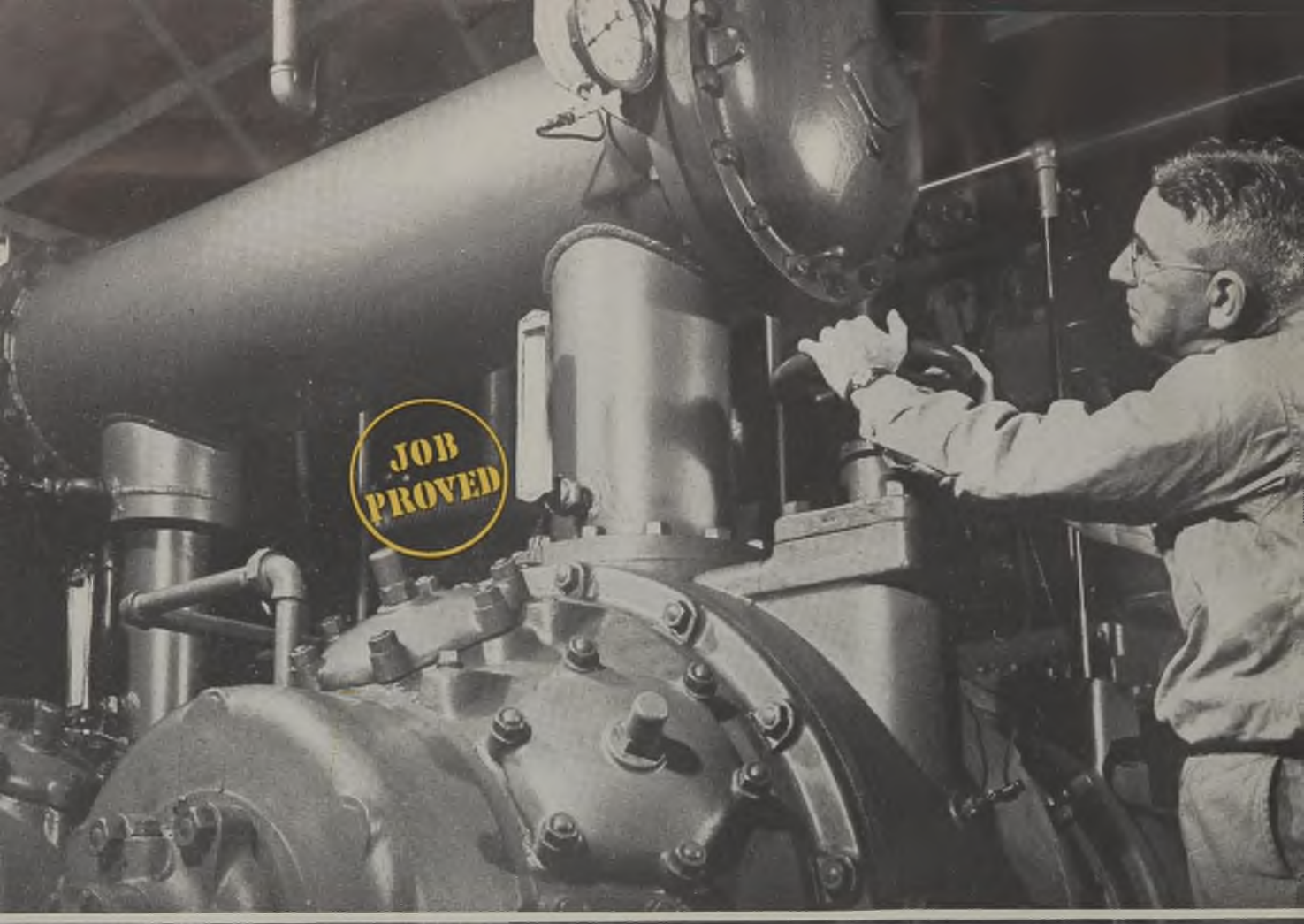
Coal Age

SEPTEMBER, 1946

★ NATURAL GAS . . . . p. 72



20,010 HOURS OF *Trouble-Free* OPERATION

SUN LUBRICANT . . .

Keeps 400-H.P. Compressor Running 24 Hours a Day for Almost Three Years without Apparent Wear

This big compressor, lubricated exclusively with Sun oil, supplied air 24 hours a day for almost three years.

After 20,010 hours of operation, the compressor was disassembled for the first time. No wear was apparent in cylinders No rings were stuck. No parts had to be replaced There was no hard, flinty carbon. There were no gummy deposits on valves.

This record is the kind which "Job-Proved" Sun products have hung up in dozens of mines, on loaders, conveyors, drag-lines, hoists, compressors, cars, locomotives. Throughout America's coal-producing areas you will find Sun mine lubricants proving themselves on the job.

The Sun Engineers near you know coal mining and can specify lubricants for every type of machine or mine condition. To produce more . . . to keep machines running longer . . . at less cost . . . call in these men for down-to-earth help and advice.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUN
SUNOCO
INDUSTRIAL PRODUCTS

Photo courtesy U. S. Bureau of Reclamation

That's no place for a tool to strangle

A typical example of B. F. Goodrich improvement in rubber

THEY'RE drilling holes for dynamite charges, to blast out rock for a dam. It's no cinch to lug a heavy air hammer up that cliff. Too many times it had to be promptly carried down again — the tool had choked to death.

Oil in the compressor sprayed out into the air hose. Oil destroys rubber. Particles of rubber came loose, flew up into the air hammer, finally choked and ruined it.

B. F. Goodrich engineers who had designed and made hundreds of kinds of better hose, set out to find the answer to this problem. They worked on a new "recipe" for rubber, and by adding, subtracting, changing proportions, they finally found a rubber that would not only have high resistance to oil, would not flake off to choke tools, and yet had the flexibility needed for air hose.

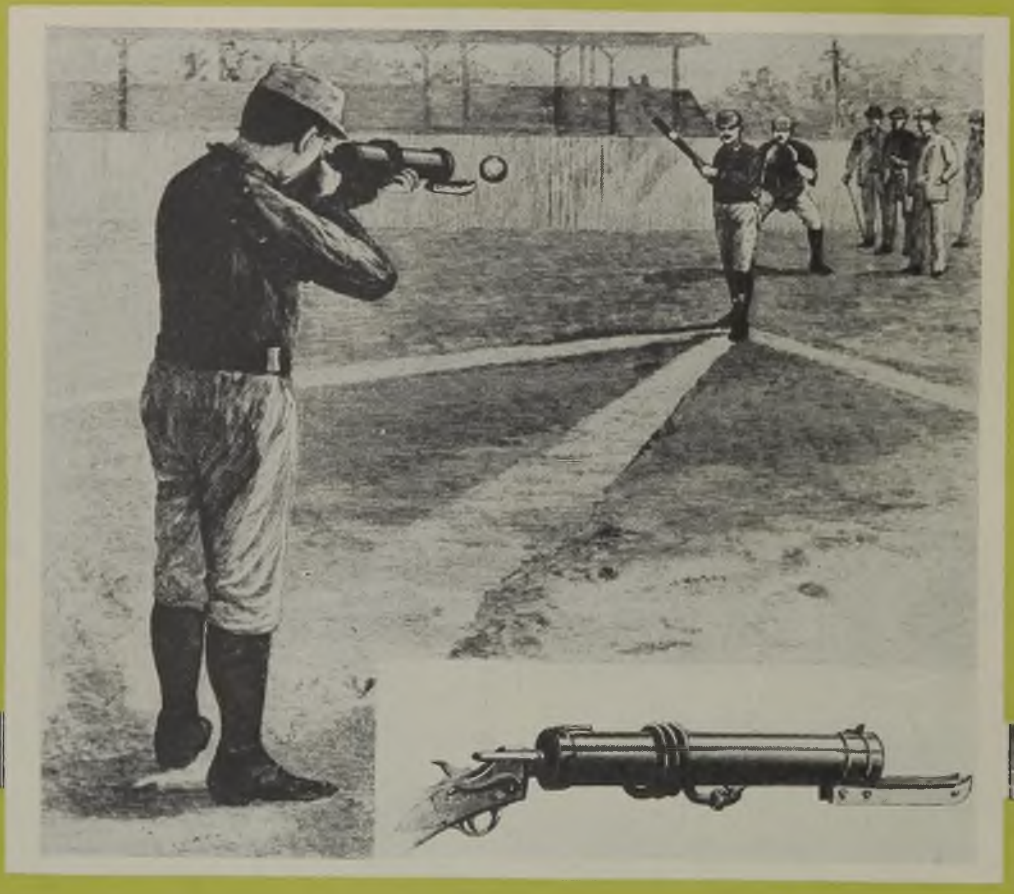
Hose lined with this new rubber was made and put to work. On jobs where hose had had to be changed in weeks to save tools, this new B. F. Goodrich hose lasted months, even years. The development was just in time to save money and trouble on big jobs such as Shasta, where 57 miles of BFG hose was used.

Development work like this goes on constantly at B. F. Goodrich to improve every product. That's why you're sure of better values in rubber when you specify B. F. Goodrich to your distributor. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

First in its Field....



THE FIRST *(and last)* BASEBALL GUN TO SHOOT A CURVED BALL!

This battery-operated electrical device for delivering a curved ball was invented by Professor C. H. Hinton and used on the Princeton Ball Grounds June 8-10, 1897. However, it never could replace the human skill needed to throw a curve. This feat was first accomplished by Pitcher Arthur Cummings, in 1866, who played on the Stars of Brooklyn, some 27 years after the invention of the game of Baseball by Colonel Abner Doubleday.

No sir — like the hand-pitched curved ball — there are many things you can't improve on. Take GREASE for properly lubricating coal mining equipment. No one has ever been able to improve on, or equal, HULBURT QUALITY GREASE, plus down-in-the-mine service of HULBURT LUBRICATION ENGINEERS. If your mining machinery has "two strikes" on it due to faulty lubrication — get smooth running with HULBURT QUALITY GREASE.

HULBURT OIL & GREASE COMPANY — PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

...a record of

American Leadership

HULBURT

THE
"FIRST NAME"
IN

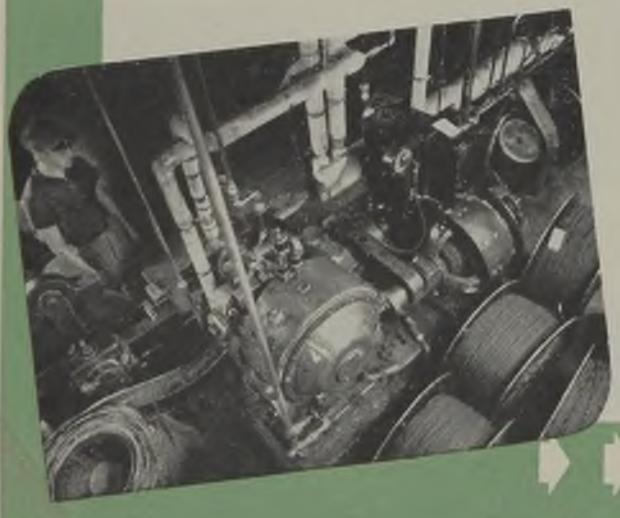
Quality

GREASE

How these tests at Wilkes-Barre PAY OFF FOR YOU

LONG, TROUBLE-FREE LIFE with your insulated wires and cables starts with the type of raw materials that go into their manufacture. So Hazard checks and tests rubber, synthetics and plastics, cotton, metals, jute. Every item received must first pass thorough laboratory tests for electrical characteristics, aging qualities, uniformity, mechanical strength, etc., before release to the production department.

Tests... tests . . . and more tests! Hazard checks raw materials . . . manufacturing operations . . . every finished product — all to eliminate the possibility of dangerous and costly wire and cable failure in *your mine*. Come war, come peace, come shortages or abundances of materials — you can select Hazard insulated wires and cables with complete confidence always. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.



CABLE UNIFORMITY AND STABILITY are rigidly controlled through every critical step in manufacture by sensitive gauges and instruments that control temperature, pressure, dimensions . . . that continuously measure electrical strength of the insulation and stop machinery instantly if the slightest change develops.

A TRIPLE-CHECK IS YOUR PERFORMANCE INSURANCE. In addition to all the tests and checks made of raw materials and production operations, every inch of every Hazard wire or cable when completed, must stand up under an electrical pressure test far above what ever could normally be expected in service.

HAZARD

insulated wires and cables for every mining use

4690

Coal Age

Alfred M. Staehle, *Publisher*

IVAN A. GIVEN, *Editor*

R. Dawson Hall — J. H. Edwards

R. R. Richart — W. A. Stanbury, Jr.

W. H. McNeal

H. Roan, *Art Director*

F. A. Zimmerli, *Associate*

Donald D. Hogate, *Washington*

H. R. Mathias, *Sales Manager*

World News offices: London, Paris Berlin, Moscow, Prague, Shanghai, Bombay, Mexico City.

A McGRAW-HILL PUBLICATION

COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address.

Subscription rates: United States and possessions, $3 for one year, $4 for two years, $5 for three years. Canada, $4 for one year, $6 for two years, $8 for three years. Pan American countries, $6 for one year, $10 for two years, $12 for three years. All other countries, $15 for one year, $30 for three years. Single copies, 35 cents each. Entered as second class matter Oct. 14, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in the U. S. A. Cable Address: "McGraw-Hill N. Y." Member A.B.P. Member A.B.C. Please indicate position and company connection on all subscription orders.

•

Return Postage Guaranteed

JAMES H. McGRAW
Founder and Honorary Chairman

JAMES H. McGRAW, JR.
President

CURTIS W. McGRAW
Senior Vice President and Treasurer

JOSEPH A. GERARDI
Secretary

NELSON BOND
Director of Advertising

EUGENE DUFFIELD
Editorial Assistant to the President

J. E. BLACKBURN, JR.
Director of Circulation

Publication office, 99-129 North Broadway, Albany 1, N. Y. Editorial and executive offices, 330 W. 42d St., New York 18, N. Y. Branch offices: 520 North Michigan Ave., Chicago 11; 68 Post St., San Francisco, 4; Aldwych House, Aldwych, London, W.C. 2; Washington, 4; Philadelphia, 2; Cleveland, 15; Detroit, 26; St. Louis, 1; Boston, 16; Atlanta, 3; Los Angeles, 14; 738-9 Oliver Bldg., Pittsburgh, 22.

All communications about subscriptions should be addressed to the Director of Circulation, Coal Age, 99-129 North Broadway, Albany 1, N. Y., or 330 West 42d St., New York 18, N. Y.

District Managers: T. E. Alcorn and F. W. Roets, New York; W. A. Potter, Philadelphia; W. M. Spears, Cleveland; W. S. Drake, Pittsburgh; S. J. Alling, Chicago; C. J. Coash, St. Louis.

CONTENTS

Volume 51 **SEPTEMBER, 1946** *Number 9*

CHANGE OF ADDRESS

Director of Circulation, COAL AGE,
330 West 42nd St., New York 18, N. Y.

Please change the address of my COAL AGE subscription as follows:

Name .....

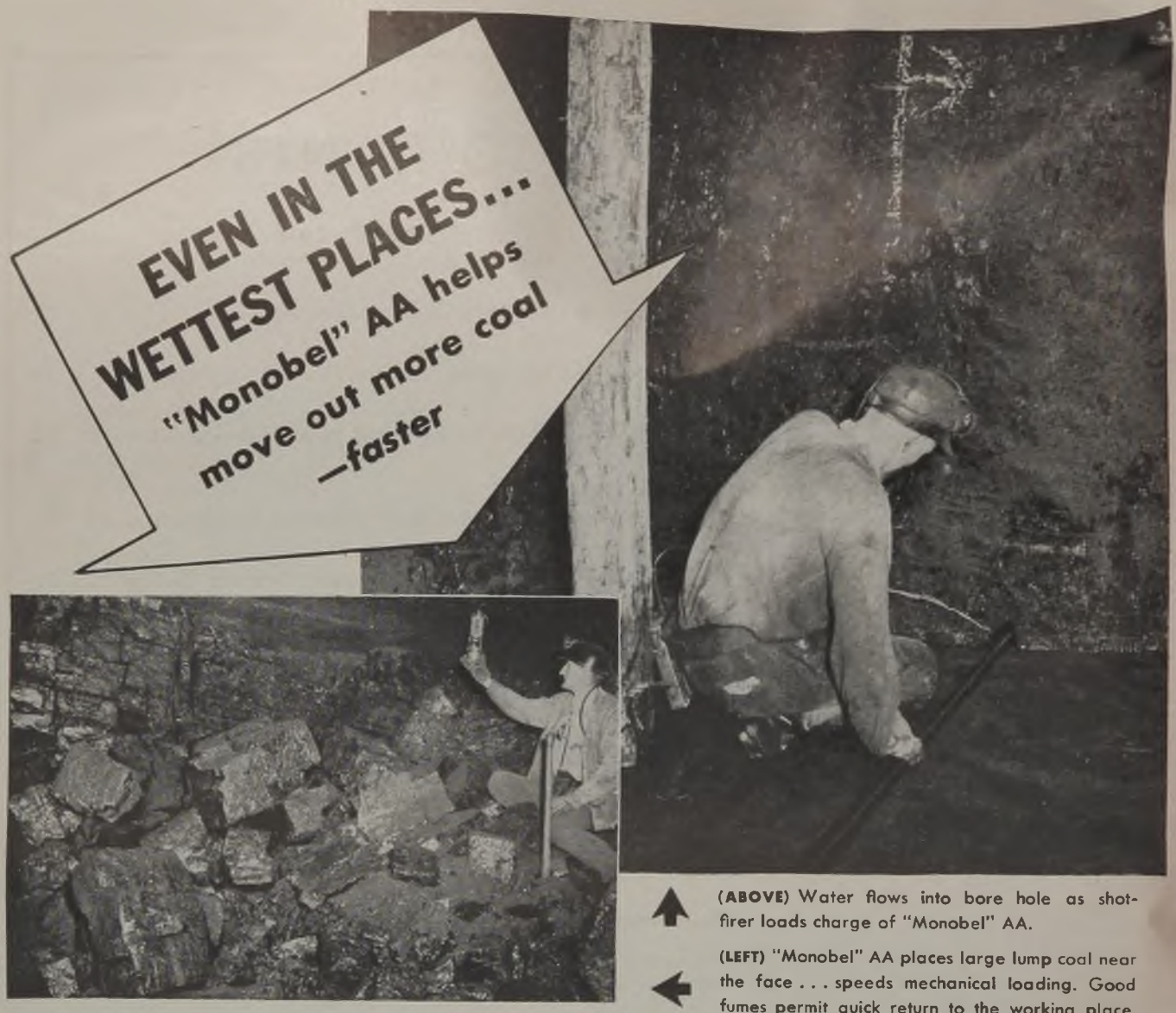
Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....

EVEN IN THE WETTEST PLACES... "Monobel" AA helps move out more coal —faster



(ABOVE) Water flows into bore hole as shot-firer loads charge of "Monobel" AA.

(LEFT) "Monobel" AA places large lump coal near the face . . . speeds mechanical loading. Good fumes permit quick return to the working place.

"MONOBEL" AA resists water and gives you better coal even in extremely wet working places. In many mines, this new permissible—a powerful coal-getter developed by Du Pont research—is shot after it has been loaded and under water for an entire shift!

"Monobel" AA gives you big lump coal right up close to the face. High-speed mechanical loaders can get at it in a hurry. It helps increase percentage recovery. Fumes are Class A, allowing quick return to the working place.

In addition, you get clean, square-sheared ribs and face with "Monobel" AA. Users also report that "Monobel" AA saves them drilling time because frequently fewer holes are required . . . and many have found that it eliminates the need for using two or more permissibles.

In these times, maximum efficiency in getting coal out faster is highly desirable. That is why "Monobel" AA has so rapidly gained in popularity. Today it is one of the best-selling permissibles. Ask any Du Pont Explosives Representative for complete information.

E. I. DU PONT DE NEMOURS & CO. (INC.)
EXPLOSIVES DEPARTMENT
WILMINGTON 98, DELAWARE

DU PONT PERMISSIBLES

Blasting Supplies and Accessories

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

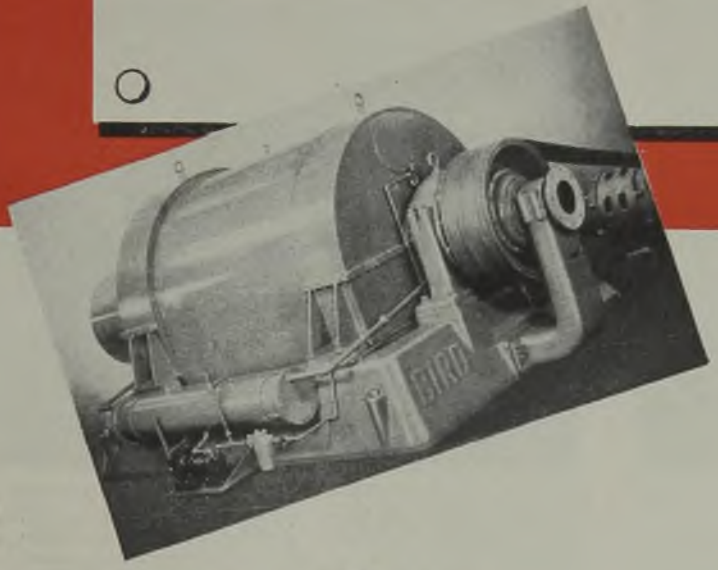
(*Listen to* "CAVALCADE OF AMERICA"—*Monday evenings—NBC*)

NOTICE

TO EVERY OPERATOR WHO WANTS HIS FINE COAL CLEAN AND DRY

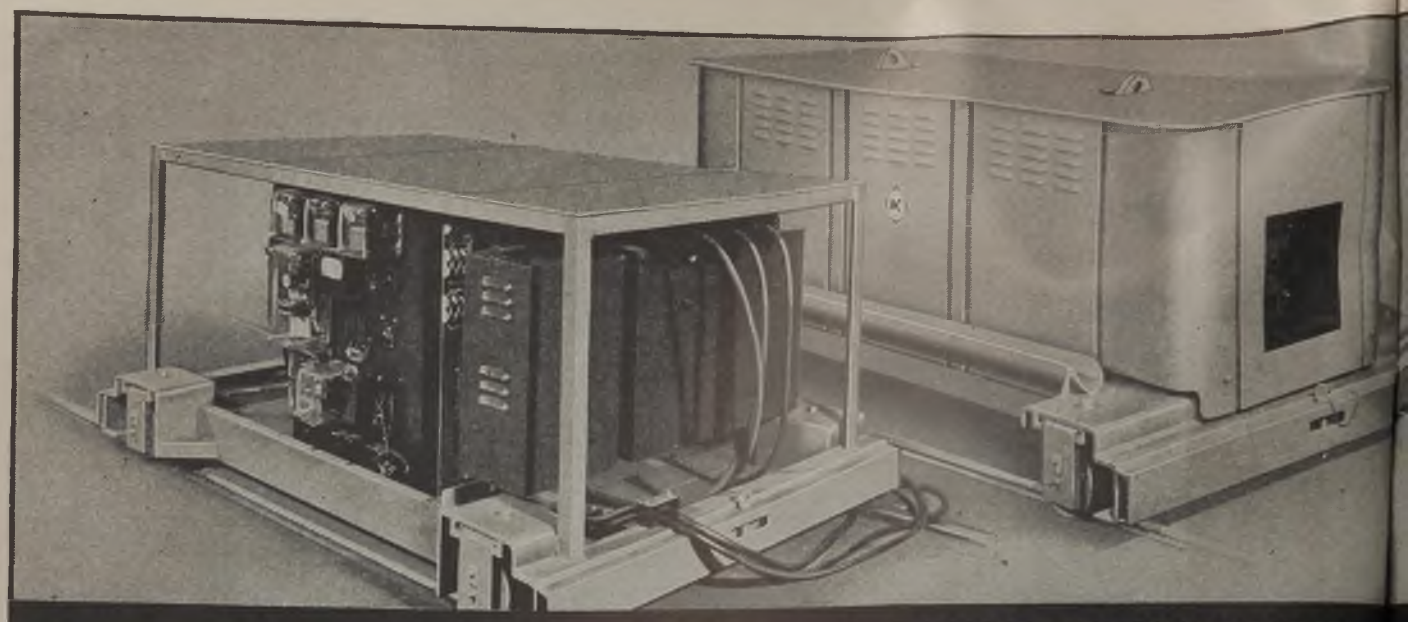
This Bird Continuous Centrifugal Filter takes all fine coal (for example, feed of $-\frac{1}{4}+0$ containing 6 to 8% -200 mesh). It delivers 40 tons or more per hour containing not more than 5% surface moisture. Breakage is negligible.

It operates continuously for months without a shutdown for repairs or replacements. Over-all costs are exceedingly low.



Why not find out all about this unit and how nicely it fits into your cleaning system. Get in touch with Bird Machine Co., South Walpole, Mass.

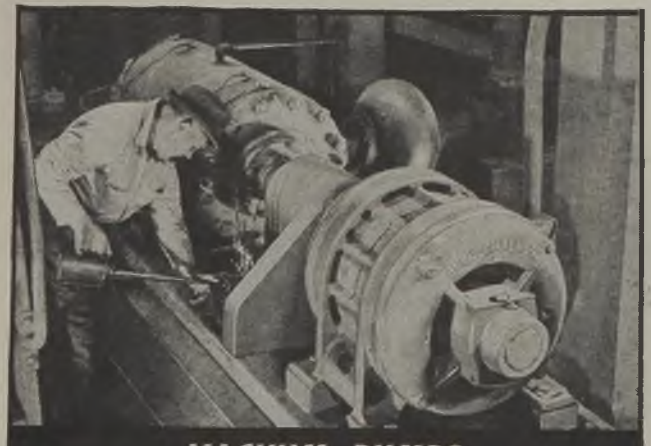
The BIRD *Continuous Centrifugal* **FILTER**



A-C TO D-C POWER CONVERSION

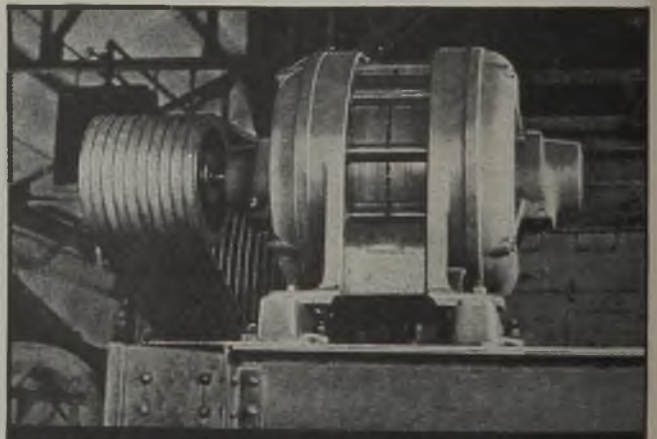
PUT POWER RIGHT WHERE YOU NEED IT MOST! Mobile a-c to d-c power conversion boosts face voltage, can result in as much as a *10% increase in output per man* on cutting crews! The Allis-Chalmers portable 3-car Excitron Unit Substation provides service continuity . . . assures a *steady, dependable* source of power at load centers underground. The complete Excitron unit consists of an a-c car equipped with a 2300 or 4000 volt air circuit breaker, a rectifier transformer car designed to eliminate strain on core and coils, and a d-c car with rectifier tube heat exchanger, control panel, and auxiliaries.

Recommended . . .



VACUUM PUMPS

ROTARY VACUUM PUMPS are being used increasingly with vacuum filters in coal preparation and cleaning plants. Installation shown above is a compact Allis-Chalmers Type WS single-stage unit rated 1590 cfm at 26 hg, direct-connected to filter. Rotary pump has very economical, non-pulsating operation . . . requires no cushioning device . . . *handles more air at less cost!* BULLETIN B6211.

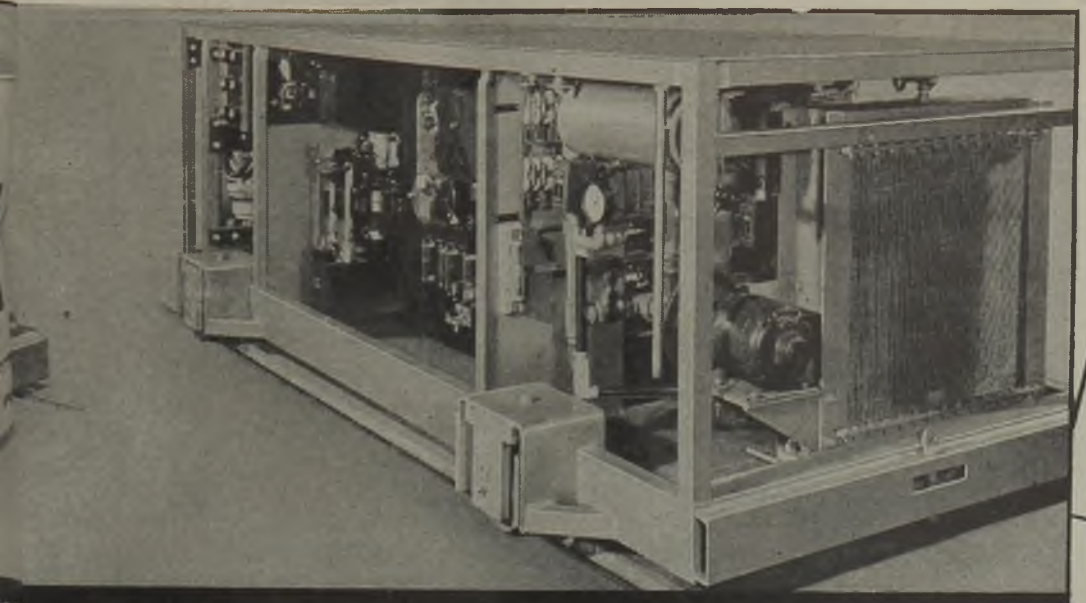


POWER EQUIPMENT

ALLIS-CHALMERS MOTORS AND TEXROPE DRIVES are a combination that will deliver efficient, *dependable* power . . . despite tough operating conditions. Totally enclosed, fan-cooled Allis-Chalmers motors may be obtained for particularly dusty, gritty locations. Tough Super-7 v-belts resist wear, essentially eliminate the possibility of belt failure. BULLETINS B6052F AND B6051F.

ALLIS CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products



3-CAR MOBILE MINE UNIT

One of a Series of Buying Guides for Coal Operators

Excitron is an all-automatic power conversion unit that saves copper and power . . . is capable of carrying loads of 150% for two hours. It's furnished with modern protective equipment for highest safety standards, and can be obtained with either open or enclosed construction, as shown above. Base construction of cars provides for adjustment to various track gauges.

Simple . . . Flexible . . . Foolproof — the Allis-Chalmers mobile Excitron Unit Substation is built ruggedly for long, trouble-free service . . . will give you compact power that keeps face voltages up — resulting in substantially reduced production costs.

by Coal Experts!

PROCESSING EQUIPMENT

HIGHER COAL DEWATERING EFFICIENCIES can be obtained with the Allis-Chalmers End-Tensioned Deck on Low-Head or Ripl-Flo vibrating screens. *Longitudinal* tensioning of screen surfaces results in coal being distributed *evenly* over *all* of the screening area. You get better dewatering efficiency . . . greater economy . . . increased capacity. Send for BULLETIN B6321.

ALLIS-CHALMERS EXAMINES EQUIPMENT PROBLEMS FROM AN INDUSTRY ANGLE

WHEN YOU CALL IN an "Allis-Chalmers man" you get the practical helpfulness of a *coal expert* who knows just how and where Allis-Chalmers equipment can help increase tonnage and cut costs. He understands *your* equipment problems. What's more, he has an *industry*-conscious organization behind him.

Yes, working with your Allis-Chalmers man is a group of coal industry specialists who are continuously working on a long-range program of product development and improvement. Many Allis-Chalmers products have been engineered and developed specifically for the coal industry. Get *expert* equipment recommendations from the A-C representative nearest you. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2074

. . . builds for COAL

Built for a LIFE-LONG Beating

Smacko! When these big dippers bite into the rock bank, shock loads travel from one end of the machine to the other — seeking vulnerable spots that might weaken on repeated impact.

But P&H Electric Shovel construction is shock-proof — built of rolled alloy steels, *all welded*. Far stronger, far tougher, their rigid strength is assured year after year.

Using deep box section construction — the strongest design principle known — such assemblies as boom, carbody and revolving frame are each welded as integral units. This one-piece construction is weave-proof.

It provides maximum shock resistance. Alignment of machinery is permanent.

P&H originated all-welded construction of excavators. This longer and broader experience provides added values in steadier production, less lay-up time, and far lower maintenance cost.

It will pay you to learn about all of P&H's Added Values when you're in the market for an electric shovel.

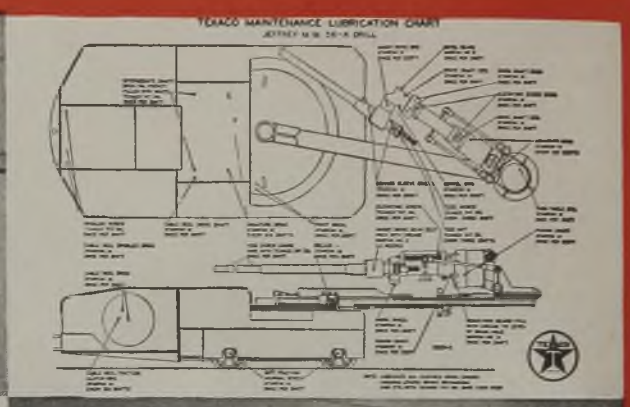
P&H ELECTRIC SHOVELS

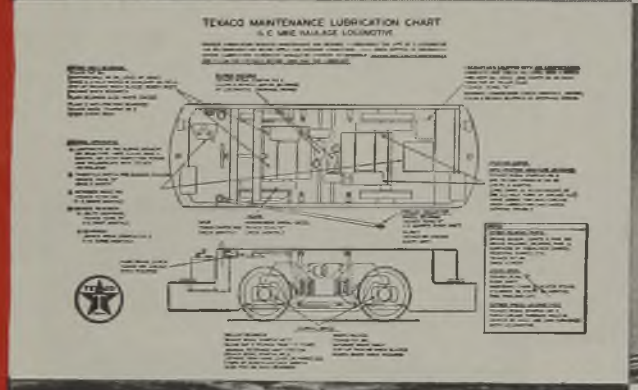
HARNISCHFEGER CORPORATION

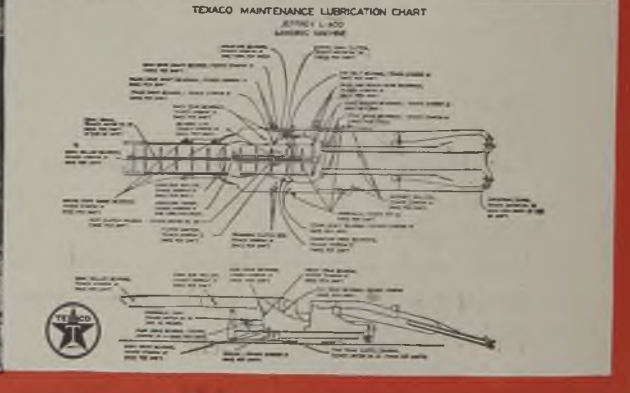
4540 W. National Ave. Milwaukee 14,

LEADING THE WAY IN ELECTRIC SHOV

Increase Tonnage







TUNE IN THE
TEXACO STAR THEATRE
WITH JAMES MELTON
EVERY SUNDAY NIGHT
— CBS

TEXACO

TEXACO LUBRICANTS

... Reduce Costs

WITH EFFECTIVE LUBRICATION

YOU'LL keep your mechanized equipment — old or new — on the job with fewer interruptions . . . get greater tonnage with lower maintenance costs . . . when you use effective lubrication — *Texaco.*

Texaco Regal Starfak, for example, assures longer life and more dependable, trouble-free operation for grease-lubricated ball, roller and plain bearings in all types of mining equipment. Its use increases efficiency, and reduces depreciation and maintenance costs.

Texaco Regal Starfak has very high resistance to oxidation and gum formation, to separation and leakage. It stays in the bearing longer, gives effective protection against high bearing temperatures and washout, promotes easier starting.

For Texaco Products and Lubrication Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, *National Sales Division, Dept. C,* 135 East 42nd Street, New York 17, N. Y.

TEXACO MAINTENANCE LUBRICATION CHARTS. Leading manufacturers of underground mining machinery approve Texaco products for use on cutters, loaders, locomotives, etc., and have cooperated in preparing these charts. Charts show clearly where and when to use the proper Texaco lubricant. Order the charts you need by make and model of each machine.

For the Coal Mining Industry

COAL PREPARATION EFFICIENCY

Mechanized coal mining can achieve full cost saving only when underground preparation is reduced to a minimum or eliminated. With R & S equipment, which integrates the several cleaning processes in one surface plant, run of mine coal can be handled efficiently, all the way from the largest coarse sizes to the fine coal sizes, permitting complete mechanization underground.

This newest and most modern Roberts and Schaefer Coal preparation plant—at the New East Diamond Mine of the West Kentucky Coal Company—is built around R & S Hydro-Separators for coarse coal 6″ x ¼″ and R & S Hydrotators for fine coal ¼″ x 0″. Low cost mechanization underground and efficient coal cleaning on the surface mean additional profits.

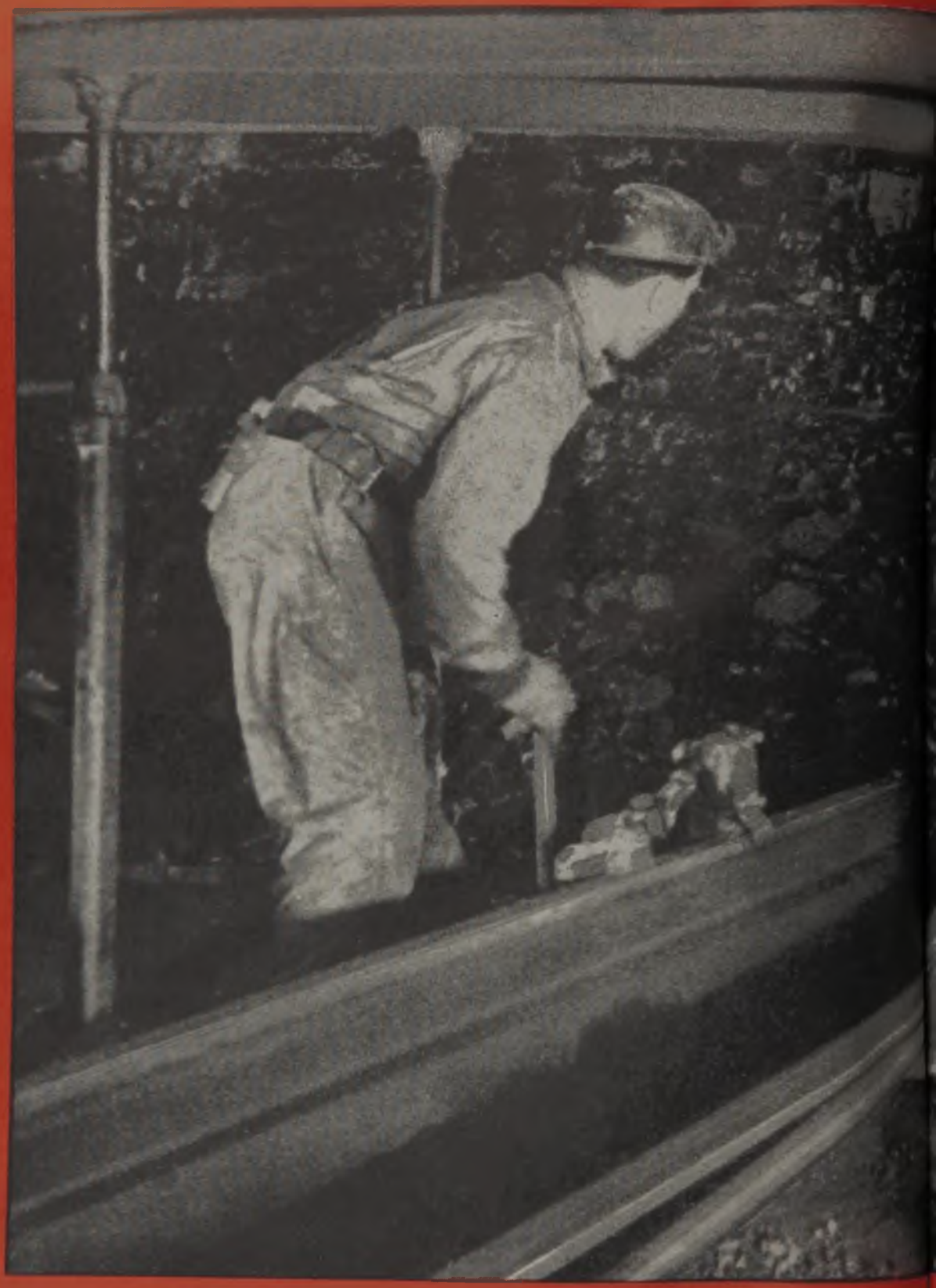
— *Speaks for itself*

ROBERTS and SCHAEFER CO.

305 North Michigan Avenue, Chicago

2221 Oliver Building
PITTSBURGH, 22, PA.

P. O. Box 570
HUNTINGTON, W. VA.



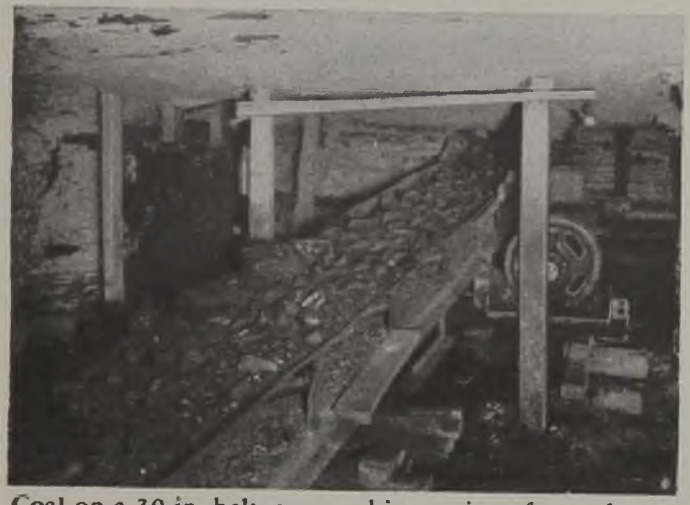
DUCKBILL-SHAKER CONVEYORS

GOODMAN MANUFACTURING COMPANY

Chicago 9, Illinois

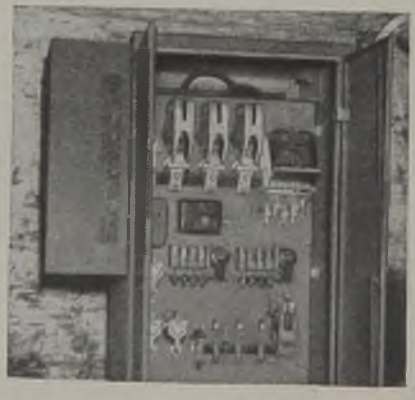
Award Winner ★1944★ MOVES

Diagram shows how a G-E-equipped network of 32-in. and 42-in. belt conveyors serve North Diamond No. 2 over a mile stretch from face to slope belt.



Coal on a 30-in. belt, approaching point of transfer to 42-in. belt line.

G-E wound-rotor motors like the one above drive the main conveyor belts. Typical ratings at 40 hp and higher.



G-E combination starters with full undervoltage and overload protection, control all conveyor motors rated 50-hp and higher.

This G-E rotary switch cannot be actuated until a predetermined belt speed is reached. It assures coordinated conveyor speeds.

5,000 TONS A DAY

... on G-E-protected belt system

Mile-long conveyors at North Diamond No. 2 depend on G-E interlocking drives and controls for high-speed operation without risking coal pile-ups or personnel hazards.

At the North Diamond No. 2 mine in Earlington, Ky. you won't find idle face loaders waiting for conveyor bottlenecks to clear. That's because this efficiency award-winning mine moves coal *fast* — over 5000 tons of it every 24 hours! This calls for high conveyor speeds without confusion, pile-ups, or accidents. All this is made possible by a highly reliable system of G-E conveyor drives and interlocking controls.

From cross-entry belts straight through to slope belt, conveyor operation is tightly co-ordinated. Neither power interruptions, shutdowns for inspection, nor operators' errors can tangle up this system. Here's what G-E interlocking control does:

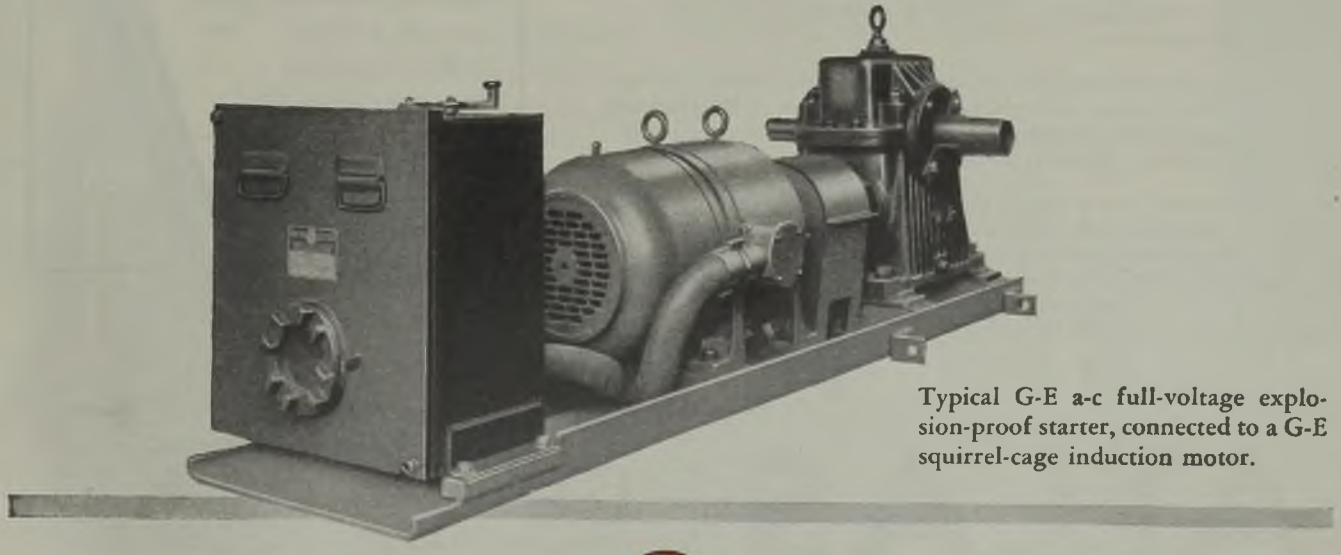
1. It makes every belt start in its proper sequence.
2. It prevents an intermediate belt from starting until the belt preceding it is up to speed.
3. When it stops a belt, it automatically stops all belts feeding it.
4. It reduces spillage possibilities at transfer stations by cutting down belt coasting.

Some of the control developments that made possible these advantages are G-E starters that permit easy motor starting without sacrificing torque, important when belts are fully loaded; G-E relays that respond to control signals over 2500-foot leaps; and a G-E rotary-type switch which precisely times the operation of belt-drive starters.

Greater Safety

Besides the increased output you can expect from G-E interlocking conveyor control, you make more efficient use of power when conveyor motors are prevented from starting all at once. Safety conditions are improved because unexpected restarts are eliminated. Maintenance is less when motors start and operate at the right speeds.

We will be glad to discuss ways and means of applying this new system of conveyor control in your mines. Just call the nearest G-E office. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

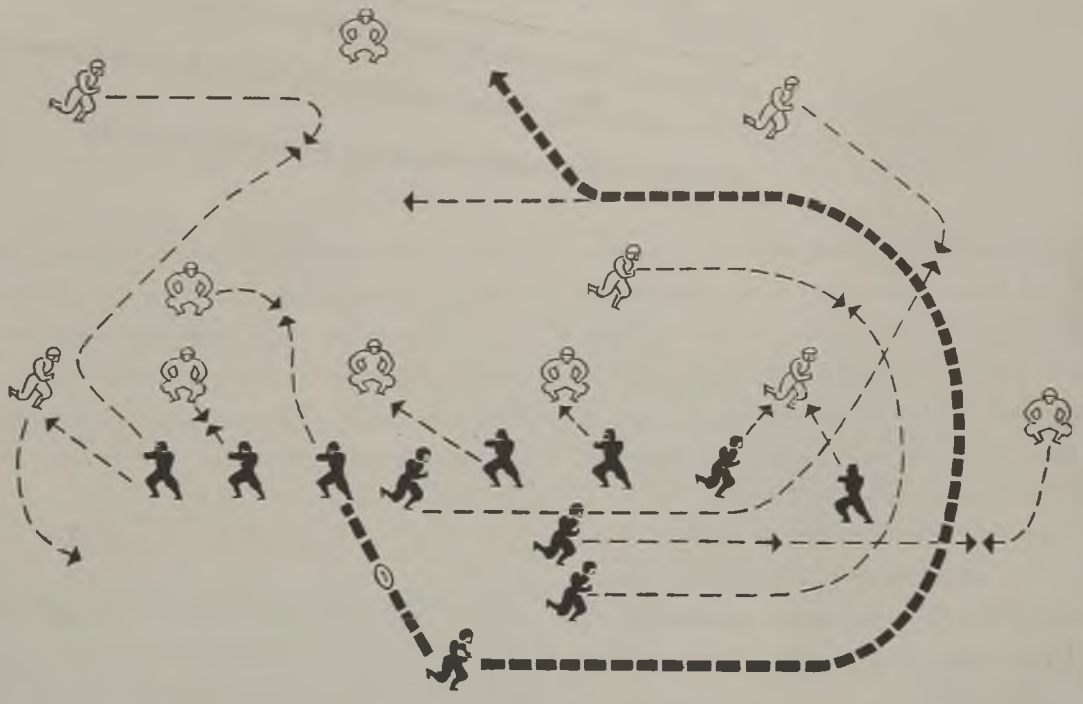


Typical G-E a-c full-voltage explosion-proof starter, connected to a G-E squirrel-cage induction motor.

GENERAL ELECTRIC

657 54-148

In a **ROCKMASTER** Blast . . . In an Off-Tackle Play . . . Precise "TIMING" Pays Off



A winning football play depends on precision timing. The play can be shifted to suit circumstances. It "pays off" with touchdowns.

The precision split-second timing of the new Atlas Rockmaster Blasting System has "paid off" hundreds of users in terms of greatly increased fragmentation, saving dollars through stepped-up shovel efficiency and cutting down on secondary blasting. Furthermore, in many cases it has eliminated complaints about noise and vibration from blasting, even when more holes have been fired by the Rockmaster System. It has helped cut down "backbreak" in quarries and open-pit mining, and saved much of the expense of secondary shooting on the grizzly in underground operations.

The Rockmaster Blasting System, like the football coach's favorite play, is shifted to suit circumstances. All factors in a Rockmaster blast—timing, loading, detonators, explosive and "know-how"—will adapt the system to your own particular job.

The wise football coach knows that the off-tackle play is not the answer to every situation. Likewise, Atlas does not claim that Rockmaster is the answer to every blasting problem. Yet Rockmaster may be able to achieve the same outstanding results for you as it has for many others. For an honest opinion of what Rockmaster can do for you, consult the Atlas Representative.

PLUS THE GREATER SAFETY OF ATLAS MANASITE DETONATORS

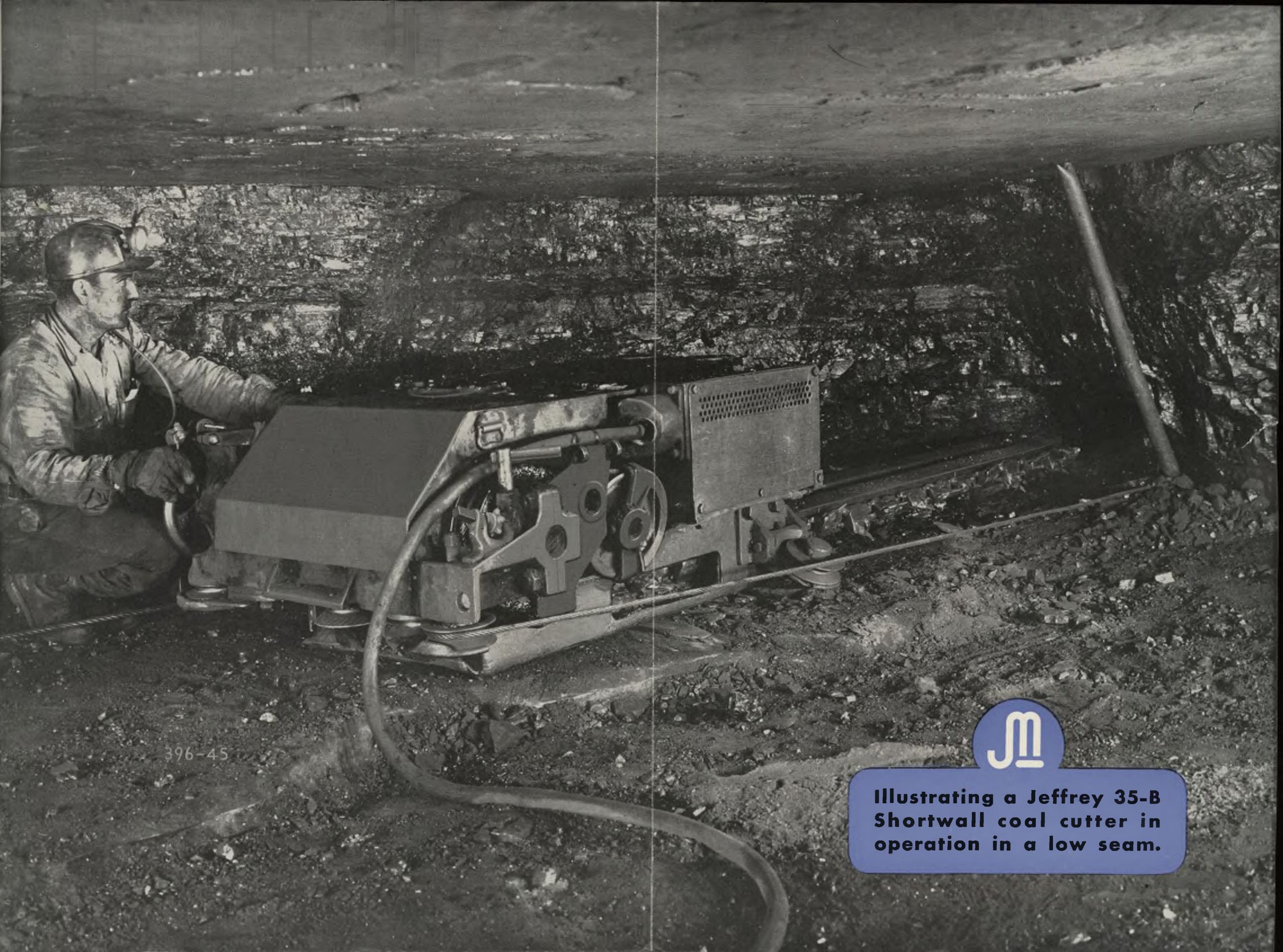
Remember, the Atlas Rockmaster Blasting System also incorporates Atlas Manasite. This means decreased sensitivity to impact and friction . . . no sacrifice of economy . . . less chance of accident!

"ROCKMASTER"—Trade Mark
Manasite: Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES
"Everything for Blasting"

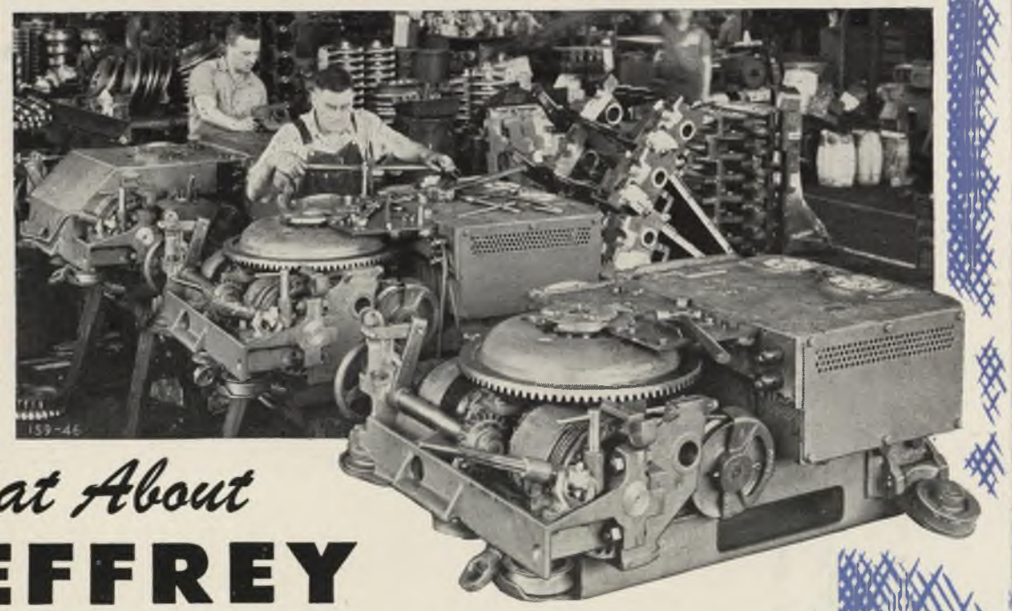
CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*



396-45

Illustrating a Jeffrey 35-B Shortwall coal cutter in operation in a low seam.

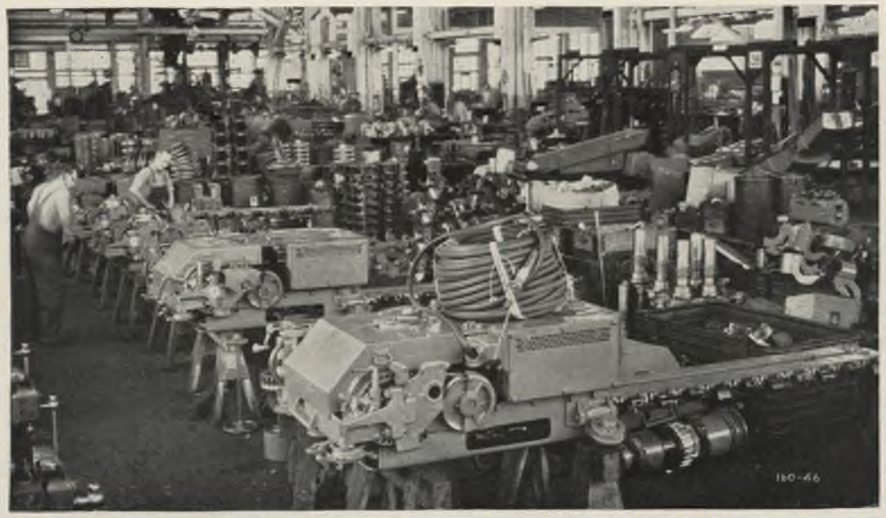


What About JEFFREY 35-B COAL CUTTERS?

● Unfailing performance in the field . . . nothing new about that for we hear those reports often. But behind the many records of efficiency and endurance stand the unfailing performance, too often unsung, of the men who build Jeffrey 35-B coal cutters.

In these photos, showing the progressive assembly of these machines, we emphasize the fact that our employees with long experience and plenty of "know how" follow through—from start to finish—with fine workmanship and careful construction.

Just as our many users take pride in every aspect of Jeffrey performance in the field so do these Jeffrey employees on the 35-B assembly line take pride in the product which enables us to maintain our leadership in coal mine service. "Designed and Built by Jeffrey" is no idle phrase . . . it is your guarantee of the best.



A Study in Progressive Assembly

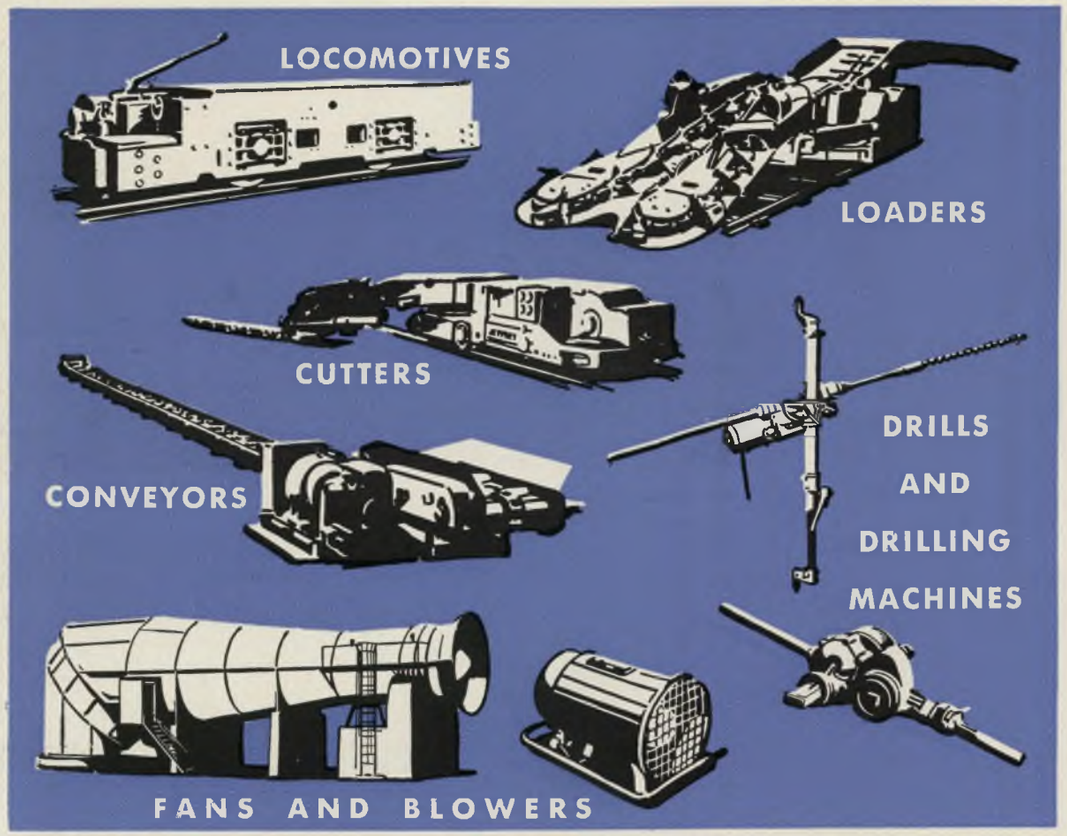
●

FROM TOP TO BOTTOM
Jeffrey 35-B Coal Cutters in various stages of assembly

FROM TOP TO BOTTOM
a fine product

Jeffrey EQUIPMENT FOR COAL MINES

JEFFREY SERVICE TO THE COAL MINES MEANS SERVICE TO ALL INDUSTRY



THE JEFFREY MANUFACTURING COMPANY

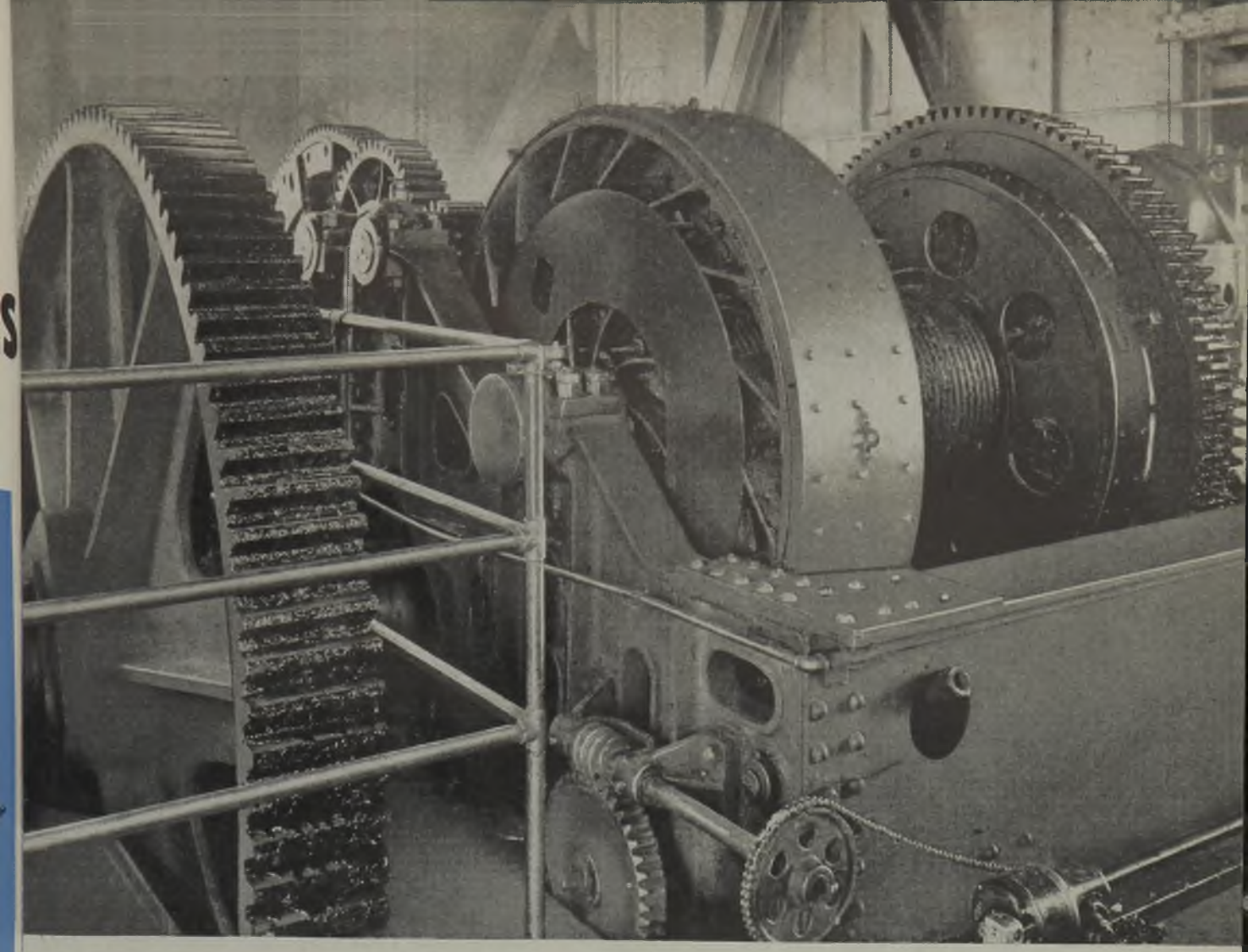
Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond, Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.



Longer life for gears

CALUMET Viscous Lubricants

● Calumet Viscous Lubricants are not the old type of gear shield usually made from residual products of petroleum. They are true greases manufactured from selected oils and special soaps, plus additives, to secure the qualities most needed in a modern gear lubricant.

Calumet Viscous Lubricants give these advantages:

1. *Save time in application.* Because all grades can be applied without heating and all except the heaviest grades can be sprayed, Calumet Viscous Lubricants cut application time to the minimum.

2. *Prevent waste.* Because spraying gives a smooth, even coating of lubricant, it eliminates applying excessively heavy amounts which may drop off before the lubricant is worked into the gears.

3. *Give long-lasting protection.* The additive in Calumet Viscous Lubricants gives them remarkable wetting ability—that is, the ability to adhere closely to metal. This additive prevents throw-off and provides a long-lasting film under ordinary operation; and it also gives a film that resists heat and water.

