit, guarding Fort Richardson, Elmendorf Air Force Base and the Anchorage areas, is located more than 3,000 ft. above sea level in the barren Chugach peaks, exposed to the full force and violence of the elements.

The site required about three times as much preliminary engineering as usual. There were no known points from which to start. The entire survey had to be completed using monuments at a much lower elevation as a base. This required several weeks of field party work just to give us a starting point.

We had to wait several weeks for the snow to melt in order to establish elevations and thus determine how much excavation we would need for

the site, roads required and other construction needs.

Approximately six weeks of field engineering was required on the before a single shovelful of earth could be turned.

Bids on the three Anchorage area Nike sites were opened March 20. The Seattle branch office of Alaska District, Corps of Engineers, Patti-MacDonald Construction Co., St. Louis, and M-B Contracting Co., Seattle, as a joint venture, offered a low total bid of \$9,513,964 for three sites.

On April 5 Col. P. V. Kieffer, Alaska District Engineer, announced award of the contract for the three Anchorage area sites to the joint venture of Patti-MacDonald and M-B. The contractors named William Barker as project superintendent. G. E. Leffer is Alaska project manager for Patti-MacDonald and H. Gall is general superintendent. Daniel J. Dougherty is project engineer for M-B. Supervision for the Corps of Engineers is by the Alaska District, under the Fort Richardson residency, Capt. E. S. Walters, acting resident engineer.

After the bid opening in March, Barker and I visited the Summit Site. We had to travel there on snowshoes because of the heavy drifts still clinging to the hills.

Work on the site got under way approximately April 22. Preliminary work consisted mostly of snow removal. Some of the drifts which had to be cleared before our access road to the construction site could be built were 40 ft. deep.

Seven miles of road had to be built on steep hillsides. Sites had to be picked for Nike launching structures, the battery control building, quarters for the military garrison and necessary utilities.

A temporary road was constructed to the construction sites, following the easiest grade. Then heavy equipment for drilling and blasting was moved in and permanent road work started.

One of those unexpected incidents in every construction supervisor's shopbook took place one bitterly cold spring day just after a crew had completed the laborious task of pounding stakes for the launching structure in the frozen earth. A helicopter passed over, then settled

(Continued on page 41)

ALASKA NIKE JOB

(Continued from page 34)

earth near the site. Blasts of air from the rotors were so powerful they popped out all the stakes.

As the road-building effort progressed, compressors and dirt-moving equipment were moved in for the big job of blasting and excavating required by the site's tough location. More than 20,000 cu. yd. of solid rock had to be blasted to construct the road up the mountain peak where winds and fog, low clouds, rain, snow, sleet and hail often cut visibility.

Using wagon drills and jackhammers a series of holes were drilled and put around a pinnacle to give working space. Some of the holes had to be drilled 28 ft. deep. We have blasted as many as 750 holes at one shot. Fractured rock from the blasting was used to build up the site area.

The type of backfill material on the mountain presented another problem. Ordinarily excavated and classified material can be used in backfilling and is compacted to about 95% density. The material we encountered at Site Summit, however, was altogether different. It consisted of various sizes of fractured rocks giving a deficiency of fines in some instances and in others an over-abundance of fines, depending on the strata in which excavation was taking place. To meet specifications, a problem of sorting and grading to required compaction in the backfill had to be worked out.

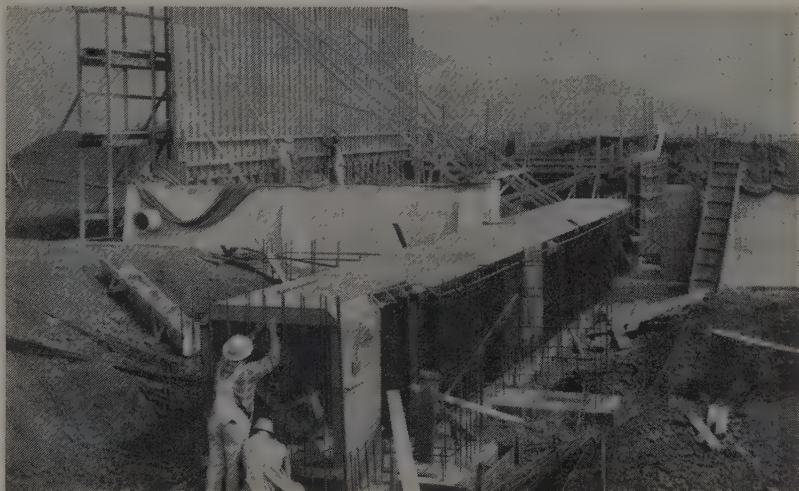
Because of weather conditions at the site and a limited construction season (probably 55 days less than in the lowlands below) high-early cement was used for construction.

A type-III (high-early) cement was used. This cement, which is ground much more finely than the ordinary Portland cement, has a very quick setting action. The initial set takes place within 30 minutes of the time water is added. We found that using this type of cement on the emergency job, the seven-day strength of the concrete was equivalent to 28-day strength where type I cement is used. This special type cement had the added advantage of permitting stripping of forms within 24 hours of placement. Every hour saved by the tractor on stripping time gives another hour in which to proceed on the structure—a vital consideration when the short construction season is a paramount factor.

Cement is bought from an Anchor-



WITH A background of rugged Alaskan scenery, excavation was a problem for both access road and structures. Rock was porous and the ice melted as the surface was uncovered. This water collected in all excavated areas, and heavy rains were common.



SAFETY WAS emphasized on all operations, since hazards were increased by terrain and weather. Weekly safety meetings were held. Instructions were given on the proper clothing to wear during cold and wet weather. The excellent safety record proved these efforts worthwhile.

age supplier and trucked to a batch plant on the mountain at an elevation of 2,600 ft. From here, transit-mix trucks transport the mixture up steep grades to the construction site, located at an elevation of more than 3,900 ft. About 75% of the concrete poured on the job is placed into the forms and slabs by a Bucyrus-Erie 22-B crane.

We soon realized that although we were on top of a mountain, water conditions in the area were a major construction problem.

Rock strata on the mountain, we discovered, were seamy and porous. Large quantities of water trapped within these structures remained frozen until the rock was exposed by excavation. Then the water thawed and collected in large quantities in the excavated area. Terrific rains which occur frequently in the area add to the problem.

Pumps were installed at all the excavation sites, but this was complicated by the fact that excavations were at three levels and water pumped from the highest level found its way into the next-lower excavation, which, in turn, poured into the

next lower area. A series of pumps, working simultaneously allowed us to keep up to schedule with the needed construction.

Jaeger centrifugal pumps were used in this work.

Pumping the excavation area was required at each stage of construction up to the backfill. After concrete was placed and forms stripped, the area had to be kept dry until the surface could be primed with asphalt primer, so a damp-proofing vapor barrier could be applied to the concrete.

Likewise, areas around the building had to be dry before backfilling could take place.

Concrete pouring will continue all this summer and part of next, starting with launching foundation footings for battery control buildings, launching structures, fueling and storage buildings and utility installations.

The only communication between the site and "civilization" is radio, requiring careful planning in dispatching of equipment and supplies to the job.

(Continued on page 78)

Profits sag when contractors neglect a sound plan of— Preventive maintenance for diesels

Equipment supervisors will find much of value and many usable ideas from the successful record of Pacific Intermountain Express and its maintenance plan resulting from years of experience in operating 800 diesel-powered units.

ARE YOUR RESOURCES sliding down a grease trap, and your valuable working capital being towed to a junk heap?

Could be, if you've neglected a sound diesel maintenance program. Can't afford to install one? You can't afford not to—unless you're prepared to stand the expense of wasted man-hours, idle equipment, costly field repairs, and possible penalties incurred by late completion of contracts. Job delays due to unnecessary breakdowns are high-priced.

Admitted, diesel users in these Western states have a fight on their hands right from the start. Huge distances, scorching deserts, rugged mountain climbs can tear the heart out of an engine. Constant wear and tear makes adequate maintenance imperative.

Just how important adequate maintenance is can be readily substantiated by Pacific Intermountain Express whose equipment is subjected to these very same tests of endurance over a 17,000-mi. motor freight system in the Western two-thirds of the nation. Its line-haul runs are dependent on the trouble-free operation of some 800 diesel-powered units.

P-I-E's Preventive Maintenance Program that covers each truck and trailer in the company takes nearly 18¢ of every revenue dollar—a total \$9,000,000 outlay to keep vehicles rolling on time and in good condition. But every cent is worth it, company officials believe. They're confident fleet maintenance more than pays for itself in better customer service, lower labor and repair costs,

less need for equipment replacement and most important in building margin of safety into industrial and highway operations.

Simple in concept, efficient in operation, effective in getting results, P-I-E's program has earned industry-wide acclaim, and could well serve as a pattern for other diesel operators.

In essence, P-I-E's policy is to stop trouble before it starts. A series of carefully spaced checks between each engine overhaul accomplish just that. Mileage intervals are determined by spot inspections, surveys, manufacturers' recommendations and last, but not least, experience. So successful has been the program that mileage between checks has tripled since 1948, hiking the overhaul point from 70,000 to 225,000 mi.

At the end of each run—whether over Donner Pass between Reno and Oakland, through hot desert stretches from Salt Lake City to Los Angeles or other route segments—a shop supervisor decides the mechanic work necessary by studying the v



MAINTENANCE is speeded and improved with good working conditions. This is the type of head-high service pits, with adequate lighting,

and proper ventilation at a P-I-E shop which helped the organization win six consecutive awards in the National Shop Excellence Contest.

Tractor or Truck No.

THIS SECTION & EQUIP. DAMAGE DIAGRAM ON REVERSE SIDE
FOR DRIVER USE ONLY

1st	From _____ To _____ Arrival Time _____ Date _____ Fuel & Oil Added Enroute - Fuel _____ Gallons _____ Oil _____ Quarts _____ Mileage _____ Driver's Remarks: _____ _____ _____ _____
2nd	Driver's Name - _____ From _____ To _____ Arrival Time _____ Date _____ Fuel & Oil Added Enroute - Fuel _____ Gallons _____ Oil _____ Quarts _____ Mileage _____ Driver's Remarks: _____ _____ _____ _____
3rd	Driver's Name - _____ From _____ To _____ Arrival Time _____ Date _____ Fuel & Oil Added Enroute - Fuel _____ Gallons _____ Oil _____ Quarts _____ Mileage _____ Driver's Remarks: _____ _____ _____ _____
4th	Driver's Name - _____ From _____ To _____ Arrival Time _____ Date _____ Fuel & Oil Added Enroute - Fuel _____ Gallons _____ Oil _____ Quarts _____ Mileage _____ Driver's Remarks: _____ _____ _____ _____

NOTE: BEFORE ADDING OIL OR GREASE REFER TO SPECIFICATION AND HOLDER

NOTE: BEFORE ADDING OIL OR GREASE REFER TO SPECIFICATION CARD HOLDER

FORM 120 (7-1-57)

THIS SECTION AND REVERSE SIDE FOR MAINTENANCE USE ONLY

[illegible]

Fuel & Oil Added by Shop - Note: Show Oil in Quarts, and Fuel in Gallons

hicle's accompanying report. This shows when it was last serviced, total mileage, general condition and driver reports.

In compliance with Interstate Commerce Commission regulations,

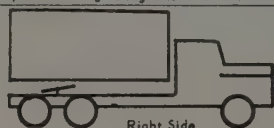
every 1,500 mi., safety items such as brakes, lights, oil and air pressures, tires and fuel lines are scrutinized.

At 2,500 mi., it's time for an "A" inspection which means another safety check plus thorough cleaning

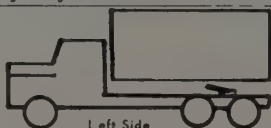
and maintenance of external parts including engine priming, valve hood, front end, cab mounts, battery and fifth wheel. At 7,500 mi., a "B" check subjects these components even more intensive examination and

TRACTOR & TRUCK SERVICE CHECK LIST					
1,200 MILES SAFETY CHECK	MECH. EMP. NO.	INSPECT & REPAIR - Cont.	MECH. EMP. NO.	CLEAN	MECH. EMP. NO.
		Rear Spring, Saddle & "U" bolts Front Spring, Hanger & "U" bolts		Air Boxes Air Compressor Air Cleaner	
CLEAN		Rear Diff. Seal & Mounting Front Diff. Seal & Mounting		Magnetic Plug In DD Pump Oil Strainer	
Windows		Lower Torque Arms Rear Axle Housing		Air Cleaner and Replace Oil	
INSPECT & REPAIR		Aux. Transmission Aux. Transmission Shift		INSPECT & REPAIR	
Tractor Warning System Oil Pressure Gauge		Speedometer Cable Drive Lines & Universal Joints		Air Cleaner Oil Filter	
Air Gauge Air Governor		Main Transmission Steering Linkage		Generator Brushes Starter Brushes	
Ammeter Lights & Reflectors		Exhaust Pipe & Muffler		Starter Commutator Air Heater	
Windshield Wipers Turn Signals		Oil Pan Oil Cooler		Generator Drive Chain, Seal & Coup. Com. Valve & Injector Adj.	
Emergency Equipment Cab Glass		Emergency Stop Air Box Drains		Comp. Unloading Valve Right Fender & Braces	
Horn Defroster & Heater		Gear Case Cover Front Crankshaft Oil Seals		Left Fender & Braces Dromedary box & Mounting	
Foot Brake Lever Emerg. Breakaway Control Valve		Engine & Radiator Mounting Blower		Connecting Tube Bearings Lubricate Starter Bearings	
Trailer Brake Valve Sun Visor & Mounting		Engine Soft Plugs Comp. Release		Change Fuel Filters	
Shovel Check Blocks		Fuel Pump Drive Chain Shutter & Operation		15,000 MILES B ₁ CHECK Perform B Check & Following	
Trailer Hose, Glad hand & Valve Trailer Electrical Connection		Water Hoses Water Manifold		CHANGE	
Emergency Brake Air Tanks		Throttle Linkage Compressor & Lines		Engine Oil Sock-Type Oil Strainer Elements	
Brakes Brake Chamber & Lines		Water Pump Head Lights & Driving Light Wires		Oil Filters	
Radiator for Leaks Exhaust Manifold		Engine Oil Condition		75,000 MILES C CHECK Perform B ₁ Check & Following	
Fan, Fan Belts & Fan Hub Fuel & Air Lines		L.F.F. Wheel Bearing L.F.R. Wheel Bearing		INSPECT & REPAIR	
TIGHTEN		R.F.F. Wheel Bearing R.F.R. Wheel Bearing			
Wheel Nuts		R.F.D. Wheel Bearing R.R.D. Wheel Bearing		Front Wheel Toe-In Cut Out Relay	
CHECK		L.F.D. Wheel Bearing L.R.D. Wheel Bearing		Maximum Voltage Current Regulator	
Tire Air Pressure		License Plates & Cab Cards		RESET	
2,500 MILES A CHECK Perform Safety Check & Following		CHECK		GMC Gov., Valves & Injectors	
CLEAN		Tire Condition & Matching		CHANGE	
Cab Interior & Exterior Fuel Pump Screens		LUBRICATE		Shutterstat Fan & Compressor Belts	
GMC Air Box Drains		Throttle Ball Joints Shutter Bearings		Water Hoses Cuno Fuel Filter	
DRAIN		Door Hinges, Locks and Dovetail Generator Bearings		Cum. Oil Cooler Air Cleaner	
Air Tanks Sediment from Tanks & Filters		Drag Line Steering Spindle		REPACK	
INSPECT & REPAIR		Front Spring Pins Clutch Release Bearing		L.F.F. Wheel Bearing L.F.R. Wheel Bearing	
Clutch Lever Gear Shift Lever		Brake Shoe Anchor Pins Brake Cam Bearings		L.F.D. Wheel Bearing L.R.D. Wheel Bearing	
Engine Priming Valve Weatherstripping		Slack Adjusters Universal Joints		R.F.F. Wheel Bearing R.F.R. Wheel Bearing	
Doors & Door Locks Rear View Mirror & Arm		Fifth Wheel Pins Fifth Wheel Plate		R.F.D. Wheel Bearing R.R.D. Wheel Bearing	
Hood and Hood Hooks Bumper & Front End		Connecting Tube Check Trans. Oil Level		Connecting Tube Bearing	
Fuel Tank, Cap & Straps Frame		Check Diff. Oil Level Check Steering Gear Oil Level		DRAIN & REFILL	
Cab Mounts Fifth Wheel		Check Engine Oil Level Check Oil in Air Cleaners		Radiator & Add Soluble Oil	
Battery Cables		Hydraulic Fan		Transmissions Differentials	
Battery Condition & Water Level		7,500 MILES B CHECK Perform A Check & Following		TEST	
				Tractor on Chassis Dyno.	

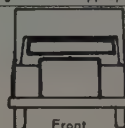
Equipment Damage Diagrams: Note: Individual discovering damage should indicate location of damage by placing an 'x' in appropriate place on appropriate diagram.



Right Side



Left Side



Front



Rear

provides maintenance as required and chassis lubrication. Often called a "fancy lube job," the "B-1" at 15,000 mi. once more gives close attention to these points and in addition provides for changing of oil, oil filters and sock-type oil strainer elements. The most detailed "C"-check examination prior to an overhaul comes at 75,000 mi. when valves, injectors, belts and air cleaners are replaced. Dynamometer test at this stage takes the truck through its engine rpm. range under simulated driving conditions and gives valuable clues to hidden trouble spots.

When 225,000 mi. are run, the truck is entitled to complete "face-lifting" at one of P-I-E's general shops—either at Denver, Portland, or Los Angeles. Fleet maintenance representatives are quick to point out, however, that major overhauls are not restricted to a rigid mileage schedule. They're performed solely on the basis of need in line with prior maintenance reports and the assigned foreman's judgment.

The preventive maintenance program described in the preceding paragraphs, from 1,200-mi. safety check to final 225,000-mi. overhaul, has been developed after years of intensive study by operating and shop executives of P-I-E. Two concise but complete charts have recently been prepared for the use of drivers and shop men, providing all needed information on the servicing record. These charts are reproduced completely with this article.

P-I-E's most modern shop installation is the 68,000-sq. ft. Los Angeles facility equipped with overhead cranes, a machine shop, ceiling flues to eliminate exhaust fumes, and four service pits, each 70 ft. long. The installation can service an average of 10 vehicles per 8-hr. shift.

After 225,000 mi. are turned on the speedometer a foreman studies the log for each vehicle. If the unit still in good condition it may make a few more trips. Before any serious trouble develops "Overhaul" is written on the "Work to be done" line. This one word sends the truck down the line where it is dismantled part by part and piece by piece to start rebuilding a "new" unit.

Used parts are disassembled, inspected, repaired or rebuilt, and stored for future use. The stripped-down frame starts along an assembly line and comes off the end completely reconditioned and ready to take its load a distance equal to ten times around the world.

Now long is a unit laid out for a



FAMILIAR sight on Western highways, the diesel engine in this truck receives servicing and maintenance that keeps it running 225,000 mi. between complete "overhauls."

maintenance check or overhaul? P-I-E estimates that an expert mechanic can give a diesel unit a thorough "A" check and write it up in less than an hour. At the Los Angeles shop a diesel-powered rig can be overhauled, painted, and be back on the road in 48 hr.

P-I-E recognizes that equipment wear varies among different units. And this trucking firm would be the first to admit that success or failure of its maintenance program hinges on the judgment and skill of the men who wield the wrenches and micrometers in company shops. Shop employees are encouraged to use service and maintenance procedures prescribed in mileage charts as guides—not as orders to be blindly obeyed.

To further accelerate engine diagnosis, P-I-E has contracted to purchase a spectrometer which will provide a chemical analysis of crankcase oil samples to accurately reveal the condition of the engine and pinpoint potential trouble spots. Its installation is expected to extend intervals for overhauls from 225,000 to 300,000 mi.

An adjunct to any practical service and maintenance program, and one not to be underestimated, is a controlled system for recording inspection data. Reports of parts, labor, mileage and type of service expended on each unit assure the company that proper inspection and maintenance are being performed at prescribed

mileage intervals. Moreover, they offer a built-in cost accounting and inventory control system.

P-I-E officials fully realize the truth in that saying "Give him enough red tape and he'll hang himself." They don't intend to be burdened by unnecessary paperwork, so there is constant alertness for methods to simplify and compress fleet maintenance records without reducing useful information. One solution is the Driver Trip Report and Shop Service Report reproduced with this article, providing a running account of all required data for the maintenance central control point.

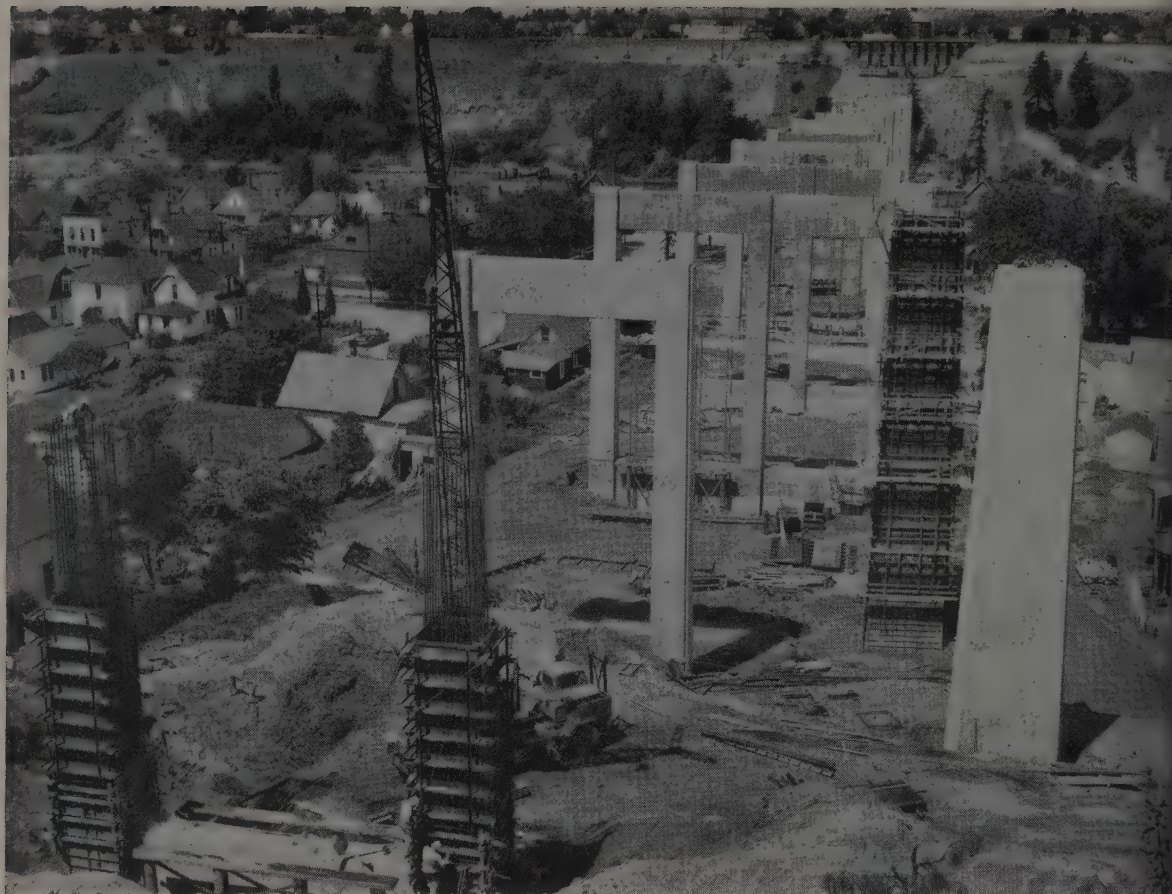
At the end of each haul, the driver must record point of origin, destination, mileage, fuel and oil additions plus his evaluation of the vehicle's condition. From this Driver Trip Report section a foreman can decide the maintenance work required. His instructions, written on the form, are carried out by a journeyman mechanic.

The same day the truck is ready to roll, this entire report (Form 120) is coded on IBM cards from which periodic reports are made. Thus, P-I-E has an up-to-date record of vehicular mileage, maintenance performed, fuel and oil consumed, types of parts replaced, and most vital, an indication of the success of its maintenance procedures. Briefly, management knows where maintenance money is going—and why!

Of course, there is the danger of under-maintenance, often predicated by financial conditions, or over-maintenance which reflects lack of cost-consciousness. The latter means wasted materials and labor costs. On the other hand, under-maintenance increases road failures and job delays. A well-planned program must achieve a balance where necessary maintenance is handled within budgetary limitations.

By applying its preventive maintenance procedures, P-I-E is always working toward "a fleet owner's dream"—vehicles that never break down nor wear out! The company still gets good service from some units purchased as far back as 1947. Its fleet is kept up-to-date by trading in serviceable equipment and replacing these with new, more advanced models. Maximum equipment performance is the goal.

An adequate preventive maintenance program carried out by skilled employees will help turn profits for any company toward the bank rather than down a grease trap or to the junk heap.



Substructure for Spokane toll bridge

Foundation problems, unusual job-made forms, and coordination of four contracts are features of project.

UNFORESEEN schedule and construction problems occur on every job and estimating engineers often give as much consideration to the potential "problem factor" in the bidding of a job as they do to the specifications themselves. Take a job, however, that calls for four contracts to be carried on simultaneously, each with a work schedule that must accommodate the other and you have a "gray hair" stimulant for the planning force of any construction firm. Add to that the necessity of maintaining normal railroad and street traffic on a large portion of the job area and at the same time maintain favorable public relations amongst a dozen city blocks of residential property within the construction area and you have more than the usual number of headaches.

When the Washington State Toll Bridge Authority finally worked out their planning and financing problems on the Maple Street Toll Bridge in Spokane, Washington, they were well aware that their invitation-to-bid carried no ordinary challenge. Strictly a locally planned project from the start, financing necessitated more than an ordinary appeal for public support. The \$5,000,000 bridge, including cost of acquiring right-of-way, was to be financed by 4% bonds to be liquidated over a period of years by a 10c toll fee.

Planners forecast a traffic expectation of near 3,500,000 vehicles with the bridge opening scheduled in 1958 and a steady traffic increase to over double that in the next 20 years. Appreciative of the public selling factor necessary to secure public ap-

proval as well as Toll Bridge Authority sanction, the project designer Tudor Engineering Company of San Francisco, California, presented most thorough and appealing method of toll collection as a part of the prepared plans. All toll collection were to be automatic to avoid operational expense. The motorist need only drop his dime in a slot to receive a green light to clear him past the toll gate with one lane accommodating a semi-automatic change-making booth.

In the final award the project was parceled out to four prime contractors with the Washington State Department of Highways supervising the construction for the Toll Bridge Authority.

Paul Carnine was named resident engineer for the State with his staff made up of Frank Flagan, Gardner Johnson, Paul Drake, Gerry Sanford, Ed Grover, Vernon Wagner, No Elliott, Gil Hergesheimer, Fred Pop, Don Davis and Sherm Bradley.

First phase of the 4-part contract

more speed...
more heap...
more pay...
here's why!



One of 3 C Tournapulls with Fullpak scrapers, operated by Robert J. Farish, So. San Francisco, Calif. These easy-loading 18-yd. scrapers prepared roads and 400 homesites in Pacific Heights subdivision, south of San Francisco. Push-loaded by 191 hp tractor, C Fullpaks heaped average 12 pay-yards of dry, tough high-void shale and clay in 45 seconds. Units then hauled 174' down 16% grade in 31 sec.; spread over 154' in 15 sec.; returned 15' upgrade in 87 sec.; completed 958' cycle in 2 min. 58 sec.

On average jobs — on your bread-and-butter work — you'll load faster and easier, heap more yards, and move more pay dirt per day in a C Tournapull® with Fullpak* scraper. Here's why!

This LeTourneau-Westinghouse "C" gives you big rated load capacity of 18 heaped yards. Yet, using your same pusher, easy-loading Fullpak scraper gets capacity low-void pay-loads, *faster* and with *less* effort than many smaller rigs... hauls extra pay-yards in the time saved.

Look for the "boil"

You'll know a Fullpak by the slick way it loads. Dirt rolls in easily, fills back corners, "boils" up with lively thrust of incoming material. Curved top on tailgate directs material up and forward, to pack in extra pay-yards. Clean, smooth side sheets let scraper build a high heap without wasting power and load time.

Less work against gravity

Your pusher makes quick contact with "C's" big 43" x 16", easy target push-block. Pusher power is directed straight to blade, for easiest cutting. Scraper wheels inside 9½' cutting width, hold wide, flat-bottom bowl low... angled only 2°. Dirt slides in almost horizontally, so unit uses less power for lifting... applies more "muscle" to slicing thru tough material fast.

Quick-release on bowl-hoist lets your operator "pump" huge loads in loose material. Apron lifts 6'1" high, for fast loading and unloading of chunky material. Clear, unobstructed view of load, blade, and pusher, saves seconds of uncertainty... avoids wasteful overloading.

Extra cycles... extra yardage

Every round-trip, C Fullpak saves time in the cut... picks up more time on the haul, spread, and return. It makes more cycles — it earns more "pay" — than other comparable self-propelled scrapers.

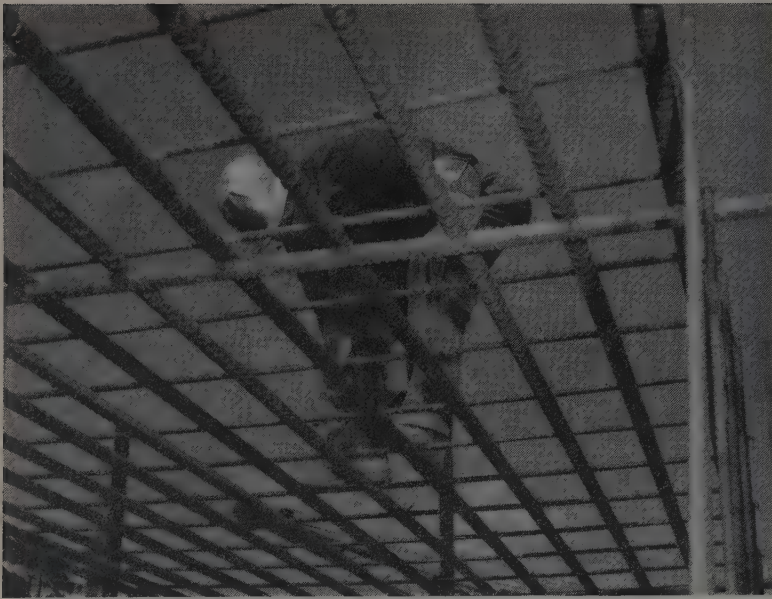
Compare this fast-loading C Fullpak with scrapers you're now using, or having demonstrated... in same material... with same pusher. Ask us to prove our performance.

*Trademark CP-1553-DCJ-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



STEELWORKER sets reinforcing bars for one of the piers for Spokane's Maple St. toll bridge. Bethlehem Pacific's Seattle plant supplied 500 tons of reinforcing steel.

to start was the \$674,552 substructure awarded to Morrison-Knudsen Co., Inc. This contract called for construction of the 20 concrete piers of the substructure. The piers varied in height from 25 to 130 ft. The piers were of 2-column design with all outside columns having a double batter.

The bridge itself calls for two 24-ft. roadways with a 2-ft. dividing strip in the center and a 5-ft. bordering sidewalk. In the superstructure specifications two main steel girders averaging 150 ft. to the span with lateral bracing will support the roadways. Steel structure would be both riveted and welded with, in some instances, the contractor being given the option of using high strength bolts. The bridge deck was to be paved with lightweight expanded shale concrete under a subcontract awarded the Louis Elterich Co. of Port Angeles, Wash.

Morrison-Knudsen Co., Inc., placed V. E. Valentine in charge of the job as project manager. Valentine's headaches came fast. It was found that the particular geological formation on the south shore of the river would not take the steel shell casing to be used for the concrete forms of the piers. The design called for the driving of 381 of these steel casings exclusive of the two piers that would have their foundation in the river bed.

By means of test pits, Valentine quickly disclosed a layer of hard gravel over a soft clay layer with a good sand foundation beneath the clay. To meet the problem, specifica-

tions were changed to permit the driving of H-piling down to depths of 25 to 77 ft.

Novel plywood forms

A novel method of placing concrete pier forms quickly overcame the schedule changes experienced. Forms were prepared in 16-ft. sections allowing for 32 ft. of pour to the setting. Plywood $\frac{1}{4}$ in. thick backed with 2 x 6's with vertical steel walers made of 9-in. channel iron were fastened together with four $\frac{3}{4}$ -in. bolts at the corners to form each 16-ft. section. A section of forms could be installed in approximately 3 hr. and could be reused as many times as desired. For erection work of the forms two cranes, one a Northwest 80-D crawler-mounted crane and a Lorain 20-ton Moto-Crane were used.

With the substructure contract well under way, the north and south shore bridge approach contracts were started. The south shore contract for \$300,729 awarded to Charles A. Power of Spokane was scheduled for 315 working days plus authorized shutdowns while the north shore approach awarded to Henry Hagman of Spokane at \$763,387 was given the same timing schedule. However, the north shore contract got under way in November 1956 while the south shore approach was not begun until January 1957. The north shore approach presented the most involved problem in that the bridge thoroughfare would be made

up of an overpass structure for or avenue of traffic as well as an overpass structure and fill for the clearance of two mainline railroads, the Union Pacific and the Great Northern. The north shore approach also included the toll plaza.

Oliver Braaten was named superintendent of the north approach job with the right-of-way excavation work subcontracted to Neil Degestrom.

In the Broadway Ave. overpass, 430-ft. long retaining wall was erected and for the two railroads the contractor built shooflies around the construction area, with piling used for supports. The belt loader and tractor method of excavating was used throughout with a Hough Paul loader being used on some sand work. Other major equipment on the job included a Lorain 15-ton Moto-Crane, a Luria Model 34 crawler crane, 2 Caterpillar D-9s, 3 Caterpillar D-8s, one Caterpillar D-4, 4 with dozer blades, 2 Caterpillar Motor Patrol No. 12s, 3 Euclid scrapers, one Euclid bottom dump truck, 10 10-yard rear dump trucks and one skid pile driver. With never a day loss in schedule the approach job went ahead with railroad traffic on the two mainlines of the Union Pacific and the Great Northern never being interrupted.

On the south shore approach, J. G. Manser was named superintendent. Here also the main job was that excavation for the north-bound lane to the bridge allowing for a curved off-ramp for south-bound traffic and the construction of two overpasses for streets near the bridge.

Two problems confronting the south shore approach were the necessity of demolishing existing structures, mostly residences and motels and for the off-ramp excavation 1,150 ft. which went from zero down to 22 ft. below street level. The 22-deep ramp went 600 ft. from the railroad to the bridge. The two overpass structures, on Riverside and First Avenues, were supported by 2-ft. thick foundation of reinforced concrete. Superintendent Manser utilized a Northwest Model 6 shoofly with six International 6-yd. rear dump trucks for his excavation and a Northwest Model 25 truck-mounted crane and a Northwest Model 25 crawler mounted crane for his lift work.

The fourth contract awarded was for a superstructure with the American Bridge Division of the U.S. Steel Corporation receiving the award of \$1,596,152.

Builds mile-long berm for concrete irrigation ditch at Arizona ranch



Completed concrete-lined irrigation ditch
— like that under construction at Wing
Low Ranch, 25 miles northwest of Tucson.

20 hp torque-converter grader averages 4.73 mph on heavy ditch-cuts

Eddie Givens Ditching Co. builds irrigation ditches for ranchers in the arid land around its headquarters at Wing Low Ranch, Arizona. This affiliate of the Eddie Givens Construction Co. is its investment in an Adams* POWER-Flow* 660 grader pays off in the work done each day... in faster completion... in lower costs.

Superintendent Pat Duhamell says, "This Power-Flow grader is the best we've had that ever hit our company! As

the need arises, we will replace our motor grader fleet with more '660's'."

Loosens ground... borrows side dirt

The torque-converter-drive Adams built a 14' berm... foundation for a mile-long, concrete-lined feeder ditch to carry precious well water across the Wing Low Ranch, 25 miles NW of Tucson. 190 hp grader bladed through sandy loam and tough caliche subsoil... loosened the dirt with ditch-cuts... then borrowed side material and formed the berm over this loose ground.

A special ditching plow then cut out the precise ditch contour, which served as the outer form for concrete lining. During construction of the berm, water was sprinkled on the loose dirt. This aided compaction, kept ground plastic and stable for ditch-excavation, and slowed setting of concrete.

Full-throttle operation on 2700' stretch

POWER-Flow 660 was timed on 10 consecutive ditch-cuts. In 2nd gear-

range (0.0 to 7.6 mph) grader averaged 4.73 mph per pass, from start to stop. At the end of each cut, Adams' heel-toe forward-reverse clutch made it easy to reposition, in an average 53 sec.

Operator Dick Van Weelden started each pass with a big cut, using full rpm from a dead stop. He continued with full power as he accelerated the load. At high blading speed, grader attained maximum output... top speed for that particular blade-load... fast as full engine-power could move the dirt.

Thus, POWER-Flow transmission actually gives you the effective work-power of an infinite number of gear ratios. Tailshaft governor maintains constant grader speed pre-selected by operator. No operator action or judgment is required. POWER-Flow accurately and automatically changes gear ratios in the pre-selected range, as work conditions vary... *automatically moves more dirt, faster!*

"Other graders just can't compare with Power-Flow 660," says Operator Van Weelden. "It has lots more power, and works faster... really rolls the dirt."

For your toughest grading, you'll want at least one of these profit-boosting 190 hp POWER-Flow 660's. Call or write for a demonstration.

*Trademark G-1523-DCJ-1



... loosening dirt in place, Eddie Givens Ditching Co.'s POWER-Flow 660 borrows material at one side, builds 14' berm over loosened ground. With fully loaded 14' x 28" blade, grader rolls a big load at about 6 mph.

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Road paving starts at Glen Canyon

Contractor is assembling a portable asphalt plant capable of producing over 200 tons per hr. as work starts on paving 25 mi. of access roads and an airstrip.

A MINNEAPOLIS, Minn., construction firm is betting on one of the largest asphalt plants manufactured to complete the paving of 25 mi. of access highway and an airstrip at Glen Canyon Dam in less than three months.

A \$1,517,412 contract for the surfacing of the Bitter Springs Access Highway and airport at Page, Ariz., was awarded to the Alexander Construction Co. May 31 with 180 days to complete the job.

In mid August the contractor transported the first sections of a mobile Barber-Greene Continuous Hot Plant, Model 848-A, to Manson Mesa near the Glen Canyon townsite where crushing equipment had already been put into operation stockpiling aggregate.

The 4-unit plant will have a total output of over 200 tons per hr., making it one of the largest in use. The gravel, which is excavated and crushed on the site, is fed into a 9 x 20-ft. dryer where the moisture is removed by a fuel oil and air mixture blown in and ignited at 300 deg. F.

Also combined in the drying operation is the removal of dust by an 8-ft. squirrel cage suction fan with 3-ft. blades. The dust which is sucked out by this action is deposited in conical shaped silos.

A hotstone elevator fitted on the end of the shoot of the dryer feeds the material into a vibrator shaker where screens separate the material into bins. A volumetric system is used in feeding the dry aggregate onto conveyor belts where it is mixed with asphalt oil in the pugmill.

The gravel is broken down to size by two Cedarapids crushers with outputs of 250 and 350 tons per hr. Other equipment used on the job includes an 80 Northwest shovel with a 2½-yd. dipper, a Lorain 1-yd. crane and a fleet of International 5-yd. trucks.

Up to 400 gal. of water per min. will be pumped from the Colorado River and transported by means of a



AS THE UNITS of the asphalt plant arrive on the job a Lorain crane begins assembling them. The 9 x 12-ft. rotary dryer on the right is the largest made. The barrenness of the countryside in the background indicates the remoteness of the project site.



WHEN ALEXANDER Construction Co. gets the plant in operation it will resemble the above photo of a typical installation. The Model 84A is Barber-Greene's largest.

6-in. steel pipeline to the job site. An estimated 18,000 M gal. will be required for preparation of the road subgrade while another 8,000 M gal. will go into the construction of the airstrip.

Oil for the job will be shipped from Standard Oil Co. of Calif. refineries to the railhead at Flagstaff, Ariz., and from there transported by tanker truck to the dam site.

A total of 121,400 tons of plant-mix bituminous surfacing will be needed for airport and road construction with 1,465 tons of liquid

asphalt for prime and tack coats 6,020 tons of asphalt cement; an 885 tons emulsified asphalt for seal coat.

Specifications for surfacing call for a crushed rock base course of 6 in. a prime coat of liquid asphalt over the entire width of the base, a plant mix surfacing, and a stone-chip seal coat. The amount of asphalt oil used in the plant-mix will vary from 3-7% depending on the nature of the aggregate.

The entire job is to be complete by Nov. 27.

In restricted areas,

Rear-Dumps outmaneuver, outproduce ordinary haulers



... fast maneuvering in confined
ing areas... hauling heavy mate-
over poorly-graded winding roads,
dumping safely over high embank-
ts... investigate the advantages of
y-duty Tournapull® Rear-Dumps.

ort turns speed loading cycle

... the 22-ton "C" Rear-Dumps, for
ance... middleweights in the Le-
neau-Westinghouse line. In con-
d loading areas, where width of
ing is limited, "C's" short 28'8"
in haul position (only 20'8" in
p position) comes in mighty han-
It enables operator to maneuver
ly and easily... spot fast under
er. Compare this tight-turn ability
that of ordinary dump trucks in
"C's" tonnage hauling class.

... 'Pull's low rear-entry (5'8") lets
el operator swing bucket in and
of bowl at low dumping heights.
vel can heap a good load in a
y, with minimum spillage.

762 sq. in. of brake surface

... multiple-disc air brakes on all 4 wheels
3,762 sq. in. of braking surface...
ide ample safety for downhill haul.

... special safety feature for hilly work
s is the optional *Electrotarder*. It
ides auxiliary non-wear, electric-
tance braking through generator
rive-shaft... virtually slows ma-
e to a "walk" without braking.

Dumps fast, safely... keeps firm footing

To dump, operator wheels and spots
fast at edge of target area. Setting in-
dependently-controlled rear-wheel
brakes only, he activates electric hoist
motor to raise body into "dump" po-
sition. As body raises, wheelbase short-
ens... swinging bowl below and be-
tween rear wheels. This keeps rocks,
stones, etc., from piling under hauler
or against rear wheels during dump.
Front-wheel drive keeps power and
traction on solid footing, well ahead
of rear wheels.

Rear-Dumps have 4-way built-in pro-
tection against bogging down: 1) Pow-
er-transfer differential automatically
transfers most of the power from slip-
ping wheel to wheel on firm footing.
2) Power-steer through geared kingpin
"walks" prime-mover out of ruts—
should both drive wheels bog down.
3) "Hump" action, in dumping, brings
rear wheels forward as body raises,
pushes front wheels forward as bowl is
lowered, to inch hauler out of soft foot-
ing. 4) Big, low-pressure tires on all
wheels float over, don't dig into loose
materials, keep traction always.

Interchangeability adds profits

'Tournapull Rear-Dump's "bonus" is
its interchangeability feature. Rear-
Dump body can be easily switched
with 18-cu. yd. scraper, 20-ton flat-bed
hauler, bottom-dump or crane. Change-

At this quarry, C Tournapull Rear-Dumps are
loaded with rock and overburden by a large-
capacity shovel. Here the machine's big air-
brakes, simple electric controls, positive power-
steer, and 90° turning radius, enable it to spot
fast under the dipper, maneuver safely and
easily over boulder-strewn surfaces.

'Pull's operator backs "C" right up to edge of
embankment. Streamlined bowl sheds material
readily, clear over bank. Clean unloading cuts
costs for dozer cleanup. Front-wheel drive per-
mits fast, safe getaway after dump.



over, using same 2-wheel prime-mover,
takes just a few hours.

Increase your earning power with this
interchangeable unit. Handle more
work at a profit... all year-around!
There's a Rear-Dump size... 11, 22 or
35 tons... to match the capacity of
your shovel. Ask for details.

CR-1205-DC-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Ocean outfall project features control by —

Helicopters, radio, and television

Use of the latest equipment for communication and transportation made the Hyperion outfall project resemble a military invasion—with the difference that progress was measured from the shore outward.

BOTH SPEED of construction and a unique method of laying 7 mi. of submarine pipe at the Hyperion Ocean Outfall Project at Los Angeles (WESTERN CONSTRUCTION, July 1957) tended to overshadow another important aspect of the job. While this was the longest, deepest, and fastest submarine pipe laying job of its kind to date, it was also like a modern military invasion operation in its use of the helicopter, radio, television, and divers. In this case, the operation was from the shore outward.

A most vital factor in the expediting and coordinating of the job was the use of the helicopter. A pontoon-equipped, three-place Hiller 12-C from International Helicopters of Los Angeles was employed. It was flown by Pilots Frank Mettner and Stan Winchester. A four-fold function of personnel transport, emergency servicing, aerial inspection and coordination, and project filming work was assigned to it.

Personnel and equipment were

ferried to the barges offshore when time was an important factor, or when it was too rough for launches. Key supervising personnel were frequently flown from Long Beach, by-passing one of the nation's busiest auto traffic complexes.

A daily aerial reconnaissance was made with the job foreman aboard to take progress and expediting notes, as were daily flights with a movie cameraman to record the job.

Most important example of the time-saving afforded by the helicopter was a breakdown occurring on the pulling barge, a converted LSM fitted with a 1,000,000-lb. capacity Seamaster winch used to pull the pipeline out to sea. It was necessary to bring both a mechanic and spare parts out from Los Angeles. Leapfrogging the metropolitan rush hour traffic, the helicopter dropped into a downtown parking lot, picked up the mechanic and parts, and returned to the barge, miles out at sea—repair was complete in an hour's time.

On one trip, a 600-lb. winch trans-

mission was carried out to the pulling barge, slung between the helicopter pontoons.

When rough offshore weather made launch operation risky or impossible, complete personnel shifting had to be made by air. A landing platform had been constructed on the pulling barge, and the pilots rapidly evolved the proper technique of landing on the rolling and pitching barge.

Some 20 two-way radio sets, Dumont and Motorola, provided the only communication from the shore operations to the launching range area ashore. Both the Dumont Model MCA-104-B and the Motorola Model T61GJD-1 battery-powered portable sets, fixed at 43.02 megacycles, were used by Submarine Pipeline Construction Co. and Healy-Tibbitts Co., joint contractors on the job with DeLong Corp. Maximum range needed was 25 mi., with satisfactory performance at that distance.

An important function of the portable two-way units was in the surveyors' triangulation of the center line of the pipe as it was pulled out to sea. "Fixes" were made from base leg between two widely separated shore points. These had already been vital in positioning the 160,000-lb. end anchor and aligning the pulling cables. Constant communication had to be maintained between the pulling barge, the shore control tower, and the men manning the pullback winch used to maintain alignment and to prevent overrunning of the pipe sections.

As progress was made toward the 300-ft. depth where the line would terminate, it became increasingly difficult for divers to inspect the movement of the pipeline along the bottom. The underwater television equipment made by Underwater Surveys of San Diego was put to good use. Their Model G-2 camera, coupled with a high-intensity light unit, provided observers with a clear image of the conditions under water on a 10-in. monitor set.

Full use of divers with standard deep-sea equipment rounded out the aspect of military coordination presented by the entire Hyperion job.

R. R. Helen was project manager for Healy-Tibbitts-Submarine Division on the \$2,526,044 project.



THE HOLD-BACK winch on the shore and the pulling barge at sea were coordinated by two-way radio communication. The pipe-pulling technique was described in the July issue.

trips dirt for 6000' taxi-way t mile-high Farmington Airport



R. Brown's Tournatractor, with cable-operated scraper, self-loads about 8 loose yards of taxi-strip excavation at Farmington, N. M., Municipal Airport.

ing parallel to the cut, operator Ed. L. presses toggle switches, operates scraper bowl, apron, and tailgate electrically... loads dirt precisely, on-the-run.



ork-and-run Tournatractor® handles boom-town dirtmoving

ington, N. M., is a modern boom-town... center of feverish petroleum and uranium operations in the San Juan Basin. Population of the high, western-slope city has tripled in the past 7 years — from 3,637 to its present 21,000.

To handle the increasing load of dirtmoving work — in an area where job-to-job travel over unpaved roads is typical — Scott R. Brown, Farmington, purchased a speedy over-tired LeTourneau-Westinghouse Tournatractor. His 210 hp work-and-run tractor goes anywhere and everywhere. It moves dirt for paving and extending city streets, grades subdivisions... pioneers new roads... develops oil field drilling sites... and maintains Farmington's hydroelectric water supply line on the Animas River.

The Tournatractor with scraper blade grades for paving contractor. Based air traffic made necessary construction of a 6000' all-

weather taxi-way at Farmington's Municipal Airport. City awarded the contract to Jensen Ready-Mix Co., which engaged Brown to handle the dirt work for the project.

Brown's regular operator drove the C Tournatractor, with an 11-yd. L-W scraper, out to the airport. At the mile-high field, the combination worked all alone... took level cuts along the taxi-strip and wasted dirt on-the-run, parallel to the new strip. The outfit self-loaded about 8 loose yards in 1¼ min., in 100'... completed 250' cycles in 2½ min. After Tournatractor-scraper finished dirtmoving, a grader smoothed the subgrade, ready for base and surfacing.

Moves on and off jobs fast

Tournatractor mobility enables Brown to move his equipment around quickly. For instance, on day photos were taken, operator Ed. L. Groat worked Tournatractor about three-fourths of the day on the taxi-

strip, then "high-balled" down to the city's water supply dam to do a bit of needed maintenance. Next morning, the 1-man work team was back on the airport job.

Says Groat, "This Tournatractor is much faster than a crawler. It gets around much quicker to the many scattered jobs we have up here. It's easy to operate... easy on me!"

Finger-tip controls

Tournatractor operates Contractor Brown's 15-year-old scraper almost as fast and smooth as a modern self-propelled scraper. Tractor has an L-W double-drum control unit, powered by two L-W electric motors which precisely control scraper's bowl, apron, and tailgate. The same instant-action control system raises or lowers the bulldozer blade.

If you want real dirtmoving power... plus work-and-run mobility... see the modern 210 hp Tournatractor. Call or write for complete information and a demonstration.

CTS-1269-DC-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

High lifts for approach girders

Steel erection on the parallel Carquinez bridge included two 20-ton members 8 ft. deep and 105 ft. long. Two cranes made the lift of 120 ft.

TWO FIFTY-TON crawler cranes equipped with king-sized booms were necessary to lift long and ponderous steel girders into place in the last stretch of the approaches for the new Carquinez Straits bridge and Crockett interchange.

As steel erection for these approaches nears the point where connection will be made with the old and new bridges, progressively heavier sections of steel will be needed for the longer spans.

Bethlehem Pacific Coast Steel Corporation, prime subcontractor for the job, will have erected some 4,400 tons of steel by the end of August when this portion of the project is expected to be completed. Most of the steelwork is in the form of heavy welded plate girders. The web of these girders varies from 8 to a maximum of 12 ft. in depth for the longest spans.

To lift the girders in place at higher elevations, a team of two crawlers, one equipped with a 130-ft. hammer head boom, the other with a 140-ft. hammer head, was necessary.

Typical of their assignment were two lifts of 105-ft. long sections, weighing 22 tons apiece. They were raised to an elevation of 120 ft. These girders had an 8-ft. web and flanges were 2½ in. thick at the splice ends.

In this case, the lifted sections were to be spliced over falsework for a total span of 150 ft. For purposes of erection, however, the span was divided into thirds. The first third was composed of two 45-ft. girders erected from a pier to falsework at the 120-ft. elevation. Girders forming the other two-thirds of the span were spliced together on the ground into two 105-ft. sections.

The long sections were erected one at a time with a truck relaying them to a "pick" position underneath the 120-ft. piers. Here two crawler cranes equipped with the long booms raised them to their final connecting position.