Let this wear-reducing, time-saving lubricant protect open gears on all shovel and tipple equipment. A Standard Oil Lubrication Engineer will survey your mine and help determine the grades you need and the most economical method of application.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

FACTS YOU SHOULD KNOW ABOUT ELECTRODES

Are you familiar with the mechanical properties of electrodes? . . . Do you know the different types of electrodes for welding cast iron — mild steel—high tensile, low alloy steels . . . which electrode will do the job better, faster — at less cost?

This, and other vital information is all contained in Airco Catalog No. 120. Compiled by leading technicians in the field, this definitive work gives authentic, understandable information on electrodes . . . application, welding procedure, mechanical properties and specifications are thoroughly covered.

Every metal man will find almost daily use for this big, helpful manual. It will save him time, effort and needless worry. It will answer almost any question regarding the proper electrode for welding any particular base metal — for any given type of work.

Send for this valuable, informative guide today! Just fill in the coupon, and mail it to: Air Reduction, General Offices, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, General Offices, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

CA

AIR
REDUCTION
60 E. 42nd Street
New York 17, N. Y.

Please send me a copy of Catalog 120.

Firm_____

Name_____

Address_____

City_____ Zone____ State____

AIRCO AIR REDUCTION

Offices in All Principal Cities

HEADQUARTERS FOR OXYGEN, ACETYLENE, AND OTHER GASES...CARBIDE...GAS WELDING AND CUTTING APPARATUS AND SUPPLIES . . . ARC WELDERS, ELECTRODES AND ACCESSORIES

. . . ROEBLING CABLES!

They're TOUGH—to take abuse day in and day out

They're FLEXIBLE—yet non-kinking, for easy reeling and handling

They're SAFE—to meet vital mining requirements

They're RESISTANT—to heat, water, oils and acids

In both Roebling Mining Machine and Portable Power Cables, the conductors are rope-laid, tinned copper strand, products of Roebling's own modern copper mill. A high grade 40% Performance Type rubber compound provides the insulation. The outer jacket is a tough 60% Performance Type neoprene compound, extra resistant to abrasion because it's lead-mold cured. With these cables on the job, you get peak performance . . . at low cost.

A Roebling engineer will gladly make an on-the-spot survey of your cable problems, help you with valuable pointers on selection and maintenance. Why not profit by this added service? Call him at our nearest branch office.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING PORTABLE POWER CABLES

Roeclad for high abrasion and impact resistance, and Roecable for extra flexibility, both supplied with or without ground wire.

ROEBLING MINING MACHINE CABLES

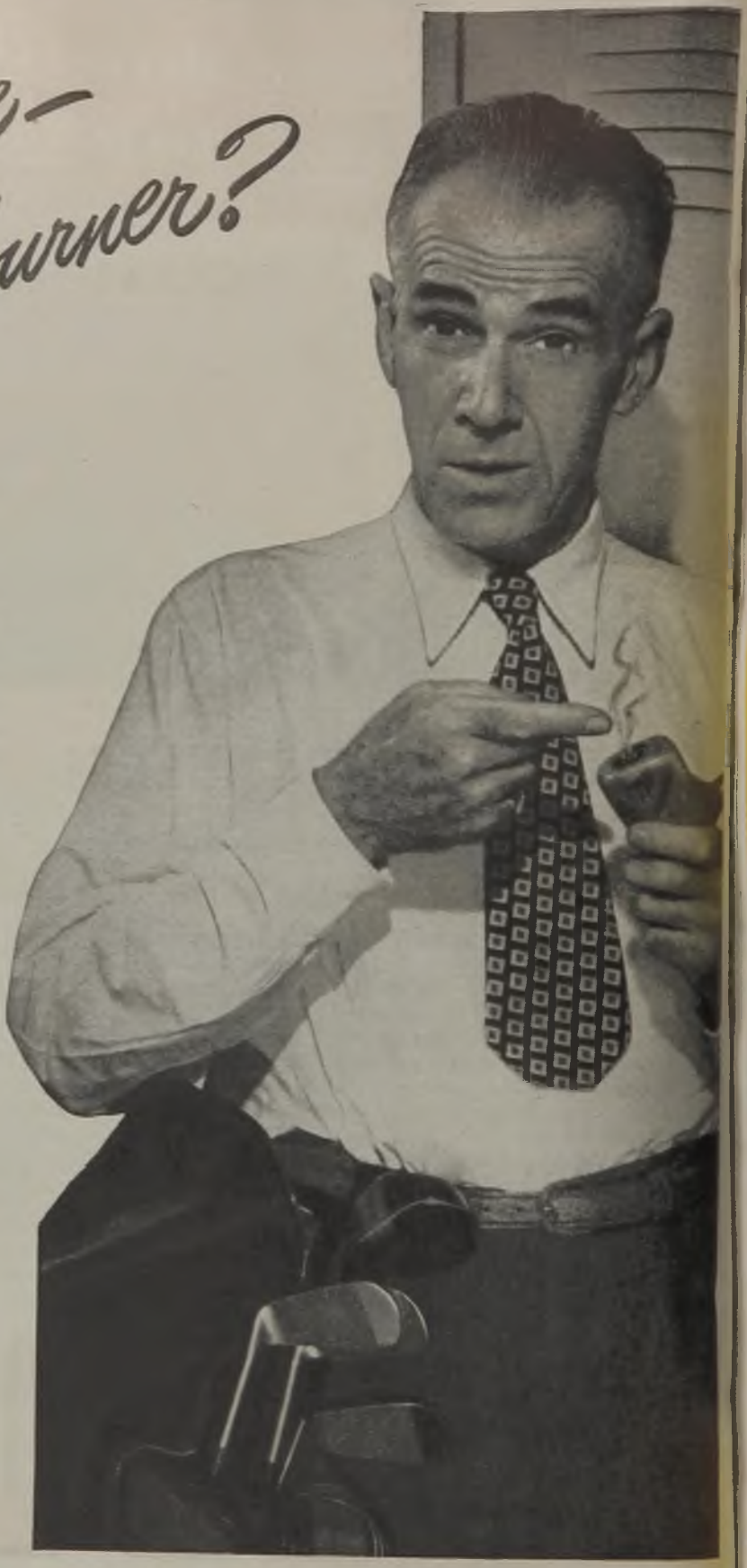
Twin Flat Type with parallel conductors. Also Single Conductor Type specially designed and suitable for mine locomotive reels.

ROEBLING

ELECTRICAL WIRES AND CABLES

WEATHERPROOF WIRE • SERVICE ENTRANCE CABLES • RUBBER AND PLASTIC COVERED WIRES AND CABLES (INCLUDING SMALL DIAMETER INSULATED BUILDING WIRES) • RUBBER SHEATHED PORTABLE CABLES • RUBBER INSULATED POWER CABLES • MAGNET WIRE • TELEPHONE WIRES • PIGTAIL AND BRAIDED COPPER • BARE COPPER STRAND • TROLLEY WIRE • VARNISHED CAMBRIC POWER CABLES

My pipe—a COAL burner?



A MOLDY joke? Not at all. *All* tobacco pipes are COAL burners, in a way. At any rate, the tobacco processing industry in the United States uses *hundreds of thousands of tons* of coal every year.

But what industry doesn't? The food products industries use nearly *twelve million tons* of coal yearly. The textile industry, *eight million tons*. The chemical industries, *twenty million tons*. Automobile plants, *four million tons*.

Every day in the year American industries and American homes use over a *million tons* of coal for steam, power, and heat. That's a lot of coal. But science knows that there are still greater values in coal. More and more coal is being used as raw material for the manufacture of things for comfort and beauty — for food and shelter—for business and pleasure —for almost every human need.

Things ranging from shimmering textiles woven from synthetic fibers to tar paints for waterproofing cellars—from symphonic recordings to plastic printing plates—from mothproofing chemicals to the heady perfumes of beautiful women.

The railroad industry uses about 23 per cent of the nation's annual coal supply—over *one hundred million tons* each year. Chesapeake and Ohio itself is one of the largest users of coal. When you ship via Chesapeake and Ohio, you know your coal is being hauled exclusively by coal burning locomotives.

THE CHESAPEAKE AND OHIO RAILWAY

"The 100% Coal Railroad"

USERS WRITE THE BEST ADS

"There's no comparison between 'Caterpillar' and other manufacturers' equipment. The D7 is the easiest running track-type tractor I've ever run—and I've run them all."

E. S. PATTEN
Sunnyhill Coal Co.

A "Caterpillar" Diesel D13000 Engine powers this Lorain Shovel for Sunnyhill Coal Co. Working 24 hours a day, it loads an average of 2700 tons into the trucks.

"Boy, she's a dandy. Haven't had a bit of trouble with her. She has the power."

CATERPILLAR TRACTOR CO., PEORIA, ILL.

Sunnyhill Coal Co. gets the coal out with "Caterpillar" Diesels. On this strip-mining operation at Imperial, Pa., a "Caterpillar" Diesel D7 Tractor is shown clearing the land, while a "Caterpillar" Diesel D8 pulls a scraper, stripping overburden.

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

SCORING POWER

Gould Kathanode Batteries deliver full power longer

Kathanode powered mine locomotives stay in the game, moving at full speed right up to the closing minutes of each working shift. They will not have to be sent to the side lines because of failing battery power.

THE BATTERY PICKED BY ENGINEERS

And here is the reason why—

Gould introduced, and for 21 years has developed the spun-glass mat. Placed on both sides of each positive plate in the Kathanode battery, these mats hold all useful active material within the grid. There it continues to produce current at 100% or more of the battery's rated capacity.

Kathanode's exclusive construction means more power. Get the facts by writing Dept. 119 for Catalog 200 on Gould Kathanode Batteries for Mine Locomotive Service.

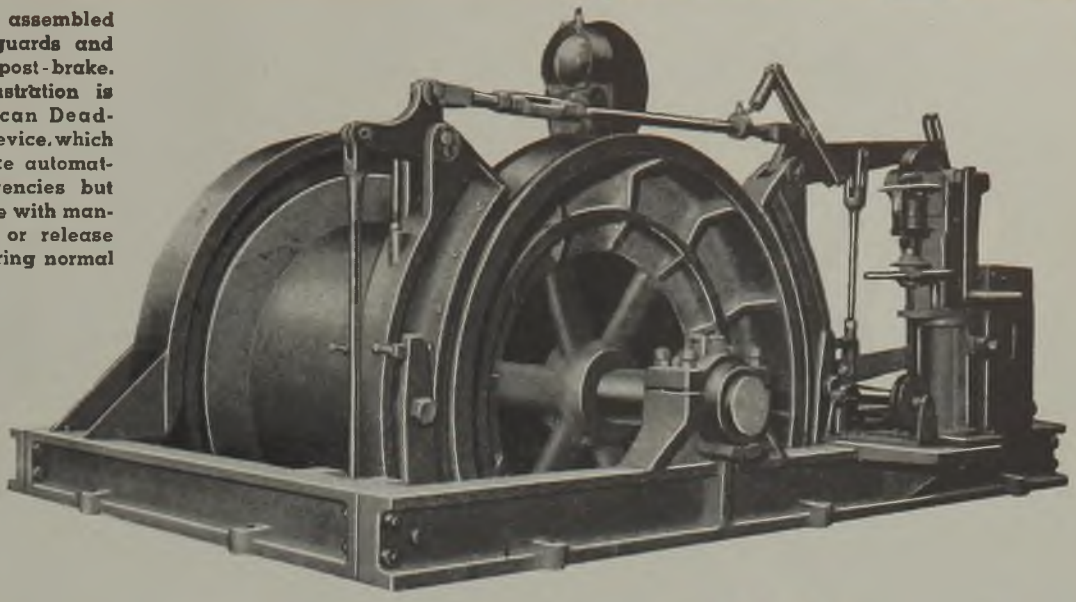
GOULD

LONG LIFE CONSTRUCTION

KATHANODE

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y.
Service Centers: Atlanta • Boston • Buffalo • Chicago • Cincinnati
Cleveland • Detroit • Kansas City • Los Angeles • New York
Philadelphia • Pittsburgh • St. Louis • St. Paul • San Francisco • Seattle

Hoist completely assembled showing gear guards and parallel-motion post-brake. At right of illustration is shown the Vulcan Dead-Weight Safety Device, which applies the brake automatically in emergencies but does not interfere with manual application or release of the brake during normal operation.



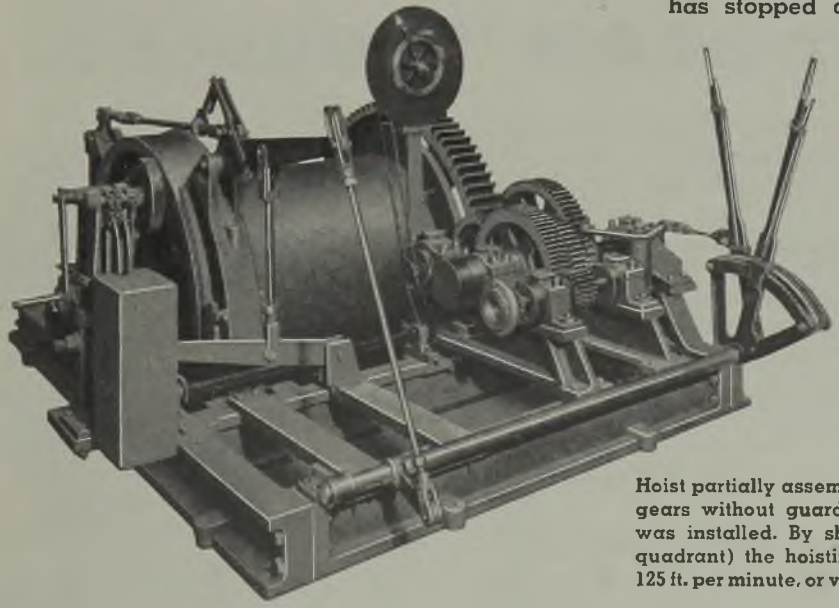
This Modern Two-Speed Slope Hoist

Solved a Two-Load Problem in a West Virginia Mine

The regular working load is not very great — approximately 12,000 lbs. on a maximum grade of 45 percent — but the hoist must also be able to pull out mine locomotives and other heavy equipment weighing as much as 26,000 lbs. To meet this condition with maximum electrical efficiency and minimum initial expense Vulcan furnished the two-speed hoist here illustrated, which not only fulfills all operating requirements but is also equipped with thoroughly-proved safety devices providing automatic protection against power-failure, over-travel and over-speeding in either high or low gear.

Safety equipment includes provision for delaying automatic application of the brake, for any reason, until the upward momentum of the load has stopped and it begins to move backward. Accumulation of slack is thereby prevented — eliminating danger of over-running the rope, or of breaking it if the load falls back rapidly enough to take up the slack with a sudden jerk.

Correspondence regarding any present or prospective requirement for money-saving specially-designed hoists is cordially invited and will receive prompt attention from our experienced engineering executives.



Hoist partially assembled showing double-reduction two-speed gears without guards and before the 65 hp. induction motor was installed. By shifting gears (with lever on right side of quadrant) the hoisting speed can be changed from 500 ft. to 125 ft. per minute, or vice versa, without changing speed of motor.

VULCAN IRON WORKS, Wilkes-Barre, Pa.

Heavy-Duty Electric Hoists
Self-Contained Hoists
Scraper Hoists
Car-Spotting Hoists
Room Hoists

Shaking-Chute Conveyors
Chain Conveyors
Cast-Steel Sheaves and Gears
Cages, Skips and Gunboats
Coal-Preparation Equipment

Steam Locomotives
Diesel Locomotives
geared and electric drive
Gasoline Locomotives
geared and electric drive

Load-Carrying Larries
Rotary Kilns, Coolers and Dryers
Crushing Rolls and Pulverizers
Briquetting Machines
Ball, Rod and Tube Mills

Spring-Cushioned
AGAINST BOOM TROUBLE . . .

Quarries are tough on shovel booms. That's why we made the Heavy-Duty Rock Boom on the new Koehring 605 tough as they come, then added extra protection with the Boom-Guard Shock Absorber.

HERE'S WHAT HAPPENS TO UNPROTECTED BOOMS:

Inevitably, side strains and shock twist unprotected booms. Built-in flexibility snaps them back into shape. But continued twisting eventually fatigues even the strongest steel.

HERE'S WHAT KOEHRING DOES ABOUT IT:

On the Koehring 1½-yard rock shovel, heavy coil springs, one on each side of the boom foot, absorb twisting stresses, cushion out torsional strains.

New 24-page catalog lists other reasons why the Koehring 605 thrives on rock. Get your copy today.

KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN
Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

WITH the coming of the railroads, the western frontiers were conquered. They brought men, implements for building homes and towns, transportation for marketing products. Then factories were built. And industries thrived where railroads paved the way.

In the 13 great states served by Union Pacific, there still is land to be tilled, minerals to be unearthed, livestock to be raised, room for new homes and industrial expansion.

Union Pacific will continue to serve the territory it pioneered, by providing efficient, dependable, safe transportation for shippers over the time-saving Strategic Middle Route.

be Specific – say "Union Pacific"

★ *Union Pacific will gladly furnish confidential information regarding available industrial sites having trackage facilities in the territory it serves. Address Industrial Dept., Union Pacific Railroad, Omaha 2, Nebraska.*

UNION PACIFIC RAILROAD

The Strategic Middle Route

2-CYCLE DIESEL TRACTORS

put more in the Profit Pocket...

take less from the Cost Pocket

FASTER — quick pick-up . . . high working speeds . . . fast maneuvering . . . more yards per shift.

S-M-O-O-T-H-E-R — easier on engine and tractor . . . more time on the job . . . less in the shop.

START INSTANTLY — electric starting and operation on Diesel fuel . . . go to work quicker.

LESS SHIFTING — Maintain high torque over a wide speed range . . . hang-on in tough going . . . less operator fatigue!

The way of all costs is DOWN with Allis-Chalmers 2-Cycle Diesel Tractors . . . the way of PROFITS UP!

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

FOUR 2-CYCLE DIESEL MODELS
HD-7, HD-10, HD-14, HD-14C (Torque Converter)
60 to 132 Drawbar H.P.

For Longest and Best Service...

UPSON-WALTON LAYRITE (PREFORMED) ROPE

WHEREVER installation and maintenance costs are high (and that is practically everywhere) U-W Layrite wire rope can help lower them. And in almost every case where wire rope is used, Layrite will do a better job.

For rotary drilling lines...mining machine ropes...all kinds of earthmoving and excavating machinery...grab buckets, shaft hoists, cargo falls—the instances where Layrite does a better job are as broad as all industry.

Because every single strand in a U-W Layrite rope is *pre*formed to the shape it will take in the rope before it ever comes in contact with another strand, Layrite is a *permanent* rope; it's been constructed to hold its shape until the wires themselves wear out; it is safer and easier to handle . . . consequently it saves valuable time on the job in installation and saves expensive maintenance where shorter-lived rope would require re-rigging.

For best service on any job, specify *U-W Layrite Preformed, Perfection Grade.*

U-W

Established 1871

All Upson-Walton Products Available Through Your Local Upson-Walton Distributor

THE UPSON-WALTON COMPANY

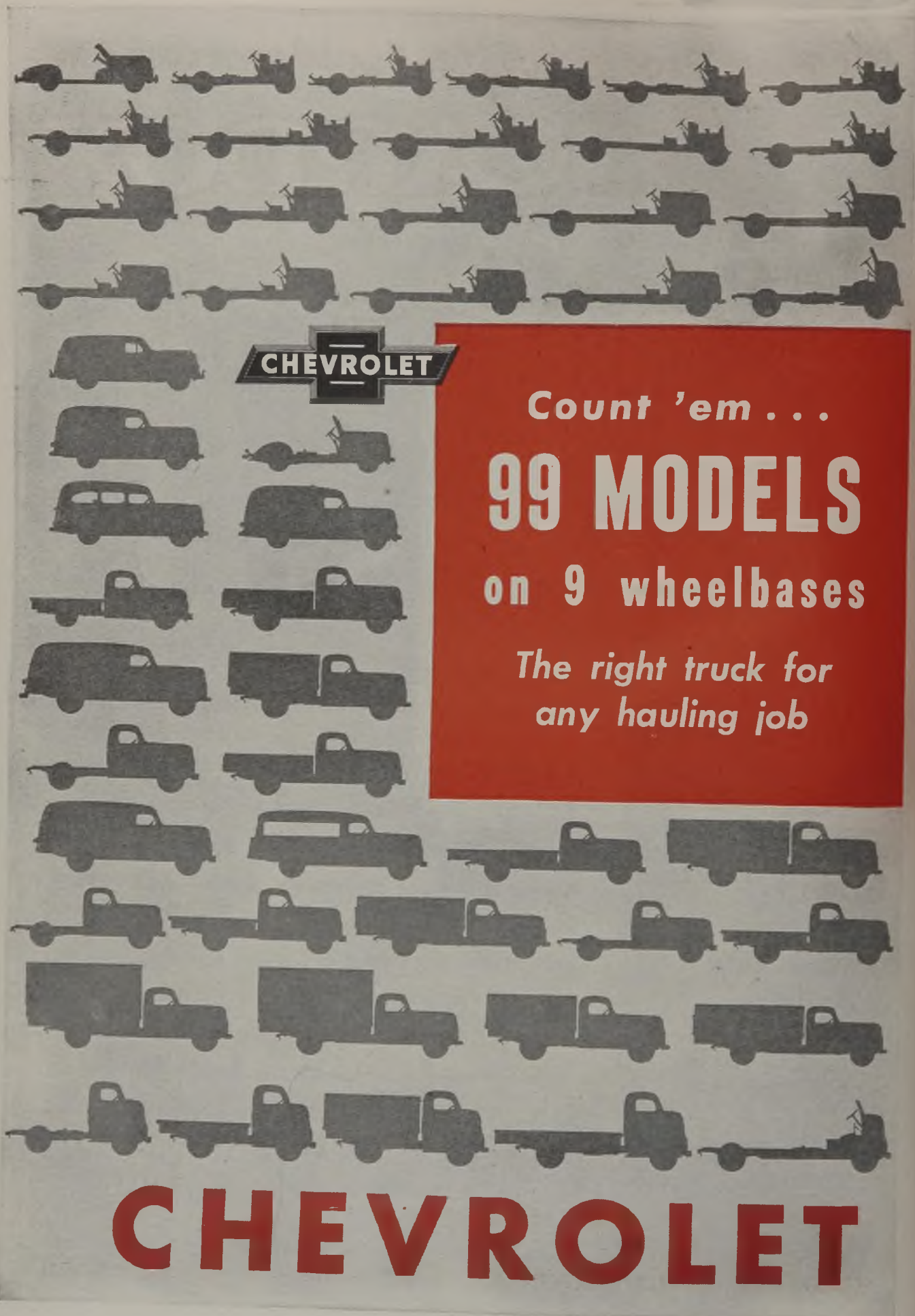
Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

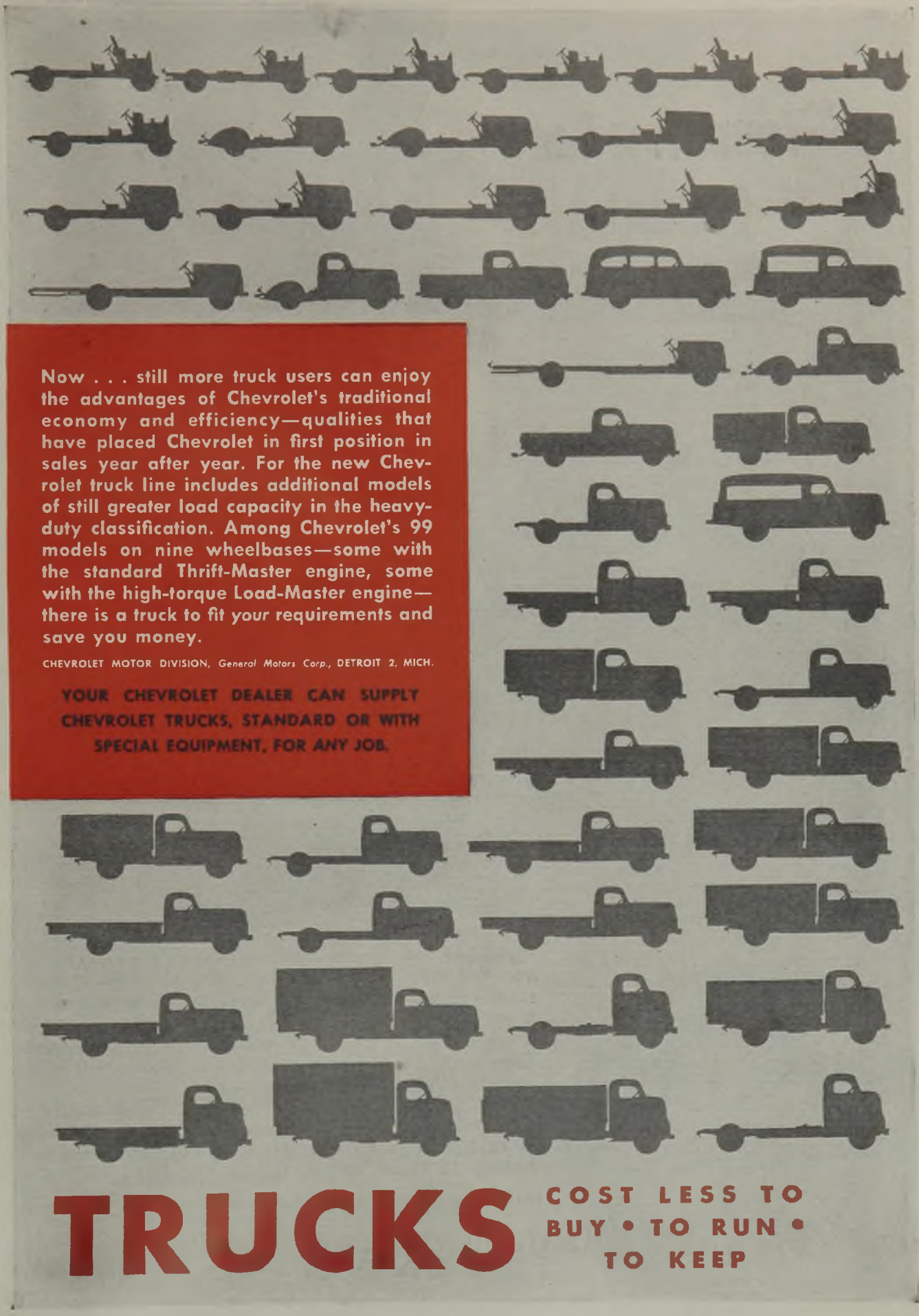
MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

114 Broad Street, New York 4

737 W. Van Buren Street, Chicago 7

241 Oliver Building, Pittsburgh 22


CHEVROLET
Count 'em . . .
99 MODELS
on 9 wheelbases
The right truck for any hauling job
CHEVROLET


Now . . . still more truck users can enjoy the advantages of Chevrolet's traditional economy and efficiency—qualities that have placed Chevrolet in first position in sales year after year. For the new Chevrolet truck line includes additional models of still greater load capacity in the heavy-duty classification. Among Chevrolet's 99 models on nine wheelbases—some with the standard Thrift-Master engine, some with the high-torque Load-Master engine—there is a truck to fit your requirements and save you money.
CHEVROLET MOTOR DIVISION, General Motors Corp., DETROIT 2, MICH.
YOUR CHEVROLET DEALER CAN SUPPLY CHEVROLET TRUCKS, STANDARD OR WITH SPECIAL EQUIPMENT, FOR ANY JOB.
TRUCKS
COST LESS TO BUY • TO RUN • TO KEEP

Your New Car is Coming . . .

How Wire Rope Contributes to it

Automobile factories are working hard to get your new car to you as soon as possible. They use many cranes and hoists which depend on wire rope to transmit power to moving parts. Much of this wire rope is Preformed—because Preformed is more flexible and runs over small sheaves with minimum wear. This means it lasts longer. Preformed wire rope also resists kinking or twisting and so helps speed production.

Building of new roads over which you'll drive your new car is also speeded by using Preformed wire rope on shovels, bulldozers, scrapers, graders and concrete mixers. This modern wire rope spools evenly, reduces shutdowns for replacements.

Oil that will run and lubricate your new car comes from fields where equipment rigged with Preformed wire rope is at work. Drillers like Preformed because it resists whipping, spools better on the drum. It also makes faster round trips.

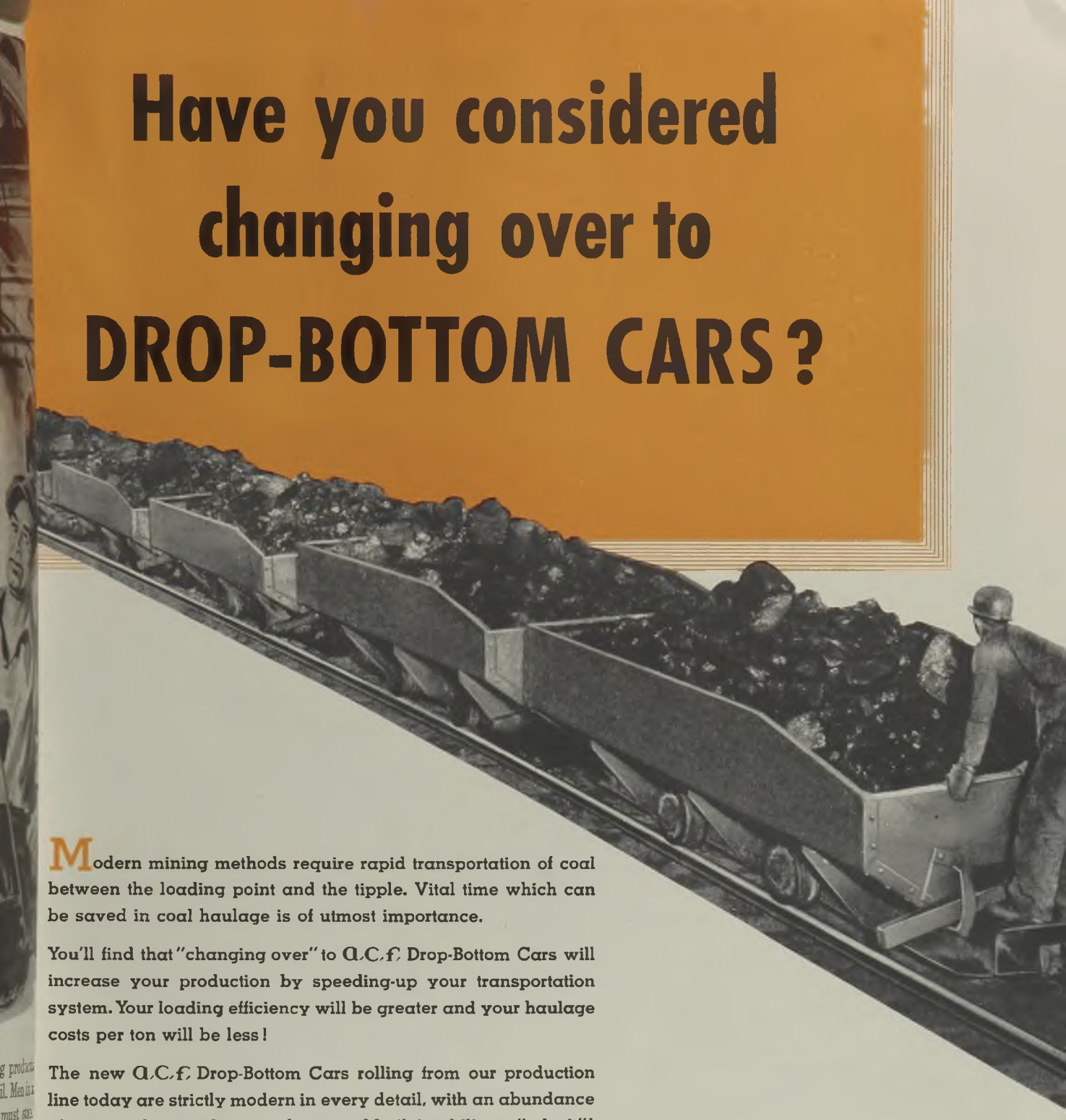
Preformed wire rope contributes to speeding production of your new car . . . building roads . . . drilling oil. Men in many industries which require a wire rope that must stand up under severe service specify Preformed. In fact, companies which change to Preformed find that its exclusive built-in features pay big dividends in time, money and efficiency. Preformed is the modern wire rope for modern machines.

Send for an interesting new free booklet, "PREFORMED WIRE ROPE—WHAT IT IS—WHAT IT DOES." Write the Preformed Wire Rope Information Bureau, 520 North Michigan Avenue, Chicago 11, Illinois, or

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

HANDLES EASIER - LASTS LONGER

Have you considered changing over to DROP-BOTTOM CARS?



Modern mining methods require rapid transportation of coal between the loading point and the tipple. Vital time which can be saved in coal haulage is of utmost importance.

You'll find that "changing over" to A.C.F. Drop-Bottom Cars will increase your production by speeding-up your transportation system. Your loading efficiency will be greater and your haulage costs per ton will be less!

The new A.C.F. Drop-Bottom Cars rolling from our production line today are strictly modern in every detail, with an abundance of structural strength, ruggedness and built-in ability to "take it"! The strong, husky, doors are "lubricated" for smooth positive action and protection against corrosion—the double-action, heavy duty, spring bumpers absorb those severe draft and buffing shocks. The smooth car interior permits coal to unload easily—the welded end sill members and other features which are provided make these cars a real buy!

Ask our Sales Representatives about the possibilities of "changing over" your mine to A.C.F. Drop-Bottom Cars!

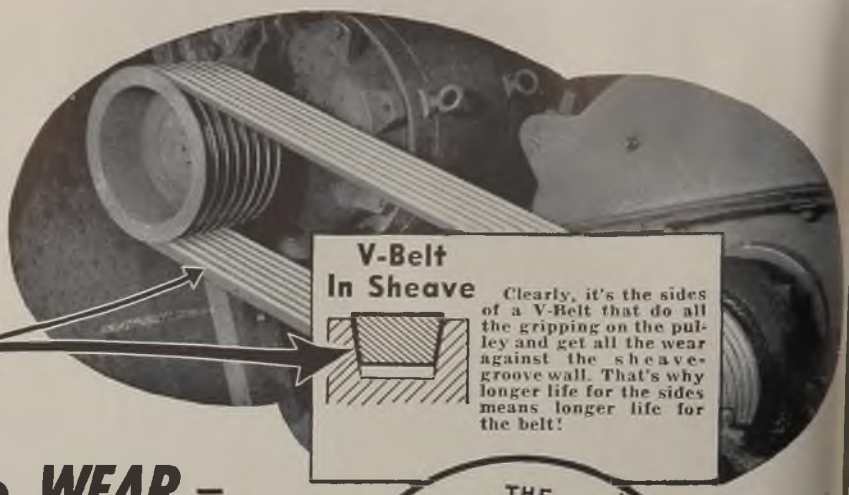
A.C.F.

MINE CARS

AMERICAN CAR AND FOUNDRY COMPANY

New York • Chicago • St. Louis • Cleveland • Washington, D. C.
Philadelphia • Pittsburgh • Huntington, W. Va. • Berwick, Pa.

it's the SIDEWALL



of a V-Belt that Gets *ALL* the *WEAR* –

–*That's Why the* CONCAVE SIDE *is IMPORTANT!**

Every man who works around V-Belt driven machines knows from experience that it is nearly always the *sidewall* of a V-Belt that *wears out first.*

There is a perfectly natural reason why the wearing out starts with the sidewall—and here it is—

It is the *sidewall* of a V-Belt that has to *grip* the pulley and drive it. It's the sidewall that *transmits* to the pulley all the power the pulley ever receives. No other part of the belt gets anything like the *actual* wear the sidewall gets. Is it any wonder the sidewall of the *ordinary* V-Belt is the part that wears out first? Clearly, then, prolonging the life of the sidewall is the *one thing needed* to prolong the life of the belt!

The simple diagrams on the right show clearly why the ordinary, *straight-sided* V-Belt gets excessive wear along the *middle* of the *sides.* They show also why the Patented Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight sided V-Belts can possibly give.

*Even MORE Important NOW

with Rayon Cord and Other Stronger Tension Members

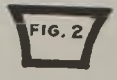
Now that Gates Specialized Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important today than ever before!

Straight Sided V-Belt

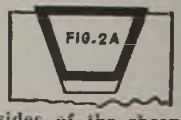
How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall



Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley



No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

THE GATES RUBBER COMPANY

DENVER, U. S. A.

World's Largest Makers of V-Belts

Gates

THE MARK OF SPECIALIZED RESEARCH

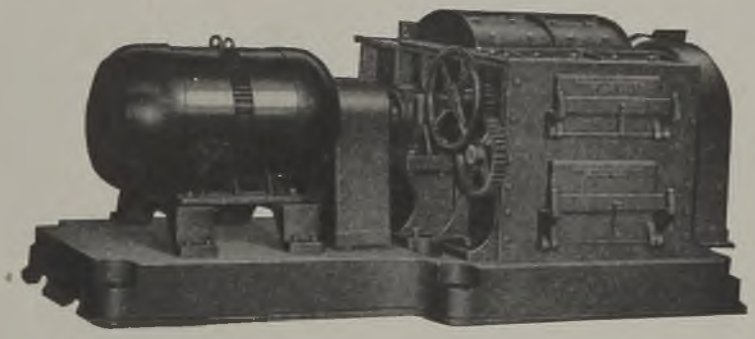
469

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS **of the U. S. and 71 Foreign Countries**

Nothing makes up for lost tonnage except **EFFICIENCY!**

Get your tonnage up with AMERICAN Rolling Ring CRUSHERS



In your efforts to close the gap between your delayed output and your present production requirements, consider the many advantages that American have to offer.

Only increased efficiency can help you "catch up" on delayed production schedules, and this efficiency is portrayed in the AMERICAN Rolling Ring CRUSHER. Americans are dependable crushers that reduce in one operation, ROM or lump coal to uniform stoker or pulverizer size, at less than 1¢ per ton.

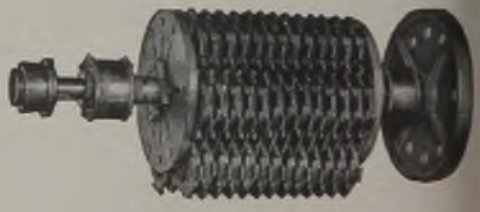
Simplicity of operation . . . easy adjustability . . . low cost operation . . . high capacities . . . endurance to withstand severe usage under all kinds of conditions . . . Americans measure up to all of these conditions.

Costly, time-wasting breakdowns are practically eliminated. The deflection of shredder rings upon contact with tramp metal protects the Crusher against damage. Housings are heavy castings, rib-reinforced to withstand greatest crushing strains — Rings, breaker plate, grinding plate and grate bars are of manganese steel. Capacities up to 500 TPH.

One of the many features of the American Rolling Ring "AC" Crusher, is its many shredder rings with multiple cutting edges. They develop their tremendous splitting impact through rotating with powerful centrifugal force at right angles to the rotor mainshaft. Through this slow speed, rapid-impact shredder ring method coal is split instead of crushed to uniform stoker or pulverizer sizes.

Used effectively and economically in many mines all over the country—Americans are proved a dependable crushing unit, custom-built to fit your specific job requirements.

Patented Manganese Shredder Rings, each with 20 cutting edges, are found only in Americans. They split instead of crush coal, thereby, minimizing fines and preventing clogging. In contact with tramp metal, the rings are deflected to prevent any damage to them, and thus eliminating the need for shear pins and other conventional safety devices.



Send for illustrated bulletin "Crushing Coal At Less Than One Cent a Ton"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Avenue
St. Louis 10, Mo.

Two More Major MARION Developments FOR THE MINING INDUSTRY!

MARION 111-M

A truly modern, fast, and powerful 3-1/2—4 yd. Diesel Shovel that insures top yardage and low production costs under all digging conditions. Features include: anti-friction bearings for all high speed shafts—air control of all operations—ships without major dismantling—readily convertible to dragline or clamshell.

MARION 151-M

Built especially for high production in rock and ore where its fine balance of speed, power, and weight are proving daily that it is truly the "machine of tomorrow for today's jobs." Outside dipper handles—single hitch—Ampli-dyne or Rototrol control—Herringbone gear drive—plus many more features insure top production and long life.

What is Your Material Handling Problem?

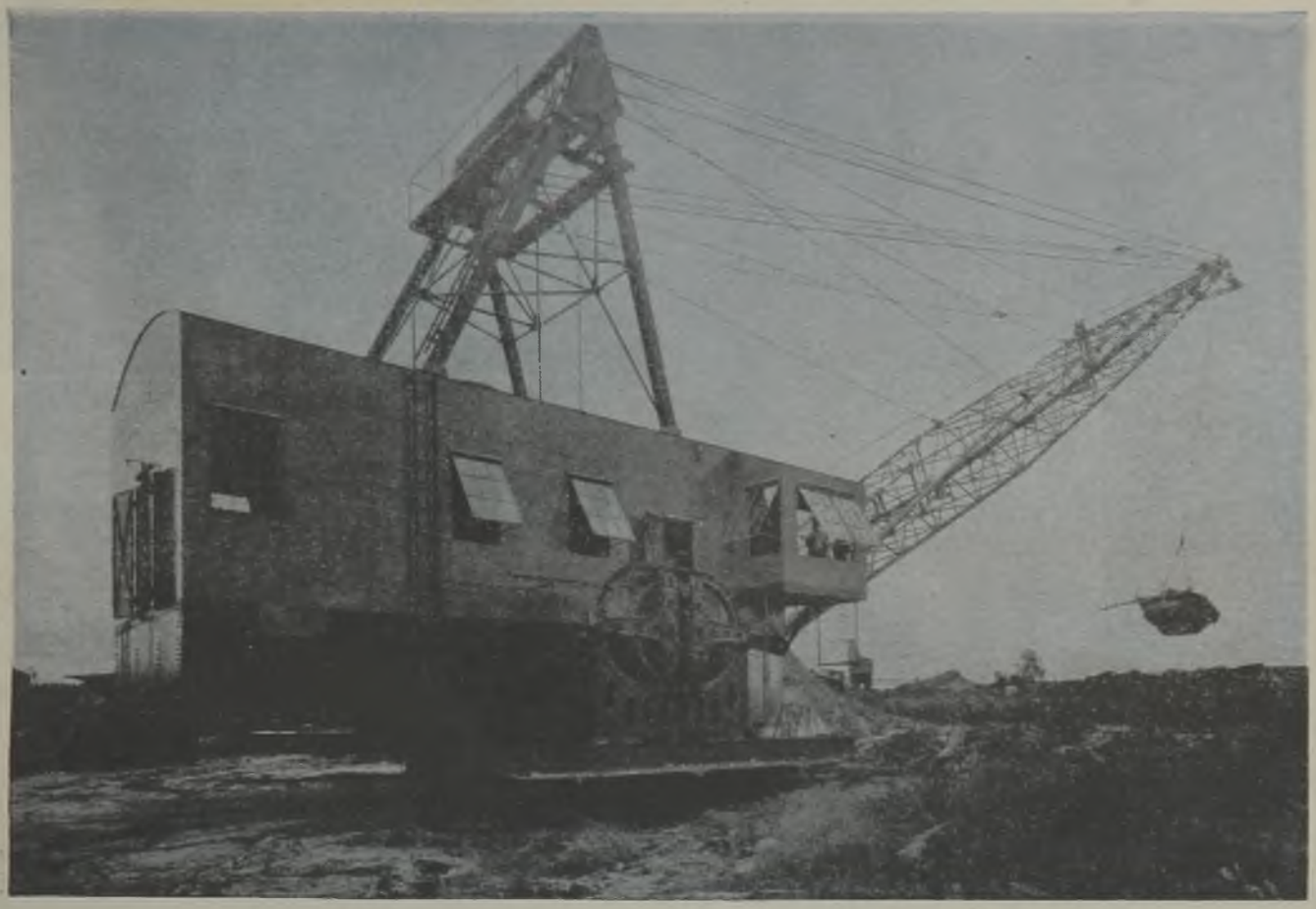
From 3/4 Cu. Yd. POWER SHOVEL COMPANY MARION SINCE 1884 To 40 Cu. Yds.

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

Offices and Warehouses in all Principal Cities • Established 1884



Newest type Dragline, equipped with Fawick Airflex Clutch.

YOU CAN GET RID OF NEEDLESS CLUTCH EXPENSE

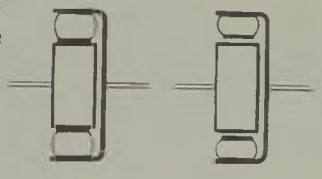
Why pay a useless penalty for sticking to conventional old-style clutches for heavy-duty drives?

Operating entirely through controlled air pressure, the Fawick Airflex Clutch brings you these proved operating savings:

1. Reduced maintenance—no adjustments to make —no lubrication required.
2. No arms, springs or levers to wear out or break.
3. Replacement of parts seldom required.
4. Down time reduced.
5. Torque, shock and vibration controlled by air— full protection for both prime mover and driven unit.
6. Remote control through air pressure, if needed.

These are not experimental hopes—they are proved facts—on machines just like yours.

Our experienced men will gladly help you engineer and install Fawick Clutches, Slip Clutches, Brakes and Power Take-offs. Let us hear from you.



How the FAWICK AIRFLEX CLUTCH Works

Compressed air expands the rubber - and - fabric gland—to engage clutch with any degree of "grip" you want. Release the air and clutch disengages.

FAWICK AIRFLEX COMPANY, INC.

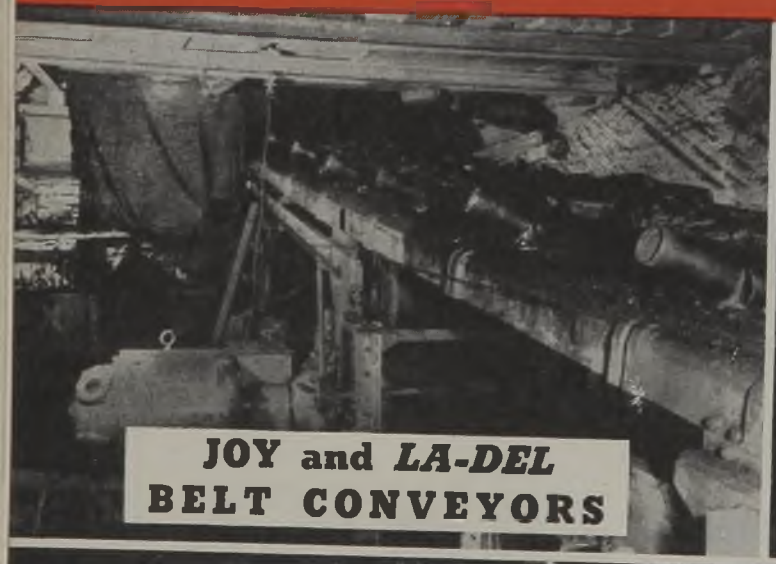
9919 Clinton Road • Cleveland 11, Ohio

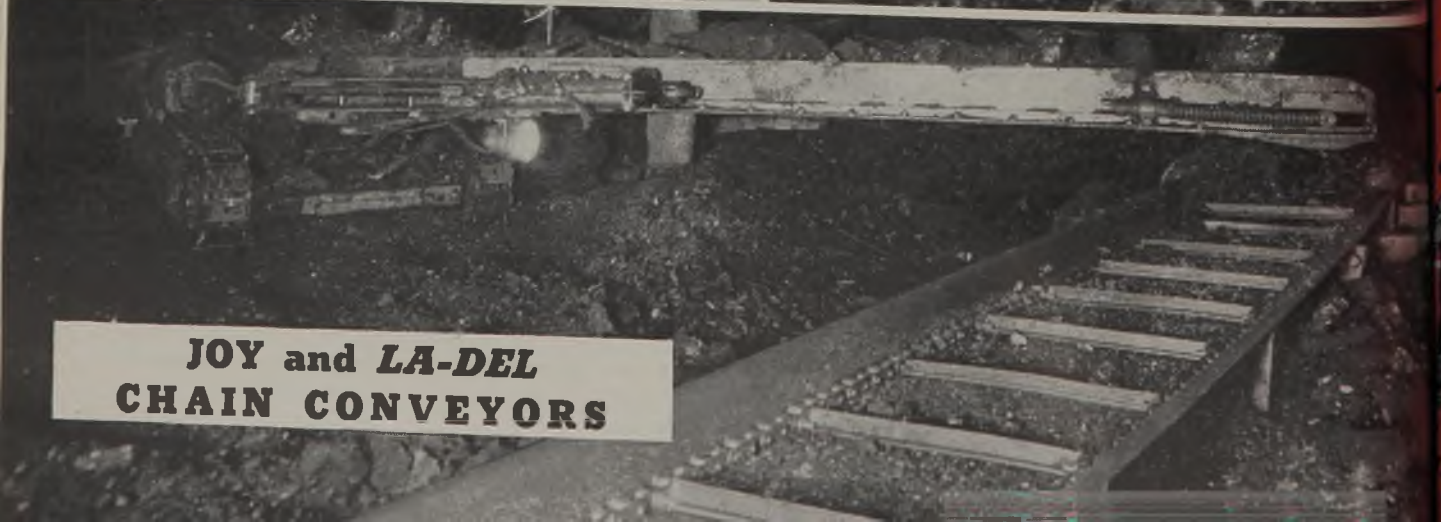
In Canada, Reynold-Coventry Ltd., Montreal, Toronto, Vancouver
In Britain, Crofts Engineering, Ltd., Bradford, England

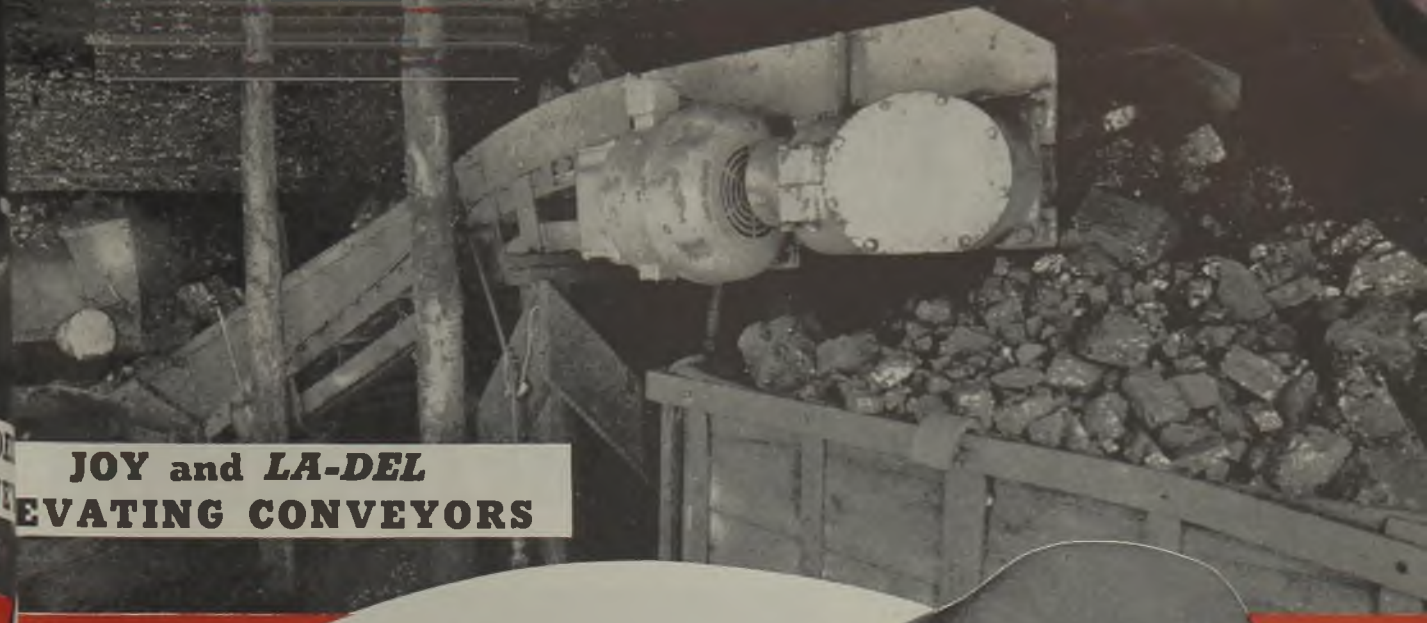
FAWICK
Air flex
CLUTCH

Take Your Choice

FROM THE ONLY COMPLETE LINE OF LOADING AND CONVEYOR UNITS







JOY and *LA-DEL*
EVATING CONVEYORS

JOY and *LA-DEL*

CONVEYORS

Operate Economically

They are sturdy, heavy duty tonnage movers

Consult a Joy Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING, PITTSBURGH, PA.

...ete line of Mining Equipment"

Efficiency UP...Costs DOWN... with BETHLEHEM

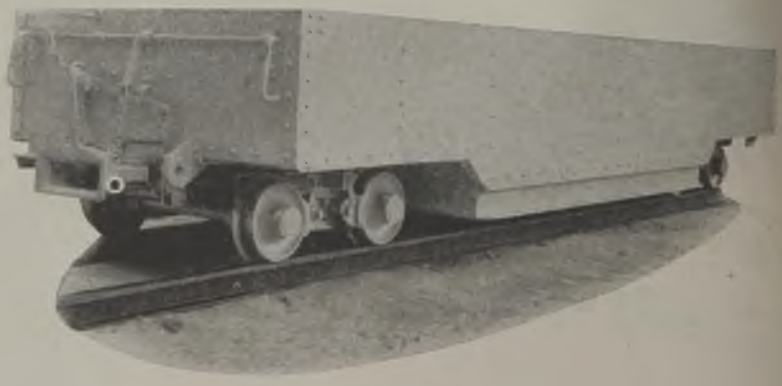
PREFABRICATED TRACK

Before designing a track set-up, Bethlehem engineers carefully study your mining system and the various factors that influence it—such factors as room and crosscut centers, roof and bottom conditions, size and wheelbase of mechanized equipment, radii of curves, etc.

Full details of the proposed track plan are then submitted to you. After approval, Bethlehem cuts the rails to proper length, curves them to correct radii, and accurately prefabricates the needed parts—all in its own shops. The track comes to you ready for immediate and easy assembly, complete with turnouts, switches, switch stands, frogs, joint bars, steel ties, bolts, nuts, and all other necessary equipment.

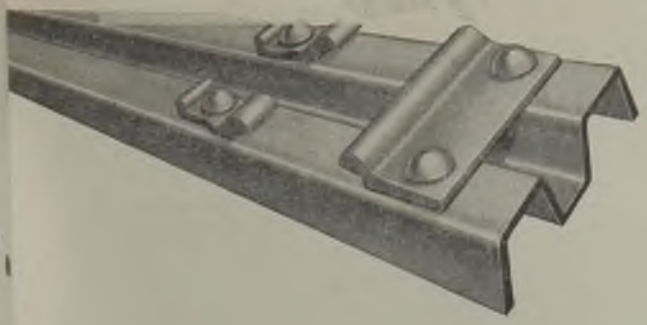
Among the many advantages to be expected of Bethlehem prefabricated track are the following: (1) marked reduction of installation and removal time; (2) faster, safer haulage with fewer derailments; (3) lower maintenance costs; (4) improved overall efficiency—lower cost per ton hauled, as proved by actual records.

Send for Folder 521.



ALL-STEEL MINE CARS—For many years of low-maintenance, low-cost haulage service, standardize on Bethlehem all-steel mine cars. No matter what sort you want . . . whether end-dump or rotary-dump, high- or low-side types . . . Bethlehem can make them for you, equipped as you specify.

An example is the eight-wheel car that is shown above. Its features include automatic self-centering couplers, body plates of rust-resisting Mayari R, roller-bearing trucks, and brakes that are fully equalizing on either curved or tangent track.



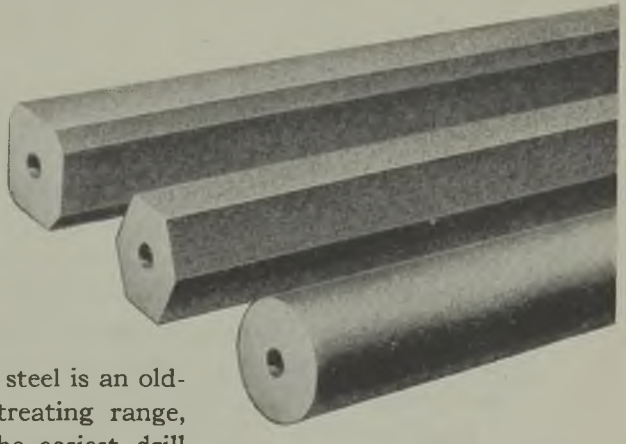
STEEL TIES—An integral part of any Bethlehem prefabricated track system. Installation is simple. Merely fit the rail flange against the stationary clip, then tap the revolving clips into place with a hammer. No spiking, no gaging.

Bethlehem steel ties are made in a wide range of sizes and weights for varying conditions of service. Ask for Catalog 168.

EQUIPMENT FOR MINES

WIRE ROPE—The reliability of Bethlehem wire rope has been well established in coal mines all over the country. Whatever your needs . . . big rope or small, preformed or non-preformed . . . see Bethlehem first.

Our engineers will be glad to make the proper recommendations for shaft rope and rope for incline planes, slopes, and mining machinery. There is also a full choice of lines for power shovels, dragline excavators, bulldozers, etc. used in stripping operations. Bethlehem mining rope is backed by a fully-integrated field organization whose business is to help customers select the *right* rope . . . and to get maximum service and economy from every single foot of it.



HOLLOW DRILL STEEL—Bethlehem drill steel is an old-time favorite in mining work. It has a broad heat-treating range, hardens readily, holds its edge well, and is one of the easiest drill steels to redress. It is a tough, fatigue-resisting steel—one equally suitable for forged-on bits and threaded rods used with detachable bits. A metallic core, withdrawn after the rolling of the bars, produces a smooth, uniform, accurately-centered hole.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BATTERY-POWERED Shuttle Cars Reduce Power Peaks

...ALKALINE BATTERIES Reduce Dead Weight

BECAUSE battery-operated shuttle cars carry their own power supply, they place no load on the mine d-c power supply while operating. Their batteries can usually be charged during off-peak hours thus reducing maximum power demand. A lower maximum demand is assured even when continuous shuttle car operation requires constant charging of exchange batteries, because a charging load is always more steady than a gathering load.

High operating flexibility is also obtained with battery-powered shuttle cars. Being self-contained units, they can take the shortest practical route from face to loader and back. No time is lost in making and breaking external power connections or round-about maneuvering to avoid running over them. They are also easiest to keep in working order because they have the minimum number of working parts.

Altogether, the superior flexibility, high availability and overall operating and maintenance economy of the battery-powered shuttle car make it an inherently dependable and efficient haulage unit . . . especially when powered with Edison Alkaline Batteries. With steel cell construction, an electrolyte that is a preservative of steel, and a fool-proof electrochemical principle of operation, they are the longest-lived, most trouble-free and most durable, yet lightest, of all mine haulage batteries. The Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Co. Limited, Montreal and Toronto.

Edison
ALKALINE BATTERIES

POWER · · · SPEED · · · ROADABILITY

DIFFERENTIAL

8 WHEEL AXLESS LOCOMOTIVES

DIFFERENTIAL MAN TRIP CARS

Differential man trip cars allow your crews to be hauled to and from work with greater speed, safety and comfort. Fitted with Differential AXLESS trucks, these cars provide riding comfort, long wheel life and extreme roadability. Their construction affords protection against roof falls, trolley wire contact and gives men a dry, comfortable, safe ride sheltered from cold intake air.

DIFFERENTIAL LARRIES

These larries are available in a number of sizes to fit almost any refuse disposal condition. Generally they are 3-way dump, dumping to both sides and over the end. The end dumping feature permits extension of dump without use of cribbing and the elevation of the dump is maintained by plowing material into the track—using the end door as a plow.

• In line with the present demands of the coal industry for greater tonnages and lower costs, Differential provides this powerful locomotive for high speed, safe, economical haulage.

The AXLESS trucks provide greater traction—power on all eight wheels—smooth riding—and enable locomotive to haul heavy loads at high speeds with safety. Negotiates curves without slippage—saving wear and tear on both wheels and rails.

DIFFERENTIAL *high capacity* 8 WHEEL AXLESS MINE CARS

Due to the high capacity of Differential patented AXLESS truck mine cars the production of the loading machines is substantially increased because of fewer car changes. Easy riding quality allows for topping cars without shaking off. The roadability of the AXLESS truck permits greater speed and its ability to stick to the track greatly improves safety records.

DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO, U. S. A.

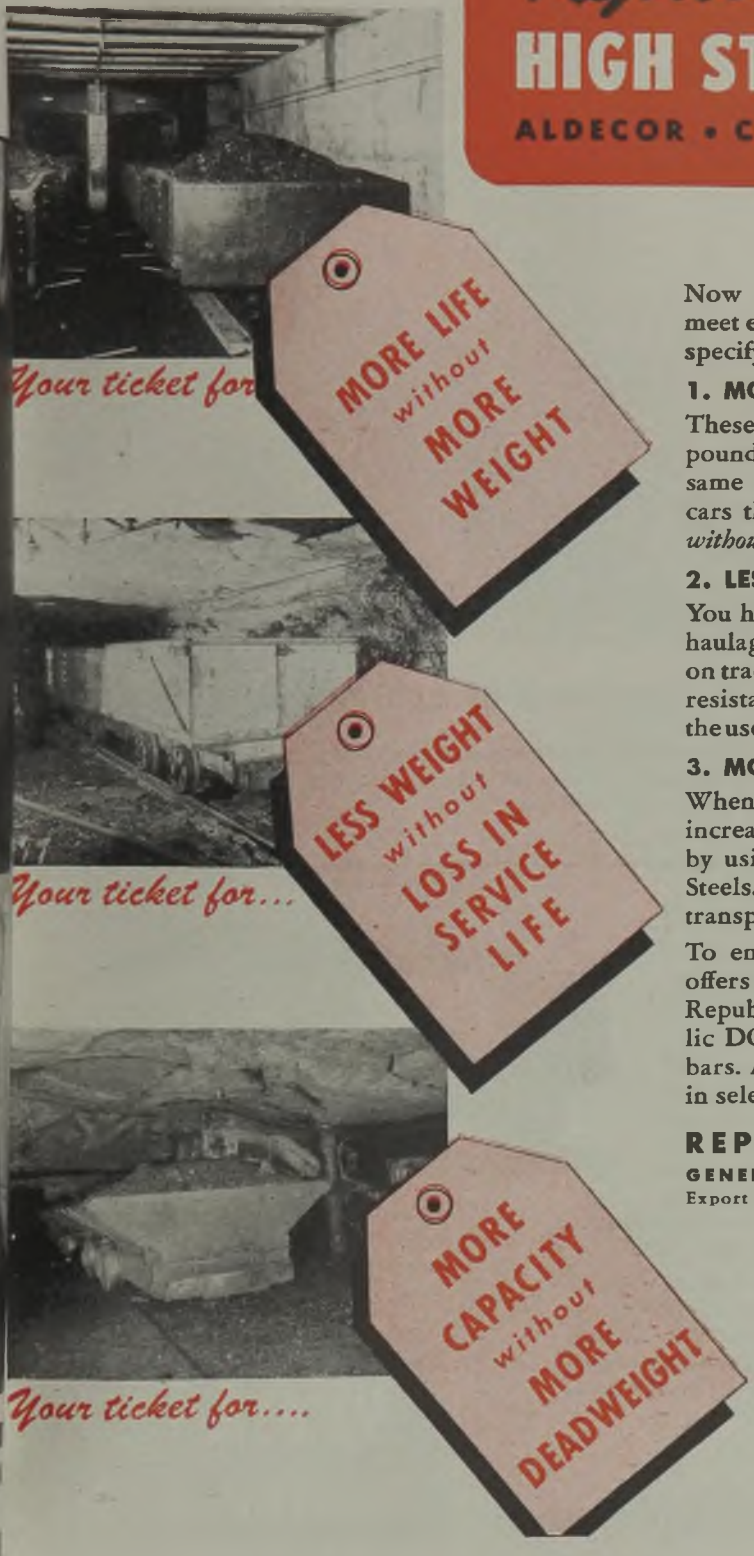
Builders of Haulage Equipment Since 1915

AIR DUMP CARS · MINE CARS · MINE LOCOMOTIVES · ROCK LARRIES · DUMPING DEVICES
BURDEN-BEARING LOCOMOTIVES · STOCKPILING CARS · COMPLETE HAULAGE SYSTEMS

Write your own ticket with

Republic HIGH STRENGTH STEELS

ALDECOR • COR-TEN • DOUBLE STRENGTH



Now you can design and build metal mine cars that meet each mine's individual needs. Here's what you can specify—with Republic High Strength Steels.

1. MORE LIFE WITHOUT MORE WEIGHT.

These steels have a minimum yield strength of 50,000 pounds per square inch. You can apply them in the same thickness you now use and thus build stronger cars that stand rough use for more years of service—*without any increase in weight.*

2. LESS WEIGHT WITHOUT LOSS IN SERVICE LIFE.

You have an opportunity to reduce deadweight—to cut haulage power, add extra cars per trip and reduce wear on trackage. The higher strength of these steels and their resistance to atmospheric corrosion and abrasion permit the use of thinner sections without sacrifice of service life.

3. MORE CAPACITY WITHOUT MORE DEADWEIGHT.

When conditions justify the use of larger cars, you can increase capacity without any increase in deadweight by using thinner sections of Republic High Strength Steels. In this way you haul more coal per car and cut transportation cost per ton.

To enable you to achieve greatest benefits, Republic offers you THREE different High Strength Steels—Republic ALDECOR, Republic COR-TEN and Republic DOUBLE STRENGTH in plates, sheets, strip and bars. And Republic metallurgists are ready to help you in selecting the steel best suited to your needs. Write us.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES • • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, New York

REMOVE MINE WASTE ... Cheaper, Faster!

Consider this experience at one mine!

Just one Walter 20-ton Dumper is handling the *entire* mine waste removal job—*eliminating four trucks previously used*—at huge savings in fuel, operation and maintenance. It climbs 16% grades and slippery surfaces on the way to the dumping point, without difficulty.

THE use of Walter Tractor Trucks for removing mine waste is doing away with the need for expensive, cumbersome, permanent installations. And it's showing substantial savings and advantages over conventional truck hauling, too.

Such gruelling going brings into full play the unique Walter Four Point Positive Drive. It maintains full tractive power every foot of the way, even though surface conditions may vary from wheel to wheel. Three automatic locking differentials proportion the power to each of the FOUR driving wheels according to its traction at any instant. There is no wheel spinning to churn into soft ground, damage roadways or wear tires.

Other features of the Walter Tractor Truck include engine-ahead-of-wheels for short wheelbase, correct weight placement and easy maneuvering; suspended double reduction drive for larger gear capacity, less unsprung weight, higher ground clearance and protection of vital driving mechanism. Write for complete details.

WALTER TRACTOR TRUCK with 30-ton bottom dump coal trailer. Permits hauling 60 ton payloads with two trailers in tandem.

WALTER MOTOR TRUCK CO., 1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N. Y.

WALTER TRACTOR TRUCKS

union Wire Rope

"Steel Tendons" is a new book of photographs and descriptions which show you how Union Wire Rope is made, from the laboratory to the master reel.

Nine educational bulletins entitled "Rope Dope" are published at frequent intervals. They contain valuable information for the wire rope user on such subjects as: replacement of wire rope as to size, tread, diameter, type of construction and correct grades of steel; explanation of the lays of wire rope; types of wire ropes with complete specifications; factors which determine rope life; installation and abuses to be avoided; care of wire rope; abuses and their results and figuring the working load and actual stresses.