One of the difficult tasks for Beth-



WITH HAMMER-HEAD booms 130 ft. and 140 ft. long these two cranes picked up and placed this 105-ft. 22-ton girder section at a height of 120 ft. One of the cranes was positioned on a pile of dirt placed on an existing highway, and the other occupied an area leveled by bulldozers.

lehem Pacific was the positioning of the crawlers close enough to the steel so that the "pick" weight of 22 tons combined with the extremely long booms would not act as a lever to overcome the weight of the crawlers.

One of the cranes was positioned on top of a pile of dirt which had to be hauled in to cover a portion of an existing road. The other crane was located on a hillside slope graded level by a bulldozer.

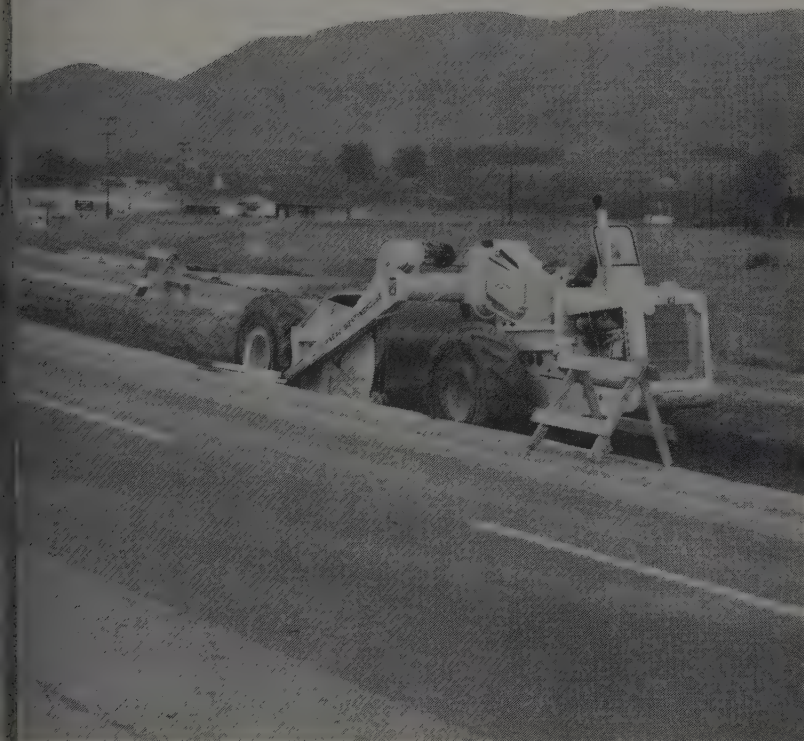
Positioning each of the steel girders for the cranes took approximately 40 minutes; the actual lift of the steel into position only 10 minutes. Two raising gangs were used. The booms, working at maximum height and a minimum radius, lifted and positioned the steel in one smoothly synchronized operation.

The lifted sections had already been fitted out with splice plates in the shop. Most of the high tensile

bolts to be used for connections also were installed on the ground. Drift pins were used to align the lifted sections to complete the span over the falsework. A number of pins were left in place at the neutral axis to maintain alignment for welding. Before welding, the two lifted sections were joined laterally by sway bracing at cross framing steel members. But welding of the top and bottom flange plate was the only field welding necessary. All other connections at the splice were made by high strength A-325 bolts. Welding was with the conventional low hydrogen type rod.

Peter Kiewit Sons' Co. is the prime contractor for the approach and interchange portions of the bridges under a \$4,700,000 contract with the State Division of Highways. The structural steelwork was designed by the State of California Division of Highways.

Low California contractor built temporary high-speed traffic lanes



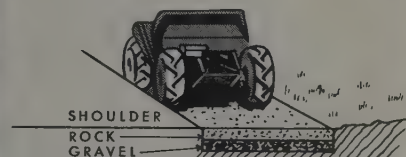
To shift traffic of the outside traffic lane, while repairing a long curve, Ball & Simpson Construction Co., Berkeley, California, built a temporary lane in the median strip of the busy 4-lane, Oakland - San Jose Freeway.



1. D Tournapull® cut flat trench 7' wide, adjacent to existing shoulder.



2. "D" spread pit-run gravel dumped in trench by trucks.



3. Tournapull loaded, hauled, and spread crushed rock over gravel, to prepare firm base for blacktop surfacing.

Pulls* handle finish work, plus handyman dirtmoving

On the Oakland-San Jose Freeway (17) south of Hayward, California, Ball & Simpson Construction Company, Berkeley, handled 16 miles of road grading and resurfacing. The job consisted of 2 segments. On the north section of the job—known as the Road Project—company's work included dirtmoving, grading, bridge bridges, and all painting.

Sub-grade finish work on this north highway, as well as on access roads, cloverleaf, etc., this contractor used 1 of their 3 D Tournapulls. To cut high spots, filled the low to make the final sub-grade and prepare concrete paving. It also smoothed ditches, backfilled at bridges and overpasses, built-up and graded access roads and traffic interchanges.

Rents 4th 'Pull for southern section

On the Warm Spring Project—at the southern end of the 16-mile job—contractor rebuilt and blacktopped an existing 4-lane highway. Because the company's 2 other "D's" were busy on other work, Ball & Simpson rented a 4th D Tournapull for this section. It worked on odd-lot dirtmoving jobs similar to those illustrated at top of page.

Ball & Simpson also has three interchangeable 11-ton LeTourneau-Westinghouse Rear-Dump trail-units for their Tournapull prime-movers. These extra work-units keep contractor's prime-mover investment working full-time... come in handy for hauling shovel-loaded dirt in muddy, rutted or other difficult off-road conditions frequently encountered in their area.

Likes short-radius turnability

Says L. D. Mosier, company official, "We use 'D' scrapers for finish work because they're the *only* machine that can cut dirt on the short radiuses we encounter on these jobs." Supt. A. D. Ostrum reports, "We have a lot of sub-grading and finishing work. Tournapull does an excellent job on these operations." "I'm sold," says operator Lew Jones. "On clean-up work, it's the best outfit I've ever run."

For profitable small-yardage and work-and-run type dirtmoving... for handyman clean-up, finish grading, and pioneering... you can't beat 29.5 mph, roadable, 9-yd. D Tournapulls. Find out how "D's" can cut costs on your jobs. Call or write for complete details and a demonstration.

*Trademark DP-1552-DCI-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Unusual feeders speed classifying



CLASSIFYING SYSTEM feeds minus 3-in. material to horizontal conveyor which brings it to silo for loading into bottom-dumps. Plus 3-in. slides down chute into rear-dumps.



A CRAWLER TRACTOR dozes down a steep slope high above the steadily growing Casitas Dam. Located on Coyote Creek above Ventura River, the dam will be 275 ft. high, 2000 ft. long.

Two Wobblers are splitting material into two sizes at the rate of 1,200 yd. per hr. at Casitas Dam.

TWO UNUSUAL feeders are classifying 1,200 cu. yd. of gravel per hr. on the Casitas Dam project, Ojai View, Calif. The project is under contract to Winston Brothers Construction Co. and will require 3,948,000 cu. yd. of material to be placed before the scheduled completion date of February 1959. Of the total, about 3,200,000 cu. yd. will be minus 3 in. and about 741,000 cu. yd. will be plus 3 in. The borrow pit contains material in the proper ratio of sizes. Separating them is the problem.

Winston installed two 48-in. wobble feeders, called Wobblers, designed for the job by Universal Engineering Corp. The feeders contain 16 revolving elliptical bars. The distance between the bars remains constant, allowing only material of a selected size, or smaller, to pass through. The Wobbler feeder was first described in *WESTERN CONSTRUCTION* in December 1956 after it had been used successfully at Montgomery Dam, Colorado by Fisher Contracting Co. of Phoenix, Ariz.

The loading platform over the classifying system admits both bottom-dump and rear-dump trucks. Hopper walls slanted at 85 deg. carry the material to the feeders where the plus 3-in. material is carried to grizzlies while the minus 3-in. material drops through to a conveyor which carries it 50 ft. to a storage hopper.

At the beginning of the classifying operation early this spring, wind moisture in the sandstone and gravel material caused it to build up heavily on the loading hopper wall. It was necessary to install a compressed air system to keep the material flowing.

According to Fred G. Peters, project manager for the contractor, the present classifying system cost about \$30,000 less than a comparable shaker system, and requires about half the power, needing only 15-hp. motors equipped with Universal Vari-Drives.



Teer's CAT* No. 12s help build approach to Patapsco River Tunnel

An important new highway link for North-South travel through the Patapsco River Tunnel, south of Baltimore, Md., will create a direct connection between Rt. 40 and S. 1 without bucking mid-city traffic.

Nello L. Teer Co. of Durham, N. C., is building a 2-mile section of the four-lane divided expressway leading to the tunnel. The contract calls for moving 100,000 cubic yards of earth. Teer's spread on this job includes 12 Caterpillar DW20 Tractor-Scraper units, D8s, a D9 and two Cat No. 12 Motor Graders.

Good haul roads contribute to low-cost earthmoving, and keeping roads in shape is a motor grader job. With its rugged construction, balanced design and dependable four-cycle Cat Diesel Engine, the No. 12 is built for top production around the clock. Positive-tilt controls, easy blade positioning and excellent visibility all help the operator do more work with less effort. The exclusive Caterpillar oil clutch operates smoothly many hundreds of hours without adjustment. Bias-ply tires, at no extra cost, reduce tire down time. In-cab starting, electric or gasoline, is standard.

Your Caterpillar Dealer not only sells these top-performance machines but takes a personal interest in

protecting their long work life with reliable parts and service. See him today.

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

CATERPILLAR*

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

**WANTED—
THE HARD WORK**

THE LATEST, MOST COMPLETE INFORMATION ON THE NEW HIGHWAY PROGRAM — FREE

Here in one booklet is *all* the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways; final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.

Dept. WC-10, Caterpillar Tractor Co.
Peoria, Ill.

Please send me immediately
copies of "The Road Ahead."



Name.....

Company.....

Address.....

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

EARTHMOVING . . .

Third of a series—The working-rate-per-crew-per-shift basic for estimating.

By **RICHARD BENNETT**
Construction Consultant
Saratoga, California

THE "working-rate-per-crew-per-shift" estimating method is the most advanced to appear in many decades. It is a truly direct method—it deals with production, as influenced by equipment use and local economic

conditions—rather than historical costs. The crew-shift method, as opposed to the commonly accepted individual man-hour-basis, was discussed in the preceding discussion and is further elaborated here.

Production and costs are basically tied to the crew-shift, which includes all costs involved for one complete crew for one shift. It permits analysis of both large or small crews, and determines the efficient crew make up.

Date		CREW-SHIFT				Est. No.	Sht. of
Item <i>Spread</i>		COST & PRODUCTION ESTIMATE				Est. by	Chk'd
EQUIPMENT							
No.	Equipment Item	Size	Unit Days	Per Shift Cost per Unit	Amount	TOTALS	
	<i>Excavation only - does not include fill cost.</i>						
<i>4</i>	<i>Scrapers</i>	<i>13 C.Y.</i>	<i>4</i>				
<i>1</i>	<i>Pusher</i>		<i>1</i>				
<i>1</i>	<i>Pusher - ripper</i>		<i>1</i>				
<i>1</i>	<i>Motor grader - bank sloping</i>		<i>1/4</i>				
<i>1</i>	<i>Lubrication truck</i>		<i>1/4</i>				
	<i>Etc.</i>						
Total equipment cost							
OPERATING CREW & LABOR							
No.	Classification	Man Days	Per Shift Unit Rate	Amount			
<i>1</i>	<i>Foremen - General</i>	<i>1/4</i>					
<i>1</i>	<i>" - Grade</i>	<i>1</i>					
<i>7</i>	<i>Equipment operators</i>	<i>6 1/4</i>					
<i>2</i>	<i>Lubricators</i>	<i>1/2</i>					
	<i>Etc.</i>						
Total labor cost							
Insurance: % of total labor cost							
Total labor and Insurance cost							
OPERATING SUPPLIES							
Item		Unit	Quantity	Unit Cost	Amount		
<i>Diesel fuel</i>		<i>gals.</i>					
<i>Motor oil</i>		<i>gals.</i>					
<i>Grease</i>		<i>lbs.</i>					
<i>Etc.</i>							
Total material & supplies cost							
Total cost - equipment, labor & supplies						<i>← Crew</i>	
Estimated 100% production per shift		<i>4400 c.y.</i>	Estimated actual production per shift		<i>2860 c.</i>		
Estimated production percent eff.		<i>65%</i>	Estimated cost per unit				
Note - Overhead and contingencies included in bid summary							

Crew-shift costs are easily determined by applying current labor rates. Present wages and material prices are known. Probable increases during job life are investigated and then allowed for. Therefore estimating production rates, and setting up a system which will secure this production, is the problem. It is a job which requires skill, experience, and job data.

The method is illustrated in the accompanying chart. Shift cost is analyzed and computed by a five-step formula: 1—List all required equipment and time required; 2—List all required supervision, operators, and labor with time required; 3—List all required supplies; 4—Compute total shift cost for one crew; and 5—Compute unit cost which is the estimated job unit cost, not including overhead costs nor profit.

Careful analysis and skill are required to determine equipment needs to meet job conditions and to secure maximum economy. This analysis includes operation, maintenance, rental, ownership, moving in and off the job site, and all other costs involved. Equipment rates to be accurate must be based upon experience and historical data. Published figures are seldom worth much—they simply just don't meet YOUR job conditions.

Local economics has a very important effect upon labor efficiency. In good times jobs are plentiful and labor is scarce, usually resulting in high production and high job costs. In normal economic conditions, labor, production, and job costs tend to become average. If the economy is bad the area slumps jobs become scarce, labor and production is good. The value of good competent crew management cannot be over-estimated.

The results which have been secured by the use of the crew-shift estimating method justify the assertion that it offers a ready solution for many construction problems, which in the past have proven more or less intangible. It is sound, time-saving, easily applied, economical, involves fewer steps and calculations, and has greater inherent accuracy.

It is more inclusive because it automatically analyzes many often neglected factors; more comprehensive because it tends to encompass the areas where estimating mistakes most often occur; and can be applied to all production operations, any crew makeup or size, whether dependent upon labor or power equipment, or both.

Letter of comment on ACI charts

The problem of spacing between lapped bars

SIR:

The writer noted with interest "Structural Design Chart—XII" on lap splices by Mr. Thomas Haran, printed in the July issue of WESTERN CONSTRUCTION.

Mr. Haran states that this chart is based on the 1951 ACI Code and expresses the opinion that the ACI minimum bar spacings apply between lapped bars, although the Code does not specifically state this.

The writer agrees that Mr. Haran's logic is correct; however, experimental work performed since 1945 does not sustain the conclusion.

William T. Walker reported¹ in 1951 that grout penetrated the space between lapped bars in contact even when the bars were square. Pull-out tests showed no significant difference in strength of spaced and contact splices.

S. J. Chamberlin reported² in 1952 on pull-out tests that indicated contact splices were superior to spaced splices.

All the specimens but one in Walker's test failed by longitudinal splitting of the concrete encasing the splice, and Chamberlin's specimens did likewise until he reinforced the concrete with a spiral of wire around the splice.

Ralph W. Kluge and Edward C. Tuma reported³ in 1945 on beam tests which showed no significant difference in strength between contact and spaced splices. Their beams contained one spliced bar flanked by two bars continuous through the splice zone. During the latter stages of their tests, longitudinal splitting occurred over the spliced bars.

Beam tests⁴ were run at The University of Texas by Phil M. Ferguson, J. Neils Thompson, and the writer in 1954 on beams containing only spliced bars, and these tests showed no significant difference in strength between contact and spaced splices, either. All specimens failed by longitudinal splitting.

The above tests offer sufficient evidence that contact splices are at least as strong as spaced splices, regardless of whether failure is by pull-out or longitudinal splitting. The 1956 ACI Building Code (Sec. 506 a) recognizes this when it states, "The clear distance between bars shall also apply to the clear distance between a con-

tact splice and adjacent splice or bars."

Failure by splitting is receiving more attention these days because such failures occur at lower loads than failure by pull-out for shorter lap lengths. J. Edward Martin recommended⁵ in 1955 that the allowable bond stresses in splices not reinforced against splitting by stirrups be limited to:

For top bars $u = 0.038 f'c \leq 245$ psi.

For all others $u = 0.055 f'c \leq 350$ psi.

The ACI changed its Building Code requirements in 1956 to a minimum lap length of 24 bar diameters but not less than 12 in.

The writer has performed some additional research beyond that previously reported and is inclined to favor Mr. Martin's recommendations over those of the ACI Building Code. It is believed, however, that even Mr. Martin's recommendations are unconservative when bar spacings are close to the minimum ACI allowances.

Sincerely,
JAMES CHINN
Associate Professor of
Civil Engineering
University of Colorado

1. Walker, William T., "Laboratory Tests of Spaced and Tied Reinforcing Bars," ACI Journal, Jan. 1951, Proc. V. 47, pp. 365-372.

2. Chamberlin, S. J., "Spacing of Spliced Bars in Tension Pull-out Specimens," ACI Journal, Dec. 1952, Proc. V. 49, pp. 261-274.

3. Kluge, Ralph W. and Tuma, Edward C., "Lapped Bar, Splices in Concrete Beams," ACI Journal, Sept. 1945, Proc. V. 42, pp. 13-33.

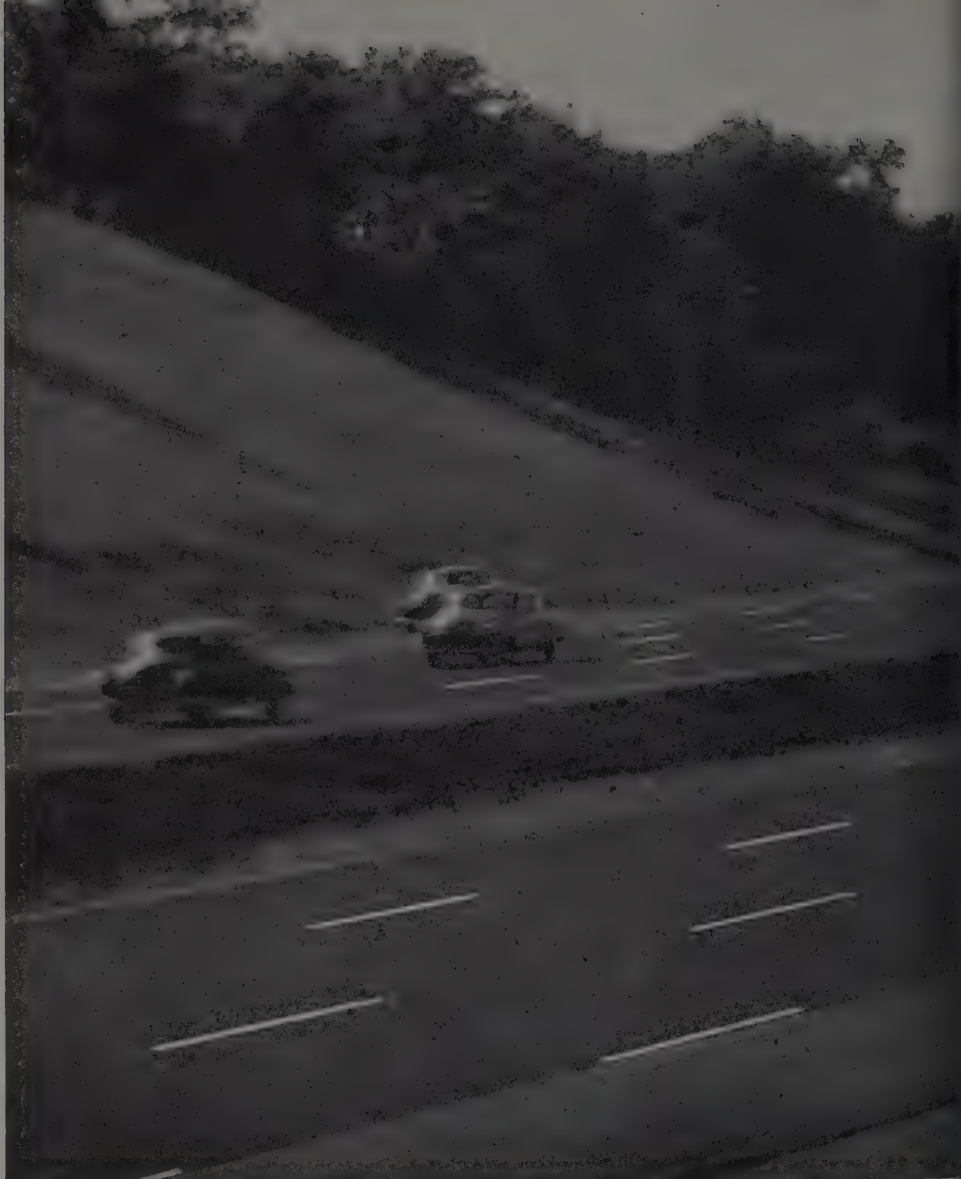
4. Chinn, James; Ferguson, Phil M.; and Thompson, J. Neils, "Lapped Splices in Reinforced Concrete Beams," ACI Journal, Oct. 1955, Proc. V. 52, pp. 201-213.

5. Martin, J. Edward, "Continuity Splices," Letters from Readers, ACI Journal, May 1955, Proc. V. 51, pp. 939-941.

Alaska hydro project

THE Federal Power Commission has granted the City of Seward, Alaska, a 50-yr. license for a proposed hydroelectric project on Crescent and Carter Lakes, Kenai Peninsula, Alaska. The project, to be located 40 mi. north of Seward, will consist of an earthfill dam 20 ft. high across the outlet of Crescent Lake which would raise and back up water into Carter Lake creating 21,000 ac. ft. of usable power storage; a 5,000-ft. equalizing channel between Crescent and Carter Lakes; an intake channel 1,500 ft. long at the outlet of Carter Lake; 1,500 ft. of steel pipe connected to 2,650 ft. of penstock; reinforced concrete powerhouse with initial installation of one 5,400-hp. impulse turbine with provisions for two additional power units.

The new Asphalt constructed Route 128, near Boston, replaces the old route built 25 years ago. The highway consists of two roadways each of which has three 13' lanes and a 10' shoulder. Roadways are separated by a depressed grassed median varying from 30' to $\frac{1}{4}$ of a mile. The pavement consists of 12" well-compacted gravel sub-base, 4 $\frac{1}{2}$ " penetration macadam base, 1 $\frac{1}{2}$ " Asphaltic concrete binder course and a 1 $\frac{1}{4}$ " Asphaltic concrete surface course.



Old road that gave traffic "the creep" ... built with high economy... for low maintenance

Outmoded road conditions slowed traffic to a creep on the old Route 128, in Massachusetts.

So a new, wider Route 128 was recently completed ... for today's and *tomorrow's* traffic. With greater capacities ... better layout, grades and crossing eliminations.

It's a smooth-driving, long-lasting Asphaltic concrete highway. Built at low cost. To make cars and trucks glide along, safely. And to be easy on taxes ... for generations to come.

Modern heavy-duty Asphalt construction has proved to be ideal for highways and primary roads

in every section of the country. It allows maximum design versatility ... speed and ease of construction.

Asphalt pavement is resilient, rugged, skid resistant. Glare-absorbent. It seals out damaging moisture ... is not affected by de-icing salts which usually damage other pavement. Snow and ice melt faster, too. The way ahead is clear, quicker.

In the face of rising construction costs you can stay within budgets by paving with Asphalt.

You'll keep costs down ... keep performance ... keep taxpayers happier ... when you design with modern Asphalt construction.

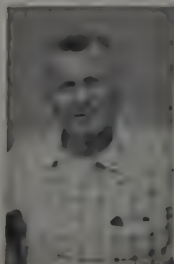


aced with wide, durable Asphalt Highway ow future taxes

ERS Asphalt Construction

One of the companies that played a leading role in the building of the new Route 128 is De Matteo Construction Company, Framingham, Mass.

Superintendent of this company, Roland S. Delaware, writes, "I have been working with Asphaltic pavements since 1935 and have always advocated the use of asphalt in preference to other types of pavement. I like it from an engineering standpoint...and enjoy the riding qualities of asphalt pavement of construction."



THE ASPHALT INSTITUTE

Asphalt Institute Building
College Park, Maryland



Ribbons of velvet smoothness

MODERN **ASPHALT** HIGHWAYS

REPORTS from the COURTS

By HOWARD S. BURNSIDE, Low and Burnside
Attorneys at Law, San Francisco—Menlo Park

City cannot take state land by eminent domain

The powers of state and federal governments came into conflict and were reviewed in a recent and very complicated case of general interest in the state of Washington. The case symbolizes that menacing shadow of federal intervention into every phase of our life.

The city of Tacoma was granted a license by the Federal Power Commission to construct two dams on the Cowlitz river. The state of Washington participated in the hearings. The present action was instituted by the City against the taxpayers of Tacoma and certain state officials to test the City's right to sell revenue bonds to finance construction of the dams. The State was subsequently added as a defendant.

The proceedings were exceedingly complicated. The court held that a city could not condemn state-owned lands which had been dedicated to public use, although licensed to construct a dam under the Federal Powers Act.

The Supreme Court of Washington affirmed the judgment and pertinent portions of the opinion follow.¹

"A municipal corporation does not have an inherent power of eminent domain. It may exercise such power only when it is expressly authorized to do so by the state legislature . . . This is consistent with the general proposition that ' . . . a municipal corporation, being but a creature of the state, derives its existence, powers, and duties from the legislative body of the state.'

"We deem it conclusively settled in this jurisdiction that a municipal corporation or a public corporation does not have the power to condemn state-owned lands dedicated to a public use, unless that power is clearly and expressly conferred upon it by statute . . . After a careful review . . . we do not find that the legislature has expressly authorized a municipal corporation to condemn state-owned land previously dedicated to a public use; hence, we conclude that the city of Tacoma has not been endowed with the statutory capacity to condemn the lands.

"There remains the subsidiary question: can a municipal corporation of this state be endowed, by Federal legislation, with power to condemn state-owned lands previously dedicated to a public use, in the absence of power and capacity to so act under state statutes . . .

"This is not a question of the right of

the Federal government to control all phases of activity on navigable streams, nor a question of its power, under the Federal Power Act, to delegate that right. It only questions the capacity of a municipal corporation of this state to act under such license when its exercise requires the condemnation of state-owned property dedicated to a public use.

"In the instant case, the subject matter—the inherent inability of the city to condemn state lands dedicated to a public use—does not present a question of state statutory prohibition; it presents a question of lack of state statutory power in the city. It does not present a Federal question; it presents a question peculiarly within the jurisdiction of the state of Washington.

"The Federal government may not confer corporate capacity upon local units of the government beyond the capacity given them by their creator, and the Federal Power Act, as we read it, does not purport to do so.

"If it be held that the Federal government may endow a state-created municipality with powers greater than those given by its creator, the state legislature, a momentous and novel theory of constitutional government has been evolved that will eventually relegate a sovereign state to a position of impotence never contemplated by the framers of our constitutions, state and Federal.

"Therefore, for the reasons we have set forth and discussed herein, the judgment of the superior court is affirmed."

In connection with the foregoing it is noted that on the question of the legal capacity of the city to act under the Federal power is taken for granted and not questioned in the area of navigable streams.

1. City of Tacoma v. Taxpayers of Tacoma 302 P. 2d 567

Forfeiture rule applied

Statutes of the state of California, similar to statutes of other states, provide that contractors for public works "shall pay not less than the specified prevailing rate of wages to all workmen employed in the execution of the contract." If there is a violation, a forfeiture of \$10.00 may be imposed. This forfeiture may be withheld from the payments due the contractor by the Department of Public Works.¹ Ninety days after completion, the amount of the forfeiture is sent to the State Treasurer. Any action by the contractor to

recover a forfeiture must be commenced within the 90-day period.²

In a recent case, the Labor Commissioner advised the Department 2,240 violations. A sum of \$22,400 was withheld from payments due the contractor for highway construction work. The work was formally accepted May 3 by an inter-departmental communication; the contractor was advised by letter of May 6 of the acceptance and a notice of completion was recorded on May 9. Ninety-one days after May 3; that is, on August 2, the contractor brought an action against the Department to recover the \$22,400, and the case was dismissed on the ground that he had not acted within the 90-day period.

When you are dealing with the sovereign power of the state, you can usually expect short periods on limitations actions. Diligence and promptness are essential. To remedy the harshness of this type of situation, you must see your legislator, because your attorney cannot change the "rules."

1. 1727, 1774, 1775 Labor Code, State Calif.

2. 1730, 1732, 1733 Labor Code

3. Madonna v. State of California 151 A 925

Disciplinary action of license board

"The record discloses . . . the house was to be completed . . . in April 1954.

"In early 1954, after having been formed by Mr. Hall (the owner) the danger, appellant (contractor) permitted rain and moisture to enter open structure, resulting in damage cabinets, walls and ceilings. In April 1954, . . . the house was still incomplete and Hall already had paid (contract price) but then agreed to pay an additional \$474 for the so-called extras, plus \$196 as an inducement appellant to complete the construction . . . Some of the 'extras' were it called for in the original specification. After this payment, appellant insisted that Hall pay further sums for items listed in the original contract, and again informed Hall that otherwise the house would not be completed."

The contractor left the project May, 1954, in an incomplete condition. He failed to pay certain subcontractors and materialmen.

"On November 3, 1955, the Contractors State License Board found that appellant . . . had violated . . . the Business and Professions Code, and revoked appellant's general contracting license. The decision was reviewed by the superior Court and affirmed on appeal. The sections of the Code cited relate to abandonment of a construction project without legal excuse, misrepresentation of fact in application for license, failure to complete a project for the price stated and wilful failure to pay any moneys, when due, for any materials or services.

Beach v. Contractor's State License Board 151 A 114



er of many Caterpillar-built machines on the Great Falls
ing Project: two DW15 (Series E)-No. 428 LOWBOWL
apers, a D8 Tractor and a No. 12 Motor Grader. The

blocks in this area of the project are 430 feet long, and the
street width 35 feet. Excavation of heavy clay soil averaged
525 cubic yards a block here.

HIGH PRODUCERS IN NARROW STREETS

**New CAT* DW15 (Series E)-No. 428 LOWBOWL Scrapers
set fast pace on \$4,186,721 Great Falls Paving Project**

ur firms associated under the name of City Construc-
s were awarded the contract to handle the Great
ls Paving Project, Montana. The project involved
reconstruction of about 900 blocks. Among the
v Caterpillar DW15 (Series E)-No. 428 LOWBOWL
apers on the job were these two units, owned by
Birch Inc. & S. Birch & Sons Construction Co. Here
see them at work in heavy clay soil on a typical
foot-wide street.

The street was excavated to the depth of a foot for
uilding. Loads were restricted to avoid damage
ilities and improved streets. Averaging 12 cubic
ds a load, each unit made five trips an hour on a
00-yard round-trip haul through traffic.

This is just one of many jobs where the new DW15
ries E) unit proved itself a high producer. In fact,
reports from other jobs, this point is clear: When
new DW15 is compared with competitive units of
ilar capacity, it leads the pack in performance.
ny factors contribute to its superiority. For ex-
ple, it has a high travel speed of 37.2 MPH with
stability of four wheels. Very maneuverable, it
is within a 35-foot diameter, and its stability per-
s short turns at high speeds. Its wide-section
5 x 25 tires provide maximum flotation. And the
No. 428 Scraper's LOWBOWL design means a
er loading rate clear to the end of the loading cycle.

The new DW15 (Series E) delivers 200 HP (max-
m output capacity). The new No. 428 has a capac-
of 13 cubic yards struck, 18 cubic yards heaped.

Your Caterpillar Dealer, who backs you with prompt
service, will be glad to show you cost-of-operation fig-
ures on actual jobs. Better still, name the date—he'll
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ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

TERMINATION DUST—By the time this is published, the mountains of Alaska will have received their first dusting of snow—the “termination dust” of the construction man’s jargon. Alaska’s annual exodus of construction workers is under way—with winter just around the corner. Scores of construction men are returning from “bush” jobs to the centers of Anchorage and Fairbanks, from which points they catch planes for the “outside”—the Alaskans’ term for the United States. Some construction men are taking advantage of the fall hunting season for caribou and moose before they return home. As this column has pointed out frequently, the tempo of Alaskan construction slows down perceptibly in the winter. In some areas, jobs are “buttoned up” until next spring. In others, interior work on structures is pushed. All in all, it has been one of the finest summers for construction since I arrived here more than ten years ago. A succession of warm, sunny days characterized the summer—and work output I’m sure, when all the figures are in, will set some kind of record.

WAGES—There was gold in Alaska’s hill this past summer for the average construction worker. The “payroll” gold—amounting to as much as \$400 and \$500 a week in some outlying jobs—shows signs of dwindling for the next construction season. Several contractors I talked to said the overtime would be shaved on a number of projects, even though the basic wage rates remain high. Now that the construction season is over, and the gold is in the poke, however, the construction men aren’t too concerned about next year. One man—just in from the bush with a beard that looked like a bush—told me he had earned enough during the past summer to “put a down-payment on a tourist camp down in Arkansas.” He remarked: “It’s my last winter here. You get pretty good money, but they don’t just hand it to you.” Wages for the average construction man during the past summer, according to data I’ve received from employment and union officials, averaged from \$175 to \$250 a week. With the construction men living in contractors’ camps paying only a moderate lodging fee, most of this money could be salted away for tourist camps, new homes, vacations or, as a couple of the unmarried construction stiffs told me, “a good old time.”

GET TOUGH MEASURES—Fairbank city officials have issued a warning to all builders in the city concerning construction standards. The old days when an “anything goes” attitude existed concerning commercial construction in Alaska seem to have gone

with the North wind. Both in Fairbanks and Anchorage, all indications point to more rigid standards, tighter inspection of all municipal jobs.

WORD IS OUT—Fairbanks’ City Building Inspector Joe Grainous issued the word on the “new order” there. He said some leniency was practiced in the past because of the short construction season. “We find this leniency must be ended,” he advised contractors. “Plumbing, electrical, and sign contractors have been feeling the effects of similar clamp-downs and are now operating as scheduled.” Grainous warned that architects, engineers, and building contractors will feel the pinch of rigid enforcement starting immediately. Optimum moisture tests, compaction tests, and test cylinders from concrete pours are now required.

ANCHORAGE ACTION—In Anchorage a more critical eye has been given to commercial construction. Attention here is being focussed on the need for elimination of slum-type commercial structures, some of them remnants of the town’s birth back in 1915. A number of buildings, all frame, are being considered for condemnation, so the commercial construction volume for Anchorage in the next few years should increase perceptibly. Some building owners in the downtown area are taking the hint and planning new structures without waiting for the condemnation order.

SCHOOL CONSTRUCTION—The need for schools in Alaska—and in most cases, the lack of funds to build them—has administrators perplexed. In Anchorage, for example, the local school district has estimated that 19 new schools will be needed within the next few years, including two new high schools, four new junior high schools, and 13 new grade schools. Already, the school district has been allotted \$1,600,000 for construction of a junior high school. What steps the district takes next will be determined at the Oct. 1 municipal election when a \$5,000,000 bond issue will be presented to the voters. A similar need for new school construction is evident in Fairbanks and, to a lesser degree, in other Alaskan cities.

ALASKA JOB RACKET—A. T. Rose, director of the Wisconsin Employment Service, is being commended by Alaskan employment officials for a protest against the operators of job lists which advertise that high-paying jobs are available in Alaska. Rose said the advertisements in newspapers and magazines promised opportunities to “get rich quick,” but pointed out that no such opportunities really exist. “The

only guy who makes money on Alaska jobs is the one who sells the \$3 list.” Alaska Employment Service has issued a bulletin to all directors of state employment services pointing out that there is already a surplus of construction workers in Alaska. This is especially true at this time of the year when the construction season is over.

JOBLESS PAY—The shadow over dreams of some construction men pining to remain in Alaska and “rocking chair money”—unemployment compensation—is the report from Juneau on the status of the Unemployment Compensation Fund. The fund now has a deficit of more than half a million dollars, with the deficit expected to increase to at least one million dollars following payment of claims in court case. Merrill E. Weir, director of Alaska’s Employment Security Commission which administers the fund, says the deficit and steady decline in the fund’s balance was attributed to great unemployment in the interior of Alaska in 1957 as compared to 1956.

CIVILIAN PAYROLLS—Military economy budget cuts are having a direct effect on Alaska payrolls, including civilians employed by the military in some construction craft categories. For example, in the Anchorage area alone more than 200 civilian employees of the military are slated to lose their jobs before June 30, 1958. Some of the jobs will be eliminated by the expedient of failing to fill vacancies as they occur. Other workers will get “pink slips” when their jobs are hacked off. The Alaskan Air Command has set up a special point system for determining which employees will get the axe. The Army headquarters at Fort Richardson issued a reassuring statement to the effect that “nobody will be forced out of a job.”

URBAN RENEWAL—Slum clearance activities in Alaska, particularly in Anchorage, were reported hampered by requirements set up by the Housing and Home Finance Agency, which is charged with carrying out the program. M. Gebhart, executive director of the Alaska Housing Authority, had accused the HHFA of unnecessarily delaying projects by setting up requirements for the work—in terms of staff and information requested—that were impossible for Alaskan authorities to meet. Gebhart recently reported a change in the attitude of stateside officials and announced the program is moving forward again. The only project now being deferred by the HHFA is that of Juneau, Gebhart said.

CONSTRUCTION NEWS NEWS GETS—A new cargo-passenger service has been inaugurated between California ports to Seward by the Coastwise Line, the first time regular passenger service to Seward from the states has been established since the service was discontinued by the Alaska Steamship Company.

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ROCK GRIP

Cougar Dam design studied by consultants

A BOARD of consulting engineers visited the Cougar reservoir site on the South Fork McKenzie River last month and later conferred with engineers of the Portland District, Corps of Engineers. Consulting engineers on the board are Dr. Arthur Casagrande, Harvard University; James P. Growdon, Pittsburgh, Pa.; I. C. Steele, Oakland, Calif. Also on the inspection visit were Edward B. Burwell, Jr., former chief geologist, office of the chief of engineers in Washington, D. C., and also from the office of the chief of engineers: F. Slichter, G. E. Bertram, R. H. Nesbitt, and R. L. Bloor and from the North Pacific division office F. S. Brown and Harold Stuart.

From the Portland District Office were Col. Jackson Graham, Ben Peterson, John Kemple, Buell Wilcox, Lewis Knerr, Gene Brown, Leonard Stejn, Paul Thurber, Robert Pope, Lloyd Ruff and Robert Baunach.

Cougar Dam, a unit in the Corps of Engineers' comprehensive plan for development of the Willamette River Basin, is part of an alternative plan selected to replace the originally authorized Quartz Creek Dam on the McKenzie River proper.

Quartz Creek was authorized by the Flood Control Act of 1938. However, within a few years after authorization, strong opposition to a main-stem dam on the McKenzie River began to develop among commercial fishery interests and proponents of recreational use of the stream. The alternative plan consists of three headwater tributary dams: Cougar Dam on the South Fork McKenzie River, Blue River Dam on the Blue River, and Gate Creek Dam on Gate Creek.

Col. Graham said his office plans to advertise for bids for construction of Cougar Dam, outlet works and power intake works sometime next spring.

Survey work in Alaska

KARL F. TUTTLE Engineering Co., Inc., Arcadia, Calif., has been awarded a contract for \$472,955 by the U. S. Army Engineer District, Alaska. The firm's contract is for performing all services required to make topographic and hydrographic surveys, construction layouts, triangulations and control surveys in the vicinity of Ladd, Eielson and Elmendorf Air Force bases and at other

locations where the Alaska District is supervising construction for the U. S. Army, Air Force, and civil works.

For the rush summer job the contractor is supplying six 4-man parties, also three 4-man parties with computer, and one 4-man party with cartographer—an estimated total of 1,970 man-hours. The Tuttle firm has been low bidder on several previous survey jobs over widespread sites over Alaska territory.

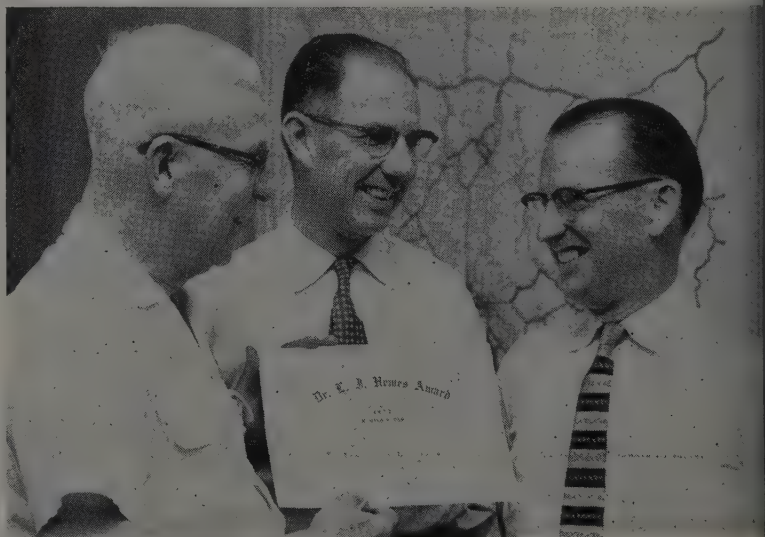
Housing plan for movie lot

WITH an estimated cost of \$100,000,000, a community development including, apartment houses, hotel, office buildings, schools and stores has been proposed for part of the 20th Century-Fox Studios location in Los Angeles. The residential development would feature garden-type apartments with extensive park areas and space dedicated for use as a public school as well as other recreational facilities. At the present time several producing oil wells are located on the property and the plans do not indicate how these wells would be treated in the plans for community development.

A \$275,000,000 plan to expand EBMUD

A 10-YR. construction and development program costing \$275,000,000 being planned by the East Bay Municipal Utility District to meet the area constantly expanding needs for water. The program, developed by the EBMUD engineering department over the past nine years, will now be reviewed by the Bechtel Corp. of San Francisco. The Bechtel engineering study and review authorized by the District board of directors, is now under way and is expected to take at least four months. Because of the magnitude and importance of the expansion program the District felt a review by an independent consultant was advisable.

The Bechtel firm has agreed to make a careful, detailed check of the project proposed by the Water Resources and Planning Division which estimates an average consumption of 200 mgd. in 1967. At the present rate of consumption increase each year, this 200-mgd. figure appears inevitable within the next decade. The Bechtel report, will include a complete analysis of District plans and cost estimates.



ARIZONA HAS WINNER OF "DR. L. I. HEWES AWARD"

Announced at the 1957 Conference of the Western Association of State Highway Officials in Houston last June, Glen Ryden, Chief Computer, Arizona State Highway Department was the winner of the "Dr. L. I. Hewes Award." Ryden was at the conference, and the formal presentation was made recently by Grover Duff, chairman of the Highway Commission (left), with the official approval of Bill Willey (center), State Highway Engineer of Arizona. Selection of the annual recipient is made by the WASHO executive committee from official nominees submitted by the highway engineering departments of the West. The certificate and the \$500 cash award is made available by Western Construction.

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FACTORY AND HOME OFFICE: SEATTLE, U. S. A., DISTRIBUTORS IN THE UNITED STATES AND MOST FOREIGN COUNTRIES

Water consumption has reached the point where a start must begin on construction of major additions to the system. The East Bay area, one of the fastest growing sections in the nation, can continue to expand without hardship only with the positive assurance that an ample supply of good quality water will be available for industry and homes.

The program will be financed by bond issues at a future date. After the Bechtel Corp. report is complete, the District will be in a position to announce full plans for meeting the area's future water requirements.

Robert C. Kennedy is chief engineer of the East Bay Municipal Utility District.

Idaho employs consultants

TWO FIRMS of consulting engineers have been retained by the Idaho Highway Department to prepare plans on sections of the interstate highway system. Use of consulting engineers was authorized by the State Highway Board because the department lacks sufficient engineering personnel to plan highways fast enough to keep up with the accelerated construction program.

One firm is the Karl F. Tuttle Engineering Co. of Arcadia, California, which will do preliminary engineering work and prepare final plans for two sections of the interstate system totaling about 38.6 mi.

The other firm is Hoffman, Fiske & Millar of Boise, Idaho, which will do design work on an interstate project near Caldwell.

\$330,000,000 gas line project moves ahead

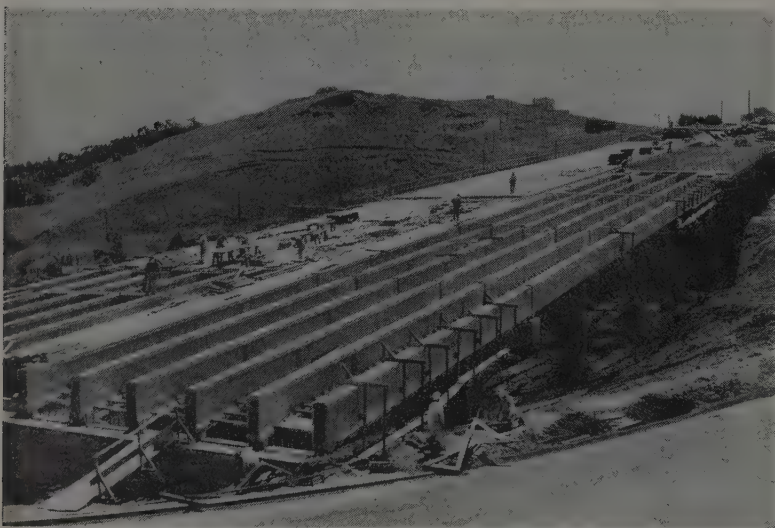
SPONSORS of the planned \$330,000,000 natural gas pipeline from Alberta to California and officials of Shell Oil Co. have announced jointly that negotiations have been completed for the purchase from Shell of a substantial part of the natural gas required for the 1,300-mi. pipeline.

The arrangement will result in payment to Shell during the first ten years of gas delivery of more than \$100,000,000. Of this total it is estimated that approximately \$15,000,000 will be paid to the Alberta Provincial Government in gas royalties.

In the joint announcement Jack K. Horton, president of the newly formed Alberta and Southern Gas Co., Ltd., said the gas will be purchased for Pacific Gas and Electric Co. of San Francisco, for distribution in the California market.

Paul L. Kartzke, vice president of Shell Oil Co., Calgary, estimated his company will be able to supply 200,000,000 cu. ft. of natural gas per day to the transmission system.

Construction on the Alberta-California pipeline will commence as soon as formal clearances have been obtained from the Alberta Oil and Gas Conservation Board, the Canadian Board of Transport Commissioners at Ottawa, the Federal Power Commission in the United States, and, in California, the California Public Utilities Commission. Present plans schedule the project to go into operation late in 1960 with initial deliveries of 400,000,000 cu. ft. daily.



PRESTRESSED 60-FT. CONCRETE GIRDERS CLIMB SAN FRANCISCO HILL
Precast, prestressed concrete girders, fabricated by the Structural Concrete Products Division, Basalt Rock Co., Inc., form the structural backbone of the widening project to relieve congestion on upper Market Street in San Francisco. For the vehicular bridge, 108 girders eliminated falsework and allowed significant gains in construction speed. Girders were shipped by trucks from Basalt's Napa plant for installation by crane. Basalt's girders are of I section and rectangular section design, and 60 ft. long. Ninety I sections were stressed with five 1/8-in. Stresssteel rods, and weigh 20 1/2 tons apiece. The remaining 18 rectangular sections were stressed with six 1/8-in. Stresssteel rods, and weigh 34 tons. The project was designed by the Department of Public Works, City and County of San Francisco. General contractor is the M & K Corp., San Francisco.

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Lorain 2-Lever, "Joy Stick" Power Controls are available for all classes of Lorain Crawler and Rubber-Tire Shovels, Cranes, Hoes, Draglines and Clamshells.

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Glen Canyon contractor speeds housing at site

HEADQUARTERS and plant facilities of Merritt-Chapman & Scott Corp. for the construction of Glen Canyon Dam in northern Arizona are being built adjacent to the damsite on both sides of the Colorado River.

Merritt, general contractor for the 700-ft. high dam under a \$107,955,522 contract awarded by the Bureau of Reclamation, will maintain temporary headquarters at Kanab, Utah, 72 mi. northwest of the project, until offices and shops already under construction at the damsite are completed.

In addition to administrative and operational facilities, Merritt has started construction of barracks, mess halls and trailer parks near the job area. The company shortly will begin to erect housing for its personnel in Page, Ariz., a new townsite being developed by the Bureau of Reclamation on the east side of Glen Canyon, two miles from the damsite.

Herbert S. Booth, Merritt's project manager, expects a steady buildup of employment over the next 18 months, with a peak of about 2,000 by mid-1960. Employment to date has been confined primarily to office and engineering personnel, plus a few specialized skills. Hiring of construction workers will proceed

as soon as housing facilities are available at the project.

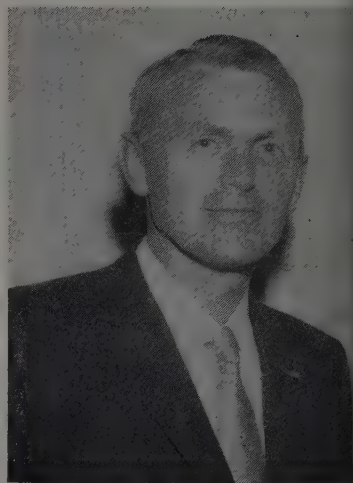
Under present schedules, it is planned by January 1959 to divert the Colorado River around the damsite by means of tunnels driven through the east and west walls of the canyon. The first concrete on the dam itself—the world's third highest dam when completed—is expected to be poured in November 1959.

Construction of the diversion tunnel on the river's east bank, sub-contracted by Merritt to Frazier-Davis Construction Company, of St. Louis, Mo., is scheduled to get under way immediately. The other diversion tunnel is being driven by Mountain States Construction Company, of Denver, Colo., under an award separate from the prime contract.

Merritt's sub-contract to Frazier-Davis also calls for the construction of the spillway and access road tunnels on the east side of the river, and the spillway and power tunnels on the west bank.

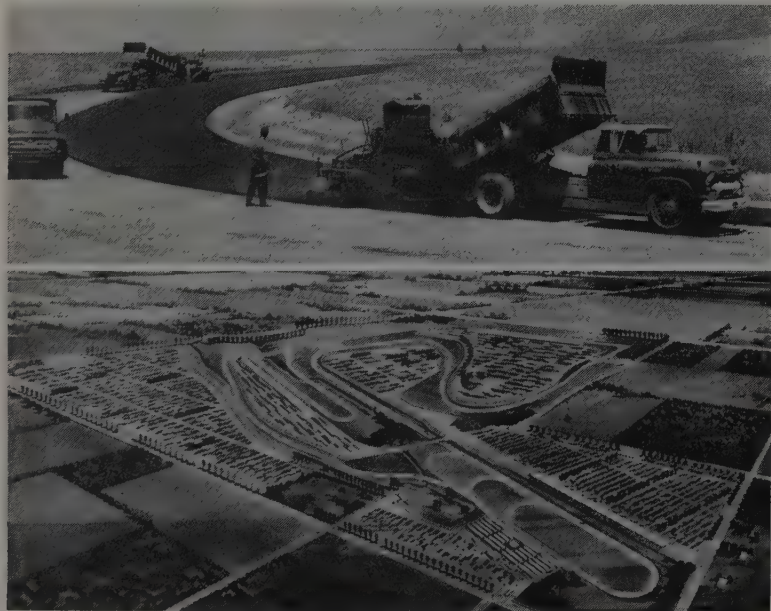
Seattle files for power

THE City of Seattle, Wash., has filed an application with the Federal Power Commission seeking a license for a proposed hydroelectric project on the Pend Oreille River in Pend Oreille County, Wash. The proposed development, designated as the Boundary Project, would consist of a thin arch type dam, approxi-



BEN C. GERWICK, JR.

The Prestressed Concrete Institute's its third annual membership meeting held in San Francisco, elected **Ben C. Gerwick, Jr.**, national president for the coming year. He is president of **Ben C. Gerwick, Inc.**, well-known Western construction firm. **Harold Price**, manager of the Structural Division of **Basalt Rock Co., Inc.**, Napa, Calif., was elected vice-president. Among the directors elected for two-year terms was **T. Y. Lin**, University of California.