Union-formed wire rope is designed to do specific jobs better—longer and with greater economy. Internal stress and strain are removed by special forming giving Union-formed more flexibility and stamina.

union-formed

(preformed)

THE ULTIMATE IN LOW COST WIRE ROPE

is Made by Specialists Who Share Their Knowledge to Help Users Get Maximum Service

Ours is an organization of specialists devoting their whole time to the making of wire rope and to its application.

The latter is of importance to the user because the life and efficiency of the best wire rope is foreshortened if improperly applied.

To safeguard against this, distributors of Union Wire Rope are fully equipped with a thorough working knowledge of wire rope application and are capable of making sound recommendations.

To post users of Union Wire Rope on proper application and on many other factors involved in its use, a library of useful information is published. Sent gratis on request.

UNION WIRE ROPE CORPORATION

2130 Manchester Avenue — **Kansas City 3, Missouri, U. S. A.**

Send book or bulletin as checked.

Firm Name_____

By_____ Title_____

Address _____

City_____ Zone_____ State_____

_____

State above use of wire rope contemplated.

- ☐ Steel Tendons
- ☐ Rope Dope No. 1
- ☐ Splicing Wire Rope
- ☐ Correct Handling of Wire Rope
- ☐ Socketing Wire Rope
- ☐ Wire Rope Lubrication


HERE'S WHAT
WE MEAN !

Here's a Graveyard that pays BIG dividends

MANY profitable mine car graveyards have been made this year. Why? Because it pays big dividends to discard old-fashioned mine cars and install the wonder cars—the modern S-D 1-2-3 "Automatics." Records show that they save an average of at least 26 cents per ton and you can rent them from us at an average cost, over a fifteen year period, of less than 2 cents per ton of coal hauled in them. Of course, in buying them outright, you can make even more money than this, perhaps, because we make a profit out of it on the rental basis. You can produce far more coal per man with S-D "Automatics" and you can produce it at the least possible cost. Write us and we will prove this to you beyond question.

FACTS BEHIND OUR CLAIMS

Records taken from the books of several coal mines prove an average saving of at least 26 cents per ton. Not so long ago, a big operator wrote us as follows: "Our savings with S-D 'Automatics' will pay for the cars in less than 20 months." We are getting letters like this all the time. There is no question about the savings. Another operator writes: "In equipping a new mine, our first and only thought regarding cars is S-D 'Automatics'." Still another writes: "Your new type S-D 'Automatic' car with 'Floater' wheels is without doubt the best car we have ever used. At one mine we have been able to produce 47,000 tons in one month with only 100 of these cars." These are facts, all of them. Would you like to have photostatic copies of the complete letters and others besides? Write for them.

DON'T WAIT to put in new S-D "Automatics". Get busy now and, if you haven't enough cash on hand at the moment, let us rent them to you.

We prefer to equip our mine cars with S-D "Floater" Ball Bearing Wheels. We guarantee that they will run the first five years with only one greasing. Scientific engineering tests prove that these remarkable wheels speed up haulage approximately 10 per cent and increase haulage motor capacity approximately 49 per cent and save about $5.00 per car in electricity per year, based on cost of 1½ cents per KWH, compared with tapered roller bearings.

Sanford-Day Iron Works, Knoxville 9, Tennessee

1 Planning
2 Engineering
3 Fabrication
4 Erection
5 Service
6 Cooperation

HOW We Plan A COAL PREPARATION PLANT

"On the Site" Systematic Planning always has been the cornerstone of H+P success in the building of Coal Preparation Plants.

The primary step in H+P planning is a visit to the site and a consultation with mine officials who are interested in an individually engineered Coal Preparation Plant. Through these visits and consultations, H+P Engineers are able to develop the following basic information necessary for the successful planning of a Coal Preparation Plant:

The Ultimate Market for the Mine's Coal.
The Physical Properties of the Coal.
The Economic Possibilities of the Coal.
The Physical Characteristics of the Site.

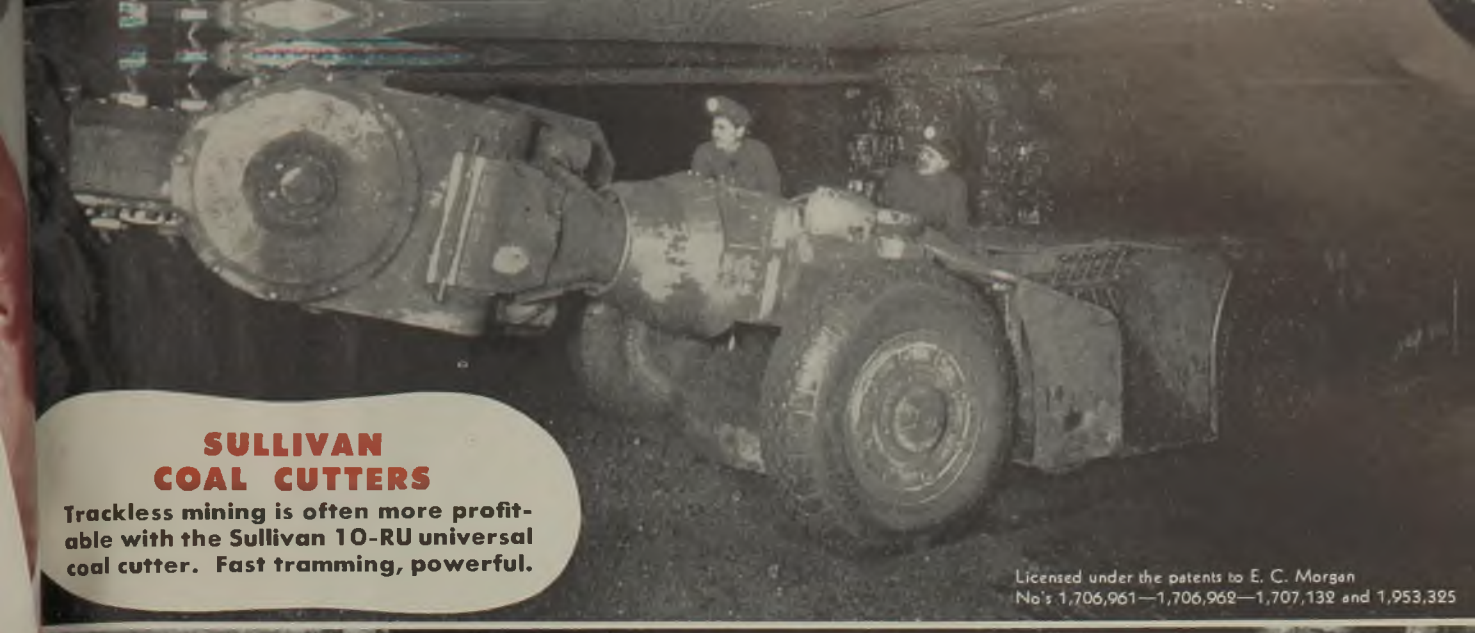
Upon this solid foundation, we are prepared to plan a Coal Preparation Plant which will embrace all the features necessary for successful operation.

The H+P Planning Way will fit into your plans for Better Coal.

Rotary Mine Car Dumpers
Coal Crushers
Refuse Disposal Cars
Coal Storage Bridges
Ore Bridges
Railroad Car Dumpers
High Lift-Turnover-Rotary
Boat Loaders & Unloaders
Car Hauls & Boat Movers
Bradford Breakers
Coal & Coke Handling Equipment
Pig Iron Casting Machines

Heyl+Patterson, Inc.
"SINCE 1887"
55 WATER STREET · PITTSBURGH 22, PA.


Joy Mining Equipment
Represents
Economy
for you
all along the line...
More Coal per Shift
Faster, smoother production of coal with lower operating cost is the natural result in modern mines with Joy mechanized mining equipment on the job.
Rugged Precision Construction
Advanced engineering design and skilled workman ship combine with the correct application of metals and alloys to make Joy equipment last longer.
Greater Tonnage
As production costs fall, tonnage figures and profits climb to new highs when you mech anize your mine with Joy equipment. Writ for detailed bulletins or consult a Joy Engine



SULLIVAN COAL CUTTERS

Trackless mining is often more profitable with the Sullivan 10-RU universal coal cutter. Fast tramming, powerful.

Licensed under the patents to E. C. Morgan
No's 1,706,961—1,706,962—1,707,132 and 1,953,325

JOY LOADERS AND SHUTTLE CARS

Joy mobile loaders work smoothly with easy-to-operate Joy shuttle cars to save money moving coal quickly.

LA-DEL CONVEYORS

Simplified design keeps maintenance costs low on all La-Del Conveyors; assures fast, smooth flow of coal under the most difficult conditions.

Consult a Joy Engineer

JOY

SULLIVAN DIVISION
MANUFACTURING COMPANY
GENERAL OFFICES: HENRY W. OLIVER BLDG., PITTSBURGH, PA.

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

Coal Age

SEPTEMBER, 1946

Ivan A. Given, EDITOR

Crossroads?

WHAT will result from the conference of Sept. 10 between Lewis and the bituminous negotiating committee still was behind the curtain of the future at the time this was written. But it was possible to state that this conference could set the pattern—free enterprise or increasing government control—for a long time to come. It also was possible to say what should come out of the conference—and to hope that it would mark a return to action for the greatest good of the greatest number, that number including the public as well as the miners and operators.

In the long run, how well miners and operators fare depends solely upon what the public thinks of the industry. For too long a time, the public comfort and pocketbook have been affronted by interruptions in supply and higher prices. As a result, competition has been cashing in on strife and cost increases in coal mining.

What coal needs more than anything else is a period of peace—a period in which it can get its cost down by raising efficiency; a period in which it can improve its product, sales and service; and a period in which it can rebuild public confidence and good will. If that period also could bring about a better understanding between management and men and, above all, an arrangement for settling differences without penalizing the consumer, so much the better. Whether coal will get that opportunity or whether it is fated for continued government operation and, quite possibly, nationalization by the back door was, as stated, still to be determined. However, it was to be hoped that the right decision would be made or, failing that, that coal would be vouchsafed another chance before being started irrevocably on the road away from freedom and better service to the public.

Still No. 1

THE SUBJECT of safety, as coal men well know, has taken on added interest with the promulgation of the new federal code. Its provisions, embodied in some 300 standards in 81 sections, include four sections and ten standards dealing with timbering and roof hazards. This, in part, reflects the difficulty of coping with this hazard. It reflects also the need for greater study of ways and means of protecting men, including a solution of the problem of reducing as far as possible personal decisions as to whether or not timbers should be set.

The answer seems to be a system or a type of roof support that must be employed automatically. Standards governing minimum timber requirements and methods of placing them are a big step toward automatic application of support. This plan, known as systematic timbering, has proved its worth, although as long as there are open roof areas, even between posts or bars, it is not the complete answer. To cover the entire roof area, it seems logical to use something like a wire-mesh net mounted on suitable standards so that it can be moved easily. Such a support would serve two purposes: (1) complete coverage of the roof, where the hazard arises, and (2) automatic use, since it always would be available at the place it is needed.

No Real Shortcut

COAL MEN, in the recent investigation of the natural-gas industry by the Federal Power Commission, made a strong case for more regulation of natural-gas distribution and use. That case was based on a keen desire to protect markets and thus protect miners' jobs and operators' investments against an essentially laborless fuel. But, as *Coal Age* has pointed out before, this weapon is one that should be used with caution since, if the principle that a federal agency can limit the market for one fuel is established, there is nothing to prevent that same principle being used against coal in the future.

Fundamentally, as always, the final answer to competition is better service and more convenience at the same or lower cost. That is the only way natural gas or any other competitive fuel can be licked permanently with the greatest advantage to coal. Better coal, better burning equipment and better service to users, including district heating, are steps in that direction. Research, it will be noted, is involved in most if not all of these. Research also is the key to an economical and competitive gasification process, which would go even farther toward beating natural gas on fundamental grounds—service to the consumer.

NATURAL GAS . . .

Growing Coal

With coal as its chief target, natural gas is laying plans for a major market expansion. Gas promises tough but not insurmountable competition. In the following material, Coal Age analyzes the natural-gas program, discusses the outlook and reviews the weapons coal can use.

"TRANSLATING THE NATURAL GAS to be available from the Big Inch line into tons of anthracite on a B.t.u. basis, we find this 275 million cubic feet of natural gas equal to 10,185 tons of anthracite coal, or 3,055,000 tons per year on a basis of 300 working days. In 1945 your company produced 3,379-275 tons of anthracite in domestic sizes."

This stern warning, provoked by plans of the natural-gas industry to pump peacetime gas instead of wartime oil from Texas fields to industries and homes in the Philadelphia-New York area through the Big and Little Inch pipelines, was voiced in a pamphlet recently issued to its miners by the Philadelphia & Reading Coal & Iron Co. Reflecting what has already happened in some of coal's traditional markets, notably Chicago, Minnesota and the District of Columbia, it is prophetic of what may soon be expected in other regions. For the natural-gas industry, with a hell-for-leather strategy closely molded after that of its hand-in-glove partner, the oil industry, is hatching plans to expand operations already established and to explore new marketing frontiers. Gas men believe they have something that will sell and they are going all-out to sell it, even at the expense of invading parts of the nation that are far removed from major gas fields in Texas, Oklahoma, Kansas and Louisiana.

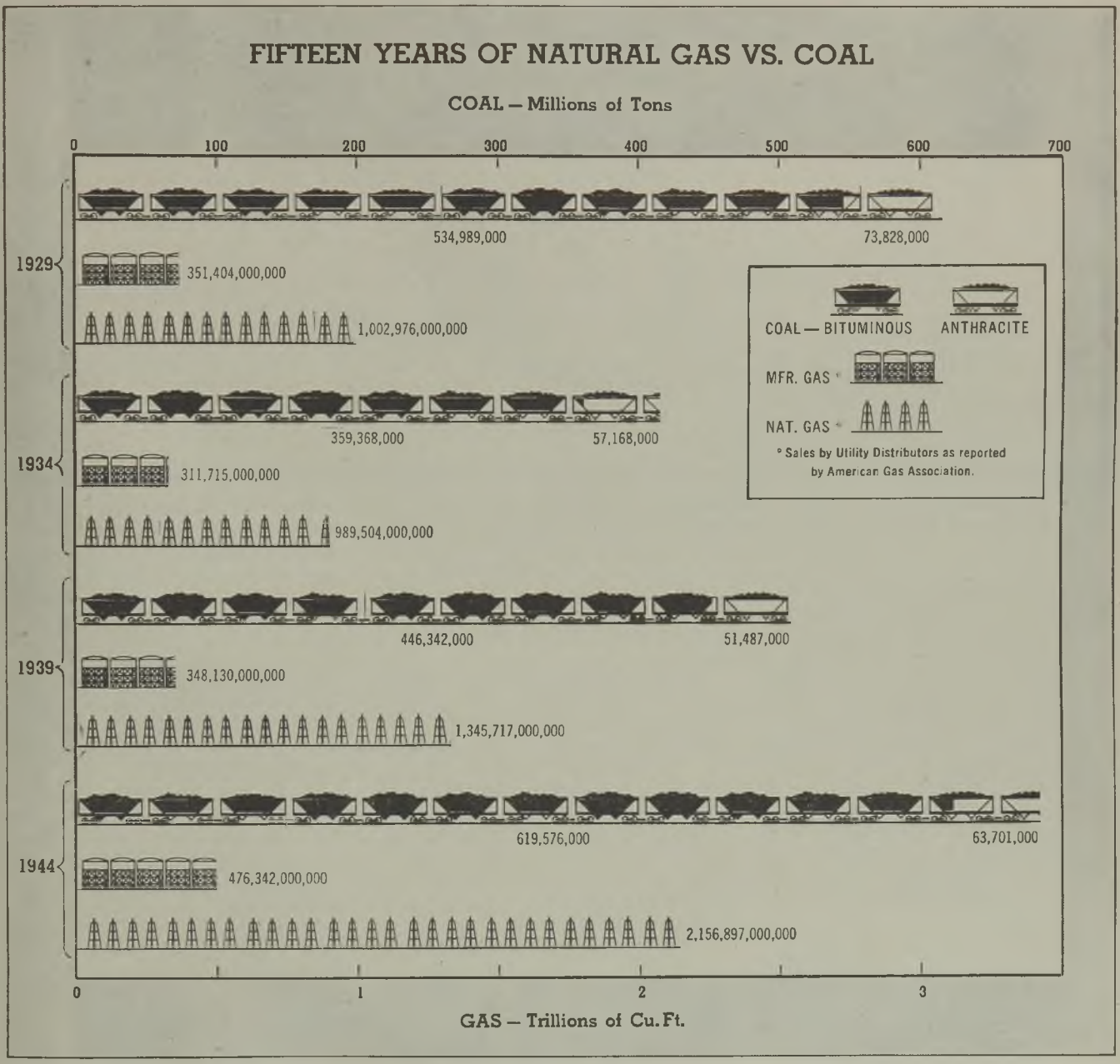
Natural Gas Expanding

Realistic appraisal of the competitive situation gives coal men little cause for complacency—not that they have any on this score. Indeed, there is good reason for busy days and some sleepless nights these next few years if the coal industry expects to beat off this new threat without incurring too many losses. For there is no question that natural gas will be a problem to coal unless coal can meet or better its claims. Natural gas, its producers are fond of pointing out, is clean. Push-button controls provide trouble-free heat. It is piped in and requires no basement storage space. Gas-burning equipment is efficient and modern in design. The natural-gas industry will not let the public forget these points.

The natural-gas industry has grown spectacularly in the last quarter-century. Since 1920, its gains in supplying the nation's energy have been equivalent to —although not entirely responsible for —the losses suffered by anthracite. In the 15 years from 1929 to 1944, the number of natural-gas utility customers, according to the American Gas Association, has risen as follows: residential, 5,854,000 to 8,578,000; commercial, 353,000 to 635,000; industrial, 23,000 to 57,000; total, 6,230,000 to 9,270,000. Total sales of natural gas to these groups more than doubled in that period, rising from 1,002,976,000,000 to 2,156,897,-000,000 cu. ft. The latter is equivalent to 86,000,000 tons of coal and is a little more than half the total production of 3,780,232,000,000 cu. ft.

The pressure still is in the upward direction. For example, J. H. Isherwood, vice president, North Penn Gas Co., Port Allegheny, Pa., at the May 7 meeting of the Natural Gas Department of the American Gas Association, pointed out that a survey in the first three months of 1946, covering 10,000 customers in twelve normal northwestern Pennsylvania towns with no war industries and varying from 1,500 to 5,000 in population, showed an 11-percent increase in residential use of natural gas compared to 1945.

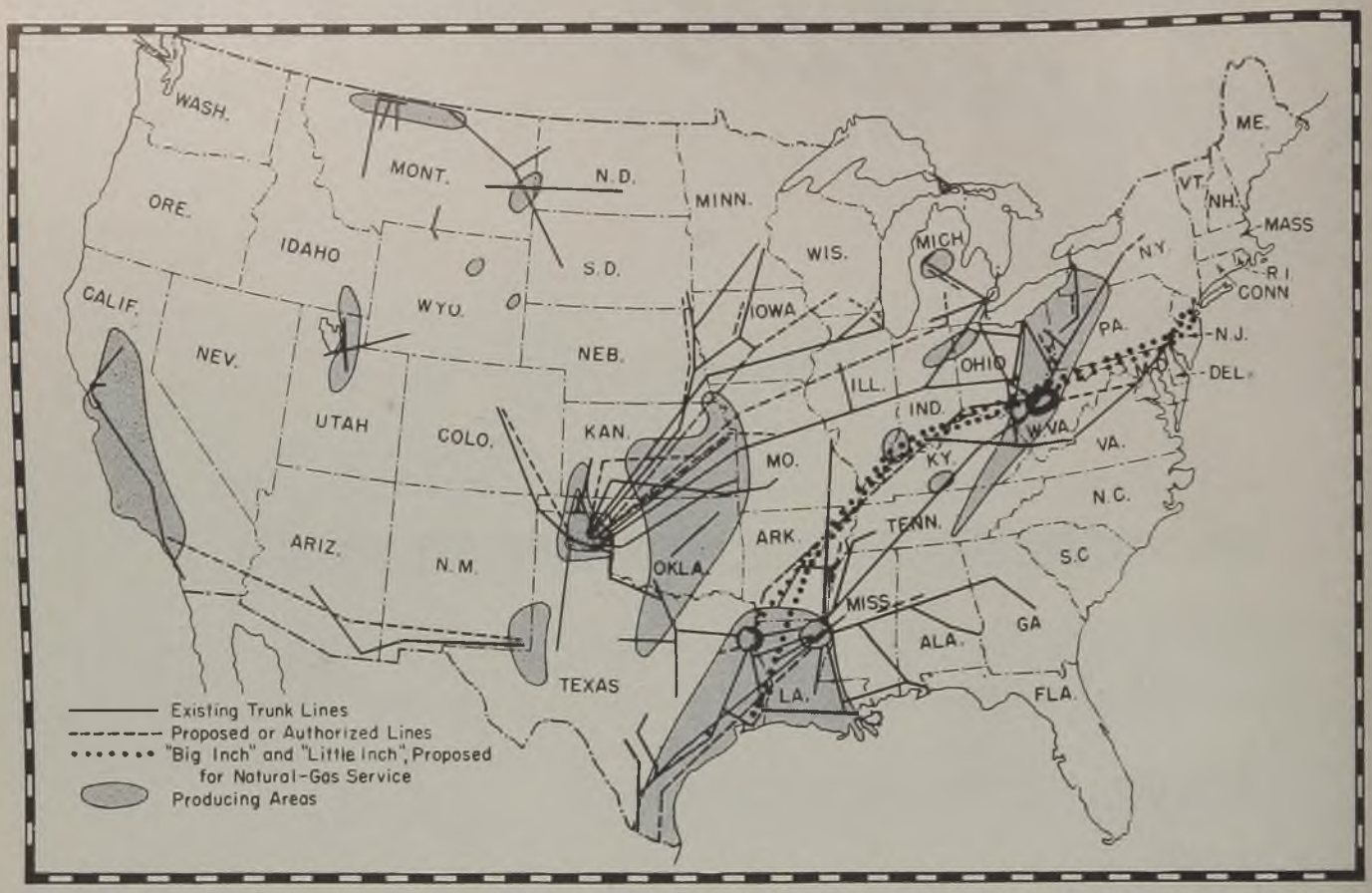
Competitor



At the same meeting, R. H. Hargrove, department chairman, claimed that natural gas "now serves 41 million people in 33 states with a network of 218,000 miles of trunk lines and mains with a total capacity of 3½ trillion feet and a market value of $750,000,000. It has advanced from 38 to 48 percent in the number of customers served by the whole gas industry. A recent statistical analysis of 116 natural-gas companies shows total assets of over three billion dollars. . . It has a ready market wherever it can be economically delivered. It is the fuel of the future."

Whatever the merits of Mr. Hargrove's claims for gas as "the fuel of the future," the natural-gas industry has been

NATURAL GAS LOOKS NORTH AND EAST FOR MARKETS



How natural gas sees its marketing problem is indicated by this map of major pipelines—proposed and in service. The trend is toward the populous and industrial East and Middle West.

growing and building with lusty vigor. Recent years have seen the construction of several major pipelines from the Southwest to the most attractive of all fuel markets—the populous and industrial East and Middle West. For example, in 1944 the Tennessee Gas & Transmission Co. built a line stretching 1,265 miles from Texas to West Virginia, with a capacity of 225 to 300 million cubic feet daily.

The gas industry has filed applications with the Federal Power Commission for still further expansions and is pushing hard for approval. Some of the principal projects are:

Cincinnati Gas Transportation Co.—70-mile extension near Foster, Ky., to give Cincinnati an additional 50,000,000 cu.ft. daily.

Iroquois Gas Corp. and United Natural Gas Co.—Joint request for facilities in New York State and Pennsylvania to serve the Buffalo area.

Central New York Power Co.—Substitution of natural gas from Texas and West Virginia for mixed and manufactured gas in Syracuse, Watertown, Rome and Utica.

Tennessee Gas & Transmission Co.—Expansion of its Texas-West Virginia line at a cost of $29,500,000, to meet growing demands in the eastern United States.

Natural Gas Pipe Line Co. of America—Additional facilities for boosting deliveries in Chicago and starting new service to a number of Illinois, Iowa and Wisconsin cities including Milwaukee, where the principal fuel for many years has been coal.

Public Service Co. of Northern Illinois—Substitution of natural gas for mixed gas in 37 suburbs north and northwest of Chicago if the application of the Natural Gas Pipe Line Co. is granted.

Michigan-Wisconsin Pipe Line Co.—$71,000,000 line with a capacity rising to 320,000,000 cu.ft. daily by 1952, from Texas fields to serve Des Moines (now served by the Northern Natural Gas Co.) and several communities in Wisconsin (here conflicting with plans of the Natural Gas Pipe Line Co.). This application is said to have the support of Wisconsin public utilities officials. Panhandle Eastern Pipe Line Co., however, charges that it is an attempt to oust it from the Michigan area.

Washington (D.C.) Gas Light Co.—Substitution of natural gas for a mixture of natural gas from the Appalachian region and manufactured gas.

Mississippi River Fuel Co.—Enlargement of facilities in Louisiana, Arkansas, Missouri and Illinois, tripling capacity to 183,000,000 cu.ft. daily at a cost of $11,574,000.

Add to these robust plans for enlargement of natural-gas facilities the possibility that gas interests may win the battle for operation of the Big Inch line, which stretches 1,400 miles from Longview, Texas, and the Little Inch line, which reaches 1,700 miles from fields near Beaumont, Texas, and thus bring natural gas to the nation's most concentrated potential fuel market in New Jersey, New York and the Philadelphia area. Among other bids for the two huge wartime oil lines, the War Assets Administration on August 1 found fabulous offers from natural-gas men. The Big Inch Natural Gas Transmission Co. offered an on-the-line cash payment of $85,000,000. Another group, headed by E. Holley Poe and Dr. E. DeGolyer, offered $80,000,000 cash on delivery plus transmission fees that

probably would amount to $20,000,000 additional. An alternate proposal of the Poe-DeGolyer syndicate asked for a 40-year lease with a minimum annual rental of $6,500,000, subject to increase as deliveries grow. A large segment of the petroleum industry, as well as Ford, Bacon & Davis, engineering firm engaged by the Reconstruction Finance Corporation to study uses for these lines, favors their conversion to natural-gas transport.

Gas Claims Ready Markets

This picture of natural-gas plans and achievements, though incomplete, gives Mr. Hargrove reason to claim that "natural gas has a ready market wherever it can be economically delivered." If two recent public actions welcoming natural gas are a sign of the trend of the times, the coal industry has good reason to be concerned for its long-held markets. In one case, the local city council authorized the Philadelphia Gas Works to provide natural gas for 9,000 additional homes. This expansion, according to the Philadelphia & Reading Coal & Iron Co., means displacement of enough coal to keep all the company's deep mines working seven days each year. Secondly, the citizens of St. Paul, Minn., recently voted 8 to 1 for natural-gas service, meaning the possible displacement of 500,000 tons of coal per year at coke plants and 500,000 tons per year in homes and elsewhere. Public reaction to the bituminous-coal strike and the uncertainty of coal supplies influenced the St. Paul vote, according to the city's coal men.

The gas industry, eager to capitalize on coal's labor troubles, is taking full advantage of the coal strike to blow its own horn. At the Natural Gas Department convention previously mentioned E. Holley Poe, of E. Holley Poe & Associates, New York, spoke as follows:

"Today, as we meet here in Cincinnati, in the thirtieth day of the huge bituminous coal strike, we look back at the 68 millions of tons of coal that have not been mined . . . The coal consumers who are so anxious about those 68 millions of tons of *unmined* coal could have used one and one-half trillion cubic feet of natural gas and gone about their jobs with complete confidence and a higher percentage of efficiency than they can look to with their coal-fired operations. . . Of course, coal strikes are nothing new in the coal industries. The bituminous and anthracite industries had 3,193 strikes in the period 1927 through 1945. They could have mined about 393 millions of tons during these strike periods.

"Incidentally, while the natural gas industry was boosting its sendout during the war period by over 50 percent, the bituminous and anthracite industries were having their usual strikes and left about 82 millions of tons in the ground. Critical war production waited for the historical process of the coal industries to be completed. I would like to get that into the record."

Perhaps Mr. Poe forgot the record-breaking 620-million-ton bituminous production in 1944, in spite of government interference, manpower shortages, wartime stresses and irresponsible labor leadership. But he makes his point well: the gas industry intends to capitalize on coal's periodic labor upheavals.

The leaders of the natural-gas industry have taken "an earnest pledge that the gas industry in the postwar period would meet and beat its competition wherever and whenever it found it, and in doing so would bring comfort, convenience, economy and better living to the people it served," as D. A. Hulcy, another convention speaker, put it. The promotional plans of the industry, well heeled with a $200,000 fund, are aimed directly at postwar home construction. "Much of the future of the gas industry," Mr. Hulcy said, "will be measured by the extent to which gas is used in the millions of new homes that are to be built and in the millions of others that are to be modernized. . . We intend to be pioneers in developing that frontier. We recognize that the time to install gas in these homes is before they are built. This means that a primary campaign must be directed toward those who plan and build the houses and those who finance them. The gas industry is well fortified for such an effort."

Industry Stresses Promotion

Outlining in detail the industry's promotional plans, Mr. Hulcy directed attention to the following tools: a revised *Reference Manual of Modern Gas Service*, recently shown at the Architects and Builders Show in Chicago and now being distributed through utilities; Home Planning Bureaus already established in cities and towns as a public service to veterans and other citizens; plans to strengthen and increase the promotion of gas home heating and automatic gas hot-water systems; sound motion pictures in color for showing before women's clubs, public-school organizations and civic groups; a Speakers' Bureau "to make the voice of the gas industry heard in places where public opinion is formed"—at national conventions of builders, contractors, architects, bankers and plumbers; and a special six-unit course in "Residential Gas Salesmanship" for training gas-company employees.

For research, gas interests have set aside an $1,800,000 fund for the next three years. Among other things, the projects include kitchen ventilation, broiler, oven and top-range performance, home-humidity control, long-life burners and controls, fundamentals of heat transfer, design of pilot lights, cooking methods and design of gas burners and flues.

Its Plans Highly Competitive

Clearly the natural-gas industry intends to go places. Its plans are on a grand scale. Its pressure is relentless. Its leadership is wide awake to opportunity. Its marketing techniques are bold and aggressive and its plans for future growth reflect optimism and dynamic planning. In a recent period of only four months gas-trade journals published a dozen or more articles dealing with techniques of selling and servicing gas and gas-burning equipment, courteous telephone salesmanship, cordial customer relations, methods of recruiting employees, dealer cooperation, display advertising and kindred subjects. Gas men intend to replace coal-burning equipment in old homes and install gas-burning furnaces in new homes. They plan to replace manufactured gas with natural gas, even in regions far removed from principal gas fields and traditionally served by coal. They are out to seize large industrial markets that will carry the bulk of the traffic and make domestic gas sales profitable.

What are the economic factors on which gas men build their hope for capturing new markets? Do the facts give the inside track to gas interests?

The cost structure of the natural-gas industry is simple and pretty well stabilized. The major item of cost is transmission, which, it must be granted, represents a large capital outlay. Eighty percent of the nation's gas reserves are located in 2 percent of the producing fields—western Kansas and Oklahoma, the Texas Panhandle, the Beaumont-Corpus Christi area of Texas and northern Louisiana, near Monroe. These fields are far removed from the large industrial plants of the East Coast and the Great Lakes. Yet once a pipeline is in operation, 500 million cubic feet can be transported as cheaply as 50 million cubic feet. The generally accepted rule in the industry is that large commercial consumers and electric power utilities buy gas at a price that will only maintain the pipeline and retire capital outlay, while charges to domestic consumers provide the profits for the industry. A pipeline, moreover, is a one-way track; there are no empty return trips to boost transportation costs. In contrast with this decreasing scale of unit-

TESTED WEAPONS AGAINST COMPETITION

1. High operating efficiency for the lowest possible cost.
2. High quality and uniformity.
3. Continuous supply.
4. Good merchandising, including development of good cooperative producer-wholesaler-retailer programs to reach consumers.
5. Development of more efficient coal-burning equipment.
6. Promotion of processes and methods providing increased cleanliness and convenience in utilization, such as heating service, smokeless community heating, gasification and liquefaction.
7. Research to improve present methods and equipment in the utilization of coal and to develop additional ones.

transportation costs, a ton of coal is a ton of freight; transportation charges are fixed by the ton on every delivery, whatever the volume.

Exploration and prospecting costs for natural gas are low. In most instances discovery of gas fields has been incidental to oil prospecting, with consequent dividing of capital outlay between the two industries. In addition, labor costs in production for domestic and industrial consumption are negligible, the labor force is small and, up to this time, labor leadership has not forced costs upward or ruthlessly stalled production.

Costs—Coal Vs. Gas

These are the elements in the gas industry's cost structure. With it gas companies can produce natural gas at the field for 5 to 15c. per thousand cubic feet. It can be transported and sold to a utility like the Washington (D. C.) Gas Light Co. for about 30c., and the consumer will pay about 75c.

On the basis of cost to the domestic consumer coal can compete with natural gas in regions like the East Coast and the Great Lakes area, which are not easily accessible to natural-gas fields. In New York City in May, for example, a ton of stoker coal sold for $9.80, the OPA retail ceiling price. Natural gas, if piped in from Texas fields, would sell for about 75c. per 1,000 cu.ft. On a B.t.u. basis, this is about $0.00038 per 1,000 B.t.u. for coal, against about $0.00069 for natural gas. To compete with coal on a heat-content basis, natural gas would have to sell for about 42c. per 1,000 cu.ft.

In the East Coast and Great Lakes regions natural gas is not now selling at a competitive price to the typical domestic consumer, who uses about 20,000 cu.ft. per month for home heating and cooking. In Atlanta, Ga., the domestic consumer pays about 73c. per 1,000 cu.ft.; Staunton, Va., about 78c.; Madisonville, Ky., about 53c.; Altoona, Pa., about 62c.; Bath, N. Y., about 83c.; Detroit, Mich., about 73c.; Cleveland, Ohio, about 57c.; Whitehall, Ill., about 67c.; Rochester, Minn., about 54c., according to the *American Gas Association Rate Service.*

But before shouting about the fact that coal undersells natural gas, coal men must pause to take stock of what the figures mean. They mean that natural gas has millions of customers who are willing to pay a premium for the convenience and cleanliness of natural gas. These customers will be difficult to win back unless coal can offer equal or other compelling advantages. In fact, it appears that, as long as coal is marketed and burned in the style of a quarter-century ago, natural gas will keep on winning more home-owners away from coal.

In a comparison of proved reserves of natural gas and coal there is a faint glimmer of hope—if coal men are willing to wait 30 years or more for gas competition to flicker out. Proved reserves of natural gas add up to about 200 trillion cubic feet. In 1944, about 4.2 trillion cubic feet was withdrawn. If the gas industry should level off at that rate, reserves of natural gas would last about 47 years. But if consumption expands at the rate gas interests confidently hope for, reserves may approach exhaustion in about 30 years. The best figures on coal reserves indicate a supply for nearly 4,000 years. Thus, if coal can hold its own for the next 30 years competition from natural gas may disappear, giving coal clear coasting from then on, except for water power, with atomic power a competitive possibility, although at present somewhat remote.

What Must Coal Do?

In the light of these facts, what course must the coal industry steer to win the competitive race for industrial and domestic markets?

Coal can let the ship drift with the current, relying on government controls to confine the sale of natural gas to areas where coal would founder in surging freight costs—California and the Southwest. Gas interests are opposing such controls, and there are signs that they will be successful in blocking restrictions. Coal can try to ram and sink its competitor by fighting extension of pipelines into regions far distant from gas fields—the Great Lakes

and the eastern seaboard. Coal can batten down its hatches to ride out the storm in the faint hope of winning by default—an unlikely eventuality, though it might appear that gas interests in Illinois, Michigan and Wisconsin are waging a suicidal intra-industry civil war. Or coal can stand by as an anchor to windward till conservationists warn against depletion of the nation's gas resources—30 years hence.

Basic Measures Needed

But adhesive-tape measures like these, though they provide a breathing space and time to bring up reserves, are not the strategy to win. Though shaken by historic upheavals and scarred in many battles, the industry is still seaworthy and it enters the contest with the wisdom of long experience and a determination born of new inspiration. In this new emergency coal men must resolve to run a strong race and to battle it out to the finish line. The stakes are high—a multi-million-dollar postwar fuel market. Coal men must put their bets right on the line—a huge investment in mining machinery, safety equipment and preparation plants, the highest wages ever paid in the industry, sustained activity in research to produce better burning and handling equipment and the collective energy and skill of business-wise operators, producers and retailers.

How will the race be won? The contest is on, and gas interests claim that it is half won already.

First of all, there must be no loss of heart at the boasting of the natural-gas industry. Instead, coal men would do well to re-assess the superiority of solid fuel and rebuild their sales appeal on rediscovered advantages that are so familiar as often to escape attention. Coal offers a long-term source of supply, adequate to meet all needs and unlikely, except in time of war, to be restricted as to end use. It provides sustained heat, even and easily controlled. Its performance is dependable, unaffected by periodic peak loadings and community-wide breakdowns that sometimes interrupt public utility services. It is a safe fuel. It is produced in a variety of sizes with a wide range of burning characteristics to assure its customers of a fuel for every different purpose.

Not to be overlooked in re-assessing coal's superiority are new automatic controls that reduce firing, handling, temperature control and ash-removal to push-button simplicity. Aware that coal's basic superiority is boosted even higher by these controls and convinced that coal heat, when made equally convenient, can reverse the trend toward oil and natural gas, more and more retailers and distributors are equipping themselves to install and service modern coal-burning equipment. The coal merchant who delivers coal to the bin and then forgets it is as antiquated as grandfather's buggy. Modern heat merchants must deliver complete heating service and satisfaction.

This new conception of the coal dealer as a heat-service merchant may conceivably force a complete reconstruction and overhauling of local coal retailing, with contracts for year-round heating and maintenance service, monthly bills that budget costs over a twelve-month period, city-wide merging of receiving, storage and delivery facilities to increase operating efficiency and reduce costs, cooperative coal-credit bureaus to improve collections, joint educational promotion of coal rather than costly competitive advertising and 24-hour emergency service like that offered by electric and gas utilities.

Retail Promotion Effective

Perhaps some of these changes lie far in the future. Others may not be practicable in every community. But some of them have been tested already and found good. In Waukesha, Wis., for example, the Anderson Co., a subsidiary of the Anderson Fuel Co., offers credit-bureau and advertising service to coal retailers, asserting that accounts receivable can be reduced as much as 51 percent and that retail sales can be upped as much as 149 percent.

Though Lewis' long bituminous strike in April and May throttled the program before it had got well under way, the potentialities of joint educational advertising were assessed and found good last spring in Chicago, where the Commonwealth Edison Co., in cooperation with the Midwest Stoker Association and the Chicago Coal Merchants Association, scheduled a four-month series of newspaper advertisements, supplemented by billboards and direct mail promotion, to stimulate the sale of power, stokers and coal. Slogan of the campaign was to have been "Take It Easy, Mister . . . Get a Coal Stoker . . . Enjoy Abundant Comfort." A stoker exposition was planned to show the latest coal-burning equipment, model homes, model basements and home plans. In addition, the Coal Merchants Association prepared layouts to appeal to prospective home builders and buyers. This would have been good advertising, with zip and punch. It was to have been a three-way joint effort by coal, stoker and power interests. It would have meant good marketing in Chicago. Undaunted by the sabotage of this year's campaign, the Chicago group are now getting a running start for next spring's program. Smaller cities and towns can be fertile fields for similar plans of somewhat smaller scope that bring coal, furnace and power men together.

New Heating Methods Attractive

With private and government-sponsored housing projects beginning to take shape, residential group heating is moving into position as a leading contender for the domestic and commercial heating market (*Coal Age*, March, 1946, p. 66). With service via pipeline to homes, apartment buildings and commercial and industrial establishments, smokeless community heating from central coal-fired plants provides reliable heat, hot water and other conveniences at low cost and without expensive basement excavation and individual heating plants; without dirt, dust and smoke; without troublesome hauling, storing, firing and cleaning; and without ash handling and fire hazard. Costs are comparable with oil and gas and in some cases are substantially lower. The fact that coal can supply all the comforts and conveniences of other fuels and more besides under the smokeless-heating program and do it at no more and possibly less cost is a powerful argument for much greater stress on this competition-beater.

Gasification is another possibility for beating natural gas on its own grounds. If a cheaper, more flexible gasification system can be developed, coal can meet or beat natural-gas transmission costs and thus shut it out on the best of all bases—equally good service at a lower cost. If research receives the proper support, cheap gasification is a distinct possibility (*Coal Age*, November, 1945, p. 82). It is another string to the coal man's bow and therefore merits full support, research and otherwise.

Modern coal-burning equipment, modern merchandising, including heat service, and research therefore stand out as the answer not only to natural gas but to all other competition. If backed up by efficiency in mining to assure the lowest possible cost, higher quality and uniformity and ways and means of preventing interruptions in supply, they can go far toward assuring coal continued dominance in the country's fuel markets.

The outlook for natural gas and other competition is not one to generate complacency. Neither is it one that need cause coal to throw up its hands. The answers are available or can be found. Their use will extend coal's opportunity to serve and thus assure a prosperous future for management, men and stockholders.

MECHANIZED MINING

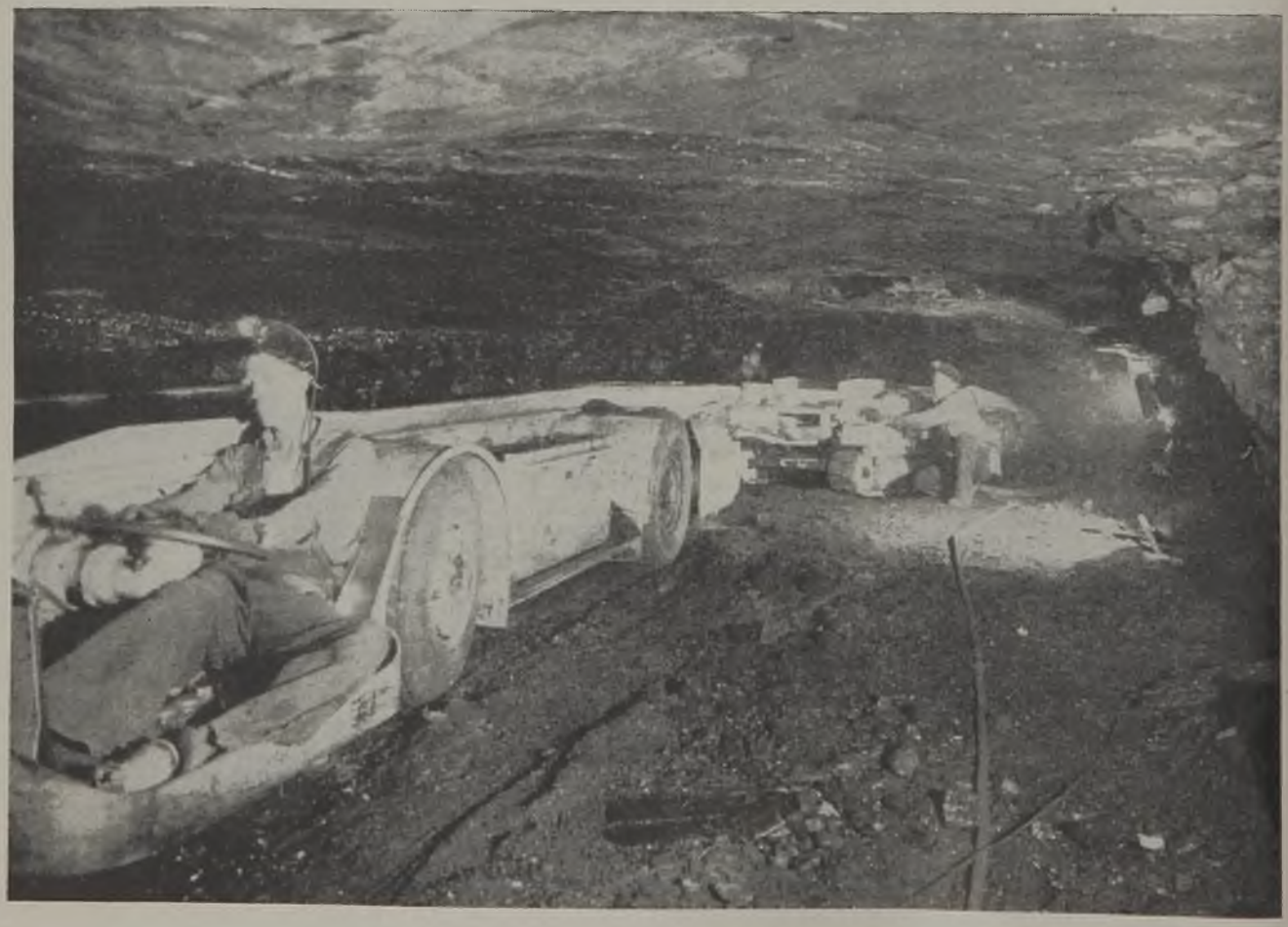
Boosts Cutshin Truck-Mine Output to 1,400

Loaders in 46-In. Coal Served by Shuttle Cars—Large Drop-Bottom Mine Cars Dump to 600-Ton 12-Gate Hopper—13-Mile Haul to Tipple Contracted—Trucks Dumped by an Electric Hoist on I-Beam Trolley

BY INSTALLATION of modern loading and transportation equipment, the Cutshin truck mine of the Cutshin Coal Co., at Wooten, Leslie County, Ky., has been brought to a production of 1,400 tons per day from a humble start with hand loading in September, 1941. The truck haul is 13 miles to the company's railroad tipple at Combs, in Perry County. The first loading machine and two shuttle cars, installed at the mine in October, 1944, and working two shifts while honeycombing pillars, produced 600 tons per day. A tilting-platform truck dump at the railroad handles 25 trucks per hour. Vibrators do all of the screening and a 75-ton bin has been added for the stoker coal.

E. J. Davis, president and manager of the company, who maintains his office at Combs, near the tipple, lives at Hazard which is six miles away by paved highway. He is on the job early and late, spending much of his time at the mine or at the tipple. Although the mine is only eight miles airline southwest of Hazard it is 20 miles by paved highway.

This mine is a drift operation where the seam is at tipple height. It is in the No. 4 bed, which here lies practically level, averages 46 in. thick and is devoid of any continuous impurity bands. The main top is a strong dependable sandstone. Thirty inches of drawslate is present on the side of the property where the main portal is located. As development has progressed this top slate has thinned until only about 4 in. is now encountered. Crop prospect holes on the far side of the hill show the strong sandstone roof but no drawslate. Cover over the



Loading 46 in. of clean coal. The 4 in. of drawslate over the coal was pulled down and loaded first.

Cutshin mine workings. The territory worked by the original mine is shown below the heavy broken line. Hand loading was the practice when it was opened in 1941. In 1944 and 1945, one loading machine in the original workings produced 600 tons per day of two shifts. The new mine, worked entirely by loading machines, is above the broken line.

workings ranges from 75 to 250 ft.

Principal mining equipment now on the job, much of it received in the last few months, is as follows: two Sullivan 7B 50-hp. undercutters with 9½-ft. bars and Prox throwaway bits, one Goodman 12AA undercutter, two Joy T2 crawler machine trucks, three Cincinnati clutch-safety electric coal drills, three Joy 14BU loaders, four Joy 2½-ton 32-in. rubber-tired shuttle cars of the two-wheel-drive two-wheel-steer type with 500-ft. No. 6 con-

Undercutter sumping in. The crawler truck appears in the foreground. The cutters also do the drilling.

The combination mine-car-dumping and truck-loading hopper holds 600 tons. Drawslate and other mine rock are hauled away from two chutes at the near end.

Circle haulage for the trucks has been arranged for by building a short private road joining the paved highway at two points.

A 2½-ton shuttle car delivering to a 5-ton drop-bottom car via an elevator. Trips are moved by a spotting hoist.

centric cables, two Brown-Fayro car-spotting hoists, 25 Sanford-Day 5-ton drop-bottom mine cars, one Jeffrey 13-ton trolley locomotive, one Westinghouse 6-ton locomotive and one MSA Bantam portable high-pressure rock duster.

Seven Headings Driven

In the accompanying mine map, the section above the heavy broken line shows the seven-entry development of the present mine, which has 1,000 acres of territory under lease and more available. Below the line are the abandoned workings of the openings made in September, 1941, using 1½-ton mine cars. Recovery by honeycombing the pillars with the one loading machine and two shuttle cars was 70 percent not including crop areas and other areas abandoned because of faulty conditions. Working two shifts, one loading machine produced 600 tons regularly per day.

Headings are driven 18 ft. wide on 50-ft. centers and the room plan specifies a 40-ft. width, 50-ft. centers and 200-ft. depth. Shooting is done with Austin permissible explosive. The 4 in. of drawslate now being encountered comes down in fairly large pieces and is pried down on top of the fall of coal and handled by the loading machine into shuttle cars and thence to mine cars before the coal is loaded.

The new 5-ton Sanford-Day "Automatic" cars are 28 in. high. They are of the three-door four-wheeled type, 48-in. gage, 16 ft. long inside and 6½ ft. wide over all. They have 15-in. wheels with ball bearings, are without brakes and have spring bumpers at both ends. Main-line track consists of 70-lb. rails on composite ties using the projecting bolt ends to keep the ties from slipping. These ties are illustrated and described on p. 108.

Ten men comprise a normal loading machine crew, as follows: loader operator and helper, undercutter operator and helper (they do drilling also), two shuttle-car operators, one shot fireman, one timberman and two men who pull down drawslate and prepare the fall for the loading machine. Normally, the shuttle car hauls do not exceed 300 ft. in development and 250 ft. in room work.

Capacity of the hopper bin into which the mine cars discharge is 600 tons. On one side along the bottom are 12 gates and chutes for truck loading. One end of the same bin is used for drawslate and mine rock, which is disposed of by truck. This bin is built with steel columns and bottom supports, wood framing and wood sides. The hopper bottoms are lined with

Here, a flat-bed truck has been backed onto the dumping platform at the tipple and the chain of the electric hoist has been hooked to the platform ready for tilting it up to discharge the coal.

Dumping platform at the tipple tilted to the maximum angle by the electric hoist to discharge the coal. The pivot axle is 3 ft. from the rear end of the 21-ft.-long steel underframe of the platform.

steel plates. The private road which the mining company built to serve this truck-loading station is a short loop connecting with paved Highway No. 80. Traffic is one way and the distance on the private road is ¼ mile to the loading chutes and ½ mile back to the highway. This ¾-mile road is surfaced with crushed rock.

Truck Haulage Contracted

Along the 13-mile truck haul on Kentucky State Highway No. 80 to the railroad tipple, two mountains must be crossed. However, they are not high and the grades are not severe. At first, the coal company operated its own trucks but later sold them and now the hauling is contracted to individual truckers who receive 75c. per ton. The truckers have an advantage in the tipple dumping facilities which permits them to use flat-bed trucks which have high capacity, a low center of gravity and are less expensive in first cost and maintenance than self-dumping trucks. The loaded trucks are weighed at the company's office which is on the paved highway close to the railroad tipple.

The railroad was built on the site of a plant serving a mine now abandoned and where the coal seam is at convenient tipple height. The loaded trucks drive up a side road to the old portal, head in toward that opening then back away from the hill out onto the dumping platform of the tipple. In

Trip of drop-bottom cars pulling onto the dump hopper.

New high-pressure portable rock duster. The new steel mine car at the left is 16 ft. long inside.

The tipple, with a capacity of 125 tons per hour, is served by two tracks and two loading booms but loads at four points. An electric hoist shifts the railroad cars.

Lined up at the main portal of the new mine are (left to right): Bradley Begley, mine electrician; Fred Wolfe, section foreman; J. L. Evans, assistant superintendent; Lewis Kidd, assistant section foreman; and Jimmie Lewis, engineer.

Underground are (left to right), Wilmer Becker, assistant foreman; Wallace Wells, mine superintendent; Preston Fortney, mine foreman; and John Stubberfield, section foreman.

most cases, the whole truck is tipped backwards by tilting the platform with a 5-ton Shepard electric hoist. Those few trucks on which the body is hinged at the back are dumped by using the electric hoist to tilt the body only. The loads carried by the various trucks range from 5 to 12 tons.

The platform is 21 ft. long and the shaft or axle is approximately 3 ft. from the rear end, where the stop blocks are attached. The electric hoist is hung on a trolley which is free to move along an overhead I-beam mounted 20 ft. above the center and parallel to the long dimension of the platform. Thus the hoist slides along the beam to position itself for hoisting by a chain attached to the front end of the platform or, alternatively, to assume the proper position to hoist the front end of a tilting body.

One tipple man hooks and unhooks the chain and operates the hoist. Ordinarily 2¼ to 2¾ minutes are required to handle a truck load, that being the elapsed time between one truck leaving the platform and the next one backing onto it, dumping its load and leaving. This balanced truck dump is said to be the first of its type in eastern Kentucky. Now, a number on that general principle are in use in that section of the state.

Vibrating Screens Used

Capacity of the tipple is 125 tons per hour. It is a wooden structure with four loading points on two loading tracks, using one belt type boom and one apron boom. All screening is done with vibrators made by the Bonded Scale Co. A crusher provides for crushing lump to increase the output of ¼x⅜-in. stoker. Railroad cars are shifted by an electric hoist driven by a 40-hp. motor. Markets for the coal are prinipally steam and domestic. However, some of the mine output goes to byproduct ovens.

Power is purchased to operate both the mine and tipple. Direct current at 275 volts for underground machinery is supplied through rotating equipment installed in a substation near the 600-ton bin and fitted with a d.c. automatic-reclosing circuit breaker. Feeder is 1,000,000-circ.mil bare cable and the trolley wire is No. 9 section 400,000-circ.mil. Cap lamp equipment consists of 70 Edison Model P units.

Wallace Wells is mine superintendent; J. L. Evans, assistant; Preston Fortney, mine foreman; Bradley Begley, mine electrician; and W. T. Moore, tipple foreman. The mine output is sold by the Midland Coal Corp., Cincinnati.

THE MINE BOSS:

What's on His Mind Re His Job and Future

Security, Recognition, Help in Getting Ahead and a Share in Policy Stand First in the "Wants" of the Mine Boss—Survey Results Point up Supervisor Thinking and the Way to Better Foremanship

By WILLIAM H. KUSHNICK
Consultant on Industrial Relations
Wallace Clark & Co.
Consulting Management Engineers
New York, N. Y.

WHAT MAKES a mine boss tick? That was the question uppermost in my mind as I headed for my first venture underground to study, for one of the leading bituminous coal operators, the attitude of mine supervisors toward their company's policies and practices.

I spent a month interviewing individually 150 men who had come up from the ranks and who now held supervisory positions ranging from fireboss to assistant foreman and up through mine superintendent. I went down into a dozen different mines and talked with supervisors in their normal working environment—on the man trips and at the face, as well as in their offices. I soon found that the same things motivate and deter men no matter where they work. In other words, I found that the underground boss was not essentially different from the factory supervisor in his requirements for doing an effective job for his company.

In some respects, digging coal seems to develop certain characteristics that I believe make underground bosses potentially better supervisors than factory bosses. In mechanical mines especially, the area to be covered by an assistant foreman usually is greater and consequently the miners in each unit and section are not within the continually close eye-range supervision that is common in factories. Hence, mine supervisors seem to understand more readily the necessity for advance planning, clear instructions and continual training of their crews so that production is sustained in the foreman's absence from the point of work.

I was also impressed with the cost-and-quality consciousness of these mine bosses. Because they had made mining their life's work, everything that affected the industry was vital data. They were well informed on the low margin of profit in coal and were concerned about the inroads of other types of fuel. Yet their pride in their mining know-how constantly bolstered their confidence that for many generations coal still is going to be marketable competitively.

These managerial potentialities developed from the very nature of mining suggest that better results can be obtained with less training than is possible with the average surface-plant worker.

WILLIAM H. KUSHNICK

Developing ways of getting better results with manpower has been Mr. Kushnick's principal activity over the past 20 years. From Pearl Harbor to V-J Day, he served the Secretary of War as director of civilian personnel and training, including recruitment and training and establishment of personnel policies for the Department's one and one-half million workers and supervisors. He traveled extensively to assist Army commanders with their labor problems. Before the war he was production executive for several leading manufacturing companies. During the past year he has been advising the clients of a consulting management engineering firm on their industrial relations practices.

The primary purpose of my survey was to obtain the reaction of the mine bosses to the company's personnel policies.

On the whole, I found the supervisors reasonable, yet firm in their convictions. There was none of the venom that one might expect to find rising out of the traditional friction between employees and owners. Nor did they look with suspicion upon this attempt of the company to improve their relationships. The mine bosses had confidence in the survey because they knew that the "outsider" had no axe to grind and was only seeking the facts. They knew also that my information would be reported back to them as a group exactly as it was to be reported to the president of the company.

Some of the company practices that were criticized by the mine bosses were immediately curable; others required longer range plans. A few will not be changed at all, but top management now knows that it has a job of educating and "selling" the various levels of supervision on the purpose and value of those practices.

The things that stood out foremost in the "wants" of supervisors were security, advancement, fair appraisal and recognition of performance, help in improving their personal effectiveness and opportunity to express themselves in their own behalf and in the development of company policies. Obviously, the comments the men made during the interviews were not specifically in those terms, but in their statements about working conditions and salaries, about how they were handled in matters of promotion, layoff and discharge, about their attitude toward their subordinates, their superiors and their fellow bosses, they all summarized their views in terms of these "wants."

There was no intention in this survey to dig into the attitude of the supervisors toward foremen's unions. Undoubtedly, some of those inter-

viewed already were members of District 50. However, the company was fully aware that sound practices and relationships must exist, regardless of the question of union affiliation and recognition. In fact, it appeared to me that the company was exceedingly wise in stepping ahead with a better program to reduce the causes of friction that might become targets for union attacks.

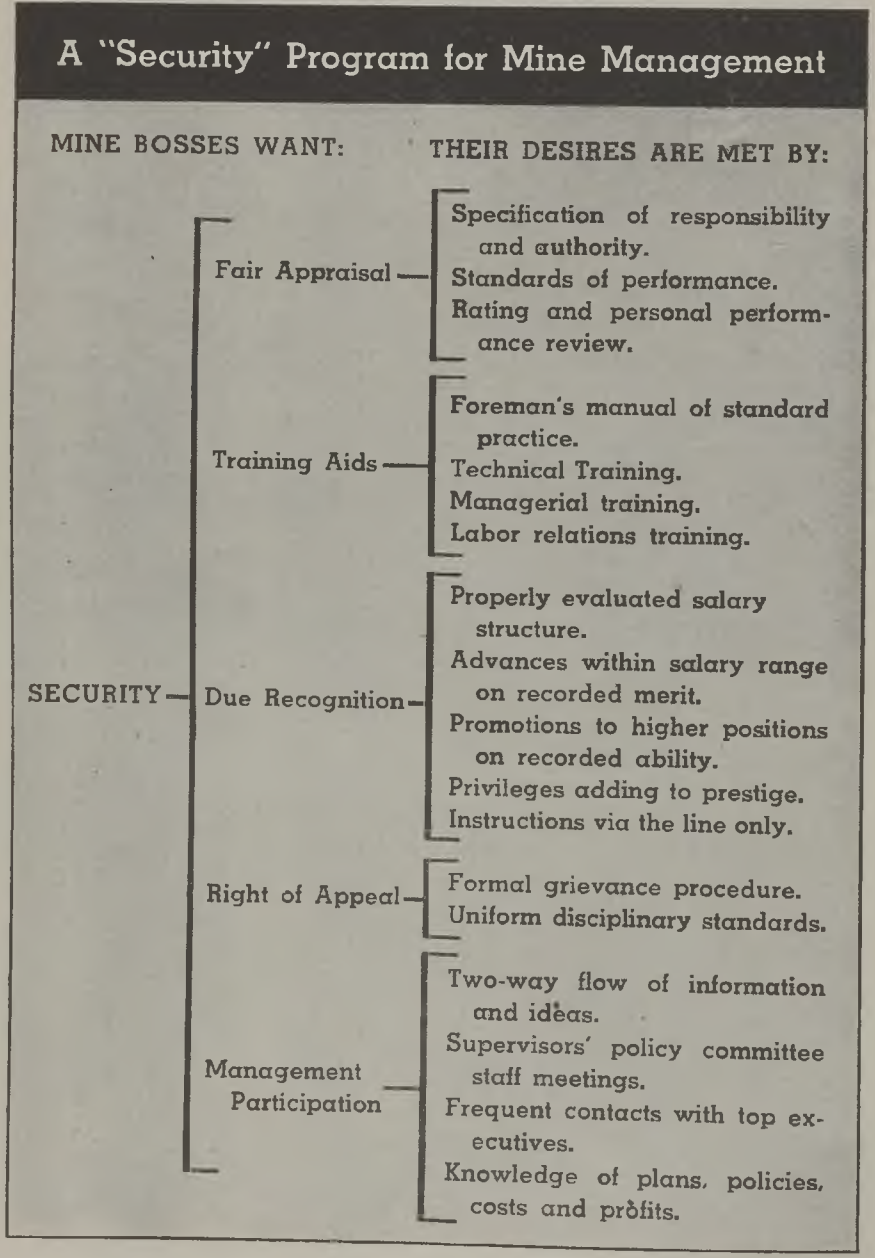
On the question of responsibilities, it is my impression, from having talked with and observed these mine bosses in action, that the first-line supervisor underground is required to exercise more independent judgement and be more of a management representative than is common in the average mill or factory. The assistant foreman, who directs the work of the miner, is far from being a simple "traffic cop." His responsibility for men, material, and machinery, for planning and control, for discipline and safety, warrants the statement that not only is he part of management—he is the management in the area of his jurisdiction.

One of the fundamental "gripes" underlined by the survey had to do with the assistant foreman's "security." Its impacts were felt in many diverse ways—promotions, demotions, transfers, layoffs, discharges and so on.

The men generally felt that decisions affecting their status were made without fair recognition of their full merit. Frequently, they said, they were adversely affected on the basis of a single unfortunate incident without regard to a long previous background of good performance. Moreover, they felt that many decisions were made on the basis of favoritism—that sometimes a new mine superintendent just "cleaned house" on the principle of being "under new management" without due regard for past records. All these things made them feel less secure as members of management. In fact, a few ventured to say that the rank-and-file miners, because of union protection, were given more consideration in such matters than supervisors.

These are not uncommon complaints in any type of industry. My survey did not reveal that the men were completely in the right. However, it did bring to light a most significant oversight on the part of top management: there were insufficient records of an assistant foreman's true performance. Without such records, a mine superintendent is prone to forget a supervisor's past achievements in the heat of a present failure. Without proper records, it also is conceivable that the one who was promoted may have been a less-qualified candidate than others. On the other hand, were we to assume that top management's judgment in such matters was always wisest, the unfortunate fact still remains that the feeling of unfairness prevailed down through the line. Something more positive needs be done to increase the confidence of the lower levels of supervision in the fairness of such decisions by there superiors.

A "Security" Program for Mine Management



Foremen Realize Profit Need

The company had done much to promote the concept that real security is tied in with profitable operation. The supervisors were fairly well imbued with the understanding that increased quality, quantity and safety in coal production are the keys to permanent and better jobs. However, that understanding did not serve as a complete answer to the kind of security they were worrying about.

My further inquiries brought to light the existence of a supervisor's rating form. It had been well designed for its purpose, but ran too much to the personality attributes of the man under review. It had been filled out by the mine foremen and superintendents at six-month intervals over a period of several years.

It might have been a constructive rating tool except that those who were rated never saw the form and were aware of its existence only when about to be discharged or demoted. At such a time, either the mine superintendent or the personnel manager, or both, pulled out a copy and said: "Joe, these

reports show you've had a bad record for a long time." Obviously, Joe usually said that the record was news to him. Consequently, it was considered by the supervisors largely as a secret device purposely designed to justify an unfair decision. In short, management was making a negative use of the rating.

A rating record that is used only to condemn a man cannot be expected to be popular or to inspire confidence. On the other hand, a rating record that serves as a constructive analysis of the strong and weak points of a supervisor's effectiveness and is used openly to recognize his merit and to point the way toward his improved performance is one of the best devices for developing high morale and better supervision.

Accordingly, the survey report suggested that the old record be abandoned in favor of a new one. In the new form, provision was to be made for a more factual record of individual performance, as well as for the essential personal characteristics of the supervisor. Moreover, the procedure of rating was expanded to include a personal interview by the rater with each person rated at the time of rating. During such an interview, the accomplishments would be cited and the shortcomings stressed. The rater, from his analysis sheet, also would be in a position to suggest how and where the individual might be helped, or could help himself, to obtain the knowledge, skill or experience required to improve his next rating.

Supervisors Draft Rating Form

This general plan was adopted by the company. To further the concept of the supervisors actually participating in the development of management policies and practices, the working out of the details of the form was assigned to a committee of supervisors. I sat with that committee, consisting of representatives of the assistant foremen, mine foremen, the mine superintendent and the personnel department. It was an ardent group of men. They dug up books and articles for study and guidance. They argued every element out in a practical and objective manner. They evolved a rating record that will satisfy the entire management.

It is too early to forecast the results. The rating form probably will be further refined after tryout. The raters themselves will have to be trained to handle the interviews constructively. It is easier to fill out a form for the files than to justify one's analysis in a man-to-man appraisal. But the effort is bound to pay dividends.

Confidence will increase not only because the record is the design of those to be rated but because the record will be an open book, with top supervision taking the lead in using it to pat on the back those who are deserving and help the weaker members to correct their deficiencies. When these less efficient men know the facts, when they have been given the opportunity and help to improve themselves, yet continue to slip, then it will not be news to them, or even to a union, when it becomes necessary to adversely change their status. For the more efficient men, the record will assure proper recognition in matters that affect their personal security.

There were many other significant possibilities pointed up by the survey. Those interviewed expressed themselves as wanting to add to their security by learning more about the art of supervision. In committee fashion, again, a very realistic and down-to-earth plan has been developed so that supervisors can increase both their technical and their managerial knowledge continually.

It was recognized, also, that care must be exercised in selecting supervisors from the ranks. A State certificate alone is not sufficient. To reduce the disappointments and demotions that might result from haphazard selections, a representative committee has evolved a set of qualifications and characteristics from which to judge the suitability of a candidate for promotion from the ranks. Consideration also is being given to using a few tests to determine more scientifically the degree of intelligence, resourcefulness, leadership and other attributes of the candidate. Putting these and other equally constructive plans to work awaits the demise of government operation.