PAVING 5 MILES OF MOTOR RACEWAY TRACK

Two Barber-Greene asphalt finishers take a tight curve as they pave a stretch of the \$5,000,000 Riverside International Motor Raceway track near Los Angeles, Calif. This multimillion dollar figure includes track, grandstands, parking areas, etc.; a project which will be three years in completion. Lower picture shows an architect's conception of the new 5-mi. raceway.

James E. Peterson shares the general contracting of the track with W. E. McKnight Construction Co. of Baldwin Park. The asphalt paving is being jointly undertaken by Industrial Asphalt Co. of Los Angeles and E. L. Yaeger of Riverside. Paving, now going on at the rate of about 14,000 tons a week, will cover the 5-mi. track circuit and includes steep grades as well as hairpin turns.

mately 385 ft. in height and 975 ft. long at the crest, providing a gross head for power purposes of 261 ft.; a reservoir with 42,000 ac. ft. of usable storage; spillways, conduits, and powerhouse.

The powerhouse would include six generating units each rated at 100,000 kva. The estimated cost of the proposed project is approximately \$134,215,760.

Bids called for tunnel by Hawaii Water Authority

PROPOSALS for the construction of a water tunnel from the North Fork Kaunakakai Gulch to Waikolu Valley diversion structures, wells and appurtenances on the Island of Molokai, Territory of Hawaii, will be received by the manager-chief engineer of the Hawaii Water Authority in Honolulu before October 24.

Work includes the construction of approximately 27,000 ft. of water conveyance and development tunnel, consisting of approximately 25,000 ft. of 6-ft. 6-in. x 8-ft. horseshoe shaped section and 2,000 ft. of 8-ft. diameter circular section; the drilling of wells, miscellaneous pipelines and diversion structures.

Plans and specifications may be obtained at the office of the Hawaii Water Authority in Honolulu, or at the office of Jacobs Associates, consulting engineers, 503 Market St., San Francisco, Calif., upon the deposit of \$100 for the first set of documents and \$25 for each additional set. Bidders must pre-qualify before October 11.

More Western hydro projects planned

Applications before the Federal Power Commission show jobs proposed for the future.

INTEREST in Western water development, with particular emphasis on the production of hydroelectric power, is indicated by several recent actions by the Federal Power Commission. The more important of the recent decisions follow:

A license has been issued to Garkane Power Association, Inc., Richfield, Utah, for a power project on two forks of Boulder Creek in Garfield County. Initial development would include an earth-fill dam with concrete spillway and 22,000 ft. of penstock leading to a power plant containing two 1,975-hp. turbines. Later, a small rock-fill dam would divert water to a 24-in. pipe from the West Fork to the reservoir created by the earthfill dam on the East Fork. Estimated cost of the final project is about \$600,000.

In Alaska, a license has been issued to the Chugach Electric Association, Inc., Anchorage for a proposed 15,000-kw. project. Construction would include an earth dam 60 ft. high storing 82,000 ac. for power development. Water would be delivered through a tunnel, conduit and penstock having a combined length of 10,300 ft. to a powerhouse on Kenai Lake with two 7,500-kw. units. Estimated cost of the project is \$6,000,000.

Also in Alaska, a preliminary permit has been granted for a 560-ft. dam on the Copper River providing more than 1,000,000 ac. ft. of storage and a powerhouse with an installed capacity of 1,000 kw. This permit is issued under

the name of Central Alaska Power Association, Inc., of Anchorage. The permit establishes priority but does not authorize construction. This is the same project for which a preliminary permit was issued in 1954 to Harvey Aluminum, Inc. This company indicated that the proposed project should more properly be developed by an agency or group in Alaska for the benefit of many industrial and private users.

A proposed power project on Priest River in Bonner County, Idaho, has been placed on file by Northern Lights, Inc., of Sandpoint, Idaho. This project estimated to cost \$1,300,000 would involve an earth and rock-fill dam on Priest River about 3 mi. below the outlet of Priest Lake. A 1-mi. canal would deliver water to a powerhouse containing two 2,125-kw. units. The organization is now seeking a license for the project having held a preliminary permit for three years.

The Pacific Gas & Electric Co. of San Francisco has filed an application for a license to develop power on the McCloud and Pit rivers. The application supercedes one dated February 1954. The proposed project estimated at a cost of about \$44,000,000 would include three dams: a concrete arch 230 ft. high, a timber crib 16 ft. high and an earthfill 175 ft. high. The remainder of the project would include two tunnels, the longest 40,500 ft., to deliver water from the McCloud River to a powerhouse on the Pit River which would contain two 107,000-hp. turbines.

The Federal Power Commission denied one application for a preliminary permit and dismissed another involving a proposed project in the Northwest.

Application of the Montana Power Co. for a proposed project on the Flathead River was denied. The FPC held that the company had been issued three preliminary permits two of which are still outstanding for projects in the same general section of the river. An application of the Eugene Water & Electric Board, City of Eugene, Oregon, was dismissed without prejudice. The proposed work on the South Fork of the McKenzie River would have provided for building power generating facilities below the Cougar Dam authorized for construction by the U. S. Corps of Engineers.

Fast progress on Trinity

WORK continues to advance at a fast rate on most features of the Trinity River Project being carried out by the Bureau of Reclamation in Northern California.

About a month ago, the construction of the buildings for the government community, including 90 houses, street work and utilities was practically complete. This was a \$1,576,588 contract carried out by Barry J. Richards Co.

Also nearing completion was the county road relocation work and the connecting access road.

Work on the main dam, a \$48,928,100 contract held by Trinity Dam Contractors was over 7% completed with about 1,000,000 cu. yd. of material removed from the site and concrete pouring started on the cutoff that extends from bedrock into the fill. The dam embankment will require the placing of 30,000,000 cu. yd. of material.

The other large contract which provides for driving the 10.8-mi. tunnel is being carried out by Shea-Kaiser-Morrison on a bid of \$36,644,556 and is just getting under way with about 1% completion.



TRAILER WITH 11 AXLES AND 42 TIRES HAULS LARGEST CONCRETE PIPE

The utility trailer is hauling the largest pipe ever built by American Pipe & Construction Co. Weighing 52 tons, its outside dimension is 16 ft. 4 in. and it is 16 ft. 8 in. long. This, and other pipe sections are being transported for sub-aqueous installation at the Southern California Edison Co.'s steam station, Huntington Beach.

The load, distributed over 11 axles and 42 tires, is being hauled on a specially-designed multi-axle low bed jeep and trailer, whose over-all length, including tractor, is 99 ft. Built by Utility Trailer Manufacturing Co., Los Angeles, the unit is the result of planning and design talent of both companies. In addition, according to Ed Trotter, su-

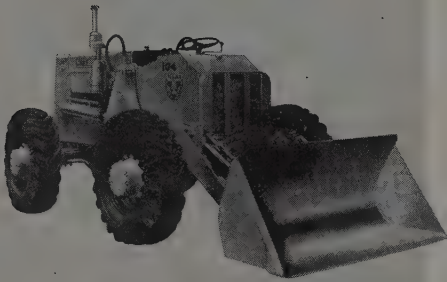
perintendent of mobile equipment for American Pipe & Construction Co., "We were particularly grateful for the big assist we received from the California State Highway Department. W. E. Wilson, permit engineer, and Dick Wagner, bridge engineer, both were most helpful in our preliminary planning and discussions."

MODEL 154



**2 cu. yd. cap., 4-wheel drive
with Torqmatic transmission.**

MODEL 104



**1 1/2 cu. yd. cap., 4-wheel drive
with Torqmatic transmission.**

MODEL LHM 75



**1 1/4 cu. yd. cap., 2-wheel drive
with torque converter.**

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For almost 90 years the famous YALE trademark has appeared only on products of the highest quality. Today, the YALE trademark appears on the TROJAN line of tractor shovels—machines that have pioneered the development of many construction and operating features that have helped set a new trend in bulk material handling techniques.

In the new line of TROJAN tractor shovels you'll find machines that will deliver extra digging power and faster loading ability—permit safe, fatigue-free handling because the operator is completely protected—operate efficiently and economically because every single feature is engineered to produce faster, smoother loading cycles.

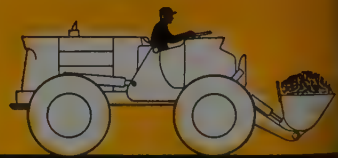
This complete combination of desired features will demonstrate to contractors and public officials that only the best is good enough to carry the YALE trademark.



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LOW LOAD CARRYING POSITION

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TROJAN*

*REG. U. S. PAT. OFF.

YALE & TOWNE

TRACTOR SHOVELS

2 & 4 Wheel Drive Front-End Loaders

CONTRACTORS MACHINERY DIV., THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK; SAN LEANDRO, CALIFORNIA

Another 7-mile outfall awarded by Los Angeles

THE BOARD of Public Works of Los Angeles has awarded a contract in the amount of \$20,297,530 for construction of a 7-mi. long effluent outfall, the newest element of the city's elaborate Hyperion sewage works program.

The contract amount represents the low bid submitted by a six-company joint venture known as Hyperion Constructors, sponsored by Raymond Concrete Pile Co. of New York. Other venturers include Macco Corp., Paramount, Calif.; De Long Corp., New York; Healy Tibbitts Construction Co., San Francisco; Peter Kiewit Sons' Co., Omaha, Neb.; and Tavares Construction Co., La Jolla, Calif.

Said to be the biggest outfall construction job undertaken to date, it will dis-

charge waste water from the Los Angeles Hyperion Sewage Treatment Plant 5 mi. into the Pacific Ocean. Contract calls for installation of a 200-ft. tunnel under the Del Mar coastal highway; then 27,500 ft. of 12-ft. diameter concrete pipe in water up to 190 ft. in depth. At that point the line will split into two diffuser sections, each leg of which will contain 2,400 ft. of 8½-ft. diameter pipe and an additional 1,560 ft. of 6-ft. diameter pipe. The contractors have 1,000 days in which to complete the job.

Specifications call for installation of the "onshore section" of 3,699 ft. within a sheetpile cofferdam (in the wet) and handled by equipment working from a trestle. Here the contractors are proposing to handle four 24-ft. long sections at a time, for a total unit length of 96 ft. The gross weight of each of the largest sections thus handled will be approximately 325 tons.

ALASKA NIKE JOB

(Continued from page 41)

At present, 120 men are employed on the job, consisting of virtually all building trades except painters. The construction workers commute from the Anchorage area.

Thorough safety program

A primary problem on most construction jobs—the problem of safety—was given extra attention.

We felt that, because of the unusually severe weather conditions prevalent there and the nature of the terrain, the ordinary hazards of construction were intensified. Therefore every possible effort has been made to instill safety-consciousness in job personnel.

Job foremen have been asked to make a mental note of every potential hazard. Extra attention was given to putting up very sturdy scaffolding, guard rails and hand rails and cleated access ramps.

We considered the possibility of fire and placed fire buckets and barrels at strategic spots, and also placed fire extinguishers in a handy position within a few seconds walking time of every section of the job.

Weekly 15-min. safety meetings were set up at which foremen reviewed potential safety hazards with the men in their crews.

No trash was allowed to accumulate in the work area. The men were instructed to tear nails out of boards as soon as the board was stripped from the building.

Employees were instructed in detail on the hazards of driving on the steep terrain, the danger of working in too few clothes in the extreme cold temperatures encountered, the necessity for wearing hard hats at all times while on the jobsite.

Contractors vehicles have been equipped with back-up alarms—going which emits a loud sound when the truck is in reverse—thus providing a warning to individuals in the area.

An ambulance is kept in readiness at all times on the jobsite. So far, no safety record on the job has been perfect. There hasn't been so much as a skinned knuckle to report since the job started.

Credit for the success of this program and for keeping the entire project ahead of a rigid time schedule to the hard-working team of supervisory personnel.

These include Charles Steadman



TILT-UP FEATURED IN CONSTRUCTION OF MARKET FACILITIES

One of the construction features of the \$2,000,000 Young's Market Co. facilities on South Central Ave., Los Angeles, Calif., is the wide use of tilt-up devices. Shown above is one of the 28-ton concrete wall panels for the 124,000-sq. ft. warehouse being placed into position. The Hinds pick-up arm of Special Purpose Products, Inc., was used in the lifting and placing of 104 tilt-up wall panels averaging 25-30 tons each. The floor of the warehouse was used as the casting bed for the tilt-up wall panels. The contractors are Twaits-Wittenberg Co. Architects-engineers are Albert C. Martin & Associates. The new facilities which include a warehouse, general offices, meat plant and garage will be completed this year.

GAS or ARC

*it's Airco quality for
superior results*



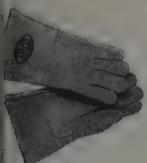
AIRCO HELMETS:

A complete line of welding helmets and face shields including the new hard hat equipped with "helmet blocks" for attachment of welding helmet.



AIRCO HOLDERS:

Available in 25 models, jaw and screw types, ranging from 200 ampere holders to the heavy duty model for handling 700 amperes.



AIRCO GLOVES: The same quality that makes other Airco accessories the best value you can buy extends to welders' gloves and leather sleeves.



AIRCO CABLE AND CONNECTIONS:

Unrivalled dependability, long life and flexibility. Sizes from 4 to 4/0, for wide range of amperages at varying distances from welding machine. Make sure of good connections with Airco ground clamps, cable splicers,

Milk-Trik cable connectors and cable lugs.



AIRCO GOGGLES: For gas welding or cutting. Precision made, they afford excellent ventilation with maximum eye protection.



AIRCO CYLINDER TRUCKS:

Make your welding and cutting outfit easily portable with an Airco two-wheel hand truck. Strong, rigid, welded steel frame; broad steel platform. Five models offer wheel sizes and styles for every type of surface.



AIRCO SAFETY HATS AND CAPS:

Lightweight, molded of fiber glass and polyester resins to give maximum protection. Available in seven standard colors.

See the new hard hats equipped with "helmet blocks" for the attachment of welding goggles or vispers.



AIRCO TWIN-HOSE:

Two lines of hose molded into a single, light flexible unit. Close, tight braid permits thicker rubber cover for greater wear resistance.



YOU NAME IT — Airco has it . . . oxygen, acetylene, torches, tips, regulators . . . sparklighters, soapstones, tip cleaners, circle cutting attachments, carrying cases, chipping hampers, brushes . . . all at low prices. Call your Authorized Airco Dealer or nearest Airco office for your arc or gas requirements.



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Air Reduction Pacific Company is a division of Air Reduction Company, Incorporated. Principal products of other divisions include: PURECO — carbon dioxide — gaseous, liquid, solid ("DRY-ICE") • OHIO — medical gases and hospital equipment • NATIONAL CARBIDE — pipeline acetylene and calcium carbide • AIRCO — acetylenic chemicals • COLTON — polyvinyl-acetates, — alcohols, and other synthetic resins.

inspector for the U. S. Army Engineer District, Alaska; William Barker, the project superintendent; Percy Morgan, carpenter foreman; Jay Tennyson, concrete foreman; Al McCoy, steel foreman, and Joe Sipes, excavating superintendent.

Careful sidewalk supervision

Working with this topnotch team has been a great source of satisfaction. Another factor that makes the job more interesting for everyone involved is the variety of "sidewalk superintendents" that look in on our job every once in a while. So far, the visitors have included moose, bear, wolves, goats and coyotes and—from the air—eagles and ptarmigans.

The scenery from Site Summit is unexcelled—when we can see it. Many times, the sun is shining on our summit construction site, but the valley below is obscured by a thick layer of clouds.

Low bids and contract awards

ARIZONA

Dale F. Payne, contractor of Phoenix, submitted a low bid of \$1,042,601 for approximately 9 mi. of grading and surfacing east of Benson on the Benson-Steins Pass highway in Cochise County. A \$1,463,530 contract was submitted by Wallace & Wallace of Phoenix for 5.6 mi. of grading and surfacing and structures on the Flagstaff-Holbrook highway, east of Winslow in Navajo County. A low bid of \$206,537 was submitted by Royden Construction Co., Phoenix, for 5 mi. of grading and surfacing the Yuma-Parker highway northeast of Yuma in Yuma County. Heuser & Garnett of Phoenix submitted a low bid of \$189,951 for grading, surfacing and widening 4.6 mi. of the San Luis-Yuma highway near the town of Somerton in Yuma County. A low bid of \$108,767 was submitted by W. J. Henson of Prescott for 2½ mi. of grading, draining and surfacing the Kirkland-Prescott highway near Prescott in Yavapai County. Southern Engineering & Construction Co., Inc., Long Beach, Calif., submitted a low bid of \$1,059,157 for water supply system for Page. Vinson Construction Co., Phoenix, submitted a low bid of \$706,519 for 1.1 mi. of grading and surfacing south of Cameron in Coconino County. A low bid of \$163,242 was submitted by Mohamed Earthmoving Contractor of Phoenix for approximately 6½ mi. of grading and surfacing east of Gilbert in Maricopa County.

CALIFORNIA

A \$5,748,745 contract was received by Guy F. Atkinson Co. of South San Francisco for grading and surfacing an 8-lane roadway for 3.6 mi. on the San Diego Freeway in Culver City and Los Angeles, and construction of 8 bridges and one pedestrian undercrossing and 12 retaining walls in Los Angeles County. Madonna Construction Co., San Luis Obispo, received a \$1,679,044 contract for grading and surfacing 6.4 mi. of Sign Rte. 190, between Worth Road southwest of Springville, and construction of 2 bridges in Tulare County. R. E. Hazard Contracting Co. and W. F. Maxwell Co., San Diego, received a \$1,368,476 contract for 1.1 mi. of grading and surfacing U. S. 101 and construction of one box girder bridge in city and county of San Diego. Schall & Farrell of San Rafael received a \$317,448 contract for 5.7 mi. of grading and surfacing the Frazier Valley road, northeast of Porterville in Tulare County. Rockport Redwood Co., San Francisco, received a \$344,394 contract for 1.6 mi. of grading and concrete cribbing and drainage facilities installed in Mendocino County. Lester L. Rice & Sons, Inc., of Yuba City submitted a low bid of \$294,452 for 1.5 mi. of grading and surfacing and construction of two bridges on the Gridley-Colusa highway west of Gridley in Colusa and Butte counties. Griffith Co. of Los Angeles submitted a low bid of \$4,199,746 for 2 mi. of grading, surfacing and separation structures and pedestrian undercrossing to be constructed in Los Angeles County. Peter Kiewit Sons' Co., Medford, Ore., submitted a low bid of \$530,232 for 1.1 mi. of grading and surfacing and construction of one bridge south of Gualala River and Gualala in Sonoma and Mendocino counties. A low bid of \$672,566 was submitted by Granite Construction Co., Watsonville, for 2.9 mi. of grading and surfacing in city and county of Santa Cruz. Peter Kiewit Sons' Co. of San Francisco submitted a low bid of \$7,235,235 for 1.4 mi. of grading and surfacing a portion of multilane, 2-level welded steel and concrete separation structures to be constructed, ramp approaches and city streets to be graded and electrical systems to be installed in city and county of San Francisco. A. Teichert & Son, Inc., Sacramento, received a \$160,910 contract for construction of one culvert and widening two bridges on Rte. 128 in Winters, Yolo County. A. J. Raich Paving Co. of San Jose received a \$323,547 contract for 1.4 mi. of grading and surfacing and drainage facilities to be installed in Santa Clara County. A contract for \$206,867 was received by Arthur B. Siri, Inc., of Santa Rosa for construction of concrete bridge and approaches across Stony Creek at Stonyford on Rte. 1117 in Colusa County. M. H. Golden Construction Co., San Diego, received a \$1,365,000 contract for the construction of runway at the Naval Air Station, North Island, San Diego.

COLORADO

Colorado Constructors, Inc., of Denver submitted two low bids for road work in Delta and Prowers counties: low bid of \$1,695,000 for 6.2 mi. of grading and surfacing Cedaredge-Mo Rte. in Grand Mesa National Forest in Delta County, and \$235,320 for pavement widening, structures and stabilization from Wiley Jct. to Arkansas River Bridge, north of Lamar in Prowers County. Gardner Construction Co. of Glenwood Springs, submitted a low bid of \$1,466,898 for grading, structures and bridge over railroad tracks and river in city and county of Pueblo. F. R. Fe Construction Co. of Hutchinson, Kan., submitted a low bid of \$1,695,622 for construction of weapons maintenance shop and warehouse, including boiler house, Pueblo Ordnance Depot, in city of Pueblo. Roberts Construction Co. and Western Paving Co. of Denver submitted a low bid of \$1,016,154 for stabilization, concrete pavement, surfacing and shoulders between Denver and Castle Rock in Denver, Arapahoe and Douglas counties. Blanchard Construction Co., Derby, submitted a low bid of \$321,821 for grading, surfacing and structures on 8.7 mi. between Cheyenne Wells and Burlington on S. H. No. 5. Kit Carson and Cheyenne counties. A low bid of \$200,239 was submitted by Hunt Construction Co., Steamboat Springs, for 3.1 mi. of grading and surfacing between Powderhorn and La Junta in Gunnison County. A low bid of \$589,442 was submitted by J. B. Kenne Inc., Denver, for five structures east and west of Idaho Springs in Clear Creek County.

Peter Kiewit Sons' Co., Denver submitted a low bid of \$1,122,983 for construction of two underpasses, three overpasses and approaches between Denver and Castle Rock in Arapahoe and Douglas counties. Domenic Leon Construction Co., Inc., of Trinidad submitted a low bid of \$1,064,831 for 8 mi. of grading, structures and surfacing between Pueblo and Walsenburg in Huerfano County. A low bid of \$444,585 was submitted by Z. H. Lowdermilk, Inc., Englewood, for 3.5 mi. of grading, structures and surfacing between Pueblo and Beulah in Pueblo County. H. & E. Lowdermilk, Englewood, submitted a low bid of \$277,638 for 8.6 mi. of grading and surfacing between Conifer and Bailey in Jefferson and Park counties. Northwest Engineering Co., Denver submitted a low bid of \$377,777 for 10 mi. of grading, structures and surfacing between Loveland Pass and Silver Plume in Clear Creek County. A low bid of \$267,208 was submitted by Monaghan & Smith Construction Co. of Darby, for plant-mix asphalt surfacing between Ft. Garland and Russell in Costilla County. A low bid of \$267,208 was submitted by Siegrist Construction Co. of Denver for grading, stabilization and structures between Colorado National Avenue and Stoneham in Weld County.

Q. Why are you using only Cat-built equipment on this job?

A. "My partner and I were superintendents for one company for 10 years using all kinds of equipment. When we went into business for ourselves, we didn't consider any equipment but that made by Caterpillar. We have been 100% Caterpillar since the company was organized."

A. D. McCullen, Cunningham & McCullen, Shreveport, La.



Cunningham & McCullen knew production would be high on this 11-mile relocation job near Bunkie, La. Their spread is 100% Caterpillar. For 10 years, they had seen Caterpillar-built equipment prove itself in performance and dependability.

On this job the CAT* D6 Tractor, teamed with two DW15s, a D8 and a No. 12 Motor Grader, is moving up to 4,000 yards a day.

Now you can expect even greater production and economy. The D6, for instance, delivers 75 HP at the drawbar—productive horsepower because of the unit's sure-footed traction. And the D6 is equipped with the exclusive Caterpillar oil clutch which in-

creases machine availability and reduces service and maintenance costs.

From the 48 flywheel HP D2 to the giant 320 flywheel HP D9, there's a complete line of six track-type tractors to meet your needs. Call your Caterpillar Dealer today. He will demonstrate this high-production, versatile equipment on your job. And you can count on him to back its long work life with efficient, 24-hour service and quality Caterpillar parts.

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

CATERPILLAR*

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

**WANTED—
THE HARD WORK**

IDAHO

Marion J. Hess of Malad received a \$105,091 contract for 5 mi. of grading and surfacing and drainage structures on the Deep Creek Road in Oneida County. **Howard S. Wright & Co., Inc.**, D. L. Cheney of Seattle, Wash., and S. Birch & Sons Construction Co. of Great Falls, Mont., on a joint venture received a \$6,044,695 contract for construction of the Flight Engine Test Facility at the National Reactor Testing Station.

NEVADA

Frank Capriotti of Reno submitted a low bid of \$166,145 for sewage treatment plant, reconstruction of access road to plant, water lines and electrical

service lines to plant, Stead Air Force Base. **Dodge Construction, Inc.**, of Fallon, received a \$340,871 contract for construction of a portion of the State Highway System south of Shoshone in White Pine County. **Wells-Stewart Construction Co., Inc.**, of Las Vegas received a \$289,335 contract for construction of a portion of State Highway System, Rte. 673, near Lund in Nye and White Pine counties.

NEW MEXICO

O. D. Cowart of Albuquerque received a \$1,280,806 contract for 5.5 mi. of grading, surfacing and structures on the Valencia-Bernalillo County Line-West Road on U. S. Highway 66 in Va-

lencia County. A \$748,504 contract was received by **Skousen-Hise Contracting Co.** of Albuquerque for 10.4 mi. of grading, surfacing and structures, De Moines West Road, U. S. 64-87 in Colfax and Union counties. **Longenbaugh & Coe, Inc.**, Albuquerque, received two contracts for roadwork in San Miguel and Torrance counties: a \$474,158 contract for 12.7 mi. of grading and surfacing the Trujillo-West Road, SR-65 in San Miguel County, and \$185,254 for 8.3 mi. of grading and surfacing the Tajique-Chilli Road, SR-10 in Torrance County. A \$364,823 contract was received by **Allison & Haney** of Santa Fe for 7.9 mi. of grading and surfacing the Gobernador-West Road, Highway SR 17 in Rio Arriba County. **Imperial Paving Co.**, Oklahoma City, Okla., received a \$148,523 contract for 6.6 mi. of the Moses-North and East Road, SR-18-32 in Union County.

OREGON

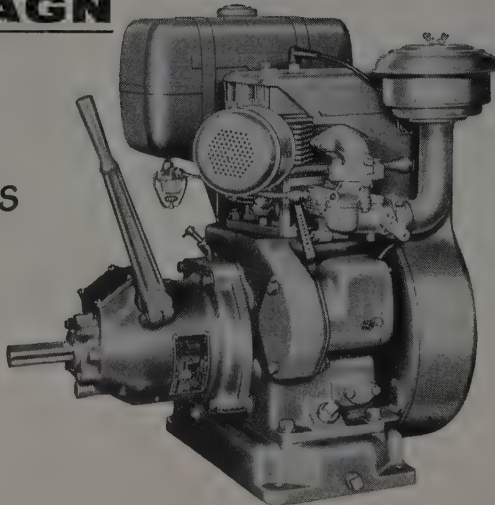
A low bid of \$322,935 was submitted by **F. H. McEwen** of Eugene for five RO grade separations, North Jefferson Jct. North Albany, on the Pacific Highway in Marion and Linn counties. **Henry H. Miller Constructors, Inc.**, of Roseburg submitted a low bid of \$208,252 for grading the North Unit, S. P. railroad overcrossing-Santiam Jct. on the Pacific Highway in Linn County. **Rogers Construction Co.** of Portland submitted a low bid of \$153,063 for grading and paving Northeast Glisan Street in the city of Portland, Multnomah County. A low bid of \$131,940 was submitted by **Inland Construction Co.**, Milwaukie for Ross Island Bridge widening on the Mount Hood Highway in Multnomah County. **Keith Bros. Construction Co.** of Medford submitted a low bid of \$167,692 for grading and paving the Ross Lane-Jacksonville section of the Crater Lake Highway-Jacksonville Road in Jackson County. **Warren Northwest, Inc.**, Portland, submitted a low bid of \$246,503 for grading and paving the Interstate Bridge-Oregon Slough section on the Pacific Highway in Multnomah County. **Roy L. Houck & Sons**, Salem submitted a low bid of \$666,289 for grading the South Unit, S. P. railroad overcrossing-Santiam Jct. on the Pacific Highway in Linn County. **Parker Schram Co.**, Portland, submitted a low bid of \$500,656 for grading and paving the Highlands Interchange on the Sunset Highway in Multnomah County. A low bid of \$149,954 was submitted by **A. L. Harding, Inc.**, of Stayton for grading the Valley Junction-Wallace Bridge unit on the Salmon River highway, Polk County.

UTAH

Thayn Construction Co., Salt Lake City, submitted a low bid of \$585,270 for earthwork, pipelines and structure trunkline, West Framington, Wood Cross, Davis Aqueduct, Weber Basin Project. A low bid of \$145,784 was submitted by **Lewis-McNeish Construction Co.** of Bountiful for 1.5 mi. of grading

A NEW, **BIG**, 4-Cycle Single Cylinder Air-Cooled Engine... the **WISCONSIN 12½ hp.** **MODEL AGN**

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Specialists



Model AGN Engine
with Clutch Assembly.
Also available with
stub shaft or with
Reduction, Clutch
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• It takes full-time engine "know-how" and full-scale engine manufacturing concentration to design and produce engines of outstanding character and Performance Ability.

The new Wisconsin Model AGN 12½ hp. engine is the product of this unbeatable combination. *Engine specialists designed it. Engine specialists are building it.*

Putting 12½ hp. into a single cylinder air-cooled engine calls for basic *High Torque . . . the load-holding Lugging Power* that keeps the equipment *working* through sudden shock loads. It also calls for heavy-duty construction in all details . . . plus dependable cooling under all weather conditions from sub-zero to 140° F.

Bulletin S-216, just off the press, will give you details about Model AGN. Write for it.



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and surfacing on State Road No. 46 from the Utah-Colorado State Line easterly in San Juan County.

WASHINGTON

Babler Bros., Inc., of Portland, Ore., received a \$497,135 contract for 1.4 mi. of grading and surfacing in the Satus Pass vicinity, Klickitat County. A contract of \$206,109 was received by Macrae Bros., Seattle, for grading and surfacing in the city of Seattle, King County. Wilder Construction Co., Bellingham, received a \$341,676 contract for grading and surfacing 3.5 mi. of State Road in Whatcom County. The Harrison Brothers Co. of Tacoma received a \$177,679 contract for 6.1 mi. of grading and surfacing P.S.H. No. 9 in Clallam and Jefferson counties. A \$1,013,301 contract was received by Paine-Allucci, Inc., of Tacoma, for 1.7 mi. of grading and surfacing Pierce County Road in Pierce County. Interstate Asphalt Co., Inc., Aberdeen, received a \$1,044,460 contract for 3.2 mi. of grading and surfacing in city of Aberdeen, Grays Harbor County. Pacific Sand & Gravel Co., Centralia, received a \$248,294 contract for 5.7 mi. of grading and surfacing King County Road, in King County. A. Sullivan, Spokane, received two contracts for work in Grant and Kittitas counties: a \$167,259 contract for 9 mi. of grading and surfacing the Priest Rapids to Jct. S.S.H. 11-A in Grant County, and \$104,914 for 2.7 mi. of grading and surfacing Thrall-Badger Pocket Road in Kittitas County. A \$154,978 contract was received by R. L. Moss & Co. of Puyallup for 2.8 mi. of grading and surfacing in city of Seattle, King County. Morrison & Co., Inc., Walla Walla, received a \$113,990 contract for 6 mi. of grading and surfacing in Walla Walla County.

WYOMING

Coker Construction Co., Peter Kiewit Sons' Co. and Condon-Cunningham, Inc., (joint venture) of Omaha, Neb., submitted a low bid of \$14,434,000 for construction of Glendo Unit, Wyoming Region Trail Division, Missouri River Basin Project, Fremont Canyon powerplant and power conduit. Long Construction Co. of Billings, Mont., submitted a low bid of \$680,460 for left abutment outlet works and rehabilitation of penstock intakes, Shoshone project.

ALASKA

Manson-Osberg of Seattle, Wash., received a \$1,041,050 contract for construction of a small boat basin at Kodiak. The boat basin will provide the primary operating base for commercial fishing between Seward and Dutch Harbor, a distance of more than 750 mi. Ramo Construction Co., Anchorage, submitted a low bid of \$152,450 for repair of runway and parking area and lighting at Gulkans for the U. S. Civil Aeronautics Administration.

YOUR DAVIS DEALER IS DEALING...SEE HIM NOW!

A large advertisement for the Davis Loader-Backhoe. At the top, a man sits on the machine, which is a tractor with a backhoe attachment. A circular logo with the word "DISCOVER" and "DAVIS" in large letters is positioned above the machine. Below the main image, there are two smaller inset photos: one showing the backhoe digging a trench next to a building, and another showing the machine in a field. Text is overlaid on the right side of the main image and in a box at the bottom right.

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DAVIS

Davis Model 210 Backhoe and 102 Loader on a Model 202 Work-Bull Tractor.

YOU CAN SEE FOR YOURSELF

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at any price...on any tractor!

Davis 210 digging flush alongside a building.

Davis 210 digging flush alongside a building.

Only the Davis Loader-Backhoe allows you unrestricted vision. You can see why this rig, with many such exclusive features gives you more **earning power**.

You sit high on the backhoe so you can see exactly where you're working and you move with the boom so you always face the bucket — just like on the big power shovels.

Only the Davis 210 Backhoe lets you dig flush alongside a building, wall, or fence. Vertical stabilizers, right-angle digging, and 10,000 pounds breakaway power give you the **advantage on every job**.

The Davis Loader—with built-in strength and streamlined design—has been widely copied, but never equalled.

You would naturally think that this rig would cost you more, but it actually costs less than most other makes.

Davis Loaders and Backhoes are available for all popular models of International, Ford, Work-Bull, Fordson Major, Ferguson, Case, Massey-Harris, Allis-Chalmers, Oliver, John Deere, and Minneapolis-Moline Tractors.
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ENGINEERS and CONTRACTORS

Albert J. Gallardo, recently of the U. S. Bureau of Public Roads' Region 7 office in San Francisco, has been made area engineer at the BPR Sacramento division office.

* * *

Raymond Dodson, who has been with Guy F. Atkinson Co. at Coyote Dam, Ukiah, Calif., has moved to Lewiston, Calif., as job cost engineer for Trinity Dam Contractors, joint venture constructors, of which Atkinson is the sponsoring partner.

* * *

Fred W. Poe, civil engineer with Worthington & Skilling, structural engineers of Seattle, Wash., was recently assigned to the National Advisory Committee for Aeronautics—Ames Aeronautical Laboratories at Moffett Field, Calif. With this assignment Lieutenant Poe's active duty with the U. S. Army will end in November, 1958.

* * *

John W. Brown, civil and structural engineer of Reno, Nev., announces the removal of his offices to 642 North Sierra St.

* * *

Risto L. Basich, 70, died suddenly at Pasadena, Calif. A builder of highways, dams and other major projects in the West, Basich with his brother Nicholas formed the Basich Bros. Construction Co., South San Gabriel, Calif., in 1905.

* * *

James H. Cairns, survey and plans engineer of the Idaho Department of Highways, has been elevated to the post of assistant state highway engineer. He has been a member of the department for 26 years.

* * *

The State Highway Commission of Montana announces two personnel changes as the result of the resignation of **Henry C. Helland**, deputy highway engineer, also the appointment of a secretary. Named to the new post of programming engineer is **Horace B. Williams**, road plans engineer for 30 years. **M. R. Wickman**, assistant road plans engineer for the past twelve years, has been promoted to road plans engineer. **John D. Wheeler** was named secretary for the Commission, succeeding **C. E. Cunningham**, who resigned the end of July. Helland left the highway department to join a private engineer firm in Salt Lake City, Utah, and his former position of deputy highway engineer has been eliminated.

* * *

To better serve clients in the Western region, Haarstick Lundgren and Associ-

ates Inc., St. Paul, Minn., have opened an office in San Francisco, Calif., at 333 Montgomery St. The firm engages in a general practice involving a variety of architectural and engineering commissions. **Robert A. N. Bennighof**, associate, is in charge of the Western operation.

* * *

The firm of **Leland S. Rosener, Jr.**, Engineers, has become Rosener Engineering Incorporated, Engineers and

Architects, maintaining the same key personnel with offices at 149 New Montgomery St., San Francisco, Calif. The new corporation is a continuation of private practice dating back to 1904 when **Leland Rosener's** father established a consulting engineering business.

* * *

Robert T. Lawson, chief engineer the San Francisco office of Dames Moore, and **Warren D. Curtis**, former engineer in charge of the Salt Lake City office of the civil engineering firm, have been admitted as partners, according to recent announcement.

* * *

Ray S. Marvin, Los Angeles building contractor, has been elected president of the City Planning Commission, succeeding **R. W. Harper**, resigned. **L. N. K. Boelter**, dean of the College of Engineering, University of California, Los Angeles, was elected vice president.



IMPORTANT MEN on the \$10,261,636 contract held by the joint venture firm Westbrook—M.K.—Parker for main runway paving at Beale AFB near Marysville, Calif., are top (l. to r.): **A. B. Pope**, project superintendent for the contractor **Don Fenton**, materials specialist with the Corps of Engineers; **Ross Westbrook**, one of prime contractors; bottom (l. to r.): **Hurst Lewis**, inventor and manufacturer of the Lewis float finisher; **Col. A. E. McCollam**, Sacramento District Engineer, C. of E.; **Lt. Col. P. A. Loop**, assistant district engineer for operation C. of E.; and **Don Hitchcock**, project engineer for the Corps at Beale. This concrete paving project is described in this issue on page 25.

INSURE TRACTION

**ANOTHER TAMPO FIRST!
FIELD PROVEN!**

**TAMPO'S new
Model 56 COMPACTOR
specifically
designed to be pulled by
Rubber Tired Tractors.**

**6 tons
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EUCLID S-18

The unique design of Tampon's Model 56 fifty ton compactor makes it possible to exert six tons of dead weight on the rubber tired tractor king pin — in this manner utilizing a total of approximately 8500 lbs. at this point. This alleviates necessity of loading tires with water to insure traction on the tractor drive wheels. Rubber tired tractors coupled with Tampon's weight/traction feature provide big savings in tractor operation overhead.



EUCLID 8 TDT



CATERPILLAR DW-15



EUCLID S-12

Special tongues are available for 2 and 4 wheel rubber tired tractors — including models of Caterpillar, International Harvester, Euclid, LeTourneau and Allis Chalmers.



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Herman A. Mallman recently retired from the Corps of Engineers' South Pacific Division laboratory at Sausalito, Calif. He served the Corps for 24 years.

* * *

Irving T. Hallstrom has accepted a position in the San Francisco Bay area with the U. S. Maritime Administration. He is shipyard superintendent at the reserve shipyard at Richmond, Calif., supervising maintenance and security. Prior to this new connection, Hallstrom was with the Bonneville Power Administration, Portland, Ore., as construction management engineer.

* * *

Donald E. Anderson, who had been an estimator in the home office of Lewis A. Hopkins & Co., Pasco, Wash., before serving with the Engineers, U. S. Marine Corps, has rejoined the Hopkins contracting firm as field engineer on the Wahluke siphon 6 mi. east of Othello, Wash.

* * *

Howard Payne is resident engineer for the Bridge Department of the California Division of Highways which is building a bridge and one mile of new highway in Gualala, Mendocino County. The job, to cost \$530,000, is being done by Peter Kiewit Sons' Co., who has **Sherman Ward** as superintendent.

* * *

Stanley H. Froid is Tudor Engineering Co.'s representative in Honolulu for the joint venture of Law & Wilson, Tudor & Towill. His job is to coordinate the structural design features performed in Tudor's San Francisco office with the balance of design being done in Honolulu by the other joint venture firms on the Kaimaki section of the Lunalilo freeway in Honolulu.

* * *

A. R. Stuckey, projects engineer for Stone & Webster Engineering Corp., has been on hydro projects in British Columbia and elsewhere since leaving the West Coast, and at present is working on transmission lines for the firm at East St. Louis, Ill.

* * *

Intermountain Branch of Associated General Contractors recently moved its headquarters in Salt Lake City to 438 South Main St., Postal Zone 1.

* * *

Legal setbacks causing delays in construction progress on Tacoma City Light's Cowlitz River power dams in Washington resulted in the departure of 19 members of the Utility's engineer staff. Among those leaving for other positions were: **John C. Richards**, assistant head civil engineer, to the Corps of Engineers' Eagle Gorge Dam project in western Washington; **Henry L. Cook**, to Laminated Wood Products Co., Tacoma, as construction engineer; also to Laminated Wood Products, **Marvin Wallingford** and **Joe E. Morris**; **Robert L. Berquist**, to Anderson, Birkeland and Anderson, Tacoma; **Richard C. Lofgren**, to R. W. Beck Co., Seattle, as a hydroelectric engineer; **James Thompson** to Pacific Hoist Co., Seattle; **Elliott Seymour**, to Fluor Company, Los Angeles; **Dou-**

las Gray, to Corps of Engineers, Portland; **John Satherthwaite**, to Public Works Department, City of Tacoma; and **Gene Clark** to Port of Tacoma.

Harvey Snyder returned to home territory and an engineering position in Texas; **Gerald Parker** and **Robert Ho** assumed new posts in California. Five surveymen who also left City employment are **Charles Parizek**, **Oren White**, **Myron Goyette**, **Gordon Stark** and **Jack Blanksma**.

* * *

Paul E. Radasch, civil engineer, until recently with Howard, Needles, Tammen and Bergendoff, is now located in Greeley, Colo., with the consulting firm of Harold Hoskins and Associates, consulting engineers, specializing in sewerage, waterways, highways, bridges, airports, etc.

* * *

Raymond J. Briggs, consulting engineer of Boise, was recently re-elected chairman of the Idaho State Board of Engineering Examiners. **Wendell W. Wilson**, Pocatello city engineer, was chosen vice chairman, and **Orland C. Mayer**, Idaho Power Co. engineer, was named secretary.

* * *

Reamy C. Fitch 54, prominent Phoenix civil engineer, died recently in Phoenix. He had his own consulting firm, and was recently concerned with the expansion of sanitary sewers in the north Phoenix and Scottsdale areas. He was a member of the Arizona Section, American Society of Civil Engineers, the Society of Professional Engineers, and American Water Works and Sewage Association.

* * *

Lt. Col. William H. H. Mullin has been assigned to the post of assistant district engineer, North, for the Alaska Army Engineer District. His headquarters are at Ladd Air Force Base near Fairbanks and his area of responsibility will be the vast interior north of the Alaska Range within the boundaries of the 11th Air Division and the Yukon Command.

* * *

Five engineers from the Corps of Engineers offices in the South Pacific Division area were recently named to membership on the U. S. Committee on Large Dams. The committee represents this country as one of 35 member nations of the International Commission on Large Dams whose objective is the fostering of improvements in building and operating large dams of the world. The new appointees are: **Brig. Gen. William F. Cassidy**, South Pacific division engineer; **Col. Carroll T. Newton**, Los Angeles district engineer; **Everett L. Knutson**, chief of the South Pacific Division operations division; **A. Gomez**, chief of the Sacramento District's planning and reports branch; and **William L. D. Bortorf**, chief, hydraulic and hydrologic section of the SPD engineering division. Another SPD engineer, **William C. Cassidy**, chief of the technical engineering branch, has been a member since 1951.



GEORGE E. LANG, former Arizona State Highway Engineer and recent state maintenance engineer, receives from **Wm. E. Willey**, present State Highway Engineer, a certificate of appreciation for his long service to the Department at an informal ceremony marking his retirement from State service. The ceremony was attended by members of the engineering staff and long-time friends of Lang.

CALENDAR

- Oct. 14-18—American Society of Civil Engineers, annual convention, Hotel Statler, New York City.
- Oct. 18-19—Professional Engineers Oregon, convention, Eugene Hotel, Eugene, Ore.
- Oct. 21-25—National Safety Congress and Exposition, annual meeting, Chicago, Ill.
- Oct. 23-26—Associated Equipment Distributors, tri-regional meeting, D Monte Lodge, Carmel, Calif.
- Oct. 28-30—American Road Builders Association, annual National Highway Conference for County Engineers and Officials, French Lick-Sheraton Hotel, French Lick, Ind.
- Oct. 31-Nov. 1-2—Structural Engineers Association of California, annual meeting, Hotel del Coronado, Coronado, Calif.
- Nov. 5-6—American Concrete Institute regional meeting, Benjamin Franklin Hotel, Seattle, Wash.
- Nov. 11-13—Structural Clay Products Industry, annual convention, Greerbrier Hotel, White Sulphur Springs, W. Va.
- Dec. 2-6—Committee C-1 on Cement and C-9 on Concrete and Concrete Aggregates of the American Society for Testing Materials, fall meeting, Fortin de las Flores, Mexico.
- Dec. 4-5—The Asphalt Institute, annual meeting, New York Athletic Club, New York City.
- Dec. 9-13—Committee D-18 on Soils and Engineering Purposes of the American Society for Testing Materials, joint meeting with the Mexican Society of Soil Mechanics, University of Mexico, Mexico City.

SUPERVISING the jobs



RAY HOLLERN (left), superintendent for Union Credit Co. This contracting firm is now finishing a job consisting of 2.8 mi. of grading and gravel surfacing with oil penetration on the Hamilton-east highway in Ravalli County, Mont. **Al Schmidt** is foreman on the \$125,933 project. With Hollern is **Lewis M. Chittim** as the two appeared on a prior highway job in Montana. Chittim is division construction engineer at Butte for the Montana Highway Commission.

J. W. Cherf and **Charles Stierwalt**, project manager and superintendent respectively, head the list of construction men on a \$509,993 recent award to Cherf Brothers, Inc., for undercrossing and approaches on S.S.H. 11-G in Grant County, Wash. Other key men on this grading and paving job are **Ralph Stalsberg**, crushing superintendent, and **Dee Briggs**, foreman. **Lou Schaeffer** is in charge of excavating, which is under subcontract. The job is expected to be finished next March, and has been under way since August.

William Paukovich is asphalt superintendent for The Brannan Sand & Gravel Co. on a contract in the amount of \$153,671 for street improvement in Denver, Colo., consisting of excavation, curbs and gutter, and complete asphalt paving. Project foreman is **James Thomas**, and field engineer is **Earl Branstrup**. Work started Aug. 14 and will be finished Nov. 14.

W. I. Sawyer is superintending for Peter Kiewit Sons' Co. a \$520,032 recent award for grading and draining 4.8 mi. of the Lewis and Clark Highway in Bearwater National Forest, Idaho County, Idaho. **Dave Cavender** is powder foreman, and **Ray Howard** is labor foreman on the job, which started

in August and will be finished about July next year.

Walter C. Ewers is superintending a farm-to market road job which was recently awarded to J. H. Marshall on a low bid of \$180,630. The job, which got under way Aug. 12 and will be finished about the middle of October, consists of 13 mi. of grading, surfacing and oil southwest of Portales-west in Roosevelt County, N. Mex.

Dave Richard is project superintendent for Wismer & Becker and P. S. Lord who were recently awarded a \$1,802,368 contract at the Rogue River Basin Project in Oregon. This contract is for construction of the Green Springs powerhouse, part of the Talent Division, and includes installation of all equipment including furnishing and installing 8,000 ft. of penstock. **Earl Courtney** is office manager for the contracting firm. Work started on this construction in August and will be finished about the end of 1958.

Thomas Miller, aided by **Robert M. McGary** and **Jack Guthrie**, shifters, is superintending Natt McDougall Co.'s \$279,563 contract for 2 mi. of grading and surfacing in Clark County, Wash., between Burnt Bridge Creek and Stockford. This job is expected to be finished by Nov. 1; has been under way since mid-July.

Arnold Blair, superintendent, and **Ed Dempsey**, assistant, are in charge of construction of 6.2 mi. of U. S. Highway 40, east of Sparks, Washoe County, Nev. Timekeeper is **Al MacMasters**. Isbell Construction Co. is doing the work at a cost of \$2,631,956; started on the job in August, expects to finish October 1958.

Robert L. Powell, superintendent for Hart & Hynding Co., is in charge of a \$1,291,996 recent award to this company for alterations to seven stories at the University of California Hospital in San Francisco, Calif. This is a year-long project which started in September.

John G. Lundstrom, general manager for West Coast Steel Works, is in charge of a recent bridge job awarded to the company at \$208,600, with **William L. "Buzz" Sawyer** acting as general field superintendent. Job foreman is **Hank Schmidz**. Work is located at Hills Creek reservoir on the Middle Fork Willam-

ette River southeast of Oakridge, Ore., on relocated Ridgon Road, and consists of bridge construction using salvaged steel girders plus approach work. Chief engineer for West Coast Steel is **John R. Gray**; job engineer is **Donald J. Zarosinski**, and estimator is **J. M. "Buck" Buckmaster**. August was the starting date, with July next year set for the finish.

L. W. Schall, superintendent; **Jack Lowell**, engineer, and **Les Switzler**, mechanic, comprise the key personnel for Schall & Farrell, contractor who successfully bid the 5.7 mi. of grading and surfacing on Frazier Valley road, north-east of Porterville, Tulare County, Calif. The \$317,448 project got under way in August and will be finished by next January.

Page R. Thiers as general superintendent for Mercer Construction Co. is in charge of complete road realignment for 2 mi. in Gila County, Ariz. Foremen on this \$137,679 stretch of grading and draining of the Apache Trail between Roosevelt and Grapevine are **L. M. Hart**, general; **G. "Val" Massingill**, grade and **Antonio Acevedo**, labor. Job started in August and will probably end Nov. 1.

R. F. Johnson, project manager; **Harold Sherwood**, superintendent of grading; **Charles Stierwalt**, structures superintendent, and **Ralph Stalsberg**, crushing superintendent, comprise the chief personnel for Cherf Bros., Inc., successful bidder at \$811,222 on 8.8 mi. of grading, surfacing, and structures in the vicinity of Moses Lake, Grant County, Wash. Cherf started on the job in September and figures to have it finished next April.

C. M. Fournier, superintendent, aided by **Perry L. McDowell** and **Kenneth Hodgkins**, foremen, is directing grading and oiling on the Butte Creek Pass section of John Day Highway in Wheeler County, Ore. for Natt McDougall Co., who is doing the job at \$592,244. With the work earmarked for completion by next June, job has been going since June 19 last.

Fred Merritt, superintendent for Miller, Smith & Jones, is in charge of a \$689,460 construction contract for 9.2 mi. of grading and surfacing on the Hobbs-Lovington highway in Lea County, N. Mex. Work started in July and will be finished the end of the year.

B. H. Pebley, superintendent of road construction, and **Clyde Weatherly**, superintendent of bridge construction, are supervising a \$200,239 project for Hunt Construction Co. for 3.1 mi. of grading, surfacing, and structures between Powderhorn and Lake City, Gunnison County, Colo. A 4-month job, it will be finished some time in December.

Joe Kremen is supervising a \$206,109 award to MacRae Bros. for removal of



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WELLPOINTS

"Build seven bridge piers, base them 18½ feet below a wet, sandy riverbed, at an elevation of 3500 feet... and do it in a hurry!" Such was the order confronting contractor Gordon H. Ball during construction of a new section of U. S. Highway 66 near Victorville, California, for the State of California.

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asphalt, brick and stone block pavement, and streetcar rails, and repaving in the city of Seattle, Wash. **Al Kennedy** is foreman on the job, under way since August and scheduled to be completed in November.

* * *

Richard Chafin is general superintendent for Madonna Construction Co., recently awarded highway work in Tuare County, Calif., on a low bid of \$1,679,044. The following are key men also on this job which covers grading and surfacing 6.4 mi. of Sign Route 190, between Worth Road and southwest of Springville: **Les Johnson**, structural foreman, with **Chester Bowlin** assisting; **Orval Beeman**, excavation foreman; **Dale Ellison**, master mechanic, with **Jobby Canel**, assisting, and **Otis Maxwell**, labor foreman. Work here started in July and will run until summer next year.

* * *

R. L. Moss, project manager, **Dave Iolt**, superintendent, **G. K. Campbell**, office manager, and **Al Seitsinger**, equipment foreman, comprise the key men of R. L. Moss & Co. on this contractor's 154,978 contract with the City of Seattle for street car track removal and 1.8 mi. of grading and surfacing. Under way since September, the job is expected to be finished in November.

* * *

Noel Gold, superintendent, **J. C. Frost**, office engineer, and **Harry Larson**, foreman, are key men working for Kenneth Thayne, successful bidder at \$585,72 for earthwork, pipelines and structures, and trunkline, at West Farmington, Woods Cross, Davis Aqueduct, Weber Basin Project, Utah. Job got under way in August.

* * *

Sherm Ward is supervising a \$530,32 recent award to Peter Kiewit Sons' Co. covering 1.1 mi. of grading and surfacing and construction of a 585 x 31-ft. box girder bridge, south of Gualala in Sonoma and Mendocino counties, Calif. **Charlie Van Lawick** is office manager, and **Fred Pitschner** is master mechanic.

* * *

William Roberts, project superintendent, **Tom Markel**, project engineer, and **Harold Brown**, office manager, are the top trio selected by Coker Construction Co., Peter Kiewit Sons' Co. and Condon-Cunningham, Inc., for construction of the Glendo Unit in Wyoming, Oregon Trail Division of the Missouri River Basin Project. This \$14,434,000 contract got under way in March and it is anticipated will be finished by March 1960.

* * *

R. G. Wallace, vice president of Loyden Construction Co., and general superintendent for the company has in charge of a recent award covering 5 mi. of grading and surfacing of the Yuma-Marker highway northeast of Yuma, Ariz. Job superintendent is **J. G. Powers**. **T. S. Loyden**, also vice president, is acting purchasing agent. The field office is

in charge of **J. M. Donaldson**. Foremen on the job, which started in September and will run till December, are **Dave Tucker**, grade; **Ed Imus**, concrete, and **R. M. Ramirez**, labor.

* * *

Arlie Flanders is general superintendent for Gibbons & Reed Co. which is doing 3.3 mi. of grading and surfacing on Highway 171 in Salt Lake County, Utah, under a \$226,289 contract. Job includes drainage, widening with soil cement, and asphalt paving. Important foremen here are **Steve Norris**, drainage; **Sid Troolson**, asphalt, and **Lloyd Rule**, grading and soil cement. Started in July, work is expected to end about Oct. 15.

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Eugene G. Alves, head of the Eugene G. Alves Construction Co., is acting as his own project manager on a \$214,209 award to the company for 2.4 mi. of grading and surfacing and a new Sonovoid bridge on the Alvarado-Niles road in Alameda County, Calif. Superintending the job is **Dale Marr**, while **R. C. Tipton** is project engineer, and **Claude Kinsey** manages the office. Work started in July and will probably be finished by Nov. 1.

* * *

Charles Ott, project manager, and **Charles Atwater**, general superintendent, are head men on the \$2,892,000 contract for additional facilities under construction at the Air Force Base at Klamath Falls, Ore. Hall-Atwater, Inc., and White Bros. has the contract, with **Ernie Moore** acting as chief engineer. The office is in charge of **L. Omey**. In the field, the following are superintendents: **M. D. Gunderson**, **Dan Looney**, **Bob Young**, and **Dave Kirk**. Contractor men shown in the accompanying picture



are: left to right, **Hal Wilson**, engineer; **Bob Young**; **Lou Helard**, concrete foreman; and **Gunderson**. The job is running two months ahead of schedule and is expected to be finished about Oct. 15.

* * *

Bud Real, superintendent; **Bert Stanford**, engineer, and **Norm Westling** and **Dick Hart**, assistant superintendents, are the key men on contract being executed by Peter Kiewit Sons' Co. for construction of Port Washington Narrows Bridge, Unit 2, in Kitsap County, Wash. This is a 1,717-ft. box girder and structural steel bridge with 7 piers in water, under construction since July. It is estimated the work will be finished about October next year. Contract price, \$2,324,834.

Earl Nelson and **I. L. Buttram** are superintending Martin Construction Co.'s recent award in the amount of \$230,834 for 3 mi. of grading, draining and surfacing the Benson-Douglas highway in Cochise County, Ariz. Foremen on the job, which will probably end in November, are **W. L. Christy**, grade, and **Otis Yount**, carpenter.

* * *

M. H. Bell, as project manager for Davis & Butler Construction Co., is in over-all charge of several large contracts in Utah. A \$750,000 job for the Weber Basin Conservancy District for construction of a water treatment plant at Bountiful, on which **John R. Lyman** is superintendent; an \$885,000 building contract at water treatment plant at Ogden for the same District on which **T. Palmer** is superintendent; and a \$1,350,000 building at a sewage treatment plant at Layton for the North Davis County Sewer District. **Fred Jackson** is superintendent on this latter job which started in early May and is expected to run until August 1958.

* * *

John R. Butler, project manager, is in charge of two recent awards to Davis & Butler from the Bureau of Reclamation. One is for a powerhouse at Loveland, Colo., costing \$460,000, and expected to be finished about Oct. 1, 1958. The other is a \$500,000 powerhouse construction at Gateway and Wanship, Utah. **C. Kofford** is superintending this work which has been under way since the first of May, and will be finished about July 1, next year.

* * *

W. P. Frank, project manager; **John Barry**, general superintendent; **Frank Granich**, field office manager, and **Bill Blevens** carpenter foreman, comprise H. C. Smith Construction Co.'s key men on an award from the Los Angeles Department of Water & Power on which they were low bidder for construction of Scattergood steam and pump chamber at Playa del Rey, Calif.

* * *

Neal Saul, general superintendent for J. E. Haddock, Ltd., is in charge of a recent award to this contractor to grade, pave and four structures, involving 1,225,000 cu. yd. of excavating (mostly rock) in Camarillo, Ventura County, Calif. Other important men on this \$3,742,457 job are **Pat Murphy**, job office manager; **J. L. Robinson**, blasting superintendent; **Del Martin**, structure superintendent; **Lyle Hartwig**, excavating foreman, and **Jess Black**, street foreman. The work is earmarked for completion December 1958.

* * *

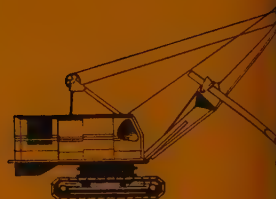
L. Curtis is general superintendent, **H. D. Revelle** is general foreman, and **Lloyd Belz** is engineer, for Chert Brothers, Inc., Sandkay Contractors, Inc., and Birch & Sons Construction Co., joint venturers on a \$1,636,739 contract for earthwork, canal lining and structures, Soda Creek feeder canal, Talent Division, Rogue River Basin Project, Ore. Job started in June and will be finished in November next year.



American



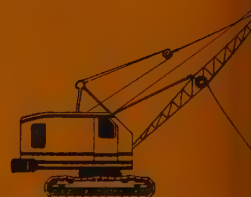
Bay City



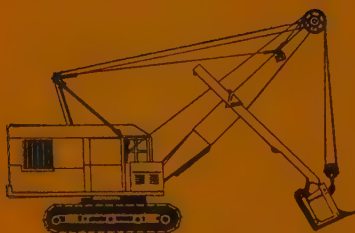
Bucyrus-Erie



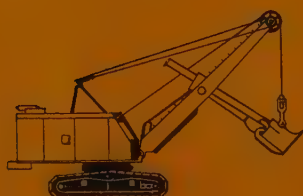
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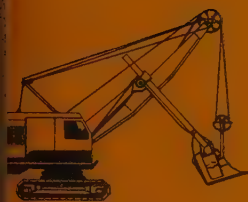
Dominion



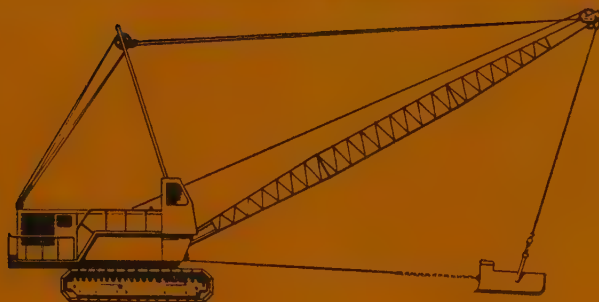
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Hank Rollston, general superintendent for J. E. Haddock, Ltd., and R. M. Price Co., heads the job personnel for grading, surfacing and construction of three bridges in the cities of Buena Park, Fullerton and Anaheim on Santa Ana Freeway, Orange County, Calif. Job engineer is **Bob Melbourne**, and job office manager is **John Slaughter**. **R. M. Harris** is structure superintendent and **Jack Erwin** is structure foreman. General foreman is **Jack Donovan**. **Tom Hudson** is in the master mechanic spot. Started in June, the job will run till July 1958.

* * *

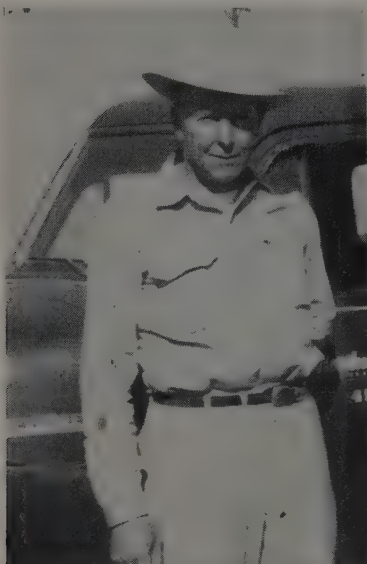
J. E. Dunn, general superintendent, **Arlan D. Gilbertson**, project engineer, **E. D. Ledavell**, concrete superintendent, and **Harold R. Olson**, office manager, were the men chosen to run the job for C. F. Lytle Co. when this contracting firm received word they were low bidder at \$1,707,145 for construction of Vega Dam on the Collbran Project, Colo. This contract involves an earth-fill dam, concrete spillway and outlet works, canal, and relocation of county road. The project is scheduled for completion the end of 1958.

* * *

T. C. Ledgerwood is supervising a street improvement project in the city of Denver, Colo., contract for which is held by Northwestern Engineering Co. in the amount of \$481,360. **David Neiss** is field accountant on the job, which got under way in mid-July and will be finished the end of the year.

* * *

Hank Eberhardt is superintending a \$464,676 award to Northwestern Engineers for structures, grading and surfacing 3.7 mi. of Dove Creek road extending through town, on S.H. 10 in Dolores County, Colo. **Marvin Jensen** is field



Eberhardt

accountant for the project, work on which started in August and will be finished in December.

Joe Jurkovich, superintendent, **H. E. Montgomery**, foreman, and **Lucio Reis**, mechanic, are key men on 2.5 mi. of grading and surfacing with plant-mix on untreated base west of Corcoran in Kings County, Calif. The \$173,164 contract is held by Valley Paving and Construction Co. and Anton Dolo, who started the job in August and expect to finish in December.

* * *

J. D. Balden, superintendent for Summit Construction Co., is in charge of 6 mi. of construction on the Sussex-Linch road in Johnson County, Wyo. Foreman on the job, which involves some grading, draining, base course surfacing, surface treatment (inverted penetration type), and miscellaneous work, is **Robert E. Proctor**. The \$347,506 job will be completed in November.

Do you qualify for the "Turtle Club"?

ABOUT EIGHT YEARS have elapsed since the formation of The Turtle Club, a life saving organization started in British Columbia for the purpose of encouraging the wearing of head protection among construction workers exposed to the hazard of falling objects. The motto of the club is "Shell on Head; You're Not Dead."

To qualify for membership in this unique club the applicant must show proof in the form of a printed application that his life had been saved by the wearing of a hard hat. Each member admitted will receive a scroll setting forth the history of his case, and will receive a lapel pin in the form of a turtle.

Now international in scope, The Turtle Club recently admitted several additional members from this Western area.

Paul J. Stevens, employed by Montag-Halvorsen-Cascade-Austin at The Dalles Dam, Oregon, was working near a falsework bent which was being lowered into a scroll case by a whirley. When the 6 x 6, 450-lb. timber bent was being lowered, the top pulled out and the bent fell 55 ft., striking Stevens a glancing blow on the head. His hard hat absorbed the impact and prevented a more severe injury.

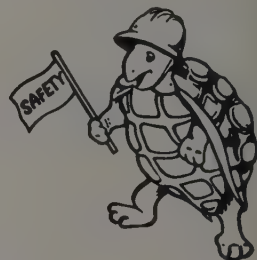
Cipriano Martinez, an employee of Kennecott Copper Corp., Salt Lake City, Utah, while at work was hit by a flying rock from a pot hole blast 1,000 ft. distant. Although the rock weighed only 2 lb., the force of the blow was enough to cause laceration of the scalp. A more serious injury was avoided by his safety hat.

George McGarrath is employed by Stearns-Roger Manufacturing Co., Denver, Colo. While working on a construction project at Albuquerque,

Marc Latham, general superintendent, **H. B. Raun**, engineer, **Earl Bowman**, carpenter superintendent, and **Vitor Franks**, steel superintendent, are key men working for W. F. Maxwell Co. grading and surfacing a portion of lane highway on U. S. 60, and construction of one bridge, near Riverside, Ca. This is an \$872,046 project expected to take 12 months to complete. Job started in July.

* * *

George Williams, aided by **Rob Hurst** and **Don Proebstel**, foremen, supervising construction of bridges, a some sewer lines, on the Valley Highway between Santa Fe Dr. and Log St., in Denver, Colo., for C. L. Huber Co., holder of the \$2,249,140 contract. Work started in July and will be finished next September.



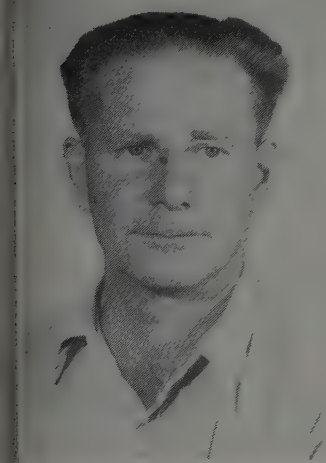
N. Mex., making adjustments on the unloader on an air compressor, a 50-lb. hose became hot, blew off, and struck McGarrath on the head. But for the protection of a hard hat he might have been seriously injured.

Victor Padham is employed by Troy T. Burnham Co., contractor of Seattle, Wash. While working on the Percival Creek Bridge, Olympia, Wash., a 250-lb. pump became dislodged and fell into the cofferdam. Its fall of about 12 ft. was arrested 5 ft. from the bottom when it swung against Padham's side, forcing his head against a steel sheet piling. Although he received other injuries, his safety hat cushioned the blow so that his head was not injured.

Irel Harrus, in the employ of Columbia-Geneva Steel Corp., Pittsburg, Calif., was dismantling a thrust bearing with a 5-ton hoist. The bearing stuck in the back-up chock, putting tension on the hoist boom. When wedges were driven between bearing and chock, the bearing sprang loose and the release of tension caused the boom to strike a glass light cover which fell 30 ft., striking the worker's safety hat which absorbed the blow and prevented injury.

For complete information about purposes, membership, duties of members, privileges, and functions write **Western Construction**, 606 Mission St., San Francisco 5, Calif. or **E. W. Bullard**, International Sponsor, The Turtle Club, 2680 Bridgeway, Sausalito, Calif.

Bill Rice, project manager, and Ralph Wigle, general superintendent, are in charge of 1.5 mi. of grading and surfacing and construction of two bridges on the Gridley-Colusa highway in Colusa



Wigle

and Butte counties, Calif. The contract was recently awarded to Lester L. Rice Sons, Inc., on a low bid of \$294,452 and work got started in September. By May 1958 the job is expected to be finished.

* * *

Ralph Wells is supervising a \$334,968 job for Cherf Bros. & Sandkay involving earthwork and structures for the main canal east, main canal west, and wells area 6, Michaud Flats Project, Idaho. General foreman is Dick Green, and master mechanic is Jack Moon.

* * *

Bob Millard, superintendent and co-owner of J. F. England's Sons, Inc., is directing construction of 9 mi. of grading and surfacing on the Miles road-Jordan highway, in Garfield County, Mont. He is aided by Joe Huston, grade foreman, and Al Nordall, mechanic. England won the contract on a bid of \$269,588, started work Sept. 1 and expects to finish next June.

* * *

Dick Baker is superintending the grading, draining, clearing and surfacing of 2 mi. of mountain access road in Blaine County, Idaho, for Goodnow Brothers, the successful bidder at \$5,043. Head mechanic is Ted Valenzuela; labor foreman, Chalmers Corle. Scheduled for completion in November, the job has been going since September.

* * *

Edwin V. Harris, project manager for H. Golden Construction Co., has under his direction a \$1,365,000 project at the Naval Air Station, North Island, San Diego, Calif. Superintendents on the job, which covers the extension of landing runways and taxiways, and storm drainage, are Charles Erreca, Albert Cadwell and John Lemon. August 1957 was the starting date and the project will probably be finished in May 1958.

Doug Fife is acting as project manager on a recent award to Fife Construction Co., Inc., for grade, gravel, oil and three bridges, Pineview Dam-Huntsville, Huntsville-Eden, in Weber County, Utah. Superintending the job is Steve Smith, assisted by Joe Farnsworth, grade foreman; Deloy Johnson, labor foreman, Fred Homer, master mechanic, and Dick Lower, structures. Fife reports that work will all be completed this fall, except the oil which will be mixed in June next year.

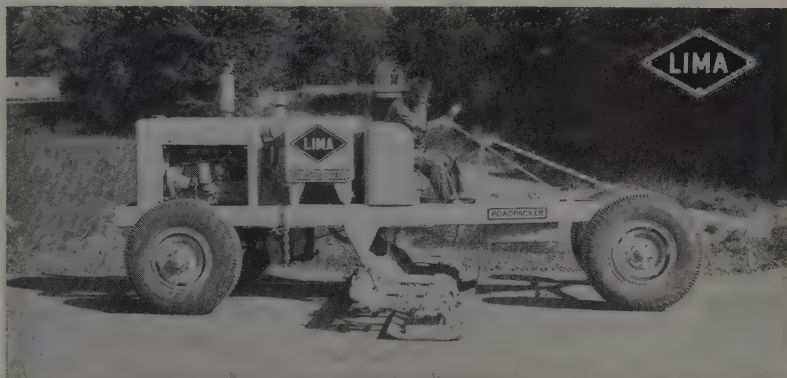
* * *

W. C. Treadwell, general superintendent; C. C. Turner, job superintendent, and L. F. Foster, heavy duty

mechanic, are Schutt Construction Co.'s key men on a clearing contract in Oregon. A \$124,400 job, the site of the work is known as Area G, one of several parcels to be let or already let in the clearing of the Hills Creek Reservoir area south and east of Oakridge. This particular contract got under way in July and the contractor expects to be finished in December.

* * *

Clyde Reams was named to superintend the 9.2 mi. of grading and surfacing the Alamogordo-Holloman AFB road in Otero County, N. Mex., a \$202,312 contract held by Miller, Smith & Jones.



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Macadam Bases—Coarse aggregate for bases up to 12 in. thick can be spread in a single layer, then uniformly compacted to final density by the Roadpacker over a 13 ft., 1 in. width. This single course construction, possible only with vibrators, reduces spreading time by half. Also it eliminates the need for backtracking all the equipment for the second pass; and contour shaping is done once—instead of twice. In waterbound work, the Roadpacker's tamping and vibrating action runs in screenings solid from top to bottom. Only three spreads of screenings are required, and much of the hand labor of spreading, brooming and rolling is eliminated.

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- **Fast and maneuverable**—Highway speeds up to 28 mph, reverse speeds up to 7

mph. Steers easily. For work in tight places, can be operated with only four shoes. Shoes can be folded up easily and need not be removed from machine.

- **Easy to operate**—Operator is above dust, away from engine heat and exhaust for maximum comfort and efficiency. He has excellent visibility... controls are readily accessible.

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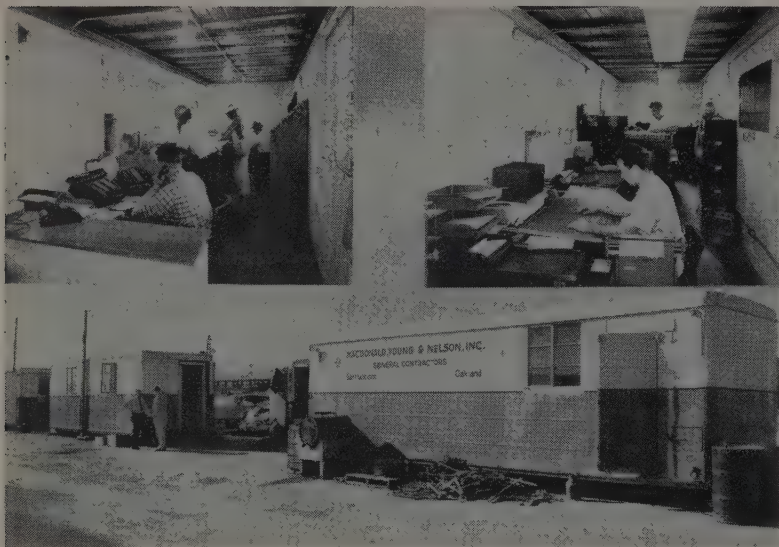
Reno Equipment Sales Company, 1510 W. 4th Street, Reno, Nevada; Feenaghty Machinery Company, 112 S.E. Belmont Street, Portland 14, Oregon; Feenaghty Machinery Company, 600 Fremont Street, Boise, Idaho; Faris-Moritz Equipment Company, 1554 Wazee Street, Denver, Colorado; Evans Engine & Equipment Company, 4300 11th Avenue N.W., Seattle 7, Washington; Bay Cities Equipment, Inc., 2702 Cypress Street, Oakland 7, California; Bay Cities Equipment, Inc., 1178 West San Carlos Street, San Jose, California; N. C. Ribble Company, 1304 North Fourth Street, Albuquerque, New Mexico; Smith Booth Usher Company, 2001 Santa Fe Avenue, Los Angeles 54, California; Shriver Machinery Company, 1756 Grand Avenue, Phoenix, Arizona; Weiner Equipment Company, 501 West Seventh South, Salt Lake City, Utah; Hall-Perry Machinery Company, 902 Central Avenue, Billings, Montana; Hall-Perry Machinery Company, 812 East Iron Street, Butte, Montana; Hall-Perry Machinery Company, 1116 15th Street North, Great Falls, Montana; Hall-Perry Machinery Company, 127 East Main Street, Missoula, Montana; Modern Machinery Company, Inc., East 4412 Trent Avenue, Spokane 10, Washington; Evans Engine & Equipment Co., Inc., Post Road—Box 894, Anchorage, Alaska; Shasta Truck & Equipment Sales, South 99 Highway, Redding, California

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Construction Equipment Division—LIMA WORKS

CONSTRUCTION BRIEFS



Used trailer-boxes make job offices

CONTRACTORS whose work is primarily on major projects have long faced a fairly sizable occupational problem: the need for portable office and storage space at job sites.

One California firm, MacDonald, Young and Nelson of San Francisco, has found an interesting solution to this problem. They use the "boxes" from second-hand Fruehauf trailers.

The firm used to build their own portable offices and tool sheds at a cost of some \$500 to \$800 each, but experience demonstrated these structures, though well built by standards of wood construction, would not hold up beyond three or four jobs. The stresses of being jacked up and moved from job to job soon loosened joints to the extent that the portable buildings became useless.

MacDonald, Young and Nelson now have 15 converted trailer boxes which are used on jobs in California and Nevada. They figure the cost of these units at under \$500 apiece, find them practically indestructible.

Frank Stearns, construction foreman of the firm, suggests that users thinking about trying trailer boxes for offices should specify equipment that was refrigerated when used as a highway hauler. "These old refrigerated trailers," says Stearns, "are well insulated, minimize air conditioning problems in both summer and winter. We purchased ours from the used trailer sales branch of

Fruehauf Trailer Company in Oakland, and have been very satisfied with them. Painted with company colors, they are attractive, and have good advertising value, too."

In operation, the boxes are lifted to the deck of a flatbed trailer, either by

fork lifts or hydraulic jacks. If the construction job is to be a long-term project, the trailers are then placed on the ground at the site for semi-permanent installation; should the job be a short-term project, the trailer boxes are lifted on the flatbed.

Conversion of the trailer boxes to portable offices is simply a matter of installing windows, flooring and wiring. Use as tool sheds requires little or no conversion.

What concrete savings has use of trailer boxes effected? "Figure it this way," says Stearns, "before we got the trailer boxes, we used to build from 10 to 15 portable offices or storage houses each year—moneywise, somewhere in the neighborhood of \$4,000 each year. Our trailer boxes, which have already paid for themselves, will save us the \$4,000 next year and each year thereafter."

Ready-mix with no trucks

A NOVEL IDEA for marketing concrete paid off for a sand and gravel producer who did not own or operate mixer trucks. Rather than buy a fleet of trailer trucks and compete for the ready-mix business with his customers, Fair Oaks Gravel Co., Fair Oaks, Calif., installed a semi-automatic batching plant to supply concrete exclusively to ready-mix companies and contractors already operating mixer trucks. The additional service lowered hauling cost for both parties and resulted in the sale of more sand and gravel. The plant was erected by Fair Oaks Gravel Company's own men and easily produces the 400 to 500 yd. per day maximum requirement of the area. Aggregates are charged on a conveyor loaded by truck or secondary loader. Plant is manufactured by The Noble Company, 1860 Seventh St., Oakland 20, Calif.



EXTRA WHEEL FOR MOVING CAT DW21S

To redistribute axle weights of the Caterpillar DW21 to meet highway load limits, the Shepherd Machinery Co. has developed an auxiliary wheel. The wheel carries about 11,250 lb., reducing the weight on the tractor axle to about 23,500 lb. Called the M267 Transporter (patent pending) the device consists of four wheels mounted on a single axle to which is attached a piston and brackets. A piston holds pressures constant on the wheels regardless of the terrain encountered during moving. Purchase price is about \$1,395 f.o.b. Los Angeles. Rental cost is \$15 per day per unit. Shepherd Machinery Co., 3400 S. San Gabriel River Parkway, El Monte, Los Angeles, Calif.



In carrier landings, planes coming in at more than 100 knots are stopped in a split second. This amazing performance is made possible by having each plane hook onto one of several wire ropes stretched across the flight deck. Both plane and rope receive an almost unbelievable shock at the moment of contact. Needless to say, only top-quality wire ropes can be used for this application because...

you can't bargain with safety

While your use of wire rope differs from this carrier application, *safety should be just as important to you.* For, although a "bargain" rope may save you money, it can cost you your peace of mind. So don't bargain with safety. Buy a rope that's a *quality* rope—buy Wickwire Rope.

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New York • Philadelphia

LOOK FOR THE
YELLOW TRIANGLE

110-mg. reservoir lined in 20 working days

ASPHALTIC CONCRETE was used to line a \$650,000 reservoir built recently for the Helix Irrigation District near San Diego, Calif. The novel lining job called for placing 18,000 tons of plant-mixed asphaltic concrete in the 1,000 x 850 x 25-ft. reservoir, and was handled by the Kenneth H. Golden Co., Inc., of San Diego. General contractor was the Rogers Construcion Co., also of San Diego.

Applying the 3-in. lining to the sides and bottom of the 110,000,000-gal. reservoir was complicated by the fact that the

sloping sides measured 80 ft. and were at a 3-to-1 angle. At first it appeared that ordinary roadbuilding equipment wouldn't serve, but after some field tests it was discovered that with a little extra skill in handling, regular motor graders and rollers were suitable for the job.

The motor graders, used to run the a.c. from top to bottom of the sloping sides, were able to operate on the steep grade without modification. The trucks dumped the material at the top of the slope and the grader took over.

When the graders had distributed the black-top evenly down the slope, a two-stage rolling operation began. First, a 5-ton tandem roller was winched up and

down the slope by a track-mounted crane to achieve initial compaction. Operation in the second or finishing stage was the same, except that an 8-ton roller was used. Engines in the rollers were kept operating only to supply power to the steering mechanisms. All movement up and down the slope was controlled by the winch operator, who had an unobstructed view of the work from the crane in his crane at the top of the slope.

It was obvious that while the construction of the new reservoir was underway, the other facilities of the Helix Irrigation District would be overtaxed. This was important, therefore, that construction be rushed if the new installation was to be ready to help meet the increasing summertime demand for water.

It is estimated that the new lining system saved nearly three months over conventional lining methods. The entire lining operation was completed in 20 working days.

The lining was not designed to provide a completely waterproof barrier. Rather, its principal function is to provide a smooth interior surface that will simplify periodic cleaning of the open reservoir.

The reservoir itself is of the flood reserve type, and is designed to maintain a constant 20-ft. level. Automatic controls handle both in and out flow.

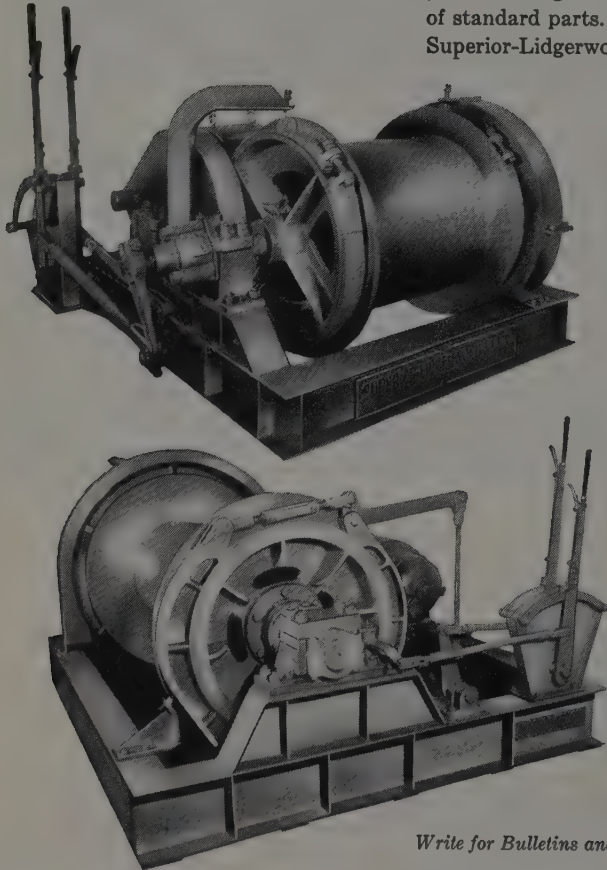
In-flowing water is channeled through a series of 30- and 36-in. concrete pipes laid on the reservoir bottom. Upper surfaces of the pipes are drilled at regular intervals to speed flow of water and direct it away from sides and bottom.

Working on the project under C. Watters, chief engineer of the Helix Irrigation District, were R. H. Wilken, project engineer, and Tom V. Venator, project inspector.

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New ACI Manual ready

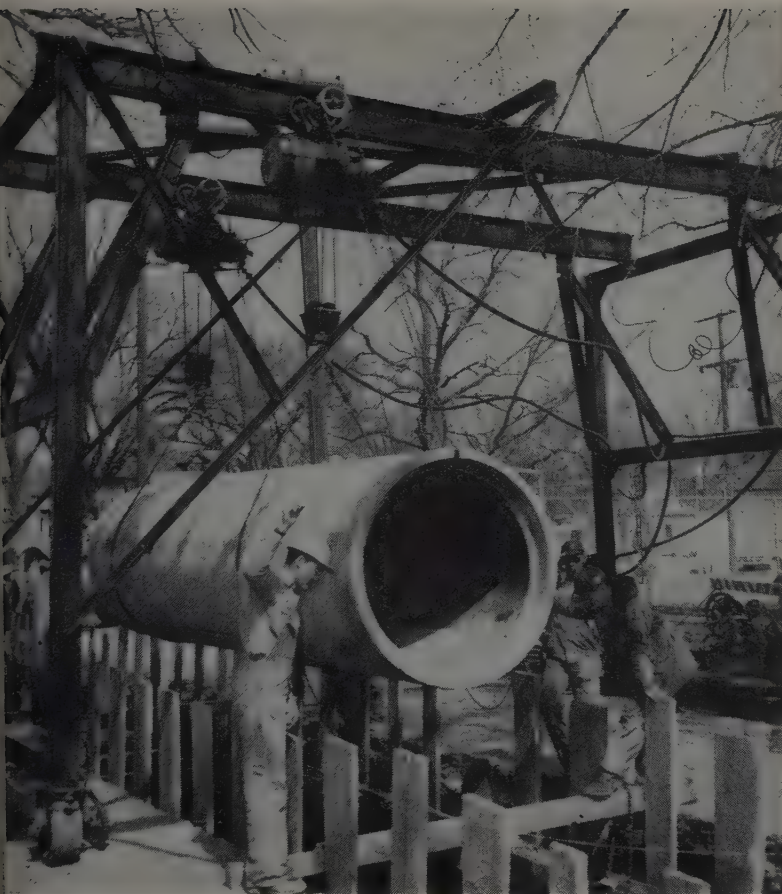
THE NEWEST EDITION of the pocket-size ACI Manual of Concrete Inspection is now ready for distribution.

The 4th edition of the manual contains 240 pages of descriptive material on the inspection of concrete construction. From concrete fundamentals to the latest developments in construction, the manual covers the problems and techniques in concrete inspection with methods which are accepted as good practice. The manual is intended as a supplement to the usual job specifications and a guide in matters not covered by the specifications.

This newest edition brings up to date those sections of the manual dealing with mix proportioning, winter concreting, and hot weather concreting as well as general editorial revisions throughout the text. The first two chapters are directed to those who arrange for and direct the work of inspection.

Written and bound for use at the construction site as well as the laboratory and design office, the text tells why as well as how, is brief and readable.

The manual is available at \$3.50 per copy.



Air hoists handle 7-ton pipe fast

DOUGLAS BROTHERS INC., Topeka, Kan., contractors, were using a 30-ton crane to lower sections of concrete drain pipe into trenches on a \$500,000 sewer job. Each section of the 16-ft. pipe weighed 7 tons, and this weight, combined with the weight of the crane, was breaking up the street and disturbing the traffic. The damage was so great that after the drain pipe was in place and the trench was filled, it was necessary to resurface the whole street. This tremendous added expense ran the cost way over their estimate, and unless a better method was quickly discovered, they figured their loss would run \$250,000 in the first month.

So William Douglas purchased two Ingersoll-Rand Size EZ air hoists and signed a structural steel frame to mount them on. At the same time he bought a small Ingersoll-Rand Size Utility hoist to replace the "come along" they had been using to pull the sections into place for fit-up.

Douglas Brothers found this new rig only eliminated breaking of the pavement and the need to resurface the whole street, but it also increased the rate of pipe laid from 64 ft. per day to 160 ft. per day. Added advantages of air hoists are the ease with which pipe can be spotted, and the saving

of \$330 a day through elimination of the need for the 30-ton crane and operator alone. Not only can the concrete pipe be spotted faster with much more accuracy and safety with the air hoists, but as either end of the pipe can be lifted or lowered independently, the fitting-up operation is done with more speed. The small hoist used for pulling the sections into place once they are in the bottom of the 30-ft. trench has shown similar advantages.

Speed in reverse helps

DURBIN BROS., Eugene, Ore., construction firm, are finding the speed their two International 95 Payhauler trucks achieve in reverse gear is a big advantage on 3.5-mi. road construction project between Roseburg and Klamath Falls, Ore.

The haul route on this project, which is flanked by cliffs and the north branch of the Umqua River in a sector about 50 mi. east of Roseburg, is so narrow that it has been found more economical to have the trucks cover one half of the route in reverse gear.

In spite of the reverse gear operation these trucks are keeping the 2½-cu. yd. Northwest Model D shovel busy.

This stretch of new road will be part of a modern highway that the Bureau of Roads is laying across the Sierras from Roseburg to Klamath Falls.

Durbin has the \$400,000 contract for the earthmoving phase of the project, which entails cuts through the rocky terrain varying from 50 to 119 ft. deep. The trucks are moving 350,000 cu. yd. of rock and 120,000 cu. yd. of rock and earth mixed to prepare the grade and place the rock cushion.

Work began on the project in January and is scheduled for completion in September.

Sound advice to extend service of wire rope

HERE'S WHAT HAPPENS inside a cable as it bends when passing over a sheave and then straightens out while moving to the next sheave. The individual wires are performed in what might be thought of as a long spiral and twisted together into strands. The strands are twisted together into a rope. This construction permits great flexibility without excessive "stretchiness" and minimizes friction between wires as the cable bends and straightens. In operation, a cable is a group of fitted moving parts.

Cable, like any other part of a machine, requires reasonable care. Its service life can be shortened by abuse or lengthened by proper use and maintenance.

It's not at all uncommon to see a reel of cable rolled over an obstacle with the cable taking the brunt of the shock, or to see a pry bar being used to move a reel of cable. Whenever this occurs, some of the life is taken out of the cable before it's ever put to use.

Sharp bends or kinks in a cable are very frequently the cause of rapid wear. When bent or kinked, the wires and strands are moved out of their relative positions and unequal tensions are created on individual wires.

Kinks are caused by careless handling of the cable either on or off the machine. When unreeling or uncoiling cable from a reel, pull the cable straight away from a rotating reel. Do not let the reel rotate faster than the cable is being removed as the danger of kinking is increased, considerably. When cable is removed from a reel which does not rotate, uncoil the length of cable required, placing one coil on top of the other. The cable can then be easily moved to the job site and installed without kinking.

Here are some other important facts to remember when installing new cable. Always be sure to use the correct cable size. Weld or otherwise bind the end of the strands of cable together. In this way, the strands are held in their relative positions and cable wear will not be excessive because of loose, high strands which have moved out of position. The strands of the cutoff end of the reel should also be secured and the end of

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Marionair CONTROL

USED ON ALL DIESEL POWERED MARION MACHINES

The hardest working air in the world passes through Marionair Controls. It knocks the wind out of the toughest jobs — and finishes most of them in a breeze. It's like harnessing a hurricane . . . taming a tornado . . . turning their energy into job profits.

Why Air Control—Air is safe: no shock or fire hazard. Air is simple, without costly and complicated linkage. No return lines needed. Operating men understand it easily.

Why MARIONAIR Control—Marion went all the way with air control as early as 1940; Marion has devoted 16 years to its refinement and perfection. Marion has the world's broadest line of air controlled excavators and cranes. Marion makes air do more.

Easy Does It—Marionair Control gradually and smoothly exerts from 0 to 90 or more pounds of pressure on the clutches, in direct proportion to hand pressures on the controls. It is easy to use, easy to service.

Efficiency Goes Up—Operators remain fresh and alert all shift long because Marionair Control virtually eliminates operator fatigue. "Feel of the load" is retained, helping the operator to work confidently and efficiently.

Easier Maintenance—Its simplicity means fewer maintenance problems. No rods, levers and pin connections to become loose with wear.

Smooth Performance—A smooth, positive flow of power to the clutches, without jerkiness or delay. No need for a fine sense of timing to put the dipper, bucket or crane load where you want it.

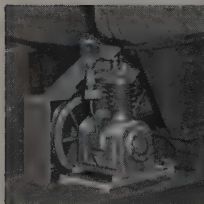
FIELD PROVED FOR 16 YEARS

Marionair Controls have been proved by 16 years of on-the-job . . . by all types of service and working conditions. Marionair Control has been integrated into the basic design of machines. Marion has made full possible use of compensating valves for gradual, smooth engagement of friction clutches . . . poppet valve for jaw clutches and other "on or off" controls. Marionair Control puts full power at the operator's finger tip . . . gives him instant, accurate control of the load. It's Marionair Control's "muscles of air" to work on your jobs. Let a compressor—not your operator—do the huffing and puffing.

CRANE EXPERTS: HEAR THIS!

When Marionair Control is teamed with big, smooth Marion clutches, a torque converter and a foot accelerator, you are ready for the most ticklish precision crane jobs involving the lightest or heaviest loads. One foot on the accelerator can lift the load, lower it, inch it into position or hold it in one position.

MARIONAIR CONTROL STEP-BY-STEP



Dependable, kingsize compressor, operated by power unit through V-belt drive, has capacity to maintain full pressure in extremely fast cycles; its operation is automatically controlled.



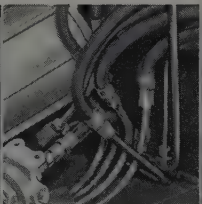
Pressure reservoir tank, in out-of-the-way pocket of upper frame, stabilizes pressure entering the lines; fitted with safety release valve and outlet for use in draining excess condensate.



Compensating valves "meter" air to cylinders or expanding tubes controlling friction clutches. Operator retains feel of the load, gets smooth, gradual engagement or fast, crisp cycle time.



Poppet valves govern operation of jaw clutches and other "on-or-off" controls. Operator's wrist movement produces instant, positive action. Controls conveniently grouped on panel in cab.



Strong copper tubing and heavy-duty flexible hose carry air pressure to all parts of machine; replace conventional levers, rods and pins. Operators like simplicity and reliability of air.



Marionair Control engages this clutch in direct proportion to the speed and firmness of the operator's hand pressure on control lever. The response is uniform, consistent and dependable every time.

LIFT WITH



POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

For every job requirement, there is a Marion machine of the right size and type for greatest efficiency. Your MARION distributor is the man to see. He can save you money!

SEASIDE, OREGON—Western Equipment Co., 1360 W. First Avenue, P. O. Box 3205, Phone: 4-4285; PORTLAND, OREGON—Western Equipment Co., 2244 N.W. Savier Street, Phone: 4-8-4128; SAN FRANCISCO 3, CALIFORNIA—George M. Philpott Co., Inc., 1080 Bryant Street, Phone: HEmlock 1-5476; FRESNO, CALIFORNIA—George M. Philpott Co., 375 South Railroad Avenue, Phone: FRESno 6-9843; OAKLAND, CALIFORNIA—George M. Philpott Co., Inc., 2928 Poplar Street, Phone: GLEncourt 2-0458; LA PUENTE, CALIFORNIA—Kyle Equipment Company, Division of Wills E. Kyle, Inc., 125 North Vineland, P. O. Box 2128, Phone: EDGewood 6-4581; SACRAMENTO, CALIFORNIA—George M. Philpott Co., 2609 Folsom, Boulevard, Phone: GLadstone 2-2641; PHOENIX, ARIZONA—State Tractor and Equipment Co., 107 South 17th Avenue, Phone: ALPine 2-1731; TUCSON, ARIZONA—Tractor and Equipment Co., 1202 North Main Street, Phone: 4-2335; DENVER 4, COLORADO—Western Machinery Company, 2400 West 7th Avenue, Phone: TAhor 5-7151; CASPER, WYOMING—Moss Equipment & Supply Company, 3100 East Yellowstone, Phone: 2-4547; GRAND JUNCTION, COLORADO—Western Machinery Co.; SEATTLE, WASHINGTON—Western Machinery Company, 241 Lander Street, Phone: ELHolt 0760; SPOKANE, WASHINGTON—Star Machinery Company, E. 415 Sprague Avenue, Phone: RIVERSide 6121.

the cable secured to the reel. Do not drive nails through the cable to secure it to the reel as wires can be damaged or broken and the cable weakened. When installing new cable, assemble the cable on the drum in the direction of the natural coils. If installed correctly the cable will have a greater tendency to reel onto the drum in a smooth layer.

Clean and lubricate

Proper lubrication of cables will extend cable life, promote safety and reduce downtime. The frequency of cable lubrication depends largely on operating conditions. If operating in dusty conditions, the cable should be lubricated sparingly, if at all, since dust will adhere to lubricant and cause wear on both cable and sheaves. Cable lubrication is recommended in areas where atmospheric conditions support rusting and corrosion. A film of lubricant will definitely extend cable life.

To prevent rusting, cable lubricants should be water resistant, contain no acids or alkalis and have a high surface tension. Each time a cable is flexed, the wires in each strand and the strands which make up the cable must slide over each other. For this reason, a penetrating, clinging lubricant of high melting point such as "crater compounds"—used for open gears and cables on shovels or cranes—should be used. In the event of an extended or seasonal shutdown, the

cable should be cleaned and well lubricated. Sheaves and rollers should always be kept clean and well lubricated to facilitate free turning, and minimize sliding wear on the cables.

Avoid cable strain

Properly maintained equipment means extended life for all parts concerned. Inspections to determine operating conditions and the replacement of worn or broken parts is economy and not a waste of time or money.

The operation and maintenance of cable controlled equipment determines, to a large extent, the life of a cable. Misaligned sheaves, bad sheave grooves and frozen (non-rotating) sheaves can reduce cable life by causing burning and eventually fraying. Whenever there is excessive friction between the cable and the other parts of a machine, burning usually results. Burned cable soon becomes brittle and cracks. Cracked wires soon lead to frayed strands and a weak spot in the cable.

The usual life of cable can also be reduced by operating over sheaves that shimmy. Shimmy is caused by worn sheave bearings and results in rope vibration which causes steel fatigue.

After installing a new cable, treat it as you would a piece of new equipment. Don't overstress it. Let it break in easy so that the individual wires and strands have an opportunity to stretch and posi-

tion themselves in the sheaves and around the drum. Sudden starts or stops should be avoided. Jerking out slack can break even a new cable. "Birdcaging" of the cable can result from sudden stops. The sudden reduction of tension weakens cable considerably.

In almost every application in which cable is used there are points at which wear is more rapid. Therefore, it is economical to reverse the cable, end for end, when wear becomes apparent.

Some owners have equipped the dozers with a small spare drum or reel of cable so only the length of the cable needed can be quickly fed through the "dead end" to replace the length of cable cut off or broken. When cable wear occurs on the drum end, the "dead end" wedge can be removed and new cable pulled through the system far enough to eliminate the worn section. The worn cable, anchored to the cable control drum, can be cut off as necessary and the "dead end" wedge reinstalled.

A similar method of obtaining maximum cable life can be used on scrapers. The reels, which are mounted on the scrapers, carry extra cable which can be pulled through the system a sufficient distance to provide an unworn section of cable over sheaves. The worn cable on the cable control drum can then be cut off as necessary.

The above information on cable care has been supplied by J. B. Sinclair, Service Dept., Caterpillar Tractor Co.

When Ordering Engine-Powered Equipment Up to 20 BHP... Be Sure to Specify American MARC Diesel Engines

AMERICA'S LARGEST MANUFACTURER OF AIR-COOLED DIESELS PRESENTS

THE BIG 4



AC1: Air-cooled, one-cylinder, 4-cycle, 6.5 BHP @ 1800 RPM



AC2: Air-cooled, two-cylinder, 4-cycle, v-type, 14 BHP @ 1800 RPM



WC1: Water-cooled; one-cylinder, 4-cycle, 7 BHP @ 1800 RPM



WC2: Water-cooled, two-cylinder, v-type, 4-cycle, 15 BHP @ 1800 RPM

AMERICAN MARC INC. dominates the field of light-weight, low-horsepower Diesels by building its diversified line from the "Big Four" basic models illustrated here. Purchase and maintenance of engines and parts are simplified by the use of these compact and rugged prime movers. All four types of American MARC Engines are employed daily by thousands of satisfied customers in industrial, agricultural, petroleum or marine fields.

AMERICAN MARC'S COMPLETE UNITS

Complete units for many purposes are also manufactured by American MARC—Diesel generating plants from 3 to 10 KW (AC or DC, and industrial three-phase), Diesel pumping units from 48 to 1700 GPM, marine propulsion, refrigeration units and power-packages for other services. American MARC can adapt any of its Big 4 engines to fit any job requiring from 6.5 to 20 BHP.

IN DIESEL POWER

6-103

AMERICAN MARC INC.

1601 WEST FLORENCE AVE. INGLEWOOD, CALIFORNIA



Dept WC-10

INQUIRIES ARE INVITED FROM QUALIFIED DISTRIBUTORS AND DEALERS.

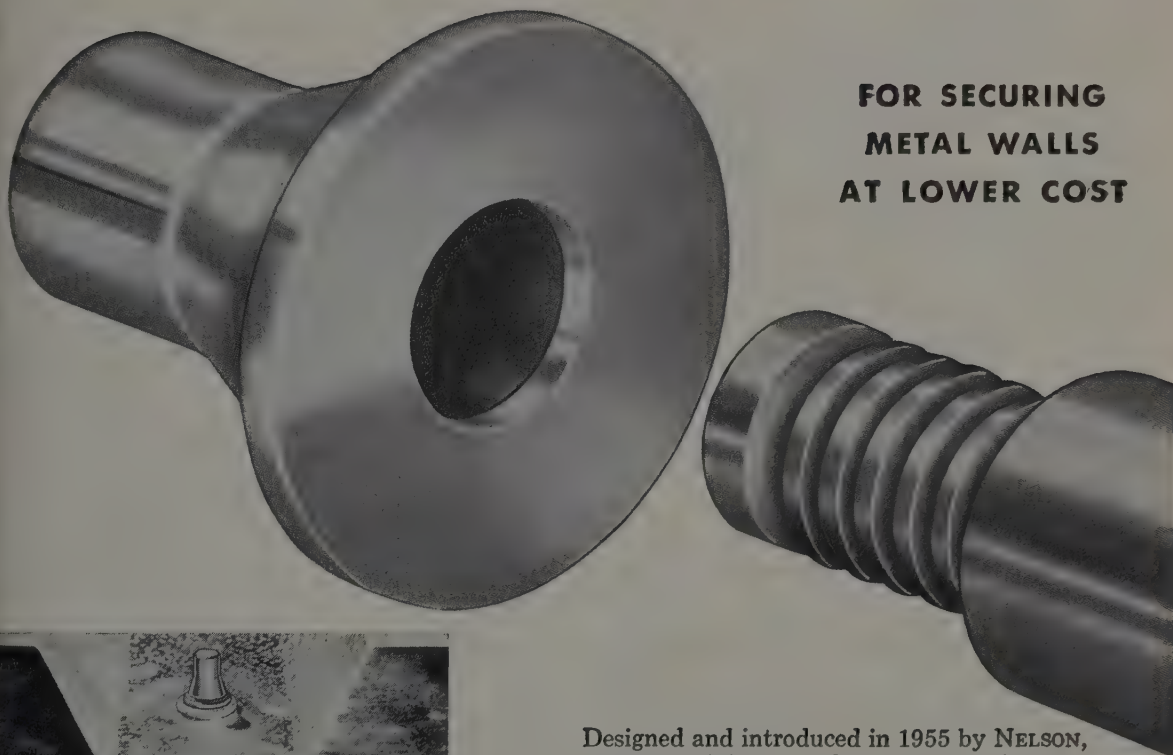


A1Q Generating Plant: 3KW generator quill-mounted to American MARC air-cooled Model AC1. This and the Model A2Q Generator (5 KW) are ideal all-weather plants for marine, industrial, and rural electrical service.

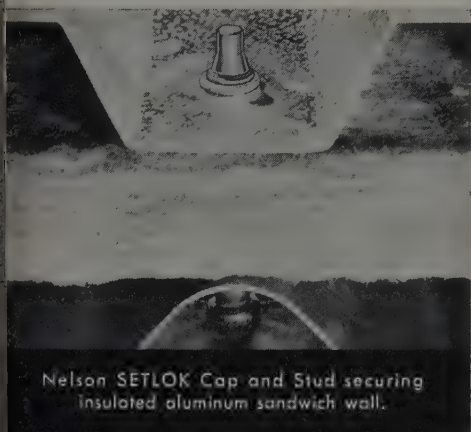
designed and introduced by **NELSON...**

SETLOK[®] CAP AND STUD

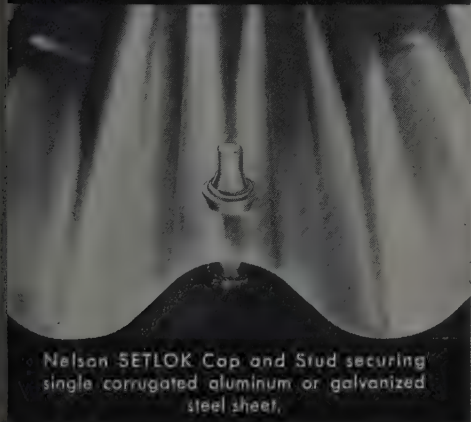
Pat. Applied For



**FOR SECURING
METAL WALLS
AT LOWER COST**



Nelson SETLOK Cap and Stud securing insulated aluminum sandwich wall.