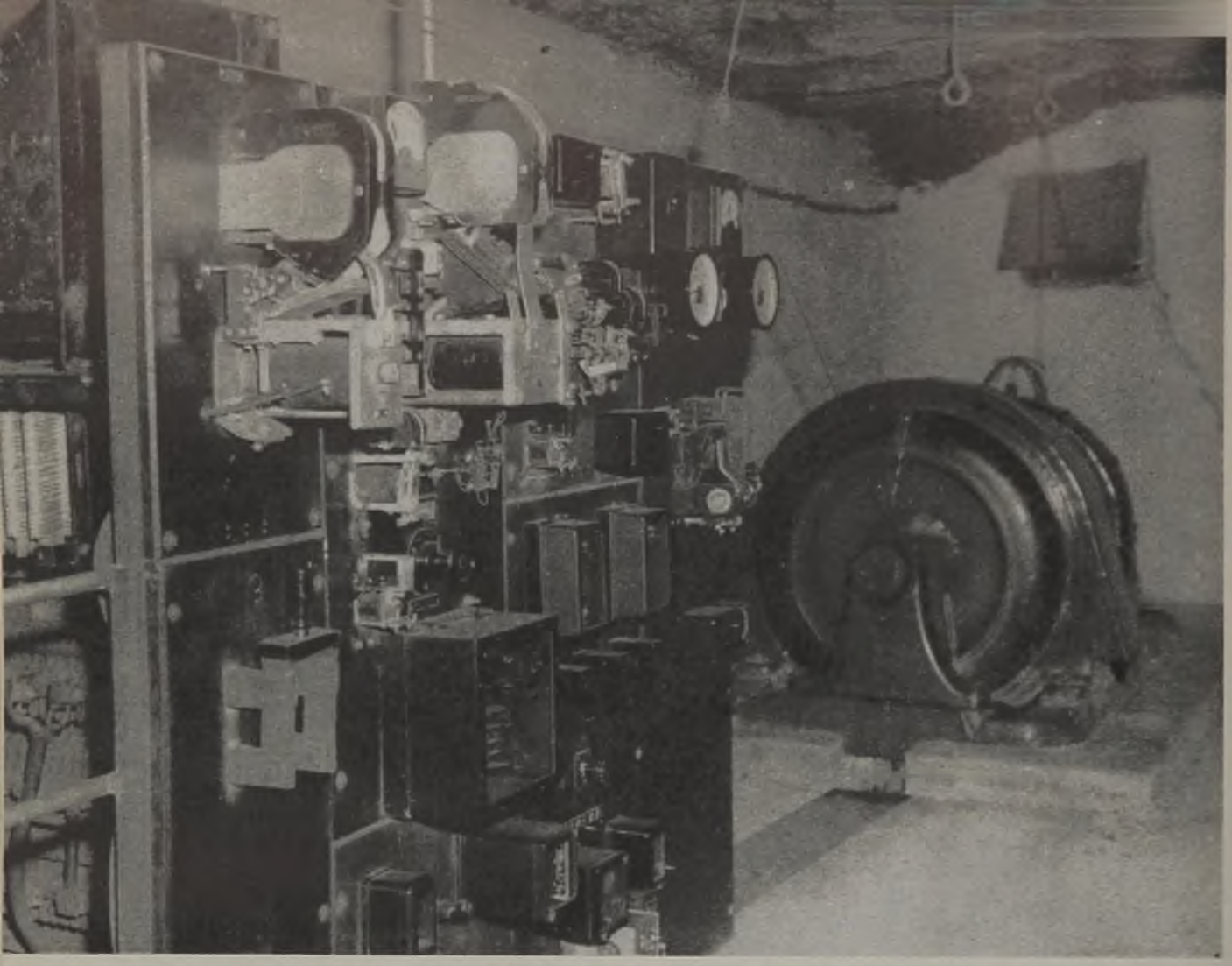
It should not be assumed from this presentation that the company under survey was deficient in its supervisory personnel program. In fact, I know that in many phases of its industrial relations activities it is considerably in advance of what many other organizations are doing both in the mining and the manufacturing industries. Its progressiveness is apparent from the fact that it undertook to audit its current program. The attitude survey measured the results of past efforts. It gave the company a firm basis upon which to reconstruct its personnel policies affecting supervisors out of knowledge of the facts, rather than out of feeling that the policies were sound. It told top managers they were on the right road even though the goal was still uphill. Just as they would do in their sales program, if it were faltering, they are stepping up their industrial relations campaign to win and hold their supervisors' confidence in the company's leadership.

Other coal operators have been known to say: "Supervisory programs? They're the bunk—we're out to get coal!" Instead, this leader in the industry will say: "Production is primarily a matter of supervision—and if we know what really keeps our mine bosses from giving their best, then we also know why we are not getting the maximum tonnage."

With such a spirit, it is safe to predict that the company will get the results it wants and will justly deserve them.

Ten Steps Toward Better Mine Supervision

1. Select the supervisor by interview, tests and prior work record.
2. Prepare and indoctrinate him through training.
3. Define his duties and delegate authority to him.
4. Observe, record and rate his performance.
5. Continue his development of supervisory "know-how."
6. Encourage his ideas.
7. Provide financial and non-financial incentives.
8. Stimulate his leadership of subordinates instead of his "drivership."
9. Keep him fully informed.
10. Accept him genuinely into the "management family."



Typical m.g. substation in Kenilworth mine. Automatic reclosing circuit breaker, automatic load limiter, automatic motor starter, no attendant required.

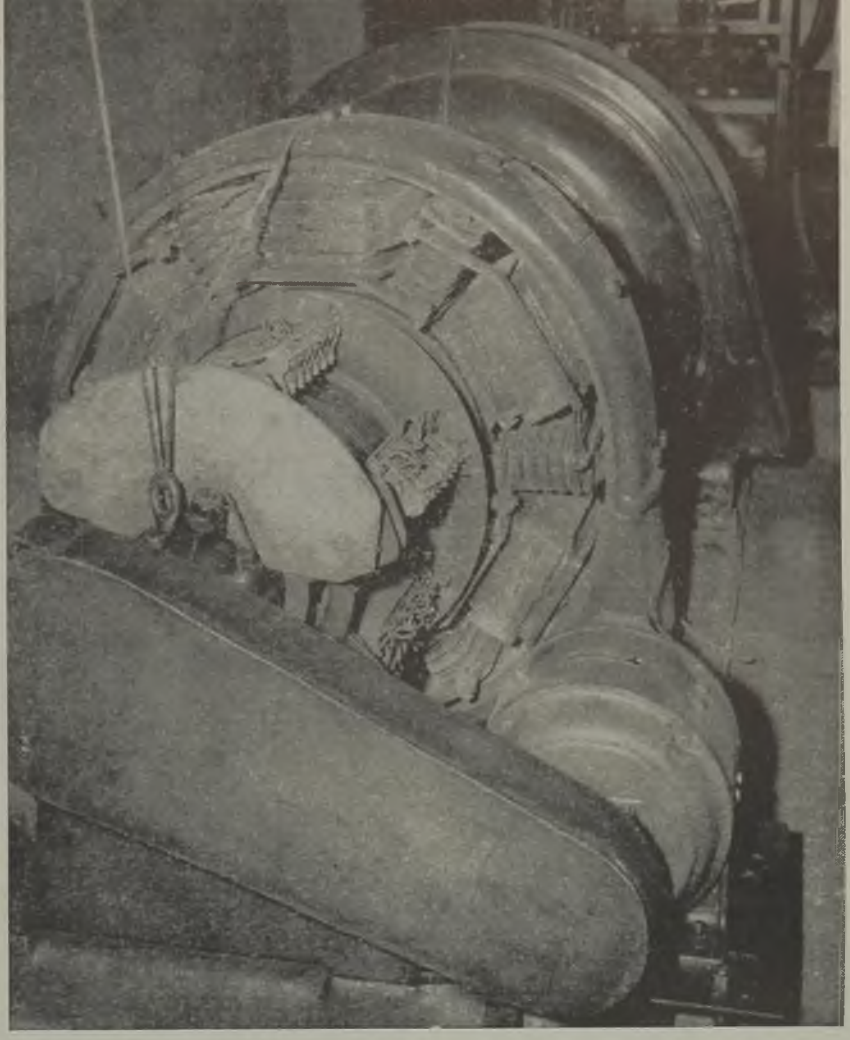
D. C. SECTIONALIZING

Localizes Interruptions at Kenilworth

Ten Tie and 17 Stub-End Sectionalizing Units in 1650-Kw. System—Load-Limiting Equipment Permits Overloaded Substations to Operate At Reduced Voltage—Time-Delay Relay Disregards Momentary Peaks

GREATER SAFETY and better service to production equipment have followed complete sectionalization of the d.c. distribution system and installation of load-limiting equipment at the Kenilworth mine of the Independent Coal & Coke Co., Kenilworth, Utah. With six operating and one stand-by substations, Kenilworth mine, at the time this was written, was using ten tie and 17 stub-end breakers of the automatic reclosing type with load-measuring relays. In addition, each of the substations was equipped with load-limiting equipment to enable other stations to help those experiencing unusually heavy demands.

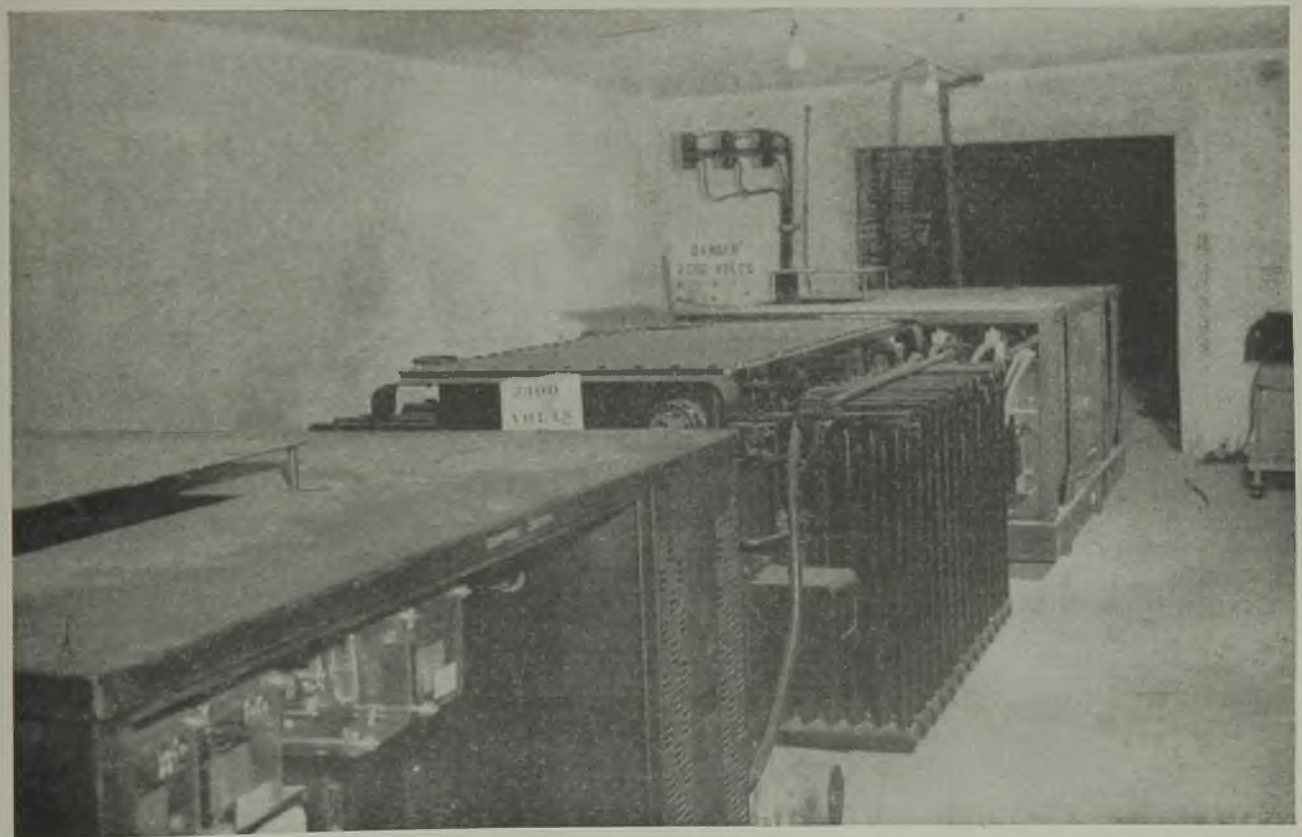
Developed with the advice of Leonard Wilson, consulting engineer, and installed and fitted to the job by mine operating officials, including W. C. Painter, master mechanic, the new d.c. system was the answer to several difficulties previously encountered at Kenilworth mine, where Walter F. Clarke is general manager, George B. Jackson is superintendent and E. O. Jackson is general mine foremen. Prior to the installation of the sectionalizing and load-limiting equipment, circuits



With the installation of load-limiting equipment, V-belt-driven exciters for synchronous-motor fields were added to the m.g. sets

were protected only by switchboard breakers in the substations. All sets operated in parallel, which is still the case, but previously all units could feed into a short to the limit of their capacity, meaning that usually a short was burned clear with consequent hazard, not to mention increased and wider-spread interruptions of service due to the attempts of the substations to continue feeding the fault or faults. Now, in case of a short or other excessive overload in a section, only one substation is affected, the tie breakers opening to isolate it and leave all other sets to operate normally.

With an average daily production of 3,800 tons in two production shifts, Kenilworth mine is served by three 44,000/2,300-volt substations. One is at the preparation plant and shops near the portal of the main-haulage tunnel. It's capacity is 1,000 kva. and it serves primarily the surface installations in addition to a d.c. substation for the outby portion of the main haul. Pole lines from this point serve two other substations supplying the mine. One, 1,200 kva., is at the portal



Latest d.c.-power unit at Kenilworth—a 300-kw. mercury-arc rectifier. Special equipment gives the same drooping-voltage characteristic as on m.g. sets for load-limiting purposes.

Fig. 1—Main a.c. and d.c. circuits at Kenilworth, showing use of tie and stub-end breakers for safety and efficiency in d.c. applications.

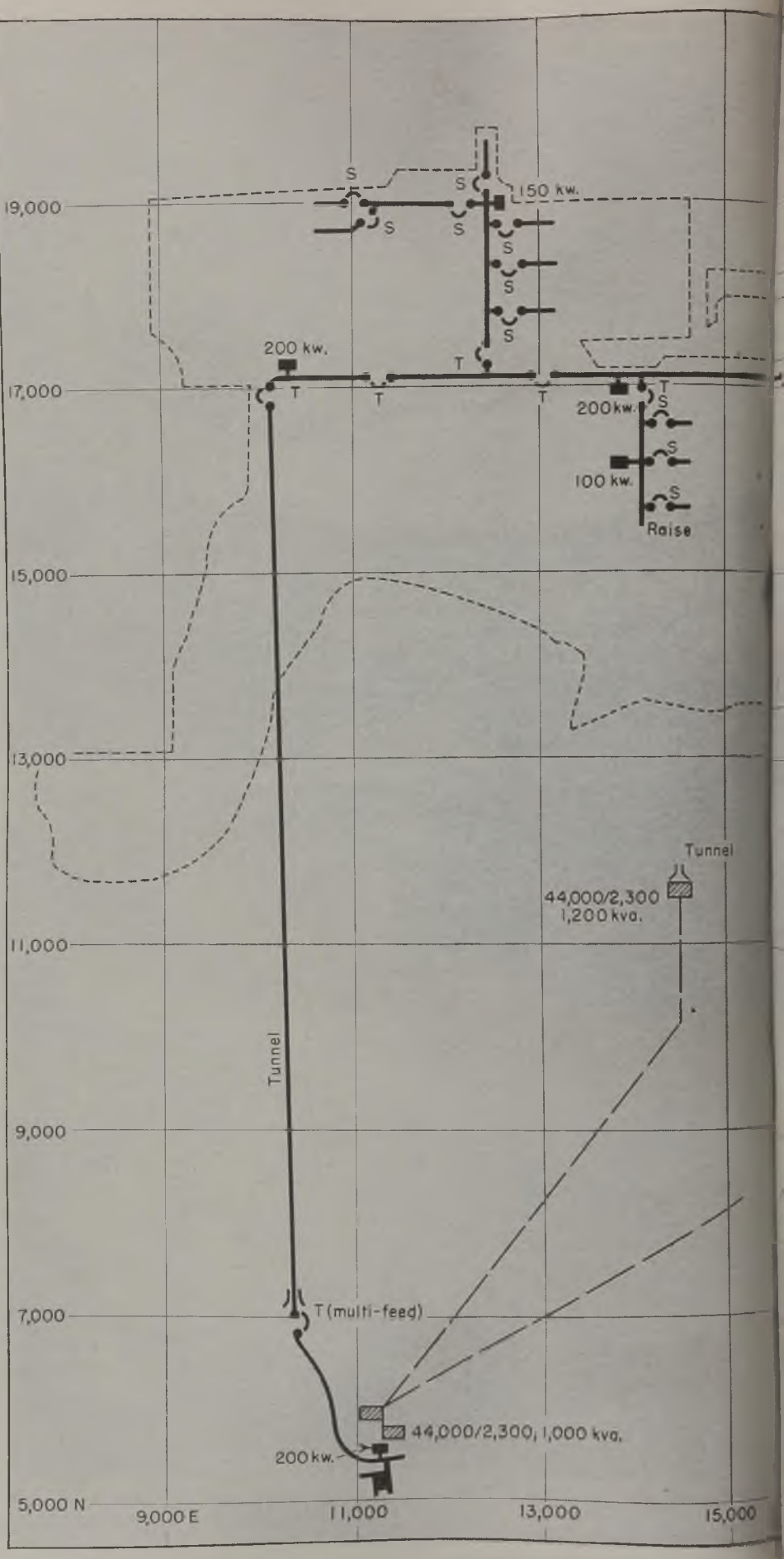
of a rock tunnel about midway of the property and the other, 1,000-kva., is at the top of a borchole at the back end of the mine. From these points, 2,300-volt power is taken underground by lead-covered cables, 2/0 conductors, two cables in multiple.

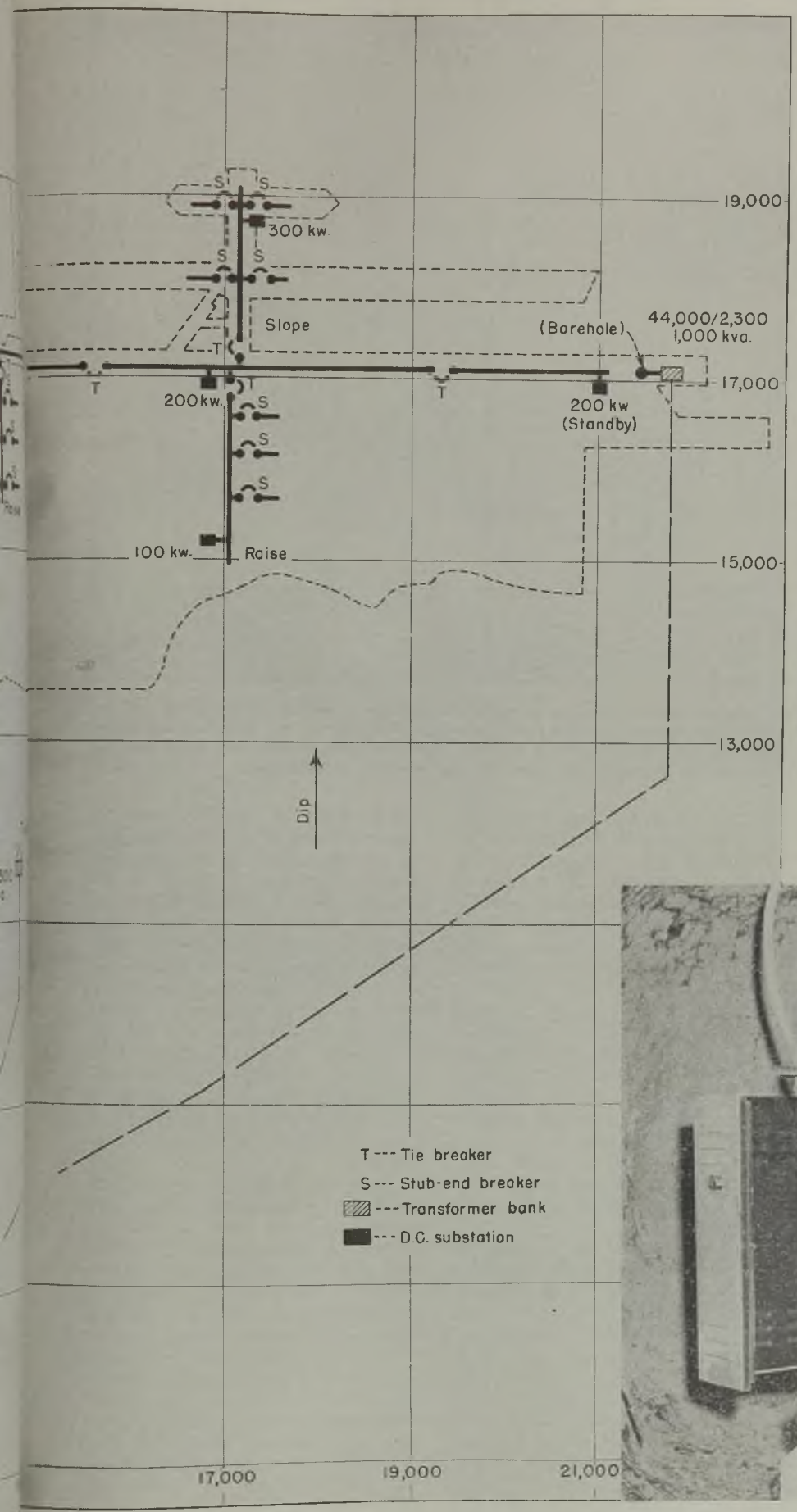
Minimum face voltage at Kenilworth is 250. As noted, six substations, with a seventh in an area developed but not now being worked, supply d.c. power. In order on the way into the mine, they are 200 kw. (outside), 200 kw. (inside of main haulage tunnel), 150 kw. (No. 2 slope), 200 kw. (foot of No. 3 raise), 100 kw. (No. 3 raise), 200 kw. (foot of No. 4 raise), 100 kw. (No. 4 raise), 300 kw. (No. 4 slope) and 200 kw. (far limit, Main East entry, standby). The 300-kw. unit is a Westinghouse, mercury-arc rectifier. All others are motor-generator sets. Two are old sets with a maximum full-load voltage of 260, whereas it frequently is desired to run at 290 at the switchboard. Consequently, they have been especially equipped to meet this condition and have rendered a lot of service that otherwise it would have been impossible to secure.

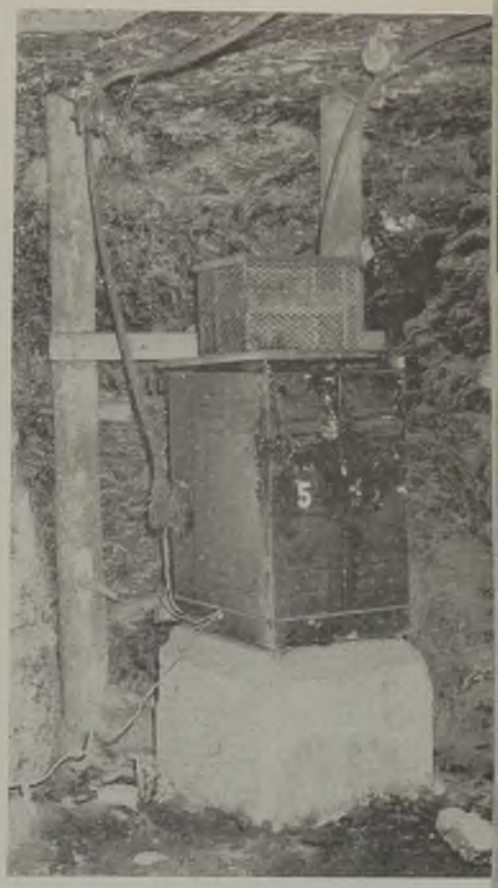
While the substation capacity is high for the load, the center shifts rapidly and consequently sets frequently are called upon to handle more than their normal overload rating. This was primarily the reason for the installation of load-limiting equipment, including the rectifier, the first and so far only rectifier to be so equipped.

How Load-Limiters Work

How load-limiting is accomplished is shown in the accompanying diagram. Each set is accompanied by a full-automatic panel, which includes a main station breaker, normally set, on 200-kw. sets, at 1,200 to 1,500 amp.—proportionally on smaller sets. Back of the main breaker is a load-limiting contactor, normally set at 1,000 to 1,200 amps. on 200-kw. sets. When the load builds up to approximately 150 percent of the generator rating, the load-limiting contactor, opens the series field and shunts all load current through a 0.04-ohm resistor to the negative side. This connection, by substituting a resistor in place of the series field and leaving the shunt field connected trolley to rail, gives the generator an excessively

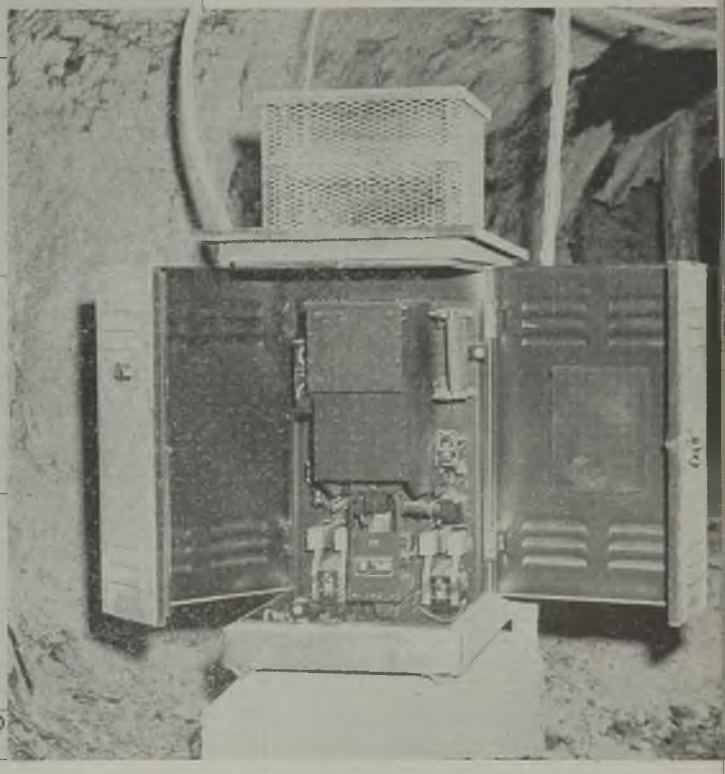






One of the several tie breakers used at Kenilworth to isolate substations in case of heavy overload or trouble on the system.

Stub-end breaker with covers opened to show working parts.



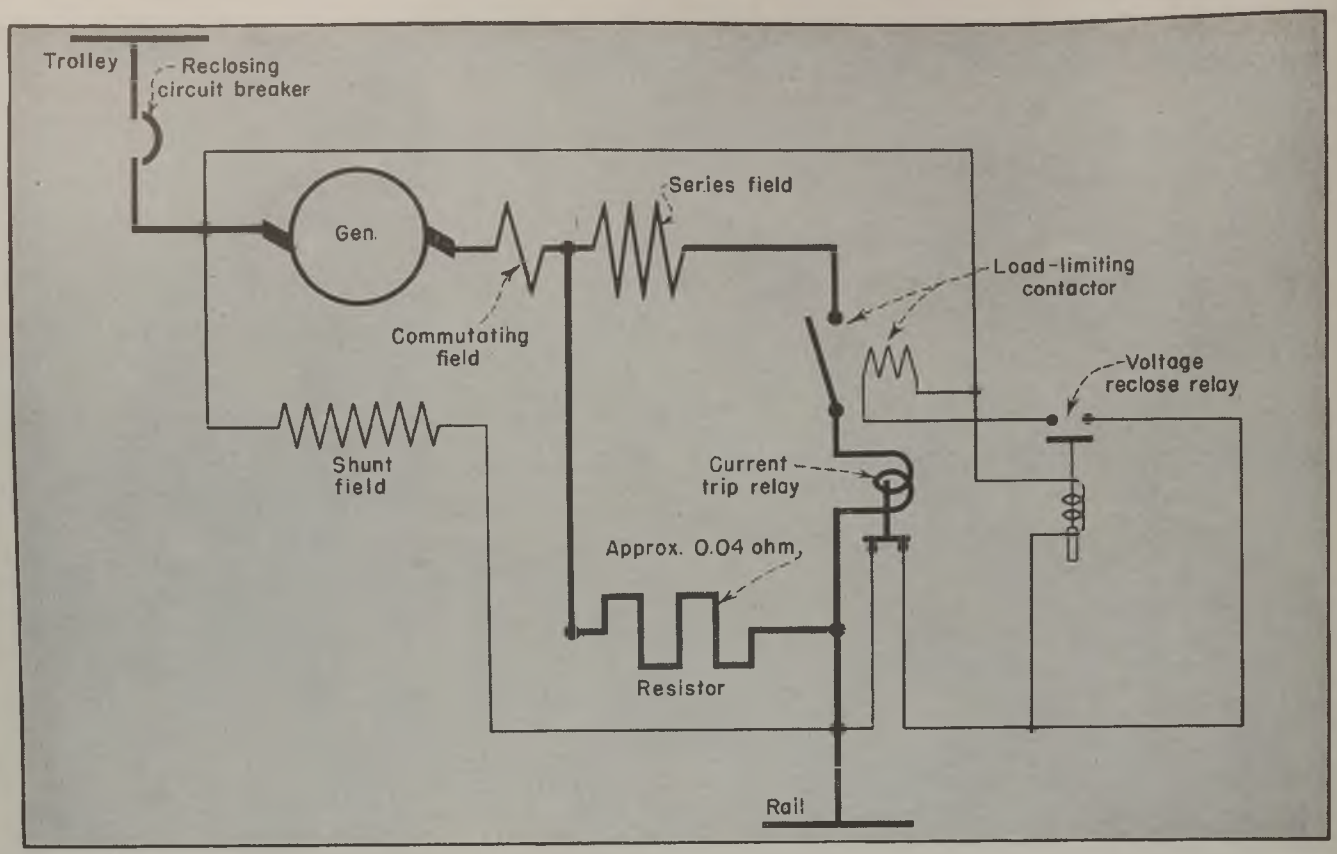


Fig. 2—The load-limiter contacts for the typical motor-generator at Kenilworth remain closed under normal operation. When the load current exceeds 150 percent of the generator's rating the current trip relay opens its contacts, dropping out the load-limiting contactor and voltage-reclose relay. Generator voltage drops, and the current trip relay recloses, feeding the voltage-relay coil which does not reclose until the system's voltage has recovered, signifying that the overload has subsided.

drooping voltage characteristic. On a dead short the voltage would drop to zero without injury to the generator. By adjusting the value of the resistance through taps, any type of drooping voltage desired can be obtained. Lowering of the voltage automatically limits the generator load and the sets on both sides pick up more load.

The resistors were made from old locomotive grids and in many cases old locomotive contactors were employed. To maintain constant field strength on the synchronous motors of the sets regardless of the drooping voltage on the d.c. side, separate exciters were provided. These are 5-hp. motors connected as generators and V-belt driven from the shaft. The load-limiter on the rectifier functions by timing the ignition and provides the same drooping-voltage characteristics as on the m.g. sets.

The substations are automatic start and stop. When the mine a.c. power is shut off, all the substation switches open, and when power is restored each substation starts up automatically in its proper sequence as controlled by a timing relay. Each substation has five separate fault-detecting relays, and when any one of them is actuated it locks out the substation and shows the relay number on an annunciator panel.

Sectionalizing at Kenilworth is accomplished with I-T-E automatic reclosing circuit breakers with load-measuring relays to govern reclosing after tripping. Tie breakers are Type KSC, with one at the haulage portal a multi-feed unit. Stub-end breakers are KSA. All are rated at 600 to 1,200 amp. The settings generally are 1,200 amp. However, graphic recording equipment has been purchased and settings on stub-end units will be adjusted to the level in each section. Generally, in loading machine sections, the load is made up of an 80-hp. track cutter, a 50- or 75-hp. loading machine, a 3-hp. drill and an 80- or 100-hp. 8- or 10-ton gathering locomotive.

A novel method of tripping the circuit breakers permits discrimination between short-duration excessive-operating peaks and long-duration fault currents of lower value. Excessive current on a generator drops the voltage to perhaps 65 percent of normal. If the cause was a momentary operating peak the voltage quickly starts creeping up and does not actuate a special time-delay low-voltage relay. If however the cause was a partial short-circuit, the voltage remains low and actuates the relay. This trips the generator circuit breaker and also the sectionalizing breakers midway to adjoining substations. This kills the whole of the substation district, and all the stub-end breakers open on low voltage. Immediately, each of the circuit breakers recloses as soon as its load-measuring relay (or differential voltage relay) permits. In all probability the partial short was on a stub-end line and not of sufficient magnitude to have operated the overcurrent trip of the stub-end breaker. This breaker will therefore remain open until the trouble is removed. All other breakers will have reclosed.

Along with sectionalizing and load distribution Kenilworth mine uses ample copper for good face voltage. In general, the trolley on the main line and in each working territory (6/0) is paralleled by 500,000-cir. mil feeder as far into the working section as necessary. Good bonding is the rule, using a short steel-weld U-bond. This, plus other revisions in the d.c. distribution, has almost eliminated armature burnouts, which previously were frequent, along with controller fires and, particularly important, arcs and fires due to shorts and grounds.

BLASTING VIBRATION:

Facts Refute Property-Damage Claims

Research Proves Normal Commercial Blasting Operations Incapable of Damaging Houses and Other Structures by Vibration—Reducing Blasting Noise and Air-Borne Effects the Road to No Complaints

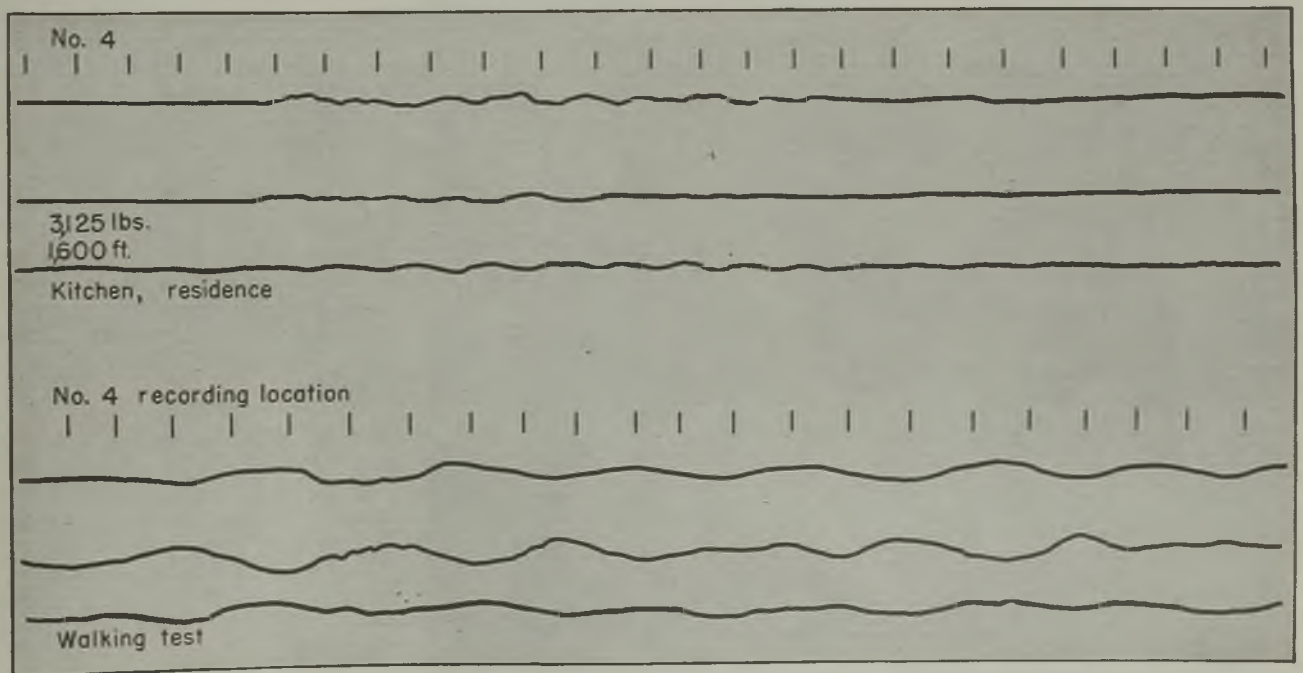
By L. DON LEET
Associate Professor and Seismologist
Harvard University
Cambridge, Mass.

WHENEVER DYNAMITE IS USED to break up earth materials, a small part of its energy escapes from the place of detonation in the form of vibrations in the ground and in the air. These are sometimes perceptible at distant points and this may lead to complaints that they are doing damage to property. For over fifteen years, however, modern scientific methods have been applied to a study of these vibrations and many things about them are well established today.

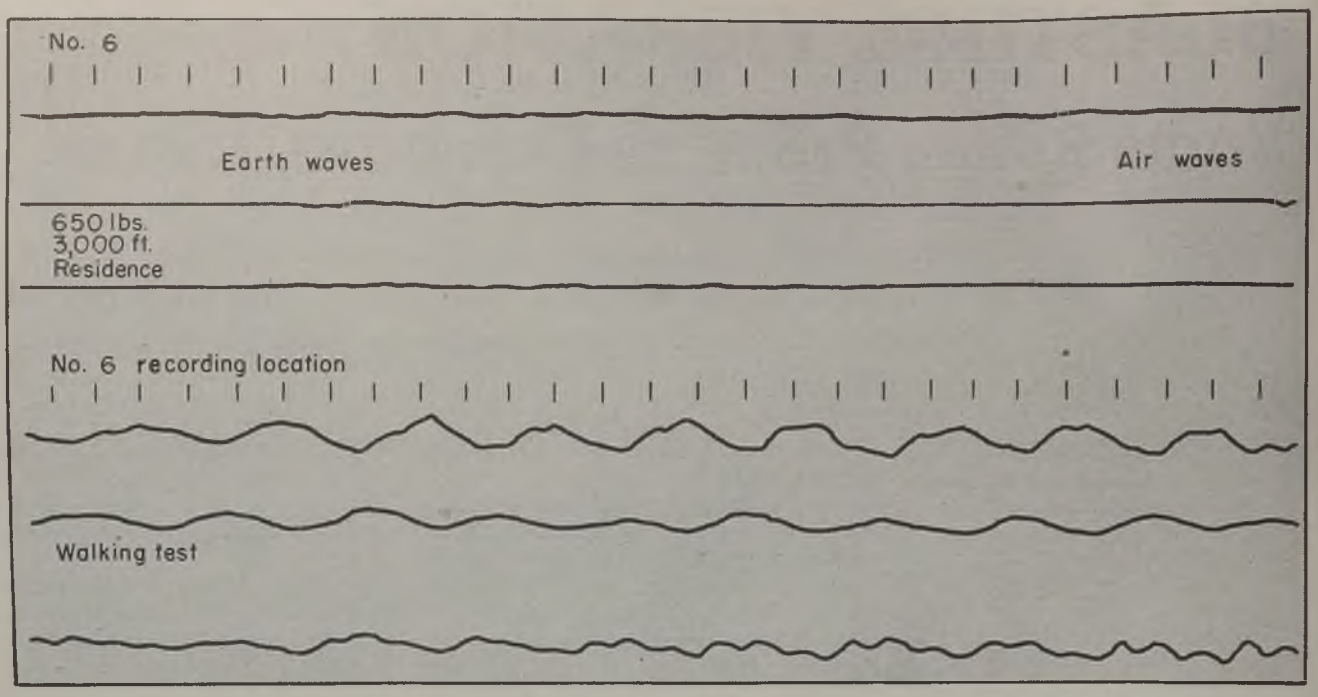
The investigations started in the realm of seismology (that's Greek for the science of shaking) but in many cases have ended in pure psychology (that's Greek to most of us). They have included measurement of vibrations from sources ranging from a slamming door to the atomic bomb. In one sense, the results have been disappointing to the seismologist because the vibrations have been so small. This came as somewhat of a surprise to one who had listened to graphic descriptions of houses racked and ruined hundreds and even thousands of feet from blasting operations.

Making the Measurements—In the early days, several ingenious but indirect approaches were made to the problem of measuring these vibrations. One was to sit relaxed in a well-sprung easy chair. Another was to balance a pencil on a porch rail or elsewhere. This usually would remain standing during passage of the vibrations from blasting, but would topple over when someone walked by. Another was to fill a glass of water to the brim and watch for spillage as the vibrations passed.

The pencil test was eventually formalized in what became known as a "falling-pin set," or "falling-pin seismometer." This originally was proposed in two forms. In one, cylindrical pins of the same height but different diameters were set up on a level base. In the other, which ultimately became the standard, cylindrical pins of the same diameter but different heights were used. A set of the first type was used in tests at the Aberdeen Proving Ground between Oct. 4 and Nov. 4, 1920. A set of the second type is reported to have been used about 1920 by the General Crushed Stone Co. U. S. Patent 1,825,554, based on an application



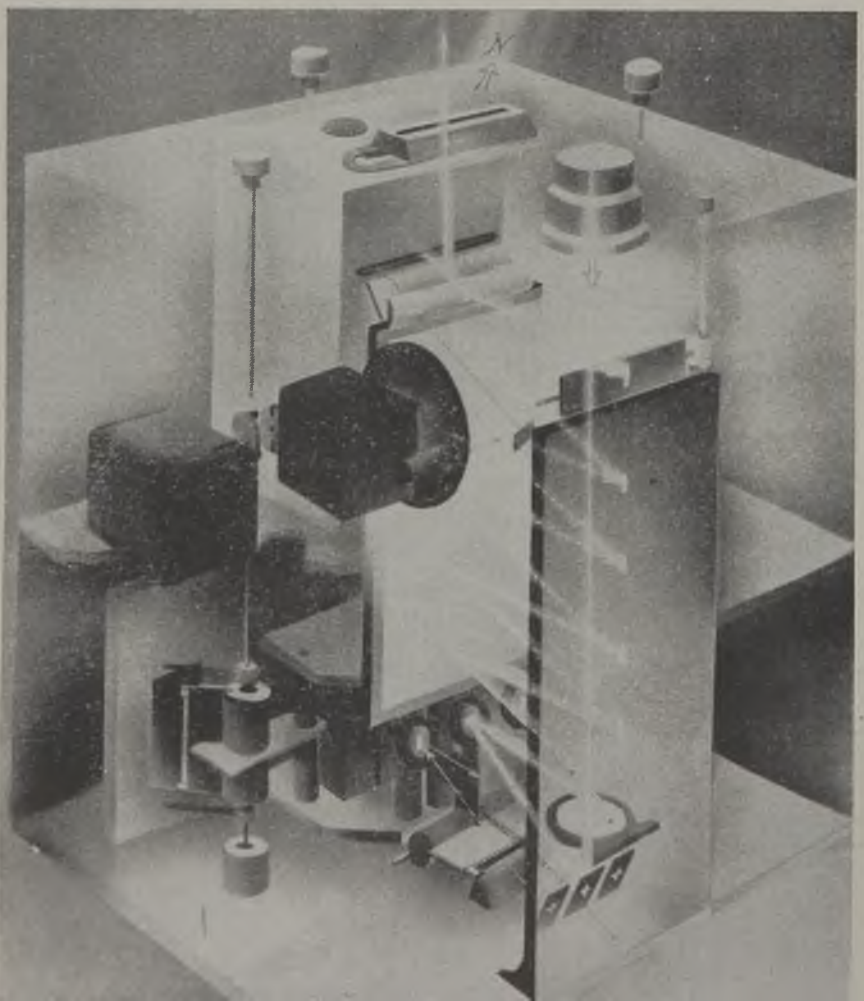
Walking vs. blasting vibrations. At the top is a record of vibrations 1,600 ft. from a 3,125-lb. bank shot in a strip mine. At the bottom is the record of vibrations produced by walking over the floor supporting the seismograph on which the top record was made.



Walking vs. blasting vibrations—Example 2. Top, vibrations 3,000 ft. from a rock shot in strip mining; bottom, vibrations from walking over the floor supporting the seismograph.

filed Nov. 12, 1925, was issued Sept. 29, 1931, to Walter O. Snelling and Guy A. Rupp of Allentown, Pa., assignors, covering the falling pin seismometer in either of these forms.

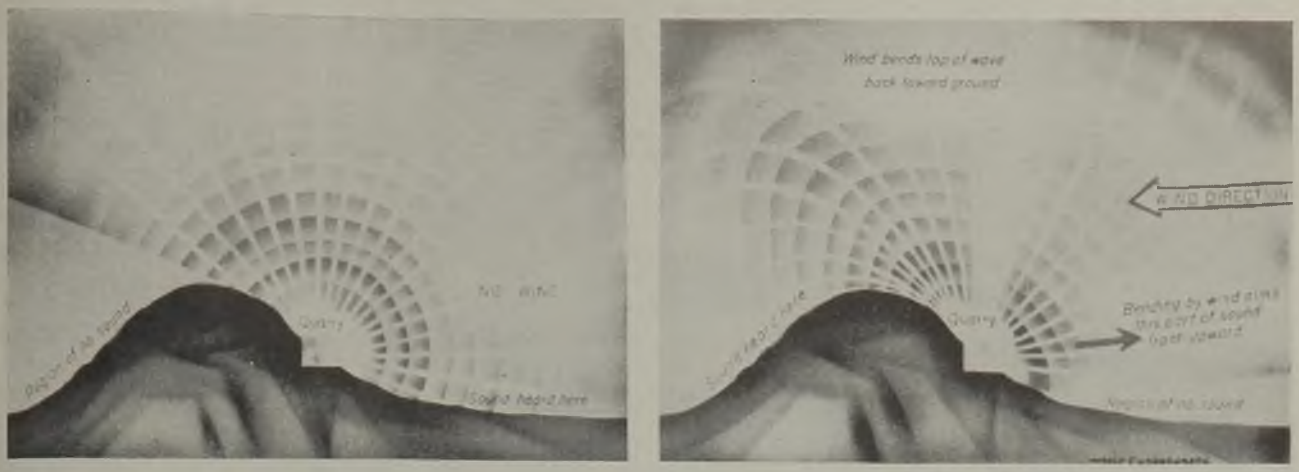
All these early methods were either negative or largely qualitative in nature and none produced actual records of the vibrations, whether large or small. Eventually, photographically recording seismographs were brought to bear on the problem. Anyone curious enough to go to the trouble can find one of these described in "Ground Vibrations near Dynamite Blasts," by Leet, in the Bulletin of the Seismological Society of America, Vol. 29, pp. 487-496, 1939, and another in U. S. Bureau of Mines Bulletin 442, 1942.



Cutaway view of the Leet three-component portable seismograph (courtesy *The Explosives Engineer*).

The latest form of the Leet seismograph is described in detail in "Vibrations from Blasting, a Manual on their Nature, Measurement, and Effect," published by the Hercules Powder Co., Wilmington 99, Dela. This form produces on a strip of photographic paper a magnified record of ground displacements in three dimensions on a time scale divided into hundredths of a second. From such a record, actual ground displacements, frequency of the vibrations and duration of the motion are measured directly. Acceleration or other characteristics can be computed if needed. This instrument was completed early in 1945, just in time to be given an assignment recording ground motion from the test of the atomic bomb in New Mexico on Monday, July 16, 1945.

Results of Measurements—Over the past twenty-five years, a number of investigations of blasting-vibration problems have been conducted by both government and private scientists. These have been independent of each other, used widely varying techniques and covered the country from coast to



Effect of wind on the audibility of sound in the vicinity of a dynamite blast (courtesy *The Explosives Engineer*).

coast. They covered blasts ranging from a half-stick of gelatin dynamite to the atomic bomb and various commercial operations, including sewer excavations, quarrying, road construction and coal mining. From all of this have come strikingly unanimous conclusions that normal commercial blasting operations do not—in fact, cannot—produce vibrations capable of causing damage to structures of any kind whatsoever.

Tests Disprove Claims

The evidence falls into two main categories:

1. It can't happen here.
2. It hasn't happened here.

In Category 1, the U. S. Bureau of Mines has played a significant role. Scientists of that agency, after several years of trying to run down a case of damage to property from routine blasting, gave up the chase as hopeless and set about producing and observing the effects of vibrations from sources of their own. One of these was blasting underground with progressively larger charges at shorter and shorter distances from a government-owned test house until finally plaster was damaged. Seismographs kept records of the displacements, so the quantity necessary to produce damage was determined. Government researchers also hooked a motor-driven eccentric weight to test structures and ran through a series of controlled vibrations until damage resulted. As a result, the Bureau of Mines finally issued, in their famous Bulletin 442, figures on the amount of vibration necessary to damage plaster as well as figures showing the amount of vibration caused in ground of various kinds by dynamite blasts up to 10,000 lb. at distances up to 6,000 ft. The Government Printing Office's stock of this Bulletin is exhausted so some of the results have been copied and reprinted in the writer's manual on "Vibrations from Blasting" previously mentioned.

It is well established by now that ground vibrations from blasting generally cause in houses in the neighborhood less movement than results from normal use, such as walking about, slamming doors and clumping downstairs.

In Category 2, the nature of cracks in plaster and of other alleged damage is the key. From the effects of earthquakes, much has been learned about the pattern of damage produced by vibrations from sources outside a building. At the same time, engineers have supplied us with an extensive body of fact about the effects upon a structure of defects in foundation or construction, as well as the operation of normal forces of expansion and contraction from temperature and moisture variations. With this background, it usually is possible by inspection of a building to say that cracks found in it (and few buildings, of course, have none at all) not only were not caused by vibrations from external sources but actually resulted from one or several of the known normal causes.

In spite of all this, complaints not only continue but seem to become more numerous as the years pass. In fact, if vibrations from blasting were as lethal as a tabulation of complaints would suggest, Europe and Japan would have been a shambles and the war over long before the nuclear physicists could have finished their atomic bomb. As a matter of fact, experience has shown that a great majority of complaints naming ground vibrations as the cause of disturbance and alleged damage arise from the perceptibility and psychological effects of air-borne noise and concussion. The Bureau of Mines and others have investigated these aspects, too, and found even less physical substance to claims of damage. On the other hand, as a practical operating matter, users of explosives who are able to reduce the noise and air-borne effects of their blasting will find that they have reduced or eliminated complaints, because, in many cases, the ground vibrations are literally imperceptible and residents would not know blasts had been fired if they did not hear them. An example of that occurred recently when I was standing by with a seismograph to record a blast at a quarry which had neighborhood complaints from every shot fired. The shot involved more dynamite than had been used for years. As the time for firing approached, a thunderstorm developed and at the instant of firing the noise could not be distinguished from a roll of thunder in the distance. There wasn't a single complaint because the ground motion was so small that even I, supposedly experienced in such matters and standing with a stopwatch to tell me when the explosion occurred, could not feel it, and the noise was mistaken for thunder.

Technicians Can Help

Even though the source of complaints can so often be traced to noise and air-borne concussion, there are very few sweeping generalizations that can be offered to operators who wish to eliminate this condition. The detonation of uncovered Primacord and the mud-capping of boulders are well-known sources of noise. A complete prescription for minimizing noise and concussion, however, can be obtained most satisfactorily from the field technicians of explosives companies, since ordinarily the problem is unique for each operation.

WELDING, FLAME CUTTING

For Efficient Maintenance and Low Cost

Modern Welding and Flame-Cutting Equipment Lends Itself to Repair, Rebuilding and Fabrication of Mining Equipment—How It Can be Employed in the Maintenance of Preparation and Electrical Equipment

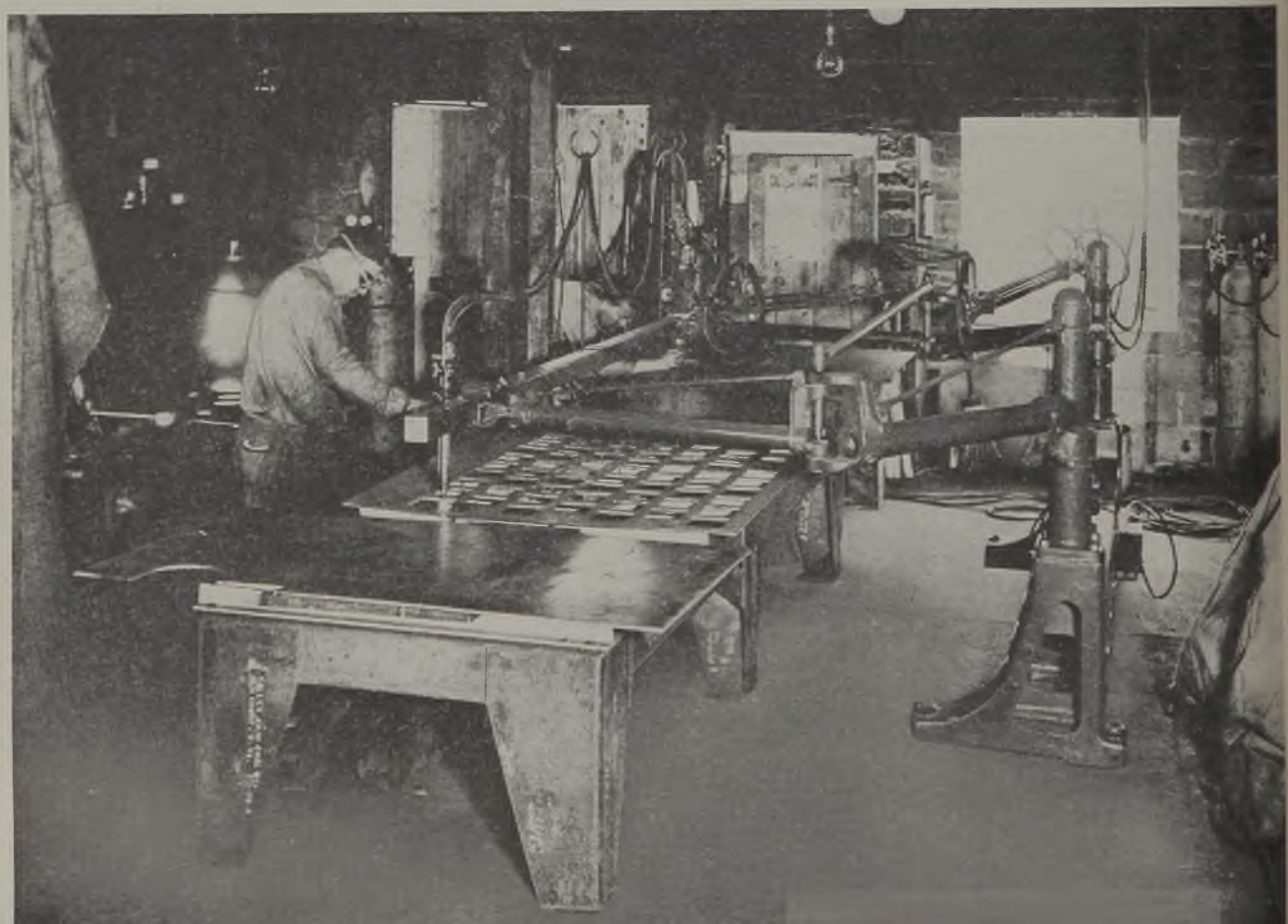
By A. D. STOUT JR.
Technical Sales Division
Air Reduction Sales Co.
New York, N. Y.

THE INTRODUCTION of modern mechanical equipment into coal mines undoubtedly has been the greatest single factor in strengthening this industry's competitive position in the fuel market. Today, operators realize more than ever how important a role efficient maintenance methods play in assuring continued top-notch performance of their equipment. Mining machinery and tools are constantly subjected to abuse, abrasion and corrosion, which, if allowed to progress unchecked, are soon reflected in decreased operating efficiency and high replacement of parts at considerable annual expense. This realization, coupled with the shortage of replacement parts during the war years, started a definite trend toward fully exploiting the advantages of the welding and flame-cutting processes in maintenance and fabrication work. More recently, this trend has been accentuated by the necessity of trimming operating expenses to the demands dictated by increasing competition and higher wages.

Now that replacement parts are becoming more plentiful the question is sometimes asked: "Why bother to repair a defective part if it can be replaced?" In the first place, this question is based largely on the popular misconception that welding in maintenance work is a "patching" process. With the modern welding and cutting equipment available today, in the hands of competent operators, welding is not patching but a re-

First of a series of articles on welding and flame-cutting in modern coal-mining operations. Underground and transportation equipment will be discussed in sections in later issues.

Fig. 1—An investment in modern cutting and welding equipment enables the shop to fabricate at low cost much equipment formerly purchased outside at a considerably higher cost. In this illustration, a universal gas-cutting machine is in the process of cutting a screen from steel plate.



building operation. This is well borne out by the fact that in many cases rebuilt parts will last two to six times longer than new replacements—the job often being done at a fraction of the cost of the new part.

Suppose the rebuilding operation should cost more than the price of a replacement. If past experience has proved that the rebuilt part will last considerably longer, the operation may still be profitable. There are other factors, too, which weigh the scales in favor of welding, such as reduction of capital tied up in spare parts and, in many cases, a great reduction of machine "down" time when a replacement is not readily available.

Wide Application Possible

While most tools of industry are designed for a specific purpose, the scope of the application of welding and cutting equipment where metals are concerned is practically unlimited. This brings us to a very important point: namely, ability of the welding personnel. It must be realized that welding, particularly in maintenance work, is definitely an industrial art and too much emphasis cannot be placed on hiring the best operators available. This means not just an operator who can make sound welds or good cuts but one who has sufficient imagination and ability to handle any job in the most economical way, devising the necessary jigs and fixtures to increase the efficiency of the operation when necessary. Such an operator greatly expands the potential value of the welding and cutting equipment so that a greater variety and volume of work can be efficiently undertaken. It is interesting to note that often a type of repair or fabrication that has saved time and money in one mine is not economial in another and this inconsistency may often be traced directly to the operator.

In this series of articles, the welding and cutting operations described represent a cross-section of the kind of work that confronts the average repair shop in both bituminous and anthracite mines. In some of the more important applications, details of the operations have been included. Naturally, the extent of savings will depend largely on quality of the equipment and ability of the welding personnel, as previously pointed out.

In many operations, either the oxyacetylene flame or metallic arc welding may be used. Brazing or braze welding is done with the oxyacetylene torch. For hard-facing work, oxyacetylene application is preferable wher-

Fig. 2—Slate bucket cut and fabricated from ¾-in. sheet steel. Sections were welded with AWS E6020 electrodes and flame cut wearing strips were hard-faced

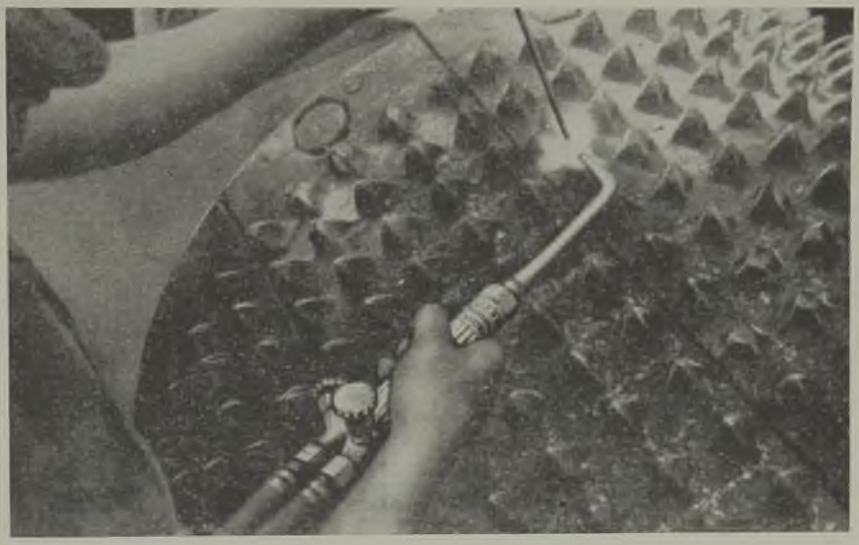


Fig. 3—Worn manganese roll-crusher teeth rebuilt with hard-facing material outwear new teeth at one-fourth the cost.

ever the nature of the deposit must be considered, since a smoother deposit is obtained, requiring less grinding or machining for the finished job. On light metal work, the arc is recommended to minimize distortion. Proper choice of hard-facing material is very important, as some types are designed to resist abrasion and others shock or impact.

The final decision on what equipment and techniques to use should be based on the most economical method of obtaining the desired results under local conditions.

Coal-handling equipment housed in the tipple and breaker offers a multitude of opportunities where an investment in welding and flame cutting equipment soon pays for itself many times over. A good example of this is the universal flame-cutting machine illustrated in Fig. 1, which permits one colliery's central repair shop to fabricate equipment, such as the plate screen shown here, at low cost. This screen, cut from 5/16-in. plate, contains 60 5x5-in. squares. The speed of cutting this material was 24 in. per minute and the total inches cut was

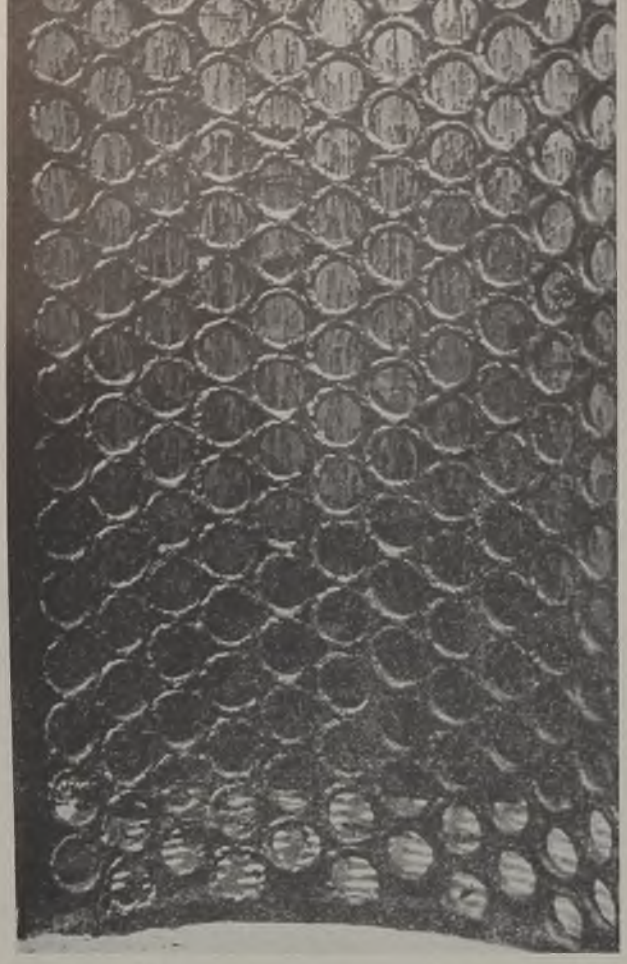


Fig. 4—Hard-facing material around the openings on punched sheet and plate screens more than doubles screen life.

Fig. 5—Conveyor-bucket lip at top has been built up and hard-faced with abrasion-resisting material.

1,200 requiring 50 minutes for cutting with an additional two hours and ten minutes for the operator to handle the plate and manipulate the torch and tracing wheel from square to square. Equipment such as this formerly was purchased outside at a considerably higher cost.

Other Work Found Practical

Since the installation of this machine, the shop has been encouraged to shape cut and fabricate at a considerable saving other equipment such as the slate bucket shown in Fig. 2 —work formerly considered impractical to attempt without machine-cutting equipment. This slate bucket was cut from ⅜-in. mild steel and then welded with AWS E6020 electrodes by one man. Wearing strips on the bottom of the bucket were also flame cut and then hard-faced with metal designed to resist abrasive wear after they were welded in place. These examples illustrate the importance of hiring competent cutting and welding operators who can get the best out of their equipment. A simpler straight-line and circle-cutting machine, a considerably smaller unit, also is popular in many progressive shops. This is a portable machine that runs on tracks for straight-line cuts and can be equipped with a radius rod and center point for circular cuts.

An ingenious job that demonstrates the extent to which hand-welding and cutting equipment is profitably employed in one shop is the fabrication of belt-conveyor idlers from scrap material. A piece of pipe the diameter of the proposed idler was cut to the length of the required face and circular pieces of slightly lesser diameter than the inside diameter of the pipe were cut from plate with a hand torch. These pieces were welded into the ends of the pipe, after which the idler bearings were properly aligned and welded into the center of the circular plate.

Crushers—In comparison with most other equipment housed in the preparation plant, crushers require relatively little maintenance. Occasionally, pyrite or other hard foreign material which has not been removed will cause a break in the roller which may be repaired quite easily by brazing with manganese-bronze rod.

The reclamation of manganese roll-crusher teeth in anthracite breakers presents an outstanding example of where the application of hard-facing material results in a product that gives longer service than new replacement parts at one-fourth the cost when the proper technique and materials are employed. Best results are produced with oxyacetylene equipment, as shown in Fig. 3, but arc welding also has produced satisfactory results. As only the tip of the segment is heated, the quench is rapid and alternating from one side of the roll to the other tends to further minimize the possibility of adverse effects from overheating.

Screen, Chute and Conveyor—The use of stainless steel for sizing, classifying, dewatering and dedusting screens has been found to more than justify its increased cost through much greater life in preparation plants. Whatever the material, however, tack welding these screens, when rigid bracing or anchorage is required, assures maximum life and eliminates any future maintenance trouble from bolts working loose. When punched carbon-steel sheet and plate screens are used, preventive maintenance in the form of hard-facing material applied around the openings before installation, as shown in Fig. 4, pays off by

more than doubling screen life. Corrosion-resisting steels also have been used increasingly for chute linings, conveyor bottoms and linings and on other equipment handling abrasive and corrosive materials, particularly in the washing plant. Here, the use of this metal serves a two-fold purpose as it not only outwears ordinary steel many times but the smooth surface eliminates the tendency of wet coal to clog. Stainless plate welded into the bottoms of chutes is of particular value in this respect. Conveyor linings also may be tack welded in place with the butt joints welded to provide a smooth, permanent surface. Coal and refuse conveyors of the bucket or endless-belt type can be profitably rebuilt. Worn idlers are built up to size with either arc or oxyacetylene welding equipment using an all-purpose rod. When guides and guards become worn, new pieces can be welded in place and hard-faced if the parent metal is of sufficient thickness. Abrasion-resisting hard-facing material applied to conveyor bucket lips greatly increases life, as the comparison in Fig. 5 clearly indicates.

Washing Equipment—In the washing plant the jig-box assembly, classifier or sand flotation-type cones, settling cones, tanks and other equipment subjected to the constant corrosive and abrasive influences of wash water, fine pyrites and other solids are comparatively short-lived without proper maintenance. At intervals, during shut down periods, this equipment should be thoroughly dried, descaled and repainted or coated with asphalt or a suitable rust inhibitor to check further deterioration. Some mines have discovered that this seemingly tedious work can be done very quickly and effectively with the oxyacetylene flame-cleaning and dehydrating torch. The flame thoroughly dries the metal—a condition absolutely necessary before refinishing—turning the moisture into steam which rapidly explodes off most of the scale. The remaining rust is easily removed by wire brushing. Any metal surface to be refinished should first be flame cleaned and dehydrated in this manner to prevent continued corrosion under the new finish.

In plants where dry cleaning is employed, the maintenance of fans, cyclones and air ducts which handle fine abrasive dust is a big problem and these installations must be watched closely. As soon as wear spots appear they should be welded or protected by liners tack welded in place.

Pumps and Pipe—The effect of water acidity, slurry, pyrites, gob, sand and coal on pumps and pipes is a cause of special concern to all preparation-plant maintenance crews. Though, in recent years, pumps have been made of special alloy steels and often lined with rubber, replacement costs are still high without proper maintenance. The principal wear occurs with impellers, casings, shafts and flanges.

Pumps used in mining operations vary greatly as to type and material from which they are manufactured. Before any attempt is made to repair by welding, an analysis of the metal should be secured and the work done by a welder experienced in this type of work. Generally speaking, the oxyacetylene torch is most satisfactory for pump repair.