Nelson SETLOK Cap and Stud securing single corrugated aluminum or galvanized steel sheet.

Designed and introduced in 1955 by NELSON, millions of SETLOK Caps and Studs have been used with excellent results in building construction.

Building owners, architects and engineers like SETLOK Caps because they fasten securely, seal tight, and are attractive on building exteriors. Contractors save time and money because it takes only a hammer blow to seat them. The Caps are aluminum, so there are no corrosion problems or requirements for paint.



NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC.
LORAIN, OHIO

NELSON STUD WELDING
Division of Gregory Industries, Inc.
Lorain, Ohio

Please send complete information on SETLOK Caps and Studs to:

Name
Company
Address
City Zone State

Chemical stabilizes clay

USE OF PHOSPHORIC acid as a soil stabilizing agent in construction projects may overcome problems of heavy clays according to an announcement by the research department of Monsanto Chemical Company's Inorganic Chemicals Division.

Clay soils, when dry, exhibit exceedingly high bearing strengths and would be suitable for subgrade or base course construction. When wet, however, the soil structure expands considerably and much, if not all, of the bearing strength is lost.

Experiments have shown that if 2% of phosphoric acid is added to a fat plastic clay and the material compacted, a hard, durable mass is produced that will withstand prolonged exposure to water and to wintering.

No major difficulties are foreseen in the field application of this method of soil stabilization. Generally, the construction procedure would be similar to the methods now employed with present commercially available stabilizers. The treatment of soil with phosphoric acid appears to hold several economic advantages over conventional methods, including lower storage, hauling and processing costs.

In an effort to demonstrate more fully these and other points, Monsanto is conducting further laboratory investigations in close cooperation with several state highway departments. This work is

aimed at obtaining additional information necessary for the construction of test road strips. Final judgment of this new method of road base construction cannot be made until a thorough evaluation of the performance of such test strips is determined.

Improved form design

A NEW METHOD of building concrete pouring form panels, that can be re-used many times more than can the conventional type, is helping contractors and builders hold down construction costs, according to Timber Engineering Co., research affiliate of National Lumber Manufacturers Association.

Providing added strength and rigidity in each panel, the new method not only extends the service life of the forms, but permits greater precision in poured concrete construction.

The new panels employ the usual type of frame, consisting of 2 x 4's on which plywood is nailed. Their uniqueness, however, is in the method of fastening the frame members together. Instead of using customary spikes or perforated metal strips, the new system has whalers fastened to studs with Teco framing anchors.

As the anchors provide nailing on three sides of a joint, with all nails in shear, the panels are better able to withstand twisting, bulging, and racking resulting from heavy use. In contrast to

conventionally fastened frames that lacking sufficient strength, pull apart when removed from the falsework, Teco anchored panels can be removed easily and re-used many times, with minimum repairs.

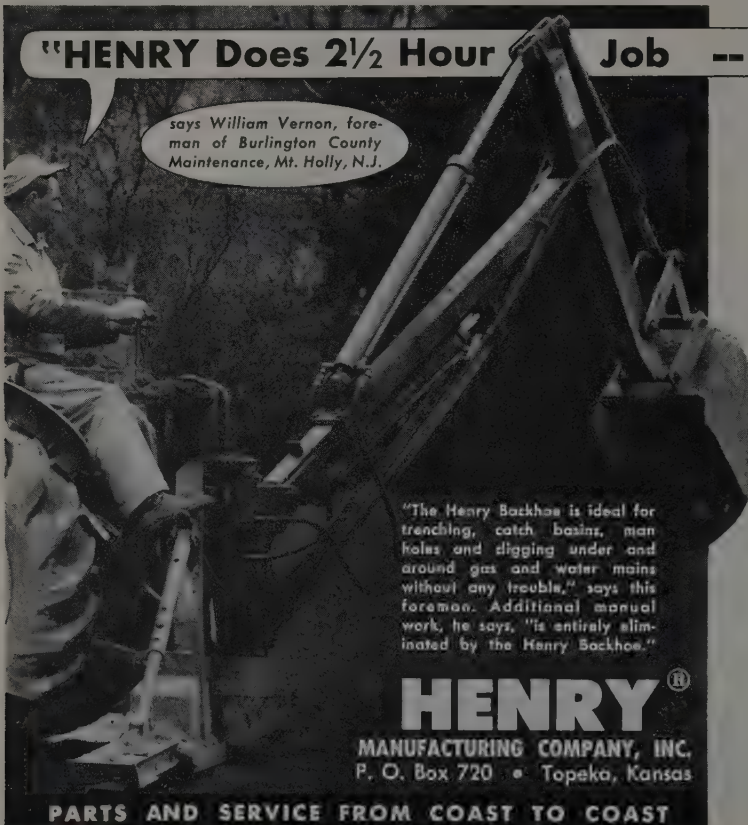
Construction of the new type panel detailed in T-L-G Specification Sheet No. 14, and its use shown in a new Teco Project Sheet. Both publications are available, without charge, from Timber Engineering Co., 1319 18th Street N.W., Washington 6, D. C.

ACI Book of Standard

THE 1957 EDITION of the ACI Book of Standards is now off the press. This 300-page book represents the most recent compilation of current ACI standards, recommended practices, and specifications.

Eleven ACI standards are compiled under one cover, incorporating such subjects as the evaluation of compressive test results; building code requirements for reinforced concrete; design and construction of concrete chimneys; winter concreting; selection of proper proportions for concrete; and the measuring, mixing and placing of concrete. The book also discusses the application of portland cement paint, concrete pavements and bases, precast concrete floor units, construction of concrete farm silos and the application of mortar by pneumatic pressure.

The book sells at \$4.00 per copy.



"HENRY Does 2½ Hour Job -- in 20 Minutes!"

says William Vernon, foreman of Burlington County Maintenance, Mt. Holly, N.J.

"The Henry Backhoe is ideal for trenching, catch basins, man holes and digging under and around gas and water mains without any trouble," says this foreman. Additional manual work, he says, "is entirely eliminated by the Henry Backhoe."

HENRY®
MANUFACTURING COMPANY, INC.
P. O. Box 720 • Topeka, Kansas

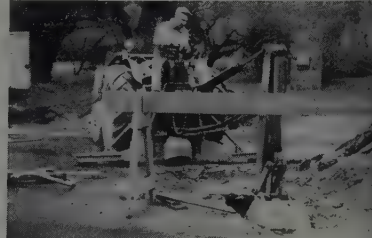
PARTS AND SERVICE FROM COAST TO COAST

"The Henry Backhoe is a wonderful digging tool for all types of jobs," reports Mr. Vernon. "We use it to dig around pipes, then we use it to lower pipe into the trench."

On the job pictured, the Henry dug a half-mile of storm sewer trench with one lateral trench (30' long by 9' deep) across the roadway. Average rate, 20 ft. per day. An important point: The Henry dug the roadside trench without interrupting the normal flow of traffic.

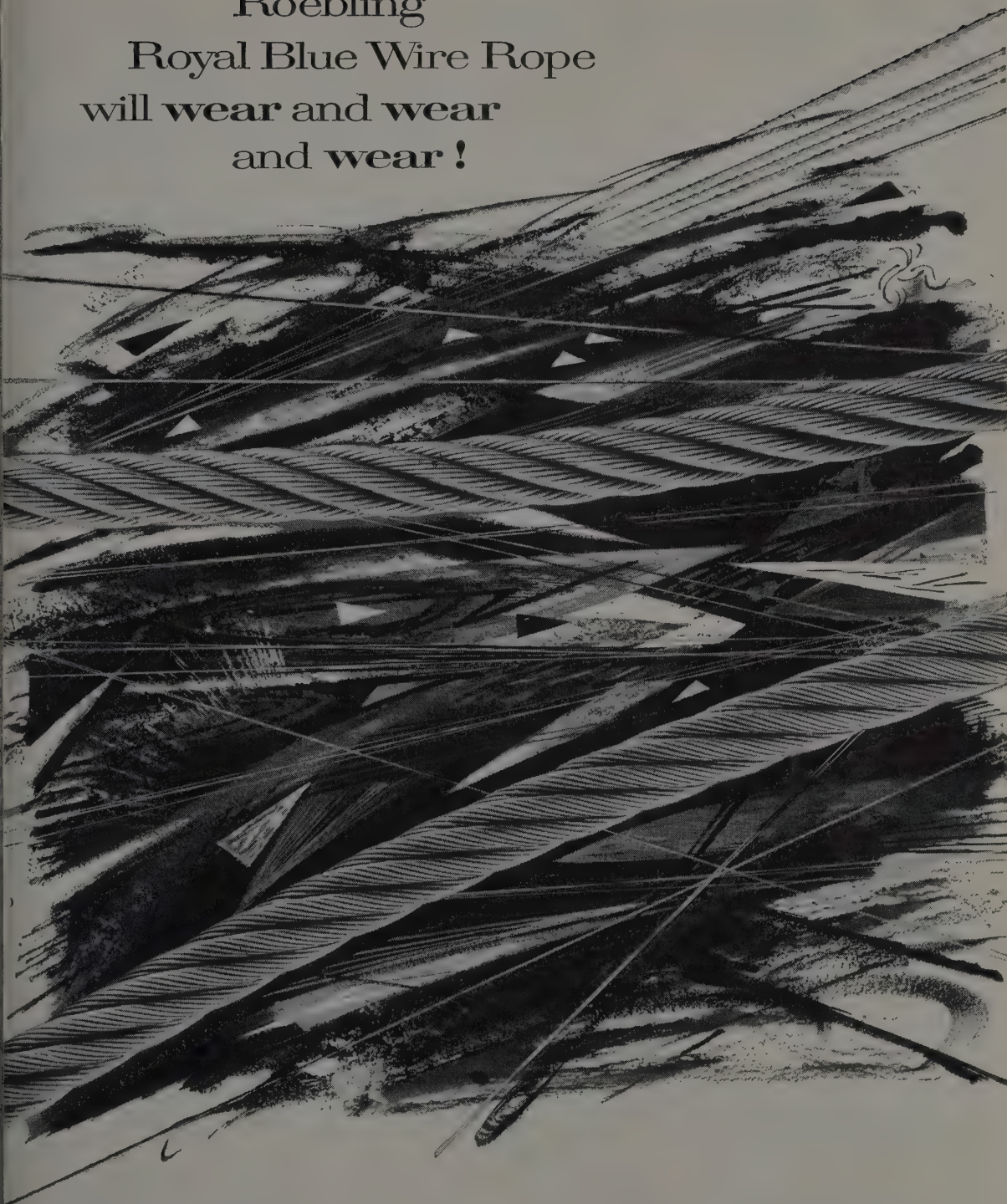
For digging catch basins Mr. Vernon says: "It would take one man approximately 2½ hours of digging . . . with the Henry Backhoe the job is finished in 20 minutes!"

"You can do it BETTER with a HENRY"



Burlington County finds the Henry's bucket action is ideal for digging manholes 24" by 24". Mr. Vernon, an operator more than three years, says of the Henry: "No maintenance nor maintenance costs outside of the daily greasing which takes about ten minutes for the entire machine."

Roebling
Royal Blue Wire Rope
will wear and wear
and wear!



This working quality means longer service life on *your* job. Add to this the fact that Royal Blue is stronger than the strongest rope you have been using and you have two excellent reasons why it has enjoyed faster acceptance than any wire rope in Roebling's history. Your distributor or Roebling Sales Office will give you the complete story, or contact John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING 

Distributors, Branches and Warehouses Throughout the Country—Subsidiary of The Colorado Fuel and Iron Corporation.

NEW LITERATURE

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

Proper use of cranes

In a recent data sheet entitled "Crawler, Truck and Similar Cranes," The National Safety Council has given a breakdown of the causes of crane accidents occurring in the field and a list of the basic steps necessary for safety. Data Sheet D-448, which has been prepared and reviewed by expert safety engineers, may be had by writing to the **National Safety Council**, 425 N. Michigan Ave., Chicago 11, Ill.

Cat filter elements

A pamphlet describing the features of Cat filter elements answers such questions as "Why use filters at all when additive oils are supposed to keep engine parts clean?" And "Won't most any filter element trap impurities?" The new publication, "Have You Been Around When Your Engine's Torn Down?" presents drawings and photographs showing the effects of varnishes, sludge and abrasive particles on critical engine parts, and explains the functions of detergent oils and their relation to filter elements. Copies available from local Cat dealers or by writing **Caterpillar Tractor Co.**, Peoria, Ill. Ask for Form DE732.

New air tool trouble chart

A new 8-page bulletin explaining troubles encountered, causes, and remedies when using rock drills is now available. The bulletin, AT-116B, is titled, "I know airpower." In addition to the rock drill "trouble-shooting chart," 2 pages of the bulletin are devoted to growing usage of air as power. Pictures and drawings are used widely to illustrate construction and maintenance of various air tools. The bulletin is available by writing the Sales Promotion Department, **Le Roi Division, Westinghouse Air Brake Co.**, Milwaukee 1, Wis.

Regrinding and protection of steel bits

Atlas Copco Pacific Inc., 930 Brittan Ave., San Carlos, Calif., is offering two publications. Leaflet E-589, "How to Regrind Sandvik Coromant Detachable Bits," shows, in a series of 14 photographs, when and how to sharpen the tungsten carbide bit inserts and gage surfaces. Detailed dimensions and tips for prolonging bit life are given. Folder E-567, "Eliminate Corrosion with Sandvik Coromant SR," describes the company's new process for protecting drill steels from corrosion by moisture. It illustrates the types of fatigue failure in

drill steels caused by corrosion, and explains the new surface treatment which protects the wall of the flushing hole and outer rod surfaces.

Horn Construction Data Handbook

A new 108-page "Horn Construction Data Handbook" for the Pacific Coast Division of **A. C. Horn Co., Inc.**, subsidiary of **Sun Chemical Corp.**, has been prepared for distribution to architects, engineers, contractors and purchasing agents in the West Coast area. Over 30 construction tables, guides and time saving charts are included in the handbook to help solve problems in building maintenance, construction and engineering. Three separate indexes permit quick, easy reference to more than 95 specialty products manufactured by **A. C. Horn Co., Inc.**, for industrial, institutional or commercial users in the eleven Western states. With each product description is a brief outline of recommended uses, methods of application, covering capacity, colors, packaging and shipping data. Requests for copies of the "Horn Construction Data Handbook" should be addressed to: **A. C. Horn Co., Inc.**, subsidiary of **Sun Chemical Corp.**, 252 Townsend St., San Francisco 7, Calif.

New utility ditcher catalog

A new catalog, featuring the improved **Gar Wood-Buckeye** model 403 utility ditcher, has just been made available through the customer service department of **Gar Wood Industries, Inc.**, Wayne, Mich. The colorful, 8-page catalog is thoroughly illustrated with mechanical views of all major components. Action photos, showing the ladder-type ditcher at work under a variety of conditions, are also included.

Formgrader paving equipment

A 4-page leaflet giving the applications and specifications of their paving equipment has been issued by **The Cleveland Formgrader Co.**, Mills Rd., Avon, Ohio. Covered in the pamphlet are the **Cleveland Formgrader**, the form tamper, the subgrade scratch template, the heavy duty **Trailgrader**, the **Junior Trailgrader**, bridges, aluminum and steel

straight edges, an all steel bull float, p brooms, a form and stake puller, toggle action floats and trowels, steel hat floats, lutes and a powerroll. More detailed descriptions are available on individual data sheets for each piece of equipment.

Clyde Whirleys

A new bulletin (12-P) containing many interesting photographs of **Clyde Whirleys** and showing the wide variety of work they can handle with hook magnet or bucket, is now available through **Clyde Iron Works, Inc.**, Duluth, Minn. The 32-page booklet features illustrations of Whirleys on construction jobs, at shipyards, industrial plants, and on deck and dock. Complete specifications are also listed. For further information about **Clyde Whirleys** and a copy of the bulletin write to the company.

Welded steel plate sections

A new 4-page folder on **Claymo** fully-welded steel plate sections has been prepared by **The Colorado Fuel and Iron Corp.** Welded sections are widely used for highway bridges and other structural applications. The booklet describes the welded sections as lower cost and lighter in weight, yet stronger pound for pound than riveted sections. Copies of the folder are available at the corporation's New York office, 57 Madison Ave., or at any of **CF&I** regional sales offices.

Bituminous concrete testing

Will Corp., Rochester 3, N. Y., has available a new 4-page illustrated brochure describing apparatus for bituminous concrete testing for asphalt content. Included are specification and prices of sieves, extractors, balances, solvents and hot plates.

Carbide-tipped masonry drill

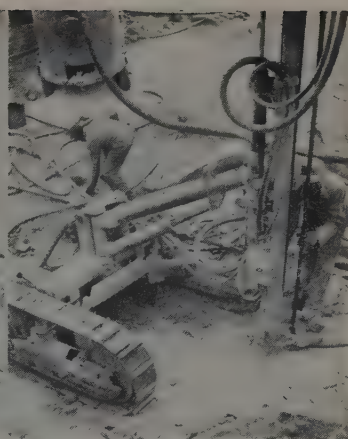
The **Tip Top** rotary masonry drill described and illustrated in a specifications sheet issued by **Termite Drills, Inc.**, 99 N. Lotus Ave., Pasadena, Calif. Offering low-cost drilling in all types of masonry, the rotary drill features an extra-thick carbide grinding cutter, and a drill body and cutter of the same diameter which results in cleaner, more accurate holes and maximum cutting durability. Ask for sheet No. **TIP-1056**.



There is no fussing with time consuming hoists and wire rope to spot this drill.



The big savings are in speed of set-ups and maneuverability. Set-up time is not production time.



Convenient controls, reverse and release rotation make for fast and easy steel changes.

the NEW CRAWL-IR

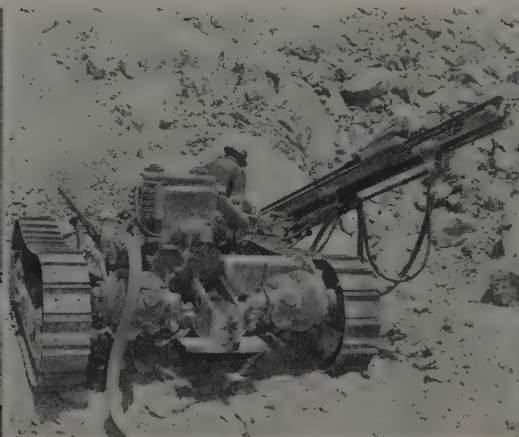
MOST FULLY MECHANIZED CRAWLER DRILL EVER DEVELOPED

No other crawler drill is so fully powered —so fast and easy to setup—so safe and convenient to use. It will drill horizontally, vertically, or at any angle, with all boom and tower motions controlled hydraulically at the touch of a throttle.

The CRAWL-IR tows its own air power up slopes or over rough terrain. Heavy duty air motors propel the rugged knee-action crawlers. Call your I-R man or write for bulletin 4189.



The CRAWL-IR is not dependent on other equipment and men to move its power—it tows its own.



Here is a graphic example of complete flexibility—see holes out over the side of the crawler.



Sound design, convenience of controls and rugged construction give you all you could ask for in a crawler drill.



a Constant Standard of Quality

Ingersoll-Rand

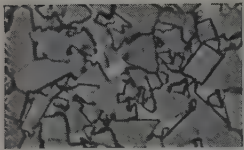
11 Broadway, New York 4, N. Y.



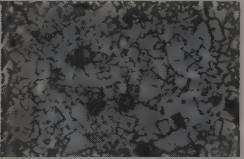
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FOR A PACE-SETTING DRILLING COMBINATION, POWER THE CRAWL-IR WITH A GYRO-FLO COMPRESSOR.

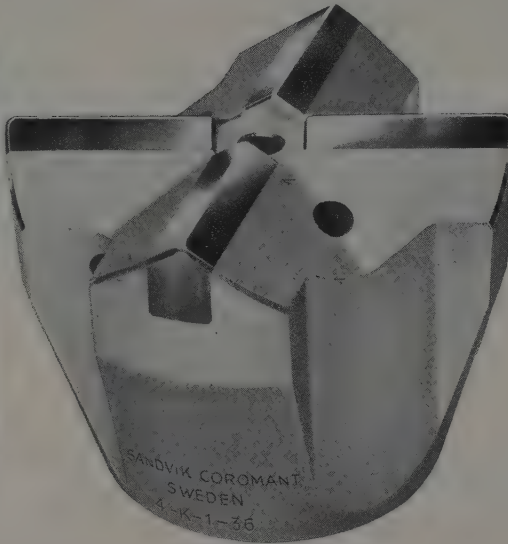
Longer bit life—with *new* Sandvik Coromant X-Bits



Sandvik Coromant Tungsten Carbide. (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide. (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.



NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

- 1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.
 - 2 the bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.
 - 3 the bigger Sandvik Coromant bits are all of X-design, which prevents rifling.
- No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

THESE STANDARD SIZES ARE AVAILABLE

	THREAD	DIAMETERS AVAILABLE (IN INCHES)
SHOULDER TYPE	$\frac{7}{8}$ " F.....	$1\frac{1}{2}$
	1" H.....	$1\frac{1}{8}$, $1\frac{3}{8}$, $1\frac{1}{2}$ and $1\frac{7}{8}$
	$1\frac{3}{8}$ " D.....	2, $2\frac{1}{8}$, $2\frac{1}{4}$, $2\frac{3}{8}$, $2\frac{1}{2}$, $2\frac{3}{4}$ and <u>3</u>
	$1\frac{1}{2}$ " K.....	<u>3</u> , <u>$3\frac{1}{2}$</u> , <u>4</u> and <u>$4\frac{1}{2}$</u>
BOTTOMING TYPE	$1\frac{1}{4}$ " Rope.....	$1\frac{7}{8}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, <u>$2\frac{3}{4}$</u> and <u>3</u>
	2" Rope.....	<u>$3\frac{1}{2}$</u> , <u>4</u> , <u>$4\frac{1}{2}$</u> and <u>5</u>
	400.....	2, $2\frac{1}{4}$ and $2\frac{1}{2}$
	600.....	<u>$2\frac{1}{2}$</u> , <u>$2\frac{3}{4}$</u> , <u>3</u> and <u>$3\frac{1}{2}$</u>

The sizes underlined are X-shaped bits

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—cross bits from $1\frac{1}{2}$ " to $2\frac{1}{2}$ " and extension steel equipment.

Write, phone or cable today for further details to any of the addresses below:

Atlas Copco

EASTERN — P.O. Box 2568 Paterson 25, N.J. Phone — Armory 4-3310
 PACIFIC — 930 Brittan Avenue, San Carlos, Calif. Phone — Lytell 1-0375
 CANADA — Montreal Airport, Quebec. Phone — Melrose 1-1871
 MEXICO — Apartado Postal 56, Torreon, Coahuila. Phone — 39-07

Literature from Heltzel and Flex-Plane

Now available from Heltzel and Flex-plane are three catalogs with diagram and specifications on Heltzel steel form (Bulletin H-563) and Type 200 Batch-master (Bulletin H-561), and a general catalog of Flex-Plane construction products (FP 552). Bulletins include on-the-job pictures. Also available, an illustrated leaflet (Data Sheet No. 1) of Flex-Plane's Corrugated Contraction Joint Installing Machines. Write to The Flexible Road Joint Machine Co., an Heltzel Steel Form and Iron Co. Warren, Ohio.

Sanitary landfill

Information on sanitary landfill methods, organization, operation and necessary equipment with which to carry out the job, highlights a new 8-page booklet on the methods and benefits of sanitary landfill (MS-1159), now available from the Construction Machinery Division, Allis-Chalmers Manufacturing Co. Milwaukee, Wis. Photographs of equipment working on landfill and detailed sketches showing how the various landfill methods are developed illustrate the new book.

Catalog features Gar Wood power cranes and shovels

A new 24-page catalog, featuring Gar Wood Industries' 75B series of $\frac{3}{4}$ -yd. power excavators, is now available from the Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan. The catalog is widely illustrated with detailed action photographs of power shovels, cranes, draglines and other optional excavator attachments. Important parts and assemblies of the 75B are pictured and described in detail.

Mohawk crushing plant

Now available from Lippmann Engineering Works, Inc., 4603 W. Mitchell St., Milwaukee 14, Wis., is a brochure on one of the company's latest developments, the "Mohawk," a new portable primary crushing plant. The plant has range of four sizes, "Mohawk Cub," "Mohawk Scout," "Mohawk Warrior," and "Mohawk Chief." Details and specifications concerning these plants are contained in the bulletin, which may be had on request.

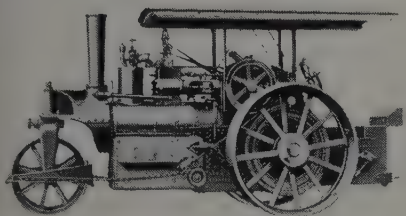
Reciprocating blade saw

An illustrated brochure pointing out the features of the Wright Rebel reciprocating blade gas power saw and illustrating the saw's varied uses is available from Wright Power Saw and Tool Corp. 410 S. Third St., Louisville 2, Ky. It included also are specifications and data on the Rebel.

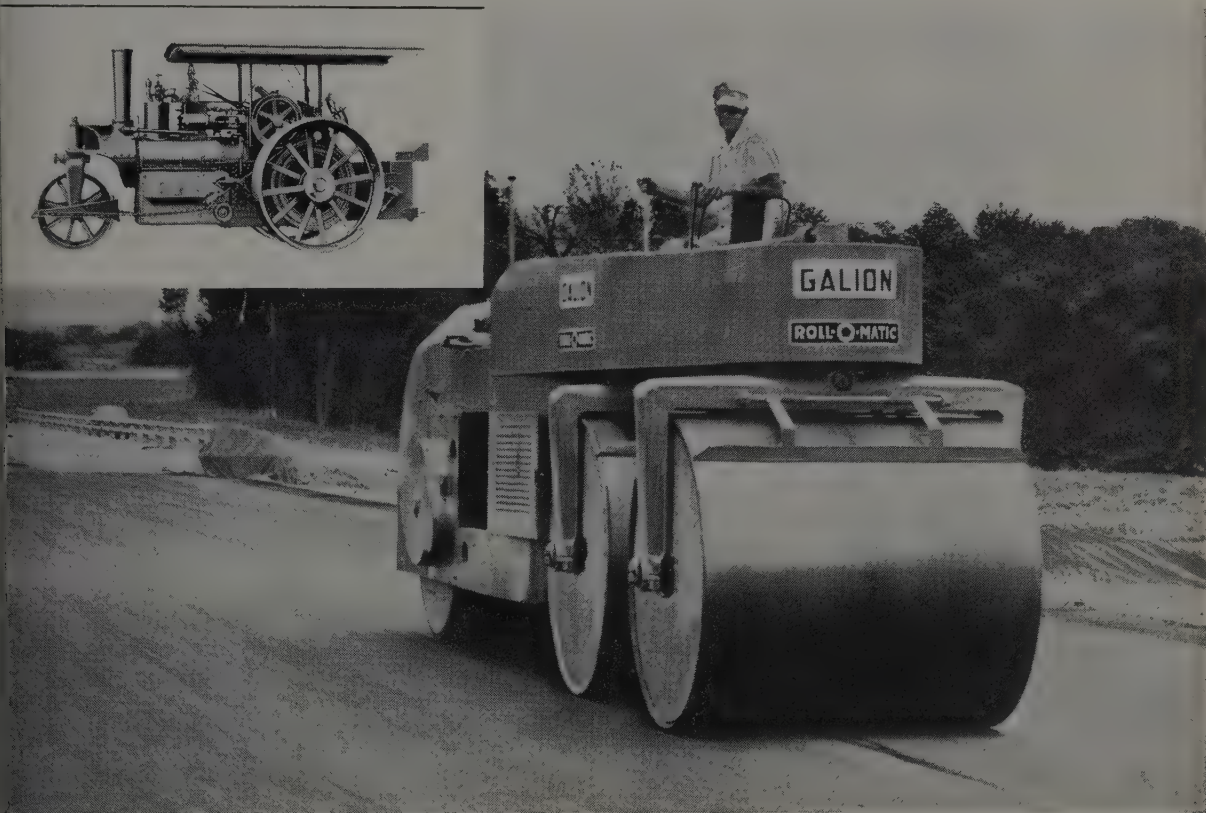
ALLISON salutes GALION's 50 Years of Progress

*The Allison Division of General Motors proudly congratulates
The Galion Iron Works on a half-century devoted to the design
and manufacture of better road-building tools*

YESTERDAY—This early Galion "steamroller" was a road-building miracle in its day. Key to its efficiency was the smooth, quick reversing possible with steam power. From this model Galion went on to more modern motor rollers.



TODAY—Galion's 3-axle tandem Roll-O-Matic is the result of half a century of manufacturing skill. And its modern TORQMATIC DRIVE brings back the smoothness of steam-engine reversing. The Galion Roll-O-Matic is one of the most important tools of today's road-builder.



Through constant research and development Galion has grown from a modest beginning in 1907 to its present position as one of the world's leading manufacturers of road rollers.

Allison is proud to be playing an important role in Galion's latest highway construction equipment—the Galion Roll-O-Matic. Allison TORQMATIC Converters make these streamlined road rollers completely modern, pointing the way toward Galion's continued progress as it begins another 50 years of service to the American road-building industry.



Allison
**TORQMATIC
DRIVES**

Blue Book on electric plants

D. W. Onan & Sons, Inc., 2600 University Ave., S.E., Minneapolis, Minn., has revised their "Blue Book" of general information concerning the selection of engine driven electric plants. The pocket-sized booklet traces the history of electric plant development and describes in easy-to-understand language the three general groups of electric plants: a-c., d-c., and battery charging. Reviewed are the three types of prime mover which furnish the mechanical power for driving the generator, namely: gasoline engine, diesel engine, and gas engine. Copies available by writing the manufacturer. Ask for the "Blue Book."

Concrete curing with Fiberglas paper

Now available from Owens-Corning Fiberglas Corp., Industrial Textile Division, 598 Madison Ave., New York, N. Y., is the booklet, "New Facts about Curing Concrete with Fiberglas Reinforced Weatherproof Paper." The booklet describes what takes place during the cure, and outlines the many curing techniques now in use. Step-by-step photographs show the technique of curing with Fiberglas reinforced paper, on highway and building construction projects. Photographs also show other uses of reinforced paper, such as under concrete slabs and foundations as fill cover, under flooring as a dust and moisture barrier, under roofing as a dry sheeting, and as a construction material for temporary shelter.

Pioneer's feeder line described

More than 50 types and sizes of unit feeders and 2 sizes of portable apron feeders are described in an 8-page bulletin announced by Pioneer Engineering, Division of Poor & Co., Inc., 3200 Como Ave., Minneapolis 14, Minn. Newly-redesigned Pioneer portable apron feeders are available in 36-in. and 42-in. widths, both 30 ft. long, and furnished to include

one of two standard drives. The new bulletin contains general specifications, capacities and hp. requirements on the complete line, and numerous photographs of different type and size apron feeders. Available from the manufacturer or any Pioneer distributor. Ask for Form N 662.

92-page tool catalog

A 92-page catalog of tools used by builders in the trowel and general construction trades has been issued by **The Goldblatt Tool Co.**, 1910 Walnut St., Kansas City 8, Mo. The new book, which is available upon request from the company, includes building tools that range from the simplest hand tools to husky power equipment. A total of 1,500 tools, which are sold by direct mail and through dealers, are described in this free catalog.

Tips on plywood

Three new booklets on how to work, how to finish, and how to buy fir plywood have been released by the **Douglas Fir Plywood Association**, Tacoma 2, Wash. "How to Work Fir Plywood," in step-by-step photographs, illustrates correct procedures for joint construction, nailing, screwing, as well as other vital points. "How to Finish Fir Plywood" details various methods for painting and finishing fir plywood. "How to Buy Fir Plywood" explains the meaning of plywood types and grades. Points covered include: typical uses of each grade, veneer quality, and standard stock sizes. Single copies of all three booklets may be obtained free on request.

Problems of watertight masonry

A new 6-page folder by the **Master Builders Co.**, 7016 Euclid Ave., Cleveland 3, Ohio, has just been published on

the subject of design and specification of watertight masonry. The folder covers mortar ingredients and proportioning; compatibility of brick and mortar; control of shrinkage and bleeding; separation cracks; effects of mechanical disturbance; and the importance of proper protection. Ask for folder "O.M."-8.

Torque converters

Torque converters for excavators, cranes and shovels, and their advantages in this heavy duty service are presented in the first of a new series of data sheets issued by **The National Supply Co.**, Gateway Center, Pittsburgh, Pa. The new 4-page data sheet, No. 10, briefly explains 12 features of the single stage torque converters in operation, including output shaft governor drive, overspeed back-clutch, and mechanical disconnection clutch. It also points out the advantage to be gained in matching National torque converters with electric motor drives and includes information on special converter designs and accessory equipment. Representative types and makes of engines with which the 17 sizes of converters can be used in the 100- to 1000-hp. range are listed.

Clark offers brochure on 6,000-lb. outdoor fork truck

A 4-page brochure (Bulletin YD-60-A) describing in detail the features, specifications and operating characteristics of the YD-6024, a 6,000-lb. capacity fork truck for outside handling, is now available from Industrial Truck Division, **Clark Equipment Co.**, Battle Creek 80, Mich. Specifications given include weight, length, width, wheel base, underclearance, turning radius and tire sizes. Charts indicate tractive effort at gradeability in both high and low range. Features described include planetary drive axles, twin hoist units, upright assembly and gas powered 68-hp engine.

Notice to publisher of CHANGE OF ADDRESS

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San Francisco 5, California

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Why Your New Mobile Work Unit Should Be a JOHN DEERE

FIRST OF ALL, a sturdy, quality-built John Deere Crawler or a John Deere Utility Wheel-Type Tractor will serve you faithfully in a hundred-and-one ways, just as John Deere Tractors have been doing down through the years. "John Deere dependability," owners call it.

Next, when you choose a John Deere, you know you have a tractor that simply can't be beat for holding down costs. That is all-important to you. For nearly 40 years, economy

has been a "second name" for John Deere Tractors.

Finally, these tractors bring you amazing work power for their size, plus the kind of comfort, convenience, and ease of handling that will please the most particular operator.

Get acquainted with these modern time- and money-saving tractors and equipment now at your John Deere industrial dealer's store. You'll be glad you did!



CRAWLER DOZER

A great outfit for land-scapers and builders—the John Deere "420" Crawler (with approximately 30 engine horsepower) and John Deere 6-foot dozer blade. So compact, it maneuvers within a one-car garage!



Left: The Utility Tractor and Power Hole Digger—today's easy method for digging holes for posts, guard rails, tree settings, and construction work. Digs as deep as 40 inches; several auger sizes.



Left—John Deere "420" Utility Tractor and rear-mounted scarifier-scraper. This is one of many "pick up and go" tools that mount on the tractor's standard 3-point hitch.



John Deere Crawler and Heavy-Duty Industrial Loader-Scarifier. Just the outfit for low-cost excavating, leveling, dirt moving, and similar jobs.



Backed by nearly 40 years of tractor manufacture for dependable service and quality.

Send for FREE LITERATURE

JOHN DEERE • Industrial Division
215 S. E. Morrison St., Portland 14, Oregon
651 Brannan Street, San Francisco 19, California

Please send me your new illustrated booklet on John Deere Tractors and Working Equipment. Include name of nearest industrial dealer.

Name _____
Firm _____
Address _____
City _____ State _____

"Quick-Way" crane shovels

Two bulletins are available on request from "Quick-Way" Truck Shovel Co., 2401 E. 40th Ave., Denver, Colo. Bulletin 656 describes model 85A, a 4/10-yd.-8½-ton capacity crane shovel with carrier. Bulletin 756 covers Model 105AC, a two-speed crawler-mounted shovel with a capacity of 5/10 yd., 7 tons. Both folders contain illustrations and specifications.

Barber-Greene Wheel Ditcher

An illustrated folder on the new Barber-Greene Wheel Ditcher, model 774, is available from Barber-Greene

Co., 400 No. Highland Ave., Aurora, Ill. A dependable machine for heavy-duty digging, the 744 is recommended for pipeline, irrigation, drainage, and excavating contractors. Folder contains on-the-job photographs and structural diagrams which illustrate the new principles of drive and wheel suspension employed in the ditcher.

Transcrete truck mixers

Illustrated descriptions of the individual features to be found in the Transcrete truck mixer, as well as a breakdown of the complete machine are offered in an 11-page catalog (TM-57)

published by the Advertising Dept. of the Construction Machinery Co., Waterloo, Iowa. Described are Transcrete floating drive, its swing-out hoppers, faster cycle, water system, and many way discharge chutes. The 2-color catalog is available on request.

K & E catalog

An illustrated 17-page catalog that lists a complete line of optical tooling equipment has been issued by Keuffel & Esser Co., Hoboken, N. J. Copies may be obtained by writing directly to the company. The catalog lists such standard items as jib transits, alignment telescopes, and Paragon Tilting Levels, together with a large number of accessories, instrument stands, fixtures, collimators, scales, targets, and optical attachments, including the optical square.

IH catalog on

4-cyl. carbureted power units

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., has announced it now has available an attractive 8-page catalog on its new increased horsepower line of 4-cyl. carbureted power units. This free booklet reserves a page of space for valuable data on each of the four heavy-duty dependable units. An informative line graph, illustrating power and fuel consumption curves, provides a useful ready reference on each unit. Dimensions and brief specifications on the members of this line can be obtained by requesting Catalog GR-510-G.

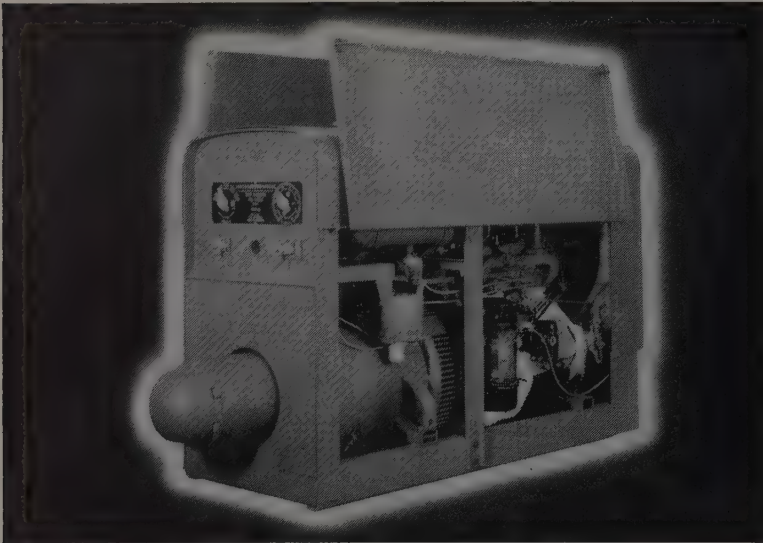
New brochures

on Clipper masonry saws

The Clipper Manufacturing Co., 280 Warwick, Kansas City 8, Mo., announces that two new brochures are now available on their complete line of masonry saws. The outstanding features of the company's new 2-hp. Supermatic and 1½-hp. original Select-A-Notch masonry saws are graphically pointed out. For information on the Supermatic ask for brochure 2019; for a description of the Select-A-Notch, brochure 2021.

Folder on Daybrook power loader

The Power Loader, which is installed on the truck frame immediately at the rear of the cab and operates within a full 360-deg. area of the truck, is described in a new 4-page folder, published by Daybrook Hydraulic Division, L. A. Young Spring and Wire Corp., Bowling Green, Ohio. The Power Loader fits any standard truck chassis. Load lifting capacities are given up to 4,000 lb., depending upon the boom length. A copy of the folder is available on request. Specify Form No. PL-457.



NEW MODEL OF THE GREAT 6090

(at the same low price)

Shield-Arc 200 has these new features

Extra Horsepower—New 36 h. p. Continental engine (at the same low rpm) insures top output after thousands of hours of continuous, hard use. Also gives full welder performance at high altitudes.

Large Gas Tank—16 gallon capacity allows operation for full 8-hour shift without refueling.

Precise Current Control—Shield-Arc's famous dual control made even more accurate by increasing steps of current selections.

Rugged Base and Housing—Heavy gage steel base, top and doors, and extended housing protects welder from damage through rough use in the field.

Complete specifications are contained in Bulletin SB-1337. Write for it.

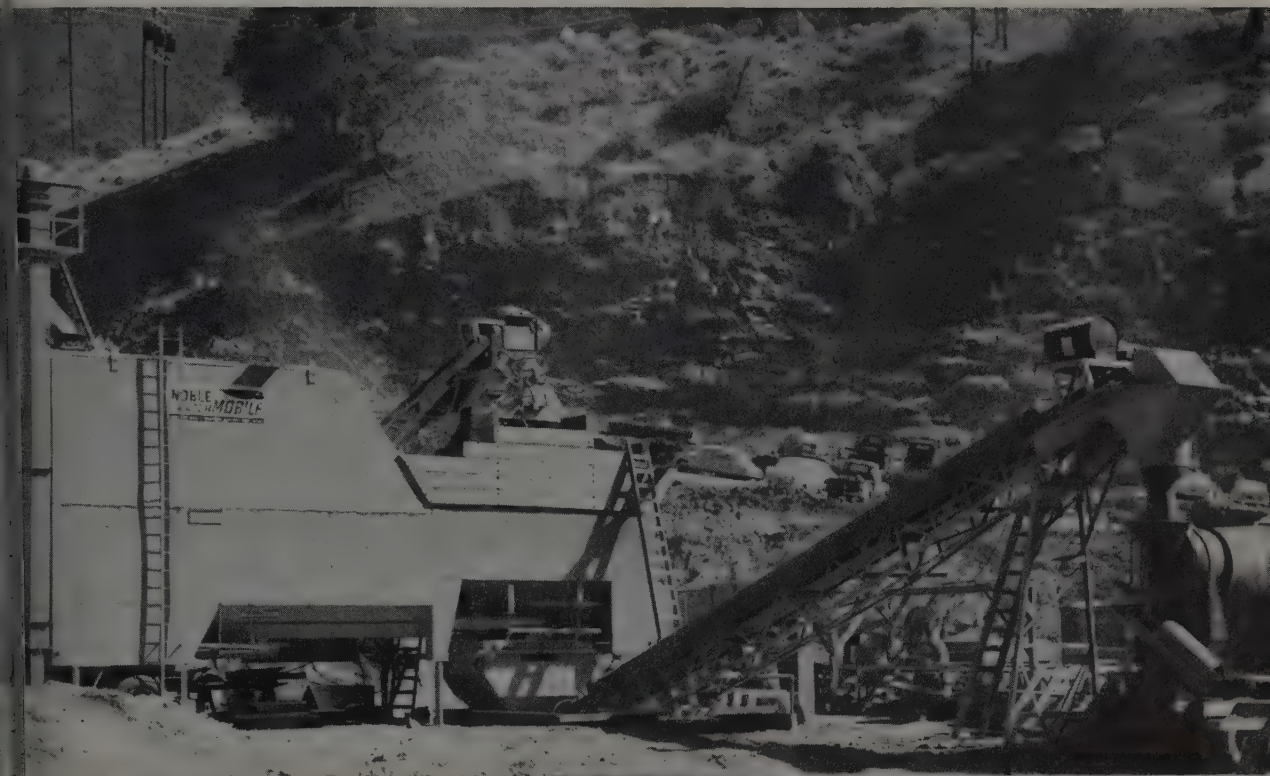


THE LINCOLN ELECTRIC COMPANY

Dept. 4317, Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

problem and saved 70% in installation cost



MOBILE BATCHING PLANT

concrete to transit trucks. May also be dry batch or pre-mix. Has bulk storage silo with truck hopper unloading and elevator. Weighs aggregates separately and simultaneously. Automatic or semi-automatic control. No field concrete foundations required on job.

Mobile is driven to the job site and goes into production promptly. Purchase is easier than stationary plant.



▲ 1,000 yards of 2 1/2", 1 1/2", 3/4" aggregates and sand, hauled by truck from Oroville 25.1 miles away, are stored in compartmented piles at the site. They are fed by a scooploader to a conveyor leading to the plant. The materials are automatically batched and discharged by a conveyor to the transit trucks for the approximate 2-minute haul to the pouring site.

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NEW EQUIPMENT

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

New 7,000-lb. GVW FC-170 added to Willys "Jeep" series

A larger, more powerful vehicle in the new series of "Jeep" forward control models has been recently announced by Willys Motors, Inc., Toledo, Ohio. Identified as the "Forward Control 'Jeep' FC-170," the new heavy-duty truck carries a gross vehicle weight rating of 7,000 lb., highest payload capacity of any "Jeep" vehicle introduced to date. With a wheelbase of 103.5 in., it provides the largest cargo area in relation to length of any pickup model in its weight category. The

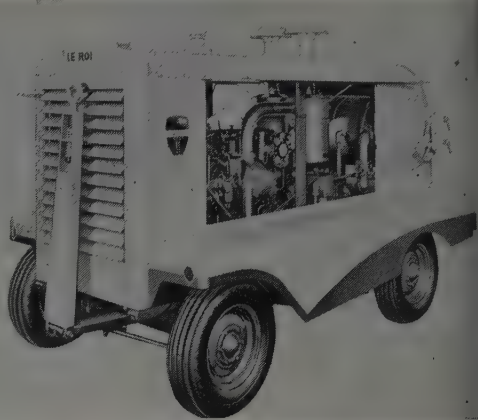


FC-170 continues the four-wheel drive engineering characteristics of the "Jeep" FC-150. However, payload is 30% greater and the FC-170's high torque "Super-Hurricane" engine provides substantially higher power performance. The up-front location of the cab, situated well forward of the engine, allows maximum usage of the vehicle's wheelbase for payloads, and places the driver in the best position for all-direction visibility. The pickup or stake bodies provide a full unobstructed 9 ft. of cargo length. Suspended brake and clutch pedals, level-plane steering wheel, and location of the shift and four-wheel drive control levers at convenient height contribute to effortless handling in both over-the-road and off-the-road travel. Engine access covers are located between the seats and when removed provide easy all-weather service access to major components from within the cab. Engine features include new cam design which provides 190 ft.-lb. of torque at a low 1,400 rpm., a new and more rugged cast iron alloy block, new chromium oil and compression rings, heavy-duty Moraine bearings, and Stellite valves for longer and more economical service. The FC-170 offers nine forward and three reverse power combinations with standard transmission, and 12 forward combinations with optional four-speed transmission available at extra cost. Equipped with power take-off, the new FC-170 becomes a source of stationary power available at the rear for powering winches or belt and shaft-driven equipment, and at the center for operation of generators, welders and other bed-mounted machinery. The FC-170 has an overall length of 181.5 in.; width of 76.75 in., and height of 79.5 in.

Lightweight, short-turning rotary air compressor offered by Le Roi

The lightest, shortest-turning 600-cfm. rotary air compressor on the market is the way **Le Roi Division, Westinghouse Air Brake Co.** describes the first of its new line of rotary air compressors. The LeRoi 600RD2 is a portable, two-stage, sliding vane type rotary air compressor and is rated at a free air capacity of 600 cfm. Dry weight is 7,730 lb. and it has a turning radius of 11 ft. 11 in. The compressor is coupled to a GM-71 diesel engine with a hydraulically activated clutch. By use of an automatic variable capacity regulator and an

automatic governor speed control, engine speed varies match air demands. The engine-compressor is supported on



unit welded steel frame and is enclosed in a heavy molding of streamlined design. Three-point suspension engine-compressor, including rubber cushion at engine traction, protects against damage from towing distortion over rough terrain. For complete information write the Sales Promotion Dept., Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wis.

Allis-Chalmers announces new motor scrapers

Expanding its line of motor scrapers, Allis-Chalmers Motor Co., Milwaukee, Wis., announces the new hydraulic 7-cu. yd. Model TS-160, struck, 9.5-cu. yd. heaped, 12-ton payload, Model TS-160 rated at 155 hp. The TS-160 has an Allis-Chalmers 6-cylinder, 5 cu. in. displacement, supercharged diesel engine rated at 2,200 rpm. A one-piece all-steel tractor frame gives rigid support for engine, clutch and transmission and provides



easy accessibility to these components for service without disturbing adjacent parts. Final drive housing is an all-steel, fusion-welded structure that is stress-relieved and line-bored for true alignment of all gears, shafts and bearings. Five-speed constant-mesh transmission fully utilizes the high torque put from the engine. Forward speeds range from 3.1 to 10 mph. and reverse at 3.1 mph. Two-speed hydraulic steering with 90-deg. steer each way is a feature. The tractor can swing into a right-angle turn with only a 1/6 turn of the steering wheel. A complete non-stop turn is made in 24 ft., 8 1/2 in. slight turn of the steering wheel regulates the pump flow to the steering jacks for smooth, gradual turns on haul road. Apron opening of the bowl is 85 1/2 in. and width of cut is 9

36" Kolman Conveyor-Screen Plant Loads 7-yd. Trucks in Half Minute



KOLMAN
COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR • SCREEN • TRAP • FEEDER

DAMP-TO-WET GRAVEL HANDLED IN RECORD TIME BY ZASKE CO.

Contractors throughout the country are finding that the Kolman Model 101 Conveyor-Screen Plant comes through with top production under the severest operating conditions.

Here 7-yard trucks are loaded with damp-to-wet gravel in half a minute and ten-yard trucks in less

than a minute — over 800 tons an hour — by the Zaske Construction Company of Morton, Minn. And Kolman's rugged construction permits handling these heavy loads at constant rates without fear of excessive maintenance expense.

Kolman builds conveyors that are brutes for production and for

taking abuse — 18" to 42" belts on portable or stationary units of any desired length, capable of carrying single, two- and three-deck screens without additional support. With Kolman's folding feature, the single-deck screen need not be removed for transportation.

A steel dozer trap with built-in plate feeder, available as optional equipment, is an integral part of the conveyor and fully portable.

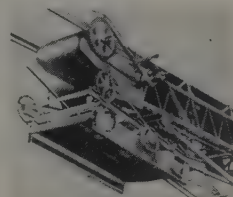
Best of all, Kolman Conveyors are competitively priced. Get the whole story before you buy any conveyor or screen.



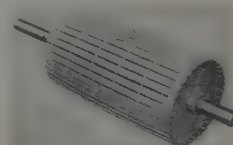
view of another installation of Zaske's employing Kolman 101 to load trucks with base lift material stockpiled by crusher.



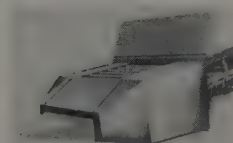
Head pulley clutch permits operation of screen while conveyor or belt is idle.



Folding feature permits weight of screen to be shifted back under conveyor.



Bar type head pulley eliminates the necessity of logging. Extended shaft.



Easily-portable dozer trap is built onto tail section. Grizzly bars stop large rocks. Designed for easy access to tail section.

SEND for FREE literature
KOLMAN Manufacturing Co.

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

Please send free literature on—
Model 101 Heavy Duty Conveyor
Model 202 Junior Conveyor
Vibrating Screen ☐ Feeders
Traps

size or.....capacity

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SEE YOUR NEAREST DEALER NOW

ARIZONA—Phoenix, Equipment Sales Co.

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Oakland—Spears-Wells Machinery Co.

COLORADO—Denver, Faris-Moritz Equipment Co.

IDAHO—Boise, The Sawtooth Co.

MONTANA—Butte, Billings, Great Falls, Missoula—Hall-Perry Mach. Co.

NEW MEXICO—Albuquerque, Farmington, J. D. Coggins Co.

NEVADA—Elko, A-D Machinery Co.

OREGON—Portland, Contractors Equip. Corp.

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WASHINGTON—Seattle, Air-Mac Inc.

WYOMING—Cheyenne, Casper, Rock Springs, Sheridan—Wortham

Machinery Co.

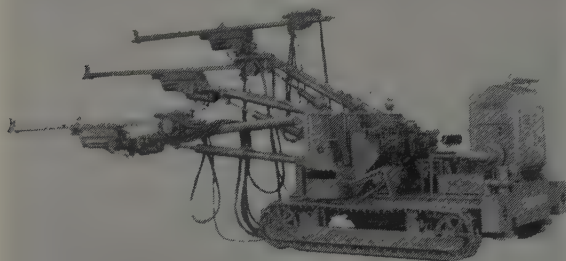
ALASKA—Fairbanks, Anchorage—The Carrington Co.

Western Representative, S. A. MADRID, 1739 32nd Ave., San Francisco 22

in. Depth of cut ranges from 0 to 24¾ in. and depth of spread is 0 to 16¾ in. Height of bowl sides is 44 in. The positive forward forced ejection and high apron lift provide fast, smooth, high-speed spreading. As the ejector moves toward the cutting edge, bulldozing material out of the bowl, the linkage moves the apron forward and upward at the same time to the large opening.

Push-button rock drilling

Developing further its conception of "push-button" rock drilling, Gardner-Denver Co., Quincy, Ill., has just announced



the new Model JMT Mobiljumbo. According to Gardner-Denver engineers, the new JMT self-propelled, crawler-mounted jumbo puts powerful rock drills under finger-tip control at the operator's position. It is available with crawlers powered by either diesel-hydraulic drive or by five-cylinder radial air motors. The new Mobiljumbo is furnished with two or three creep-free hydraulic booms. Rock drills and feeds may be selected to suit the ground being worked. An air motor drives the hydraulic pump for remote control of the boom and for drill positioning by one man. An electric generator,

air motor driven, supplies three lights that flood the working face and the drilling operation.

New type shovel-crane announced by Lorain

An entirely new type of construction tool, fully convertible to shovel, crane, clamshell, drag and hoe, has just been introduced by the Thew Shovel Co., Lorain, Ohio. It is Model 107, a self-propelled machine mounted on a short-coupled square rubber-tire carrier with 4-wheel drive and hydraulic power steering on one axle. It requires no outriggers to develop a full-rated 7-ton lifting capacity in all positions of table swing. The power take-off on the turntable is through



automatic transmission and torque converter. This coupled with the single speed transfer case on the carrier provides the travel speeds in both directions up to 15 mph. Independent travel for the lifting crane provides for traveling, hoisting and boom derricking simultaneously with each under separate clutch control.



Maximum SAFETY plus SAVINGS

1. Matched set of angular contact bearings.
2. Practically friction free.
3. Seal keeps grease in, foreign matter out.
4. Faster hoisting due to non-spinning loads.
5. Faster load placement due to easy load turning.
6. Faster rigging due to elimination of cranky wire rope performance.
7. Elimination of twists and kinks means longer wire rope life.
8. Safer load placements due to non-spinning loads.

21 standard types available from
½ ton to 250 ton working load



MILLER HIGH LIFT BLOCK

Welded Construction, Large Diameter Pin, Shortest Headroom, Moveable Swivel Hook, Individual Sheave Lubrication, Bronze spacers between Sheaves. Available with MILLER SWIVEL HOOK or TIMKEN BEARING HOOK. 5-50 Ton Capacity.



GENERAL MACHINE & WELDING WORKS INC.

1100 East Second St., Pomona, Calif.



PANEL with large window areas



WAREHOUSE

DANIEL CONSTRUCTION CO. PHOTO

Tilt-Up Costs Go Down

...with SUPERIOR "Pick-Up" Inserts, Brace Anchors, and Braces

When an outstanding Tilt-Up job rates an article in a construction publication you can be almost certain that SUPERIOR products were used. The reason is simple. SUPERIOR, as the pioneer in this field, developed designs that were thoroughly tested both in the laboratory and the field to assure safety with economical prices and low application costs.

These "Pick-Up" Inserts, Brace Anchors, and Adjustable Braces have been used and proven on literally thousands of projects, not a few of which were unique in design. With a background of such experience, the recommendation of our engineers as to location and types of Inserts and Anchors is reliable and valuable.

Avoid expensive crane delays, be assured of safety, and reduce your overall costs with these SUPERIOR products.

For further details request a copy of Bulletin TU-3



57 TON SLAB being positioned



DANIEL CONSTRUCTION CO. PHOTO

ADJUSTABLE BRACES used for quick and easy alignment of panels

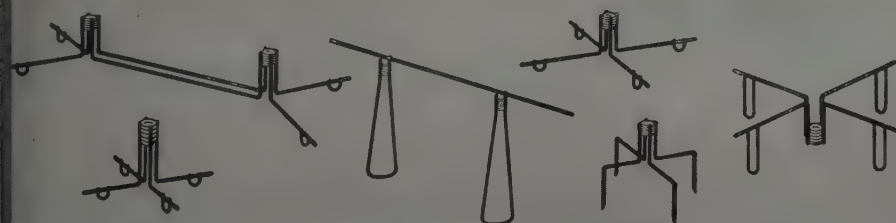
SUPERIOR

CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (A Suburb of Chicago)

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

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



SUPERIOR "PICK-UP" INSERTS ...

ANCHORS FOR BRACES ...



ADJUSTABLE BRACES

SNOWED UNDER?

MONARCH Controls Your Plow

... automatically!



JEEPS



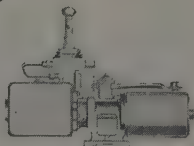
TRUCKS

POWER

MONARCH
HYDRAULIC

CONTROL

Snow removal is fast, dependable and safe with Monarch Power Hydraulic Control Equipment. cab-controlled for one-man instant action, the Monarch zips snow plows into operation with ease and speed. Fan-belt driven or Electric models are available for practically all makes of vehicles. Proven in service everywhere, over 50,000 Monarch Controls have been sold. See your dealer or write for full details.



The Monarch DYNAMIGHT Model HEP (as illustrated) combines all parts in one package for ready installation on new or existing equipment.

MONARCH

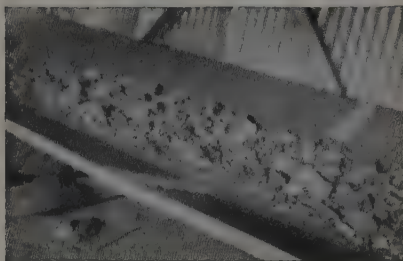
ROAD MACHINERY COMPANY

1331 MICHIGAN STREET, N.E., GRAND RAPIDS 3, MICHIGAN

FLEXCO

®

**BELT
FASTENERS
and RIP PLATES**



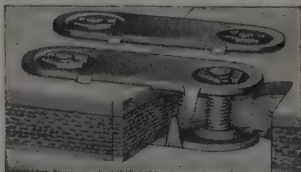
**FOR HEAVY
CONVEYOR
AND
ELEVATOR
BELTS OF
ANY WIDTH**

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur.
- ★ Also Pnomal top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

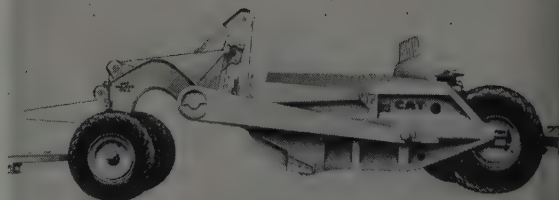
Order From Your Supply House. Ask for Bulletin F-112

FLEXIBLE STEEL LACING CO.

4704 Lexington St., Chicago 44, Ill.



Compression Grip distributes strain over whole plate area



HIGHER CAPACITY FOR NEW SCRAPER

Lowbowl scraper design has now been made available for use with Cat D7 tractor. Designated the No. 435 Scraper the new unit has a struck capacity of 13 cu. yd. and a heaped capacity of 18 cu. yd. The low-slung configuration allow material to enter the scraper with less lifting effort required and a minimum of material-against material friction. Contact your Cat dealer or Caterpillar Tractor Co., Peoria, Ill.

Asphalt reconditioner eliminates fire hazard

The Monatco Heater-Planer, original machine for one-pass reconditioning of asphalt streets, highways and airport runways, has been redesigned to remove all possibility of the machine catching fire or setting fires while being operated. It



Model M-2 the main drive engine, primary transmission and steering are placed over the front axle, out of the heat zone. Operator, fuel tanks, secondary transmission and final drive are well to the rear of the heat zone. All parts in the heat zone subject to heat damage are water-cooled. Two automatic fuel cut-offs provide final assurance against fire. Powered by 90-gross brake hp. Continental engine, the machine has 1 forward speeds—8 ft. per min. to 25 mph.—and 3 reverse speeds. Turning radius has been shortened to 21 ft. Complete information and cost operating data may be had from Monatco Manufacturing Corp., 1401 Woodland, Kansas City Mo., or through local dealers.

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- Complete ALLIED PRODUCTS

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Box 84 — Detroit 21, Michigan



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- ✓ Allis-Chalmers 200-hp Diesel Engine . . . provides more horsepower per yard, more horsepower per gross ton
- ✓ Hydraulic System . . . furnishes constant live power for steering and scraper actuation
- ✓ Apron and Ejector . . . provide fast, clean spreading with positive, forward forced ejection and high apron lift
- ✓ Correct Weight Distribution . . . for maximum traction and flotation
- ✓ Direct Electric Starting . . . 24-volt turn-key system for fast starts

Advanced design and quality manufacturing make the TS-260 an outstanding performer on many earth-moving jobs. Its rugged construction and built-in power add up to long, dependable performance that pays off in high output.

See your Allis-Chalmers dealer for full information on the complete line of motor scrapers, motor wagons, and pull-type scrapers.

ALLIS-CHALMERS

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CALIFORNIA
Horn Machinery Co.—San Diego
Horn Tractor Co.—Bakersfield
Sales & Service Co.—Los Angeles

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

MONTANA
Mountain Tractor Company—Missoula and Kalispell
Richland Machinery Company—Sidney
Seitz Machinery Company, Inc.—
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NEVADA
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Reno Equipment Sales Co.—Reno

OREGON
Haupter Tractor Company—Medford and Klamath Falls
Wood Tractor Company—Portland
Timber Tractor Company—Springfield

UTAH
Cate Equipment Company—Salt Lake City

WASHINGTON
Pacific Hoist & Derrick Company—Seattle
American Machine Company—Spokane

WYOMING
Studer Tractor & Equipment Company—Casper

Scraper has built-in ripper

A new, low-cost Utility Scraper has been announced by Seaman-Gunnison Corp., 2763 S. 27th St., Milwaukee 15, Wis. A scarifier-ripper which is built in as an integral part of the machine can be hydraulically lowered on the back haul to



rip the foil for the loading runs and serves as a counterweight for better traction and stability. Balance of the closed-coupled, short-wheelbase unit assures traction to absorb full engine torque, thus providing efficient self-loading action. The scraper is well within highway limitations for both overall widths and axle loadings. Turns of 80 deg. can be made on a 22-ft. roadway. Capacity is 4.5-cu. yd. struck, and 6-cu. yd. heaped. Power is supplied by an International 650 diesel tractor modified as an 88-hp., two-wheel prime mover. All steering and scraper controls are hydraulic. Five speeds range from 214 to 21 mph. Maximum cutting depth is 4 in. and spread is from 2 to 14 in. The Utility Scraper cuts a 7-ft. width. Weight without load is approximately 16,000 lb.

Spotter-base for earth-boring machines

A spotter-base to position earth-boring units faster and easier during digging operations is announced by the Highway Trailer Co., 405 E. Fulton St., Edgerton, Wis., for its line of skid-mounted earth-boring machines. The new spotter-base "spots" the hole thereby eliminating the necessity of constant

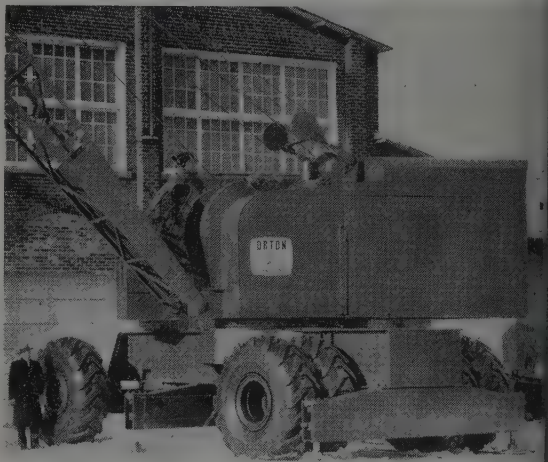


maneuvering of the truck into position for the digging or pole-setting operation. With the Spotter the operator can "reach" over digging obstructions such as large rocks and can shift digging direction should an underground obstacle be encountered. Finger-tip controlled hydraulic positioning allows the operator to position the boring machine within an arc of 80 in. and extend the unit 22 in. from the platform. The boring machine will dig at any point within this arc and within the forward and aft traverse. A hydraulic positioning ram controls auger travel across the rear of the truck body. The spotter-base can be mounted on a single axle or tandem

truck. Highway skid-mounted earth-boring machines are designed to dig holes 9 to 36-in. in diameter and up to 10' deep in any soil. Power is furnished by an integrally mounted engine and transmission. Hydraulic controls to increase efficiency and ease of operation are available as optional equipment.

Orton crane handles 50 tons at 12-ft. radius

The Orton Crane & Shovel Co. has developed a full circle crane mounted on rubber tires, with a capacity of

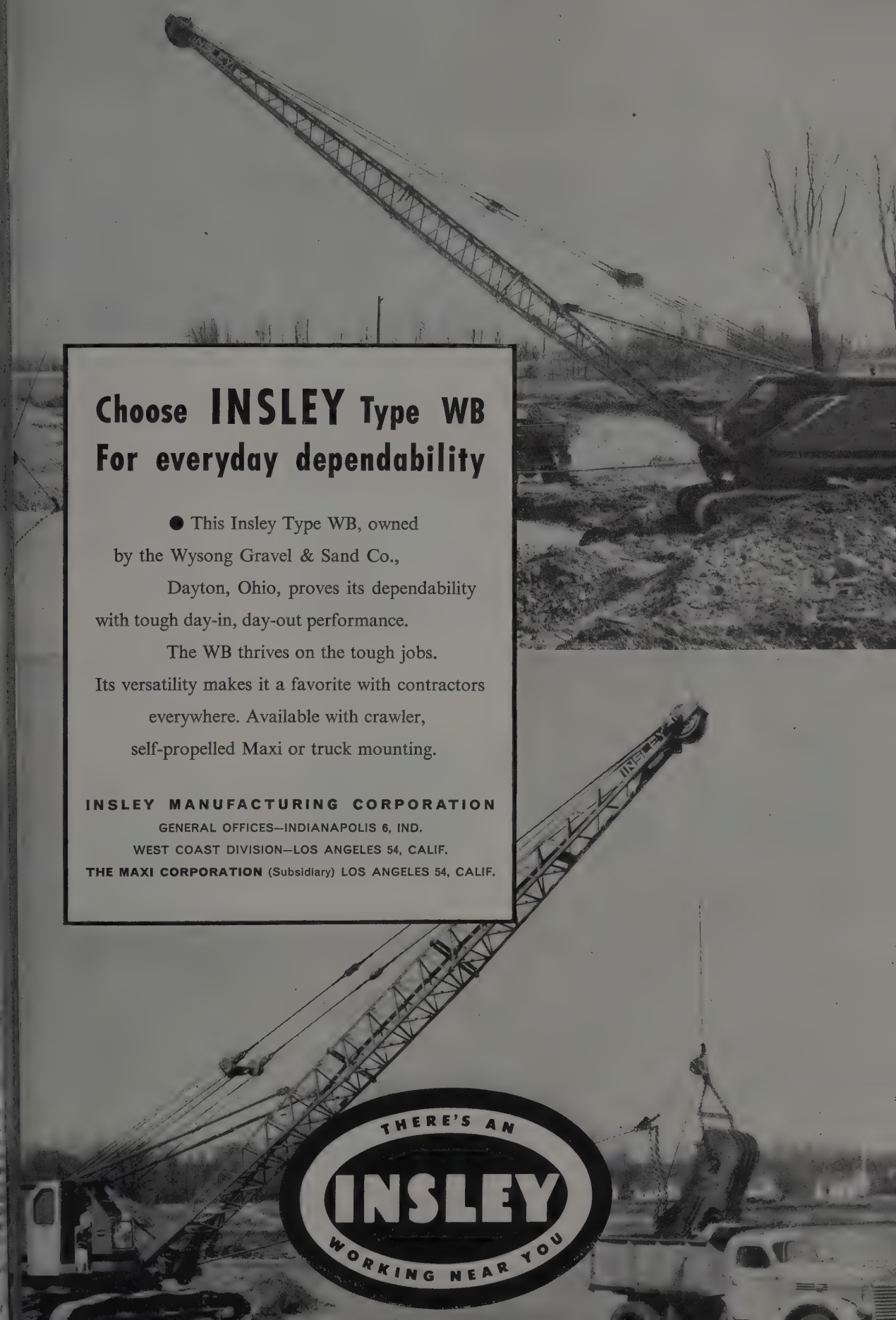


tons at a 12-ft. radius. It is a particularly valuable machine for the handling of heavy machinery and equipment, or for extra heavy road, quarry, or field handling requirements. This machine has the Torque-Control clutch, air-operated controls and other standard Orton equipment. The tires are 24.00 x 25—24-ply dual traction lugs. Literature is available from R. H. Fox, 14730 Vanowen St., Van Nuys, Calif., West Coast representative, Orton Crane & Shovel Co.



EASILY-INSTALLED PNEUMATIC COMPACTION

Midland Manufacturing Co., Columbus, Ohio, has introduced the new Graderoll, an inexpensive rubber-tired compaction unit that is installed easily and converts any tandem drive motor grader into a combination road-maintenance and pneumatic-compactor machine. Effective compacting weight on each of the Graderoll's 6 tires, when installed on a 23,000-lb. motor grader, is 1,536 lb. The unit delivers effective compaction in one operation following grader blade material distribution. It represents a versatile, new and economical machine for road widening, patching, resurfacing, and secondary road construction and maintenance.



Choose **INSLEY** Type WB For everyday dependability

● This Insley Type WB, owned
by the Wysong Gravel & Sand Co.,
Dayton, Ohio, proves its dependability
with tough day-in, day-out performance.

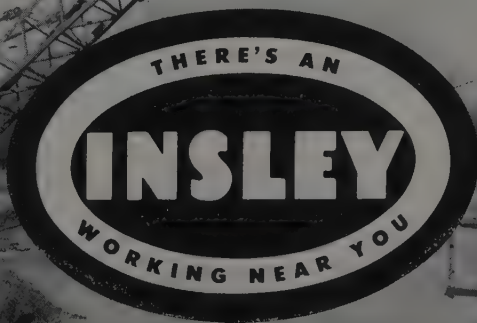
The WB thrives on the tough jobs.
Its versatility makes it a favorite with contractors
everywhere. Available with crawler,
self-propelled Maxi or truck mounting.

INSLEY MANUFACTURING CORPORATION

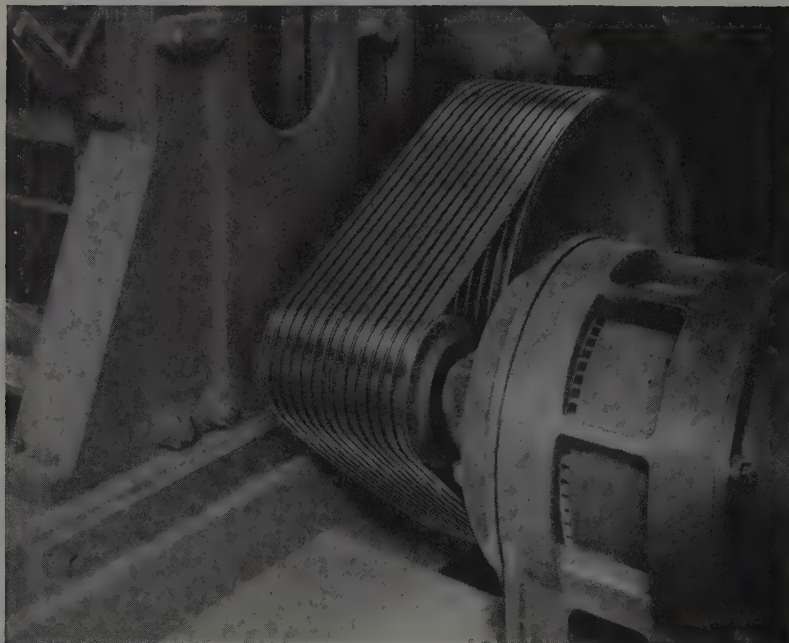
GENERAL OFFICES—INDIANAPOLIS 6, IND.

WEST COAST DIVISION—LOS ANGELES 54, CALIF.

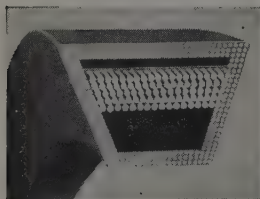
THE MAXI CORPORATION (Subsidiary) LOS ANGELES 54, CALIF.



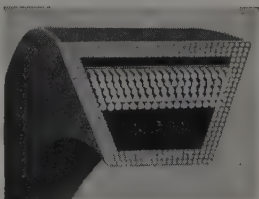
Are you using the *right* QUAKER V-BELT?



Quaker Rubber Division offers a full line of tough, long-lasting V-Belts. Each is designed to give long, efficient service. And each is designed to do a specific job. For example . . .



For drives requiring additional horsepower, the Quaker Super V-Belt—40% stronger than standard V-Belts—is available in a complete range of sizes, AP through EP cross-section.



For normal operating conditions without special speeds, loads or center distances, Quaker has the Multiple V-Belt at reasonable cost. Available from 26" to 660" in all cross-sections from A to E.

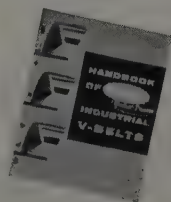


For drives under 1 HP, the Quaker Fractional Horsepower V-Belt gives quiet operation without vibration, stretch or twisting. Ideal for light duty applications. Available in cross-sections from 15" to 100".

HOW TO SELECT V-BELT DRIVES

Send for free, illustrated, 72-page handbook packed with facts on selecting V-Belt Drives . . . service factors . . . recommended V-Belt cross-sections for various horsepower and speeds . . . maintenance hints. Write:

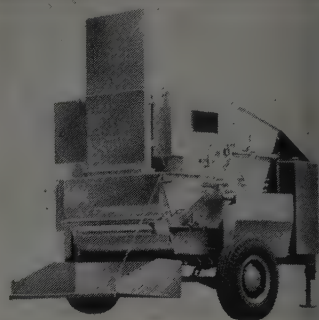
H. K. Porter Company, Inc.
Quaker Rubber Works, Philadelphia 24, Pa., or
Pioneer Works, Pittsburg, California



H. K. PORTER COMPANY, INC.
QUAKER RUBBER DIVISION

Half-ton asphalt-patching mixer

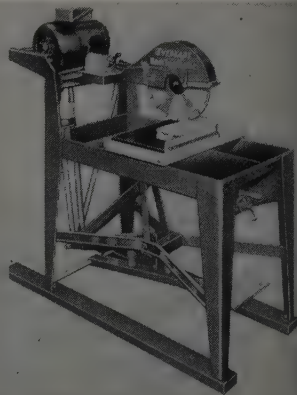
This new McConaughay HT Mixer No. 10 is one of the largest trailer type asphalt-patching mixers on the market today. Designed for use with asph-



cements, cut-backs, emulsions, or tars. The unit features twin pug-mill mixers, positive proportioning with power-driven pump and counter, low pressure burner shielded from wind and elements for dust-free operation, and replaceable liners. It weighs 5,000 lb. and carries an asphalt tank of 200-gal. capacity; the aggregate bin is of 10-cu. ft. capacity, marked for volumetric measuring. Complete specifications and proportioning tables are available from McConaughay Mixers, Inc., Lafayette, Ind.

Eveready's new automatic BrikSaw

The introduction of the new BrikSaw into the masonry cutting field has been announced by the Eveready BrikSaw Co., 1509 S. Michigan Ave., Chicago, Ill., (Dept. 645). Featuring Full-Vue cutting head, BrikSawMatic gives unlimited vision and unobstructed hand clearance. Another feature, the



cessed Eveready crank, is out of the way, yet easily reached for right- or left-hand use. One simple operation positions the blade height for any size material. There are no angle adjustment make. The Full-Vue cutting head is always level, ready to cut immediately. There are no rollers, pull knobs, slides or gears to wear out. The BrikSawMatic is powered by a 2-hp. enclosed, dust-proof motor.



A-W Crushing Plant of J. J. Cronin Co., showing primary crusher at extreme left. Washer is in center of photo. Washed sand is delivered by the conveyor on left of washer, specification material by the three stock-piling conveyors at the right.

AUSTIN-WESTERN Crushing Plant giving high-speed production for J. J. Cronin Co., North Reading, Mass.

J. J. Cronin reports: "We spent more than a month making all makes before we purchased our Austin-Western plant in April, 1954. Since then, we have had every reason to be pleased with our design. Production is fast, and we have very little downtime, as a result of the excellent engineering and rugged construction of the equipment. Present production includes: concrete sand and specification material in $\frac{1}{2}$, $\frac{3}{4}$ and $1\frac{1}{2}$ in. sizes."

In this operation, raw feed is delivered to a 36-in. per-grizzly combination and passes into the primary crusher, which has a jaw of 20 x 36 in. This is V-belt driven by a 75 hp slip-ring motor. The material is then conveyed to a 4 x 12 ft. single-deck screen. Larger sizes pass into a cone crusher,

which is V-belt driven by a 60 hp slip-ring motor. The washer is a 4 x 16 ft., 3-deck screen type, equipped with spray pipes. A single convenient push button station controls the entire closed-circuit system.

It will pay you to compare Austin-Western design and construction features before you invest in a crushing and screening plant. Each Austin-Western plant is designed to solve a particular production problem. Our engineers would welcome the opportunity to discuss your needs with you and to recommend the proper equipment.

See your nearby Austin-Western distributor today, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Edward R. Bacon Company.....San Francisco, California
 Columbia Equipment Company
 Portland, Oregon; Seattle, Spokane, Washington
 C. Ribble Company.....Albuquerque, New Mexico
 Over Machinery Company.....Phoenix, Arizona
 North Booth Usher Company.....Los Angeles, California
 Western Machinery Company.....Salt Lake City, Utah

Western Machinery Company.....San Francisco, California
 Keremi Tractor and Equipment Company, Cheyenne, Casper, Wyoming
 Hall-Perry Machinery Company
 Billings, Butte, Great Falls, Missoula, Montana
 Engineering Sales Service, Inc.....Boise, Idaho
 Macdonald Equipment Company.....Denver, Colorado
 Graid Equipment Company.....Reno, Nevada

AUSTIN-WESTERN
 CRUSHING, SCREENING AND WASHING EQUIPMENT



BALDWIN-LIMA-HAMILTON
 Construction Equipment Division — LIMA WORKS

Larger capacity pneumatic sump pump

A new pneumatic sump pump, the Model VP-8, has just been announced by Gardner-Denver Co., Quincy, Ill. According to the manufacturer, it is designed specifically to meet the demand for an air-driven pump of larger capacity

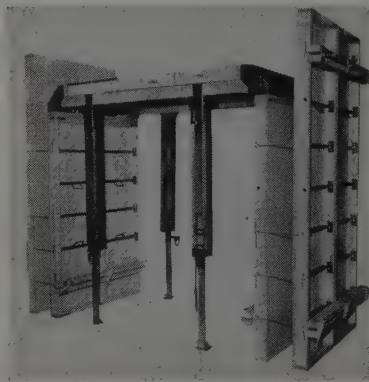


and higher head. The new Model VP-8 has a capacity of 250 gpm. and handles heads up to 280 ft. The new pump is designed with intake above the broad, flat bottom that rests in the mud during operation. Thus, the pump won't bury itself in the mud. Intake location prevents mud and other abrasive material from entering the pump shaft seal. This

eliminates undue wear and premature repair costs. Advantages of the new unit include direct air flow through the pump motor which increases efficiency by reducing friction; all bearings are uniform in size to reduce repair stock; inexpensive, easy-to-install packing unit seal; all bearings run in oil; "O" ring seals for extra protection against leakage. Over-all height of the Model VP-8 is 24 in. It weighs 110 lb. and will enter an opening up to 11 x 13 in. Oilier capacity is 2 1/4 qt.

New steel culvert form

A new steel form simplifying the construction of culverts has been introduced by Symons Clamp & Manufacturing Co., 4249 W. Diversey Ave., Chicago, Ill. The culvert form is designed to connect Symons standard wall panels and slab



panels so that a culvert can be poured monolithically. No built-up forms or other special equipment is necessary since all units are prefabricated and factory engineered. Symons' culvert form is a 9 x 9-in. steel section which provides for a 3-in. face on the roof slab and on the wall with a 45-deg.-angle surface 8 1/2 in. wide between wall and roof. It comes in lengths of 4, 6, and 8 ft. and is produced for use with both metal frame and wood frame forms. Special size forms are available on order. The form, made of 11-gage hot rolled steel, can be reused an indefinite number of times and eliminates the costly building up of special forms between wall and slab forms. Culvert forms are secured with standard form hardware. No special fittings are required. Stripping wall and slab forms is made easier by means of the wood to metal contact.

Anthony Company adds truck-crane to its truck equipment lines

Requiring only 18 in. of space behind the truck or tractor cab, this Truck Crane unit manufactured by Truck Crane, Inc., subsidiary of Anthony Co. leaves the entire body free for useful payload area. Power for the Truck Crane is completely hydraulic in all phases of operation with a PTO drive pump. Boom swing is 280 deg. It projects or retracts hydraulically in horizontal position or at any point up to an 85 deg. elevation. Both horizontal and elevating-type booms are available and o

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FROM PERMANENTE'S SILOS, MIGHTY PROJECTS GROW

Permanente Cement Company's network of distribution plants has supplied cement for some of the mightiest construction achievements in the West:

- Cement for DAMS, providing power and controlled water for millions of people and millions of acres;
- Cement for BRIDGES that are the largest in the world;
- Cement for HIGHWAYS built to last for generations in our ever-increasing complex of modern land travel;
- Cement for MASSIVE BUILDINGS to house industry.

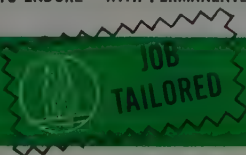
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PERMANENTE
CEMENT COMPANY



**ON THE JOB — ON TIME *
EVERYWHERE IN THE WEST**

*SERVICE MARK

Veteran operator Delbert Corman "at ease" while his Cleveland is digging gas and water lines for a Lexington, Ky. subdivision



Cleveland's exclusive multi-speed transmission provides right power/speed ratio for every job

"For easy handling and dependable digging even under the toughest trenching conditions give me a Cleveland every time," says long-time heavy equipment operator Delbert Corman of Aldridge & Poage Co., Lexington, Ky., owners of 3 Cleverlands. Thousands of trench operators and owners throughout the world agree with him. Credit for this world-wide preference for Cleverlands is due to the perfectly balanced combination of practical performance-proved features found in every Cleveland. Practically every modern trencher feature originated with Cleveland. But no single trencher feature ever developed is the equal of Cleveland's exclusive multi-speed crawler transmission.

For each of 4 digging wheel speeds this transmission provides 12 individual crawler speeds forward and 12 reverse, all closely and evenly graduated. The 48 forward speeds give the operator a choice of over 30 practical digging speeds—over 30 usable combinations of digging wheel and crawler speeds, providing the *right* combination of power and speed for digging every soil, under every digging condition. The following table of non-slipping, power-saving digging speeds for the Cleveland 95 is typical.

Cleveland's exclusive multi-speed transmission has no equal

For each of 4 wheel speeds	there are 12 individual crawler speeds												
With Main Transmission (and Digging Wheel) in	SPEEDS (in Feet per Minute) — Available in Either Direction (Bold Face Indicates Most Commonly Used Digging Speeds)												
First Speed	.5	.7	1.1	1.5	2	2.8	3.4	4.7	5.9	12.6	22.5	38	
Second Speed	1	1.4	2.2	2.9	3.9	5.3	6.6	9	11.5	23.8	43	73	
Third Speed	2	2.8	4.3	5.8	7.8	10.6	13.3	17.9	22.8	47	86	146	
High Speed (Ordinarily used when digging)	3.3	4.6	7.1	9.5	12.8	17.5	21.7	29.6	38	78	143	240	
Reverse (not used when digging)	.4	.6	.9	1.2	1.6	2.2	2.7	3.7	4.8	9.9	18	30	

THE CLEVELAND TRENCHER CO.

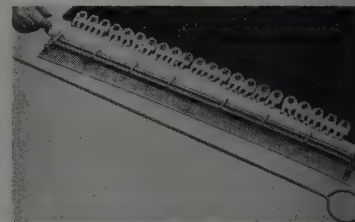
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



fer speed, versatility and increased capacity to loading and unloading operations. Capacity is 5,000 lb. Control levers are on both sides of the truck for operation from ground level. For complete information regarding versatile Truck Crane units, write Anthony Company, 1750 Baker Street, Streator, Ill.

New holder eases belt fastening

A simple but unique aligning holder has been developed, which greatly speeds and eases the application



Flexco hinged conveyor belt fastener. With use of the new holder all fasteners are kept in proper alignment while nuts are being run down. Bolts break off easily and quickly since this aligning holder keeps all fasteners and end of belt right and the hinge pin is easily inserted because all fasteners are assembled in proper alignment. The holder is made one size for belts up to and including 36 in. wide. It is manufactured by the Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.

Pneumatic compactor offers vertical oscillation

A new design in self-propelled pneumatic compaction rollers is offered by the 9-ton and the 11-ton Vertical Pak Roller manufactured by Southwest Welding & Manufacturing Co. The new roller affords vertical oscillation through

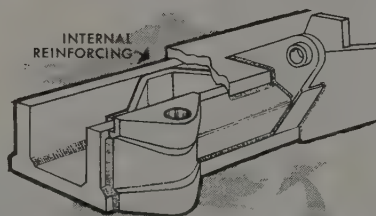


the vertical action of the rear wheel which affords a constant, uniform wheel load as well as uniform capacity on uneven surfaces, over soft spots, and where stones or boulders are present in materials undergoing compaction. Ballast capacity is 120 cu. ft. Different individual chain drives to all 4 drive wheels. Overall length of the machine is 13 ft. 1 in., overall height is 78 in. and overall width is 84 in. For complete information write Southwest Welding & Manufacturing Co., Construction Machinery Division, 3201 S. Mission Rd., Alhambra, Calif., or contact your local Caterpillar dealer.



The Big Tough RIPPER For Big Tough Jobs!

LOOK AT THE RECORD of ATECO rippers on thousands of different jobs and you'll see why this pioneer of the tractor-mounted ripper field pays off in superior performance. It works in materials other rippers can't touch, shatters it into easier-loading condition, gives you bigger scraper loads faster with less scraper wear and tear.



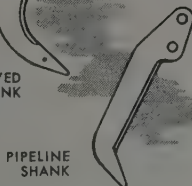
LOOK UNDER THE PAINT and you'll see why ATECO rippers have the brute strength to take the full power of today's largest crawlers, even operating in tandem with a pusher tractor!



STRAIGHT SHANK



CURVED SHANK



PIPELINE SHANK

CHOICE OF SHANK DESIGNS — Exclusive ATECO-designed curved shank for tough rock, superior shattering action, easy penetration with lighter draft, and ability to roll rock up and out into the clear. Straight shank is especially designed for sandstone, gypsum, caliche, etc. Complete range of special-purpose points available. New "pipeliner" conversion kit takes 48" or 72" straight shank, has tandem booster frame... ideal for ripping ahead of trenchers, etc.

ATECO Rock Rippers offer extra strength and ruggedness, job-proved superior performance. Why pay more and get less? They're available for easy installation on all makes of heavy-duty crawler tractors. Write or wire today for literature, specifications, prices.

American

44



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Tamprite Tips

NO WELDING!

**DRIVE OFF WORN TIPS
DRIVE ON NEW TIPS**

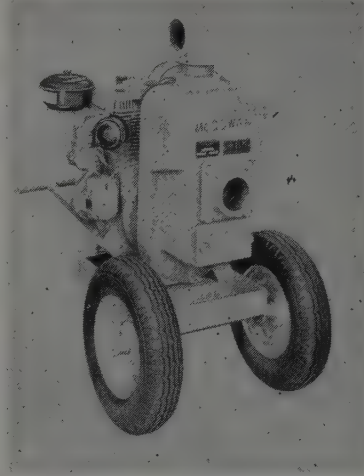
PREVENT COSTLY DELAYS BY equipping your sheeps foot rollers with Tamprite Tips and Shanks. Simple to replace on the job. Available for immediate delivery. Write for information.

PATENT NO.
2131941

LOS ANGELES
STEEL CASTING CO.
6100 So. Boyle Avenue, Los Angeles 58, California

Higher-capacity pump

A newly improved, heavy-duty self-priming pump which gives much higher capacity than the previous model is being introduced by McGowan Pumps. Replacing the former 15M, the new



model uses an improved spring-loaded lubricator for the seal, requiring less frequent attention in operation. It is easy to start, and requires a minimum of maintenance. The pump's case has been redesigned for greater hydraulic efficiency. Corners have been eliminated to provide less turbulence and smoother flow. The pump is available wheel-

mounted, and can be furnished with high-speed trailer hitch. This model rated 15,000 gallons per hour. Further details can be obtained by writing: McGowan Pumps, 58 Central Ave., Cincinnati 2, Ohio.

Channel-Flo compressor

Ingersoll-Rand Co., 11 Broadway New York 4, N. Y., announces a new compressor to be known as the Channel-Flo. It is a two-stage, 200 psi rated motorcompressor presently available in 1½- and 2-hp. sizes. The complete packaged unit includes the motorcompressor, cushioned rubber mounting, an ASME vertical tank, interconnecting piping and fittings and automatic start-and-stop control. For more details contact the nearest Ingersoll-Rand branch office or write directly to the company.

New jack used horizontally

A 100-ton hydraulic jack which can be used horizontally has been added to the complete line of industrial jacks manufactured by Duff-Norton Co., 270 Preble Ave., Pittsburgh 2, Pa. The jack weighing 225 lb., can be used either vertically or horizontally because the oil is sealed in reservoirs. It stands just 18 in. and has a power raise of 6½ in. tandem pump permits rapid engagement of the load. The ram is brought into quick contact with the load by actuating both high speed and high lift plungers. The load can be lifted easily using only the high lift plunger. Dump release valves in the base of the jack can be operated from either side. The base is drilled and tapped for a pressure gage, which is optional.



WARN HUBS

idle the front drive in 2-wheel drive

**Stop Drag
Reduce Wear**



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WARN

Free-wheeling 2-wheel drive with Warn Hubs means big savings in gear, engine, tire wear, gas, plus the pep, speed, performance and high gear power of any 2-wheel drive.

And now, with Warn Lock-O-matics, you have free-wheeling 2-wheel drive, or normal 4-wheel drive automatically, as you shift! When you need traction, you have it! When you shift to 2-wheel drive, you always have free-wheeling 2-wheel drive—with no drag, front gear whine, shimmy. Warn Lock-O-matics truly make "two vehicles out of 1!"

Ask your truck dealer for a free demonstration of Warn Lock-O-matic or Locking Hubs (manual control), or write for literature today! Models for all 4 w.ds. to 1½ tons.

OVER 100,000 WARN HUBS NOW
IN USE ON 4-WHEEL DRIVES

WARN MFG. CO.

Riverton Box 6064-WC10,
Seattle 88, Wash.

Mobile building has many uses

A standard-design construction building on wheels, for all-out mobility from job to job, has been introduced by Economy Buildings, Inc., West Chicago, Ill. Ideal for field office, storage or temporary housing, tool shed or workshop, the Economy mobile construction building is a rigid, factory-constructed 7½ x 16-ft. building. It is built of kiln-



dried, tongued-and-grooved West Coast lumber and mounted on a heavy-duty steel undercarriage. Trailer is equipped with tires and electric brakes controlled by the driver. This mobile building complete with sash, door, all hardware prime-coated exterior, and sells for \$795 F.O.B. West Chicago.



No special lifting equipment needed. The machine that dug the trench for this job was also used as a hoist in laying the pipe.

Here's the Way to Lower Your Drainage Bids Without Cutting Profits

It's easy to get the jobs *and* the profits when you figure drainage bids with Armco Corrugated Metal Structures. You save time, labor and equipment costs.

For example, with long, 20-foot lengths of Armco Pipe you have fewer pieces to haul and handle, fewer joints to make. A small crew with no special tools can do a fast, efficient job. And inclement weather is no problem.

Armco Drainage Structures are corrugated for high strength with light weight. A rope sling or a small A-frame can be used to handle the largest structure with no danger of cracking or breaking.

It will pay you to investigate Armco Corrugated Metal Structures for your next drainage bid. Wherever you may be, there's always a nearby cooperative Armco representative to assist you—and a nearby fabricating plant to help assure on-schedule delivery.

WRITE FOR HELPFUL DATA

ARMCO DRAINAGE & METAL PRODUCTS, INC.

CALCO AND NORTH PACIFIC DIVISIONS

Berkeley • Los Angeles

Portland • Seattle • Spokane



Joints can be made quickly and easily. Here one man tightens the two bolts on a connecting band with a hand wrench.

Armco Drainage Structures





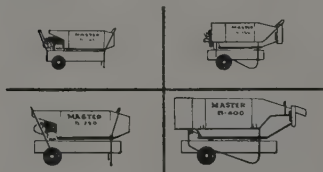
BOSS... GET THIS HEATER !

**We'll forget the cold weather
and keep your winter profits high**

"We won't be slowed down by cold weather. And we'll be a lot more comfortable, too, with a Master heater on the job.

"It puts out a steady stream of warm air wherever you want it. You can plaster, pour concrete, thaw and dry materials, spot heat outside, etc. It's portable, just wheel it around, plug it in and flip the switch. It'll run for 16

hours or more on a tank of kerosene or fuel oil. And for only 30¢ an hour it puts out enough heat to warm the biggest jobs. It's perfectly safe, too, boss . . . doesn't need a vent. So see your Master distributor, or write for all the facts on the new Master B-250 and other models. You'll see that only Master has all the features you want. No obligation."



100,000; 160,000; 250,000 and 400,000 BTU/hr. units available.

MASTER

MASTER VIBRATOR COMPANY
1752 Stanley Ave., Dayton 1, Ohio

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ANDREWS MACHINERY OF WASHINGTON, INC.	Seattle, Washington
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SHRIVER MACHINERY COMPANY	Phoenix, Arizona
SIERRA INDUSTRIAL CO., INC.	Reno, Nevada
THE SAWTOOTH CO.	Boise, Idaho
WEST COAST MASTER, INC.	Los Angeles, California

New Cat mobile diesel electric sets

Three new portable diesel electric sets have been announced by **Caterpillar Tractor Co.**, Peoria, Ill. The new units are the Caterpillar D311, D315 (Series G), and D318 (Series G) diesel electric sets, each equipped with the new, compact Caterpillar generator. The D311 electric set develops 30 kw. of 60-cycle 3-phase current, while the D315 (Series G) electric set is rated at 40 kw., and the D318 (Series G) electric set at 60 kw. These highly mobile units are available either skid-mounted or with running gear, and the output of their self-regulated, constant-voltage generators furnishes a choice of 120, 240, 120/208 or 480-volt current at 1,800 rpm. Standard equipment on the sets includes 24-volt 18-amp. charging generators and 24-volt 170 amp.-hour battery sets. The power units also come equipped with 24-volt direct electric starting, wrap-around bases, control panels and water temperature-oil pressure safety shut-offs. The two smaller sets have 50-gal. fuel tanks and the D318 (Series G) has a 57-gal. fuel tank. Control panels for the new electric sets have an a.c. ammeter with phase selector switch, a.c. voltmeter, battery charging ammeter, circuit breaker and 3 current transformers. In addition the electric set packages include radiators, blower fans, lubricating oil cooler and vernier-type governor controls.

New 85-cfm. portable rotary compressor

Ingersoll-Rand Co. announces the addition of a new 85-cfm. size to its line of Gyro-Flo compressors. With this addition, the Gyro-Flo line of portable compressors has been increased to six sizes—85 cfm. through 900. The Gyro-Flo 85 weighs only 1,840 lb. ready-to-go, fully equipped with tool boxes, fenders and two-wheel spring-mounted running gear. The light weight and compactness of the new compressor also make it ideal for truck mounting. As a truck-mounted unit, the Gyro-Flo 85 weighs only 1,370 lb. and stands only 42 in. high. For additional information on this new Gyro-Flo write to **Ingersoll-Rand Co.**, Broadway, New York 4, N. Y., and request Form 2307.

Flashing light lasts 9 months

A flashing warning light, which has battery life of more than 9 months (7,000 hr.), is now available in the West. The main feature of the light is that there are no moving parts. Operate electronically with dry batteries the unit is highly resistant to temperature changes, shock, vibration, and weather. Many models have flash rate control and light intensity selector switches adjust to any brilliance phase desired. Also available from the same manufacturer are barricades and warning signs with flashing lights. For further information write **Owl-Light Pacific**, P. O. Box 583, San Jose, Calif.

reduce forming costs...

with UNI-FORM PANELS

Whether you're bidding on a sewage treatment plant, industrial building, highway bridges, overpasses or abutments, heavy foundations, circular tanks or a warehouse, UNI-FORM Panels will give you the lowest all around forming costs.

Why? UNI-FORM Panels can be erected faster, using less labor and material because the three basic elements of the UNI-FORM System—Panel, Tie and Tie Key provide simple mechanical assembly into any type of form. Unique system of attaching the minimum aligning lumber required reduces labor by 50% . . . pre-engineered techniques for handling pilasters, corners, stepped footings, columns, battered walls assure fast job progress.



Steel framed, plywood faced UNI-FORM Panel



UNI-FORM TIE
for any
wall width

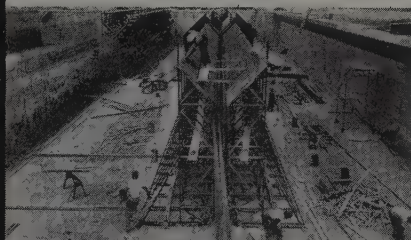
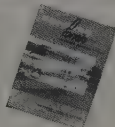


UNI-FORM
Tie Key

3

simple
elements
in
UNI-FORM
SYSTEM

INTERESTED? Get the catalog and complete details on the UNI-FORM System today. Send us a set of plans for our recommendations. You will be money ahead, and there's no obligation.



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Circular Walls



Heavy Industrial Foundations

P1500

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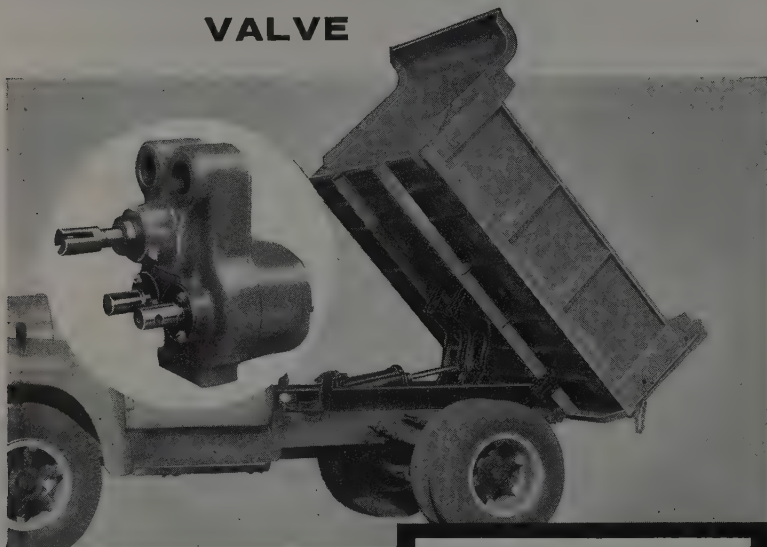
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BETTER CONTROL

with MARION'S

NEW SPOOL-TYPE VALVE



**designed
for use with
standard-duty
hoists**

MARION'S new pump with spool-type valve gives far superior control for all dumping and spreading operations. It can readily be adapted for cable control when desired. The new pump is used with both offset manifold and hose adaptation. It is interchangeable with the present type standard duty pump. Get all the facts about it and about extra performance-proved MARION dump bodies and hoists from your distributor . . . or write direct today.

MARION
BODIES AND HOISTS

MARION METAL PRODUCTS CO.
MARION, OHIO, U.S.A.

**See Your Marion Distributor.
Let Him Solve Your Dumping
Problem More Profitably!**

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Ruckstell California Sales Co.
2985 Ford Street
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452 West Yolo
Fresno, California

Woeber Auto Body & Mfg. Co.
4950 Jackson St.
Denver 16, Colorado

Pacific Body Builders, Inc.
1812 N.E. Grand
Portland 12, Oregon

Alley Manufacturing
Route No. 4 (West on U. S. 10)
Spokane, Washington

Washington Truck Equipment, Inc.
3626 Airport Way
Seattle 4, Washington

J. H. Holan Corp.
302 East Pima Ave.
Phoenix, Arizona

Pioneer Equip. Co.
1910 Skidmore Ave.
Grand Forks, North Dakota

New lightweight block practically shatterproof

A new heavy-duty digger-slush block is now available from Sauerman Bros., Inc., Dept. W-6, 620 S. 28th Ave. Bellwood, Ill. This new addition to the



line of Durolite blocks is light and practically shatterproof. Made of high quality alloy steel, it will withstand 14-ton dead loads without damage. Wide flange permits use of up to and including 3/4-in. wire rope. The block has wide applications for rigging work because of its toughness and light weight. A cast bead on the housing keeps rope in groove even when block is working in a horizontal position. The new rigger-slush weighs only 44 lb. and is available with roller or bronze bearings. Sheave diameter is 10 in. Overall length is 23 in. with swivel hook and 19 in. with shackle.

Special G.E. motors for Clipper saws

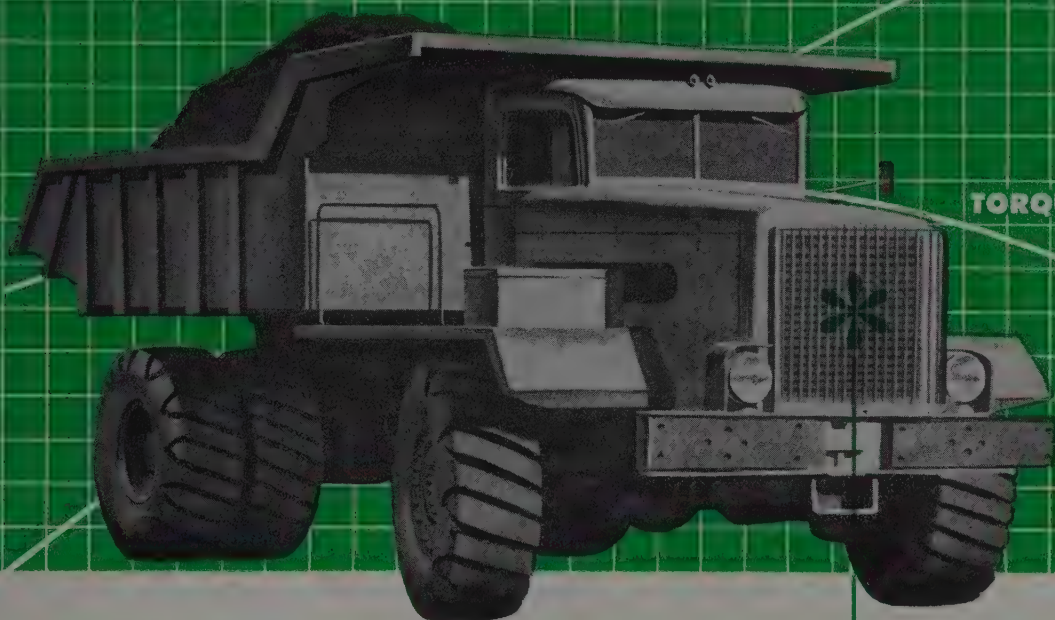
The Clipper Manufacturing Co. features General Electric motors on their complete line of masonry saws, including the new 2-hp. Supermatic, and the original masonry saw, the 1 1/2-hp. Select-A-Notch. The G. E. motors are specially designed for Clipper, and a capacitor start, capacitor run motor that require up to 20% less amperage than ordinary type masonry saw motor. The actual power developed is seven times greater than the nominal rating of the G. E. motors, up to 6 hp. on the Supermatic 2-hp. motor, and up to 4 hp. on the new 1 1/2-hp. Select-A-Notch motor. For complete information on the new masonry saws, write the Clipper Manufacturing Co., Suite 245, Kansas City 8, Mo.