When rebuilding cast-iron or steel pumps, the housing and impellers are built up with a rod of similar composition prior to hard-facing. Bronze pumps are rebuilt with a manganese-bronze or low-fuming bronze rod by gas welding or aluminum bronze by the metallic-arc method prior to hard-facing. Alloy-steel impellers may be built up with a welding rod of similar composition. Worn pump shafts are built up with welding rod of the same analysis and then machined to size at considerable saving over the cost of a replacement part. Thrust collars and other bearing surfaces usually require a manganese bronze. Building up worn inner walls of a casing is an exacting operation as too great a clearance between the impeller and the casing causes a marked decrease in pump efficiency due to increased slip. The practice of hard facing parts of the casing subject to greatest wear before installation pays off well, in some cases doubling the life of the casing before rebuilding is required. The section of worn housing from a centrifugal-type pump illustrated in Fig. 6 provides an interesting example of the protection afforded by hard-facing material. Before this casing was installed, the walls were hard-faced but the badly worn edges were not. Pump parts subject to severe abrasion and which are hard-faced when new or after building up with weld metal hold their maximum efficiency 70 percent longer.

Preparation-plant piping meets its severest test in slurry lines. One way to beat abnormally short pipe life here and in other installations where the pipe is subjected to corrosive and abrasive influences is to turn the pipe periodically, thus evening the wear, which is greatest at the bottom. However, there are certain fixed elements

Fig. 6—Section of a pump housing shows what happens when all parts are not protected. The inside walls of housing, which were hard-faced, show no wear while edges that were not protected are badly worn.

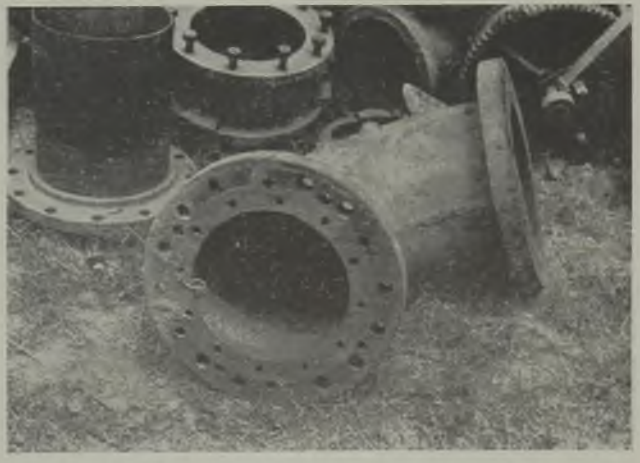


Fig. 7—Preventive maintenance pays off. This pipe bend has been hard-faced on the inside of the outer radius where it will receive greatest wear and that wear cannot be evened out by turning the bend.

Fig. 8—Connecting copper bus bars with low-temperature brazing alloy.

in a pipe line, such as curves and joints, which cannot be turned. Service life may be extended by hard-facing bends on the inside of the outer radius before installation (Fig. 7).

Installation, alteration and removal of pipe systems has been tremendously simplified by welding and flame-cutting equipment. Welding pipe sections in new installations eliminates the possibility of leaks from poor fit-ups at the joints, insures a more permanent job and costs considerably less in the long run. Turns of any angle in the system may be made by heating and bending or welding an angle turn. In laying pipe, the advantage of welded sections is particularly evident when pipes must be put in confined places where many turns of varying angles must be made. Maintenance is facilitated since line stoppages may be cleared by cutting a hole in the pipe with a torch, leaving the line in place, instead of removing sections of the pipe manually. When the stoppage has been located and removed, the holes are welded up. Valuable time and labor formerly required to take up old pipe when corroded joints had to be forced apart manually has been practically eliminated through the use of the torch, which quickly cuts the pipe into desired lengths.

Power-Plant Maintenance—Furnace and boiler repairs, such as cutting out old tubes with the torch and safe ending (where permissible) with either gas or metal arc processes, sealing tubes to tube sheet by arc welding, repairing fire doors with bronze when service temperatures will not weaken the brass deposit or with cast iron, using the oxyacetylene process, when high heat is encountered, repairing grate bars with cast iron and building up worn coal-pusher shoes with the oxyacetylene welding torch are all operations of proven economy that have become standard practice in many mines.

For steam-delivery systems, headers and piping may be economically joined by oxyacetylene welding. Special corrosion-resisting-alloy cast-iron pipe joints may be welded with a rod recommended for this purpose.

At mines where steam hoisting engines are used, cracks occasionally develop in the cylinder walls around the ports. If the crack is accessible and not too serious, the cylinder can be reclaimed by braze-welding. It is important on this type of job that a suitable preheating is employed to insure against warpage or cracking.

Electrical Equipment – Electric power in mining operations entails the use of a great variety of electric motors, generators and circuits and many mines have their own electrical shops for repair and maintenance of motor and generator equipment. Repairs generally consist of building up worn armature shafts, rebuilding broken cases or rewiring.

Worn armature shafts are built up by arc welding using a mild steel electrode producing a uniform, non-porous deposit that machines satisfactorily. When squirrel-cage rotor bars have worked free from the armature ring they may be brazed with copper-phosphorous rod. Starting-box controller segments burned by arcing may be rebuilt easily. Segments that have become detached from the controller drum may be welded into place with copper-phosphorous rod. In fact, any copper parts may be joined readily with this material, using oxyacetylene welding equipment.

Copper bus bars used in the power plant to carry heavy current loads generally are connected by a mechanical means, such as clamps or bolts. After a time, the surfaces oxidize, raising resistance. This means that all joints must be taken apart and cleaned periodically. Soft solder has been tried but soon disintegrates under the heat of service and does not possess the required strength. Low-temperature brazing alloy has been found to be the answer. The bus bar ends to be joined are first lapped and cleaned, after which thin sheets of low temperature brazing alloy, consisting of copper-silver phosphorus, are inserted and held tight in the lap joint by means of a clamp. Heat from an oxyacetylene torch is then applied until the filler metal melts. The resulting joint is permanent, and posseses the required strength and resistance to heat. No maintenance is required and the bond is permanently free from oxidation. This technique is illustrated in Fig. 8, which shows the operator brazing a nest of bus-bar leads.

Exide

IRONCLAD BATTERIES

BUILT FOR PEAK PERFORMANCE AND LONG LIFE IN HEAVY-DUTY SERVICE...

The Exide-Ironclad is a different type of battery . . . in design, construction, service qualities It was developed to meet the need for a battery to deliver high, sustained power in heavy-duty service over a long period of time.

THE POSITIVE PLATE is unique in battery design. It consists of a series of slotted, vertical, hollow tubes which contain the active material (See illustration at left). The slots in the tubes are so fine that, while they permit easy access to the electrolyte, they prevent the lead oxide from readily washing out, thus adding considerably to the life of the plate.

THE NEGATIVE PLATE has been designed and is built to equal the increased life of the positive plate. Like the positive plate, it has two feet at the bottom to raise it above the two supporting ribs.

SEPARATORS are made of Exide Mipor, a special rubber composition, and will match the long life of Exide-Ironclad plates. The cutaway illustration shows how separators rest on ribs well below bottom of plates, thus making probability of internal short circuits very remote.

THE EXIDE-IRONCLAD ASSEMBLY is sealed in jars of Giant Compound. Jars are practically unbreakable in normal service.

THE RESULT is an efficient, ruggedly built battery that assures dependable performance, long life and maximum economy . . . a battery that fully measures up to each service requirement . . .

★ ***HIGH POWER ABILITY*** . . . needed in frequent "stop and go" service.

★ ***HIGH MAINTAINED VOLTAGE*** throughout discharge.

★ ***HIGH ELECTRICAL EFFICIENCY*** that keeps operating costs low.

★ ***RUGGED CONSTRUCTION*** . . . for long life.

Exide-Ironclads are supplied in sizes to suit every application, including mine locomotives, trammers and shuttlecars of every size and make.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

The Foremen's Forum

To Suppress Dust at Face, Coal Is Soaked With Water Through Boreholes

This Practice Is Applicable Only With Creviced, Crushed and Open Coals—For Best Results, Give Water Months to Soak in

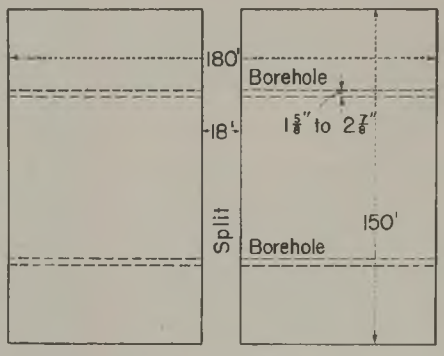
One way of reducing the dustiness of mine workings is by drilling long holes into the coal seam and forcing water into the holes thus drilled, thoroughly wetting the interior face, butt and bedding cleats and the slippage crevices of the coal with the intention mainly of moistening the dust they contain. This is done prior, sometimes long prior, to the extraction of the coal. The process is known as "infusion." It has been put in operation in many mines in Great Britain and perhaps in other countries.

Not Suitable for All Conditions—Most mining men in the United States would question, and with reason, whether the coal of this country, except in a few instances, would admit enough water to produce the result desired, but where there are many crevices in the coal and much dust, the method of infusion should prove both feasible and effective, especially where the pillars are under a heavy roof pressure, are weak and have become crushed. Deep longwall workings also furnish such an opportunity.

Tests at Coal Cliff, N.S.W.

A monograph published by the Commonwealth Coal Commission of Australia, written by R. P. Jack, production manager of that organization and entitled "Abatement of Coal Dust in Pillar Workings by Means of Water Infusion at Low Pressure," describes the tests made by the Commission in the Bulli seam at Coal Cliff colliery, New South Wales, in March, 1944. Where the test was made, the coal seam was 6 ft. 6 in. thick and the coal infused was in the 150x180-ft. pillars of places that had been standing unmined under 1,400 ft. of cover for 12 years, all of which favored the operation of this system of moistening the coal dust before it could reach the mine air.

High-Pressures Used at Metropolitan—At the Metropolitan colliery, nearby that of Coal Cliff, the method was introduced six years ago in solid working by S. M. McKensey, using boreholes 8 to 14 ft. long and water at pressures of about 300 lb. per square inch with results unstated. However, short-hole methods, with water



How the pillars were drilled for dampening of dust and later split for coal removal.

pressures ranging from 100 to 300 lb. per square inch, are still being used at that colliery. At Coal Cliff, application of water by hose and sprays at the face has been found unequal to the task of dampening the fine dust within the body of the coal, and when the coal thus uninfused is pulled over with a pick, both the recently pulverized and the normally fine coal rise as a dense cloud into the mine air.

Life of Boreholes

It was found that the walls of the boreholes drilled in full-size pillars along the line of the working face, would remain intact until the size of the pillar was so reduced by mining as to throw a fresh crush on the coal in which the hole was drilled. The holes were bored parallel to the major axis of the pillar, along the shorter axis of which, cutting the boreholes at right angles, an 18-ft. split was driven. After two months, when lifts were being taken off the inby end of the pillar thus reduced, it was still possible, if necessary, to plug the open ends of the two halves of the hole and again apply water pressure. Boreholes so cut could be retreated with water, in instances in which the initial infusion proved insufficient to keep the pillar dust moist for the full period of extraction.

Pressure Closes Holes in Quartered Pillars—However, holes drilled in such quartered pillars, about 60x90 ft., had to be treated immediately, because they soon closed as a result of the severe roof pressure. In fact, when some of the holes were being drilled in such smaller pillars, the coal was subjected suddenly to such pressure, that the hole closed and imprisoned the drill which could not be released until the miners freed it in the process of mining. For this reason, one or two pillars at all times should be kept drilled behind the line of coal recovery.

Big Holes Admit More Water

How Holes Were Drilled—In the test, the holes were drilled with a Sullivan diamond drill operated by an air turbine and later by a hand-operated unit, after the first drill had been removed for service in another location. However, an electric drill if available might have served the purpose admirably. The holes drilled were of 1⅝- to 2⅞-in. diameter, the larger holes permitting the absorption of more water, but the best diameter of hole could not be determined, for the size of the hole was varied with its distance from the line of mining face.

Moderate Pressures Serve Purpose—With pressures ranging from 35 to 40 lb. per square inch, the small interior coal "facings", within 24 hours after water was applied, were soaked for their full length beyond the seal for 37½ to 45 ft. on either side of the boreholes, giving an effective width of treatment of 75 to 90 ft. Two full-length holes sufficed to treat a pillar measuring 150x180 ft. (see illustration), but the hole should cut across the main cleavage, and not run parallel to it. The face cleats at Coal Cliff are well defined and fairly regular, occurring at about 6-in. intervals. They run somewhat askew across the pillars treated.

Gravity Pressure Inadequate

The first hole drilled was driven on a dip gradient of 1 in 80 for a distance of 137 ft. to test the possibility of applying water at only atmospheric and gravity pressure, and 1,200 gal. were absorbed at the rate of 3 gal. per hour. At a point 18 ft. from the hole, the split encountered moisture in the lower half of the seam. At 9 ft. the moisture covered the whole of the seam to within a foot below the roof. In the opinion of Mr. Jack, if the water had been fed into the hole for a longer period, it might have spread over an appreciably larger area.

(Continued on page 102)

"Job-rated" mine lubricants that keep production moving

Behind the *big* job in every mine—getting out the coal—are many specific jobs. Lubrication jobs. And you know that picking the *right* lubricant for each of those jobs has a lot to do with the smooth operation of your mine, keeping equipment in operation, avoiding delays (even shut downs) for equipment repairs.

That's why you'll welcome a chance to talk to a Marathon Mine Lubrication Engineer. He has a complete line of Marathon Mine Lubricants job-rated for every assignment, including the toughest, most complex in your mine. He has the full benefit of Marathon research, which is coordinated with developments in mining machinery, creating and compounding every type of lubricant needed to keep shaft and strip mining operations running smoothly, profitably. For full information, write, wire or phone The Ohio Oil Company.

THE OHIO OIL CO.

A complete line of lubricants for all mining equipment

General Offices: Findlay, Ohio. District Offices: Robinson, Ill., Indianapolis, Ind., Louisville, Ky.

MARATHON

PRODUCERS OF PETROLEUM SINCE 1887

Goes 60 Ft. Beyond Hole

Water Travels Beyond Intersected Faces—A second hole penetrated the roof at a distance of 90 ft. Pressures up to 90 lb. per square inch were applied and, on taking off lifts in this zone, it was found that water penetrated the pillar for a distance of 60 ft. beyond the end of the hole. The third hole, 2⅛ in. in diameter was drilled 160 ft., and a rubber seal was inserted 16 ft. beyond the face. Water was applied at 35 to 40 lb. per square inch pressure. Initial absorption was 3 gal. per minute, falling to 2 gal. per minute after two hours of infusion.

More Pressure or More Holes

That rate diminished so that, after 48 hours, 3,500 gal. had been absorbed. By that time, miners who were working in a split approaching the center of the hole found moisture when 30 ft. from it. This moisture subsequently became apparent in the side of the split, 37½ ft. from the hole.

Dust Concentration Reduced—Tests with the Owens' dust counter in the instance just mentioned showed that the dust concentration per cubic centimeter in the intake was 143 particles and at the working face 161, demonstrating that two miners pulling over coal and filling cars for a period of an hour raised the dust count in each cubic centimeter only 18 particles.

Eight months later, tests made in lifts coming off the same pillar, which had been given no further treatment, showed 128 particles per cubic centimeter, though the intake had 78 particles. Thus the quantity of dust added at that face was still only 50 particles per cubic centimeter.

Use 1½ Gal. per Cubic Yard

Can Make Coal Too Wet—About 1½ gal. of water per cubic yard of coal treated gives ideal working conditions, but where water was forced into the hole at the rate of 2 gal. per cubic yard of coal, the miners complained that the coal was too moist. The quantity of water added should enable the coal to be treated at the cleaning plant without being sprayed or with less spraying than before and should not seriously interfere with the operation of the screens. In nine months, infusion does not seem to have injured the sandstone roof or the shale floor, nor does it appear to have increased the humidity of the working places; in fact there is much less humidity than resulted from external spraying, which appeared to wet the pillar only to a depth of 6 to 9 in. in the two or three days exposure between successive lifts.

Effective Soaking Takes Time

Delay Extraction for Proper Soaking—Tests made, just after infusion, showed that when the minus 20 fines carried 3 to 4 percent of moisture, an excess of about 300 particles per cubic centimeter of dust was raised during car filling. But tests in the same pillar made eight months after treatment showed that the coal had only 1.5 to 3 percent of moisture, but the dust raised had dropped to 128 and 256 particles per cubic centimeter suggesting that during the delay the saturation had become more complete and effective.

In consequence, it is clear that the pillars should not be worked until some months after infusion. Especially is the quantity of dust raised increased in those areas that are further away from the borehole when the period of delay is insufficiently long for the water to reach and dampen the dust, spots thus undamped giving dust concentrations averaging even 1,350 particles and at spots remote from the borehole 2,830 particles per cubic centimeter when the only water that had been applied at the face was that required for regular shot-firing practice. However, broken or crushed ribs increase dust concentrations. In practice, surface applications of water will not keep the dust concentration from being raised.

Infusion Fails in Solid Coal

Seals are placed in the holes 3 to 5 ft. from the face of the coal, but sometimes, where the coal is not so badly crushed, these distances can be reduced. Infusion of water in long holes did not reduce dust concentrations where the holes were drilled in solid workings or development headings, and shorter holes 15 ft. long gave little better results under these circumstances. Even a pressure of 200 lb. pressure per square inch proved ineffective under such conditions. The results of the tests are stated in the report to be "very satisfactory".

•

Subsoil Pollutants In Mine Villages

Where the water supplies of mining towns are obtained from wells, it is important to keep in mind the direction of the dip of the measures surrounding them, for the water from coal houses may become tainted with sulphur water derived from the oxidation of the pyrite in the coal and, worse yet, other outhouses may provide even more dangerous pollutants, for water passes, not only over the surface, but also subterraneously, especially where the pollutants are themselves in pits sunk below the ground.

Watch the Dip—For this reason, the dip of the seams should be carefully studied before locating wells or outhouses. As a rule, these geological features are well understood by the officials at mines, for they have to determine them methodically in the performance of their other duties, but the importance of their sanitary connotations rarely are envisioned and seldom are regarded as of definite significance.

Avoidance of such nuisances is often difficult, where houses are arranged to face one another on each side of a village street, but if the problem cannot be solved in any other way, running water from wholly exterior sources is essential and should be provided. These available exterior sources for water also should be examined to see if there are any probabilities of pollution being derived from them, and water thus introduced should be examined bacteriologically to see if *bacillus coli communis* is present in the water. That bacillus is harmless, but as it has its origin in human or other animal excrement, its presence is indicative of the probability that dangerous pollutants will appear sooner or later. The watershed should also be examined at intervals to see if new outhouses are about to be erected that will pollute the water supply.

Operational Advantages

Health As Well As Safety Pays—This saddles the company with somewhat burdensome construction costs and legal and other regulatory action, but the comfort, safety and convenience of the tenants will pay, if not in rent, at least in the power of drawing thereby the best type of employees, and unless these employees and their families are kept in health, operation of the mine will be impeded or entirely suspended.

The moral obligation even more stringently demands that these precautions be taken. Care in location and thought for the interest of the mine personnel should be regarded as a first obligation of management. Running water is so extremely advantageous that, apart from sanitary considerations, it should be provided, even where with houses built long ago the only water facilities furnished hitherto have been wells and hand-operated pumps.

In laying out a village with a well-and-hand-pump water supply, such a site should be selected as will assure safety from bacterial pollution, both from surface and subsurface sources, or otherwise no solution will be possible except to introduce running water.

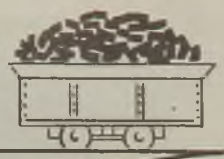
•

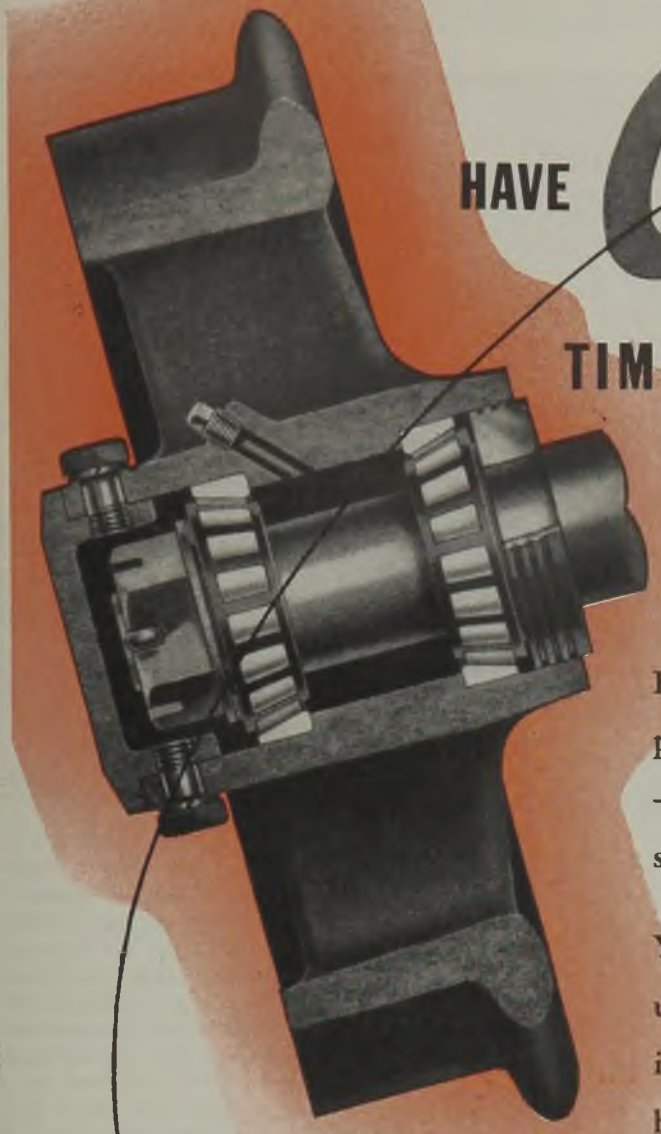
Place Too Much Stress On Explosion Limit

Five percent of methane in air, and the mixture will explode. Why then insist that the return shall have no more than ¾ or 1 percent of methane? Why do we need such a broad spread? (1) Because where there is ¾ percent of methane in the return, a much higher percentage is almost certain to be present at points along the route of the current, for some of the methane refuses to be disturbed; (2) because the outflow of methane is likely to increase unexpectedly due to fall of coal, rock or brattices, barometric changes, roof settlement and drilling of coal face; (3) because, when methane is heated or compressed as from a blow-out shot, the methane will explode at a lower limit than 5 percent; (4) because coal dust will be present to lower the explosive limit. Coal dust will explode even without the presence of methane.

A foreign physicist once remarked that he would not close down a place if it had only 4 or 4½ percent of methane. If he tried to run a mine on any such plan, said the chief inspector of his country, it would be my very painful duty to clap my distinguished colleague in jail.

A *Thousand* MINE CAR OPERATORS





HAVE OK AYED

TIMKEN BEARING EQUIPPED MINE CARS

Continued use of Timken Tapered Roller Bearings in mine cars over extended periods—periods running into many years—is conclusive proof of approval. A thousand mine operators can't be wrong.

You'll never know how right they are until you, too, have experienced the savings and other advantages made possible by Timken Bearings in mine cars and other mine equipment including electric locomotives; skips; conveyors; hoists; dumpers, etc.

Make up your mind now to specify "Timken Bearing Equipped" on your next order of mine cars; make sure the trademark "TIMKEN" is stamped on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
TAPERED ROLLER BEARINGS

State-Board Questions

Mine Foremen, W. Va. (continued)

Safety with Auxiliary Fans

Q.—Why are auxiliary (blower) fans objectionable?

A.—In the State Board Questions department of *Coal Age*, August, 1946, this subject was discussed briefly, and it was indicated that the defects of auxiliary fans did not overshadow their manifest advantages. It was shown that it was essential that the fan which services any given room should be set outside the room, and in a direction from the room opposite that by which the main ventilating current is approaching, so that the pressure of the intake air at that point would force that air into the fan long before the room mouth would be reached and would keep air that already had been driven by the fan to the face from traveling back far enough to enter the fan again and take another ride through the fan and air duct. In other words, the fan with its inlet should be well on the air-source side or "airward" from the room to be serviced.

Where Is Methane Most Dangerous?—It was shown also that methane at the working face, except beyond the trolley wire, is less dangerous than at the heading, and that methane is most dangerous when well mixed with air, which excellent mixing is characteristic of atmospheres that have traveled far, and particularly of recirculated air.

A working place driven without ventilation would have, at the face, largely unmined methane and, a short way outward, methane partly mixed with air and, at the entrance to the place, pure air (see Fig. 1). Men could not drive such a place. It would be (1) impossible to do so, and (2) if it could be done, it would be extremely dangerous to do so, but less likely to cause a catastrophe than a working place where an auxiliary fan furnishes ventilation in a heading or room without crosscuts (see Fig. 2). But that was what some persons, at first proposed and which some even attempted. As an illustration, manufacturers of explosives, who desire to get maximum explosive force by the combustion or detonation of the explosives' ingredients rely largely on two conditions: (1) enough oxygen to effect complete combustion and (2), perfection in mixing, or the production of materials in which oxygen is chemically combined so as to be back to back, so to speak, with every other atom of the combination. They, however, are seeking a violent explosion, and we are seeking the exact opposite. We hope to prevent the explosion, and if it should occur, from being of great violence.

Rearward Ventilation—What follows is a continuance of this study, and in it a comparison will be made of the characteristics and similarities of line-brattice and auxiliary-fan ventilation, and it will be indicated that, with an auxiliary fan, an important rearward, or "retroversive", current will be established in all rearward or "airward" rooms and in the goaf rearward, or "airward", from such fan. This air will get behind the fan inlet and introduce recirculation, but will do so at a point where pollution with methane will not be such as to cause an excess of methane in the circulation. It also will be explained why such air recirculation will promote a more uniform emission of methane from the goaf, and one less dependent on atmospheric changes, and therefore less dangerous when the barometer is low or rapidly lowering. Also, it will be shown how such recirculation may be reduced or altogether avoided.

Basic Fan Principles

Every Fan Makes a Peak and a Depression—It must be remembered that all fans, whether auxiliary or main fans, operate on the simple principle of taking air from one source of supply, the pressure of which source is thereby reduced, and of putting pressure upon the air thus taken, thus raising the pressure of the air in the area where that air is discharged. Accordingly, when an auxiliary fan is introduced, a low-pressure area is created behind the inlet of the fan and a high-pressure area is formed at the mouth of the air duct. Thus, in the room heading, the air behind the fan has a lower pressure than is normal. Before the auxiliary fan was introduced, the entire split with its goaf and rooms had only one maximum-pressure point, located at the mouth of the heading, and only one minimum-pressure point, which was located where the air left the heading and entered the return airway.

New Highs and New Lows—Between these two quite distant points was a constantly, if not uniformly, decreasing pressure from the commencement of the split to the point where it begins its return. The introduction of an auxiliary

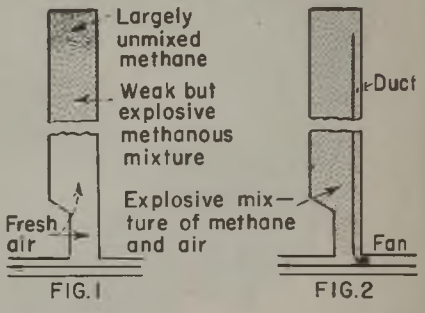


Fig. 1—Shows a room driven without ventilation. Some of the atmosphere of the room is so methanous that it cannot burn, some so methannous that it will explode and some so pure or nearly pure as to be so incapable of transmitting combustion that it cannot explode, unless coal dust is present to extend an explosion. Fig. 2—Shows a room ventilated by a recirculating auxiliary fan and so completely methanized that every part of it can explode almost instantaneously.

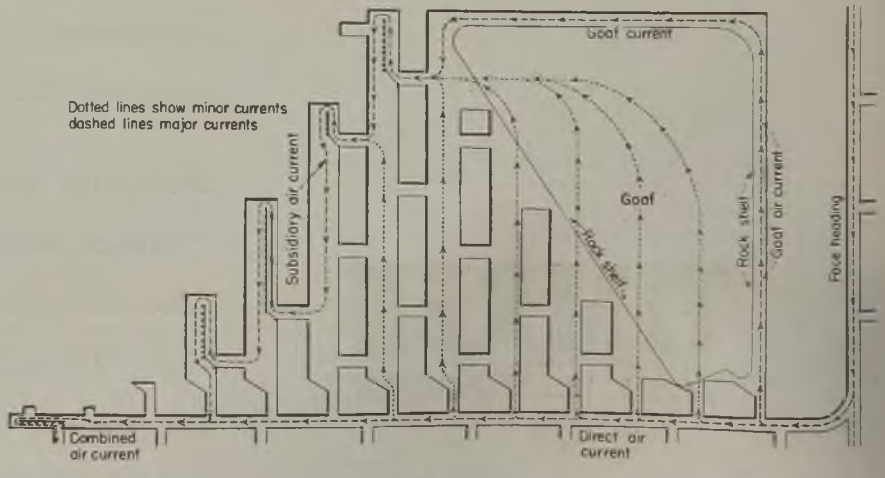


Fig. 3—Currents where line brattice is used to direct the air.

Support the roof at your working faces with *Alcoa Aluminum Beams*

STRONG · LIGHT IN WEIGHT · LONG-LIVED

Your miners will like working with Alcoa Aluminum structural shapes. The light weight of these beams makes hauling and handling easy. They can be set in place fast. Their high strength helps assure safe working conditions.

Alcoa Aluminum is highly resistant to the acid corrosion encountered in coal mines. This means that, on the job or in storage, these beams are long-lived.

Why not put some of these Alcoa Aluminum structural shapes to work, and then watch your miners' reactions? Our engineers will help you select shapes that meet your strength requirements. Call the nearby Alcoa office. Or write ALUMINUM COMPANY OF AMERICA, 1763 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN **ALUMINUM**

IN EVERY COMMERCIAL FORM

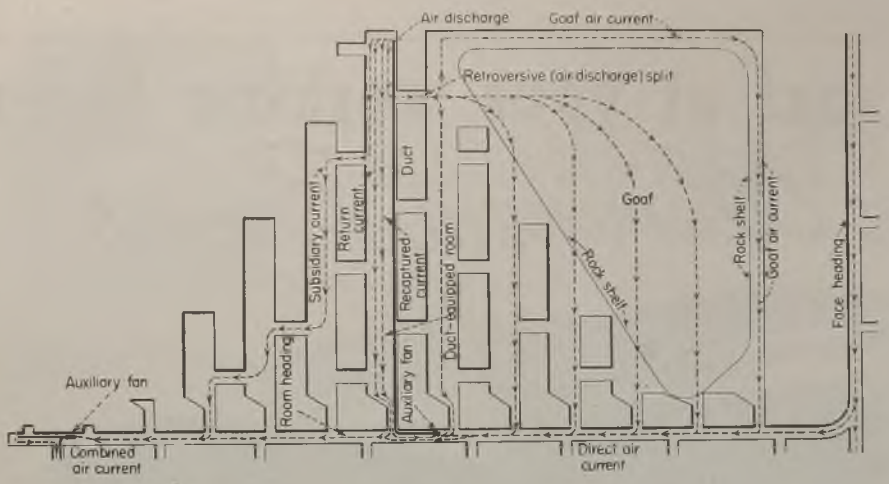


Fig. 4—Retroversive circulation occurs in rooms outby the first duct-equipped room. Only one fan is shown, obviously an unusual and undesirable condition, shown solely to illustrate the effect of a single fan.

fan or of several such fans changes the condition and creates a new low-pressure point on the intake side of the auxiliary fan and a new high-pressure point at the discharge of the fan duct. The high point may be, and usually is, the heading's major pressure peak.

Two Splits in Room Heading

Air Travels Heading, Goaf and Rooms—Let us consider (see Fig. 3) the conditions within a room heading and in the workings tributary thereto in which no auxiliary fan has been installed and in which reliance for the distribution of the air is placed entirely on line brattice and air checks. In this case, the air current divides, automatically or as the result of checks, and travels mainly along two channels.

Some of it makes its way directly along the heading, and a smaller quantity, usually a much smaller quantity (which we shall term the "subsidiary" current) enters the goaf, if one exists, and travels along it into the rooms, and then finally, by a very crooked course with altogether too many detours, reaches the working faces, compelled to enter them by line brattices. Finally, it reaches the heading and having joined with the direct, or heading, current to form the "combined" air current, travels to the heading faces and is directed to the return.

Air Travels Under Goaf Shelf—Most of the air that enters the goaf, if there is one, passes through the first room neck in the heading where the roof of the goaf, near the pillar is still standing. This narrow line of unbroken roof forms what is termed a "shelf". It usually follows all around the periphery of the goaf, though at the mouths of the rooms the weakness of the support at the room necks breaks into the continuity of this shelf, and makes travel on the heading side of the goaf almost impossible. The air travels somewhat easily along the ends and rear of the goaf, finding it a natural though unplanned passageway. It then curves easily round the rear corner of the goaf, the roof of which also has been spared by reason of the meeting of two shelves, one in what formerly was Room 1 and one which represents the far end of the extracted rooms. Thence, the air passes along the rear of the goaf, where, as stated, is a similar shelf. Some air comes in at the necks of other rooms now abandoned, but these splits are of lesser importance. However, sometimes the goaf, especially if it is a newly created one is relatively open, and then the air travels by a more direct course from the room necks toward the rear of the goaf and ignores the shelf.

Some Wishful Thinking

With Auxiliary Fans, Return Is Somewhat Modified—As we want all the air from an auxiliary fan to go in a similar manner toward the end of the heading and to pass through the last crosscut of each room and to make only similar detours at each room to reach the room face and clear it of methane, we naturally suppose that it will continue to do so after auxiliary fans are running. When we place the fans, all we desire is to get more air from the heading to travel along the faces to the point of inevitable junction with the heading split. But that is "wishful thinking." It will not continue to follow that path. Instead, it will return to the room heading after each duct-ventilated face has been reached.

Haulage on the Intake—To simplify matters and to avoid the use of the words "windward" or "airward", which do not have implicit meanings to landlubbers, and which need for many persons explicit definition, it will be assumed, for a while, that the main fan by which the whole mine is ventilated is an exhaust, that accordingly haulage is on the intake and also that, entirely contrary to the excellent practice generally adopted, only one auxiliary room fan is installed in the room heading (see Fig. 4). In this way, "outby" can be used for "windward" and "inby" for "leeward." When the results of the conditions outlined have been discussed and attention has been centered on what will be called "retroversion of air", the use of more fans can be discussed and the operation with haulage on the return either separately considered or left to the reader.

Four Paths Invite Air

Four Splits at Each Duct-Equipped Room—With a single fan (see Fig. 4) some of the air discharged from the duct goes to form a split duplicating the course of the subsidiary split. Of course, if no line brattices are used, the air will not make detours to the face of each room. The subsidiary split, however, will now start from the face of the duct-equipped room, instead of starting at the mouth of No. 1 room, as happens when line brattices are used.

Some Air Acts Like a Boomerang—Moreover, as the pressure at the face exceeds that at the room mouth, some of the air returns to the heading through the same room by which it entered. In a methanous mine, it will carry methane with it. However, some of this air when it reaches the heading will be caught by the direct current there traveling and will go with that current along the heading toward the heading face, carrying its methane with it. Let this be termed the "second split" from the duct discharge.

Some Air Enters First Fan

Part Goes to Fan—Some of this second split, however, may be forced by its pressure into the inlet of the fan and go back to the face to get another opportunity to join the subsidiary current, which is the first split of the duct discharge. This will be designated the "third split", though it travels for part of its way with the second split and forms a part of it. How much of this third-split air there will be will depend on the location of the fan and on the pressure which the latter imposes on the air.

Fourth or Retroversive Split

Section of Air Turns Outby to Outby Rooms and Goaf—The fourth, and not the least important, split goes to the outby crosscut last driven in the duct-equipped room, passes beside, over or around the duct and enters the outby rooms and even the goaf, returning often in several minor splits to the ventilating current in the heading and possibly entering the auxiliary fan. It may even travel as far as the first room neck of the goaf. If it takes any of these several courses, part of it will be sent back by the direct, or heading, current with some less methanous air to the face of the duct-equipped room from which it started.

It effectively prevents from entering into the subsidiary split any part of the air that with line-brattice ventilation has been accustomed to travel leisurely along the goaf to such outby rooms. This "retroversive split" should improve the ventilation of the outby rooms and also of the goaf, for it has more driving power than the former "subsidiary split." These several splits should prevent so large a volume of methane being stored in the goaf, from which storage, excess air during periods of low barometer formerly tended to escape, either by the heading or by the subsidiary split. However, it replaces the former and more feeble goaf current that with line-brattice operation is always present.

One of the two wheels above was in use for four months on a charging machine where it was daily subjected to repeated loadings of 300,000 pounds. Previously, regular carbon steel wheels would mushroom and have to be taken out of service in two weeks, thus presenting an expensive maintenance problem involving three men to make the replacement. A heat treated wheel of Jalloy steel was substituted and after four months' service removed for inspection. It is the wheel on the right. No appreciable wear can be seen when compared to the wheel beside it that was never in service. If you have an application that requires resistance to abrasion, fatigue and high impact strength write to us about heat treated Jalloy.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

Operating Ideas

Main Line Ties Made With Thin Bases and Long Bolts

COMPOSITE TIES for main line underground tracks at the Cutshin Coal Co.'s new 1,400-ton mine at Wooten, Leslie County, Ky., include a wood tie only 1⅛ in. thick. Seventy-pound steel ties (Bethlehem), the same as used for temporary tracks in the mine, are bolted to these thin wooden bases. The latter are white oak, dipped in creosote. Other dimensions are: width, 6 in.; length, 6 ft. Track gage is 48 in. Consequently the wood base extends 8 in. beyond the ends of the steel tie.

Important in the successful use of this composite tie is the anchorage to the mine botton afforded by the ends of the three ½-in. bolts which protrude 1½ in. below the wood. With the hard fire clay bottom these bolt ends prevent tracks shifting.

The illustrations of the composite tie showing both sides were made outside near the main portal and include the 70-lb. main-line track leading to the dump bin. It will be noted that wood ties are used on this outside road, with steel ties every 6 ft. to hold the track to gage. The mine cars are 5-ton four-wheeled units and the main line locomotive is a 13-tonner.

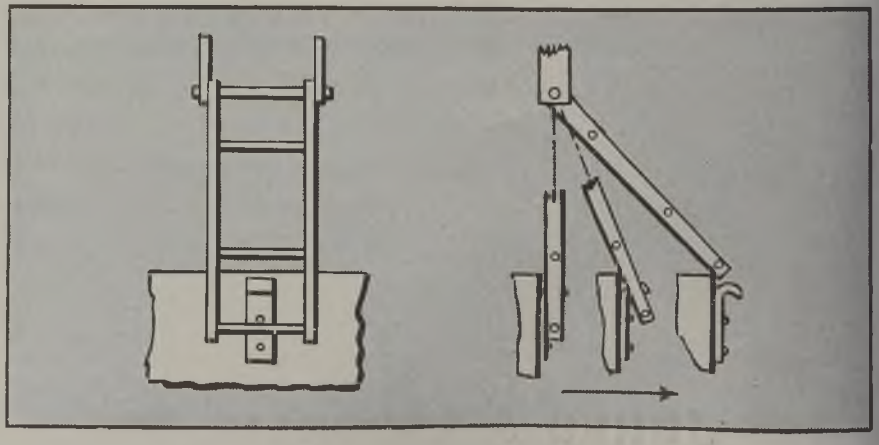
The 1⅛x6-in. wood base extends 8 in. beyond the ends of the steel tie in making this composite unit.

Composite tie turned downside up to show the three bolt ends which provide anchorage in the mine bottom.

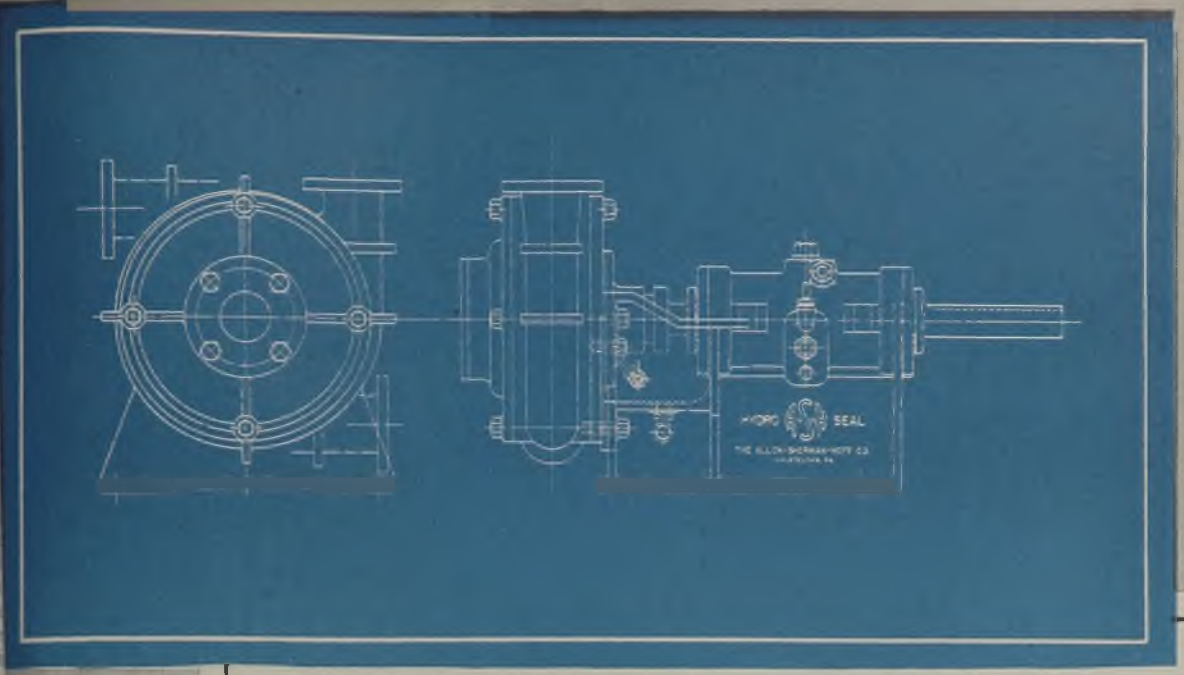
Endgate Lifter Works Automatically

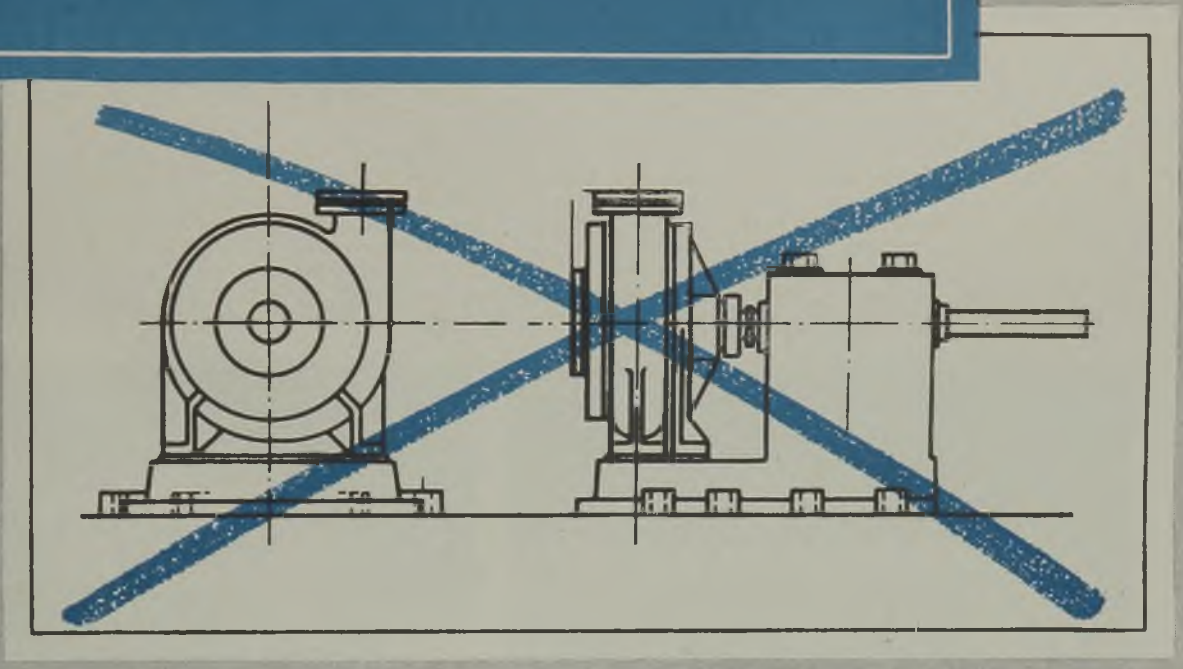
AN ENDGATE lifter that engages and disengages automatically has been developed by the tipple crew at the Brilliant mine of the St. Louis, Rocky Mountain & Pacific Co., Brilliant, N. M. Steve Williams is the tipple foreman.

Design and operation of the lifter are shown in the accompanying illustration. It consists of a ladder-like member pivoted at the top. As the car comes onto the cross-over dump the lower "rung" of the lifter catches the hook on the endgate, lifting the gate as the car is tilted. When the car comes back to normal and starts to move ahead, the lifter is pushed forward to clear the hook. As the car moves still further ahead the endgate slides over the edge and when the car is off the dump is ready for the next one.



How endgate lifter functions.





NEW, IMPROVED HYDROSEAL PUMP

NEW BEARINGS *NEW AXIAL ADJUSTMENT* *NEW PUMP SHELL*

NEW BEARINGS—Heavy duty, anti-friction radial and thrust bearings are now standard on Hydroseal Pumps. These bearings are interchangeable.

NEW AXIAL ADJUSTMENT—The pump is now provided with a *New, Improved* means for easy, two-way axial adjustment of the shaft and bearing assembly.

NEW PUMP SHELL—No rigid mounting of pump shell or engine side bell to pump base. Both are now supported from the bearing housing. This permits pump discharge to be placed at any of the three positions indicated above. In many cases, this will simplify installation of discharge piping; further, it eliminates "special pump" construction to obtain this result.

Blueprints of this New, Improved Hydroseal Pump will be sent on request, until our New Catalog, now in preparation, is completed.

NOT NEW—The maintained high efficiency and the low maintenance costs achieved by the Hydroseal Principle and Maximix Rubber Pumping Parts remain the same, because the inside construction of the pump itself is unchanged.

HYDROSEAL, PACKLESS AND MAXTMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD

Correspondence from United States and Canada to

ALLEN-SHERMAN-HOFF CO., 231 S. 15th St., Phila. 2, Pa

Correspondence from anywhere else in the World to

A-S-H EXPORT CO., 271 Madison Ave., New York 16, N.Y

CABLE ADDRESS: ASHEXPOR, NEW YORK—BENTLEY'S CODE

Either of above offices will direct you to nearest representative

Special Doors Suggested for Fire-Fighting

INSTALLATION OF SPECIAL DOORS for use in case of mine fires is proposed by John W. Harris, Ohio State deputy mine inspector, in a recent communication. "We are," Mr. Harris points out, "providing positive escapeways as described in the October, 1945, issue of *Coal Age* by Richard McGee. Some of the mines in other parts of Ohio provide neutral entries in a different manner. Some of the other systems do not, however, provide intake on the haulage road, while others do."

Commenting further on the plan described by Mr. McGee, Mr. Harris states that "there is in this particular system no provision for controlling a fire after it once breaks out. The fire is in the path of the main air currents and in a very short time is beyond control in the narrow confines of mine passageways." This and any other system "should be augmented by a door across the jaws of each heading of each set of face and bleeder entries to be closed by officials only in case of fire. Doors should include provision for regulating the volume of air during fire fighting and for providing the temporary seals when necessary. As a mine fire is fought to the last ditch and will continue to be, it is then too late to start construction of seals and, consequently, the sealing of the entire mine becomes necessary.

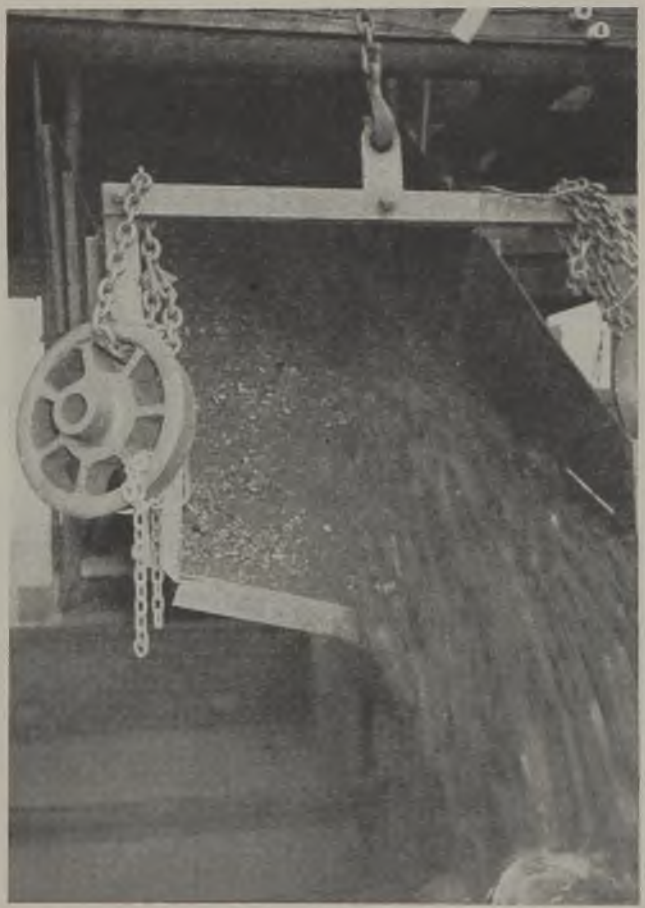
"These doors should be set back in the pillars far enough to permit the erection of permanent seals outby them. Then, when a fire wins and sealing must be resorted to, these doors can be closed in a few minutes to accomplish the temporary sealing. Thus only the immediate fire area is concerned and the rest of the mine stays open.

"With this system of neutral escapeways in mind, it is my firm conviction that production need stop only a few days while the length and danger of sealing and recovery is materially reduced. What is the sense in sealing a whole county when a few acres will accomplish the purpose? Why seal in millions of cubic feet of methane when it is unnecessary and expose rescue crews and workers to unnecessary airlocking jobs in highly gaseous atmospheres?"

Chute Permits Continuous Loading

ELIMINATION of slope-belt stoppage and spillage as car changes are made was the objective in the installation for special loading chute at Moss-Hill No. 9 mine, Hart-Ross Coal Co., Mortons Gap, Ky., according to A. L. Bishop, general superintendent.

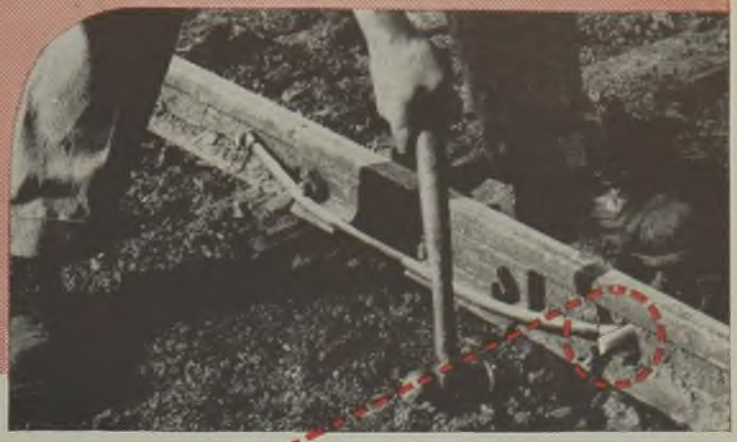
The chute, shown in the accompanying illustrations, was built in the general shop under the supervision of Will Tolleferro, master mechanic. A pivoted door forms part of the bottom of the chute as coal is discharged through the forward section. After the car is loaded, an attendant on the ground by means of a system of levers, causes the door to pivot through an angle of 90 deg. This reverses the flow of the coal. The coal then follows the back section of the chute and drops into the empty car, already coupled to the car just loaded. As soon as the new car has been dropped a few feet the pivoted door is swung back to the first position and the loading cycle begun again.



Coal flows out the forward section when the pivoted door is in the normal position.

After the door has been pivoted through an angle of 90 degrees the coal flows out the back section of the chute.

LET THE *Power of Wedge Action* HELP YOU DO A BETTER BONDING JOB



20,000 lbs. of expansion pressure "Cold-Welds" O-B WEDGE-BOND TERMINALS to rail

2711-M

Wedge Action — a few hammer blows are transformed into 20,000 lbs. of expansion pressure.

Because it utilizes the Wedge, one of man's most powerful "machines", you can do a better bonding job with an O-B Wedge Bond. A few hearty hammer blows on the wedge are transformed into 20,000 lbs. of expansion pressure. The terminal is thus "cold-welded" to the rail in a positive, permanently-tight mechanical and electrical joint. No special tools or talents are required for its installation. Wedge Action distributes the pressure evenly throughout the hole in the rail web, insuring a uniform, corrosion-proof bond. Why not put the power of Wedge Action to work for you? Specify O-B Wedge Bonds.

Ohio Brass

MANSFIELD, OHIO

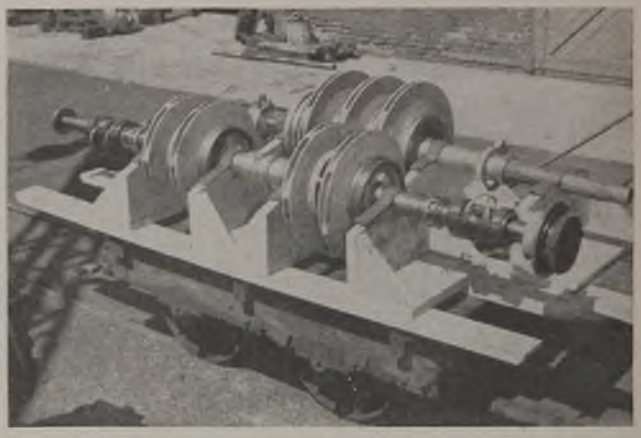
Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario

Impellers Moved in Special Crates

PUMPING IN THE ANTHRACITE REGION is an important phase of practically every operation. At some collieries, upwards of 30 tons of water are handled for every ton of coal mined. Therefore, it is no surprise to find that great care is exercised in the handling of impellers for centrifugal pumps at the Providence shop of The Hudson Coal Co., Scranton, Pa.

The special crates, shown in the accompanying illustrations and used for transporting the impellers, provide as many as four points of support for the shaft carrying the impeller assembly. Pieces of old leather belting are used to hold the shaft down in the circular seat at each support. Runners on the crates are chamfered or beveled at the ends to take pipe rollers. The crates are skidded on pipe rollers in and out of the underground pump rooms without damage to impellers.

Pieces of old belting nailed to the wooden supports in the crate holds the shaft in place.

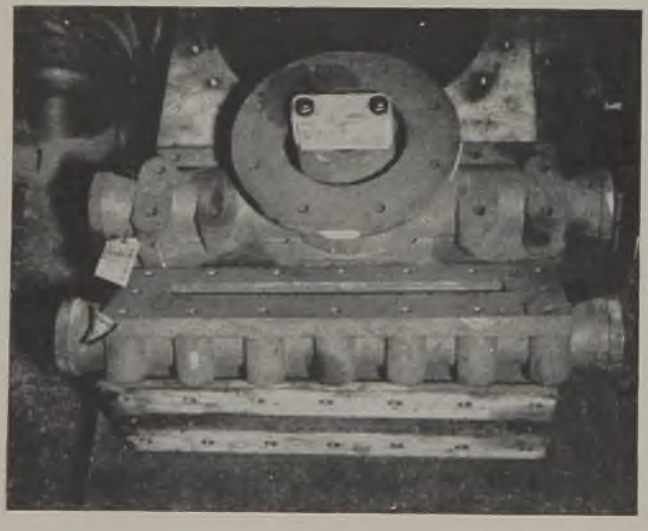


Heavy crates with several supports prevent the impeller shaft from being sprung while in transit.

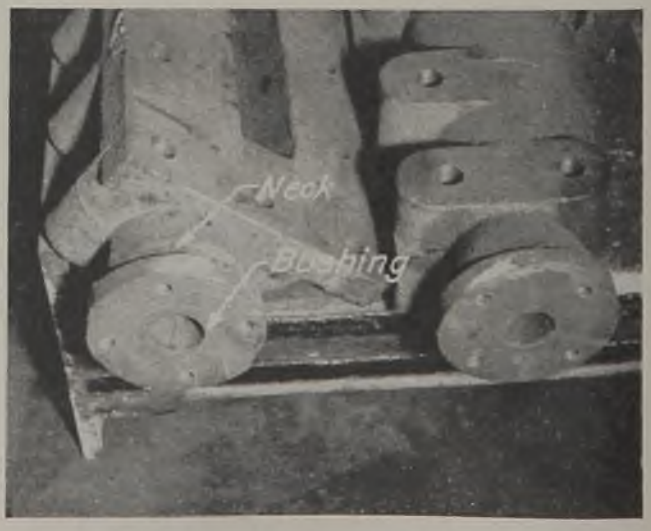
Service Life of Cone Casting Extended

THICKER INLET NECKS have tripled the life of the valve-chest castings used on Chance cone separators at the company's collieries, states William E. Baskin, general foreman, Drifton shop, The Lehigh Valley Coal Co., Drifton, Pa.

The valve-chest boot and valve-chest cylinder-support castings, shown in the accompanying illustrations, have been redesigned to increase their service life. The wall thickness of the inlet necks has been increased from ½ in. to 1¼ in. After the sand and water has cut away much of the inside regions of the necks the castings are returned to the shop where the necks are bored out and brass liners inserted. The castings are then returned to the colliery for further service.



The inlet necks of the valve-chest boots and valve-chest supports have thicker walls.



The wall of the inlet neck has been increased from ½ in. to 1¼ in. to increase service life.

Cleaning Shed Added at Providence

BEFORE ANY MINING MACHINERY is repaired it is thoroughly cleaned in a special washing shed, points out Willard E. Apgar, superintendent of the Providence shop of The Hudson Coal Co., Scranton, Pa.

The washing shed and its equipment, shown in the accompanying illustrations, is located in the center of the shop area. The one-room building is constructed of cinder blocks and has a Transite roof supported by pipe trusses fabricated and welded in the shop. Good daylight and artificial lighting is provided. However, most of the cleaning is done on the day shift. An exhaust fan provides positive ventilation to carry away all vapors and fumes and permits the workman to see where he is directing the steam spray. A steel grating covers the pit in the floor where all condensate, grease, etc., gravitates. The part being cleaned rests on a narrow gage truck over the grating. A 3-ton Ingersoll-Rand mono-rail air hoist is used to handle the parts as they are trucked from the various collieries. The building is heated from a central heating plant that also serves the other shop buildings.

Steam at 80 to 100 lb. pressure from a Hy-Pressure Jenny is used to dissolve the grease and dirt on the parts being cleaned. Cleaning compounds are used to speed up the cleaning action which in turn facilitates the repair work.

All parts to be repaired must be cleaned first to facilitate work.

The steam cleaner washes away the dirt and grease on parts to be repaired.

Dirt and grease drop through the grating and gravitate to the clean-out tray.

Open Sesame!

That was the magic phrase Ali Baba used as his door opener. Today, it takes more than mere words of magic to enter the list of low-cost mining operations. However, the elimination of operational delays, often credited to the use of one or more operating ideas, always helps to reduce costs. Won't you let us have a look at some mechanical, electrical, operating or safety ideas you are using? If accepted, Coal Age, upon publication, will pay you $5 or more for each.

The cleaning shed is in the center of the shop area.

Avoid

Lost Tonnage

Breakdowns

For maximum production at minimum cost, keep mining machines in continuous operation. Use cable that stands up on the job . . . and delivers adequate power. Anaconda Securityflex* is engineered to provide safe, convenient, long, economical service. Consult Anaconda engineers on how to utilize it in solving your cable problems. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y. Sales Offices in Principal Cities. 46329

Here are the big features of Securityflex

FLAME RESISTANCE! Specially compounded Neoprene Jacket and heat-resistant insulation make Securityflex the safest cable possible. Meets specifications of Pennsylvania Act 206.

BREAKER STRIP! Minimizes shorting under extreme heating or compression, and also anchors jacket, prevents loosening of conductors.

MORE CABLE PER REEL! Made possible by small diameter, flat parallel sides.

NO LOOSE JACKETS! Special bonding process eliminates cable failures from loose jackets.

ANACONDA *Securityflex** **CABLE**

*Reg. U. S. Pat. Off.

ANACONDA

USE CINCINNATI CHAINS and BITS

DUPLEX BIT

CINCINNATI DUPLEX CHAIN

WHEN checking your costs why not give a little extra thought to the type of coal cutting equipment you are using. Cincinnati Coal Cutting Equipment, time tested over a period of years, enables you to produce greater tonnage with less power . . . gives you larger cuttings . . . and requires a minimum of servicing. This trouble free coal cutting equipment is helping hundreds of coal operators to offset rising production costs. Why not let "CINCINNATI MINE" help you?

THE CINCINNATI MINE MACHINERY CO.

2983 SPRING GROVE AVENUE • CINCINNATI, OHIO

News Round-Up

Government Asks Contract Meeting In First Move to Release Mines

Almost three months to the day after seizure, the Government took its first step in the direction of ending the seizure of the bituminous mines Aug. 19, when Admiral Moreell, coal mines administrator, addressed a letter to John L. Lewis and Ezra Van Horn of the operators' negotiating committee, asking that their representatives meet in Washington Sept. 10 to begin work on a new contract. In his letter, he stated that "it is the desire of the Secretary of the Interior and of the Coal Mines Administrator to return the direction of the mines to their owners at the earliest practicable date. However, such return, which would involve a release from Government possession, will require an assurance of uninterrupted production." Such assurance could come only through negotiation of contract, he said, and he offered to sit in on the conference.

Both the operators and the union immediately agreed to meet as requested. Toward the end of the month, however, reports were circulating among operator groups that Lewis was planning new demands, including an eight-hour day and a five-day week with pay the same as for the present nine-hour day. Harry M. Moses, president of the H. C. Frick Coke Co., expressing the operators' general view, was quoted as saying that if these reports were true, it was "conceivable that the government will remain in charge of mining for a long time."

Union to Initiate NLRB Action

Also on Aug. 19 Admiral Moreell moved to pave the way for a court test of foremen-unionization question by requesting the U.M.W.A. to file with the NLRB a charge of refusal to bargain against the Jones & Laughlin Steel Corp. Such action was provided for in the contract signed by the government with the union as an employer cannot initiate a court review of NLRB rulings. The case is expected to finally secure a Supreme Court decision on the unionization of foremen. On Aug. 17 (Order No. 12), the coal mines administration had ordered Jones & Laughlin to put into effect the contract covering its foremen. Previously, two CMA orders, Nos. 9 & 10, had, on Aug. 13, ordered Jones & Laughlin and the Industrial Collieries Corp., respectively, to comply with the contracts signed for clerical and technical workers.

In Jones & Laughlin's court fight to prevent the CMA from entering into an agreement with foremen in its mines, the U. S. Court of Appeals for the District of Columbia Aug. 16 denied the requested temporary injunction pending appeal but did, however, order that the hearing of the appeal on its merits be advanced and slated for argument at the beginning of the October term.

Of interest to the industry was a decision handed down by the U. S. Circuit Court of Appeals for the Sixth Circuit, which upheld the NLRB order directing the Packard Motor Car Co. to collectively bargain with the Foremen's Association of America, representing the various foremen employed in Packard plants. In making its decision, the court pointed out that this foremen's union was not in any way affiliated with any union of rank-and-file production workers and that it was a "situation diametrically opposite" to J. & L.'s case against the NLRB.

State Safety Laws Prevail

On enforcement of the government safety code, Admiral Moreell has stated that the code is meant to apply only where State laws do not provide sufficient protection to the miners. In reply to Richard Maize, secretary of the Pennsylvania Department of Mines, who telegraphed Admiral Moreell on Aug. 2 that the federal code was "jeopardizing the lives of Pennsylvania miners" by providing less protection than the State laws, he said that "state laws shall prevail" when they provide adequate miner protection.

Further implementation of the Krug-Lewis agreement was effected with CMA Orders Nos. 11, 11A and 11B, dated Aug. 15, in which government operating managers were directed to provide employees full coverage possible under existing workmen's compensation and occupational disease laws where compliance or method of compliance is optional under the State laws.

Procedure for payments into the welfare and retirement fund set up by the Krug-Lewis agreement was outlined in CMA Order No. 8, dated July 29. It points out that the 5c. royalty is to be paid on every net ton of coal produced for use or sale. The First National Bank of New York has been selected as depository of the funds and the funds will be held there, with no expenditures being made until the trustees take over and receive an accounting.

Work of the medical and sanitation survey continued throughout August and an announcement in the early part of the month stated that survey groups would study parts of Illinois, Indiana, Kentucky, Iowa and Michigan. Information indicated that the survey would not be completed before late September. On Aug. 22 Admiral Moreell issued a memorandum outlining the fundamental objectives of the survey "in order to eliminate misunderstanding" that had arisen in connection with the Government's activities. In addition to an explanation of the survey's purpose and the methods employed, the memorandum pointed out that the Krug-Lewis contract does not call for enforcement of improvements to correct substandard conditions that may be found. The investigation is designed only to establish the facts, with corrective steps being left to other agencies.

Following a meeting between a committee of operators' representatives and Metcalf Walling, administrator of the Wages and Hours Division of the U. S. Department of Labor, operators were advised by the committee that they need take no action for the present in connection with the Division's order that they comply with the Fair Standards Act. Mr. Walling had previously notified the industry to come into compliance with the act as of Sept. 1, and had announced that his office would begin inspection of coal mines on Oct. 1. The committee reported that in its conference Mr. Walling stated that, in his opinion, most operators had a sufficient reservoir of credit as a result of paying overtime to cover any technical violations of the act under the present contract, and that he did not contemplate taking any action during government possession of the mines unless seizure continued for an extended period of time. He asked that a report be made to him after the forthcoming contract meeting was held.

•

Industry Active In New Operations

Large-scale development of the Deep River coal field, eight miles from Sanford, N. C., to be begun immediately by the Walter Bledsoe & Co., and John Marshall and Associates, Scranton, Pa., operating under the name of Greenwood Mining Co., has been announced by the North Carolina Department of Conservation and Development.

Present plans of the group call for the enlargement and modernization of the old Carolina slope as offering the quickest production possibilities, and production of

500 tons daily is expected within several months.

A special survey made in 1943 by the H. A. Brassert Co. and C. C. Morfit, consulting engineers, at the direction of the North Carolina Department of Conservation and Development, found that the Deep River field had an indicated reserve of 46,000,000 tons of coal. Core-drilling tests since that time conducted by the Bledsoe Co. and the U. S. Bureau of Mines have confirmed these estimates and indicate even larger reserves. The Brassert report stated that coal has good coking properties, is suitable for domestic and other uses and for the recovery of a "relatively large number of byproducts." Bureau of Mines tests indicated that the coal has a B.t.u. content of 14,200, and when coked, will yield 22 gal. of tar and 30 lb. of ammonia sulphate per ton of coal.

The Ayrshire Collieries Corp., Indianapolis, is reported to have become the industry's largest strip-mine producer, with the purchase for $1,400,000 of Delta mine, near Marion, Ill., owned by the Delta Coal Mining Co., a part of the Sinclair Coal Co., Kansas City, Mo. The Delta mine will be operated by a subsidiary of Ayrshire, the Delta Collieries Corp., and is expected to produce over 500,000 tons yearly, bringing Ayrshire's total output to approximately 3,700,000 tons annually. The No. 6 Illinois seam is to be worked, averaging about 62 in. thick. Carl Walker is superintendent of the new operation.

Shipment of the first coal from the new Island Creek Coal Co. Mine No. 24, located in Mingo County, W. Va., was reported on Aug. 1. Production is on a limited scale until development is completed and the permanent tipple is placed in operation. The coal will be mechanically cleaned and full rated production of 4,000 tons daily is expected by Oct. 1.

Purchase of a glass-casket plant near Signal Mountain, Tennessee, for conversion to a modern coal-preparation plant and construction of 16 homes for employees and other buildings has been announced by the Pikeville Fuel Co., J. W. Merriman, president. The coal-preparation plant is to have a capacity of 1,000 tons daily and will clean and oil-treat mine-run coal from local mines, screening it into 10 sizes for shipment to local and outside markets. It is expected that barge facilities on the Tennessee River will be constructed later.

The WAA has announced the offering for sale or lease a government-owned bituminous-coal facility in Scott County, Tennessee. The government has a long-term lease on the plant site and an option to lease 1,400 acres of coal land near New River, Tenn., with a coal reserve estimated at 6,000,000 tons.

Erection of a new coal-washing plant at Mingo Junction, Ohio, on the right-of-way of the Pennsylvania R.R., is planned by the Northern Coal Corp., Cleveland, Ohio. Land has been leased from the Pennsylvania R.R. and construction equipment is already on the site, but actual building operations are being delayed because of material-shortages. The plant is planned for washing of coal enroute from Northern West Virginia and Eastern Ohio.

Coal Activity

Bituminous Coal Stocks

	Thousands Net Tons July 1, 1946	P.c. change From June 1, 1946	P.c. change From July 1, 1945
Electric power utilities	11,430	+14.9	−16.7
Byproduct coke ovens	3,629	+41.5	−29.2
Steel and rolling mills	624	+35.7	−11.2
Railroads (Class I)	7,297	+17.7	−26.1
Other industrials	12,232	+13.6	−10.8
Total	35,212	+17.6	−18.4

Bituminous Coal Consumption

	Thousands Net Tons June 1946	P.c. change From May 1946	P.c. change From June 1945
Electric power utilities	5,022	+9.5	−15.8
Byproduct coke ovens	6,267	+71.5	−14.6
Steel and rolling mills	582	+6.6	−23.6
Railroads (Class I)	8,274	+4.7	−17.8
Other industrials	9,336	+11.8	−14.4
Total	29,481	+17.8	−15.8

Bituminous Production

July, 1946, net tons	50,800,000
P.c. change from June, 1946	+0.2
January-July, 1946, net tons	285,990,000
P.c. change from Jan.-July, 1945	−16.9

Anthracite Production

July, 1946, net tons	5,274,000
P.c. change from June, 1946	+45.0
January-July, 1946, net tons	34,725,000
P.c. change from Jan.-July, 1945	+9.1

Sales, Domestic Stokers Vs. Oil Burners

	Stokers	Oil Burners
June, 1946	13,029	28,395
P.c. change from June, 1945	+60.7	+199.2
January-June, 1946	84,618	158,152
P.c. change from Jan.-June, 1945	+139.7	+308.0

Index of Business Activity *

Week ended Aug. 24	183.6
Month earlier	182.5
Year earlier	179.6

*Business Week, Aug. 31

Electric Power Output †

Week ended Aug. 24, kw-hr	4,444,040,000
P.c. change from month earlier	+2.1
P.c. change from year earlier	+8.0

†Edison Electric Institute.

MEETINGS

- **New River Coal Operators Association: annual meeting Oct. 16, Mountainair Hotel, Mount Hope, W. Va.**
- **Kanawha Coal Operators' Association: annual meeting Oct. 17, Charleston, W. Va.**
- **Joint Fuel Conference of the American Institute of Mining and Metallurgical Engineers and the American Society of Mechanical Engineers: Oct. 24-25, Bellevue Stratford Hotel, Philadelphia.**
- **Illinois Mining Institute: 54th annual meeting, Nov. 15, Abraham Lincoln Hotel, Springfield, Ill.**

Long Coal Co., Madisonville, Ky., has taken over the mine of the Carbon Valley Coal Co., near Earlington, Ky. Fifty men are now employed at the underground operation and more are expected to be employed in the near future. The company is headed by Thomas O. Long and Wade Long.

L. R. Chapman, who resigned as superintendent of the Pond River Coal Co. when veterans he employed during the strike were not accepted by the union, has formed, with his brother, Louis Chapman, the Chapman Bros. Coal Co., Lewisport, Ky., and is opening a strip mine. Coal is to be shipped by barge on the Ohio River, and by rail and truck.

An application has been filed with the ICC by the Louisville & Nashville R.R. for authority to construct 16.7 miles of railroad from Blackey, Ky., up Rockhouse Creek to the mouth of Mill Branch, Deane, Ky., to tap reportedly rich, undeveloped coal fields in the Elkhorn area of Eastern Kentucky. The properties to be opened are those of the Consolidation Coal Co. (Ky.), Jenkins, Ky., and the South-East Coal Co., Seco, Ky. Other properties in the area also are expected to be opened for development.

The Miramichi Lumber Co., Ltd., Minto, N. B., Canada, has purchased from the Minto Coal Co., Ltd., all of its mining areas, properties and equipment in New Brunswick. The mines will continue under the operation of A. D. Taylor, manager of mines for the company for the past 26 years, with Alex Tooke continuing as superintendent, and Ed. Nightinghale as mechanical superintendent.

Plans for a new mine near Elkville, Ill., to produce 1,000 tons daily, were announced last month by John Mackey, O'Fallon, Ill.

Simon H. Stewart has begun operation of a strip mine near Coshocton, Ohio, under the name of Stewart Coal Co. Production of 300 to 400 tons daily is expected.

Reopening of the Kimberly No. 4 mine of the Sloss-Sheffield Steel & Iron Co., Kimberly, Ala., is reported well under way and the mine is expected to be in operation by Oct. 1. The trackless mine will be fully mechanized with loading machines loading onto chain conveyors, from which the coal is discharged from cross-chains to a main-line conveyor now being installed. Completion of the mine will provide the company with 20,000,000 tons of additional coal reserves, it is reported.

The Sinclair Coal Co., Kansas City, Mo., began shipments July 15 from its newest mine, operated under the name of Old Mac Coal Co, Red Oak, Okla. The coal is from the McAlester seam and is being marketed under the trade name of "Old Mac".

With the breaking of ground on July 11, construction of the new coal washer at the Cuba mine of the United Electric Coal Cos., Cuba, Ill., was reported well under way in August. The plant is of completely modern construction and will have a feed capacity of 800 t.p.h. Completion and initial operation is scheduled for the first of the year.

Additional development of coal lands in Letcher and Knott Counties, Kentucky, is seen in the Cheasapeake & Ohio R. R.'s survey up Beaver Creek from Wayland, preparatory to laying a 25-mile line for which ICC authority has already been requested.

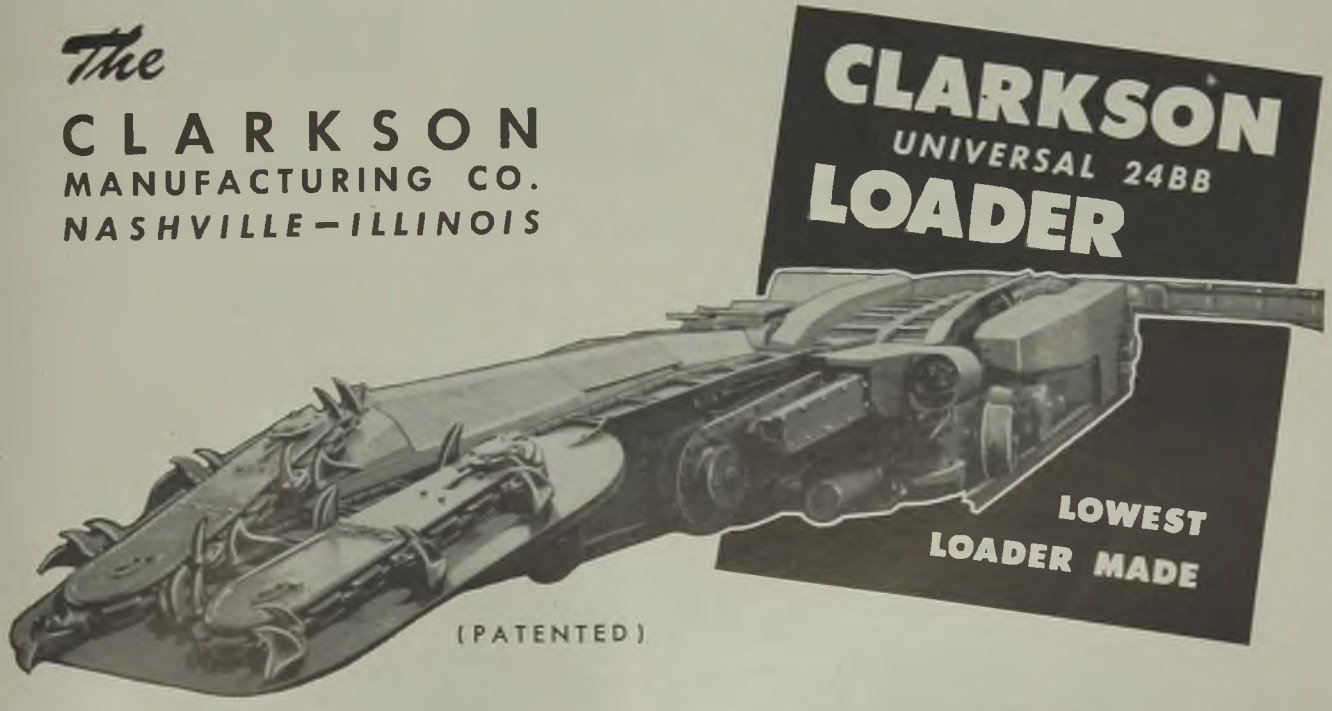
The CLARKSON Does a PERFECT Clean-Up Job !

No other LOADER "Cleans Up" the coal or rock at the face, thereby eliminating hand-shoveling, nor "mops up the floor" so-to-speak, with anywhere near the thoroughness of a CLARKSON Universal 24BB.

In addition, the CLARKSON provides unfailing performance in digging out "tight corner shots" and the entire mechanization is powered by only one 50 H.P. motor under one man central control.

Investigate Why One Company Bought
25 CLARKSON *Universal* LOADERS
as a result of point per point comparison with the various features of all other makes. It will pay you to investigate the CLARKSON before you order any loader.

The
CLARKSON
MANUFACTURING CO.
NASHVILLE—ILLINOIS



COAL MEN

Dave Thomas, chief clerk; Art Murdo and Lewis Thiel, mechanics, E. W. Beadle, office manager, Foster Creek mine, and Marcel Cenis, gen. supt., Montana Coal & Iron Co., Washoe, Mont.

H. O. Livingston, vice president, Union Pacific Coal Co., Rock Springs, Wyo.

Tolly Eli, supt., Dawson Daylight Coal Co., Dawson Springs, Ky.

P. W. Lynch, assistant secretary and treasurer, Dawson Daylight Coal Co.

F. P. Smith, president, Puritan Coal Corp., Cameo Coal Mining Co. and Lando Coal Corp., Puritan Mines, Mingo County, W. Va.

O. G. Sharrer, planning engineer, Union Pacific Coal Co.

O. T. Kent, superintendent, Ames Mining Co., Mingo Division, Thacker Mines, W. Va.

J. J. Fisher (left), assistant chief engineer; J. W. Fisher, chief engineer; S. H. Clarke, assistant general manager; and W. J. Johnson, gen. supt., Roundup Coal Mining Co., Roundup, Mont.

J. L. Rowell (left), vice president and one of the two managing partners of the Katy Coal Co., Hazard, Ky.; and Lawrence Cornett, tipple foreman.

ON THE JOB

H. Mathias (left), John Sidle, general superintendent, Clayton Coal Co., Paul Lujan, Steve J. Bokan and William Marinelli; Washington mine, Erie, Colo.

S. H. Kegan, cost engineer, Consolidation Coal Co., Jenkins, Ky.

M. A. Sharpe, supt. (left), and James Law, assistant, Stansbury mine, U. P. Coal Co.

H. M. Tibbs, personnel manager, Union Pacific Coal Co.

R. F. "Bob" Carson, mining engineer, Cole & Crane Real Estate Trust and Dingess Run Coal Co., Huntington, W. Va.

Kenneth Snarr, superintendent, Williams mine, Williams Coal Co., Crofton, Ky.

Ray Cobb, div. supt., West Kentucky Coal Co., Earlington, Ky.

John Hughes (center) general superintendent Union Pacific Coal Co., with Wang Chun-Lin, Tien Yu-Chi, An Ju-Tseng and Liu En-Ming, members of a Chinese group inspecting U. S. coal mines.

E. J. Davis (left), president, Cutshin Coal Co., and his brother, F. H. Davis, general manager, Kentucky Sun Coal Co., both of Combs, Ky.

Pipeline Bids Are Studied by WAA

Bids of leading natural-gas producers for control of Big Inch and Little Inch, government-built wartime oil lines stretching from natural-gas fields near Longview and Beaumont, Texas, to Philadelphia, northern New Jersey and metropolitan New York, were opened Aug. 1 by War Assets Administration officials in Washington. Top offer for the two lines, originally laid down at a cost of $145,000,000, was made by E. Holley Poe & Associates, New York, who asked for a 40-year lease at an annual rental of $6,500,000, totalling $260,000,000. The same syndicate bid for outright purchase of the lines for $100,000,000, with $80,000,000 cash on delivery and a deferred payment of $20,000,000, depending upon the amount of gas carried by the lines.

Glenn McCarthy, McCarthy Oil & Gasoline Co., Houston, Texas, proposed to buy the two lines for $80,000,000, one-fourth of the total in cash and the remainder over a 6-year period at an annual interest rate of 4 percent. If his offer is accepted he will use the lines to bring natural gas to the East primarily for domestic heating and cooking.

The Noyack Oil Corp., New York and Tulsa, Okla., offered $80,000,000 for the two lines, with a cash payment sufficient to show good faith. Under the terms of this bid WAA would relocate the southernmost point of Little Inch and place its western terminus at Longview, Texas.

The Big Inch Natural Gas Transmission Co. headed by former U. S. Senator Robert J. Bulkley, offered to pay $85,000,000 for the lines. Both this offer and that of E. Holley Poe & Associates agreed to maintain the lines for immediate reconversion to oil delivery in case of a national emergency.

If converted to transport of natural gas, the pipelines would have an original daily capacity of 342,000,000 cu. ft. and would be capable of carrying 500,000,000 a day.

The outstanding bid for oil interests was made by the Big Inch Oil Co., headed by Charles H. Smith, New York City, who offered $110,000,000 for purchase of the two lines. Other oil companies also submitted bids, but the absence of bids from the larger companies such as Standard, Shell and Texas indicated that oil interests prefer to continue shipments by tanker and rail, which are said to be faster and less expensive.

WAA may reject all bids if none are found suitable, and Congressional approval may have to be obtained before conversion to natural gas transmission is undertaken. Complete analysis of the bids by WAA is expected in September.

Meanwhile the Federal Power Commission extended the coverage of natural gas interests by authorizing the Virginia Gas Transmission Corp. to construct facilities to supply natural gas to customers in the District of Columbia, Maryland and Virginia.

In August also, the FPC ordered dismissal of the application of the Central New York Power Corp. to construct and operate a pipeline in the State of New York to bring natural gas to Syracuse and other communities in that area. Failure by the company to establish that public convenience and necessity would benefit was cited as the reason for the disapproval.

Industry Urged To Aid Scrap Movement

An appeal to all industries for their immediate help to relieve the acute shortage of iron and steel scrap is being made by the Committee on Iron and Steel Scrap of the American Iron and Steel Institute.

To maintain high production levels, the steel industry sorely needs every bit of scrap that it can obtain, the Committee said. "Stockpiles at steel mills are low through a combination of circumstances, and every company that is waiting for steel—whether sheets or bars for fabrication, rails or pipe to be laid, a new machine for production, a motor truck or even wire for tying packages—can help increase steel output by promptly assisting the movement of scrap," said the Committee.

Both production scrap and dormant scrap are needed. The latter includes obsolete machinery tools, equipment, jigs, dies, fixtures and so forth, which are incapable of current or immediate future use.

Industrial plants, railroads, mines, utilities, shipyards and other businesses can influence the scrap supply picture to a considerable extent, said the Committee, pointing out that during the war it was demonstrated that surprisingly large amounts of vital material and equipment could be cleaned out as scrap.

The steel industry must not only provide for its current scrap needs, which are very heavy because of the active demand for steel, but it must build stockpiles for the winter months.

"Unless receipt of scrap improves quickly," said the Committee, "the steel industry will be forced to take more open-hearth furnaces out of operation with the result that for months to come consumers may find it difficult to obtain steel. It is imperative that everyone help to start scrap flowing promptly."

Island Creek Sells Miners' Homes

The Island Creek Coal Co. joined the growing list of coal operators that are releasing their real estate holdings, with the announcement Aug. 28 that 204 homes and lots in Whitman, W. Va., had been sold to the Aldredge Land Co. for resale to indivduals. The houses were sold at a nominal cost, said by the coal company not to equal actual cost of the materials, and with the provision that until Oct. 1 present tenants could purchase the homes at only a small percentage above the cost to the land company. "The company is of the opinion that the employee will feel a greater stake in coal development if he owns his own home," said E. F. Clevenger, assistant to the vice president of Island Creek.

B. C. R. Locomotive Plans Move Forward

Three of the nation's largest manufacturers of locomotives—the American Locomotive Company, the Baldwin Locomotive Works and the Lima Locomotive Co.—have agreed to contribute to the project designs for the chassis and running gear of two test locomotives for the Locomotive Development Committee of Bituminous Coal Research, Inc. The contracts for building the chassis and running gear will be awarded after designs have been completed and studied. This announcement, made by R. B. White, chairman, Locomotive Development Committee, follows the award in July of contracts to the Allis-Chalmers Co., Milwaukee, Wis., and the Elliott Co., Jeannette, Pa., for construction of two gas-turbine locomotive power plants (*Coal Age*, July, 1946, p. 113).

This over-all arrangement will make possible the construction of the two complete gas-turbine locomotives authorized by the Locomotive Development Committee in July. Delivery of the two locomotives for test purposes is expected in about 18 months.

Stuart to Head NCA's Heating Service

The National Coal Association, through its Executive Secretary, John D. Battle, has announced the appointment of J. Nelson Stuart as manager of its newly created Coal-Heating Service division. Mr. Stuart, a veteran coal merchandising man, brings to the new post a wide background of experience in public relations, advertising, selling and sales direction covering a period of 23 years.

The administrative headquarters of the Coal-Heating Service division will be at NCA's office in Washington, with a field office in the Bell Building, Chicago, Ill.

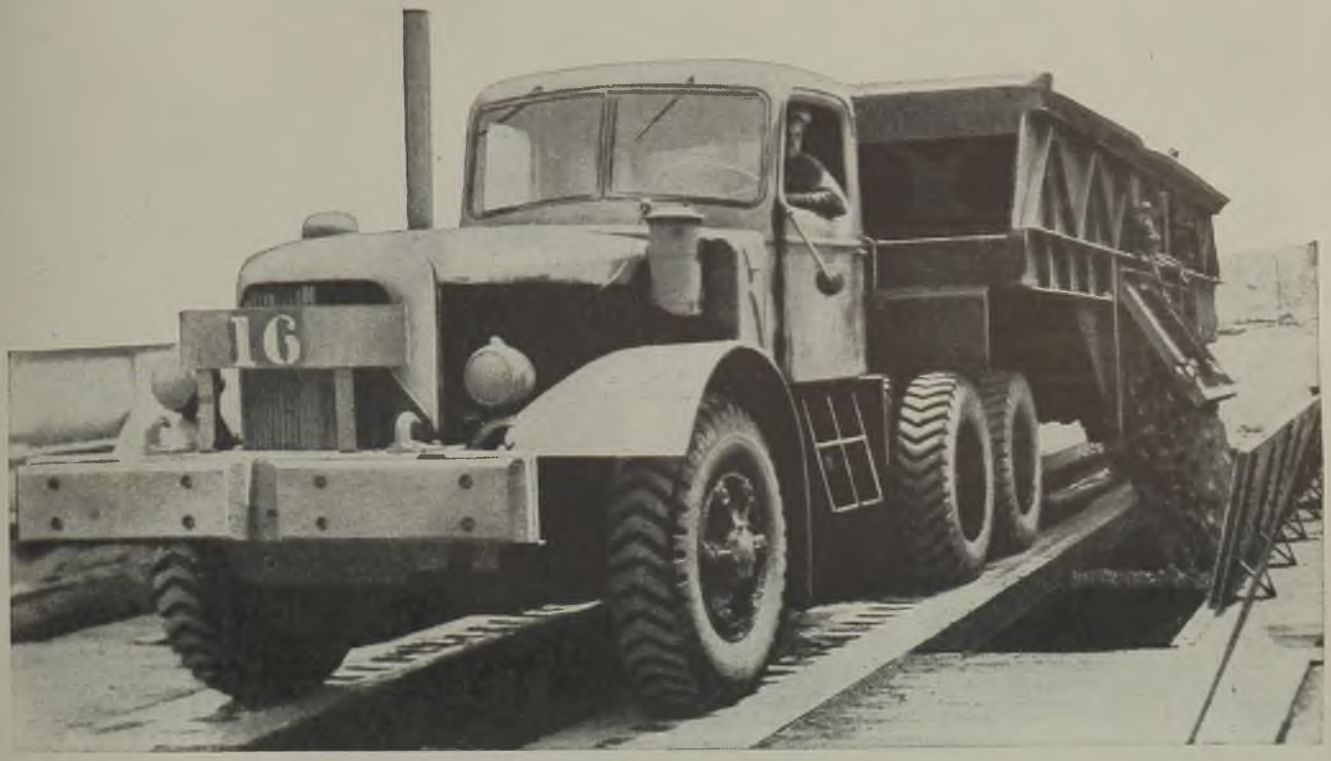
The new Coal-Heating Service, inaugurated by NCA and endorsed by retail coal merchants generally throughout the country, is the culmination of many months of intensive work on the part of the industry to bring about an improved service for users of bituminous coal for heating purposes. The development of the program has been under the direction of a special marketing committee of the National Coal Association since last March, and with the appointment of Mr. Stuart actual operations are expected to soon be under way.

Pa. Community Passes Stripping Bill

Old Forge (Pa.) Borough Council Aug. 13 passed an ordinance compelling strip mine operators to restore stripped land as far as practical to its original condition before mining operations.

Under the terms of the measure, any person engaging in stripping within the borough's limits must first register with the borough engineer indicating the acreage

A FACE-LIFTING, YES...



BUT THE SAME STOUT HEART!

In 1936 the **Southwestern Illinois Coal Corporation, Percy, Illinois,** bought ten Model FC Macks, straight trucks carrying 16-ton loads. In 1940, when greater load capacity was desired, Southwestern gave them a face-lifting.

Regular truck bodies were removed, frames shortened, fifth wheel mounted, Diesel engines installed. Using these re-built trucks as tractors, they attached 30-ton semi-trailers and just about doubled their haulage.

More Macks were added in 1944 . . . seven powerful tractors. Today, four of those original converted trucks are rolling in the modern fleet, with *not the slightest decrease* in tonnage.

Operators of Mack trucks can count on dependable performance and longer truck life. If you're looking for efficient and profitable fleet operation, call in your Mack man.

Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, New York. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE

Performance Counts!

to be affected, and file a bond considered reasonable by the borough engineer. Within one month of the completion of operations the borough engineer must be notified, and within three months after completion the cut must be refilled, according to the ordinance.

At a meeting Aug. 5 of the Jenkins (Pa.) Township supervisors, a letter from the Jermyn-Green Coal Co. was read, assuring the community that the company would refill stripping operations in the community. Full compliance with the law "and in many instances, a great deal more" was promised. Refilled areas near schools would be suitable for playgrounds, the company said.

•

King Coal Festival Planned in Illinois

The Old King Coal Cavalcade, traditional annual celebration of the citizens of West Frankfort, Ill., has been scheduled for October 3-5 after a wartime shutdown since 1941. Plans for the festival are being developed by a committee headed by Leonard Dunn, former state's attorney of Franklin County. Features already outlined include a Main Street coal mine in full operation, a display of coal-mining machinery, a "coal tree" for exhibit of coal byproducts from nylons to aspirin and a beard-growing contest. Old King Coal himself will be selected from the oldest and most experienced miners of Franklin County and a queen of the carnival will be chosen from the coal-producing area of southern Illinois.

•

P. & R. Tells Miners ABC's of Production

The new anthracite wage agreement was described as a heavy load for the anthracite industry to carry and an exceptionally heavy load for the Philadelphia & Reading Coal & Iron Co. in a pamphlet message to P. & R.'s employees announced by G. A. Roos, general manager of the company.

"Your wage rates under the new agreement are higher than any comparable industry in the country. The lowest paid laborer on the outside now receives $8.21 a day, while the lowest paid inside laborer gets $9.33 a day. All other rates, of course, are higher. And there is nothing wrong with wage rates like these so long as the men get out the maximum amount of coal of which they are capable.

"Present daily production is not high enough to sustain the new wage rates very long. It must be increased," the company added. "We can, however, work under it satisfactorily if you will put your shoulder to the wheel with us to make it work."

Employees of the P. & R. were told that the future depends upon how well they learn and practice what is called the ABC's of the situation. These were described as Absenteeism, which can and should be reduced; Better Performance, which means increased daily production; and Cooperation, which means closer cooperation between the men and the company.

Ashley Retires As Pa. Geologist

George H. Ashley

Retirement of Dr. George H. Ashley, chief of the Pennsylvania State Bureau of Topographic and Geographic Survey, was announced by Secretary of Internal Affairs William S. Livengood Jr. early in August. Dr. Ashley's retirement, made at his own request after 27 years of service to the State, became effective on August 31.

At the same time Secretary Livengood announced the appointment of Dr. Ralph W. Stone, formerly assistant to Dr. Ashley, to succeed to the post from September 1 to December 31, when Dr. Stone also will retire on age.

Dr. Ashley plans to continue research in certain geological problems, write occasional papers and accept professional consulting work in his retirement. He will continue to live in Harrisburg.

•

Correcting the Record

Transcribing and proofreading errors in the report of the meeting of the Rocky Mountain Coal Mining Institute, *Coal Age*, July, 1946, resulted in the use of incorrect figures in the material on p. 126 dealing with the heavy-media plant of the Pittsburgh Coal Co. Capacity, in particular, was given as 1.50 tons per hour when it should have been 150, and gravity in one case was given as 1.50 when it should have been 1.60. The correct version is as follows:

"The process has been incorporated in the flowsheet of the Champion No. 1 plant of the Pittsburgh Coal Co., operating on middlings refuse from the first outlet of the existing primary launder washer. It comprises about 50 percent 1.60 sink, 20 percent 1.40 by 1.60 and 30 percent 1.40 float. While the test work has not been completed, densities have been maintained at any desired points between 1.30 and 1.60. The surface area of the bath is about 48 sq. ft. and the feed averages 150 tons per hour."

Music Planned For Mine Workings

A plan to pipe recorded music to the underground workings of the Ewen colliery was announced Aug. 3 by H. C. Connolly, president of the Pennsylvania Coal Co., Scranton, Pa. Carried from a recording studio in Scranton, the music will be dispensed by loudspeakers at the top and bottom of the mine shaft and in the miners' dressing rooms. It is believed that this is the first time music has been introduced into a mine for workers' benefit.

•

Wildcat and Sympathy Strikes Spread

An umpire's decision favoring the Pyramid Coal Corp., Terre Haute, Ind., in the dismissal of 28 miners last June caused an unauthorized strike in the company's Victory mine and sympathy walkouts that spread to 17 mines in western Indiana and made approximately 5,000 miners idle in mid-August. The umpire in the dispute was employed to rule on grievance cases by the officials of District 11, U.M.W., and the Indiana Coal Operators Association. Struck mines produce a daily average of 31,175 tons.

Refusal of the Harman Coal Corp., Harman, Va., to discharge two foremen as requested by the local union sent 1,250 of the company's employees on strike on Aug. 10. The union's reasons for seeking the discharge of the foremen were not disclosed. Mines struck at Harman produce about 6,500 tons daily.

Coal Mines Administration officials on the scene in western Indiana met with both groups and urged them to meet for a settlement, but beyond that they took no active part in the dispute.

•

BCI Headquarters Moves to Washington

Plans submitted by the policy committee of the Bituminous Coal Institute for enlarging and increasing the efficiency of its public-relations and industry-advertising program were unanimously approved by BCI's board of directors at a meeting in Cleveland Aug. 1. The plans provide for moving BCI's offices from New York to Washington and closer coordination of the Institute's program with the National Coal Association, and a reorganization and strengthening of the public relations staff of the Institute to undertake the new program, the personnel of which will be announced later.

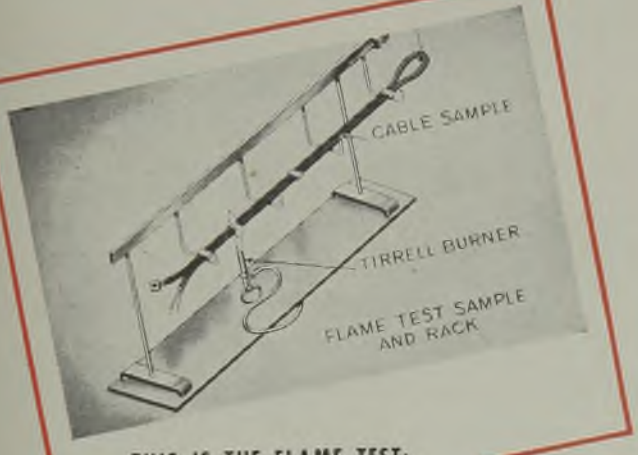
The plans agreed upon at this meeting also contemplate that the New York advertising agency of Benton and Bowles and T. J. Ross, public relations counsel, will continue their relationship with BCI.

John D. Battle, executive secretary of NCA, who also holds the office of secretary of the Institute, in commenting on today's action of the board, said, "I believe that the plans which we are now effectuating are an important step forward. They

SERVING YOU THROUGH SCIENCE

"P-103"

WHAT IT MEANS ON U. S. ROYAL SAFETY TESTED MINING MACHINE AND LOCOMOTIVE CABLES



THIS IS THE FLAME TEST:

400% overload current is applied to conductors until cable sheath is heated to 350° F. Inner cone tip of Tirrell burner flame then applied for 1 minute to bottom surface of folded cable. Total length charred is measure of flame-resistance and shall not exceed 14 in. U. S. Royal Mining Cables pass test with extra margin of safety.

P-103 is an official number assigned to United States Rubber Company by the Department of Mines of the Commonwealth of Pennsylvania. It indicates that all U. S. Royal Mining Cables bearing this number conform to strict fire-prevention regulations established by the Department.

The name "U. S. Royal", on Mining Machine and Locomotive Cables indicates that they have not only passed a severe "Flame-Resistance" test, but also tests for moisture-absorption, bending, twisting, impact and stretch.

SPECIFY THE NEW U. S. ROYAL *Safety Tested* MINING MACHINE AND LOCOMOTIVE CABLES

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

EQUIPMENT APPROVALS

Two approvals of permissible equipment were issued by the U. S. Bureau of Mines in July, as follows:

Joy Mfg. Co.—Type PL11-14RPE/F elevating conveyor; 10-hp. motor; 250 and 500 volts, d.c.; Approvals 558 and 558A, respectively; July 1.

Joy Mfg. Co.—Type PL11-8PE/F elevating conveyor; 7½-hp. motor; 250 and 500 volts, d.c.; Approvals 559 and 559A, respectively; July 15.

will bring the public relations and advertising program conducted by BCI into closer relationship with the National's own many sided and far-reaching activities, and a closer tie-in with the programs that are being carried on by Bituminous Coal Research and the Coal Exporters Association of the U. S., other affiliates of the National. All of these activities have a common purpose and are for the common good of our industry. The closer that they work together, the better."

Fred S. McConnell of Cleveland, who is president of both NCA and BCI and who presided at the meeting, said, "We hope to secure larger participation by the industry in the advertising and other public-relations activities conducted by the Institute. We shall earnestly seek this participation on the basis of accomplishments and proven worth and on the premise that the changes and the expanded program will produce even greater results and a larger return per dollar of expenditure.

"There has been no change in our aims, which are to promote a better public understanding of the industry; to win for coal better-informed and more constructive public opinion and—what is very important—to safeguard and expand the markets for bituminous coal and assure the industry of a useful and prosperous future."

•

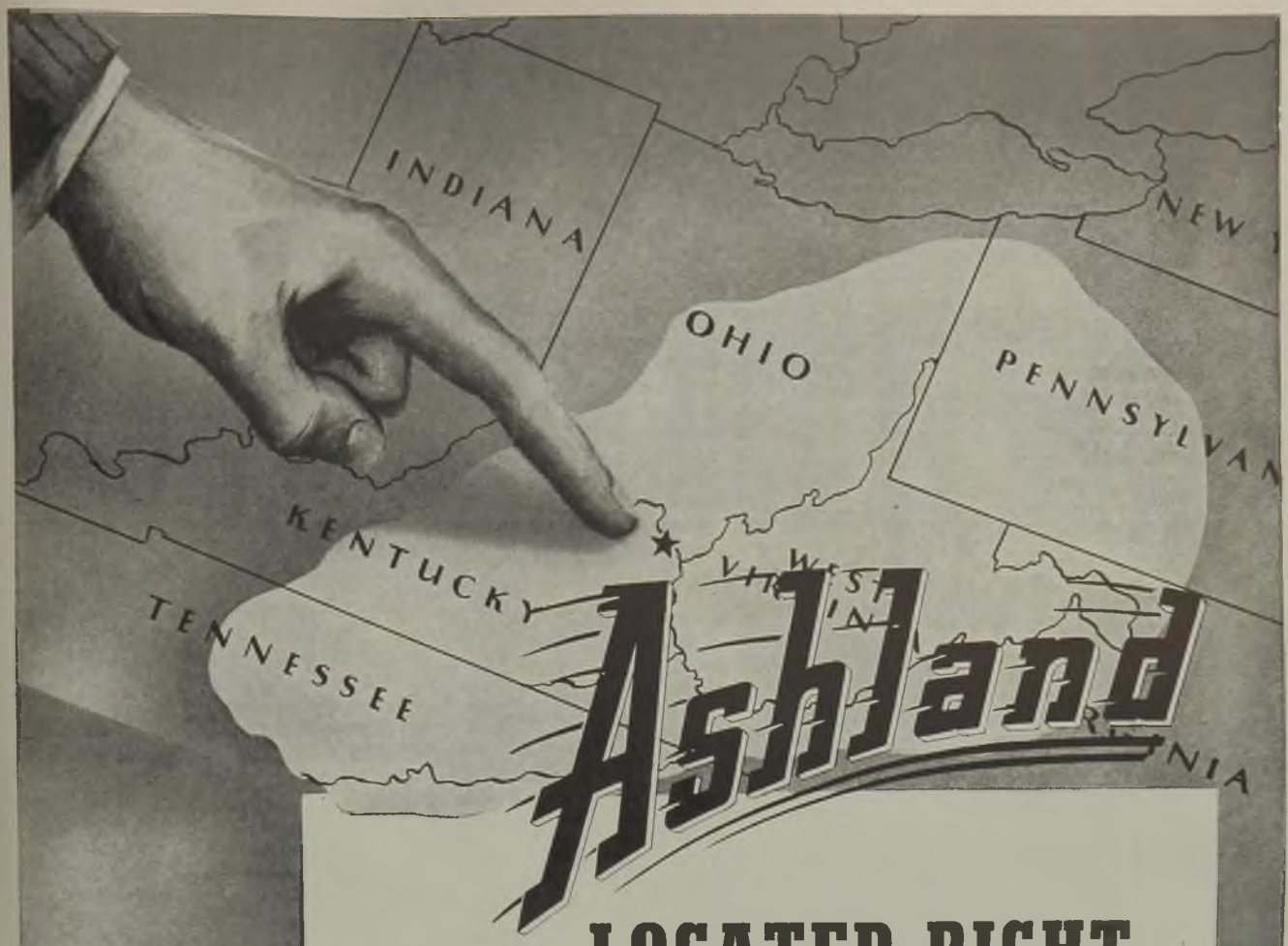
Foreman Accused By Wyoming Miners

Invoking a rarely used Wyoming statute, Henry Kaufmann, miner at a Sheridan-Wyoming Coal Co., Inc. mine, swore out two complaints last month, against Stanley Laya, assistant mine foreman, alleging that . . . "he did permit Henry Kaufmann and other miners to work underground in a mine more than eight hours in one day." The Wyoming law provides that miners cannot remain underground more than eight hours in any one day except in case of a disaster or emergency threatening human life. Conviction carries a fine of $100 to $500 or a term in the county jail of one to six months.

•

University of Illinois To Study Home Design

The University of Illinois, in co-operation with Bituminous Coal Research, Inc.



LOCATED RIGHT

for Better Coal Spray Service

★ Ashland is located right in the heart of the Appalachian coal fields, where 70 per cent of the nation's coal is mined. Just the spot for quick, economical delivery of Ashland Permatreat Coal Spray.

Mine operators have found Ashland Permatreat Coal Spray is permanent, economical protection against dust and freezing. Our portable dust index laboratory is readily available to determine at your mine the most effective treatment for your coal.

Ashland
PERMATREAT
COAL SPRAY

Ashland Oil & Refining Company
Incorporated
ASHLAND, KENTUCKY

will soon begin a three-year study of planning and design of homes to be heated by coal, it was announced by University of Illinois officials Aug. 8.

This project will consider such subjects as coal storage and handling, ash handling, furnace location, and the arrangement of heating facilities for most convenient use of coal. It will involve study of equipment and house plans and development of suggestions for builders and homeowners.

The University's department of architecture will be in charge of the project and will appoint a research professor to conduct the investigation. Bituminous Coal Research, Inc. will furnish funds. The project was arranged by the Small Homes Council at the University, which will publish the findings.

The architectural approach will distinguish this investigation from other activities of Bituminous Coal Research, Inc., which has sponsored considerable work in developing and testing chimneys, stokers and heating equipment. Until now, however, it has made no studies of the application of the equipment to the home in terms of planning.

The University of Illinois research to make coal a more convenient home fuel will involve several phases. The first will be a study of the most effective use of existing coal-burning and coal-handling equipment and facilities in homes. In the second phase, this knowledge will be applied to developing various types of house plans, emphasizing basements and heating-plant layouts, guidance and reference material for architects and contractors who are planning homes for coal heat.

A third phase in the research project will be the development of new ideas in coal-handling equipment and arrangement. This will include a study of home trends, such as basementless houses, and their relation to coal as fuel. Basementless homes and smaller homes may call for new ideas in delivering and storing coal. Smaller furnaces and stokers may be required. Such needs, if established by the studies, will be passed on for mechanical development with the assistance of Bituminous Coal Research, Inc.

•

Smoke Group Meets in Cincinnati

The Coal Producers Committee for Smoke Abatement held its semiannual meeting at Cincinnati, July 26 to review the work performed during the first half of 1946 and to lay plans for the remainder of the year. Chairman R. E. Howe announced that surveys had been completed in Toledo, Akron, Youngstown and Cleveland, Ohio, and Durham, N. C., since January, when the committee was reactivated.

It was agreed that the survey work should continue in cities and municipalities sincerely interested in the abatement of smoke, as the survey is the only known method of determining the origin and cause of smoke. Two special subcommittees, one for railroads and the other for steamboats, were authorized at the meet-

Mr. Operator . . . SERVICE-ABILITY is the only sound basis for choosing a loader!

Throughout our 38 years of building mechanical loading machines, performance has proved that the basic design and operating method of our machines are right. The performance of the Whaley "Automat" has been so effective . . . its ability to serve so complete, that it is unequaled in its field of operation.

Here are six reasons why you should give special consideration to the Whaley "Automat" . . .

1 — The "Automat" will load any lump of coal that will pass through your tipple.

2 — The "Automat" will load any lump of rock your cars, aerial tram, or larries can take and, bear in mind, do it consistently.

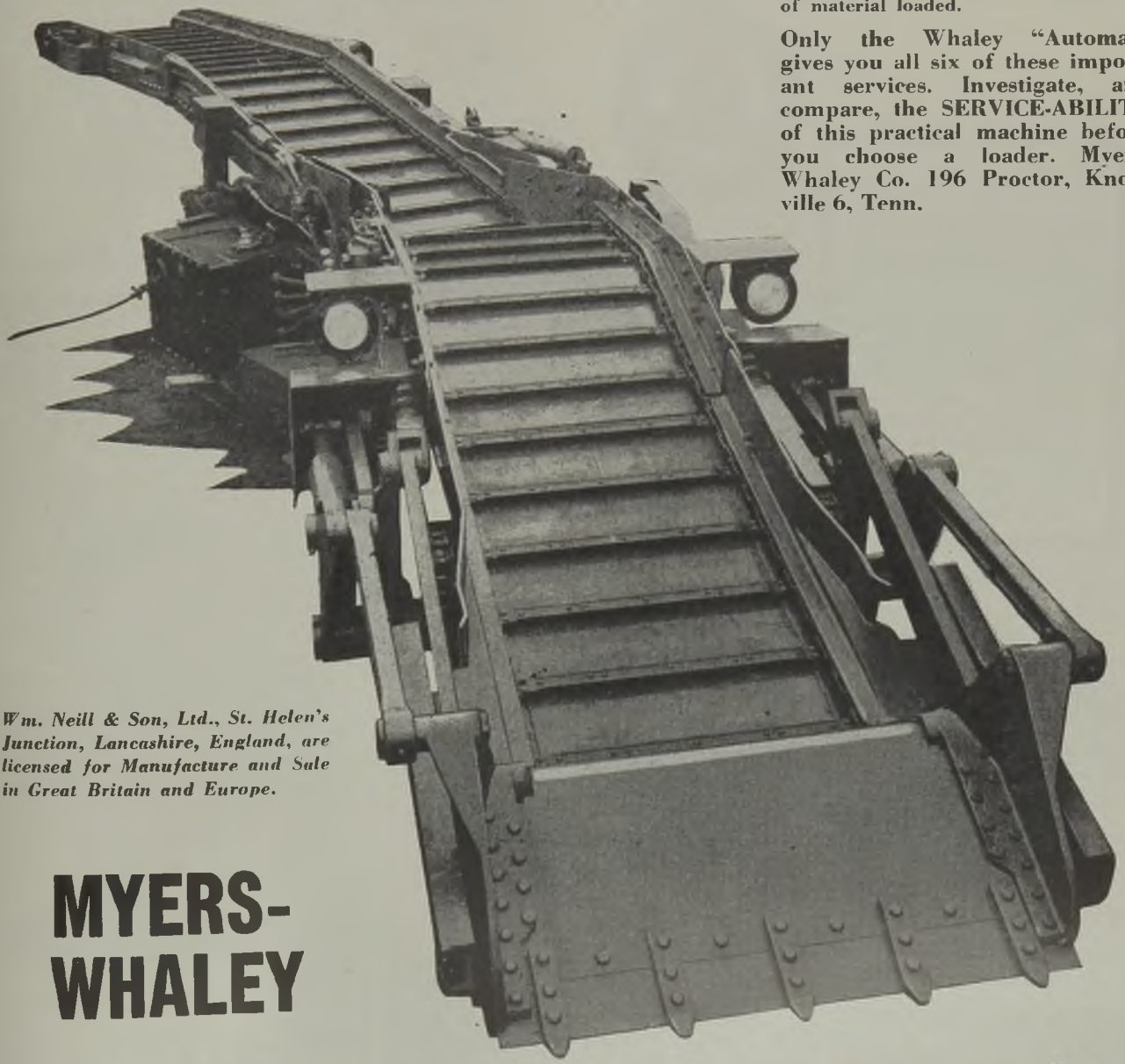
3 — The "Automat" will give you maximum production in either of the above services.

4 — The "Automat" has a Parallel Lift rear conveyor for maximum loading height in limited head room.

5 — The "Automat" gives you safe service, because of its vertical shoveling action—no danger of injuring men or knocking out timbers.

6 — The "Automat" gives you maximum production at minimum power consumption — with its one 25 H.P. Motor using only 1/5 KWH per ton of material loaded.

Only the Whaley "Automat" gives you all six of these important services. Investigate, and compare, the SERVICE-ABILITY of this practical machine before you choose a loader. Myers-Whaley Co. 196 Proctor, Knoxville 6, Tenn.



Wm. Neill & Son, Ltd., St. Helen's Junction, Lancashire, England, are licensed for Manufacture and Sale in Great Britain and Europe.

MYERS-WHALEY

Mechanical Loaders Exclusively For Over 38 Years

ing to deal with smoke from these sources.

Less than 20 percent of the smoke in the scores of cities which have been surveyed by the Coal Producers Committee for Smoke Abatement can be charged to the domestic consumer, it was disclosed at the meeting. In Cincinnati no more than 17 percent can be traced to the householder, the engineering division reported. This conclusion was based on sootfall records in the various cities. "In Cincinnati," Mr. Howe said, "the difference between the average monthly sootfall for the heating and non-heating seasons is slightly in excess of 17 percent."

Meanwhile a $9,500 subsidy to the Institute of Gas Technology, Chicago, for research aimed at production of a smokeless fuel from Illinois coal was announced Aug. 20. The fund is being provided by the Illinois Coal Products Commission. Two methods for producng smokeless fuel are now under investigation. One process, developed by A. D. Singh, a supervisor of coal and gasification at the Institute of Gas Technology, is fluidization, whereby coal is pulverized and passed through equipment that removes gas and coal tar. The remaining materials are suitable for use in powdered or briquet form. The second process, developed by the Kern Coal Conversion Co., East St. Louis, Ill., combines pulverized coal with chemicals into a briquet. The briquets are then dried and fed into a carbonizing retort to remove coal tar and gas.

•

Overseas Coal Notes

Fears for the future of the British Coal industry continued last month as July production figures indicated that both Germany and France had exceeded Britain's output, not only on total tonnage but also on the basis of tons per man.

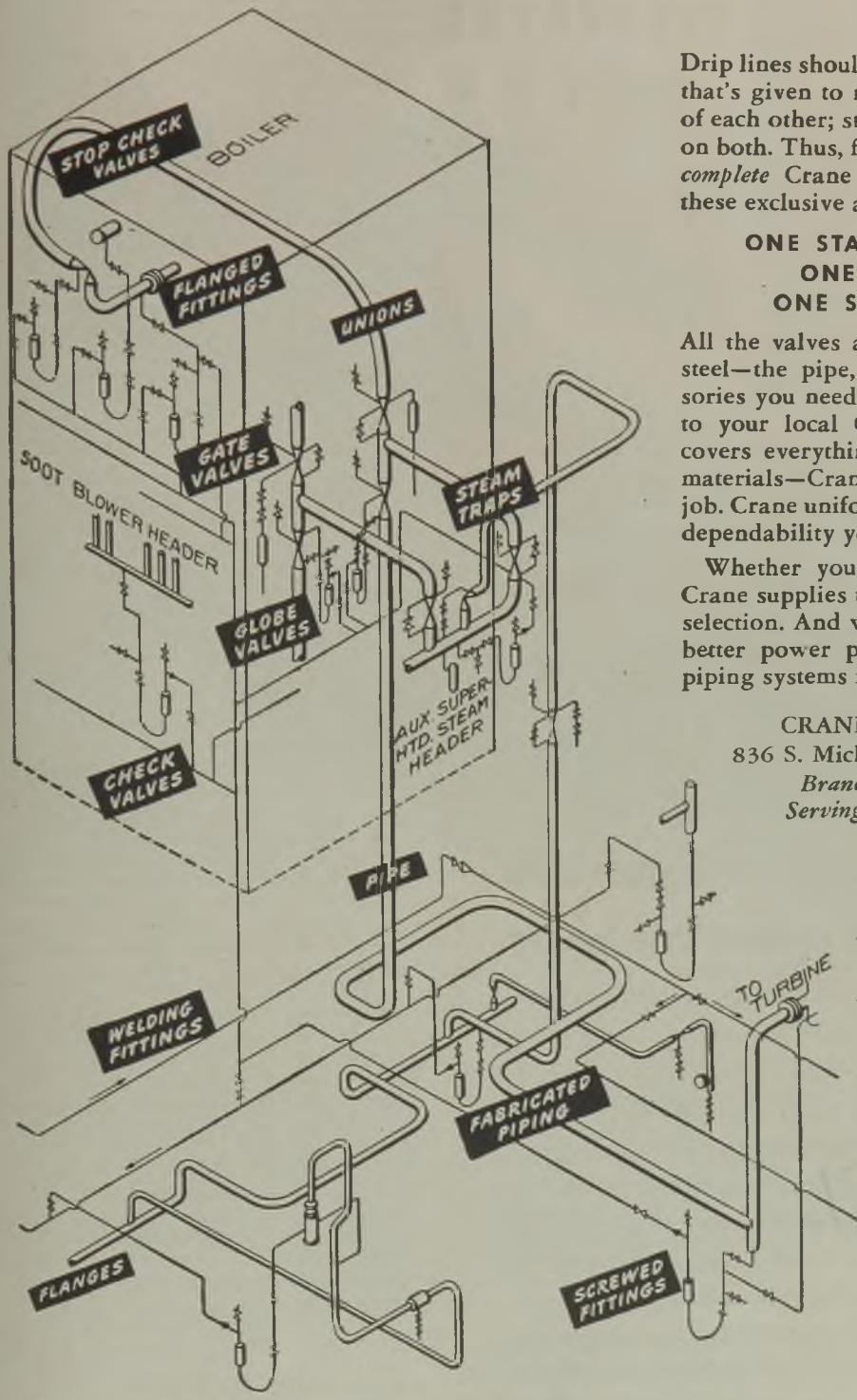
The German total of 4,750,000 long tons, though lower than the previous month, was considerably higher than the British output of 3,586,000 tons, 100,000 tons below the June level. The French figure of 4,050,000 tons was the only one to show a gain, this July tonnage representing 106 percent of the prewar level and achieved with 318,000 workers, 1,000 less than employed the month before. German workers employed totalled 237,000, an increase of 3,000 over June.

Britain's labor force remained stationary in July with 699,400 miners, but the number effectively employed was 100,000 less than this total. The decline in output was attributed mainly to the holiday season in Scotland, with an increase in absenteeism a contributing factor.

Arthur Horner, newly elected leader of the miners' union, voiced the warning that all necessary steps to attract manpower must be taken and said that the burden of providing Britain with coal no longer rested solely on the mining community. The nation must be ready to contribute needed manpower and use the fuel with utmost efficiency and care, he said.

Falsification of mine production figures has led to the dismissal and arrest of three Russian Stalingorsk Coal Trust officials,

All Drip and Drain Piping
...from the Complete Crane Line



Drip lines should be erected with the same care that's given to main steam lines. They're part of each other; steam efficiency depends equally on both. Thus, for boiler piping especially, the *complete* Crane line is preferred because of these exclusive advantages:

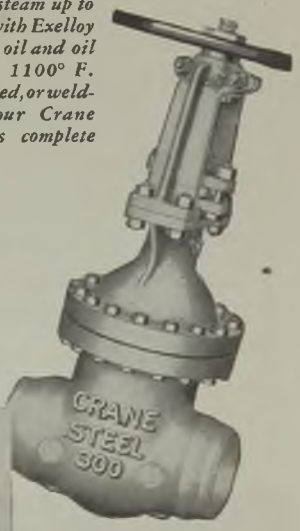
ONE STANDARD OF QUALITY
ONE RESPONSIBILITY
ONE SOURCE OF SUPPLY

All the valves and fittings, in brass, iron, or steel—the pipe, fabricated piping and accessories you need to install a boiler—one order to your local Crane Branch or Wholesaler covers everything. One responsibility for all materials—Crane—simplifies and speeds the job. Crane uniform quality assures the uniform dependability you want in all boiler lines.

Whether your needs be usual or unusual, Crane supplies them from the world's greatest selection. And what Crane can do to give you better power piping, it can also do for all piping systems in your plant.

CRANE CO., *General Offices:*
836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers
Serving All Industrial Areas

(*Right*) AT THE HEAD OF THE CLASS *for steam services — Crane 300-pound Alloy Steel Wedge Gate Valves. Supplied with Exelloy to No. 49 Nickel Alloy seating for steam, water, gas or air up to 850° F. maximum; with Stellite to Stellite, for steam up to 1000° F.; and with Exelloy to Exelloy, for oil and oil vapor up to 1100° F. Screwed, flanged, or welding ends. Your Crane Catalog gives complete specifications.*



EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
HEATING • PUMPS

CRANE

FOR EVERY PIPING SYSTEM

it was announced in Moscow Aug. 25. Until recently, an article in the Moscow *Bolshevik* stated, the coal trust had "never fulfilled its plan," but production for the last three days of July showed a sharp increase. One mine, for example, that had never produced more than 150 tons a day reported an output of 544 tons for July 29, the article said.

An unusual departure from Russian policy was announced early in August when the Four-Power Coal Commission was given authority to enter the Russian zone of occupation in Germany to study operation of German mines. In making the concession, however, Russia stipulated that Russian members of the Commission, along with French and American members, should receive full cooperation in observing closely German mines being operated by the British. A report on distribution of German coal was to be submitted by Aug. 24, and the Commission is to make a full report on production and methods employed by mid-October.

Moscow (McGraw-Hill World News)—Reconstruction of the large Artem colliery, the only one of the 35 large collieries of the Rostov Coal Combine in the Donbas not yet in operation, is nearing completion. Before the war this colliery had a daily output of 4,000 tons. The mine has been drained of about 2,000,000 cubic meters of water, and the main shaft, 500 meters deep, has been rebuilt. The rebuilders recently reached the central workings.

ANKARA, Turkey (McGraw-Hill World News)—Turkey, which sold to France 20,000 tons of coal in a recent transaction, is now reported closing a similar deal with Italy. The present output of Turkish coal (3,560,000 tons annually) leaves only a small amount for export, but plans are under way to increase production by over one million tons so as to meet the needs of new industries being developed in the country.

BRUSSELS, Belgium (McGraw-Hill World News)—Continued stagnation in the production of coal still handicaps the resumption of Belgium's industry. The daily output for June failed to exceed 77,000 tons, with 154,000 miners employed, of which 55,000 were German prisoners-of-war. Receipts of coal from the Ruhr and the United States have shown a marked decrease which aggravates the situation. The Government has just concluded an agreement with Italy whereby 50,000 Italian workmen will be hired to work in the mines, for which Belgium will ship to Italy 3,000,000 tons of coal yearly.

Chrysler to Build Coal-Fired Furnace

Introduction of a new steel coal-fired furnace in 22-, 24- and 27-in. sizes has been announced by Airtemp division of Chrysler Corp. Designed for gravity operation, the coal furnaces constitute an entirely new addition to the Airtemp line.

The new furnace has an all-steel front with concealed hinges for a smooth ap-

pearance. Attachment of the casing by merely hooking it to the steel front molding simplifies the installation of the casing, assembly of the unit, eliminates the use of ugly bolts and is also a seal against leaks. The body and radiator of the furnace are of electrically welded construction and one of the outstanding features is the combination one-piece dome-and-door cap that is double insurance against gas leakage.

The furnaces are equipped with heavy-duty locomotive bar-type grates with a double-acting dumping mechanism and a waist-high shaker lever. This type of grate assembly may be used for either bituminous or anthracite coal, it is pointed out. The fire pot is lined with non-spalling refractory and standard equipment includes a vitreous enameled humidifier.

•

Geologist Addresses Central W. Va. Group

Herschel Ice, geologist of Monongahela West Pennsylvania Power Co., stressed the importance of geology to the coal industry at the regular monthly meeting of the Central West Virginia Coal Mining Institute held Aug. 9, in Fairmont, W. Va. G. R. Higinbotham, vice president for operations, Consolidation Coal Co. of West Virginia, presided in the absence of President E. Frank Miller, general superintendent Koppers Federal mine.

Mr. Ice's address traced coal from vegetable matter to its present form, pointing out that it takes approximately 300 years of plant growth to form one foot of Pittsburgh coal. Peat, coal's first usable stage of development, requires only 10 to 20 ft. of vegetable matter, the speaker said. Coal, unlike oil and natural gas, is being continuously formed, as may be seen in the Dismal Swamp of Virginia and North Carolina.

The speaker emphasized the importance of geological information in locating coal seams, establishing preparation and service plants and determining the direction of butt and face cleats in entry driving. Sixteen of the 117 seams of West Virginia are minable today, the speaker concluded.

Discussion emphasized coal impurities and roof control, as well as the possibility of capturing the natural gas in the coal seam for commercial purposes before mining the coal.

•

Ohio Commission Delays Strip Report

Final action on the report of the Ohio strip-mine study commission was delayed until a September meeting, as the group met early in August to receive and study a report from a three-member subcommittee. The Commission is reportedly agreed that some regulation of strip mining is necessary but individual members were thought to have a wide range of opinion as to how far legislation should go.

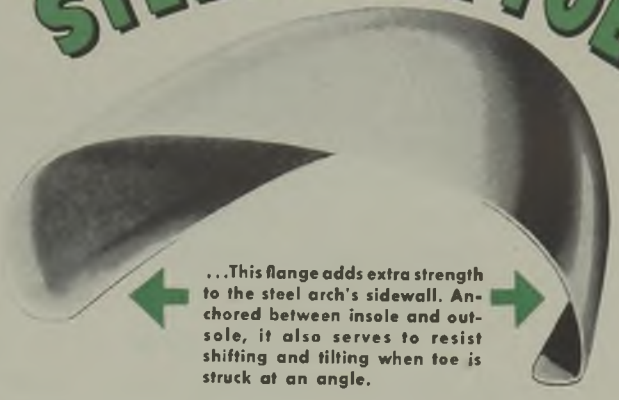
State Senator Evert E. Addison, chairman of the commission, was quoted as stating that he would recommend a State

Don't leave it to chance

IN ROULETTE—with the American wheel (two zeros) the odds against the player on even chances and numbers are 5-5/19 per cent. On the European wheel the odds are 1-13/17 per cent on even chances and 2-26/37 per cent on the numbers, and the odds against a number repeating itself 4 times is 1,679,615 to 1.

LEAVE IT TO— HY-TEST

THE SAFETY SHOE WITH THE ANCHOR FLANGE STEEL BOX TOE



...This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting and tilting when toe is struck at an angle.

Going on a hazardous job without safety shoes is "workman's folly." And fewer workmen are taking this chance since learning of the easy-wearing feel and the foot-saving record of Hy-Test Safety Shoes. Hy-Test's Anchor-Flange Steel Box Toe gains its strength from the arc of steel and further protection with the anchoring flange. Yet, these shoes are so smoothly constructed you would never guess this rigid shield is underneath the sturdy leathers. Ask about the Hy-Test plan that makes it so easy for your workers to have this extra protection.

Be Sure to Visit

HY-TEST Booth 72

34TH NATIONAL SAFETY CONGRESS
CHICAGO, OCTOBER 7-11, 1946

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST *Safety Shoes*

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MO.
EASTERN OFFICE • MANCHESTER, N. H.

appropriation of $50,000 for use of the U. S. Forestry Service to speed up its experimental reforestation of stripped lands. Senator Addison pointed out that while at one time Ohio had 25,000,000 acres of forest lands, the area had now been reduced to less than 4,000,000. He also urged that the commission's recommendations be withheld until after the November elections to prevent the question from becoming a political issue.

•

Canadian Miners Seek Wage Boosts

A wage increase of $2.50 a day, establishment of a five-cents-a-ton royalty, a welfare fund similar to that in the United States, a 40-hour week and changes in the holidays agreements, were the principal requests of the United Mine Workers of America, District 18, to Canadian coal operators last month. Further negotiations were to take place soon.

The Bituminous Coal Operators' reply to the miners' requests given to union officials suggested that 10c. an hour is a reasonable wage increase and that they could see no justification for the welfare fund. They stated they were not averse to the 40-hour week, providing they are assured employees will attend their employment during the five days and will work the 40 hours.

As in the United States, District 18 representatives want a royalty of five cents a ton on all coal produced for use or for sale. The money is to be used for health and welfare benefits for the miners.

The wage demands, among the highest asked for by any Canadian union, cover all employees. The operators' reply is based on the position taken by the Government representatives before the Industrial Relations Committee of the House of Commons that increases much beyond 10c. an hour would render price control impossible. John Stokaluk, vice president of the union, speaking at a meeting, declared the union would not accept 10c. an hour. A similar demand was placed before the Alberta Domestic Coal Operators Association by the union on Aug. 22.

•

Tree Growth Checked

A 26-year record of pine trees growing at an altitude of 7,400 ft. in Colfax County, New Mexico, has revealed an average height increase of 24.76 ft. and an increase of 17.55 in. in circumference during the period, according to J. R. Barber, mining engineer, St. Louis, Rocky Mountain & Pacific Co., Raton, N. M. The climate in which the trees are growing is described as moderate, with a rainfall average of 12 in.

"The test trees are known locally by the name Black Jack Pine, due to the dark color of the bark, and are used for mine props," states Mr. Barber. "In our coal-mine operations, we contract with local Mexican labor to cut trees off our own property.

"Another point which seems to be

cleared up is the effect of porcupine attack," he continues. "Porcupines will cut a ring of bark near the top of the tree, about a foot wide. Twelve years ago, in 1934, Trees Nos. 3 and 5 were ringed. In our inspection in 1946, Trees Nos. 3 and 5 had grown new bark and nothing showed but the scars. These trees show a growth equal to the other trees and appear to be healthy.

"The knowledge of the rate of growth is an important matter to us. It seems it might be of interest to others as showing our slow rate of growth in a desert country. We have other test trees, but these are the only ones with a 26-year record. The table below shows the record of these five trees."

Tree Growth Tests

Coal Canon, Colfax County, New Mexico
Elevation, 7,400 ft. Avg. Rainfall, 12 in.

Tree No.	1920 Height, Ft.	1946 Height, Ft.	Height Increase Ft.
1	19.71	47.0	27.30
2	23.35	44.0	20.65
3	15.65	46.5	30.85
4	18.15	42.5	24.35
5	15.65	36.3	20.65
Average			24.76

Tree No.	1920 Circum., In.	1946 Circum., In.	Circum. Increase, In.
1	24-1/4	42	17-3/4
2	29	47	18
3	19-1/8	38	18-7/8
4	22-1/4	39	16-3/4
5	21-5/8	39-1/2	17-7/8
Average			17.55

Obituary

Lem C. White, vice president, St. Louis Rocky Mountain & Pacific Co., Raton, N. M., died recently.

Alan Craig Dodson, 66, president since 1917 of Weston Dodson & Co., Shenandoah, Pa., died unexpectedly Aug. 23 in St. Luke's Hospital, Bethlehem, Pa. He organized and was the first president of the Anthracite Coal Operators Association and was long active in industry affairs.

Howard M. Girton, division engineer for the southern division, The Hudson Coal Co., Scranton, Pa., died July 29 after a brief illness. Mr. Girton joined the company in 1903.

Duncan Lippeatt, 53, one of the operators of the Dugger Domestic Coal Co., Dugger, Ind., was killed Aug. 26 in a fall of slate at the company's mine.

George Pow, 69, land agent for the Elk Horn Coal Corp., Wayland, Ky., died Aug. 28. Mr. Pow had been with Elk Horn for about 30 years and at one time was associated with the Consolidation Coal Co. and the United Thacker Coal Co.

LABOR DAY • 1946

—Time for wise union leadership

LABOR DAY, 1946, finds one hopeful element in the relations between American management and labor which was not there on Labor Day, 1945. It comes in recent expressions by a number of national leaders of organized labor that increased "real" wages depend upon *increased productivity,* i.e. increased output per man-hour. Increased money wages which are promptly offset by higher prices do nobody any good.

If these expressions, *which still remain to be substantiated by practical performance,* come to be accepted by the rank and file of labor in each community, Labor Day, 1946, can usher in a period of great and perhaps unprecedented improvement in the economic wellbeing of wage earners — as well as the wellbeing of the country at large. If, on the contrary, they remain merely window dressing and there is a continuation of the post V-J Day process of increasing wages and then prices, the outcome can only be the bursting of an inflationary bubble, with attendant suffering for workers and the community generally.

Competition requires management to bear down heavily on increased labor productivity as a prelude to wage increases. Management, however, has rarely made a more forthright statement on the importance of increasing labor productivity than that contained in a recent issue of LABOR'S MONTHLY SURVEY, an official publication of the American Federation of Labor.

William Green, the Federation president, led off with a "message to American workers." He remarked, "Our major need is increased volume of production." Observing that "wage increases this spring have been paid for by raising prices," the survey itself goes on to say that "Today America's ability to raise wages without increasing prices and living costs depends on increasing productivity in civilian industries . . . Here is the challenge to free labor and free enterprise today: *Cooperate to increase productivity and raise living standards without strikes.*" (Italics supplied.)

The importance of increasing production was also recently stressed by Walter Reuther, President of the United Automobile Workers, C.I.O., who remarked that his union "is just as eager as management to get the (automobile) industry into maximum production." In taking this general line he was in accord with the position of Philip Murray, head of the C.I.O., who in a book, "Organized Labor and Production" written with Morris L. Cooke, remarks that, "The modern labor leader also realizes that to receive a good day's pay a man must do a good day's work and that *increased productivity has been the vital factor in the country's industrial supremacy and its relatively high wage scale.*" (Italics supplied.)

In citing increased productivity as the key to increased "real" wages these labor leaders—and management — have the historical record entirely on

SPOT CHECK ON LABOR OUTPUT

In the absence of reliable general statistics on what has happened to productivity of labor since V-J Day (because of strikes and reconversion complications) the McGraw-Hill Publishing Company asked the executives of a cross section of American industry to report their own impressions. The questions asked and summaries of the replies, which varied markedly from industry to industry and plant to plant, follow.

Question No. 1. How well have workers performed since V-J Day as compared to their pre-war effort?

Answer. Worker effort has been below pre-war. There are exceptions, particularly among older and more experienced workers; and there are quite a few signs of improvement.

Question No. 2. How much headway have you been able to make since V-J Day in improving labor productivity by better equipment and organization?

Answer. Some headway is generally being made, but it has been greatly retarded by inability to get new equipment and, in some cases, by lack of labor cooperation in improvements in organization.

Question No. 3. How much improvement in equipment and organization is to be anticipated in your business over the next year?

Answer. Marked improvement in productivity (in a few cases as much as 20 per cent) can generally be made if there is sustained production and full cooperation between labor and management.

their side. In the 40 years prior to the outbreak of World War II output per man-hour for the country as a whole was approximately doubled. Over the same period the "real" hourly earnings of industrial workers were also approximately doubled. There were, of course, great variations in the increase of output per man-hour from one line of activity to another. Also, there were periods when increases in "real" wage rates lagged behind increases in productivity. But for the 40 year period as a whole and the economy as a whole there is no mistaking the fact that the route to increased "real" wage rates was increased productivity.