Weather-proof lubricant

A new open-gear lubricant, Plastigear-X, has just been announced by the Warren Refining and Chemical Co., 5151 Denison, Cleveland, Ohio. A non-melting, non-freezing, non-soluble lubricant, Plastigear-X is not susceptible to water, extreme pressure, or bad weather conditions. At high temperatures it will not melt and drip off. Because of its low pour point, high viscosity index base oil, it can be used at sub-freezing temperatures and will not chip off or change out. Plastigear-X can be applied either by hand or gun and is recommended for all types of open gears, exposed or in closed chain, wire rope or cable.

BHP

TORQUE



to pump, crush, power, or transport most efficiently

**use
HALL-SCOTT
engines**

Famous veterans in all types of construction operations are the renowned Hall-Scott engines for high-power trucks, crushers, scrapers, compressors, and generators.

There is a variety of Hall-Scott engines powered by gas or LPG: truck engines, 235 to 368 h.p.; industrial engines, up to 550 h.p.

Hall-Scott's tremendous torque makes it ideal in pulling enormous loads from a standing start on steep and rough terrain. These engines last longer and require a minimum of downtime because they are precision built.

Specify Hall-Scott for new equipment or for repowering. Write for the name of your closest Hall-Scott dealer. Field service available from conveniently located factory branches.

A note to Hall-Scott engine owners: If your records indicate that your Hall-Scott engine has operated over a million miles, inquire about our Million Miler Award.

*The Million Miler
Model 6182-B-1*



Only Hall-Scott among truck and industrial engines offers the overhead camshaft. It is one example of Hall-Scott attention to excellence. The overhead camshaft has many advantages...most important, simple maintenance. It allows the entire head assembly to be removed easily; valves may be ground right on the bench.

Hall-Scott

INCORPORATED

POWER DIVISION PERFECTION IN PACKAGED POWER

2850 SEVENTH STREET, BERKELEY, CALIFORNIA



Triple-tapered dump body

Jacob Press' Sons, Inc., has introduced a new type dump body called the Press Triple-Tapered Dump Body. This new body is wider and higher at the front than the rear and is longer at the bottom than at the top. It has been primarily designed for efficient hauling of sand and gravel. The new design allows for greater load on the front end to take advantage of strict weight laws in various states. The tailgate control is operated manually from within the cab. A

20-ton twin-telescopic hoist is used to raise and lower the body. Complete information on this new dump body may be had by writing direct to **Jacob Press' Sons, Inc.**, 501 W. 33rd St., Chicago, Ill.

Lightweight vibrator

Just announced by **Homelite**, Port Chester, New York, is the new High-Cycle Vibrator which operates from a Homelite carryable generator that can be placed on the ground or in any convenient spot within a 400-ft. radius. The

operator handles only the lightweight vibrator head and cable. The tough, kinkproof, neoprene-covered handling hose goes around corners, over obstacles, without damage to the hose. Running at a constant 10,000 rpm., this vibrator will handle 30 to 40 cu. yd. of 2-in. slump concrete per hour. For tough jobs in deep forms, 7-ft. and 10-ft. extension hoses can be quickly connected. Connectors are safe and waterproof. Power is supplied by the 2,500-watt Homelite Model 24HY dual-output generator.

Heavy-duty air hose

A new line of flexible high pressure wire-braided air hose for working pressures up to 1,500 psi. is available from the **Acme Rubber Manufacturing Co.** Div. of **Acme-Hamilton Manufacturing Corp.** Known as **Acme Gold Seal** air hose it is particularly suited for heavy-duty work where external abrasion on the hose is a problem and where maximum flexibility and lighter weight are important. In construction, this hose consists of a thick neoprene tube, a one or two strand wire braid, and an abrasion resistant hard rubber covering. The neoprene tube is oil resistant, and the wire braiding allows a higher margin of working pressure, more flexibility and lighter weight than conventional air hose. Available in ID sizes from 1/2 through 2 1/2 in. Specifications and additional information on the new line is available from **Acme Rubber Manufacturing Co., Div., Acme-Hamilton Manufacturing Corp.**, 115 Meade Street, Trenton, N. J.

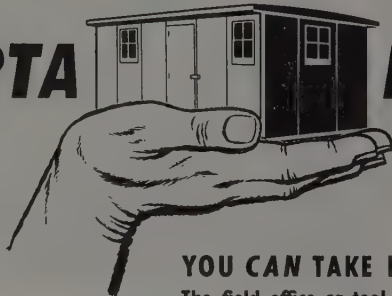
Low-cost screw conveyor

Fort Worth Steel & Machinery Co., Fort Worth, Texas, has announced the **Fort Worth Beeline**, a new screw conveyor for low-cost conveying of bulk cement. Offered at lower prices than previous conveyors in this line, the Beeline is automatically straight when assembled, and offers easier, more economical installation, greater operating efficiency, reduced maintenance, and full interchangeability of parts. The new conveyor is offered in diameters from 8 through 16 in.

New rod and target strong, warp-proof

A new engineers' and builders' rod and target, made of three pieces of selected, seasoned magnolia wood, which is light and strong and will not warp, has been introduced by the **David White Instrument Co.**, 2051 N. 19th St., Milwaukee 5, Wis. Each section is highly polished with a natural finish and is 2 1/2 in. wide, 1-1/3 in. thick, and 5 ft. long. The rod has a 14-ft. working surface when fully extended. Graduations are in feet, inches and eighths on replaceable tape and are large and easy to read. The rod extends easily and locks in any desired position with a specially constructed bracket set within the rod.

PORTA HOUSE



YOU CAN TAKE IT WITH YOU!

The field office or tool shed that you can move on a pick-up truck. Pays for itself on the first job.

Quickly assembled and disassembled by unskilled labor.

SIZES: 9' or 12' widths—to any length (in 3' modules)
(9x6, 9x9, 9x12, 9x15, 9x18, etc.—to any length)
(12x12, 12x15, 12x18, 12x24, etc.—to any length)

Light, watertight, strong.
Mass produced cheaper than you can build it!
Rental arrangements if you wish.
Write or phone collect.



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AVAILABLE
IMMEDIATELY
Plan to include
Porta Houses in
all future jobs.





How oscillating wheels can save you untold street maintenance costs...



See the flow of compaction effort that the Bros Self-Propelled roller with torque converter drive provides for street seal coating, resurfacing and shallow lift compaction...

Here's how it is helping cities throughout the country make great savings in street maintenance costs:

- With full oscillation of all wheel pairs to provide uniform compaction, the BROS SP-54 helps "key" and "lock" aggregate materials tightly in the base course to prevent various pavement failures.
- Wheel oscillation of this roller also kneads the asphalt into a tight, solid surface, eliminating hairline cracks that would otherwise turn into

surface breaks. Very important, too, rubber tire rolling correctly imbeds the wearing course chips *without* crushing them.

- Besides such proven advantages, the BROS SP-54 offers these time-saving performance features: a torque converter drive provides smooth, easy handling and eliminates "tipping" of chips when starting; it also lessens drive line strain.

- Full-reversing type transmission with shuttle gear permits rolling in either direction without shifting; turn arounds are thus eliminated.

- Infinite speed range from 0 to 18 mph; positive chain drive to both rear wheel pairs; 50 HP engine and smooth, hydraulic steering provide fast, proper compaction results that you can't get from any other roller. See a BROS Distributor or write us for full information and/or a demonstration. BROS INCORPORATED, ROAD MACHINERY DIVISION; 1057 TENTH AVENUE S.E., MINNEAPOLIS 14, MINNESOTA.

Find out, too, about the complete BROS TEAM. With the SP-54, the BROS Preparator and Roto-Mixer make the perfect combination for low cost street construction. The Preparator (in-place materials reducer) reduces native over-size materials and old blacktop to proper roadbed sizes. The Roto-Mixer stabilizes and blends the base and wearing course materials to improve load bearing values.

ROAD MACHINERY DIVISION

BROS INCORPORATED

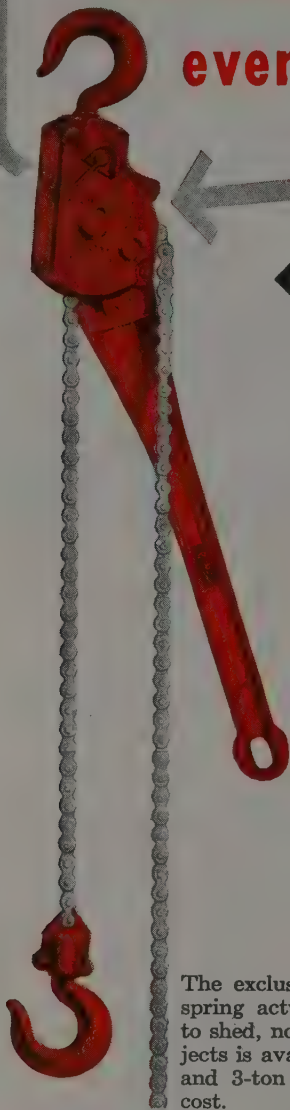
(Formerly the WM. BROS BOILER & MFG. CO.)

1057 Tenth Ave. S.E. • Minneapolis 14, Minnesota



sona Equipment Sales, Inc., Phoenix, Arizona; Blakamore Equipment Co., Oakland, California; Coast Equipment Company, San Francisco, California; Crook Company, Los Angeles, California; McCoy Manufacturing Company, Denver, Colorado; Western Equipment Company, Boise, Idaho Falls, Idaho; Western Construction Equipment Co., Billings, Great Falls, Montana; The Harry Cornelius Company, Albuquerque, New Mexico; Pioneer Equipment Company, Reno, Nevada; Loggers and Tractors Machinery Co., Portland, Oregon; Totem Equipment Co., Seattle, Washington; Keremi Tractor and Equipment Co., Casper, Cheyenne, Wyoming.

Here's the safest ratchet lever hoist ever invented!

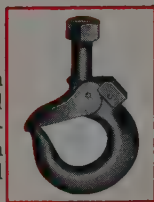


◀ If overloaded, "safety valve handle" will bend before any other part of hoist fails.

It's the original Coffing Safety Pull, a ratchet lever hoist with dual pawls and ratchet that keep load from slipping. Safety stops prevent spinning out of control and if overloaded, "safety valve handle" will bend before any other part of hoist fails. The $\frac{3}{4}$ -ton model (illustrated) weighs but 14 $\frac{1}{2}$ lbs.

Roller Chain Safety Pull hoists are available in capacities from $\frac{3}{4}$ to 15 tons. For full details, consult your distributor or write for Bulletin SP.

The exclusive *Coffing Safety Hook* with spring actuated locking latch designed to shed, not snag, on wires or other objects is available for the $\frac{3}{4}$ -ton, 1 $\frac{1}{2}$ -ton and 3-ton models at slight additional cost.



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



Coffing Hoist

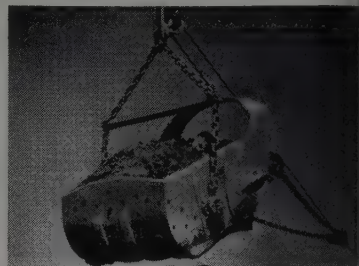
DIVISION OF DUFF-NORTON COMPANY

811 WALTER STREET DANVILLE, ILLINOIS

Ratchet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists
Ratchet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks.

New light bucket line

A new line of lower cost "A" series Page automatic dragline buckets with capacities from $\frac{1}{2}$ to 3 cu. yd. has been introduced by the Page Engineering Co. Clearing Post Office, Chicago 38, Ill. The new series features lighter weight



along with rugged construction and automatic digging action. Other features are: a heavier, one-piece bottom plate; a new, improved lip; a two-position hitchplate; a smooth action dump block flared sides; forward arch; reversible tooth points and heat treated alloy steel hoist and load chains. The "A" series automatics are available in light, medium, general purpose, and heavy duty classes. Illustrated catalog A-5 available upon request.

Continuous lubrication for pneumatic tools

An attachment which provides continuous lubrication for pneumatically operated tools is being manufactured by the Bean Rubber Manufacturing Co. 1623 S. 10th St., San Jose, Calif. Made of flexible neoprene rubber and designed to introduce lubricant mist into the air line of tools while they are in use, the attachment has positive shut-off which works automatically when the compressor is not in operation. Any suitable lubricating oil may be used and the quantity of lubricant introduced into tools is adjustable for different degrees of lubrication. The oil reservoir holds full 8-hr. supply and is loaded by removal of a screw cap at the top. The body of the attachment weighs only 1 lb. with full oil reservoir.

Hydraulic sweeper speeds operations

A new two-way sweeper, completely hydraulic in drive and controls, has been added to the line of tractor-mounted



sweepers manufactured by the M. Corp. of New Holstein, Wis. For full

two-way sweeping, the broom may be angled 30 deg. to the right or left. The hydraulic swing ram swings the broom to any position within the 60-deg. radius and is controlled by the operator from the driver's seat. The operation is further speeded by swing arms that keep the sweeping path centered ahead of the tractor, regardless of the broom angle. A second operator's control raises and lowers the broom by means of the hydraulic lift ram. The large hydraulic pump may be front mounted or rear PTO driven, depending on tractor make. Both swing and lift hydraulic rams are three inch, double-acting. The sweeper head bolts up in minutes. The new M-B two-way hydraulic sweeper is engineered to fit most popular make tractors, using essentially the same underframe as the M-B mechanical sweepers. Complete information may be obtained from your tractor dealer or by writing direct to the M-B Corp.

New paving form makes rigid joint

A new heavy-duty steel paving form, the Wedge-Lok, has been introduced by Clark Industries, Paving Form Division, 375 E. Fifth Ave., Columbus, Ohio, a



division of the Clark Grave-Vault Co. The new paving form makes a more rigid joint between forms. Sections are joined to form a continuous beam, thereby eliminating joint deflection. Manufactured from heavy duty 1/4-in. steel plate, stake pockets, guides and Wedge-Lok are fully welded; there are no rivets to loosen. Base of forms are beveled at the end to negotiate inside curves. Full information and literature are available from the company.

Increased power output on diesel battery

A first-line diesel locomotive cranking battery introduced by Exide Industrial Division of The Electric Storage Battery Co. provides greatly increased power per u. in. and, at the same time, makes substantial savings available to diesel battery users. Known as the MGD Exide-ironclad, the battery uses armored porous tubing to encase the grid spines and active material of the positive plates. The new battery in a size normally furnished for switching locomotives (600 to 1,200 hp.) will deliver power equivalent to batteries now used in larger road locomotives of 1,200 hp., and greater. One key to the high discharge-rate performance of the battery is the extreme permeability of the armored porous tub-



almost
To handle any lifting job ...
twelve dependable Duff-Norton
Hy-Power Hydraulic Jacks
capacities 3 to 100 tons

Rugged and dependable, Duff-Norton Hy-Power hydraulic jacks are available in a wide range of sizes for all kinds of lifting jobs—in all types of industries. Manufactured with care from the finest materials, they will function smoothly for many years with a minimum of maintenance. Heads may be brought up to load height quickly, saving the operator's time. For full information on these outstanding jacks, consult your distributor or write the world's oldest and largest manufacturer of lifting jacks, asking for Bulletin AD 16-A.

Branch Office: 1016 Howard Street, San Francisco, California



Duff-Norton Jacks

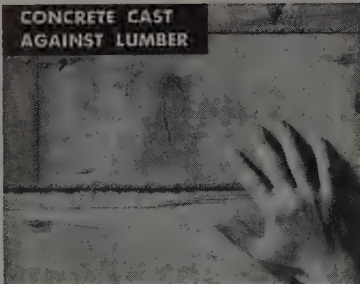
DUFF-NORTON COMPANY

P. O. Box 1889 • Pittsburgh 30, Pennsylvania

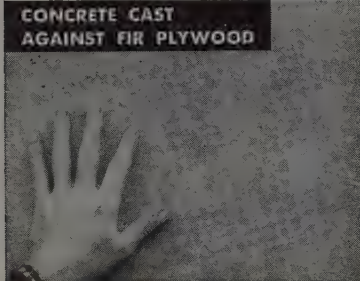
COFFING HOIST DIVISION: Danville, Illinois

Ratchet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks, Ratchet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists

CONCRETE CAST AGAINST LUMBER



CONCRETE CAST AGAINST FIR PLYWOOD



*Fins are Fine
for Fish*



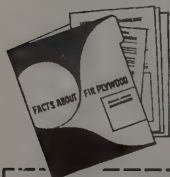
...NOT CONCRETE

THESE PHOTOS tell the story. Fir plywood reduces fins and joints to an absolute minimum... forms smoother, better looking concrete... cuts finishing time and costs. Fir plywood forms cut application time and costs, too. Interior PlyForm® grade gives up to 10-12 reuses; Exterior PlyForm® 25 or more; Overlaid plywood as many as 200!

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Fir Plywood
CONCRETE FORMS



FREE: New portfolio to help you design and use fir plywood forms. Contains complete specification, construction and design data.

DOUGLAS FIR PLYWOOD ASSOCIATION
Dept. 150, Tacoma 2, Wash.
Please send new Fir Plywood Concrete Form Portfolio. (Offer good USA only)

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Firm _____

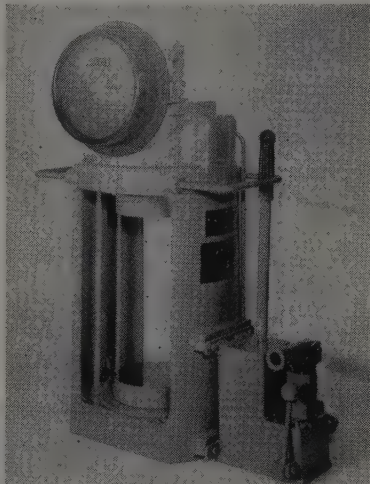
Address _____

City _____ Zone _____ State _____

ing for diffusion of electrolyte and the passage of current. The tubing acts like a highly efficient filter, facilitating electrochemical action. Further information can be obtained from Dept. MGD, Exide Industrial Division, The Electric Storage Battery Co., P. O. Box 8109, Philadelphia 1, Pa.

125-ton portable concrete tester

A new high-capacity portable concrete tester has been introduced by Forney's Inc., Box 310, New Castle, Pa. The



Forney Model FT-25 can apply controlled loads up to 8,850 psi. on standard

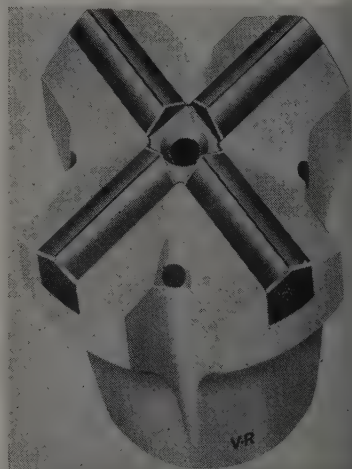
6 x 12-in. concrete cylinders. Weighing no more than the 100-ton tester, the new Model FT-25 features a Bourdon Tube Gage with an 8-in. diameter dial calibrated in lb. 0 to 250,000 with 500-lb. sub-graduations, as standard equipment. Available as standard accessory equipment are metric gages, and apparatus for testing 2 x 2-in. and 6 x 6-in. cubes, 8 x 8 x 16-in. blocks, and beams up to 40 in. long by either center or third point loading. Write for Bulletin FT-25.

Hose couplings eliminate skiving

A complete line of Surgepruf medium-high pressure hydraulic hose and hose couplings which feature the "douple-wedge grip," eliminating the need for skiving rubber-covered wire braid hose, has been introduced by the Alemite Division of Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago 14, Ill. The couplings, which may be used over and over again, bite through the rubber cover, grip solidly on either single or double wire braid hose without weakening the protective cover or the water-proofing qualities of the hose. The hose, constructed of seamless inner tube of synthetic rubber reinforced by a single steel braid for medium-high pressure, and two layers of steel wire braid separated by a layer of synthetic rubber for high pressure systems, has an operating temperature range of -40 deg. to +275 deg. F, and a burst range of from 1,400 to 1,800 lb. psi.

Bottom thread rock bit

Vascoloy-Ramet Corp., Waukegan, Ill., announces a new series of rock bits with tungsten carbide inserts made to fit directly on type 600 and 1000 series steels. Designed with the inserts mounted



in an "X" formation, these new bits eliminate riflings and provide uniform round holes in hard ground. V-R "X" bits feature 5-hole construction and wide chip channel design for faster removal of larger chips. Style 600 "X" bits are available in diameters of 3 in., 3 1/4 in., 3 1/2 in., 3 3/4 in., 4 in., and 4 1/2 in. Style 1000 "X" bits are presently available in diameters of 4 in., 4 1/2 in., and 5 in.

**For Better and Faster
Beam Construction
use the**

LUDERJAK T-HEAD



- ★ Fast—Economical
- ★ No loss of Grout
- ★ No sand pockets
- ★ First cost is last cost
- ★ Cuts stripping in half
- ★ Minimum storage
- ★ No wasted lumber

Write for information

LUDERJAK CO.

566 E. Main Street
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CARSET JACKBITS

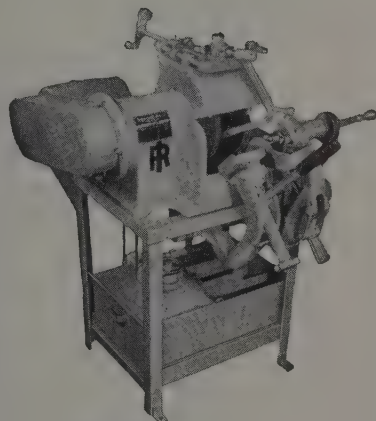
are **PRECISION MADE**

for **HIGHEST PERFORMANCE**

Maintain That Performance

by resharpening with

the NEW JC-3 JACKBIT GRINDER



JC-3 Electric Drive Grinder

- ▲ Grinds cutting faces to precisely correct profile for maximum drilling efficiency.
- ▲ Grinds bit gage to proper clearance.
- ▲ Eliminates waste of over-grinding.
- ▲ Greatly multiplies operator output.
- ▲ Available with electric, air or gasoline engine drive.

TO MAINTAIN the unequalled drilling speed of a NEW Ingersoll-Rand Carset Jackbit—and get maximum feet of hole from each bit—resharpening should be done to close tolerances and without unnecessary waste of the cutting material.

All of these requirements are met to excellent advantage with the new JC-3 Jackbit grinder—far more quickly, easily and accurately than by hand grinding methods. Ask your I-R representative for complete information on this time-saving, cost-saving machine. Or send for a copy of Bulletin 4187.



Ingersoll-Rand

11 Broadway, New York 4, N. Y.

COMPRESSORS • TURBO-BLOWERS • ROCK DRILLS
AIR TOOLS • CENTRIFUGAL PUMPS • CONDENSERS
GAS AND DIESEL ENGINES

15-518

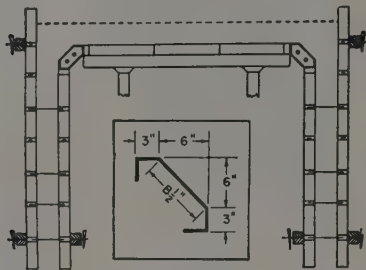
Culvert Forming



Symons Develops New Haunch Form for Culverts

Symons Safety Shores Used to Support Slab

Symons now has a new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts. This new section provides for a 3-inch face on the roof slab and



on the wall with a 45-degree-angle surface 8½ inches wide between wall and roof. No built-up forms or other special equipment is necessary.

Made of 11-gauge hot rolled steel this new section is available in 4, 6, and 8 foot lengths. It can be used with either metal frame or wood frame forms. Symons regular form hardware is used for securing the steel section to Symons standard forms. No special fittings are required.

Symons forms, shores and column clamps may be rented with purchase option. FREE literature on Symons products is available upon request.



SYMONS CLAMP & MFG. CO.

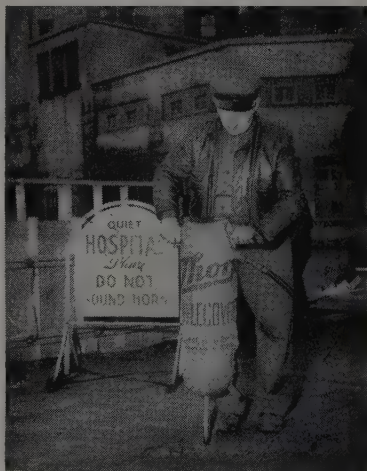
634 Williams Street Ph. Lockhaven 9-9159
San Leandro, California

Clark adds to Ranger line

Clark Equipment Co. has expanded its Ranger line of fork trucks for off-the-road hauling with the addition of the Ranger 150, a pneumatic-tire model of 15,000-lb. capacity. With four-wheel drive, power steering, power shifting and an oscillating rear axle, the new model is designed for operation through heavy mud and over rough terrain found at construction sites. Four-wheel drive or two-wheel drive is obtained by manipulation of a selector lever. The power train combines a torque converter with three-to-one multiplication with a four-speed, power shift transmission. A 95 set brake hp. gas engine or 102 net brake hp. diesel engine are available. Specifications and further details can be obtained from Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich.

Air hammer gets silent treatment

The Thor Power Tool Co., Aurora, Ill., has developed a sound-squelching Muffle Cover for its Model 25 paving breaker. The new accessory is a thick, double jacket of sound-proofing materials that



zips around the paving breaker. The cover reduces air hammer noise intensity up to 55%, making it popular during extensive field testing with street maintenance officials, public service companies and contractors working in quiet zones.

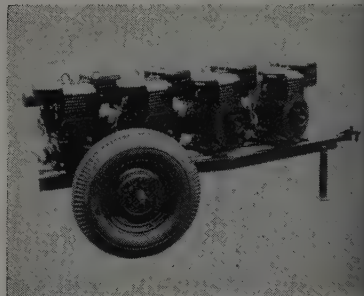
Vibration monitor system protects equipment

A new non-electric vibration monitor system, that is sensitive to increases in vibration yet ignores both starting vibration and transient shocks normal to operation, has been developed by the Fielden Instrument Division of Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia, Pa. The system combines the Robertshaw Model 65 malfunction detector, for mounting on the protected equipment, and the new

Model 651 a-c. control unit which is wired to the detector through ¾-in. conduit. The Model 65 malfunction detector is designed for use in Class I, Group D; and class II, Groups F and G locations. The control unit is oil-tight and is installed in a non-hazardous location unless connected with an air line using an optional air purge fitting. Applications include the protection of pumps, motors, blowers, compressors, centrifuges, engines, turbines and other costly equipment. The Model 651 control unit is available for operation with 115, 230 or 460 V.A.C. control circuits. Model are also available for use in d-c. circuits.

Portable generator saves fuel

A new concept in portable generator power is being introduced by the Gen-A-Matic Corp., 14741 Bessemer St., Van Nuys, Calif. The MTG units, Modular Trailerized Generators, offer a versatile power package for use on jobs requiring



power output from 5 kw. to 20 kw. Offering greater flexibility and greater fuel savings, the units enable all or part of the potential power output to be used as required by the job on hand. Mounted on the company's T-200 trailer, units are handled as easily as a single high power output electric plant yet separate assembly of the units insures all-around usefulness. MTG units are available in 120 or 140 volts, single phase, a-c.

Ditch Witch trencher

A new low-cost Ditch Witch service line trencher has been announced by the manufacturer, The Charles Machine Works, Inc., Perry, Okla. The new Model M trencher is completely mobile with three forward digging speeds, reverse plus road speeds up to 5 mph. In usual digging conditions the Model M will trench at speeds of 1½ to 6 ft. per min. It is also equipped with a trailer hitch for towing at speeds up to 25 mph. Trenching widths and depths on this machine are: 3 in. wide up to 48 in. deep, 4 in. wide up to 36 in. deep and 6 in. wide up to 30 in. deep. The digging chains are quickly interchangeable on the job. Powered by an 8-hp. air-cooled engine and equipped throughout with sealed ball bearings, the Model M weighs 500 lb.

CLINTON WELDED WIRE FABRIC

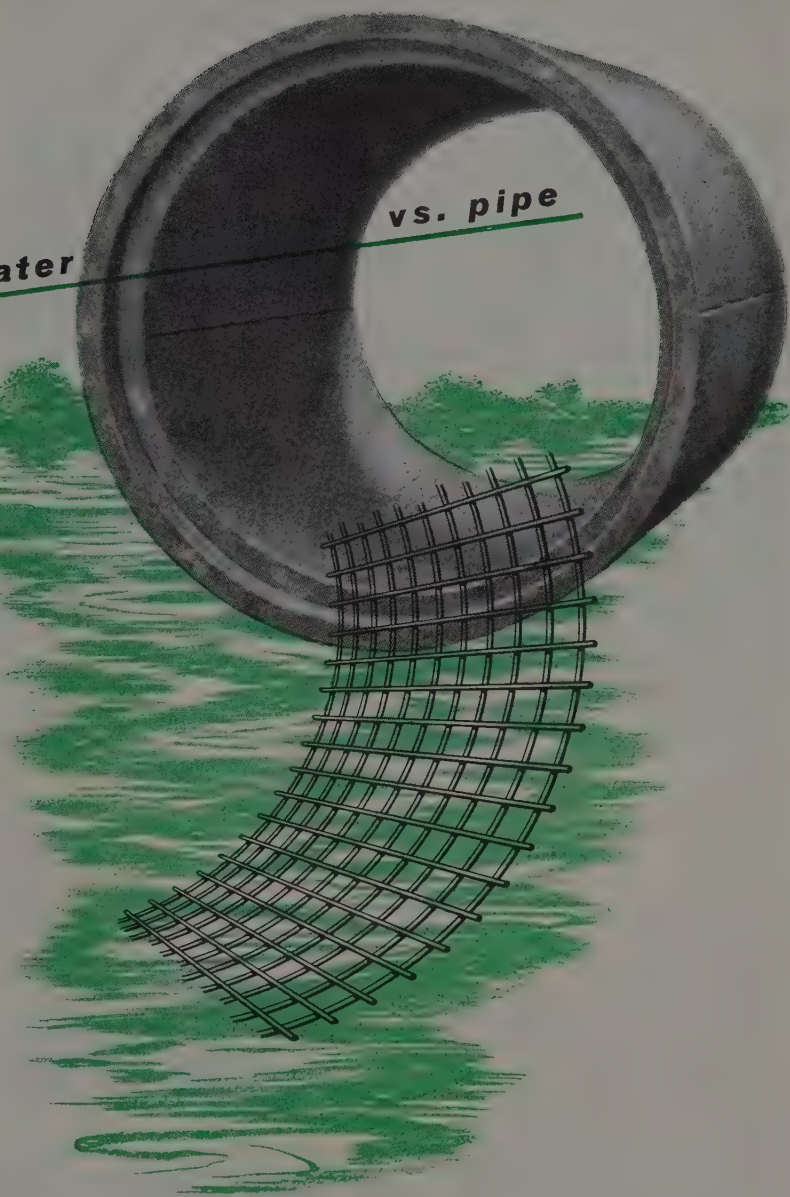
for the battle of water

vs. pipe

Danger . . . high corrosive" is the hidden sign that lurks in running water. Concrete pipe is fine for coping with the problem.

But reinforced concrete pipe is better . . . much better. For it has other important extras besides corrosion resistance. Reinforced pipe is better able to resist external loading and internal hydraulic pressure . . . gives additional decades of service . . . and does not require maintenance or replacement of sections.

Meeting all A.S.T.M. specifications, Clinton Welded Wire Fabric comes in a wide range of gauges and spacings to meet any requirement. There's a line of profitable information on the subject at the nearest sales office listed below. Call soon.



WHEN THEY ASK...

"is it Reinforced"

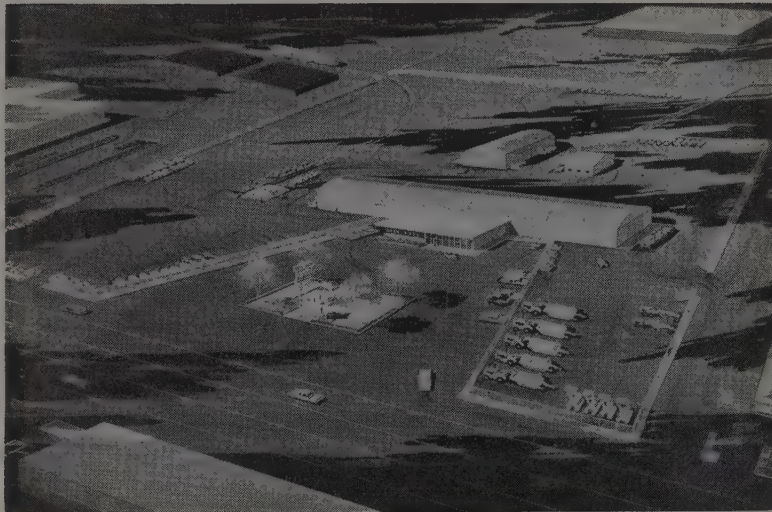
SAY YES...WITH

CLINTON
WELDED WIRE FABRIC
THE COLORADO FUEL AND IRON CORPORATION



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News of DISTRIBUTORS



SKETCH OF NEW FACILITY recently completed and occupied by Ditz Bros., Caterpillar dealership in Santa Clara and San Benito counties, Calif. Located at 2725 Lafayette St., Santa Clara, the company is headed by *George Ditz, Jr.*, and *Jack Ditz*. This new plant has 32,000 sq. ft. under roof, divided between a main building and two closely adjacent auxiliary buildings. The main T-shaped building houses the administrative office, small showroom area, the parts department, and customer service facilities. One auxiliary building is devoted to repair, and the other houses painting facilities. The service department occupies 15,000 sq. ft. of the new facilities.

Ramset promotes Hank Benedict

R. H. "Hank" Benedict has been named assistant field sales manager for Ramset Fastening System, a part of Olin Mathieson Chemical Corp., James J. Clarke, sales manager, announces. Benedict formerly headed the Ramset training school located at its headquarters in Cleveland, Ohio.

Smallman joins Gar Wood

Appointment of Ed Smallman as a tractor equipment district manager for Gar Wood Industries, Inc., is announced by D. J. Davis, general sales manager of Gar Wood's construction machinery division. Until he is assigned a fixed territory, Smallman's headquarters are at Gar Wood's Findlay Division in Ohio.

IH announces used equipment plan

The Construction Equipment Division, International Harvester Co., Chicago, announces a new plan for selling used equipment through its distributors. Called VM (Value Measured) Used Equipment, this timely program represents a new concept in used construction equipment selling and buying.

Under the plan, the International dis-

tributor reconditions a used machine and then measures the value of each major



component part. The value of these components, such as engine, transmission, etc., is derived by estimating the condition of the part if it is acceptable as is, or by listing the repairs and their cost on tags the distributor attaches to the machine. Then when the prospective buyer visits the used equipment lot, he merely checks the condition or value of the components by reading the tags. International and its distributors feel that the new program helps answer the buyer's question when buying used equipment, "What can I expect of this machine and for how long?"

New clay products distribution

Eleven distributors in twelve key Northern California locations will han-

dle a variety of clay building products from Gladding, McBean & Co., Los Angeles, Calif., in the inauguration of a streamlined system of product availability which features delivery of materials from large local distributors' inventories. These distributors are: American Distributing Co., Modesto; N. P. Bus Building Materials Co., Richmond; Construction Supply Co., Santa Rosa; H. W. Gentry Co., Walnut Creek; George C. Jacobs Co., Eureka; M. Phail's, San Rafael; Morgan Bros., San Leandro; Provenzano Bros., Santa Clara; Santa Clara; San Joaquin Materials Co., Fresno; Trico Building Supplies, San Carlos; and McLeod & Clark Corp., San Francisco.

Northwest news from Manitou

A. T. Church, president, announced that his company, Manitou Equipment Co., Portland, Ore., is now franchising dealer for Manitowoc Engineering Corp. in western Washington as well as in Oregon, with the result that the branch office and yard at 5602 First Ave., South Seattle, is now representing Manitowoc as well as Unit. This gives the equipment firm full sales and service coverage for Oregon and west Washington for the two companion lines of Manitowoc and Unit cranes, shovels, etc.

Camping named Stran-Steel dealer

Camping Corporation, 290 Hegerberger Road, Oakland, Calif., has been appointed franchised dealer for Stran-Steel industrial and retail buildings in six San Francisco Bay area counties, according to Harold Camping, president.

Leschen appoints C. C. Wallace

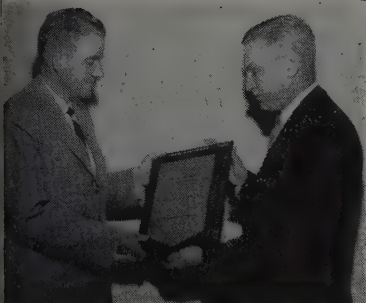
Charles C. Wallace has been appointed as sales representative for Leschen Wire Rope Division, H. K. Porter Co., Inc. His territory will cover all of Washington and Montana and most of Oregon and Idaho. He will have his headquarters at Seattle, Wash.

News from Shepherd Machinery

C. G. Claypool is now sales promotion department manager appointed to succeed M. R. Kohlbray at Shepherd Machinery Co., Los Angeles, Calif. Kohlbray has transferred into the industrial sales department. Recent products acquired for distribution by this distributor are the Caterpillar Models D353 engine and D318 electric set, as well as the Shepherd M371 integral tandem ripper.

Distributor named by Beaver-Advance

Power Rental Equipment Co., Inc. 3440 Brighton Blvd., Denver, Colo., has been awarded a distributor franchise for "Advance" tubular steel scaffold and "Beaver" hoisting towers. The various scaffolding and tower components comprising the line are manufactured by Beaver-Advance Corp., Ellwood City, Pa. Power Rental is headed by Jack H. Munroe, president, with Pat H. Munroe as vice president and secretary, and Jack H. Munroe, Jr., vice president and treasurer.



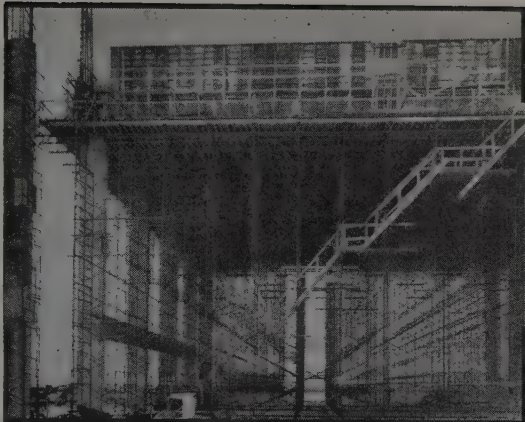
ALBERT R. PAULSEN, left, president of Hercules Equipment & Rubber Co., Inc., San Francisco, receives a plaque in recognition of cordial business relations, since 1921, with B. F. Goodrich Industrial Products Co. Making the presentation for Goodrich is **Robert H. Fox**, vice president-sales, Hercules. Fox has been San Francisco distributor for B. F. Goodrich hose, belting, and other rubber products for more than 35 years.

Orton Crane names Fox for West Coast
 Robert H. Fox, formerly with Six Wheels and Cook Bros. Equipment Co., has been appointed distributor for Orton Crane & Shovel Co., Chicago manufacturer, for California, Arizona, and Clark County in Nevada, as announced by Daniel A. Covelli, executive vice president of the firm. Fox, well known to crane and shovel users, pioneered the mounting of cranes on rubber tires. Formerly a resident of Washington, Fox now maintains offices at 14730 Vanowen St., Van Nuys, Calif.

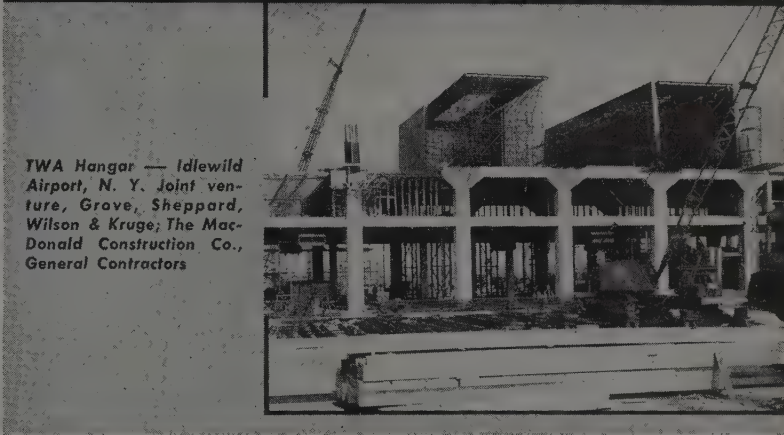
Road Machinery Co. opens new branch
 Road Machinery Co., Phoenix, Ariz., announces its appointment as dealer for the state of Arizona for Ingersoll-Rand; Bradall Division of Warner Swasey; and Chain Belt, Rex Division. Road Machinery recently opened a branch store at 2601 South Fourth Ave., Tucson, and appointed two well qualified men to operate it: William F. "Bill" Fuhst and Bruce Greer.

I. C. Shaw adds Henry line; salesman
 Henry Manufacturing Co., Inc., Topeka, Kan., has appointed H. C. Shaw Co., Stockton, Calif., as distributor of the Henry line in Arizona, California, and Nevada. The Henry line of attachments for light and medium tractors includes backhoes, front-end loaders, fork lifts and dozers. The Shaw company has branches at Santa Ana and Fresno in addition to its operating headquarters at Stockton, where R. H. Lewis is sales manager.

The company recently increased its sales force with the appointment of V. V. McIntosh as industrial sales specialist. He will work in Northern California and Nevada areas, promoting sales of the Henry line. He will also work with dealers in developing greater sales of Overland, Levelland, and E-Z Rip scrapers and ARPS Trench Hog attachments for tractors.



TWA Hangar — Kansas City, Mo. MacDonald-Creighton Construction Co., General Contractor



TWA Hangar — Idlewild Airport, N. Y. Joint venture, Grove, Sheppard, Wilson & Krueger; The MacDonald Construction Co., General Contractors

"REPEAT PERFORMANCE BY COMMAND"

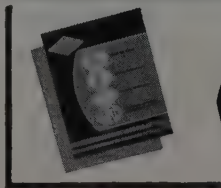
Detailing the reasons for superior scaffold performance is easy enough to do, but isn't it easier to *experience exceptional performance* again and again on your own construction jobs?

The ADVANCE scaffold shoring applications illustrated are for TWA hangars, but at widely separated geographical locations. Photo A is a project at Kansas City; Photo B is a similar hangar under construction at New York's Idlewild Airport. The fact that the ADVANCE Shoring System was used at both locations is not mere coincidence. Here's what job superintendents report:

- ADVANCE scaffold assembles faster — replaces as many as 12 wood or steel shores that require twice as much time to place.
- ADVANCE scaffold towers are self-supporting — eliminate additional lateral bracing — greatly reduce nailing requirements . . . afford more freedom of worker movement and assure maximum safety.
- ADVANCE Roller Assemblies enable speedy removal and relocation of forms from one pour area to another with substantial savings in manpower.

These and many more reasons justify "REPEAT PERFORMANCE BY COMMAND." Outstanding *value* makes ADVANCE the accepted name for *quality scaffold, engineering service* and on-the-job PROFITS!

Beaver-Advance CORPORATION
 Ellwood City, Pennsylvania



Send for this descriptive catalog, it's FREE!

BEAVER-ADVANCE CORPORATION, ELLWOOD CITY, PA.

Name.....

Company.....

Address.....

City..... Zone..... State.....

E-W moves into new building

E-W Equipment Co., San Diego County (Calif.) Cummins Engine dealer opened for business in September at its new location, 7010 Broadway (Lemon Grove) San Diego. The new building, constructed specifically for the Cummins operation has 6,000 sq. ft. of floor space and 2,000 ft. of pave work apron. Earl Winters, owner, formed the E-W Equipment Co. in 1954 to take over the San Diego Cummins dealership. Customers served include owners of Cummins-powered trucks, construction equipment, etc.

Fletcher handles David Round line

Sales representation and warehousing of David Round hoisting equipment, until recently handled by J. C. Fennelly Co. of San Francisco, Calif., has been taken over by Fletcher Sales Co., 2216 Fifth St., Berkeley, Calif. The latter company has been formed by Thomas A. Fletcher, formerly an associate of J. C. Fennelly Co. Fletcher has broad experience in the sale of hoisting equipment having traveled the Pacific Coast in a sales capacity for many years.

U. S. Rubber, Tire Div. news

United States Rubber Co., Tire Division, Portland, Ore., announces two new outlets: Oregon Tire & Supply Co., Medford, and Redd's Tire Service, Grants Pass. R. R. Walker is regional manager of the U. S. Tire Division, and E. S. "Bill" Morgan is regional truck tire manager, both with headquarters at the Portland office, where W. D. Ralston is in charge as factory representative.

Fornaciari appoints division head

Paul Fornaciari, vice president and general manager of the Fornaciari Company of Los Angeles, Calif., announces the appointment of Malcolm F. Cliff as manager of the firm's hydraulic division. He brings to the company an intensive background in the design and development of hydraulic components and systems.

Richter building nears completion

E. E. Richter & Son, distributor of Wisconsin air cooled engines and Lipe-Rollway heavy duty clutches, expects to move into their new building at 66th and Hollis Sts., in Emeryville, Calif., early in October. The new headquarters office and warehouse, of most modern construction, will give this distributor more than twice the operating space as formerly.

New distributor appointment

Cook Bros. Truck & Equipment Co., Oakland, Calif., is Chicago Pneumatic Tool Co.'s new construction equipment distributor in the San Francisco Bay area, as announced by Henry P. Hansen, branch manager for Chicago Pneumatic. James Nelson is general manager of Cook Bros.

MANUFACTURERS

Dremann becomes Moffett's ch. engr.

George H. Dremann has been appointed chief engineer of Moffett Engineering Inc., Albany, Calif. The firm manufactures overhead cranes of 1/4 to 650-ton capacity, as well as other ma-



George H.
Dremann

terials handling equipment. Dremann comes to Moffett from Bedford Foundry & Machine Co., where he was assistant chief engineer. He entered the crane business in 1941 and has served in such firms as Cleveland Crane & Engineering Co., Euclid Crane & Hoist Co. and Crane Hoist Co.

John Conway dies; Chadwick appointed

John S. Conway, 51, vice president in charge of sales, service, and advertising for the Koehring Division of Koehring Company, Milwaukee, Wis., died recently after a very brief illness. Con-



John E.
Chadwick

way joined the Koehring organization in 1941 as a clerk, advanced through various positions to sales manager in 1948, and in 1952 was appointed to the position held at the time of his death.

John E. Chadwick, sales manager, has been named as Conway's successor, according to E. A. Brugger, division president. Chadwick started with Koehring in 1945 as a district sales representative, and has been sales manager since 1952.

Key personnel named

Two new executives have been announced by the White Manufacturing Co., Elkhart, Ind. Donald M. Morgan has been appointed sales manager. He has moved to Elkhart, from Cincinnati, Ohio, where he was district manager for Eveready Briksaw Co. James E. McKinstry, a civil engineer, was named manager of engineering development. He was formerly with Kimberly-Clark Co. in Wisconsin.

New dealer appointed

Samuel W. Llewellyn, the new district manager who succeeded W. Brown (resigned), at Atlas Powder Co. Denver, Colo., announces the appointment of Stanker & Eastham as At dealer in Nucla, Colo.

Keremi Tractor makes good move

When Keremi Tractor and Equipment Co. of Cheyenne, Wyo., changed their address from 902 W. 22nd St. to 703 17th St., they increased their shop area to almost double and increased the size of their sales and accounting offices and the parts department. The Keremi organization is headed by H. R. Cathwood, president, and H. E. Martin, secretary-treasurer and general manager.

Marysville distributor adds facilities

K. D. Beatie, manager of Marysville Tractor & Equipment Co., Marysville, Calif., distributor for the Caterpillar Tractor Co., announces an expansion program now under way at their Marysville branch. The added facilities will include an additional 3,360 sq. ft. covered area of steel and concrete construction. One-half of this area will be used for expanded parts facilities, while the remainder will double the present space of the service department.

Gantry cranes produced on West Coast

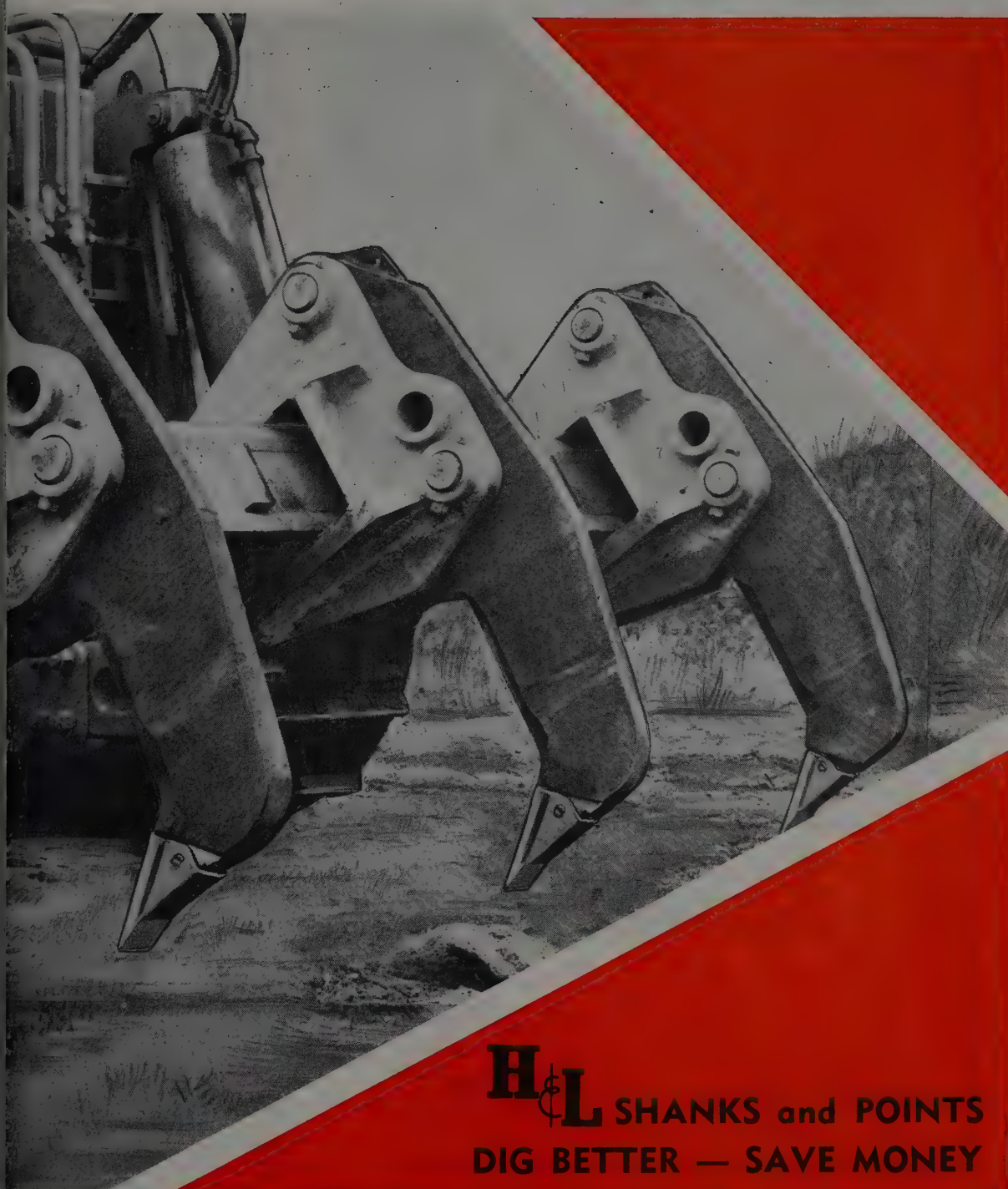
To aid Western construction companies and others to obtain gantries quicker time and at less transportation



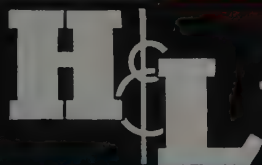
costs, the Alden Equipment Co., Gardena, Calif., has added the gantry crane to its material handling lines. The crane is shown here in operation in the yard of the contracting firm of Rutherford Skoubye at Downey, Calif.