Three economic factors played major roles in this doubling of production per man-hour which has made America the industrial marvel of the modern world. One was the skill and diligence of American workers. A second was the skill and diligence of American management in organizing production. A third was the improvement of machinery and the increased application of power to it.

Wartime Record

During World War II this sustained increase in the productivity of labor in *civilian* manufacturing industries, which had averaged about 3 per cent a year, was brought to an abrupt halt. Much of the most efficient segment of the nation's labor force went to war or war industry. Also, civilian industry was starved for new equipment while we equipped our arsenals. The result was that the productivity of labor in those civilian manufacturing industries for which the government keeps records actually declined throughout most of the war. By 1945 it was no higher than in 1941, whereas, if it had maintained the long run average, it would have been about 12 per cent higher. In the meantime, however, average hourly wages in these civilian industries had increased about 40 per cent.

In *war* industry, which started from low levels of production at strange tasks, there were substantial increases in output per man-hour. Many of these increases involved new processes, improved techniques, and better machines which can be adapted over a period of time to the improvement of productivity of labor in civilian industry.

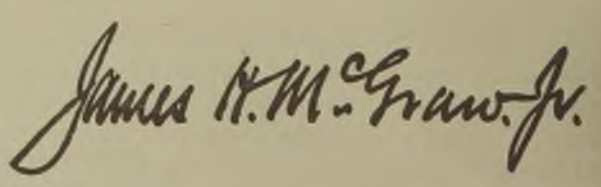
Since V-J Day, however, labor, led on by a misguided government, has had its sights on higher money wages instead of improving productivity which would have laid the foundation for increased "real" wages. Consequently, debilitating industrial strife ended in a round of wage increases which, in the absence of increased productivity, is being washed out by higher prices.

To Keep Production Rolling

However, as indicated by the summary of a McGraw-Hill sampling of the current experience of industry in increasing output per man-hour, which appears in the center of the page, there is hope that the situation ahead can be improved. After agonizing delays because of work stoppages, material shortages, and reconversion complications, industrial production is beginning to roll again. Allowed to roll it will not be long before it will be making those advances in productivity which are the only true basis for increased "real" wages.

If the process of keeping American industry rolling to new highs of productivity is to be resumed, management must see that the past practice of translating increased output per man-hour into increased "real" wages is not only sustained but wherever possible accelerated. For its part organized labor must abandon its manifold feather bedding rules and other production-restricting practices which afflict considerable segments of American industry. Further it must give incentive systems of pay, honestly conceived and honestly administered, a fair break. *Management and labor and government and the community at large must collaborate in removing that specter of working one's self out of a job which has been one of the greatest causes of restriction of output.*

The current emphasis by leaders of organized labor on the economic truth that increased output per man-hour is the only road to increased "real" wages is important. The next step is to see that recognition of this truth seeps into the rank and file of labor and industry and becomes the basis of a program of action at the local level. If it does, and quickly, Labor Day, 1946, may mark a tremendous turning point toward sustained prosperity not only for labor but the community at large. If it does not, union leadership will fail in its responsibility and must answer to the American people for the consequences of such a failure.



President McGraw-Hill Publishing Company, Inc.

MANHATTAN *Homocord* CONVEYOR BELT

CUSHIONED!

The extraordinary service records reported by users of Manhattan Homocord Conveyor Belts are due to several features of design and construction. An important feature is Cushion Against Impact. Those heavy lumps pictured below will not puncture a Cushioned Homocord Belt. Its component Strength Members are designed to dissipate shock. Sealed in with moisture-proof Flexlastics and mildew-proofed for added protection, Homocords have flexible, resilient, rolling contact with each other . . . like "rippling muscles."

Ever since its introduction, this NEW and DIFFERENT conveyor belt has been in overwhelming demand where the tonnage is heavy and conditions are tough.

CUSHIONED *"Rippling Muscles"* CONSTRUCTION

8 ADVANTAGES

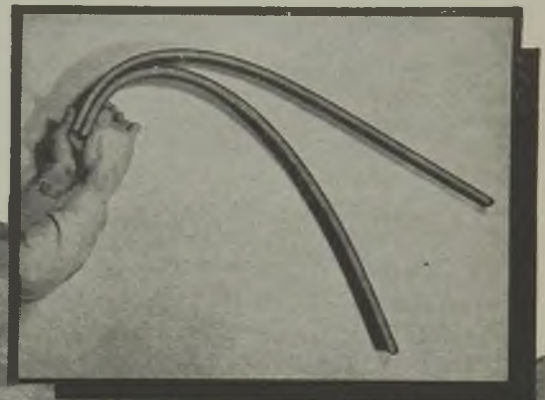
1. Complete bonding of every member into a homogeneous structure.
2. Holds metal fasteners.
3. Lateral flexibility permits perfect troughing, accurate training, reduces fatigue of flexing at bend in troughing idlers.
4. Resists destructive action of continuous or heavy impact feeding.
5. Cushion Homocord body and low inelastic stretch reduce wear and tear of top cover.
6. Homocord body reduces hazard of punctures.
7. Homocords so completely encased in Flexlastics, moisture not admitted, mildew cannot start.
8. Longer life, lower cost per ton.

TOUGH!

In demonstration below, top sample is a high grade conveyor belt of conventional construction. Bottom sample is Homocord belt. Note the extra flexibility of the new Homocord construction. This insures better troughing and longer life. Savings are considerable with a Homocord belt.

The term FLEXLASTICS is an exclusive MANHATTAN trademark. Only MANHATTAN can make FLEXLASTICS.

FLEXIBLE!



MILDEW-PROOF!

RAYBESTOS-MANHATTAN, INC.

MANHATTAN RUBBER DIVISION

EXECUTIVE OFFICES AND FACTORIES PASSAIC, NEW JERSEY

Personal Notes

Birger G. Thele, formerly electrical engineer, has been named chief engineer of coal mines, Tennessee Coal, Iron & R.R. Co., Birmingham, Ala.

Richard T. Todhunter Sr., associated with the Barnes & Tucker Co., Philadelphia, for 41 years, most recently as general manager, has been elected president of the company.

Several changes in personnel were recently announced by the J. H. Weaver Co., coal-mine operators. **Frank C. Hout**, Ebensburg, Pa., has been appointed manager of mines in Pennsylvania and West Virginia, and **Jerome C. White**, also of Ebensburg, has been named assistant vice president. **Howard Schwenebraten**, formerly mine superintendent, has been appointed general superintendent of the Heisley Coal Co., Nanty Glo, Pa.

Kirk V. Cammack, recently returned from service with the Natural Resources Section, G.H.Q., S.C.A.P., in Japan, where he surveyed and reported on various Japanese coal fields, has resumed his position with the U. S. Geological Survey, Denver.

M. O. Evans, formerly chief engineer for the district, has been named assistant district manager of Republic Steel Corp.'s northern coal mines, with offices in Uniontown, Pa. **F. J. Reed**, industrial engineer, succeeds Mr. Evans as chief engineer.

H. G. Burrill, recently released from the army as a colonel, has returned to the practice of consulting engineering and has formed a partnership with **Lewis L. Gwin**, with offices in Altoona and Baltimore.

Dr. John Frank Byrne, formerly associated with the General Electric Co. as a physicist, has been named to the division of fuels technology, Battelle Memorial Institute, Columbus, Ohio. **Abbott A. Putnam**, previously on the engineering staff of the National Advisory Committee for Aeronautics, Hampton, Va., has also joined Battelle's fuels technology group.

James W. Stewart, assistant professor of mining engineering, University of Illinois, has resigned to become professor and head of the mining engineering department, University of Alabama.

Dr. Robert W. Sandelin, a graduate of the University of Minnesota and before the war an instructor at Georgia Institute of Technology, has been appointed assistant professor of mining and metallurgical engineering at the University of Illinois.

Paul A. Mulcey, recently released from the navy as a lieutenant commander, has been appointed director of the laboratory of the Anthracite Institute, Wilkes-Barre, Pa. Mr. Mulcey joined the Anthracite Institute in 1930 and before the war was assistant director of the laboratory.

L. H. Todd, Central City, Ky., and **O. L. Riser**, Van Lear, Ky., have been named Kentucky district mine inspectors. Mr. Todd will cover the western district and Mr. Riser the eastern Kentucky fields.

Norman C. Curtin, formerly Anthracite Institute and Anthracite Industries representative in Rochester, has been promoted to supervisor of field representatives for the Anthracite Institute.

Harry L. Swihart has resigned as division superintendent of the Davis Coal & Coke Co., Coketown, W. Va., to rejoin the Simpson Creek Collieries Co., Gallowav, W. Va., as general superintendent.

C. Millard Dodson, vice president of the company since 1943, has been elected president of Weston Dodson & Co., Inc., to succeed his uncle, the late Alan C. Dodson. Mr. Dodson joined the company in 1931, returning to the organization last November after 3½ years service in the Navy. W. R. Coyle, vice president since 1917, has been elected, in addition, treasurer of Weston Dodson, and Elmer L. Mack, secretary and director for many years, was recently named vice president.

•

Preparation Facilities

Old Ben Coal Corp., Mine No. 9, Taylorville, Ill.—Contract closed with McNally Pittsburg Mfg. Corp. for crushing, rescreening and cleaning plant for 3x0-in. coal, capacity, 450 t.p.h., consisting of McNally-Pittsburg stoker-coal crushers, Allis-Chalmers vibrating screens, capable of crushing and screening raw coal down to and including 10-meshx0-in.; ¾x⅜-in. and ⅜x10-mesh to be cleaned on American Twin-Dex pneumatic separators; complete with Motocone dust-collecting, bins and blending equipment.

Locust Coal Co., Weston breaker, Shenandoah, Pa.—Contract closed with Chance Coal Cleaner for one 12-ft.-dia. Chance cone for recovery and cleaning of all sizes buckwheat and larger, constituting additional equipment; feed capacity, 200 t.p.h.

Waddell Coal Mining Co., Archbald, Pa.—Contract closed with Chance Coal Cleaner for one 8-ft.-dia. cone for recovery and cleaning of all sizes buckwheat to stove, inclusive; feed capacity, 100 t.p.h.

Banco Minero Del Peru, Lima, Peru—Contract closed with Chance Coal Cleaner for complete breaker at Chimbote, Peru, to recover and clean all sizes egg to buckwheat, inclusive; capacity, 150 t.p.h.; equipment includes one 12-ft.-dia. cone for sizes pea and larger, and one 8x8-ft. cone cleaner for buckwheat and smaller, the latter to be supplemented by a 5-ft.-dia. Hydrotator for cleaning barley and No. 4; also included is intake conveyor, breaker with seven overhead storage pockets for loading to railroad cars and belt conveyor, complete with electrical and other auxiliary equipment.

Centralia Mining Co., Centralia, Pa.—Contract closed with Chance Coal Cleaner for one 12-13½-ft.-dia. Chance cone for recovery and cleaning of all sizes buckwheat to egg, inclusive; feed capacity, 200 t.p.h.

Midvale Coal Co., Midvale, Ohio—Contract closed with Jeffrey Mfg. Co. for

washing equipment; capacity, 140 t.p.h. of raw mine-run, 6x⅜-in.

American Smelting & Refining Co., New York, N. Y. (For Compania Carbonifera de Sabinas, Rosita, Coahuila, Mexico) —Contract closed with Jeffrey Mfg. Co. for washing equipment; capacity, 275 t.p.h. of raw mine-run, 2x0-in.

•

Association Activities

National Coal Association has elected D. W. Buchanan, president, Old Ben Coal Corp., Chicago, a member of its board of directors, to fill the vacancy created by the resignation of George W. Reed, vice president, Peabody Coal Co.

Big Sandy-Elkhorn Coal Operators Association, at its annual meeting, Aug. 19, elected the following officers: Harry LaViers, vice president and general manager, South-East Coal Co., president; B. F. Reed, vice president, Black Star Coal Co., vice president; J. R. Hurt, secretary-treasurer, Sandy Valley Coal Co., treasurer; and H. S. Homan, executive secretary.

•

Coal Publications

South Wales Coal Field (Including Pembrokeshire), Regional Survey Report, Ministry of Fuel and Power, British Library of Information (New York Office, 30 Rockefeller Plaza); 218 pp., 6x9 ⅝-in.; 7 maps, paper; price, $1.20. Report of Survey anticipatory to complete nationalization of the coal industry.

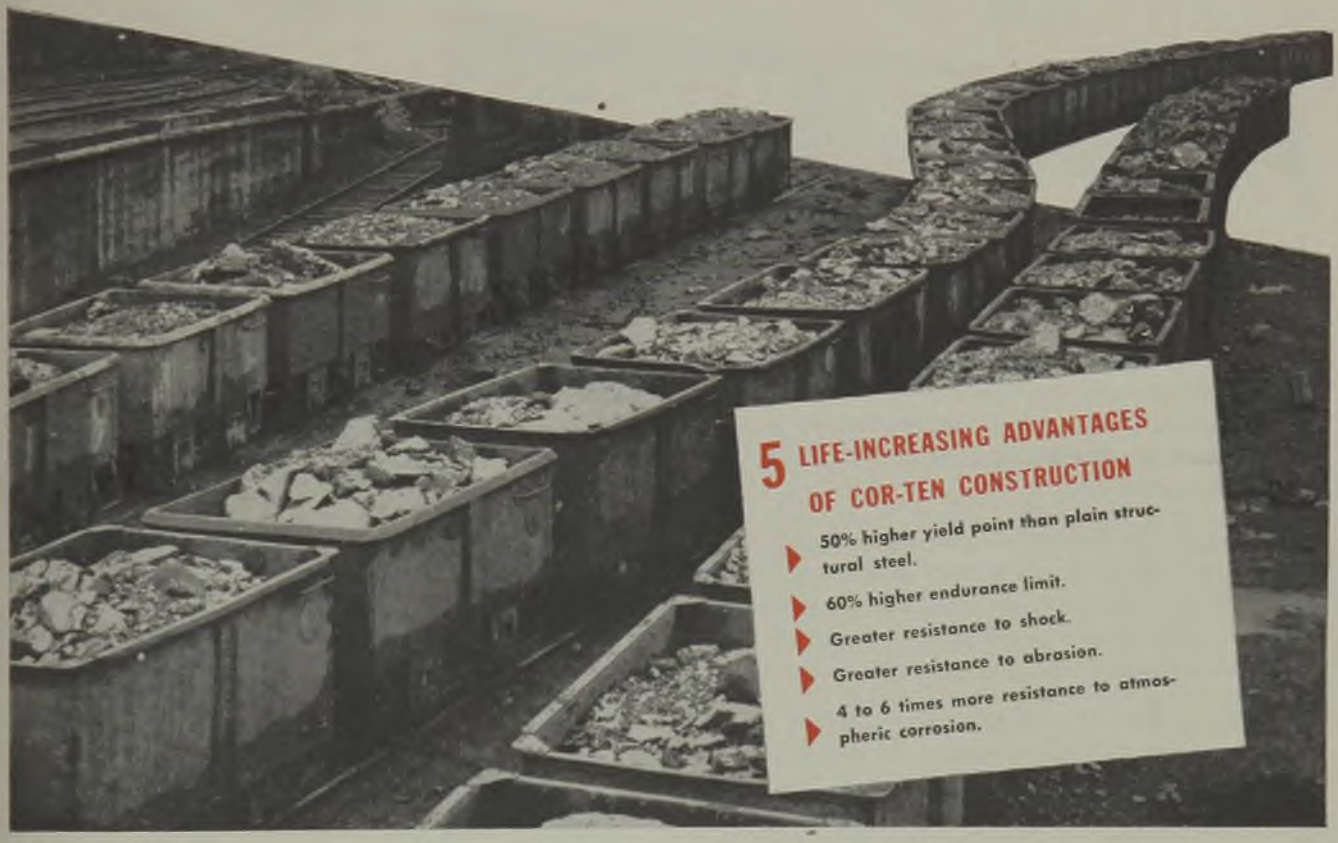
Annual Report of Research and Technologic Work on Coal, Fiscal Year, 1945, by A. C. Fieldner and R. E. Brewer, U. S. Bureau of Mines; I. C., 7352; 123 pp., 8x10½-in.; mimeograph, free.*

Flood Prevention Projects at Pennsylvania Anthracite Mines, A Preliminary Study, by S. H. Ash and L. Westfield, U. S. Bureau of Mines; R. I. 3868; 44 pp. with 5 maps, 8x10½-in.; paper, mimeograph; free. In 1920, at some collieries producing large tonnages of anthracite, 8 tons of water were pumped for every ton of coal mined underground, whereas in 1942, 30 tons of water were removed by pumping for every ton of coal thus mined. In the Northern field alone, with the water at present levels, the underground pools contain 11,926,482,000 gal. of water. These pools cannot be allowed to reach higher elevations or the water will flood other mines, forming other pools at levels much further below the surface and accordingly entailing much more expensive pumping. In the Southern field there are 32,469,000,000 gal. of water in such subterranean pools. The depth of the deepest part of the deepest bed in this field, that at Williamstown, is 2,100 ft. below sea level and 783 ft. below the surface. At Lykens, this abyssmal depth is 1,003 ft.

*Apply to U. S. Bureau of Mines Washington 25, D. C.

2250 new U·S·S COR-TEN mine cars ordered since January...

ALL ARE REPEAT ORDERS BY MAJOR COAL COMPANIES



REPEAT orders are the best index of customer satisfaction. When mine operators come back year after year for *more* COR-TEN cars, they must be doing a good job.

Right now when it is necessary to squeeze every penny, you can be sure these cost-conscious companies wouldn't be re-ordering COR-TEN equipment if it hadn't fully justified its cost.

15,465 mine cars built of U·S·S COR-TEN are now in service in 55 large companies' operations. They're of all types. They're working under every variety of condition—in thin seams and thick seams, in dry mines and wet mines, with mechanical loading and hand loading. More than a thousand have been in use for over ten years. We have yet to hear of a single failure due to wear.

From our records of their performance we can give you factual proof of U·S·S COR-TEN's ability to increase mine car efficiency . . . in service closely paralleling your own.

Write us—tell us the operating conditions in your mine, tell us what the cars are expected to do—and we'll be glad to show you how U·S·S COR-TEN can be applied to give you the results you look for . . . at lowest cost.

U·S·S HIGH STRENGTH STEELS

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

USS HIGH STRENGTH STEEL UNITED STATES STEEL

UNITED STATES STEEL

below the surface, though only 1,900 ft. below sea level. Of course, this is not as deep as many mines across the Atlantic, but these perhaps are not so wet.

The Federal Labor Laws. National Foremen's Institute, Deep River, Conn.; 72 pp., 6½x9½-in.; hard fabricoid cover, loose-leaf; price, $2.50 f.o.b. shipping point. Publication date May 1, 1946. Salient points of each law presented concisely in simple non-legal language and interpreted from foreman's point of view. Inserts carrying new labor laws or revisions of old ones will be furnished by publishers, thus keeping the publication up to date.

What Price Supervision, by R. D. Bundy, National Foremen's Institute, Deep River, Conn.; 46 pp., 6½x9½-in.; hard fabricoid cover, spiral bound; price, $2 f.o.b. shipping point. Discusses defects in present-day supervision.

The Corrosion of Feed Screws of Small Underfeed Stokers, by R. Sherman, J. F. Foster and D. A. Hinckle, Bituminous Coal Research, 912 Oliver Building, Pittsburgh, Pa., T.P. 9; 23 pp., 6x9-in.; paper; price, 25c. At 266 deg. F. calcium chloride with moisture forms an oxychloride and gives off hydrogen chloride which dissolved in water forms hydrochloric acid which in turn attacks steel vigorously. With alkaline and neutral coals, calcium chloride apparently is harmless. The more acid the coal, the greater the adverse effect of calcium chloride. An acid Illinois coal corroded about a third more than the same coal when untreated. Oil treatment may have some adverse effect, for the loss of material was the same as for untreated coal, though oil should protect the screw from abrasion. Some coal is more alkaline than bicarbonate of soda and some almost as acid as vinegar (acetic acid). The range of pH for 39 coals runs from 3.0 to 8.8. Pocahontas coal, in its various seams, covers that entire range. Conditions favorable to corrosion are (1) Evaporation of moisture at the retort end (2) backward flow of water vapor toward bin or hopper (3) condensation of moisture on coal and screw. Cures for corrosion are (1) deep retort (2) air duct around feed tube (3) ventilated hearth (4) moderately thick fuel bed.

Manufacture and Regeneration of Catalysts at I. G. Farbenindustrie A. G. Plants, Ludwigshafen-Oppau, Germany, by W. F. Faragher and W. A. Horne, U. S. Bureau of Mines, I.C. 7368; 12 pp., 8x10½-in.; paper, mimeograph; free. Includes fresh and regenerated tungstic acid, a methane-splitting catalyst and a brownoxide catalyst.

Report on the Investigation by Fuels' and Lubricants' Teams at the Wintershall A. G. Luetzkendorf Near Muechln, Germany, U. S. Bureau of Mines; I.C. 7369; 30 pp., 8x10½-in.; paper, mimeograph; free. Schmalfeldt gasification plant, gas purification, Fischer-Tropsch plant, catalyst factory, hydrogenation plant, lubricating oil, diesel oils, engine testing, Mersel manufacture.

Report on the Investigation by Fuels' and Lubricants' Teams at the I. G. Farbenindustrie A. G. Leuna Works, Merseburg, Germany; U. S. Bureau of Mines;

I. C. 7370; 193 pp., 8x10½-in.; paper, mimeograph; free. Gas production, ammonia, methanol and higher-alcohols synthesis, hydrogenation, and several processes with oil as the base.

•

Mine Fatality Rate Dips Slightly in June

Accidents at coal mines in the United States caused the deaths of 69 bituminous miners and 3 anthracite miners in June, 1946, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

For the two industries combined, the June, 1946 fatality rate was 1.33 per million tons, slightly under that of 1.43 for May, 1946, and the same as that for June, 1945, which was later revised to 1.66.

With a production of 50,700,000 net tons, the June, 1946 bituminous fatality rate was 1.36 per million tons, compared with 1.08 in May and a similar preliminary rate of 1.20 in June, 1945, later revised to 1.51.

The anthracite rate in June, 1946, in mining 3,636,000 net tons, was 0.83 per million tons, less than a third of the May rate of 2.74 and that of June, 1945 of 2.48 per million tons, which was later revised to 3.00.

June, 1946 fatalities, by causes and states, and comparable rates for the first six months of 1946 and 1945, were as follows:

U. S. COAL-MINE FATALITIES IN JUNE, 1946, BY CAUSES AND STATES

State	Underground: Falls of roof	Falls of face	Haulage	Explosives	Electricity	Machinery	Other causes	Total Underground	Shaft	Open-cut	Surface	Grand Total
Alabama	3	..	2	..	1	..	..	6	..	..	..	6
Colorado	1	..	..	..	..	1	..	2	..	..	..	2
Illinois	..	1	1	..	..	..	1	3	..	..	..	3
Indiana	..	..	..	..	..	..	..	..	1	..	..	1
Kentucky	10	..	2	..	1	..	1	14	..	..	..	14
North Dakota	..	..	..	..	..	..	..	..	1	..	..	1
Ohio	1	..	..	..	..	1	..	2	..	..	..	2
Pennsylvania (bituminous)	7	..	3	..	..	..	..	10	..	2	2	14
Utah	2	..	..	..	..	..	..	2	..	..	..	2
Virginia	..	..	2	..	..	..	..	2	..	..	..	2
West Virginia	15	..	4	1	..	..	..	20	..	..	..	20
Wyoming	2	..	..	..	..	..	..	2	..	..	..	2
Total bituminous	41	1	14	1	2	2	2	63	2	2	2	69
Pennsylvania (anthracite)	3	..	..	..	..	..	..	3	..	..	..	3
Grand total	44	1	14	1	2	2	2	66	2	2	2	72

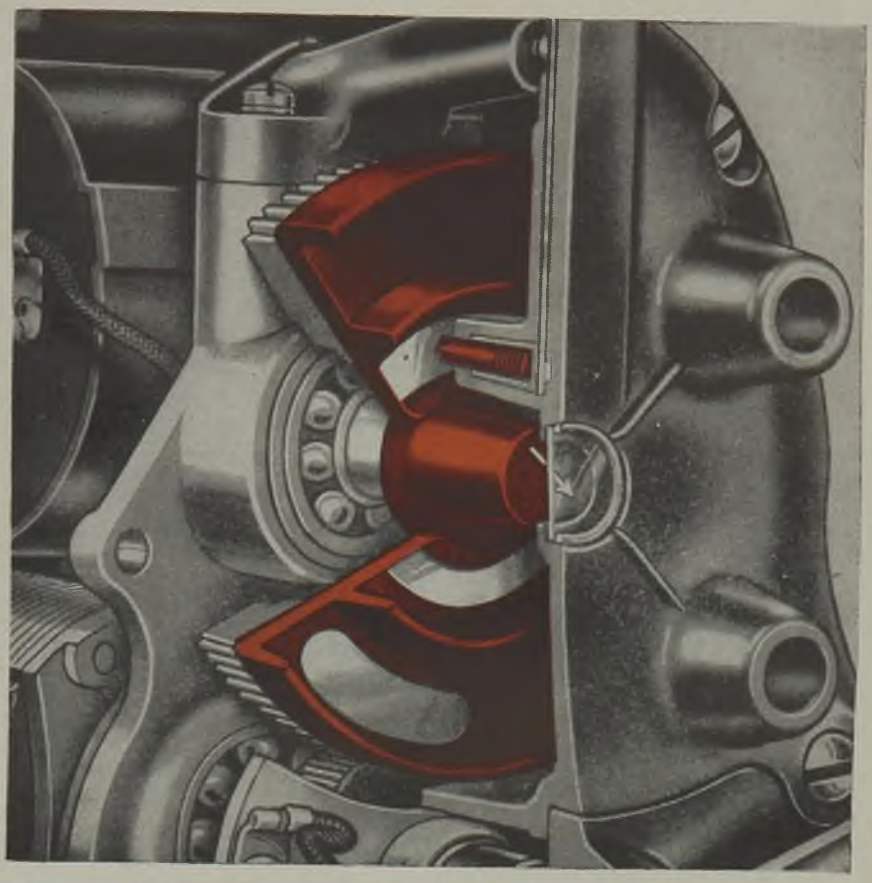
DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS* JANUARY–JUNE 1946 AND 1945

Cause	Bituminous: Number Killed		Killed per Million Tons		Anthracite: Number Killed		Killed per Million Tons		Total: Number Killed		Killed per Million Tons	
	1946	1945	1946	1945	1946	1945	1946	1945	1946	1945	1946	1945
Underground:												
Falls of roof and face	187	216	0.795	0.727	56	29	1.901	1.086	243	245	0.918	0.756
Haulage	66	109	.281	.367	13	15	.441	.561	79	124	.299	.383
Gas or dust explosions:												
Local	....	9	....	.030	....	1	....	.037	....	10	....	.031
Major	27	39	.115	.131	....	....	....	....	27	39	.102	.120
Explosives	4	13	.017	.044	4	4	.136	.150	8	17	.030	.053
Electricity	5	11	.021	.037	2	....	.068	....	7	11	.026	.034
Machinery	9	24	.038	.081	1	2	.034	.075	10	26	.038	.080
Shaft	4	6	.017	.020	1	1	.034	.037	5	7	.019	.022
Miscellaneous	11	6	.047	.020	9	8	.306	.300	20	14	.076	.043
Total underground	313	433	1.331	1.457	86	60	2.920	2.246	399	493	1.508	1.522
Stripping or open-cut	9	15	.038	.050	5	2	.170	.075	14	17	.053	.053
Surface	21	30	.089	.101	5	6	.170	.225	26	36	.098	.111
Grand total	343	478	1.458	1.608	96	68	3.260	2.546	439	546	1.659	1.686

* All figures are subject to revision.

GOOD MAGNETOS

have friendly parts



"HERE'S A MAGNETO that has made a lot of friends for me over the years . . . among people engaged in construction, road building, mining and farming. They've found it more than satisfactory, for one good reason."

•

"IT HAS FRIENDLY PARTS. The American Bosch Magneto keeps on pleasing my customers for that very reason. The generation and distribution of current within the magneto involves a fine balance in the design and choice of materials so that a proper relation of maximum conductivity and minimum wear is maintained. For example, the brush and distributor rotor are friendly to each other. It's the same with all parts. What little wear there is, is even. And that makes for longer life."

"IT'S A GOOD INVESTMENT to standardize on American Bosch Super-Powered Magnetos for all your needs. You get a liberal trade-in allowance. And you can look forward to years of economical service. Best of all, this magneto will make you a friend of mine as it has so many others."

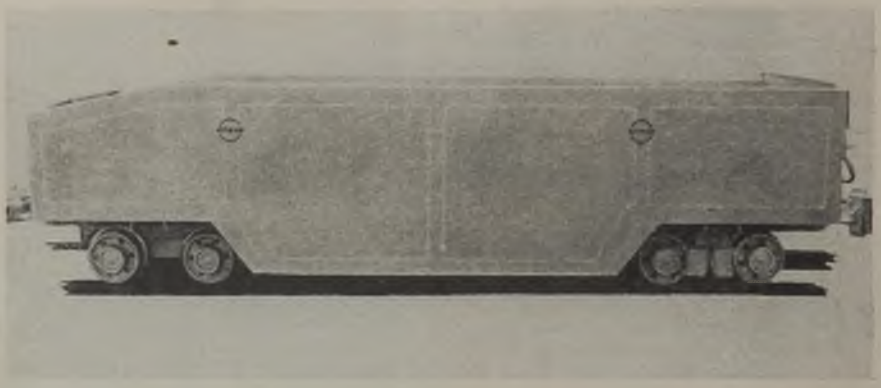
AMERICAN BOSCH CORPORATION, SPRINGFIELD 7, MASS.

AMERICAN BOSCH

Super-Powered Magnetos

Equipment News

Mine Car



An eight-wheel all-welded steel mine car has been announced by the Irwin Foundry & Mine Car Co., Irwin, Pa. The car is of modern welded design, according to the manufacturer, and has only a few bolts in the trucks and body, in order to provide easy access to certain parts. In addition to the elimination of excess weight, the design provides for reduction of tare weight, greater rigidity of body, greater inside area and added strength, it is said.

The combination of double trucks and a larger body have increased capacity of this car and the elimination of pockets and sharp corners is said to allow emptying it quickly and easily. The car measures 6x16 ft. on the inside, is 3 ft. 9⅛ in. high loaded, 3 ft. 10 in. high unloaded, and has a capacity of 8 tons.

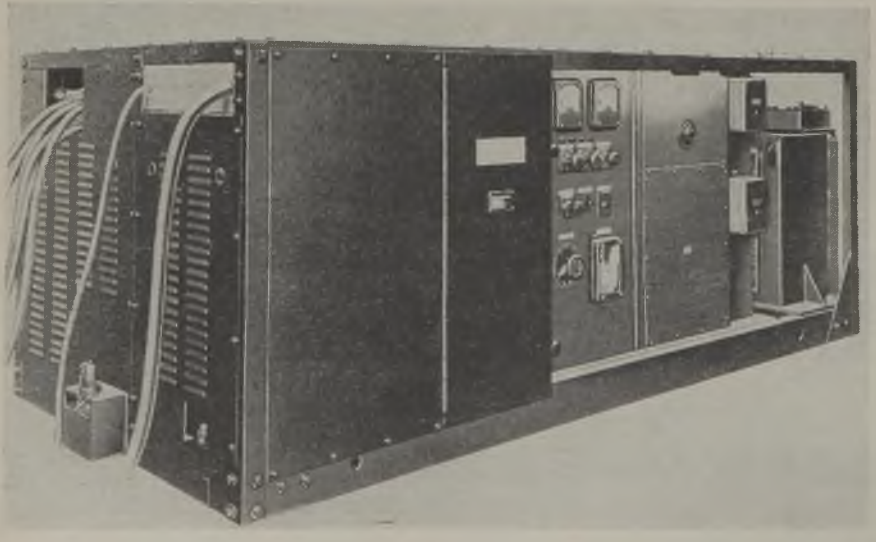
•

Portable Rectifier

The General Electric Co., Schenectady, N. Y., has announced the redesign of its line of portable, sealed-ignitron, mercury-arc rectifiers for mining service. The new equipment is a completely integrated, compact, a.c.-to-d.c. substation, mounted on mine-car-type wheels so that it can easily follow the load center as the working face moves away from the portal. Consisting of an a.c.-switchgear car, transformer car, and rectifier car, it is only 48 in. high.

The new design, available in ratings from 75 to 750 kw., gives added protection against mine dust and dirt, and increased safety for personnel, according to the manufacturer. All live parts are located behind a dead front, and newly designed swinging doors and removable barriers make all parts readily accessible.

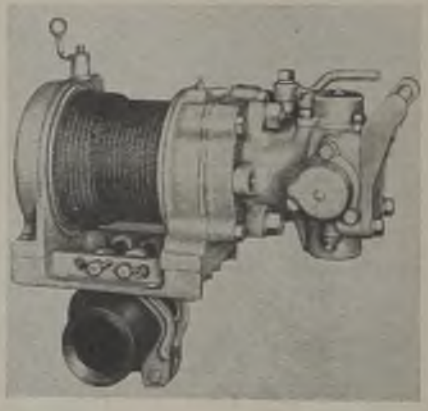
The rectifier car contains the necessary sealed ignitrons, static magnetic firing circuit, d.c. automatic-reclosing switchgear equipment, rectifier d.c.-voltage regulator, and water-to-air heat exchanger. The rectifier-transformer, which is insulated with Pyranol, is mounted on wheels and contains a built-in interphase transformer and a surge absorber that affords protection against switching surges. The a.c.-switchgear car contains the incoming line a.c. magne-blast circuit breaker, the a.c. automatic-reclosing device, Pyranol-filled control power transformer, and necessary protective devices. Bulletin GEA 4047A is available from the manufacturer.



•

Winch

The Sullivan Division of the Joy Mfg. Co., Michigan City, Ind., has announced a new, small, lightweight, air-powered hoist, the AW-80 Air-Winch, capable of lifting 500 lb. yet weighing only 85 lb. It has a rope capacity of 150 ft. of ¼-in. rope, is 18 in. long, 9½ in. high and 11 in. wide. The Air-Winch is powered by an extremely simple, four-cylinder, reversible piston-type air motor and can be used in many different ways about the average mine. Light enough for one man to move quickly from place to place, this winch



can be mounted in any position on a car, timber, column or bar, according to the manufacturer. The control is positive yet sensitive and timbers can be lifted exactly into place. A conveniently operated brake lever holds the load firmly and prevents drum from spinning.

The unit can be used to hoist and lower machines and materials, dragging blocks and scrapers, hauling slushers into place, lifting and dragging timbers, pulling large jumbos or mine cars and moving large boulders, it is said. Bulletin No. 76-H may be secured from the manufacturer.

•

Pump

Allen-Sherman-Hoff Co., 231 South 15th St., Philadelphia 2, Pa., has announced recent improvements in the Hydroseal abrasive-materials handline pump. Heavy-duty, anti-friction radial

Precisionbilt LIKE A GIANT REFLECTING TELESCOPE

J&L WIRE ROPE

PERMASET PRE-FORMED

A giant reflecting telescope is built with precision. J&L Permaset Pre-formed Wire Rope is also Precisionbilt by men of experience and skill using the finest materials.

J&L Wire Rope is made of J&L Controlled Quality steel. Our engineers will be glad to discuss your requirements with you. Write for further information.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

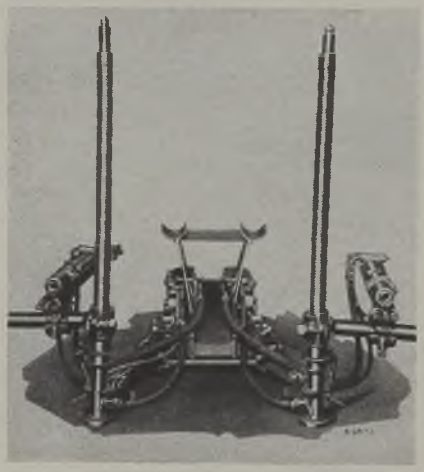
and thrust bearings are now standard and are interchangeable. A new, improved means for easy, two-way axial adjustment of the shaft and bearing assembly is provided, it is said.

Another new feature is the new pump shell. There is no rigid mounting of pump shell or engine side bell to the pump base and both are now supported from the bearing housing. This permits pump discharge to be placed at any of the three positions, according to the manufacturer, and in many cases, this will simplify installation of discharge piping. It also eliminates "special pump" construction to obtain this result.

•

Air-Drill Mounting

Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. has announced a new air-operated drill-jumbo mounting said to make for easier, safer work and faster set-ups than are accomplished by hand methods. Installed permanently on a



mine car, the resulting unit does the work, not only of setting up but of transporting the drifters, drill steel, hose and accessories to the heading. Physical effort and strain are done away with and the savings in setting-up time allow for more drilling time per shift, the company states.

On arrival at the face, the miners have only to swing the air columns into a vertical position, the footpiece hinges being designed to make full use of the force of gravity to aid the operation. Pressure of the air pushes the column pistons firmly against the roof. No blocking is needed and the drills are ready to operate. Practically no effort is required to move the arms and drifters up or down the column with the hand cranks provided, it is said. The entire unit is rigid since a force of 600 lb. holds the column and car solidly in place, and roof jacks are thus eliminated. A new bulletin containing a full description is available from the manufacturer.

•

Car Puller

Silent Hoist & Crane Co., Brooklyn 20, N. Y., offer a new model electric-capstan car puller in which the gearing is integral with motor. The unit is said to be compact, totally enclosed, making the unit dirtproof, waterproof, and ideal

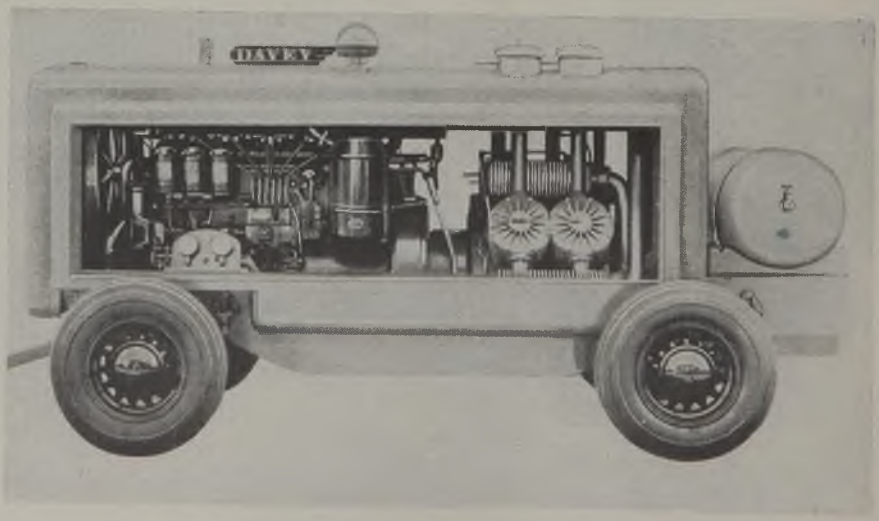
for out-of-door use in all sorts of weather. The enclosed worm-gear reduction runs in a continual bath of oil.

The new "Silent Hoist" Electric Capstan Car Puller is available in two sizes, a 7½-hp. unit with a capacity of 5,000-lb. draw-bar pull, and a 15-hp. unit with 10,000-lb. draw-bar pulling capacity. Stock units are available for 220/440 volts, three phase, 60 cycles, and also for d.c. service on application.

•

Compressor

Production of the first model in the 1947 Davey line has been announced by



Take a WALWORTH No. 225P Bronze Valve Apart...

COMPARE IT PIECE BY PIECE

It will pay you to look inside the Walworth No. 225P. Compare the improved design, construction and convenience features shown in the "exploded" view. Notice the husky bronze body, the removable seat and disc, the oversize stem, all assuring maximum protection against wear and leakage.

Further, No. 225P is the TOUGHEST bronze valve your money can buy. The stainless steel, noncorrosive seats and discs are heat treated to a hardness of 500 Brinell — hard enough to scratch glass and crush nails. For this reason, the valve can be closed on sand, slag, scale and similar flotage without injury to the seating surfaces, and "wire drawing" is practically eliminated. Thus years of tight, positive shut-off are assured.

Available in both globe and angle types (angle type: No. 227P) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. W.S.P. at 550 F, and 1000 lbs. non-shock service on cold water, oil, gas or air.

For full data on this long-life, economical Walworth Bronze Valve, see your local Walworth distributor, or write for Circular 82.

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

the Davey Compressor Co., Kent, Ohio. Known as the Model 315-W (gas) and 315 WD (diesel), the new machine produces 315 cu. ft. of free air per minute at 100-lb. pressure. It is available in standard-skid, steel-wheel-trailer, and pneumatic-tired-trailer mounting styles, and flanged-wheel types for railroad work. On trailers, spring-mounting is included without extra cost.

The compressor unit represents a radically new departure in Davey design, according to the manufacturer. It consists of two banks of three cylinders, each bank being arranged in W form. This construction, together with a short 4-in. piston stroke, reduces compressor vibration to an absolute minimum, it is said, and results in a cooler-operating, more efficient machine. The W design also permits of substantial reductions in dimensions and weight. Gasoline-driven units have an over-all length of 140 in. while diesel machines are 12 in. longer. Height is 72 in. and width 65 in. for both gas and diesel machines. Gas units weigh 7,400 lb. and the diesel weight is 7,800 lb.

•

Spiral Tubing

Ready-made, inexpensive concrete forms and mine-ventilating shafts are revealed among the possible applications of the new spiral tubing made by Pratt Industries, Inc., Frankfort, New York. Advantages of the new product are light weight, extreme rigidity and low cost, according to the manufacturer. On concrete-form work the tubing is so cheap that it may be left on finished pillars, piers, and posts. Its lightness is emphasized in drainage uses where the tubing is already in extensive use. One man can carry 60 ft. in 20-ft. lengths, and can lay several thousand feet a day.

The tubing is spirally formed from metal strip (steel or non-ferrous) with edges joined in a continuous four-ply lock-seam. Tests show that seams hold at a pull of 2135 lbs. (the limit of the testing equipment used), it is stated. The spiral "backbone" also is the secret of the tubing's rigidity, demonstrated in tests where a 2-ft. section of tubing, stood on end, supported over a ton without distortion.

Dipper

To meet demands for a dipper with optimum durability and over-all weight, the American Manganese Steel Division of the American Brake Shoe Co., Chicago Heights, Ill., has introduced the Amsco All-Manganese Steel-Welded-Type dipper.

Use of manganese steel as the sole material of construction in these dippers, except for small, complementary parts, provides

maximum resistance to fracture and wear, according to the manufacturer. Overlapping, rabbeted joints leave grooves for a welded bead. The parts are fitted together with round plugs, around which weld metal is deposited. Consequently the body of this all-manganese steel dipper is as strong and homogeneous as if made in one piece, it is said. At the same time, it is possible to remove a worn front and reweld in place a new one without destroying the back. This new dipper is made in capacities of ¾ cu. yd. and up. Sizes ¾ to 2 cu. yd. are made in two body pieces, front and back. Sizes over 2 cu. yd. are made in four pieces; front, back and two side plates.

•

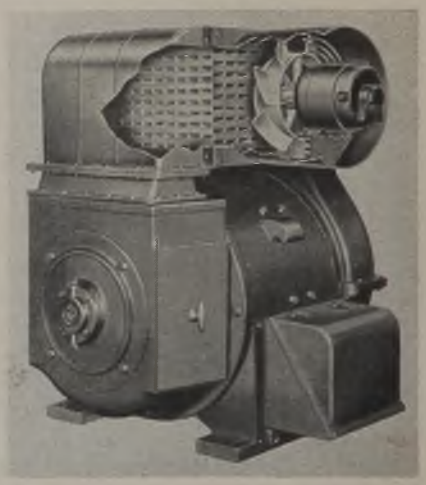
Dump Trailer

A new dump trailer, with 19-cu. yd. capacity, has been announced by the Fruehauf Trailer Co., Detroit. The new trailer is especially designed for coal delivery, but can be used equally well for hauling sand, gravel and other materials. Body dimensions are 18 ft.x7 ft. 5 in.x47½ ft. Also available are models with 8½- and 15½-cu. yd. capacity.

D.C. Motors

A new line of unit-cooled, totally inclosed d.c. motors, available in 15- to 200-hp. sizes, especially designed for operation in severe atmospheric conditions such as prevail in coal and coke plants, has been announced by the General Electric Co., Schenectady, N. Y.

A unique feature of the new motor, according to the manufacturer, is the dual ventilating system, which utilizes a compact unit cooler operating on a principle similar to that of an automobile radiator and which achieves a totally inclosed construction without external duct work, piping, air filters or pressurized air supply.



A thermostatic relay located in the airstream of the inclosed system protects the main motor in case of failure of the auxiliary-motor power supply or accidental restriction of the air intake. Installation of the unit-cooled motor is as simple as the conventional open d.c. motor, since the unit cooler is completely assembled and mounted on the main motor at the factory, the manufacturer states. Maintenance is reduced by the inclosed construction of the motor, which protects vulnerable current-carrying parts from injurious air-borne materials. Vital parts of the motor are readily accessible for periodic maintenance and inspection. The new motors can be furnished with either ball- or sleeve-type bearings. Constant-speed motors in the new line are available with shunt, stabilized-shunt or compound windings. Adjustable speed ratings are shunt or stabilized-shunt wound. Bulletin GEA 4469 may be obtained from the manufacturer.

Drill Bits

Details of its new tungsten-carbide-dipped bits for strip-mine and underground drilling has been released by Bacharach-Strauss, First Ave. & Ferry St., Pittsburgh 22, Pa. The "baC" drill-bit for horizontal and vertical drilling in strip mines has interchangeable and replaceable cutters, meaning a large saving. The design of the bit is such that holes are started easily, drilled rapidly and with reduced vibration and wear on the machine, according to the manufacturer. The bit is

furnished with hexagon, square or splined shanks and is available in 3½, 4, 5⅜, 6½, 7½ and 8½-in. diameters.

The "bAc" drill bit for coal and rock drilling has two new features, it is said. Its spiral flanges act as extensions of the auger flights and carry the cuttings back into the auger as soon as they are developed, preventing cuttings from jamming around the bit. Also, there are no non-cutting elements of the bit in contact with the sides of the hole, which reduces the frictional contact and allows the bit to drill much easier. The bits are made in various sizes from 1¾ to 3½ in.

•

Hydraulic Bulldozer

A new, small hydraulic bulldozer that possesses all the engineering features of large-type "dozers" has been announced by the industrial division of the Oliver Corp., Cleveland. Named the "Imp," this new dozer is entirely front-mounted, leaving the rear of the tractor free for

installation of other equipment, and according to the manufacturer, it is simple to install and is easily transported from job to job. Lifting, lowering, floating and hold positions are all hydraulically controlled from a single lever.

Combined with an Oliver Cletrac, Model HG-42, which has a gage of 42 in. from center to center of tracks and develops 18 draw-bar hp., the Imp dozer is an ideal unit for contractors and jobbers on work that formerly required hand labor or larger, more expensive tractor-bulldozers, it is said. The light weight and positive traction of the unit are said to enable it to operate effectively on soft terrain, and its completeness enables the unit to get into places where this type of equipment has been unable to function heretofore.

In this Vulcan heavy duty mine hoist the gears that transmit 600 HP from drive motor to hoist are of the Farrel-Sykes continuous tooth herringbone design—the famous *Gear with a Backbone.*

Because there is no center groove, the entire face width is put to work. The *backbone* formed by the continuous teeth gives mine hoist gears that extra margin of strength and load-carrying capacity which assures continuous dependability, an important factor where human safety is concerned.

Because they are precision generated by the Farrel-Sykes process, these gears are exceptionally quiet and smooth-running, even at high speeds, and in either direction of rotation. In hoists equipped with Farrel-Sykes gears, power transmission is equally smooth and efficient UP or DOWN.

There are other factors which contribute to efficient operation and long gear life. For further information send for descriptive bulletin.

The 600 HP mine hoist shown above, designed and built by Vulcan Iron Works, Wilkes-Barre, Pa., is equipped with Farrel-Sykes continuous tooth gears.

FARREL-BIRMINGHAM COMPANY, INC.
344 Vulcan St. Buffalo, N. Y.

Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston, Charlotte

FARREL
The Gear with a Backbone

Farrel-Birmingham

Arc Welder

The Hobart Bros. Co., Troy, Ohio, has announced as the newest addition to its Multi-Range welder line a diesel-engine-driven arc welder of 300-amp. capacity, especially made for use where electric power is not available and a minimum operating cost is desired. Powered by a two-cylinder, unit-injection diesel engine that features oil cooling, displacement blower, fuel filtration and easy starting,

this 300-amp. welder will cut fuel cost considerably, according to the manufacturer. The engine has a 4½-in. bore and a 5-in. stroke, and is rated 47 h.p. at 1450 r.p.m.

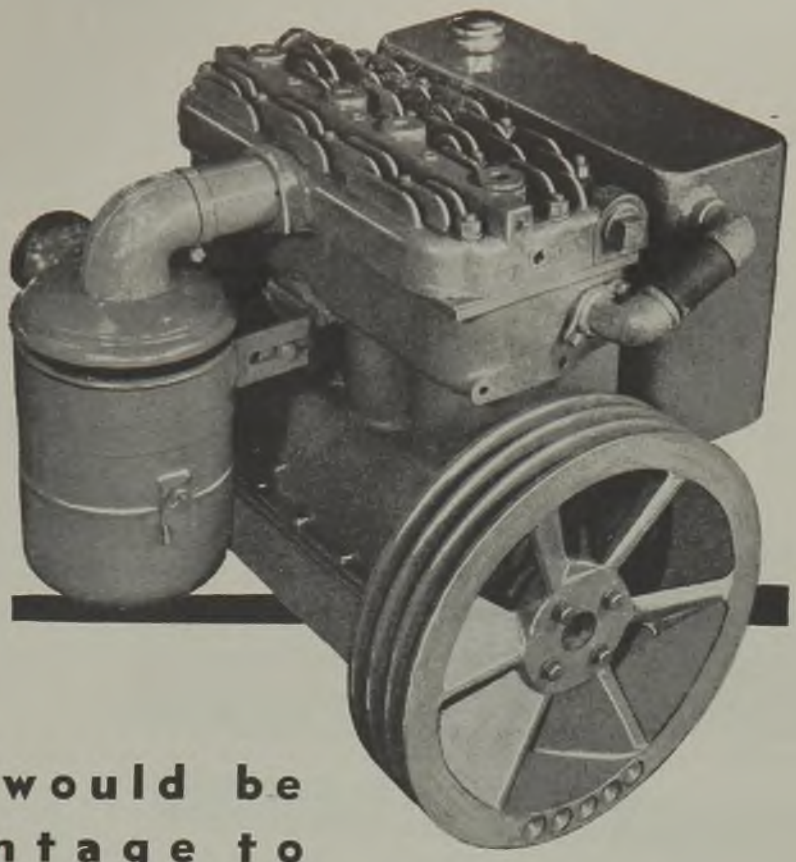
The unit is equipped with the patented Multi-Range Dual Control and exclusive remote control and, it is said, the operator can make fine volt-ampere adjustments right at the work, eliminating unnecessary steps from work to machine and back. Its 1,000 combinations of voltage and amperage permits the operator to select the right arc intensity to suit any job. Other features include separate excitation and two-way ventilation, for a smoother, more productive arc at all current values. The welding generator has a rating of 300 amp. at 40 v. Current range for welding duty is from 20 to 40 v., 60 to 375 amp. It is a single-operator variable-voltage type, with four laminated main poles and four interpoles (commutating poles). Pole pieces are removable. This unit also has an oversize, 4-pole exciter built in on the main shaft that insures quick arc recovery and build up, and eliminates accidental polarity reversal, it is said.

•

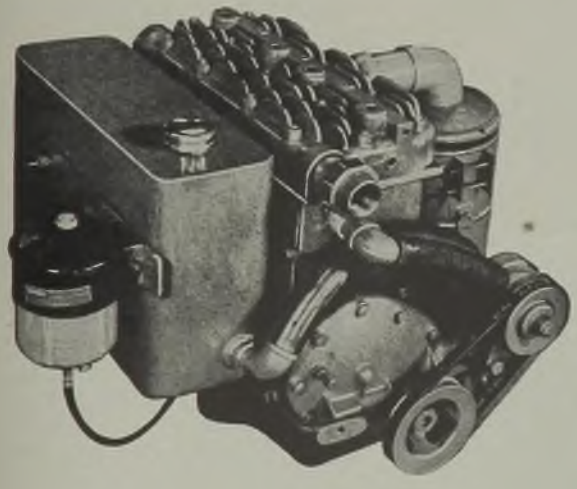
Hydraulic Jack

A new series of Hy-Power hydraulic jacks, available in 3- to 50-ton capacities for all-purpose applications in mines, has been announced by the Duff-Norton Mfg. Co., Pittsburgh 30, Pa. All 3- to 12-ton models are equipped with extension screws that can be quickly hand-raised to load height. Lifting starts with the first stroke of the lever bar, according to the manufacturer. The 20- to 50-ton models have fast-working dual pumps. Speed pump raises head to load position, and the switchover to power pump is automatic without missing a lever stroke. Pumps are positioned on bases so that maximum raise can be obtained with

"IF YOU PAID DOUBLE ITS PRESENT PRICE—



—it still would be an advantage to buy CANTRELLS"



The illustrations above show both end and side views of the Cantrell compressor assembly used in each of the five Cantrell Compressor outfits designed for every coal mine requirement.

It is important that coal mine officials know about Cantrell Air Compressors, not only because of their dependability but because of their low maintenance costs.

In air compressor service it's the compressor itself that takes the "punching". So, to assure you minimum maintenance cost Cantrell offers you a factory rebuilt compressor exchange plan, permitting replacement of compressor unit at small cost—about $7.00 monthly, even if you had to change your unit annually.

This exchange plan applies to any Cantrell outfit, whether it be the self-training or standard track type or rubber tired wheel type outfits.

Cantrell COMPRESSORS

IMPERIAL-CANTRELL MFG., CO. JELLICO, TENN.

minimum effort. Horizontal operations are facilitated by pump-guard plates that provide adequate working bases and a safety bypass prevents the ram from being pumped beyond the safe limit of raise, it is said. A descriptive folder is available from the manufacturer.

•

Fan

A newly designed corrosion-resistant fan of monel metal for damp or corrosive vapors, or of cold-rolled steel for ordinary exhaust ventilation and cooling, is now

available from the Moore Co., 544 Westport Rd., Kansas City 2, Mo. Made in 3 to 5-ft. diameters with features said to give increased efficiency, the fan is of the axial-flow ventilating type. A special high-slip, slow-speed, direct-drive motor equipped with permanently greased-and sealed ball bearings makes it possible to mount the fan in any position, the company states.

•

Industrial Notes

CARDOX CORP., Chicago, has elected John H. Bell president and Fred O. See vice president. Mr. Bell was formerly executive vice president of the corporation and Mr. See was the former sales manager of the company's mining division.

DELAVAL STEAM TURBINE CO., Trenton, N. J., has appointed A. D. Andriola chief research engineer to head its recently announced engineering-research program. Mr. Andriola, who since 1941 was assistant to the vice president in charge of engineering of the Cramp Shipbuilding Co. of Philadelphia, will work directly with C. R. Waller, vice president in charge of DeLaval engineering.

ROOTS-CONNERSVILLE BLOWER CORP., Connersville, Ind., has elected Ralph R. Newquist vice president in charge of sales.

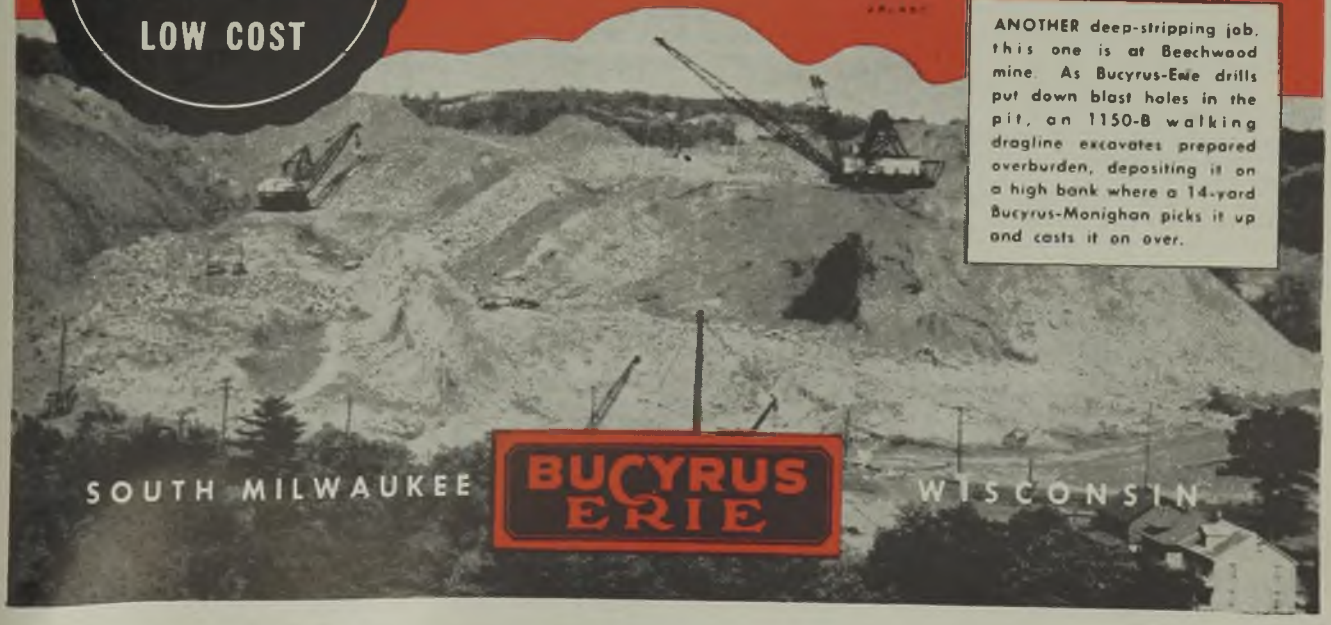
ROME CABLE CORP., Rome, N. Y., has appointed Robert C. Graham chief product engineer. Mr. Graham has been con

A 'PROHIBITIVE' JOB MEETS ITS EQUAL . .

AT BEAR VALLEY mine on 1150-B strips deep overburden to uncover anthracite.

STRIPPING problems such as those encountered by the Bucyrus-Erie 1150-B walking draglines in the anthracite coal fields were considered insurmountable only a few years ago. Today the 1150-B's take the job in stride, removing the deep overburden at costs sufficiently low to permit economical recovery. With 180-foot booms and 25-yard buckets, these big walking draglines are more than equal to the job — a fact which reduces to simplest terms the many reasons why Bucyrus-Eries continue to be "years ahead."

FOR *Sustained* HIGH PRODUCTION AT LOW COST



ANOTHER deep-stripping job, this one is at Beechwood mine. As Bucyrus-Erie drills put down blast holes in the pit, an 1150-B walking dragline excavates prepared overburden, depositing it on a high bank where a 14-yard Bucyrus-Monighan picks it up and casts it on over.

SOUTH MILWAUKEE BUCYRUS ERIE WISCONSIN

nected with the wire and cable industry for the past 16 years.

TIMKEN ROLLER BEARING Co., Canton, Ohio has appointed R. E. Wagenhals, formerly quality control engineer, director of quality control for all bearing divisions of the company. The steel and tube division of the Timken Roller Bearing Co. has announced the appointment of three district sales engineers: Sherman R. Lyle, for Cleveland; William Earle Bryden, for Chicago; and Alfred J. Kinnucan, for New York.

AMERICAN CAR & FOUNDRY Co., New York, has appointed R. S. Slater, formerly sales agent in New York, manager of tank-car sales.

AHLBERG BEARING Co., Chicago, has named Herbert C. Petzing, with the company for 25 years, manager of its Cleveland branch office.

JOHN A. ROEBLING'S SONS Co., Trenton, N. J., has promoted Forest S. Burtch to manager of sales, wire rope division, and William Hobbs Jr., to manager of sales, aircord division. Mr. Burtch, formerly manager of sales for the aircord division, succeeds Earl N. Graf, recently resigned.

CARNEGIE-ILLINOIS STEEL CORP. has elected Charles R. Cox, formerly president, National Tube Co., president succeeding J. Lester Perry, who has become assistant to president, United States Steel Corp. of Delaware.

NATIONAL TUBE Co. has elected John E. Goble president, succeeding Charles R. Cox, who has become president of Carnegie-Illinois Steel Corp., another U. S. Steel subsidiary. Serving as vice president in charge of sales, National Tube Co., since 1936, Mr. Goble has been with U. S. Steel and companies now affiliated with U. S. Steel for the last 21 years. William F. McConnor, general manager of sales of National Tube Co. since 1936, has been named vice president in charge of sales, succeeding Mr. Goble.

UNITED STATES STEEL CORP. OF DELAWARE has elected Arthur C. Wilby vice president. Mr. Wilby, who has been associated with United States Steel since 1909, will maintain his headquarters in Chicago.

UNITED STATES STEEL SUPPLY Co. has named Marcus J. Aurelius sales vice president, succeeding Leslie B. Worthington, who advanced to the presidency of the company on July 15, upon the retirement of Ernest E. Aldous.

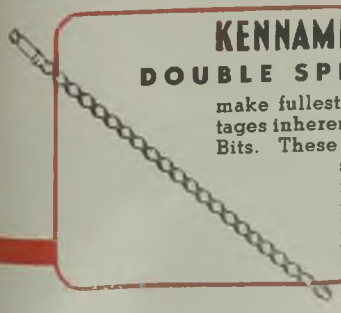
AMERICAN WELL WORKS, Aurora, Ill. has announced the purchase of the Atlas Foundry located at 2300-24 Bloomingdale Rd., Chicago. The present management and organization has been retained and will operate the plant as a wholly owned division of the American Well Works. Alvin Haas, formerly general manager of the Yates American Machinery Corp., has been named vice president and general manager of the American Well Works.

HOWE SCALE Co., Rutland, Vt., has named J. G. McCarty, service engineer in Pittsburgh since 1941, as Pittsburgh

THE Kennametal Bits shown drilled the footages noted *before being resharpened.* Many of them still do not need regrinding. All can be reground many times. Thus, total footage ultimately drilled with each bit is a score or more times the figure given. In fact, service results show that a single Kennametal Bit has drilled more than 30,000 feet of hole in coal—*equivalent to approximately 9,000 holes, forty inches deep.*

Kennametal Bits are entirely unlike any other drill head available. The brazed-in cutting tips are tough, hard Kennametal; the body is a *one-piece* alloy steel drop forging, heat-treated; the design is such that gage is continuously maintained. There are no wedges or screws to come loose and delay operations; no need to over-drill to compensate for bit wear; no danger of blow-outs due to hole taper.

Kennametal Drill Bits keep skilled men on the job drilling holes instead of changing bits; permit effective drilling in roof and floor shale; lessen wear and tear on drilling machines; reduce power consumption—actually have demonstrated that they may save up to 50% of drilling costs. *Want more information?* Write, giving details of your operations.



KENNAMETAL

DOUBLE SPIRAL AUGERS

make fullest utilization of advantages inherent in Kennametal Drill Bits. These augers are double-spiral, solid-center rolled shapes, made of forged alloy steel, heat-treated. Write for particulars.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

REG. U. S. PAT. OFF.

KENNAMETAL Inc., LATROBE, PA.

branch manager, succeeding H. J. Steidley.

American Cyanamid Co., New York, has announced that the business of the American Cyanamid & Chemical Corp., a subsidiary, will be consolidated with that of the parent company, American Cyanamid Co., and operated as the industrial chemicals division.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named R. W. Gillmore, with the company's Indianapolis office since 1935, manager of a new branch office opened in the Claremount Hotel Bldg., Evansville, Ind.

Hewitt Rubber Division of Hewitt-Robins, Inc., Buffalo, has announced the moving of its Philadelphia district office and warehouse to 401 North Broad St. The new location is under the supervision of C. F. Holden and Jack T. Sheldon.

Reliance Electric & Engineering Co., Cleveland, has announced additional sales offices and expansion of its present field sales force, in a move to provide wider coverage of all major industries. George E. Law will head a new branch office in Appleton, Wis. M. J. Sandling will head a new office in Grand Rapids and will be assisted by W. F. Cliff, electrical application engineer. William K. Schlotterbeck, another Reliance veteran to receive his discharge recently, rejoins the Philadelphia office as sales engineer. E. H. Koontz, sales engineer, is now with the company's New York office. Other sales engineers recently assigned to field sales offices are: R. L. Custis to New York; D. M. Larson to Minneapolis; A. C. Perrin to Chicago; and Albert Mann to Detroit.

Davey Compressor Co., Kent, Ohio, has appointed Wabash Equipment & Supply Co., 54 Monument Circle, Indianapolis, as distributor for all items of Davey manufacture. The company also has named Brown & Hubert, Inc., Evansville, Ind., as distributor of Davey products.

Four Wheel Drive Auto Co., Clintonville, Wis., has appointed R. A. Young & Son, Fort Smith, Ark., FWD truck distributor for Arkansas and 17 counties in Oklahoma. Appointment of the Flesch-Miller Tractor Co., Indianapolis, as FWD distributor in southern Indiana, also has been announced.

Chain Belt Co., Milwaukee, has announced the increase of their plant capacity through the purchase of a heavy ordnance plant constructed for the Defense Plant Corp. in West Milwaukee. The new facilities increase the area of Chain Belt plants to over 20 acres.

United States Rubber Co. has purchased a government-built plant in Fort Wayne, Ind., for the production of industrial rubber products at a purchase price of $2,100,000. The plant, built in 1941 by the RFC for the Studebaker Aviation Corp., was used during the war for the manufacture of aircraft engine gears. The plant will employ about 800 people at first, increasing to 1200 in six months, and further increases are expected when full production is attained. The plant will specialize in the manufacture of automo-

Partners in Protection

EDISON ELECTRIC CAP LAMPS

M.S.A. COMFO CAPS

Under all work conditions in the mine, the combination of more effective light provided by the Edison Electric Cap Lamp and better head protection furnished by M.S.A. Comfo Caps assures greater safety for the miner . . . aids higher productivity . . . increases comfort, too! Let us give you the detailed reasons; write for descriptive bulletins, and ask for a practical demonstration.

MINE SAFETY APPLIANCES COMPANY
BRADDOCK, THOMAS AND MEADE STREETS . . . . . PITTSBURGH 8, PA.

District Representatives in Principal Cities

In Canada

MINE SAFETY APPLIANCES COMPANY OF CANADA, LIMITED
Toronto . . . Montreal . . . Calgary . . . Winnipeg . . . Vancouver . . . New Glasgow, N. S.

SOUTH AMERICAN HEADQUARTERS
Casilla 773, Lima, Agents in Principal Cities

MINE SAFETY APPLIANCES CO. (S.A.) (PTY) LTD.
Johannesburg, South Africa N'Dola—Northern Rhodesia

bile rubber parts other than tires and tubes.

WYANDOTTE CHEMICALS CORP., Detroit, has announced additions and enlargements to its present plants within the next eighteen months reported to total $25,000,000. The improvements will make Wyandotte, already one of the world's largest manufacturers of industrial inorganic chemicals, an important factor in the organic field and will markedly advance metropolitan Detroit as a world chemical center, according to the announcement by E. M. Ford, president of the company.

MACK MFG. CO., New York, has named Dwight R. Collins personnel director.