Worthington news from So. California

E. Weston Hammond, district manager of Worthington Corporation at Los Angeles, reports that Norman E. Wood has transferred from the Portland, Ore. office to Los Angeles as sales engineer to serve Worthington customers in Los Angeles, San Diego, and Imperial counties. Also, just returned to Los Angeles from refresher training course for sales engineers in the East are Jim Purcell and Joe Ban. Hammond also reports that David R. Snow has been appointed technical representative for the Air Conditioning and Refrigeration Division.



H&L SHANKS and POINTS
DIG BETTER — SAVE MONEY

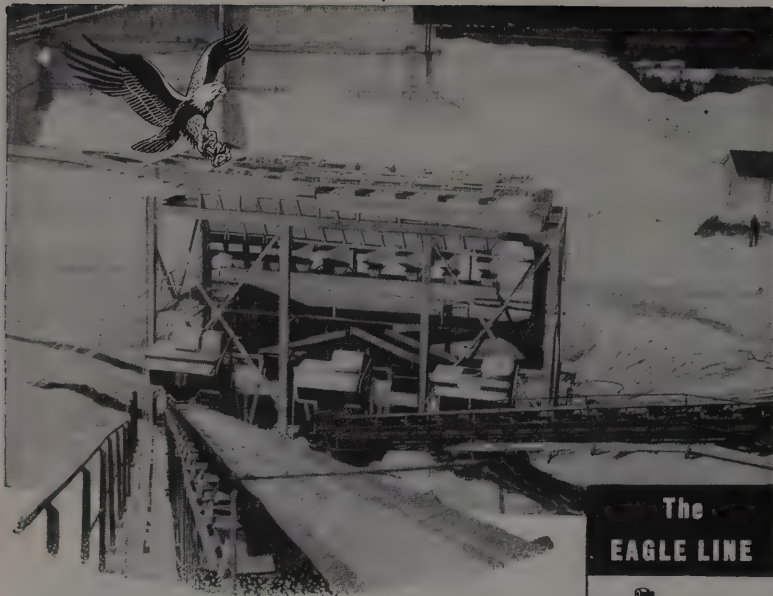


TOOTH COMPANY

1540 South Greenwood Avenue,

Montebello, California

Teeth that really dig



The simple, effective, economical way to wash and classify concrete aggregate!

THE combination of equipment shown above is an Eagle Complete Washing-Classifying-Dehydrating Section. These Sections are designed to meet capacity and product requirements of any producer.

They are a "package unit"; can be set down and integrated with any plant.

There is NO equipment or combination of equipment that comes even close, as far as ease of operation, economy and overall results are concerned. Eagle pioneered material washing and classifying and has the broadest experience in the field.

Material, in this case, is flumed to the Eagle Water Scalping-Classifying Tank. The power-operated valves assure removal of excess water, and classification within the tank by utilizing natural settling rate of particle sizes. Gated splitters below each valve, enable throwing desired percentage of each valve's bleed to multiple-cell Collecting-Blending Flume below splitters. The multi-cell Flume below the tank routes the desired gradations to three Eagle Screw Washer-Classifier-Dehydrators. They wash and further dewater the material, producing concrete sand, mason sand and plaster sand. Or, two screw units can produce concrete sand while one produces mason sand—any combination you want—utmost flexibility. The cost? Mere pennies per ton of material to meet specifications!

Send for YOUR Copy of new 44-Page Catalog 55.

EAGLE IRON WORKS, 203 Holcomb Ave., Des Moines, Ia.

Sold and Serviced by

Cook Bros. Equipment Co., Oakland, Calif.; Brown-Bevis Industrial Equip. Co., Los Angeles, Calif.; Balzer Machinery Co., Portland, Oregon; Intermountain Equip. Co., Boise, Pocatello, Ida.; Spokane, Wash.; Keremi Tractor & Equip. Co., Cheyenne, Casper, Wyo.; The Lang Co., Salt Lake City, Utah; H. W. Moore Equip. Co., Denver, Colo.; Jack Sahlborg Equip. Co., Seattle, Wash.; Shriver Machinery Co., Phoenix, Ariz.; Sierra Machinery Co., Reno, Nev.; N. C. Ribble Co., Albuquerque, N. Mex.; Western Construction Equip. Co., Billings, Missoula, Great Falls, Bozeman, Mont.

The EAGLE LINE



FINE MATERIAL WASHERS



COARSE MATERIAL WASHERS



LOG WASHERS



WATER SCALPING—CLASSIFYING TANKS.



"SWINTEK" DREDGE LADDERS



COMPLETE DREDGES



BREAKER BALLS & PILE HAMMERS.

R. G. Allen named Bucyrus-Erie vice president
Robert G. Allen has been elected to new vice presidency created by Bucyrus-Erie Co., South Milwaukee, Wis., excavator and drill manufacturer. Prior



Robert G. Allen

this appointment he was president of the Pesco Products and Wooster divisions of Borg-Warner Corp.

New sales manager for Colson Div.

Samuel A. Leone has been named sales manager, Special Products Division of the Colson Corporation. The Special Products Division, Somerville, Mass., manufactures a broad line of lifters, conveying and rack building equipment and specializes in solving difficult handling problems for industry. Prior to his present appointment, Leone was manager of Colson's Conveyor Division, Elyria, Ohio.

R. P. Brooks moves to home office

Robert P. Brooks has been promoted to assistant sales manager, large machines and blast hole drills, as announced by Bucyrus-Erie Co., South Milwaukee, Wis. Brooks, Northwestern sales manager at Seattle, Wash., since 1954, will now work out of the South Milwaukee office.

H. P. Lockhart made asst. gen. mgr.

The appointment of Henry P. Lockhart to the position of assistant general manager of Austin-Western Construction Equipment Division, Baldwin Lima-Hamilton Corp., Aurora, Ill., is announced. A veteran of 27 years service with Austin-Western, Lockhart has served in many key executive capacities, both sales and managerial, and will now, in addition to his other duties, coordinate the over-all sales, service and advertising activities of the company.

Caterpillar appoints S. W. sales rep

John E. Pilon has been appointed district representative for Caterpillar Tractor Co. in its Southwest sales division. He will work out of the company's San Francisco office and serve dealers in Maryville, Sacramento and Colusa in California, as well as Salt Lake City, Utah, and Reno, Nev. Pilon is a member of the Caterpillar organization since 1949, for the past six years. Pilon has been employed at Caterpillar, Washington, D. C., office.

American Culvert Co. moves
 American Culvert Co. announces its move to a new and larger plant at 8300 Aldwin St., Oakland, Calif. Headed by William J. Bardin, president; Norris Wiggins, vice president-sales; and Henry V. Dabadie, vice president-production, the officers believe with these improved facilities their company is better equipped to serve the corrugated culvert needs of the area.

Clipper announces new factory rep
 Clipper Manufacturing Co., Kansas City, Mo., announces appointment of Art Wilson as field representative for



Art Wilson

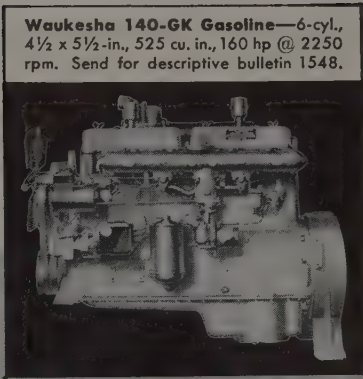
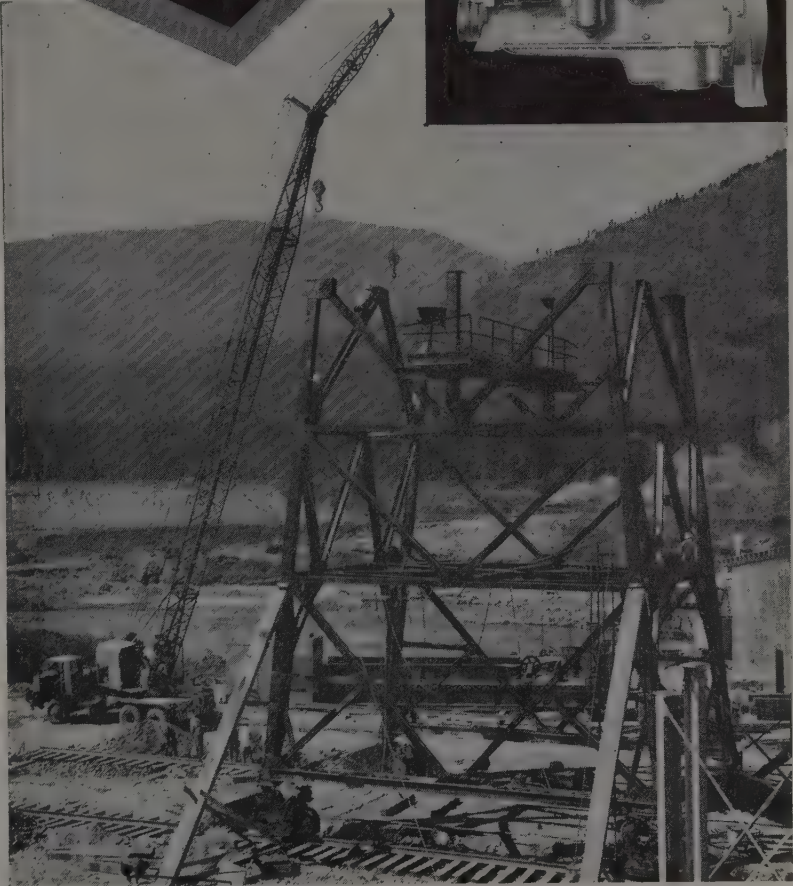
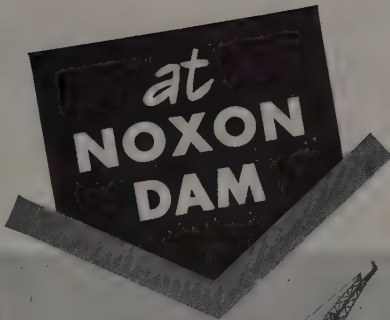
northern California. Wilson joins the staff of Clipper's district office at San Francisco. He recently completed an intensive course at Kansas City headquarters qualifying him to handle all concrete and masonry cutting problems that arise in construction and industry.

H. Olson retires from Link-Belt
 G. H. Olson, a vice president and director of Link-Belt Speeder Corp., Cedar Rapids, Iowa, subsidiary of Link-Belt Co., retired following 47 years of service. He was one of the most widely known individuals in the power crane and shovel industry.

Personnel advancements by Koehring
 Arthur V. Cossens, field service manager for Koehring Division, Milwaukee, Wis., has been made assistant sales manager. George E. Schmidt has been appointed in his place as field service manager. A Koehring Co. affiliate, the Koehring Division manufactures excavators, pavers, mixers and other equipment for the construction industry.

M-H-F buys "Davis" line
 Massey-Harris-Ferguson, Inc., Racine, Wis., has bought all the assets of Mid-Western Industries, Inc., Wichita, Kan., and will continue to market the Wichita company's loaders, backhoes, cranes, scarifiers, blades, etc. under the "Davis" brand name.

ACECO appoints new production mgr.
 Appointment of Norman Roberson to production manager of Pacific Coast Engineering Co., Alameda, Calif., is announced. Roberson has served with ACECO in various capacities since 1935, and since 1945 has been general superintendent in charge of all plant production.



Waukesha 140-GK Gasoline—6-cyl., 4 1/2 x 5 1/2-in., 525 cu. in., 160 hp @ 2250 rpm. Send for descriptive bulletin 1548.

Morrison-Knudsen own and use Lorain Crane
powered by
WAUKESHA

For the Noxon Rapids Hydroelectric Project on Clark Fork River in western Montana—Morrison-Knudsen Co., Inc. of Boise, Idaho are building a concrete and earth fill dam, maximum height 190 ft. and about 5930 ft. long. About the busiest piece of equipment on the job is their Waukesha-powered Lorain MC 505-W mobile crane. After setting up a concrete batch plant, it is shown here setting up a two whirley crane plant. The Lorain's 140-GK Waukesha Engine gives it safe, steady power with ready reserve for heavy handling as well as fast power for speedy mobility.

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WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
 NEW YORK TULSA LOS ANGELES

Allis-Chalmers completes sales demonstration at Idaho Boy Scout Camp

Allis-Chalmers Manufacturing Co.'s annual demonstration of equipment to acquaint construction machinery dealers with the complete A-C line was held for the first time in the Intermountain area, according to L. D. Myers, manager at Pocatello, Idaho. The location was Camp Tendoy, a Boy Scout camp site in a very wooded area 2 mi. downstream from Idaho's Palisades Dam, where Allis-Chalmers Manufacturing



Co., its personnel, and its dealers all participated in a \$25,000 construction project contributed to the Scouts' camp drive. More than 1,100 man-hours went into the preparation and completion of the earthmoving job which involved clearing, leveling and movement of 10,000 yd. of material to provide a lake for boating and swimming; the building of new road, rebuilding of a Forest Service road, the construction of park areas, building sites, etc. The accompanying picture shows Allis-Chalmers equipment working in the lake area.

W. B. Ansdell, Pocatello, Allis-Chalmers construction machinery sales manager in the Intermountain area, was in charge of the annual demonstration which the company calls "Operation Knowhow." He received much able assistance from the following A-C dealers and their personnel: A-D Machinery Co., Elko, and Las Vegas, Nev.; Cate Equipment Co., Salt Lake City, Utah; Southern Idaho Equipment Co., at Boise, Twin Falls and Idaho Falls.

Koehring Div. has new chief engineer

Promotion of A. L. Dassler from assistant chief engineer to chief engineer of Koehring Division, Milwaukee, Wis., is announced. Kenneth Johnson, senior

A. L.
Dassler



designer, has been moved up to assume the post vacated by Dassler. Dassler, who started with Koehring in 1935, will supervise design of Koehring's complete line of shovels, hoes, draglines and cranes.

Chain Belt acquires Burmeister Co.

Chain Belt Co., Milwaukee, Wis., announces the acquisition (subject to approval of the Federal Tax Department) of the assets of L. Burmeister Co., Milwaukee. Burmeister makes portable concrete batching plants, central mixing plants, and permanent concrete batching plants. These products will complement Chain Belt's products in the ready-mix concrete and road building industries.

Euclid campaign wins award

A merchandising program of twin-power scrapers and crawler tractors of Euclid Division, General Motors Corp., has received one of the five top honor awards in the Best Seller Awards competition sponsored by the National Industrial Advertisers Association. Presentation of the award was made during the NIAA annual convention in New York to Ralph E. Keidel, Euclid advertising manager.

Leon Moss promoted by Goodall Rubber

P. E. Moss, manager of Goodall Rubber Co., Salt Lake City, Utah, announces the promotion of Leon Moss to manager of Goodall-Rubber Co.'s Portland, Ore., branch. Jim Williams, previous manager, will continue in Portland as a Goodall sales representative. Moss is being transferred from Denver where he has been a salesman for the past year and a half. Jim Van Arsdale, office manager at Denver, replaces him as salesman. The new Portland manager has a well rounded background in sales as well as managerial duties, plus special factory training at the company plant at Trenton, N. J.

Martin-Decker key appointments

E. L. Decker, president of Martin Decker Corp., Long Beach, Calif., announces the appointment of Jack W. Knowlton as sales manager, and the naming of Robert C. McNeill as chief engineer to succeed Frank Crane who recently accepted an assignment at the Massachusetts Institute of Technology.

Haycraft transfers from Portland CIT

Don W. Haycraft, former operating head of the Portland Division of the CIT Corporation, has transferred to Eugene, Ore. There he will act as field representative for the Portland office giving local service to clients in the twenty lower counties of the state. He will make his headquarters at 2637 Way side Lane, Springfield, Ore.

Petersen named "Quick-Way" sales mgr

Theodore S. Petersen has been named sales manager for the "Quick-Way" Truck Shovel Co., Denver, Colo. Petersen succeeds Daniel S. Heffron who resigned recently from active participation in the company. Petersen has been assistant sales manager since June 1, and previous to that served as district representative in the California, Nevada, and Arizona areas. Before joining "Quick-Way" he was manager of the Bevis Machinery Co., heavy equipment dealer in Los Angeles.

CB&I appoints Mohr works manager

William Mohr has been appointed works manager of the Pacific Coast Division of Colorado Fuel & Iron Corp. according to announcement by J. J. Martin, vice president in charge of operations, Western Division. Mohr will make his headquarters at CF&I's Oakland, Calif., plant.



YALE & TOWNE Manufacturing Co.'s famous "Yale" trademark now appears on the Trojan line of tractor-shovels made at Batavia, N. Y., by the Contractors Machinery Division. Standing in front of the improved Trojan Model 154, 2-cu. yd. capacity, are the Allan family who founded the Trojan line and now directs its operations for Yale & Towne. Left to right: Frederick W. Allan, founder of Contractors Machinery Co., now a consulting design engineer for Yale & Towne; Robert G. Allan, his son, general manager of Contractors Machinery Division, and Frederick W. Allan, Jr., division comptroller.

UNIT PRICES

Selected abstracts for Western projects

Highway—Construction of 2.7 mi. of highway in New Mexico

New Mexico—Lincoln County—State. A \$366,740 contract was awarded Haake Construction Co. for construction of 2.7 mi. of highway.

Haake Construction Co.	\$366,740
Imperial Paving Co.	392,443
Wayne A. Lowdermilk.	415,300
Allison & Haney	435,118

	(1)	(2)
Lump sum	Removal of old structures.	\$9,000.00 \$7,000.00
Lump sum	Removal of obstructions.	300.00 2,500.00
Lump sum	Clearing and grubbing.	3,500.00 8,000.00
758 cu. yd.	Excavation—unclassified.	.33 .32
637 cu. yd.	Excavation for structures.	3.00 2.00
938 cu. yd.	Excavation for pipe culverts.	2.00 2.00
184 M gal.	Watering.	.30 .35
472 hr.	Rolling (tamping roller).	8.00 8.00
587 hr.	Rolling (pneumatic tired).	5.00 5.00
322 hr.	Rolling (steel tired).	7.00 8.00
612 hr.	Fifty (50) ton roller operation.	8.00 12.00
835 hr.	Mechanical tamping.	4.00 6.50
458 sta. yd.	Station yard overhaul.	.015 .015
868 1/4 mi. yd.	Quarter mile yard haul.	.05 .04
876 ton mi.	Ton mile haul.	.07 .08
2.4 mi.	Obliterating old road.	300.00 210.00
100 lin. ft.	Contour ditches.	.30 .25
291 cu. yd.	Wire enclosed riprap.	9.00 10.00
490 lb.	Wire fabric for riprap.	.35 .15
126 cu. yd.	Excavation for riprap.	2.00 2.75
180 lin. ft.	Steel stakes for riprap.	2.50 2.80
4 ea.	Cattle guard—18-in. roadway.	1,600.00 1,800.00
865 lin. ft.	Steel plate guard fence.	4.50 4.00
329 lin. ft.	Galvanized barbed wire fence.	.95 .90
23 ea.	Gates—Texas type.	7.00 20.00
9 ea.	Gates—standard type—14-ft.	40.00 45.00
1 ea.	Gates—standard type—6-ft.	30.00 25.00
122 ea.	Bracing.	8.00 10.00
811 lin. ft.	Galv. woven wire farm fence.	.35 .35
74 ea.	Right of way markers.	6.00 8.00
2 ea.	Std. Fed. Aid proj. markers, Type I.	60.00 150.00
116 ea.	Treated tmbr. warn. posts, refl. (6-in. diam.).	8.00 6.58
395 ton	Controlled gradation sub-base.	.70 .70
570 ton	Base course.	.95 .90
614 bbl.	Bituminous material, Type MC-1.	7.50 6.25
92 bbl.	Emulsified asphalt AE-3.	8.50 7.50
182 bbl.	Bituminous material, Type 120-150.	7.00 7.30
319 ton	Cover material.	5.00 5.25
1068 ton	Plant mix surface course.	3.80 5.20
1051 bbl.	Bit. mat., Type 85-100 (plant mix).	7.00 6.55
251 bbl.	Bit. mat., Type 85-100 (tack coat).	7.00 6.55
415 cu. yd.	Class "A" concrete.	55.00 48.00
46 sq. yd.	Class "A" concrete for blankets.	10.00 39.50
869 lb.	Reinforcement for concrete structures.	.15 .15
1050 lb.	Wire fabric for concrete blankets.	.40 .15
9 cu. yd.	Grouted rock retards.	25.00 20.00
392 lin. ft.	Corr. metal culv. pipe—24-in. diam.	7.00 9.00
448 lin. ft.	Corr. metal culv. pipe—30-in. diam.	7.00 9.00
154 lin. ft.	Corr. metal culv. pipe—36-in. diam.	11.00 11.50
168 lin. ft.	Corr. metal culv. pipe—42-in. diam.	14.00 14.00
152 lin. ft.	Corr. metal culv. pipe—48-in. diam.	16.00 15.50
88 lin. ft.	Corr. metal culv. pipe—54-in. diam.	18.00 19.00
254 lin. ft.	Struct. plate pipe—150-in. diam. bevel 2:1, gage 710-18.	80.00 100.00
472 lin. ft.	Chain link fence.	4.00 2.50
1 ea.	Chain link drive gate—12-ft. wide.	180.00 100.00
21 cu. yd.	Excavation for structures (bridges).	10.00 2.50
1.62 cu. yd.	Class "A" conc.—bridge substructure.	75.00 85.00
6.32 cu. yd.	Class "A" conc.—bridge substructure.	70.00 66.00
41.5 cu. yd.	Class "A" concrete for piling.	35.00 35.00
878 lb.	Structural steel.	.37 .40
368 lin. ft.	Closed-end steel pipe piles.	9.50 10.00

Highway—Construction of 19 mi. of highway for U. S. Bureau of Public Roads in Utah

Utah—Uintah & Daguerre Counties—Bureau of Public Roads. A \$353,000 contract has been awarded to Germer, Abbott & Waldron for 19.2 mi. of highway in Ashley National Forest.

Germer, Abbott & Waldron	\$353,000
Engineer's estimate.	350,000

	(1)	(2)
1000 cu. yd.	Unclassified excavation.	.90 .80
250 cu. yd.	Borrow excavation, case 2.	.33 .50
250 cu. yd.	Excavation for structures (bridges).	4.50 3.00
1000 ton	Special subbase, grading B.	1.26 1.40
1000 sta. yd.	Overhaul.	.02 .03
900 yd. mi.	Overhaul.	.30 .30
800 units	Water (1,000 gal. unit).	2.50 3.00
Lump sum	Providing and maintaining water plant or plants.	5,000.00 2,000.00
200 hr.	Rolling.	12.00 12.00
500 ton	Crushed aggregate base, grading D.	1.60 1.55
600 sq. yd.	Processing bituminized base.	.09 .08

1,640 ton	Asphalt, grade MC-0, 1, 2, or 3.	42.25 41.00
145 ton	Asphalt, grade RC-2 or 3.	46.00 42.00
6.5 ton	Bituminous additive.	735.00 1,100.00
10 lin. ft.	18-in. Galv. corr. metal pipe.	4.30 5.50
370 lin. ft.	24-in. Galv. corr. metal pipe.	6.50 7.00
182 lin. ft.	Removing, cleaning and relaying salvaged culvert pipe.	4.00 4.00
10 cu. yd.	Hand-laid rock embankment.	15.00 20.00
352 lin. ft.	8-in. Perf. corr. metal pipe underdrain.	2.10 1.75
110 cu. yd.	Porous back-fill mat. pipe underdrain.	10.00 5.00
16 ea.	Remove and reset timber guide posts.	4.00 3.00

Highway—Grading, surfacing and bridge structure

California—Imperial County—State. Ralph B. Slaughter received a \$228,528 contract for 3 mi. of road mix surfacing and construction of a reinforced concrete slab bridge.

(1) Ralph B. Slaughter.	\$228,528
(2) Basich Brothers Construction Co. & N. L. Basich.	233,425
A. S. Hubbs.	234,916
A. H. Famularo.	239,517

	(1)	(2)
Lump sum	Clearing and grubbing.	\$20,000.00 \$ 7,740.00
7,200 M gal.	Furnishing and applying water.	1.50 1.45
29,000 sq. yd.	Compact. original ground.	.07 .07
113,000 cu. yd.	Roadway excavation.	.40 .35
20 cu. yd.	Structure excavation.	5.00 3.00
20 cu. yd.	Structure backfill.	5.00 3.00
12,000 cu. yd.	Imported borrow.	.75 .35
20,000 ton	Imported subbase material.	1.55 1.70
16,000 ton	Untreated base.	2.10 2.75
12 ton	Asphaltic emulsion (sl. ct.).	60.00 58.00
55 ton	Liquid asphalt, SC- (pr. ct.).	36.00 36.30
390 ton	Liq. asphalt, SC-3, SC-4 or SC-5 (RMS)	31.00 35.95
7,750 ton	Mineral aggregate (RMS).	2.55 3.00
53,500 sq. yd.	Mixing and compact. RMS.	.08 .13
1,520 lin. ft.	Concrete lined drainage ditch.	1.45 1.95
Cont. sum	Class "A" conc. (bridge) (193 cu. yd.).	14,000.00 15,180.75
Cont. sum	Bar reinf. steel (bridge) (54,000 lb.).	9,000.00 7,712.13
1,100 lin. ft.	Furnishing concrete piling.	6.00 4.50
26 ea.	Driving concrete piles.	80.00 350.00
270 lin. ft.	Metal beam bridge railing.	6.00 8.00
56 lin. ft.	Metal plate guard railing.	4.50 4.65
80 ea.	Guide posts.	7.00 7.50
Lump sum	Raising wheel guard and rev. bridge rail.	550.00 '00.00
Lump sum	Finishing roadway.	1,000.00 1,000.00

Highway—Construction of 4.1 mi. of highway in California

California—Siskiyou County—State. A \$268,680 contract was awarded to Granite Construction Co. for 4.1 mi. of highway, to be graded and paved.

(1) Granite Construction Co.	\$268,680
(2) Bragato Paving Co.	298,139
Jesse H. Harrison.	307,094
W. H. Darrough & Sons.	310,000

	(1)	(2)
32 ac.	Clear and grub.	\$ 300.00 \$ 550.00
Lump sum	Dev. wat. sup. & furn. wat. equip.	14,000.00 15,000.00
8,000 M gal.	Apply water.	.10 1.75
25,000 sq. yd.	Compact orig. ground.	.05 .08
102,000 cu. yd.	Roadway excav.	.60 .56
680 cu. yd.	Struct. excav.	2.50 4.00
420 cu. yd.	Struct. backfill.	4.50 4.50
40 cu. yd.	Ditch & channel excav.	2.25 5.00
2,100,000 sta. yd.	Overhaul.	.004 .005
28,000 ton	Untr. base.	2.20 2.10
75 ton	Liq. asph., SC-2 (pr. ct.).	45.00 45.00
600 ton	Pav. asph. (P.M.S.).	40.00 38.00
11,500 ton	Min. aggr. (P.M.S.).	5.00 5.85
11,000 lin. ft.	Placing P.M.S. dikes.	.25 .30
380 ton	Sand cover (pr. ct.).	7.00 6.00
26 ton	Asph. emul. (sl. ct.).	55.00 50.00
350 lin. ft.	12-in. C.M.P. (16 ga.).	3.00 3.50
582 lin. ft.	18-in. C.M.P. (14 ga.).	5.00 5.50
80 lin. ft.	24-in. C.M.P. (14 ga.).	6.50 7.00
82 lin. ft.	36-in. C.M.P. (12 ga.).	13.00 12.50
176 lin. ft.	72-in. C.M.P. (10 ga.).	38.00 36.50
150 lin. ft.	22-in. x 13-in. C.M.P. arch (16 ga.).	5.00 5.00
40 lin. ft.	29-in. x 18-in. C.M.P. arch (14 ga.).	7.00 7.00
46 lin. ft.	36-in. x 22-in. C.M.P. arch (12 ga.).	12.00 11.50
38 lin. ft.	43-in. x 11-in. C.M.P. arch (12 ga.).	13.00 14.75
15 ea.	Tapered down drain inlets.	55.00 60.00
100 lin. ft.	8-in. C.M.P. down drains.	2.00 5.25
Lump sum	Finish roadway.	1,000.00 2,000.00

PENNZOIL LUBRICANTS

CUT DOWN COSTS

Builders, Contractors, and other fleet operators use and recommend ZildeeZ, heavy duty motor oil, the 4000 Series gear lubricant and 832, wheel bearing lubricant. All are guaranteed to be supreme in quality. They improve performance, protect equipment and help build PROFITS in the Construction Industry.

(Right) Quick starts and smooth performance are the results of ZildeeZ lubrication at Standard Ready-Mix Concrete Company. Their fleet of 30 mixing trucks are all ZildeeZ lubricated.



BRIDGE SHORING COSTS CUT 25% — Modern "Trouble Saver" Steel Shoring helps contractor, Mal-Bros. Const. Co., save 25% in shoring costs on a street relocation job in Scotch Plains, N. J. 272 frames with patented SlideLoks, quickly assembled in 3' x 5' towers and in rows spaced 2' 6" apart, provide ample support for the new roadbed.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY



THE PATENT SCAFFOLDING CO., Inc.

6931 Stanford Avenue, Dept. WC, Los Angeles 1, California

Phone: Pleasant 2-2571

420 Eighth Avenue N., Seattle, Washington. Phone: Seneca 7142

Ray Wayne.....1569 Hedges St., Fresno, Calif.
Capitol Scaffolding & Equipment Co.....North Sacramento, Calif.
Borchers Brothers.....342 North Second St., San Jose, Calif.
The United Materials.....814 West 14th Ave., Denver, Colo.
Crissley Fowler Lumber Co.....117 Vermijo St., Colorado Springs, Colo.

BRIDGE—Construction of prestressed concrete girder bridge in California

California—Riverside—State. A \$872,046 contract was awarded to W. Maxwell Co. for construction of a four-lane precast, prestressed concrete girder bridge, across Santa Ana River, about 0.6 mi. in length, to graded and surfaced.

(1) W. F. Maxwell Co. \$ 872,046
(2) E. L. Yeager Co. 993,361
Chas. MacClosky Co. 1,006,834
Robert E. L. Parker Co. 1,040,201

	(1)	(2)
Lump sum	26,000.00	25,000.
Clearing and grubbing.....	15,000.00	60,000.
Dev. wat. sup. & furn. wat. equip.	1,000.00	5,500.
Applying water.....	1.75	1.
Compacting original ground.....	.07	
Roadway excavation, Type A.....	3.38	
Structure excavation, Type A.....	5.00	3.
Structure excavation.....	3.00	2.
Structure backfill.....	3.00	5.
Imported borrow.....	.25	
Straw.....	70.00	75.
Seed.....	.60	
Steer manure.....	7.00	9.
Untreated base.....	2.18	2.
Asph. emuls. (opt. bndr. & fog slct.)	50.00	60.
Liq. asph. SC-2 (pr. ct.).....	40.00	40.
Pav. asph. (P.M.S.).....	5.50	28.
Min. aggr. (type B P.M.S.).....	5.50	3.
Min. aggr. (open graded P.M.S.)	6.60	3.
Plac. P.M.S. spillway downdrains.....	2.20	3.
Plac. P.M.S. median gutters.....	1.65	2.
Plac. P.M.S. dikes.....	.40	
Class A conc. (footing block).....	25.00	22.
Class A conc. (structures).....	100.00	100.
Cl. A conc. (bridge) (3,720 cu. yd.)	205,000.00	215,000.
Bar reinforcing steel.....	.12	
Bar reinf. steel (bridge) (560,000 lb.)	70,000.00	69,000.
Furn. precast, prestressed concrete girders.....	2,550.00	3,000.
Erect precast, prestressed concrete girders.....	150.00	300.
Furn. conc. piling.....	3.40	4.
Driving piles.....	120.00	100.
Misc. iron and steel.....	.30	
Class B concrete (curbs, gutters and sidewalks).....	33.00	34.
Curb dowels.....	1.10	1.
Survey monuments.....	13.00	30.
Metal plate guard railing.....	4.50	5.
Steel railing.....	8.00	8.
Gde. pst. mkr. & hor. refl. units.....	7.00	10.
New property fence.....	1.50	3.
Reconstructing property fences.....	1.50	2.
18-in. C.M.P. (16 gal.).....	6.00	4.
24-in. C.M.P. (14 gal.).....	8.00	6.
Salvage exist. pipe culverts.....	5.00	2.
Finishing roadway.....	660.00	2,000.
Highway lighting.....	11,900.00	13,000.

HIGHWAY—Widening of 2 1/4 mi. of highway in Arizona

Arizona—Maricopa County—State. A \$323,433 contract has been awarded to W. J. Henson, Contr., for the widening of 2 1/4 mi. of highway on U. S. Route 60-70-89.

(1) W. J. Henson, Contr. \$323,433
(2) Tanner Bros. Constr. Co., Inc. 345,753
Phoenix-Tempe Stone Co. 339,709
Wallace & Wallace 367,434

	(1)	(2)
33,700 cu. yd.	3.35	\$
1,300 cu. yd.	.35	
3,500 lin. ft.	.15	
1,000 cu. yd.	2.00	1.
6,700 cu. yd.	.35	
17,000 ton	.38	
Lump sum	1,000.00	1,000.
9,000 M gal.	1.50	1.
1,200 hr.	8.50	9.
42,200 ton	.44	
14,200 ton	.90	1.
180 ton	5.00	6.
8,600 ton	2.80	2.
2,530 ton	5.50	5.
495 ton	38.00	42.
190 ton	44.00	50.
30 ton	80.00	90.
30 ton	85.00	95.
25 ton	48.00	55.
249 lin. ft.	13.00	14.
506 cu. yd.	46.00	47.
410 cu. yd.	46.00	52.
144,800 lb.	.15	
92 lin. ft.	4.50	4.
1,116 lin. ft.	7.00	6.
158 lin. ft.	8.10	8.
166 lin. ft.	8.00	8.
46 lin. ft.	13.00	12.
50 lin. ft.	15.00	15.
	20.00	13.

430 lin. ft.	Furn. and drive concrete pile (steel shell or precast) (CIP)	8.50	9.50	300 cu. yd.	Coarse gravel protection.	5.00	7.00
150 lin. ft.	Pile cutoff (steel shell or precast conc.)	3.50	3.50	500 sq. yd.	Dry-rock paving.	10.00	8.00
40 cu. yd.	Removal of structure concrete.	25.00	18.00	530 cu. yd.	Concrete in structures.	100.00	110.00
60 ea.	Place dowels (CIP).	2.00	2.00	730 bbl.	Furn. and handling cement.	6.00	6.00
Lump sum	Miscellaneous removal and other work.	2,500.00	4,000.00	33,000 lb.	Furn. and placing rein. bars in struct.	.20	.20
480 lin. ft.	Road guard (Std. C-7) (CIP)	3.40	3.60	2,25 mbm.	Furn. and erecting timber in struc.	275.00	500.00
29 ea.	Guide posts (std. C-8, type BR) (CIP).	6.00	6.00	3,410 lin. ft.	Furn. and laying 12-in. diam. standard-strength rein.-conc. culvert pipe.	3.60	3.30
15 ea.	R/W markers (std. C-1 type, C) (CIP)	9.00	7.00	5,700 lin. ft.	Furn. and laying 15-in. diam. standard-strength rein.-conc. culvert pipe.	4.60	4.14
200 lin. ft.	Line fence (std. C-16) (CIP)	.20	.24	330 lin. ft.	Furn. and laying 18-in. diam. standard-strength rein.-conc. culvert pipe.	5.60	5.10
9 ea.	Steel fence gate (std. C-23) (CIP)	60.00	45.00	1,730 lin. ft.	Furn. and laying 21-in. diam. standard-strength rein.-conc. culvert pipe.	6.65	6.00
3 ea.	Conc. catch basin (std. C-27, type No. 3) (CIP)	250.00	300.00	650 lin. ft.	Furn. and laying 24-in. diam. standard-strength rein.-conc. culvert pipe.	8.80	7.74
535 lin. ft.	Combined curb & gutter (std. C-20, type A) (CIP)	2.90	2.45	220 lin. ft.	Furn. and laying 30-in. diam. standard-strength rein.-conc. culvert pipe.	11.40	9.90
733 sq. ft.	Conc. sidewalk (std. C-20) (CIP).	.50	.50	100 lin. ft.	Furn. and laying 36-in. diam. standard-strength rein.-conc. culvert pipe.	16.15	13.95
350 lin. ft.	Bank protection (std. C-23, type A) (CIP)	17.50	19.00	180 lin. ft.	Furn. and laying 21-in. diam. extra-strength rein.-conc. cu vert pipe.	8.15	7.17
310 lin. ft.	Bank protection (std. BR-2) (CIP)	27.50	32.00	1,280 lin. ft.	Furn. and laying 15-in. diam. HC50 concrete pressure pipe with type R joints	5.35	5.32
700 lin. ft.	Placing bit. mixed curbs (std. C-3)	.10	.13	2,410 lin. ft.	Furn. and laying 27-in. diam. HC50 concrete pressure pipe with type R joints	11.00	10.62
700 lin. ft.	Placing bit. mixed gutters (std. C-3) (CIP)	1.50	.95	34 lin. ft.	Furn. and laying 15-in. diam. No. 16-gage, corrugated-metal pipe.	6.00	4.30
Lump sum	Remove and salvage steel girder bridge.	2,500.00	1,600.00	40 lin. ft.	Furn. and jacking 36-in. diam., No. 12-gage, corrugated-metal pipe.	43.00	55.00

ANAL—Construction of canal for Bureau of Reclamation in Idaho

Idaho—U. S. Bureau of Reclamation. A \$334,968 contract has been awarded to Cherif Bros. & Sandkay for a canal, earthwork and structures, Idaho.

Cherif Bros. & Sandkay	\$334,968	
C. B. Eaton & Sons	368,276	
Duffy Reed Constr. Co.	386,661	
Olof Nelson Constr. Co.	395,091	
	(1)	(2)
000 cu. yd.	Excavation, common, for laterals.	.34 .32
250 cu. yd.	Excavation, rock, for laterals.	3.70 15.00
000 mi. cu. yd.	Overhaul.	.25 .30
000 cu. yd.	Compacting embankments.	.16 .35
000 cu. yd.	Placing and compacting earth lining.	1.12 3.00
500 M gal.	Water for embank. mat., first 500 M gal.	3.00 4.00
250 M gal.	Water for embank. mat., over 500 M gal.	3.00 4.00
000 cu. yd.	Excavation, common, for structures.	1.95 3.00
100 cu. yd.	Excavation, rock, for structures.	6.20 15.00
500 cu. yd.	Backfill about structures.	.37 1.00
600 cu. yd.	Compacting backfill about structures.	3.70 4.00
000 cu. yd.	Excav., com., for conc.-pipe trenches.	.67 1.50
200 cu. yd.	Excav., rock, for conc.-pipe trenches.	6.20 15.00
000 cu. yd.	Backfill for concrete-pipe trenches.	.42 1.00
800 cu. yd.	Compacting backfill in concrete-pipe trenches.	3.70 2.50
600 cu. yd.	Riprap.	5.00 5.00
270 cu. yd.	Sand and gravel bedding for riprap.	5.00 4.00

34 lin. ft.	Furn. and laying 15-in. diam. HC50 concrete pressure pipe with type R joints	5.35	5.32
2,410 lin. ft.	Furn. and laying 27-in. diam. HC50 concrete pressure pipe with type R joints	11.00	10.62
34 lin. ft.	Furn. and laying 15-in. diam. No. 16-gage, corrugated-metal pipe.	6.00	4.30
40 lin. ft.	Furn. and jacking 36-in. diam., No. 12-gage, corrugated-metal pipe.	43.00	55.00
15 lin. ft.	Furn. and placing type A rubber water-stop.	4.65	2.00
10 sq. ft.	Furn. and placing elastic filler material in joints.	2.50	7.00
39 gates	Furn. and install. 15-in. diam. metal turnout gates and lifts.	98.00	75.33
3 gates	Furn. and install. 18-in. diam. metal turnout gates and lifts.	125.00	97.84
1 gate	Furn. and install. 30-in. diam. metal turnout gates and lifts.	270.00	220.00
1 gate	Furn. and install. 15-in. flap gate.	71.00	57.93
33 assem.	Furn. and install. 2-ft. adj. weir assem.	117.00	120.00
2 assem.	Furn. and install. 3-ft. adj. weir assem.	137.00	150.00
1 meter	Furn. and install. 12-in. line meter.	555.00	595.00
3 meters	Furn. and install. 15-in. open flowmeters	665.00	700.00
25 lin. ft.	Furn. and install. 2-in. std. galv. st. pipe	2.00	2.00
115 lin. ft.	Furn. and install. 4-in. std. galv. st. pipe	3.40	5.00
7,600 lb.	Furn. and install. trashracks and safety racks.	.48	.70
3,250 lb.	Furn. and install. misc. metalwork.	.56	.70
850 lb.	Furn. and install. blow-off valves and connections for siphons.	1.12	3.50
Lump sum	Install. equip. for pumping-plant install. at Relift Pumping Plant No. 1.	670.00	650.00
Lump sum	Install. equip. for pumping-plant install. at Relift Pumping Plant No. 2.	940.00	500.00
Lump sum	Installing equip. for pumping-plant install. at Booster Pumping Plant.	1,800.00	350.00
Lump sum	Furn. and install. materials req. for elec. install. at Relift Pump. Plant No. 1.	4,350.00	2,362.00

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Pacific Telephone

Lump sum	Furn. and install. materials req. for elec. install. at Relift Pump. Plant No. 2.	4,350.00	2,838.00
Lump sum	Furn. and install. materials req. for elec. install. at Booster Pumpin. Plant.	8,300.00	5,124.00
2 assem.	Furn. and install. complete guy and anc or assemblies.	75.00	125.00

734 M gal.	Watering.	2.00	2.
15,965 cu. yd.	Unclassified roadway excavation.	.55	
50 hr.	Rolling, tamping roller.	15.00	14.
62 hr.	Rolling, pneumatic tire or power roller.	8.00	10.
20 lin. ft.	15-in. C. M. pipe.	3.20	4.
16 lin. ft.	18-in. C. M. pipe.	4.00	5.
2,205 lin. ft.	18-in. Reinforced concrete pipe.	4.50	4.
3,096 lin. ft.	24-in. Reinforced concrete pipe.	6.25	6.
315 lin. ft.	30-in. Reinforced concrete pipe.	9.00	9.
807 lin. ft.	36-in. Reinforced concrete pipe.	12.50	12.
32 lin. ft.	Relaying 14-in. iron pipe.	5.00	2.
19 lin. ft.	Relaying 18-in. C. M. pipe.	2.00	
8,050 lb.	Reinforcing steel.	.16	
10,250 lb.	Structural steel.	.35	
5 cu. yd.	Concrete, class "A."	100.00	100.
58 cu. yd.	Concrete, class "AA."	100.00	100.
6,300 cu. yd.	Excavation for structures, unclassified.	2.00	2.
10 cu. yd.	Small ditch excavation.	1.00	1.
4,400 lin. ft.	Concrete curb, type "1F."	1.50	1.
480 lin. ft.	Conc. curb and gutter, type 3M.	3.00	3.
250 lin. ft.	Removal of existing curb.	.50	1.
250 lin. ft.	Removal of existing curb and gutter.	.75	1.
40 ea.	Moving mail boxes.	5.00	5.
300 lin. ft.	Deep beam hwy. guard rail (conc. posts).	4.00	4.
71 hr.	Mechanical tamping.	7.00	6.
10 ea.	Guide posts.	7.00	8.
78 ea.	Reconst. cleanout, manhole & mon. boxes.	40.00	50.
Lump sum	Furnishing water equipment.	500.00	2,000.
Lump sum	Furnishing construction signs.	1,000.00	2,000.

HIGHWAY—Construction of 3.9 mi. of road in Utah

Utah—Weber County—State. W. W. Clyde & Co. received a \$292,452 contract award for a 3.9-mi. plant mix bituminous surfaced road.

(1) W. W. Clyde & Co.	\$292,452		
(2) Jack B. Parsons Const. Co.	293,949		
Rife Const. Co.	295,337		
Gibbons & Reed Co.	303,782		
	(1)	(2)	
29,000 ton	Plant mix bituminous surface, type A.	\$ 3.00	\$ 3.50
1,460 ton	Bit. mat., type 85-100 penetration.	31.00	30.00
193 ton	Bit. mat., type MC-1 or MC-2.	35.00	41.00
146 ton	Bit. mat., type RC-1 or RC-2.	36.00	42.00
19,925 ton	Gravel surface, type "B."	1.48	.90
16,850 ton	Gravel base course.	1.45	.80
39,825 sta. yd.	Class "A" overhaul.	.02	.03
3,165 yd. mi.	Class "B" overhaul.	.20	.30

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FOR SALE "KOEHRING 34E TWINBATCH PAVER"

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KEREMI TRACTOR AND EQUIPMENT CO.

Box 908 Phone 8-8922
Cheyenne, Wyo.

For quick sale and immediate delivery approximately 207 tons of new steel ribs and collar braces for tunnel lining.

Single track railroad cross section 24 ft. 6" vertical clearance and 18 ft. horizontal clearance.

Ribs made of 10" WF 39 lb. beams. Ribs consist of 128 sets of 4 pieces to each set.

Collar braces consist of 1524 cold formed angles 3 1/2" x 3 1/2" x 3/8" x 4'-0" long.

Detail drawings available.

For further information contact:

Mr. G. T. Wickstrom,
General Purchasing Agent,
Union Pacific Railroad Company,
1416 Dodge Street,
Omaha 2, Nebraska.

FOR SALE

1956 MODEL B. TOURNAPULL
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Write Schultz Machinery Co.
Bismarck, N. Dak. Box 868

For Sale: 42"x16' Diamond Apron Rock Feeder powered with GE 25 H.P. Vert-Drive, used only three weeks. Allis-Chalmers 8"x8" model CWG-11 solids pump still in original crate. Eagle single compartment sand tank with hydraulic controls, new, never used. Three Euclid model 27 FD trucks.

Oscar J. Mortenson
Cascade, Mont. Phone 8-5581

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Equipment from heavy
construction project. Soon
available for sale at bargain
prices. List available.

Mason & Hanger-Rolandi

P. O. Box 518
Crockett, California

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Cedar Rapids Master Tandem, with Caterpillar D-17000 Power Unit, completely portable with towing dollies. Tires in good condition. 40" x 20" Rolls; 1036 Jaws; 12' x 4' Double Deck Screen; 24" x 36" Return Conveyor; 24" x 22" Return Conveyor; 30" x 40' Feed Conveyor; 24" x 46' Delivery Conveyor; 18" x 30' Fines Conveyor; 24" x 48" Reciprocating Feeder; Air Brakes; Plant and Power Unit recently reconditioned. All new manganese; all Drives and Conveyor Rolls in good condition—ready to go to work. See it and buy it.

KEREMI TRACTOR AND EQUIPMENT CO.

Box 908 Phone 8-8922
Cheyenne, Wyo.

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A. P. JOHNSTON CO., INC.
845 E. 57th St., Los Angeles 58

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Sidewalk Superintendents Day

One of the problems of city construction work is that as the depth of the excavation increases the number of on-lookers also increases. In sufficient numbers they are a real nuisance as they will clutter the landscape with orange peels and paper wads, increase the weight of the overburden surrounding the excavation, and contradict the superintendent's orders. Mixed with concrete they create intolerable voids.

If you erect a big wooden fence to keep them out they'll drill holes in it and write colorful words on it. Besides, they complain more noisily if they can't see what's going on.

Haas and Haynie, general contractors on the \$10,000,000, twenty-story Crown Zellerbach building now under construction in San Francisco, have hatched a plan to handle the problem which we heartily applaud. Their letter is self-explanatory:

DEAR SIR:

Enclosed is your Honorary Press Membership Card in the first official San Francisco Sidewalk Superintendents Club. Please feel free to use your membership at any time by dropping into the club facilities at the site of the new Crown Zellerbach Building, where full privileges will be accorded you.

We would be especially pleased to have you present at the opening of the new Club House at 12 noon, Thursday, September 5, 1957. The "Club House" consists of 100-seat bleachers, and at that time they will be officially opened.

Mayor George Christopher and Crown Zellerbach's president, Mr. A. B. Layton, will be present to receive Honorary Charter Life Membership Cards, as will other civic and business leaders of the community.

To honor San Francisco citizens who satisfy an inner urge to encourage progress by spending varying parts of their lives looking into deep excavations, the

Board of Supervisors has, by proclamation, declared Thursday "SIDEWALK SUPERINTENDENTS DAY."

Sincerely yours,

Ted Palmer
Public Relations
Haas and Haynie Corp.
General Contractors.

Remember the old days?

The American Society for Engineering Education and the Midwest College Placement Association have joined to prepare a new "code of ethics" on Recruiting Practices and Procedures.

The code says—in effect—that industry, colleges, and students must especially seek to be prompt, businesslike, and honest in their placement activities because of the temptations of today's keen demands for graduates.

Employers should avoid "elaborate entertainment and overselling." There should be no "special payments, gifts, bonuses, or other inducements," nor should there be reward for a third party who may prevail upon a student to accept an employment offer.

On their side, students "should not hoard or collect job offers." When a student accepts an offer he should let other prospective employers know his decision and he should not accept additional interviews. Students invited to visit plants or company headquarters should decline unless "sincerely interested" in working for the company, and their expense sheets for such trips should include only expenses directly concerned.

The colleges can help, says the new report, by encouraging both students and interviewers to be businesslike, by discouraging "indiscriminate shopping," by competently advising (but not "un-

duly influencing") students, and giving interviewers complete information about graduating students.

Copies of the "code of ethics," available from the Secretary of the American Society for Engineering Education, University of Illinois, Urbana for 25c.

Traffic plan has bugs

Attracted by lights of a bridge spanning the Mississippi at La Crosse, Wis., a cloud of flying insects enveloped one night last July. Because of the rigidity of the structure many of the creatures lost their lives. The surface of the roadway quickly became very unpleasant and automobiles began slipping around and bumping into each other in an unseemly manner, eventually requiring that the bridge be closed for a few hours. We tell you this story simply to remind you that despite all the trouble breaks you've had on your project, everything has not yet happened, and you must take the proper steps at once to be prepared.

The trouble at the bridge was the result of somebody forgetting to turn on the lights, a very important thing to do on certain summer nights along the upper Mississippi. Sometimes swarms of the bugs, called "fish flies" by the natives who inhabit the region, descend upon whole towns and leave it a fearful mess in the morning. Street sweeping machines are called out and broom the bugs into 5-ft. high piles so that they can be loaded into trucks with front-end loaders. This may sound fantastic but can be proven easily by spending a summer in the Midwest.

Nature has other bizarre tricks to play on you. In Pennsylvania a couple of months ago on a construction job lightning struck an exposed reinforcing bar on a section of newly laid pavement. About 2,000 tons of concrete and 15 tons of steel were damaged and 11 holes were torn in the 9-in. pavement.

Such freak occurrences are almost always damaging but occasionally something beneficial happens. Early this summer, in Cowlitz County, Washington, 8 mi. west of Longview, the whole face of a cliff collapsed and came to rest next to the crushing plant in the county gravel pit. The quantity was estimated at 80,000 cu. yd. The last time the county freed that much rock it cost \$14,000 for blasting.

You just never know.

Wants a specimen

Somebody who claimed to be a potential advertiser recently wrote to us asking for "a specimen of the magazine." We rolled up the September issue and mailed it to him in a bottle.

... The Editor