•

Trade Literature

ELECTRICAL EQUIPMENT — Allis-Chalmers Mfg. Co., Milwaukee, Wis. Handbook B6452 describes eight classifications of electrical equipment ranging from a.c. and d.c. motors of ½ to 50,000 hp. to electronic heaters. The company's complete line of low- and high-voltage transformers, motor controls, switchboards, switchgear and circuit breakers, equipment for power generation, centrifugal pumps, welding equipment and accessories and water conditioning chemicals and equipment is included.

SCREENS—Robins Conveyors Inc., division of Hewitt-Robins Inc., Passaic, N. J. Bulletin No. 111-A describes and illustrates the Robins Eliptex Screen, which is said to employ a unique elliptical motion with three separate components: a horizontal component which moves the material across the deck quickly, giving high capacity; a vertical component which makes the material separate into sizes and "keep moving"; and an elliptical component which gives sharpest possible sizing. The screen can be installed horizontally to save headroom.

EARTHMOVERS—R. G. LeTourneau Inc., Peoria, Ill. Folder No. G-1073 contains actual job records to acquaint equipment owners and operators with the many possible applications of Tournapulls to earthmoving and construction work and includes experiences of eight major contractors on 25 completed projects assembled for study and comparison.

RUBBER HOSE & JOINTS—B. F. Goodrich Co., Akron, Ohio. Catalog section describes its suction hose for sand and gravel service, as well as the Armorite dredge sleeves for flexible connections on discharge pipe lines. A catalog section on its Flexseal hose joint, which brings rubber-to-rubber contact between hose lengths, also has been issued. The Flexseal joint is described as particularly advantageous for suction and discharge hose handling abrasive materials, acids or other corrosive liquids.

FIRE PROTECTION—B. F. Goodrich Co., Akron, Ohio. Catalog section on fire hose

describes the method of construction and manufacture and lists all brands of fire hose for this purpose made by the company, including tables on sizes, and weights. Another catalog section describes the company's carbon-dioxide fire extinguisher, which weighs only 15 lb.

WIRE ROPE—Union Wire Corp., 2130 Manchester Ave., Kansas City 3, Mo. First of a series of informative booklets on wire rope, entitled "Correct Handling of Wire Rope," serves as a ready reference manual in the office, plant and field wherever wire rope is used.

SCREENS — McNally Pittsburg Mfg. Corp., Pittsburg, Kan. Bulletin 70, a new edition of the "Morrow Handbook of Perforated Metal Screens," contains illustrations, data tables, specifications and standard-practice information on three types of perforated plate screens—flat, step, conical and cylindrical.

BRATTICE CLOTH—American Brattice Cloth Co., Warsaw, Ind. Bulletin 646 contains actual samples of three grades of A.B.C. jute brattice cloth with an explanation of the company's exclusive flameproofing processes.

VENTILATION PIPE—American Brattice Cloth Co., Warsaw, Ind. Bulletin No. 846 includes samples of Mine Vent flexible ventilation pipe and describes the manufacturing processes of this ducting or tubing for mine ventilation.

PUMPS—Economy Pumps, Inc., Hamilton, Ohio. Bulletin D-246 describes the line of SCV pumps, said to be a medium priced, compact, efficient and quiet-operating unit for a wide variety of purposes.

BALL BEARINGS—New Departure Division, General Motors Corp., Bristol, Conn. Third book in the series of technical treatises on ball bearings for designers and engineers, published under the generic title of Engineering Service, Part III, covers inclosure and lubrication for all operating conditions. Parts I and II of the study deal with principal bearing types and fundamentals of mounting practice and describe details of shaft and housing design.

VIBRATION INSULATION—B. F. Goodrich Co., Akron, Ohio. Booklet on its line of Vibro-Insulators, devices of rubber and metal to cushion industrial equipment and reduce vibration and noise, includes descriptions of three new Vibro-Insulators. Types 130, 133 and 144, recommended for use as feet or bumpers on office equipment, portable machinery, tables, blowers, fans, pumps, etc.

DRILL BITS & AUGERS—Kennametal Inc., Latrobe, Pa. Catalog of mining tools describes and illustrates with full specifications snap-button augers, plug drill bits, core drill bits, additional sizes in two- and three-way rotary drill bits, and an expanded line of undercutter drill bits.

ELECTRIC MOTORS—Louis Allis Co., Milwaukee 7, Wis. Bulletin No. 720 covers Type OG (protected type) standard squirrel-cage induction motor. Full details of construction, features and typical applications are included.

FLANGE JACKS—T. J. Persson Co., 224 Glenwood Ave., Bloomfield, N. J. Catalog sheet illustrates flange jacks for flanges up to 20 in.

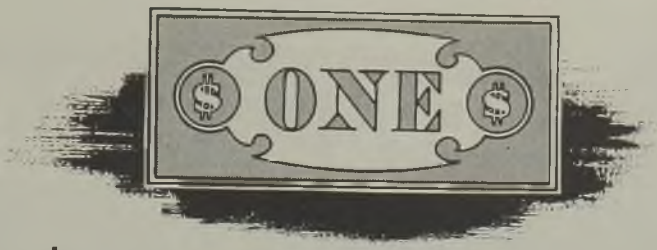
ELECTRIC LOCOMOTIVES — Goodman Mfg. Co., Halsted St. at 48th., Chicago 9, Ill. Booklet illustrates the company's full line of trolley, battery and combination-type locomotives for mining, with full details of rating, dimensions, weight, construction and features.

ELECTRIC HOISTS—Vulcan Iron Works, Wilkes-Barre, Pa. Booklet covers the construction, design and performance, with complete specification and size information, of the company's line of self-contained electric hoists, including room, scraper and car-spotting hoists.

LUBRICATION—Sun Oil Co., Philadelphia 3, Pa.—Folder describes the performance of Suntac oils.

FLOOR COVERING—American Abrasive Metals Co., Irvington 11, N. J. Folder details various anti-slip products for covering floors and stairways.

Accidents Cost Employers $4...



FOR EVERY $1 THE INSURANCE CO. PAYS OUT!

The cost of an accident always exceeds the compensation payments. Studies show that it costs an employer approximately $4 for every $1 paid out by the insurance company.

True, the $4 is mostly "hidden costs." Every time an accident occurs, interference with production and loss of time is inevitable. Time spent in giving first aid and medical treatment . . . time lost investigating an accident . . . time required for breaking in new workers . . . general slowdown in production due to weakened morale . . . all these accident effects determine the final cost of an accident to an employer.

BITUMINOUS SAFETY ENGINEERING SERVICE SAVES

Prevention of accidents means "hidden costs" can be minimized. Constantly developing its methods for nearly thirty years, Bituminous Safety Engineering has come to mean *safety and saving* throughout the coal industry.

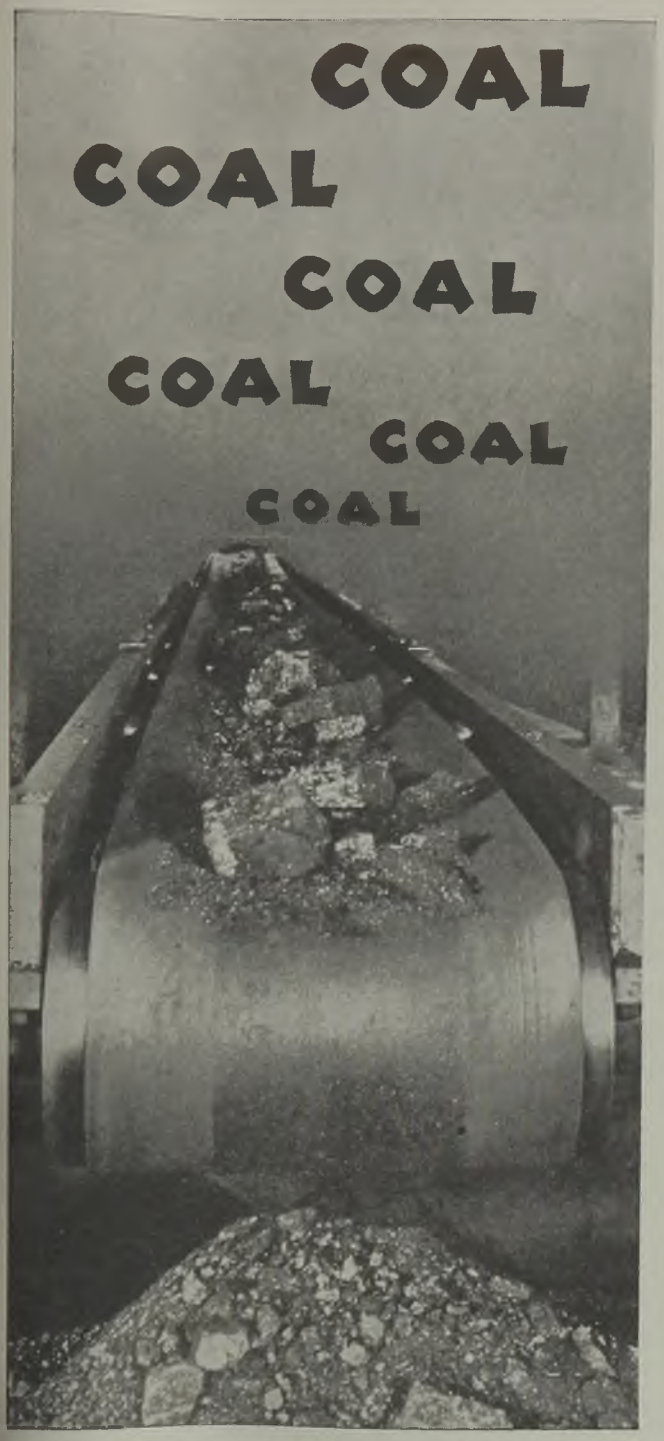
SECURITY WITH SERVICE

BITUMINOUS CASUALTY CORPORATION

ROCK ISLAND ILLINOIS

ASSETS OVER $14,000,000

TONNAGE



SMALL PIECES or big chunks of coal are all the same if your belt is a QUAKER. Coal in any size is economically handled and swiftly, too, when Quaker belts are in use.

Quaker Belts are manufactured of American-made rubber for the cover and friction; the carcass is of high grade specially selected duck and turned out under the supervision of highly trained, technical and experienced belt workers.

Quaker Conveyor Belts are what you need to deliver heap, big tonnage in your mine.

Then, too, Quaker manufactures a complete line of Industrial Rubber Products that are used so extensively in and around coal mines: Belting, both transmission and conveyor; Hose for air, water, suction, fire protection, steam, paint spray and hydraulic use; Rod and Sheet Packings; Gaskets; Pump Valves, etc.

It is good policy to keep on asking for Quaker Products.

REG. U. S. PAT. OFF.

"If there is a way to get it done—Quaker will do it"

QUAKER RUBBER CORPORATION

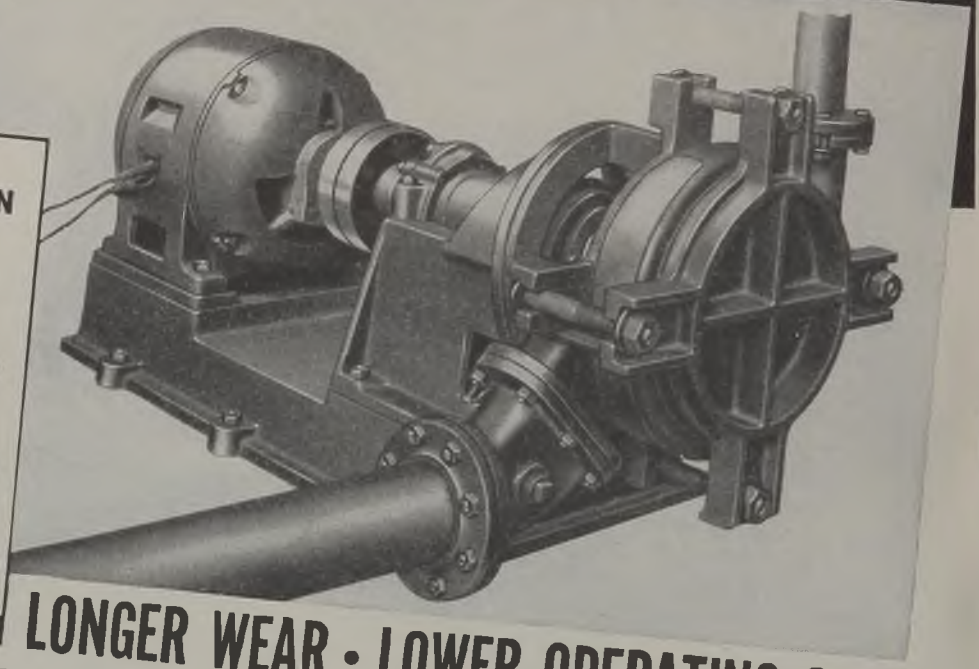
Manufacturers INDUSTRIAL AND AUTOMOTIVE RUBBER PRODUCTS

PHILADELPHIA 24, PA. • NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1

Western Territory

QUAKER PACIFIC RUBBER COMPANY • SAN FRANCISCO 5 • LOS ANGELES 21

The NEW MORRIS TYPE "R" SLURRY PUMP



GLAND UNDER SUCTION PRESSURE ONLY

•

TO DISMANTLE . . . REMOVE 4 BOLTS ONLY

•

IMPELLER AND LINER REMOVABLE WITHOUT DISTURBING PIPING

LONGER WEAR • LOWER OPERATING COSTS LESS TROUBLE . . .

DEVELOPED as a result of more than eighty years experience with various types of mine pumps, the new Morris Type "R" Slurry Pump is basically different from pumps now on the market, and incorporates progressive advances in Morris design plus the experience and discoveries of operating men in the field.

It was specifically engineered to handle sludges and silt; the moving of all types of caustic or acid mixtures containing abrasives or solids; and mixtures containing ore concentrates, tailings, slag, and the residue from filters and classifiers.

The pump takes its suction from the drive side, thus its packing is subjected only to the suction or positive-head pressures. It means that the pump operates equally well under high suction lift, or a positive head, and that it may be connected directly to any tank or be cut into the line as a booster pump without an intermediate pressure tank or a suction hopper.

12 Reasons *Why!*

1 Heavy, wear-resistant parts.

2 No internal studs or bolts.

3 No troublesome internal joints and fits.

4 Freedom from packing troubles.

5 Overcomes uncertainty of proper hub-sealing water pressures.

6 Ability to handle maximum suction lifts and almost unlimited positive suction heads.

7 With clamping effect of bolts on discs, shell is not subject to high stress. Consequently shell can be made from variety of materials with high abrasive resistance though not necessarily of high strength, such as glass or porcelain.

8 Shell interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around axis of pump to positions in any of four quadrants, a total of 16 combinations.

9 Low velocity in suction chamber reduces scouring action, increasing life of chamber which is a replaceable casting not integral with bearing frame.

10 Worn clearances on suction side of impeller easily closed by four adjusting screws.

11 Excellent hydraulic efficiency.

12 Power requirements surprisingly low.

Write today for Bulletin

MORRIS MACHINE WORKS BALDWINSVILLE, N. Y.

BRANCH OFFICES IN PRINCIPAL CITIES

THIS MITTEN

New A-O COVER-MITTS

make mittens last longer

GOES INTO THIS MITT

The new A-O 6X152 Cover-Mitt is designed to fit over welders' full mittens or one-fingered mittens, substantially adding to their life. It is made from split horsehide leather, specially tanned to resist heat and withstand rough wear. Slips on easily.

May be ordered in pairs, or all "rights" or all "lefts." Your nearest M. S. A. Representative can supply you.

LIKE THIS

American Optical COMPANY *Safety Division*

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL CITIES

WIRE ROPE LUBRICATION

New Compound Adds Life to Wire Rope

DOES NOT REQUIRE HEATING . . . CONTAINS A PENETRATING SOLVENT TO ASSURE COMPLETE SATURATION

Rust or corrosion of wire rope is a gradual decay caused by weathering or by special conditions which subject the rope to either acidic or alkaline substances. When corrosion sets in, the rope loses its flexibility. The entire rope starts to wear away rapidly. Then some of the wires become overloaded and break.

To protect wire rope from such damage and to enable it to operate satisfactorily, certain protective compounds are used.

Present Methods Take More Time

Wire rope, exposed to the weather, is usually coated with a very viscous, or plastic compound which *must be thinned down by heating* before it can be applied. It is applied by brush or paddle, or better still, by running the rope through the heated compound contained in a trough especially designed for this purpose. However, these operations are costly and time consuming.

Cities Service *Cisco Compound 5-Z* is a new and different wire rope safeguard. Unlike other lubricants, *it does not require heating*.

Solvent Penetrates Rope

Cisco Compound 5-Z contains a solvent which evaporates in a few hours leaving a *tough, tenacious, durable coating on every wire and strand*. The solvent improves the penetrating powers of the compound and assures complete saturation of the rope. As a result you get longer rope life, greater efficiency, lower operating cost, greater flexibility and greater safety.

Before applying Cisco Compound 5-Z the rope should be cleaned carefully with *Cities Service Penetrating Oil* to remove grit, dirt, and foreign matter. Penetrating Oil not only cleans the wires and strands but *lubricates the core* as well. After cleaning with Penetrating Oil, brush on Cisco Compound 5-Z. It flows on easily with no heating or fuss...assures the rope ample lubrication and protection against wear and atmospheric injury.

Clean Before Lubricating

Through continual contact with the lubrication problems encountered by industry over the years, Cities Service Lubrication Engineers have accumulated considerable information on ways and means for reducing costs and improving the performance of lubricants. See for yourself how they can help *you*. Contact your nearest Cities Service branch office or write to Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y. In the South, Arkansas Fuel Oil Co., Shreveport, La.

Expert Counsel Available

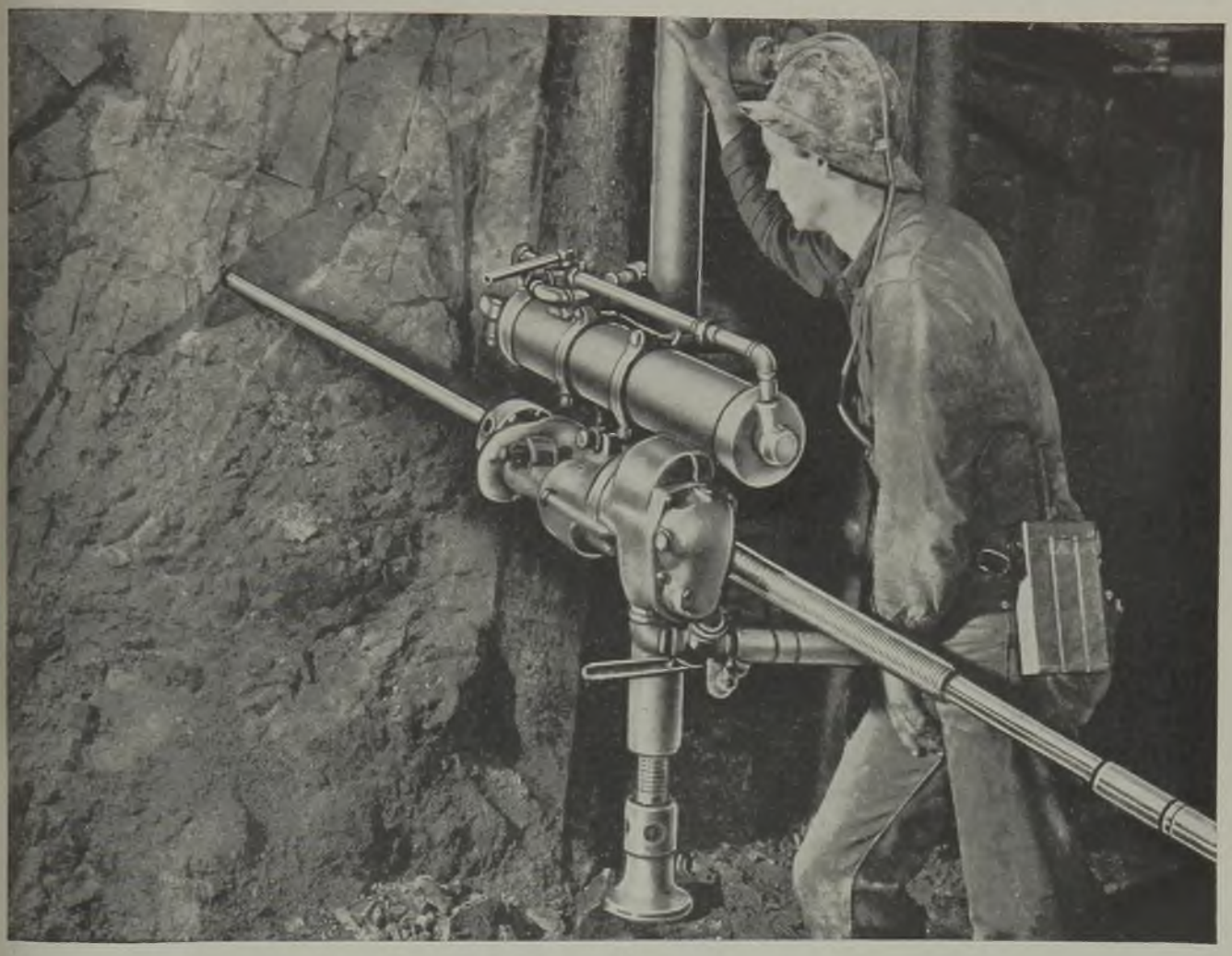
CITIES SERVICE OILS
ONCE-ALWAYS

FOR EVERY LUBRICATION PROBLEM CALL Cities Service FIRST!

For locating lost seams in underground coal mines

CP No. 5 DIAMOND DRILLS

are ideal for short hole exploratory work to depths of 500 feet, because of their one-man operation, light weight, short over-all length, fast drilling speed, low air consumption and maximum core recovery.



FEATURES:

Weight 160 lbs. without rod puller; 250 lbs. with rod puller.

Over-all length 42½".

Capacity, 500 feet with standard E rods and EX fittings yielding ⅞" core. Fittings available to yield larger cores, with corresponding reduction in capacity.

Bit speeds up to 2500 r.p.m. with stepless throttle regulator.

Mounts like a drifter on any rock saddle; works in any position from a column, arm or crossbar.

Write for Bulletin 311

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

USED GANTRY CRANES

(immediately available)

$7,000 to $24,000 F.O.B. LOCATION

Less Than 1/2 Today's Prices

5 to 50 ton pick-up capacity Whirley Portal Gantry Cranes can be bought—*right now*—at tremendous savings. These are used cranes in good condition and fit for tough service for many years.

Every crane is the product of an outstanding manufacturer, well known to modern industry. All cranes subject to prompt delivery.

To fit your requirements, YOU MAY SELECT:

- 5 to 50 long tons pick-up capacity.
- diesel, electric or steam power.
- variable boom lengths, to 110 feet.
- varying heights, track to boom hinge pin, 40 to 70 feet.
- track gauges variable to 32 feet.

Investigate now! Write to your nearest W.A.A. Regional Office for complete information and comparative costs.

All items subject to prior sale.

Although this material has previously been offered to priority claimants, 10% of the merchandise has been reserved to fulfill any further needs of priority claimants including VETERANS OF WORLD WAR II who are invited to contact the Regional Office serving their area.

EXPORTERS: Most surplus property is available to the export market. Merchandise in short supply is withheld from export and if such items appear in this advertisement they will be so identified by an asterisk.

WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

642-1

OWNERS OPERATORS

IMMEDIATE DELIVERY

ARC WELDERS...

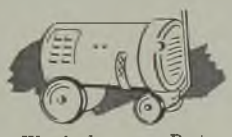
RELATED EQUIPMENT

New and used arc welders of well known makes, including Hobart, Lincoln and Westinghouse, in 200, 300 and 400 ampere ratings, either AC or DC, are now included in government-owned surplus and are available for immediate purchase and delivery.

Here you will find the equipment to modernize your shop—to replace worn-out or obsolete welders—to expand your business.

Lincoln—In all models and most ratings. Hundreds in the popular 300-400 Ampere size.

Hobart—Standard models of this make available in large quantities and most ratings.



Westinghouse — Portable models available in limited quantities.

Electrodes and Welding Rods — Millions of pounds available in all types and sizes.

EXPORTERS: Most surplus property is available to the export market. Merchandise in short supply is withheld from export, and if such items appear in this advertisement they will be so identified by an asterisk.

All arc welders are subject to priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the material offered herein.

Prices are low, based on the type and condition of the equipment. The inventory is located at various points throughout the country. It is broad and includes the machines you need. To obtain complete information on the availability, location and condition of the equipment you want **fill out the coupon and send it to your nearest War Assets Administration Regional Office.**

For full information clip and mail this coupon to:

War Assets Administration:
Please send me complete information on the availability, condition and location of the following types of equipment.

....Hobart Arc Welders	....Westinghouse Arc Welders
....Lincoln Arc Welders	....Electrodes and Welding Rods

Arc Welding Equipment: AC.... DC....
Electric Motor Driven: Volts....Phase....Cycles....
Transformer Type: Volts....Phase....Cycles....

Name.....

Firm.....

Address.....

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

WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cincinnati · Cleveland · Dallas · Denver · Detroit · Fort Worth · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville · Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia · Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane

649-1

Service and Dependability

When you need industrial equipment, tools and supplies, CALL your local Industrial Distributor!

The production schedule of your mine and preparation plant depends on having the right tools, at the right place, at the right time. Your industrial distributor offers a single source of supply for hundreds of products, saving time, money and manpower because the . . .

MINE

EQUIPMENT, TOOL AND SUPPLY MANUFACTURERS

Large Stocks of equipment, tools and supplies, close at hand and the

Fast Delivery Service of the distributor — available 24 hours a day in emergencies—enable the manufacturer to maintain

Minimum Plant Stocks, effecting a savings amounting to 10.55% total purchase (Based on study made with industrial buyers).

Frequent Sales Contacts of the distributor's salesmen bringing valuable information about many products and their applications plus

Simplified Buying resulting from combining requisitions, purchase orders, invoices and payments effect

Lower Buying Costs for high quality production and maintenance items.

A Double Guarantee — that of the distributor and the manufacturer — protects the buyer on goods purchased through the industrial supply house.

Adjustments and complaints are most satisfactorily handled by your local distributor.

• • •

Buy from your local Industrial Distributor!
It's economical and convenient!

• YOUR INDUSTRIAL DISTRIBUTOR •

SEND FOR FREE BOOKLET "SERVICE AND DEPENDABILITY" TO

MILL SUPPLIES — The Magazine of Industrial Distribution · 330 W. 42nd St., New York 18, N.Y.

the best advertisement for a Carrimor* is a competitive test!

COMPARE THE RESULTS OF THIS TYPICAL TEST BY AN UNBIASED ORGANIZATION*

Test Data	LPC Carrimor	Scraper "A"	Scraper "B"
Struck Capacity	8.4 yds.	8.2 yds.	9.25 yds.
Loading Time	1.0 Min.	1.0 Min.	1.0 Min.
Spreading Time	.157 Min.	.172 Min.	.366 Min.
Turning & Travelling time considered as constant for purposes of computation	3.22 Min.	3.22 Min.	3.22 Min.
Total Trip Time	4.38 Min.	4.39 Min.	4.58 Min.
Weighed yds. per trip	7.3	6.1	6.0
Trips per 54 Minute Hr.	12.32	12.30	11.7
Total Yds. per Hr.	89.9	75.0	70.2
Total Yds. per 8-hr. Day	719	600	562

*Name on request

Claims are easy and talk is cheap but if you want the real facts on which scraper *will put the most money in your pocket*, we suggest a competitive test with the new 8 yard LaPlant-Choate Carrimor.*

For example, here are the results of a typical test, conducted by an unbiased organization with no connection with any scraper manufacturer. Every condition was carefully controlled to get as nearly a perfect comparison as possible—same operator, same material, same tractor, same haul and *even the same loading time*. But look at the difference in scraper production, based on actual weighed loads at the fill! At 25 cents per yard, the LPC Carrimor* would earn $29.00 per day more than scraper "A" and $39.00 per day more than scraper "B".

With an opportunity for extra profits like these, isn't it worth waiting a little longer to be sure of a Carrimor*—the scraper that's "best by competitive test." LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland, Calif.

*Reg. U.S. Pat. Off.

LaPLANT-CHOATE

Job-Proved Equipment... for Lowest Possible Cost in Moving Earth

"From the standpoint of efficient braking, these Hydrotarders proved satisfactory in every respect."

This report, from one of the world's leading oil companies, is based on six years' experience with Hydrotarder equipped trucks operating in South America. Installed on three heavy-duty oil field trucks in 1940, these Hydrotarders were transferred to extra heavy truck-trailers in 1943.

In his report, the operator continues:

"These Hydrotarder equipped truck-trailers have been in almost constant use since that time on long haul work from Puerto La Cruz to San Tome and we have found them extremely satisfactory . . . there is no better brake for hill country driving . . . a fully loaded truck can be brought almost to a standstill without using either the foot or emergency brakes . . . we have no hesitancy in recommending these Hydrotarders for mountain road work."

In hill country, Hydrotarder lowers truck operating costs by making such savings as: 25% on tires; 8% in fuel; 85% on friction brakes; 25% in trip time. Let us tell you how to lick your braking problem . . . how to keep trucks rolling faster, safer and cheaper. Write today.

One of the heavy duty oil field trucks on which these Hydrotarders were originally installed. Picture made during the test run.

Parkersburg
HYDROTARDER

THE PARKERSBURG RIG & REEL COMPANY
PARKERSBURG, W VA.

Manufacturers since 1931 of the famed Hydromatic Brake—the load retarder which makes possible the drilling of deep oil wells safely and economically. Its counterpart, the Hydrotarder, enables motor transportation to operate with greater safety, economy, and speed than was ever heretofore believed possible.

Distributed by

HETZEL BROTHERS
Engineers and Manufacturers
1972 Los Angeles Street, Los Angeles 11, California

THE WINTER-WEISS COMPANY
22nd and Blake Sts., Denver 2, Colorado

The Pointer-Willamette Company
238 N. E. Oregon St., Portland 14, Oregon

Parmanco

MECHANICAL FEED HORIZONTAL DRILL.

Heat-treated gears are used in this transmission and spur gear reductions, with an ample factor of safety for the operation of machine under all conditions. Link-Belt bearings of extra size are used throughout. Augers are connected to main drive shaft through a self-aligning chuck of ample size, in which is secured the drive shaft by two shear pins which provide sufficient safety to rest of machine. The machine is raised or lowered to a height of 36 inches by jacks on front of machine, and rear of machine is mounted on two pneumatic-tired wheels which also have a 36-inch range of adjustments. The machine permits the drilling of a controlled-angle hole, which makes possible a great saving in the use of explosives through the cantilever effect of this controlled-angle drilled hole.

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

CONTINENTAL IDLERS SURE CUT HAULAGE COSTS AT OUR MINES

For complete information write for Engineering Data Book—ID—105.

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

CGC ATLANTA • DALLAS • MEMPHIS CGC

91% of anthracite coal produced in 1945

CAME FROM MINES USING HENDRICK EQUIPMENT

In 1945, there were seventy-nine mining companies in the anthracite field, that produced over 57,000 tons each, for a total of over fifty million tons out of the entire anthracite production of 51,237,031 tons.

Of these companies, mines using Hendrick equipment produced over 47,000,000 tons, or 91% of the 1945 anthracite output.

That so large a proportion of the anthracite mines rely on Hendrick equipment is the most practical kind of proof of the advantages of Hendrick quality and service.

HENDRICK
Manufacturing Company

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

41 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Whether you need THIS —or THIS

You can get what you want in the complete range of Jones Herringbone Speed Reducers

YOU will find this 128-page catalog of Jones Herringbone Speed Reducers helpful in the selection of reducers in accordance with A.G.M.A. recommended practice for all conditions of service. Jones Herringbone Speed Reducers are built in single, double and triple reduction types and in every standard ratio in ratings ranging from 1.25 H.P. to 440 H.P.

All these reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings throughout. Liberal stocks are carried to facilitate shipments.

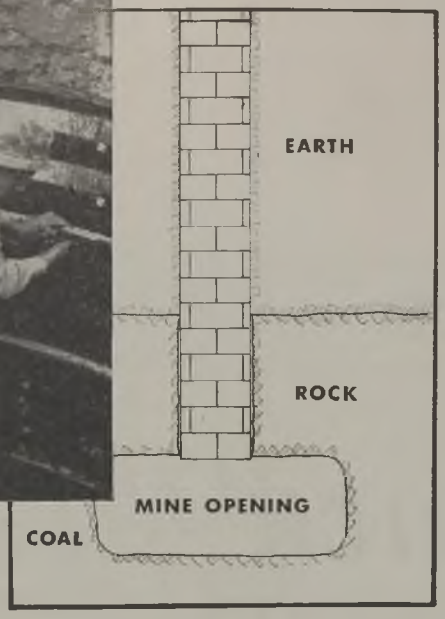
Catalog No. 70 will save you time and effort in laying out drives that call for Herringbone gears.

WRITE FOR YOUR FREE COPY

W. A. JONES FOUNDRY & MACHINE CO., 4401 Roosevelt Rd., Chicago, Ill.

Jones HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS • PULLEYS
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION
PILLOW BLOCKS • FRICTION CLUTCHES • TRANSMISSION APPLIANCES

BUILD VERTICAL OR SLOPED OPENINGS THIS SIMPLE, SPEEDY WAY



Air shafts and escape-ways are built quickly and economically with ARMCO Tunnel Liner Plates.

Here's an easy, economical way to provide ventilation and safety as active workings extend from original mine openings. Simply use ARMCO Tunnel Liner Plates to sink new shafts.

These plates are amply strong and provide worthwhile durability and safety from fire hazards. One man easily handles the lightweight steel sections, bolting them together with regular wrenches. Costs are low and the job is speeded.

You'll find ARMCO Tunnel Liner Plates ideal for sloped entries, air shafts, escapeways, substations and overcasts. Write for data on ARMCO Tunneling methods. Armco Drainage & Metal Products, Inc., and Associated Companies, Middletown, Ohio.

• • • • ARMCO TUNNEL LINER PLATES • • • •

BUILT to MEET RESPONSIBILITY
PUMPS *"by Aurora"*

The able performance of our pumps, with high efficiency and lasting dependability, fulfills the fundamental purpose of our business. Put a PUMP "by Aurora" on that next liquids handling job. You'll LIKE IT, TOO!

Aurora Deep Well Turbines for all conditions—4" to 24"

Type AD Hor. Split Case, Two Stage Centrifugal

NSA Aurora Centrifugal Sump Pump

Type OD Hor. Split-Case Double Suction Single Stage Centrifugal

Type G M C Close-Coupled Centrifugal

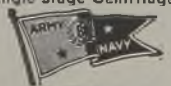
Apco Turbine-Type Pumps The simplest of all pumps. Ideal for small capacity, high head duties. Silent, compact and lasting.

The ONLY MOVING PART in the APCO

Type GGU Side Suction Single Stage Centrifugal

APCO Horizontal Condensation Return Unit

APCO Single Stage Turbine-Type



Write for **CONDENSED CATALOG M** or See Our Catalog in SWEETS.

DISTRIBUTORS IN PRINCIPAL CITIES

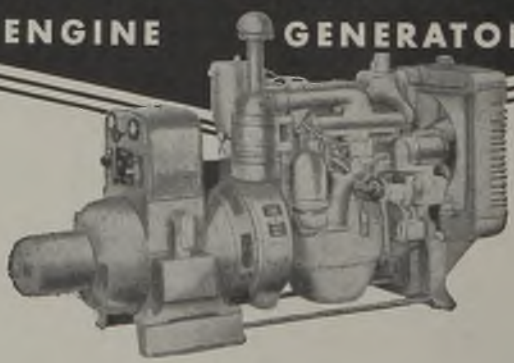
AURORA Always PUMPS

AURORA PUMP COMPANY

92 Loucks Street, AURORA, ILLINOIS

Makes Electric Power Available Anywhere!

Low Cost Electricity with READY-POWER ENGINE GENERATORS



Powered by International Harvester Engines—Diesel, gasoline or natural gas. 7½KW to 50KW.

READY-POWER Engine Generators produce low cost electric power and permit the electrification of operations miles beyond the power lines. In many cases, important savings over central station power costs can be had. READY-POWER Engine Generators are sold and serviced by the world-wide International Harvester Power Unit dealer organization, and backed by the READY-POWER Company's twenty-two years of successful experience in producing engine generators.

THE READY-POWER CO.

11231 Freud Ave. • Detroit 14, Mich., U.S.A.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: "OPPORTUNITIES": EQUIPMENT
BUSINESS: :USED OR RESALE

UNDISPLAYED —— RATES —— DISPLAYED

10 CENTS A WORD. MINIMUM CHARGE $2.00.
Positions Wanted (full or part time salaried employment only) ½ the above rates payable in advance.
Box Numbers—Care of publication New York, Chicago or San Francisco offices count as 10 words.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Individual Spaces with border rules for prominent display of advertisements.
The advertising rate is $6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

NEW ADVERTISEMENTS received by October 3rd will appear in the October issue, subject to limitations of space available.

POSITION VACANT

WANTED: MINE Manager experienced in Low Seam Coal, to work mechanized drift mine in Maryland, opportunity for right man. State qualifications and experience. Application confidential. P-369, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

WANTED POSITION. As mine foreman or assistant with a reliable company in West Virginia. Have had 8 years experience with Windsor Power House Co. L. A. Smith, Box 823, Wellsburg, W. Va.

MINE SUPERINTENDENT: Production Manager or Safety Engineer. Desires a connection with a progressive company. Experienced in all fazes of mechanical mining. Reply PW-370, Coal age, 520 N. Michigan Ave., Chicago 11, Ill.

SELLING OPPORTUNITY WANTED

ORGANIZATION OF Men long experienced in and having directly participated in the development of modern mechanical mining while representing larger equipment manufacturers, solicits accounts as manufacturers agent in West Virginia, Virginia, Kentucky and Tennessee. Thoroughly familiar with mining conditions and well acquainted with the operators in the aforementioned states. Write RA-371, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

BUSINESS OPPORTUNITIES

I CAN secure any number laborers working coal mines before Italians, Russian, Polish, Hungary, etc. Will take any thing anywhere. Also I finance and operate boarding house if necessary. Phill F. Mancuso, 251 Bowery, New York City. Phone GRamercy 7-8575.

FOR LEASE on royalty basis: Over 1000 acres unmined coal. Located near Marissa, Ill., 45 miles southeast of St. Louis, Mo., on the Illinois Central Railroad. Surface—approximately 4 acres around shaft. Underground—Rock roof at shaft. 2 or 3 trolley motors, cutting machines, pit cars and other equipment. Contact Alberta Hamilton, 507 South Park Ave., Marissa, Ill.

FOR SALE: Western Pennsylvania 900 acres of land approximately 500,000 tons of coal (possible to huy adjoining acreage of coal). Mine opened and railroad siding available—also oil and gas lease $25,000. Write BO-372, Coal Age, 330 W. 42nd St., New York 18, N. Y.

FREE BULLETIN

"SURPLUS PROPERTY"—How-What-Where: a 32 page 5x8 indexed booklet giving complete information on the purchase of government surplus in all available classifications. Write the Office of Information—War Assets Administration, Washington 25, D. C.

WE specialize in buying complete mines that are going out of business or from receivers in bankruptcy, Administrators of estates, etc.

Frank J. Wolfe

COAL MINE EQUIPMENT SALES COMPANY

306-7 BEASLEY BUILDING — L. D. Phone-34 — TERRE HAUTE, INDIANA

LATHE

30" x 66" centers BRADFORD Lathe, cone drive, back geared, Schultheis A.C. M.D. with motor. 6" raising blocks, standard equipment. Price $1650.00

CINCINNATI MACHINERY CO., INC.

218 E. Second St., Cincinnati 2, Ohio

WESTINGHOUSE

TYPE SK — MOTORS

America's Best Stock

WIRE INQUIRIES COLLECT

MOTORS, GENERATORS, TRANSFORMERS *BOUGHT & SOLD*

For prompt action, wire specifications collect

ELECTRIC EQUIPMENT CO.

PHONES: GLENWOOD 6783-6784-6785

63 CURLEW STREET, P. O. BOX 51 • ROCHESTER 1, N. Y.

FOR SALE

Locomotive Crane

Link-belt Electrically Driven

9 ft. Gauge 80 ft. Boom 8 Wheels

75 H.P. 3 Ph. 60 Cycle A.C. 440 Volts

Good Working Condition
With New Spare Parts.

Hoisting Speed.....178' per minute
Travel Speed.....288' per minute
Swing Speed.....2.2 Rev. per min.
Capacity at 73 ft. radius 7600# With Blaw-Knox Dreadnaught Handling Bucket 720-7 modified to 2-½ yds. capacity.

L. B. FOSTER COMPANY
11 Park Place, New York City

WANTED

-TRANSFORMERS-

TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign all Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
Station M — Since 1912 — CINCINNATI 27, OHIO

VIBRATING SCREENS CRUSHERS — SCALES

Immediate Shipment

3'x6'—1 deck Vibrat. Screen	$495.00
3'x6'—2 deck Vibrat. Screen	595.00
3'x8'—1 deck Vibrat. Screen	585.00
3'x8'—2 deck Vibrat. Screen	685.00
3'x8'—3 deck Vibrat. Screen	885.00
Stoker Coal Crusher	345.00
Large Coal Crusher	795.00
15 Ton Truck Scale	450.00
20 Ton Truck Scale	510.00
5 Ton Tipple Scale	260.00

BONDED SCALE COMPANY
2190 S. Third St., Columbus 7, Ohio
Phone GA 5712 — UN 2832 Evenings

Visit our factory. We manufacture more than 150 models of Scales, Screens, Crushers, and Conveyors. Inspect several models in operation.

WANTED

¾ to 4 yard Shovels
2 to 8 yard Draglines

FRANK SWABB EQUIPMENT CO., Inc.
HAZLETON, PA.
Telephones: 4910J and 4911

Air Compressors Wanted

Horizontal Water Cooled—100 CFM or larger; also
Gasoline or Diesel Driven Portable Machines

L. W. BAUER
North Bergen, N. J.

"Opportunity" Advertising:
Think
"SEARCHLIGHT"
First

FOR SALE

1—300 K.W. Westinghouse, 3 phase, pedestal type Rotary Converter, 250 volt—needs armature rewound.
2—350A Smithway Aro Welders, 220/440 volt.
1—400A Lincoln Stable Aro Welder on wheels, 222/440 Volt 3 Phase.

GUYAN MACHINERY COMPANY
Box 150 — Logan, W. Va.

Ready—for High Speed STRIPPING ?

Call for ECONOMY and "Pay-as-you-Go"

Write for information on how to own machinery in the easy modern way

SPECIAL

1—20 yd. Marion Dragline 210 Boom.

SPECIAL

1—5 yd. Bucyrus Erie 120 B Shovel, excellent condition.

1—3 yd. Lima Model 1201. Serial number in 700s. 75-80' boom. 3 yd. dragline bucket. Kohler Lighting Plant. Spare parts. Very good condition.

1—Remodeled 3 yd. Monighan Model 3T Diesel with new type Cam Walking Device. 90' Boom. 3 yd. Bucyrus-Erie Bucket, 3 yd. Page medium weight bucket. The Bucyrus Erie Bucket is in good condition, the Page needs rebuilding. 100 HP Fairbanks-Morse Diesel Engine and also a Caterpillar Model 4600 4-cylinder Diesel Engine direct coupled to the generator and which powers the swinging motor. The rail and rack have been rebuilt. This machine is in exceptionally good condition and can be seen in operation.

1—3 yd. Monighan Walker Dragline Model 3T. Serial number in 300s. 75' boom. New 3 yd. Page Bucket, 150 HP General Electric motor 440 volts. 500' Cable. Very good condition.

1—3 yd. Osgood Model 908 Dragline. Serial number in 3000s. Buda Diesel Engine 70' Boom, 3 yd. dragline bucket. Kohler Lighting Plant. Condition good.

A big dragline or shovel for stripping and a fast shovel for loading, are the combination to produce top tonnage on a strip-pit job.

Do you need such equipment, or any part of it NOW?

Then phone "COLLECT" to ECONOMY COMPANY *at any hour of the day or night.* Our lists, covering Shovels, Cranes, Draglines and Hauling Equipment, from Coast-to-Coast, will secure just what you need. Early inspection and immediate delivery, and — you may "PAY-AS-YOU-GO". Phone to-day, "COLLECT".

1—2½ yd. P&H Model 955. 2½ yd. clamshell bucket, 3 yd. dragline bucket. 80' boom. Fairbanks Morse Diesel Engine. Very good condition.

1—2½ yd. Model 2W Monighan Walking Dragline. 60' Boom, 2½ yd. dragline bucket. Powered by Fairbanks-Morse Diesel Engine of the valveless, cold starting airless injection type. Machine in good operating condition.

1—2¼ yd. P&H Model 800A. Serial number in 4800s. 80' dragline boom. Fairleads. 200 HP Atlas Imperial Diesel Engine. Condition good.

1—2 yd. Bucyrus-Erie 50B Shovel—*electric.* Shovel boom 30'. 2 yd. bucket. General Electric Motors. 36" crawlers.

1—2 yd. Page Model 220 Dragline. 110' Boom. 2 yd. P&H Bucket. Cummins Diesel Engine. Can be seen in operation.

1—Koehring 801 2 yd. Diesel Shovel. Ser. # in 2100's. D17000 engine, used and new parts.

And many other Shovels, Cranes and Draglines, 1¾ yd., 1½ yd. 1 yd. and smaller.

Phone us "Collect" for full information.

ECONOMY COMPANY, INC.

49 Vanderbilt Ave., New York, N. Y.

Tels. MUrray Hill 4-2294 - 8292 - 2295 - 2296

REBUILT EQUIPMENT—READY TO SHIP

MOTOR GENERATOR SETS

1—300 KW. 250/275 v. DC 720 rpm. type DMC General Electric Generator direct driven by 430 HP, 2200 v. 3 ph. 60 cy. General Electric Synchronous Motor complete.
2—150 KW. 250/275 v. Ridgeway Motor Generator Sets driven by 225 HP. 2200 v. 3 ph. 60 cy. Ridgeway Synchronous Motors.
1—100 KW. 250 DC Ridgeway Motor Generator set with 2—50 KW. Generators driven by 1—150 HP. 2300 v. 3 ph. 60 cy. Synchronous Motor.
1—80 KW 720 rpm. 250 v. DC G.E. Gen. V-belt driven by 150 HP 1800 rpm. 220 or 440 v. 3/60 West. Mtr.
1—30 KW 250 v. DC cp. wd. Gen. dir. con. 220/440 v. 3 ph. 60 cy. AC Motor.
1—30 KW 250 v. DC 1200 rpm. G.E. Gen. dir. con. to 2200/440/220 v. 3/60 syn. motor.
1—20 KW 1150 rpm. 250 v. Westg. Gen. dir. driven by 30 HP 1150 rpm. motor.

MINE LOCOMOTIVES

1—5 ton Ironton Storage Battery Locomotive.

PUMPS

1—Amer. Piston Pump—5½x4½"—size 8x12.
1— 48 GPM 161' hd. Roper 3" suc. 3" dis.
1— 90 GPM 225 ft. head, 600 rpm. 2x2" Blackmer.
1—160 GPM 50 ft. head Allis Chalmers.
1—220 GPM 225 ft. head, 600 rpm. 3½"x3" Blackmer.
2—243 GPM 100 ft. head Dayton Dowd.
1—239 GPM 65 ft. head Dayton Dowd.
1—359 GPM 130 ft. head Dayton Dowd.
6—378 GPM 44 ft. head Dayton Dowd.
1—500 GPM Morris Machine Wks. 4" sucs. 4" dis. 123" hd. 1760 rpm.
2—500 GPM 70 ft. head Allis Chalmers.
1—2000 GPM DeLaval 170' head.
1—3000 GPM DeLaval 144' hd. 150 HP.
1—3500 GPM DeLaval 130' hd. 1450 rpm.

SLIPRING MOTORS—3 ph. 60 cy.

HP	Make	Type	Volts	RPM
400	Westg.	CW	2200	425
5	Duquesne		220/440	1200

230 V. DC MOTORS

HP	Make	RPM	Type
25	Westg.	600	SK
25	G.E.	650	MD
20	Westg.	600	M
20	Westg.	1750	SK
20	West.	975	S
15	Al. Ch.	800	
15	Westg.	1700	SK
13¾	Al. Chal.	700	
13	Cr. Wh.	1100	CM
10	Cr. Wh.	675	33M
10	Kr. Wh.	825	CM
10	Westg.	1750	SK
8	G.E.	950	RC-11
7	Westg.	750	M
5	Westg.	400	SK

ALTERNATING CURRENT MOTORS
3 Ph., 60 Cy.

HP	Make	Volts	RPM	Type
100	Westg.	220/440	860	CCL
50	Westg.	220	1200	CD
30	Westg.	220/440	680	CS
30	West. Elec.	440	1200/1800	
15	Triumph	220	1150	

MAGNETIC STARTERS

40—NEW, 5, 7½, 10 and 15 HP 230 V. DC Cutler Hammer drip proof Magnetic Starters.

COMPRESSORS

2—315 CFM Ingersoll Rand portable 100# pres. driven by 105 HP Waukesha Oil Engines, 860 rpm.

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

CUTTING MACHINES

2—29-B Jeffrey Arcwalls, 250 volt, any gage
1—7-AU Sullivan hydraulic cutting and shearing machine 250 or 500 volt
1—12-A Goodman Shortwall, 250 volt, with or without truck
1—12-AA Goodman Shortwall, 250 volt, with or without truck
1—CE-7 Sullivan Shortwall, 250 volt, with truck

LOCOMOTIVES

1—6-Ton G.E. Type 700, 42" gage, 250 volt
1—6-Ton Goodman, Type 30-C, 250 volt, 42" gage

SUBSTATIONS

1—75-KW. G.E. M-G Set complete, 275 volt D.C. 2300 or 4000 volt A.C.
1—200-KW. G.E. Rotary Converter outfit complete, 275 volt D.C. 6600 or 12000 volt A.C.

MISCELLANEOUS

2—100-HP. Buda Diesel Engines, 1850 RPM. (new)
1—100-HP. Natural Gas engine with 220 volt A.C. generator and switchboard
1—Two stage Worthington air compressor 175 C.F.M. 150 Lb. pressure (new)
1—5' x 8' Fairmont Vibrating screen
2—Gardner-Denver all bronze centrifugal pumps, 1000 GPM, 280' head (new)
1—Sullivan bit sharpening machine complete with motor drive and with automatic oil heating furnace.
25—Push trucks with roller bearings, any gage.

A. C. & D. C. Stationary Motors, Starters, Transformers and Miscellaneous Mine Supplies
We solicit your inquiries

ALL-STATE EQUIPMENT CO.
LOGAN, W. VA. *Phone 884*

NEW CONVEYOR BELT: Large quantity 42" and 60" Conveyor Belt, 6 and 7 ply 7/16' top cover, 1/16" bottom cover, 42 oz. duck. All new. Pure rubber.

VIBRATOR FEEDER: Jeffrey Traylor 6' x 6', open pan deck, powered by four No. 5 heavy M-4 motors, including motor generator equipment for 440 volt, 3 phase, 60 cycle, operation; capacity 1500 tons of earth and stone per hour, maximum size stone 3' cubes.

LOCOMOTIVE: Steam, Lima 80 ton, 6 wheel, Switcher with tender; thoroughly modern, excellent condition. Sale or rent.

SCREENS: Jeffrey Traylor, 4' x 6'6", double deck, with 2 H.P. Electric unit. Telsmith 3 deck, size 3 x 10. Telsmith 3 x 8, single deck, Scalping Screen. Tyler Tyrock 2-½ deck, size 4 x 10. Kennedy 3 x 8, 3 deck.

A. J. O'NEILL
Lansdowne Theatre Building
LANSDOWNE, PA.
Phila. Phones: Madison 8300 - 8301.

A.C. Electric Motors

1—300 H.P. West. slip ring 3/60/2200/600
1—250 H.P. Allis Ch. Sq. C. 3/60/440/1200
1—200 H.P. West. Sq. C. 3/60/2200/1800
1—150 H.P. G.E. Syn. 3/60/2200/900
1—145 H.P. G.E. Syn. 3/60/220/900
1—100 H.P. West. slip ring 3/60/2200/600
1—75 H.P. G. E. slip ring 3/60/220-440/720
1—50 H.P. G.E. Sq. C. 3/60/220-440/900
1—50 H.P. West. type CS. 3/60/220-440/1200
1—40 H.P. West. type C.S. 3/60/220-440/1800
1—40 H.P. West. type C.S. 3/60/220/1200
3—30 H.P. West. type C.S. 3/60/220-440/900
1—25 H.P. Allis Ch. slip ring 3/60/220/1200
1—20 H.P. Allis Ch. slip ring 3/60/220/1200
1—15 H.P. G.E. sq. C. 3/60/220/1800
1—7½ H.P. G.E. slip ring 3-60-220-900

D.C. Electric Motors

1—350 H.P. Cr. Wheeler, 250 Volts, 300 RPM.
1—100 H.P. West. Type SK. 250 Volts 1800 RPM.
1—100 H.P. West. Type SK. 250 Volts, 600 RPM.

We have smaller motors as well as M.G. Sets, mining machines, Elec. Locomotives & etc.

TIPPINS MACHINERY CO.
1001 Washington Blvd.
PITTSBURGH 6, PA.

RAILS
NEW AND RELAYING
TRACK ACCESSORIES
from **5** *Warehouses*
- PROMPT SHIPMENTS
- FABRICATING FACILITIES
- TRACKAGE SPECIALISTS

EVERYTHING FROM ONE SOURCE

L. B. FOSTER COMPANY
PITTSBURGH • CHICAGO • NEW YORK

SPECIAL RAIL PURCHASE

3000 tons 90# ARA "B" FIRST QUALITY RELAYERS complete with four hole angle bars and new bolts.

200 tons 85# ASCE FIRST QUALITY RELAYERS complete with six hole angle bars and new bolts.

200 tons used "LUNDIE" tie plates . . . can be repunched to fit any rail section.

All priced within OPA ceilings

Morrison Railway Supply Corp.
1439 Bailey Ave., Buffalo 12, New York

FOR SALE

Steel Window Sash

253 horizontal fixed pivot type sash 5'2" high by 6'0-¾" wide.

Write, wire or phone

GLAZER STEEL CORPORATION
610 Chamberlain St., Phone 3-0738
Knoxville,, Tennessee

RELAYING RAIL
TRACK ACCESSORIES
MIDWEST STEEL CORP.
Gen. Off.: CHARLESTON, 21, W. VA.
Warehouses
CHARLESTON, W. VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

RAILS — CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

M. K. FRANK
480 Lexington Ave. New York, N. Y. Reno, Nevada
810 Park Bldg., Fifth Avenue Pittsburgh, 22, Pa Carnegie, Pa.

LIQUIDATING

Mining Equipment of the former Pittsburgh Terminal Coal Corp.

For Immediate Sale

1—ALLIS-CHALMERS PARSONS TURBINE #750, 3200 KW P.F. 80% 3600 R.P.M. connected to Allis-Chalmers Alternator #108218—Volts 2300—Amperes 1005—3 phase 60 cycle—3600 R.P.M. with Westinghouse Leblanc Jet Condenser Size 17—Serial #1183, Complete with Auto Starter, Dual Driven Exciter, Control Panels, etc.

1—CAPPELL MINE FAN 7'x14' Diameter (200 H.P.) 12"x22' shaft complete with mounting, Pulley and Housing, less motor. Exhaust 217,000 CFM with input of 65 K.W.

1—M.S.A. ROCK DUSTER #361-A

1—G.E. CURTIS STEAM TURBINE, #15364, KW 2500, 3600 R.P.M. Form B, 4-Stage 175# Pressure, Condesing, connected to G.E. Alternator #1353497—Complete with Motors, Exciter, Control Panels, etc.

1—VULCAN GEARED ELECTRIC HOIST (400 H.P.) Drum 6'-6", 8' Diameter—Stows 2 lines 1¼" Rope—220 foot lift—9 1/3 turns, Complete with mounting, operating and electrical panel mechanism, less motor.

3—PITTSBURGH TRANSFORMERS, each 150 KVA, 22000-2300 Volts, 60 Cycle—Serial #660098, #6600101, #6600102.

This is a partial list of available equipment. Full list will be furnished to interested parties upon request.

PITTSBURGH TERMINAL REALIZATION CORPORATION
910 Bessemer Building, Pittsburgh 22, Pa. COurt-5912

Immediately Available

2—500 HP-B & W Sterling Boilers 250# pressure—Class H4 No. 24, each in single setting. 2 steel guyed stacks 5'x150' all complete, with or without Dutch Ovens, still setup. Perfect condition. Installed new 1942.

WIRE—WRITE—PHONE

Send for Printed Circular

NEWBERRY MANUFACTURING CO.
P. O. Box 295 Newberry, Michigan
Telephone Newberry 16

LOADING MACHINES

5—L-400 Jeffrey, 250 volt DC.
3—7-BU Joy, 250 volt DC.
15—5-BU Joy, 250 volt DC.
8—Goodman type G-20 Duck Bill Conveyors, type 158, complete.

ELECTRIC LOCOMOTIVES

2—13-ton Jeffrey, 250 volt DC.
3—10-ton Goodman, 250 volt DC.
3—15-ton Goodman, 250 volt DC.
4—6-ton General Electric, HM-803, 250 volt DC.

MINE CARS

500—5-ton all steel end Dump Mine Cars, 44" gauge.
400—4-ton rotary Dump Mine Cars, 42" gauge. Both late with timken bearing wheels.

MISCELLANEOUS

Several 3, 4 and 5-track Steel Tipples, suitable for drift, slope or shaft mines, complete. Electric Hoists from 150 to 1000 H. P. motors. Shortwall Mining Machines. Motor Generator Sets. Rotary Converters.

COAL MINE EQUIPMENT SALES COMPANY
306-7 Beasley Building. Terre Haute, Ind.
L. D. Phone-34.

FOR SALE:

MARION SHOVEL

One ¾ yard Marion Steam Shovel, Model 21. Price $1,500. *Inquire*

1300 Graham Avenue Windber, Pa.

FOR SALE

NEW, UNUSED

2 Face Conveyors, Type 61 HG, 36 ft. long
2 Chain Room Conveyors, 61 AM, 300 ft. long
1 Chain Room Conveyor, 61 AM, 360 ft. long
1 "Brownie" Model HKL Car Spotting Hoist
1 400 ft. length ½ in. 6x19 hemp center plow steel wire rope wound in place on the hoist drum.

Conveyors are Jeffrey equipment; car spotting hoist was manufactured by Brown-Fayro Company.

Direct inquiries to:

THE BELDEN BRICK CO.
CANTON, OHIO

FOR SALE

NEW

Demming al-bronz oil seal plunger pump, suction 3", discharge 2½", never used, sell reasonable.

ROBERT MASON
703 Wooster Ave., Dover, O.

Practically New

2 ALLIS-CHALMERS CRUSHERS

4"x6" Dodge Type

MAGNA MANUFACTURING CO., INC.
444 Madison Avenue New York 22, N. Y.
Tel. ELdorado 5-4136

Your inquiries to advertisers will have a special value . . .

—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publisher to secure more advertisers and—more advertisers mean more information on more products or better service—more value—to YOU.

Prompt ANSWERS to business problems . . .

MISCELLANEOUS business problems are daily being solved quickly and easily by the use of the Searchlight (classified advertising) Section of this and other McGraw-Hill publications.

When you want additional employees, want to buy or sell used or surplus new equipment, want additional products to manufacture, seek additional capital, or have other business wants — advertise them in the Searchlight Section for quick, profitable results!

Air Transport
American Machinist
Aviation
Aviation News
Business Week
Bus Transportation
Chemical Eng.
Coal Age
Construction Methods
Electrical Contracting
Electrical Merch.
Electrical World
Electronics
Eng. & Min. Jour.
Eng. News-Record
E. & M. J. Markets
Factory Mgt. & Main.
Food Industries
Power
Product Engineering
Textile World
Welding Engineer

Classified Advertising Division

McGraw-Hill Publishing Co.
330 W. 42nd St., New York City 18, N. Y.

GOVERNMENT-OWNED SURPLUS

STEEL can be bought now through War Assets Administration, for immediate shipment to you. Alloy steel billets, blooms and many items of alloy steel bars, particularly in the larger sizes, are available in Chicago, Cleveland, Detroit and other Regional Offices.

Lowscale prices make it worth your while to buy this high-grade material, even if you intend it for low-cost products.

Carbon and alloy steel mechanical tubing is also available in a wide range of sizes and specifications. Contact your nearest War Assets Administration Office below, or clip and mail the coupon.

FREE INFORMATION

To War Assets Administration:*

Please send me full information, including availability and pricing of the following:

Carbon and Alloy Billets and Blooms ☐—H. R. & C. R. Alloy Sheets ☐—Strip and Plates ☐—Stainless Steel Sheet and Strip ☐—Mechanical Tubing, Carbon and Alloy ☐—Standard Type Valves and Fittings ☐

NAME.....TEL. NO.....

FIRM.....

ADDRESS.....

CITY.....STATE.....

*Send coupon to nearest Regional Office below for fast service.

All steel is subject to priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area and then to purchase the material offered herein.

EXPORTERS

Most surplus property is available to the export market. Merchandise in short supply is withheld from export, and if such items appear in this advertisement they will be so identified by an asterisk.

WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

457-Q

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1945-46 MINING CATALOG

■

■

SEARCHLIGHT SECTION
Classified Advertising

NOW..YOU CAN GET YOUR ACCO Registered SLINGS from OPEN STOCK

If your local Hazard distributor does not have a stock of standard sizes and lengths of Hazard Registered Slings on hand he can get them for you immediately by phoning the Hazard District Office. Order today. You will find them the most efficient wire rope slings you have ever used.

The Acco-Loc Safety Splice itself is neat, compact, flexible to the terminal. No seizing wires to ravel; no wire ends to barb. No distortion of rope structure. Always develops 100% of rope strength. Hazard Registered Slings are made of LAY-SET Preformed Wire Rope (Imp. Plow Steel) the kink-resisting, easy-to-handle, safe wire rope.

ACCO

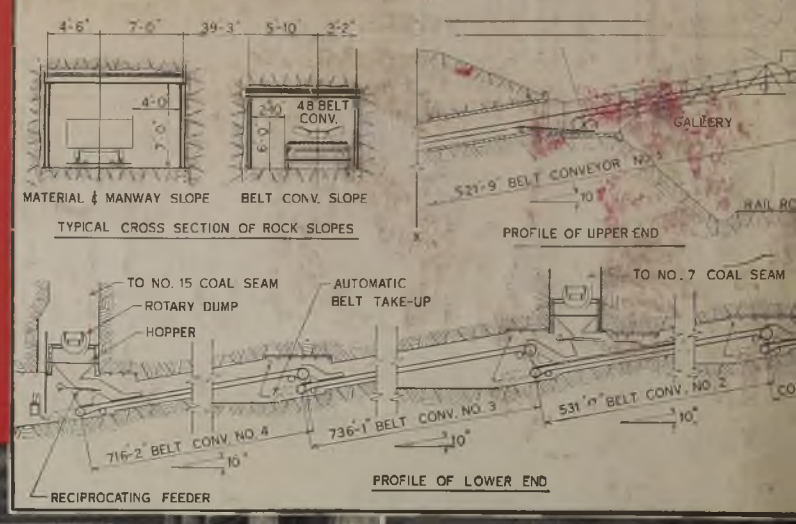
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

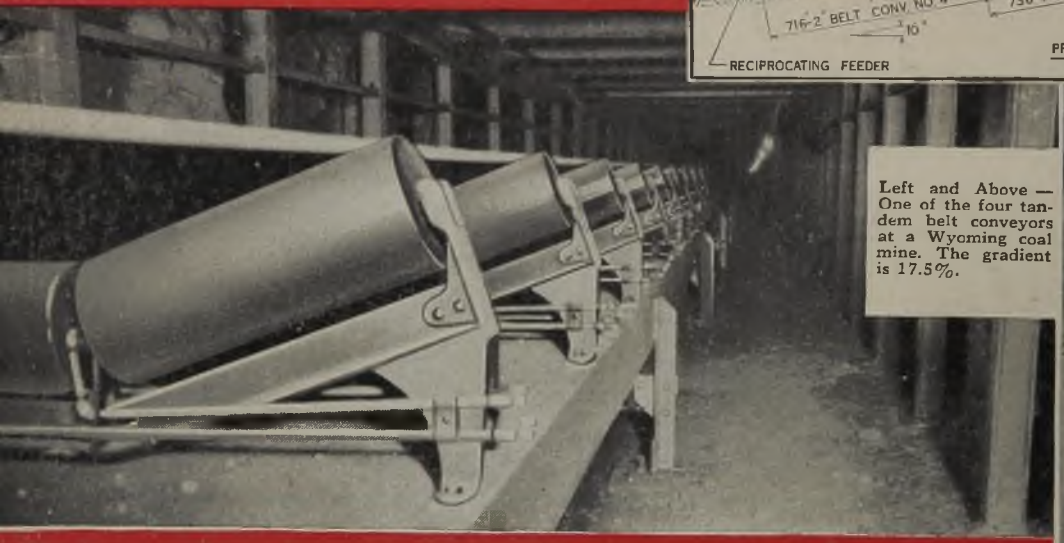
HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

LINK-BELT
CONVEYOR SLOPE HAULAGE





Left and Above — One of the four tandem belt conveyors at a Wyoming coal mine. The gradient is 17.5%.

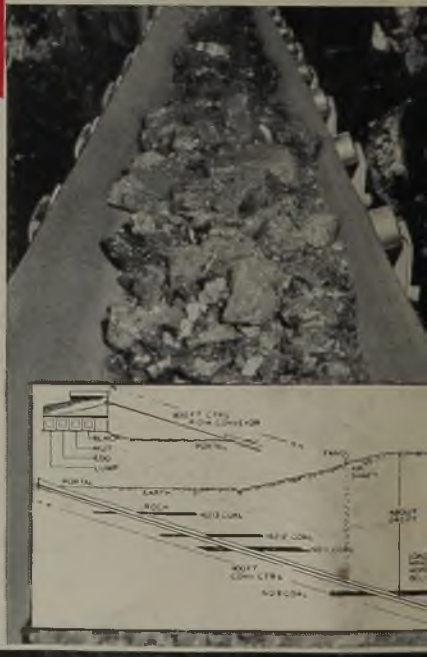
Above—Link-Belt slope belt conveyor (891 f mine bottom to preparation plant) Weirton Co Isabella, Penna. Below—900 ft. long Link-Bel conveyor extending from a point 250 ft. below on a 17° slope to the tipple at Louisville Gas & Company, Cherry Hill Mine.

Continuous COAL FLOW
→ Boosts Output—Cuts Costs

Now — more than ever — you need the highest possible mine output at the lowest cost per ton.

Where it is applicable, Link-Belt Conveyor Slope Haulage has the advantages of high capacities . . . low-cost-per-ton of coal handled . . . uniform delivery . . . low maintenance cost . . . less wear and tear on mine cars.

Of an installation transporting 6,000,000 tons in a little over five years, (four 48" belts in tandem, 2600' from mine bottom to tipple), a mine executive said, "The performance of these conveyors has been most satisfactory, with no major breakdowns and a very satisfactory maintenance cost, and we have had no replacements of any major items of machinery or structure. And the conveyor belts proper are in excellent condition." Have a Link-Belt engineer give you the complete story.



LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

10,286

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT