COAL AGE

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

SYDNEY A. HALE, *Editor*

New York, April, 1933

Freedom—and Opportunity

BITUMINOUS COAL was the first industry to have cooperative efforts banned by a strictly legalistic construction of the Sherman anti-trust act. Now, after an interval of over forty years, this same industry, in Appalachian Coals, Inc., creates a cooperative agency which invokes the most significant liberalization in judicial interpretation of the law since the Supreme Court of the United States enunciated the famous "rule of reason" doctrine in the *Standard Oil* and *American Tobacco Co.* cases in 1911. The decision of this same court in the *Appalachian Coals, Inc.*, case, handed down March 13, once again brings this statute into step with present-day economic conditions.

Two somewhat general and vital conceptions of the law go by the boards in the realistic opinion written by Chief Justice Hughes. The frequently voiced criticism that a single corporate entity, which was itself the outgrowth of actual physical and financial integration of formerly independent and competing units, had a freedom of action denied to groups of producers acting in concert but still retaining individual identity and independence is definitely read out of court as without basis in law or in fact. Attempts by such group agency to increase prices, where monopolistic oppression is absent and where such increases are a necessary part of an honest endeavor to ameliorate destructive competitive and uneconomic trade practices are not forbidden by the law.

Broad as this new charter of freedom for cooperative effort is, it is not a blanket license to violate the fundamental purpose and the underlying spirit of the law. Neither is it a cloak to cover monopoly. Each case, insists the court, must stand upon its own bottom of facts, and "realities must dominate the judgment." In applying the test to Appalachian Coals, Inc., for example, both the economic plight of the industry and the impossibility of the producing group embraced in this particular regional agency monopolizing markets or controlling prices are specifically emphasized. Obviously, therefore, where these possibilities do exist, a cooperative selling agreement—even in framework similar to that of Appalachian Coals, Inc.—would suffer the same condemnation meted out in the *Addystone Pipe* and *Trenton Potteries* cases.

Whether or not it was so intended, in giving the coal industry the right to work out its rehabilitation along paths of its own surveying, the court has definitely challenged the industry to vindicate its own leadership. Not alone the particular group embraced within the membership of Appalachian Coals, Inc., but leadership in every other district must face the test. But leadership can be successful only if adequately supported. There may be glory, but there certainly is no profit, in captaining lost causes. The leaders in the regional selling agency movement have set their objectives high. No coal man can seek to frustrate the achievement of those objectives without jeopardizing his own future and the future independence of the industry.

Gander Sauce

THAT the United Mine Workers should not be happy over the decision of the Supreme Court in Appalachian Coals, Inc., is not surprising, since the court's approval of the regional sales agency plan reduces the legislative bribe offered producers in the Davis-Kelly bill to a zero value. In a statement disclaiming hostility to joint selling agencies as such, issued from Washington a few days after the decision was announced, the union reiterates its ancient plea that it is essential that the government regulate such agencies "as a protection to the

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public and to the men who work in the mines." But nothing is said in this statement nor in any of the bills indorsed by the union about the necessity of protecting the public and the industry from uncontrolled organized labor. If the union is to dictate the terms of a possible federal regulation of the producer, it seems only fair to invite the operators to specify the terms and conditions under which labor may enjoy the privileges of such control.

Coal and Beer

"BEER PROSPERITY," which is reported to have given many low-spirited industrial enterprises a new lease on life, promises little for the coal producer. Even in the foaming heyday before the great official drought, brewery consumption of fuel absorbed less than one per cent of the normal coal output. Since then the efficiency expert has been busy; today coal consumption per barrel of brew in some modern plants has been cut in half. Indirect increases in railroad fuel consumption and in the coal requirements of manufacturers supplying the breweries with equipment enter into the picture to a minor extent. A few mines will benefit materially, but the effect on the industry as a whole will not be appreciable. So it looks as if the coal man's enjoyment of 3.2 brew will have to be more personal.

Better Roadbeds

CONCENTRATION of operations, larger capacity mines, heavier rolling stock, and the need for certainty of operation when supplying transportation to mechanical loaders are four of the factors that have made better roadbeds imperative. When the volume of traffic passing over any given road was low, and when the roads were numerous because of a lack of concentration of operation, the cost of good roadbeds would have been entirely out of line with their advantages, but today, with a decreased mileage, heavy loads and long trips, only good track is worthy of consideration, especially in view of the fact that with concentration a derailment now causes more loss of tonnage than it did when coal was coming from many points.

With further mechanization, the use of heavier cutting and loading units, and the installation of heavier rolling stock, still further improvements in roadbeds are presaged. Large cars were a disadvantage when man and mule power were used for loading, and the cost of such equipment was prohibitory so long as car-haulage distribution and gathering were slow and the cars were loaded with distressing slowness by hand labor. Mechanization, which makes the loading of a big car easier than the loading of a small one, formerly the preferable car to load, makes large cars mandatory and better track must follow. The growth in cars has not reached the period of diminishing returns, and consequently improvements in track may safely be expected to continue.

Coal Heats by Radiance

IN A NORMALLY BURNING coal furnace visible heat, or rather heat that would be visible if it were not for the environing walls, is emitted only from the lower part of the fire bed. Above that point, convective heat is passing among the black coals, and radiant heat from the combustion below impinges on the coals from their underside, but they radiate it from their efficient black surfaces to the water ring almost as fast as they receive it. This is evident; otherwise, the gases escaping from the top of the fire would not be so cool as they usually are, often not hot enough to cause any discomfort when a hand is thrust into them. This passage of heat by infra-red radiation makes an important contribution to the efficiency of the furnace.

Whether radiant heat has a power of projecting itself through iron or other opaque substances as is does through transparent substances is not clear. That heat goes through ice like light has been shown by molding ice into the form of a condensing glass. Exposed to the rays of the sun, the ice causes the rays to focus and set fire to tinder placed at the focal point. Evidently the sun's heat passes through the ice and is not conducted from layer to layer, for long before the rays could be thus conducted and could raise the ice to a temperature that would ignite tinder it would be entirely melted.

Apparently radiant heat—the leading factor in the use of coal for domestic heating—does not act like convective heat, and its powers of penetration at various temperatures may profitably be studied. The results would explain why oil and gas are so much less efficient than coal in the ordinary domestic furnace.

ENTRY-DRIVING MACHINES

+ Advance 50 Feet a Day

At New Orient Mine

By JOHN R. FOSTER
Superintendent, New Orient Mine
Chicago, Wilmington & Franklin Coal Co.

and ALPHONSE F. BROSKY
Consulting Editor, Coal Age

BECAUSE the mining law of Illinois will not allow any men save shotfirers in a mine while coal is being blasted it is seldom feasible in that state to advance any one heading more than one cut every 24 hours—or 7 ft. by shortwall cutters and 9 ft. by track-mounted cutters. Patently, a mine the size of New Orient, located at West Frankfort, Ill., operated by the Chicago, Wilmington & Franklin Coal Co., and producing 10,000 to 13,000 tons per 8-hour day by mechanical loading, must drive main entries and cross entries at a faster rate if economies are to be realized from the concentration in the opening up of new producing territories. At a slow rate of entry advance, the primary entries would have to be started long before they were put into use, in consequence of which the maintenance cost during the interim would be quite high.

This problem was solved at New Orient by the installation of two McKinley entry drivers which advance now on an average of 50 ft. per day in one 8-hour operating shift each, including all lost time due to breakdowns. Since their installation, late in 1927, these two machines together and to date have driven 50,530 ft. of heading in 683 working shifts, each linear foot yielding 3.08 tons of coal. In addition to this, the crew in attendance accounted for the shoveling of 4,917 ft. of crosscuts. Altogether, the production by the crew on the two machines in the period amounted to 170,472 tons.

Due to the rate of advancement, the two machines are operated in parallel, or one in each of two adjoining entries. In a three-entry system, one is placed preferably in the aircourse, the other in one of the returns, and the third entry is driven by loading machines at such time as the panel development is undertaken along the cross entry. Should the system be a main entry of either four or six entries, the machines are used in the aircourses and the remaining entries are driven either by loading machines in a series of head-off sections at intervals of approximately 300 ft., or, if the time permits, the machines are brought back and the remaining entries driven up to a par with the first two.

A cross-section of the entry cut out by the machines is shown in Fig. 1. The paired machine-driven entries, each 12 ft. 2 in. wide, maximum, are spaced on 32-ft. centers, which leaves a rib of

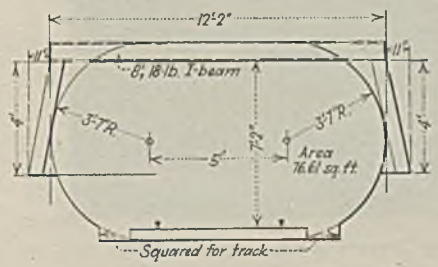


Fig. 1—Where Weak Roof Is Encountered, Steel Collars Are Set on Legs Hidden in Hitches in the Ribs.

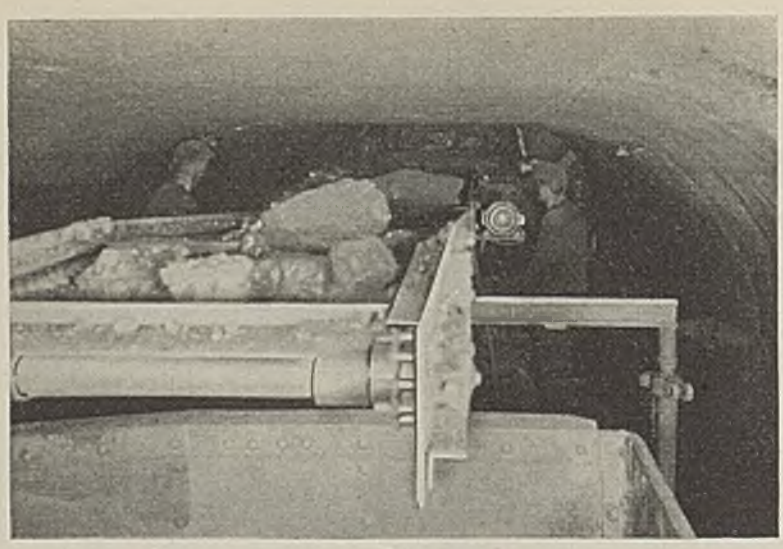
only 20 ft. These narrow centers permit a crosscut to be put through in three cuts—in two shifts in one day, if necessary. Usually a crosscut is mined by cutting in both sides of the rib, loading by hand.

Crosscuts are turned on 110-ft. centers instead of the usual spacing of 60 ft. This convenience is made possible by the use of pressure blowers and tubing. Two blowers are provided and operated alternately with each move up, the provision being that the blower in operation is not stopped until the companion unit is set up and started in the advanced position. The arrangement is indicated in Fig. 2. The blowers are equipped with ball bearings. At capacity each passes 6,000 c.f.m. The outlet is 16 in. and to it is fitted a Y which splits the air two ways for two 12-in. tubing lines which are carried to the faces of the two entries on messenger wire stretched along the ribs.

Installation of the blowers is made in the intake, which is swept by a current of 15,000 to 20,000 c.f.m. at the last open crosscut. And, in order that the danger of recirculation be avoided, the blower in operation is installed 30 ft. outby the last crosscut. Incidentally, the tubing is never extended more than 250 ft. from the blowers. By the time that the machines have advanced this distance a new crosscut is driven and ventilation again advanced.

Three motors operate the entry driver, the largest being 100 hp., which, at 460 r.p.m. through bevel and worm gears, drives two rotor bars. At the center of this bar is a pilot bit and on either side are cutter bits, 1 ft. long, which cut concentric kerfs. These bits are followed by bevel rollers which wedge out the coal between the kerfs. As the two rotor arms overlap, they leave at the top and bottom triangular sections of coal which are removed by cutting chains on wedging cutter bars. These cutting chains are driven by the main motor. Loosened coal is carried to the center by buckets on the ends of the rotors, whence a conveyor picks it up and deposits it in cars at the rear of the machine. This conveyor is powered by a 15-hp. motor.

A third motor, of 5 hp., is used to drive a hydraulic pump which provides pressure to a main jack for forcing the machine into the face of the coal, and to smaller jacks for adjusting the level of the machine to conform with the seam topography. The main jack is anchored by arms hitched in the ribs. Gradients as great as 17½ per cent have been encountered by the machines; when heavy ascending grades are encountered the machine must be blocked



Close-up of the Machine in Operating Position. About 51 Per Cent of the Coal Produced by This Machine Is Larger Than 2 In.

Curves Can Be Turned With the Entry Drivers With Almost as Much Facility and Smoothness as in the Advancing of Straightaways.

This Method Assures Straight, Smooth Ribs and Arches Which Generally Hold the Roof Secure Without Timbers.

while the thrust jack is being reset; otherwise, the machine would roll back, because of its own weight.

The hydraulic pump can be operated to exert a pressure of 3,000 lb. per square inch. At this pressure it would advance the machine at the rate of 5 lin. inches per minute; but this speed places too much strain on the machine. Consequently, the pump has been adjusted to kick off at 2,200 lb., which pressure advances the machine at the rate of 3 in. per minute.

High-speed tool steel is used for the cutter-arm bits. These are shaped on the triphammer and sheared hot. Common bits are used on the cutter chains. To change all the bits requires about 40 minutes, but only those needing change are replaced during the working shift.

To move the machines, the propellers are first thrown out of time; the 1-ft. extension on one end of each propeller is removed to provide clearance along the ribs when the machines are mounted on flanged wheels; the trimmer chain cutter bars are entirely removed, together with a 10-ft. section of the loading conveyor at the rear of the machine. Thus partially disassembled, the machines are readily moved with the assistance of locomotives, in the same manner as the hauling of a loaded car. This operation of disassembling, moving and reassembling requires three shifts.

It is the general practice throughout the mine to leave at least 9 in. of coal to hold the roof in entries. The drivers lend themselves to this provision as they cut an opening 7 ft. 2 in. high. As no explosives are used in the operation, and as boring leaves arches at the top and bottom, the roof is not disturbed. Timbering is reduced to a minimum, and the roof under normal conditions may stand for many years without falling, which lends great advantage to the use of the machine in opening aircourses. Where slips in the roof are encountered, timber sets are placed in step with the advance of the machine. Details of this timbering are shown in Fig. 1. Incidentally, due to the fact that the bottom at New Orient is of fireclay, about 8 in. of coal is left for the support of the machine while advancing.

Because the entry drivers are relatively heavy consumers of power, they are operated on the night shift. Feeders of 1,000,000 circ.mil in 1,000-ft. lengths are extended as needed from reels on cribs. These cables are hung from the ribs. The permanent cable is never more than 300 ft. from the advancing faces and power is taken to the machines through Dossert connectors and by trailing 250,000-circ.mil rubber-covered duplex cable. Protection from short circuits is provided by two

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STRIPPING OUTCROPS

+ Insures Complete Coal Recovery

At Kingston Collieries

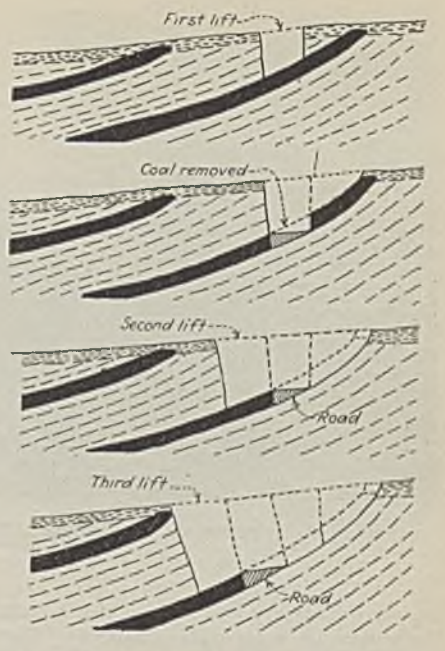


Fig. 1—Diagrammatic Plan of Typical Outcrop Stripping

OPERATING the Kingston and Gaylord collieries near Wilkes-Barre, Pa., the Kingston Coal Co., in common with an increasing number of anthracite companies, is using stripping as a means of completing the recovery of coal under thin cover and along outcrops. In many cases, the Kingston stripping program is being supplemented by driving slopes down from the strip pits to recover pillars partially mined out and abandoned in earlier days.

The veins worked by the Kingston Coal Co. slope up to the surface west of the Susquehanna River. While the average rise is approximately 10-12 deg., the veins frequently turn up sharply at the outcrop. Deep-mining operations originally were extended up the beds to the point where the solid rock roof petered out and the Buried Valley wash, a characteristic of the Wyoming Valley coal field, came in. As a result, much good coal was left in place, and is now being recovered by stripping, though, where the overburden is not unduly thick, operations frequently are extended down into the pillar areas under the rock roof.

The outcrops of the various veins at the Kingston collieries are roughly parallel, as shown in Fig. 5, a map of part of the stripping work at the Gaylord colliery. While the output from strippings and their auxiliary underground projects fluctuates from time to time in accordance with the number of operations, the average output during the winter months was 200 gross tons per day. The work will be continued until all available coal that can be reached by this method is recovered.

Preliminary work in preparing for stripping consisted of the preparation of maps showing the workings near the outcrops of the various veins. Well drills were then employed to ascertain the boundaries of such areas as were sufficiently close to the surface to make stripping feasible. With these facts determined, the tonnage possible to recover was estimated and the areas to be worked were determined as a basis for drawing up working plans. In general, the areas to be stripped were uninhabited, with the exception of a few dwellings, thus eliminating the possibility of any marked interference from that source. As the dip of the surface usually was only slightly at variance with the dip of the veins, the cover frequently shows little change in depth over comparatively large areas, thus extending the possible recovery.

Due to the character of the work, the absence of large basins and domes renders inadvisable the use of large shovels or draglines; 1½- or 2-yd. diesel-driven power shovels are used almost exclusively, and much of the overburden is hauled away by trucks and tractor trucks. The typical plan of work consists in taking successive lifts of overburden along the outcrop, as indicated in Fig. 1, until the height of the remaining wall becomes too great for further operation. Ordinarily, operations with stripping equipment are abandoned when the thickness of the overburden exceeds approximately 50 ft. Further work, if done, is confined to slope mining. With some exceptions, there is little opportunity for casting, though where the interval between two beds is not too great, it is possible to cast the spoil from the upper bed into the pit made in recovering the lower (see Fig. 1).

Occasionally, as shown in the Red Ash vein in Fig. 2, the dip of the vein changes suddenly to form an anticline near the surface. Where this happens, as in the Bennett vein in Fig. 5, a single stripping may include considerable surface area and take on some of the aspects of stripping the more common canoe-shaped basin, though, of course, the lie of the coal is reversed. Where dome-shaped anticlines are encountered, they are developed by driving a box cut at the high point, and then working down the sides until the overburden becomes too thick for further operation. Fig. 5 shows the start of a box cut to reach an anticline in the Red Ash vein at Gaylord colliery.

In general, the surface material consists of a layer of wash varying up to about 50 ft. in thickness. In many cases, however, the wash may be very thin or entirely absent. Blasting, of course, is not necessary in stripping the wash, but where the rock comes to the surface, or where the work is carried down into

Fig. 2—Profile of Coal Beds at the Gaylord-Dodson Collieries Along the Gaylord Red Ash Slope

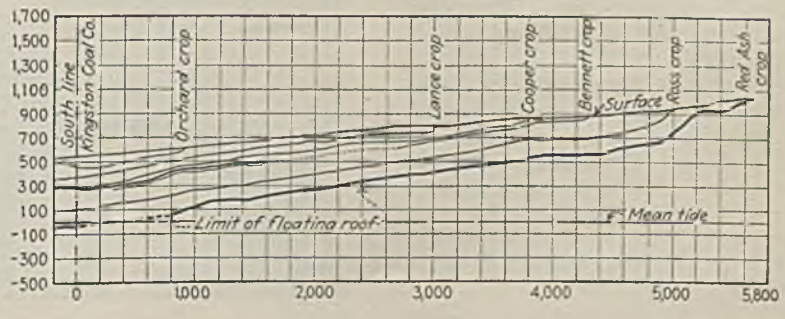


Fig. 3—Stripping the Orchard Bed, Kingston Colliery

Fig. 4—Stripping Wash Over the Lance Vein, Kingston

it, well drills are employed and the rock is broken up with high explosives. The coal uncovered is drilled and shot, and then is loaded with the same shovel that removed the overburden.

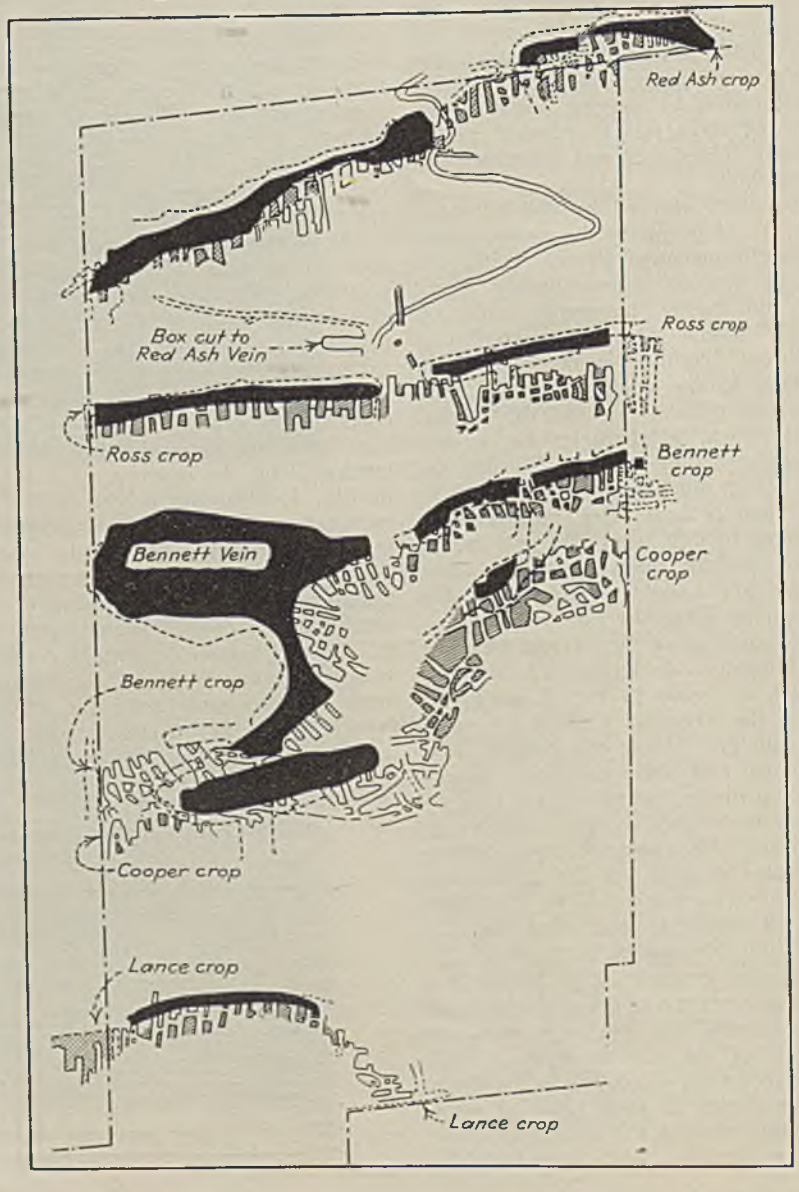
In view of the fact that outcrop strippings by nature extend for considerable linear distances and casting opportunities are relatively few, trucks and tractor trucks may be the most feasible means of hauling away both the overburden and the coal. Their use at the Kingston strippings was facilitated by the absence of steep grades, both on the surface and down along the veins. The Athey "Truss-Wheel" tractor trucks help out where much rock must be handled or where the overburden must be hauled out of the pits over more than usually steep grades.

The trucks employed generally are equipped with six pneumatic tires, two in front and four in the rear, though a few trucks with four double-tired wheels in tandem at the rear are used in difficult places. With four or eight tires on the rear wheels, these trucks are able to operate in mud or snow without great difficulty. However, quicksand occasionally is encountered, making the construction of heavy corduroy roads necessary.

In the auxiliary slope mining, the coal is brought out on a narrow-gage track in a small buggy pulled by a small portable hoist. Ordinarily, this work is not extended down more than 300 ft., though some slope mining has been extended 500 to 1,000 ft. down the bed. The coal is dumped into a temporary bin at the top of the slope, and later is hauled away in trucks.

The various Kingston projects are let to contractors, who are paid in accordance with the tonnage of coal delivered to the breakers. Early in 1933, the list of contractors included the following: Plymouth Excavating Co., Kingston Stripping Co., Wagner Contracting Co., Morgan & Mathers, and Thomas M. Kearns.

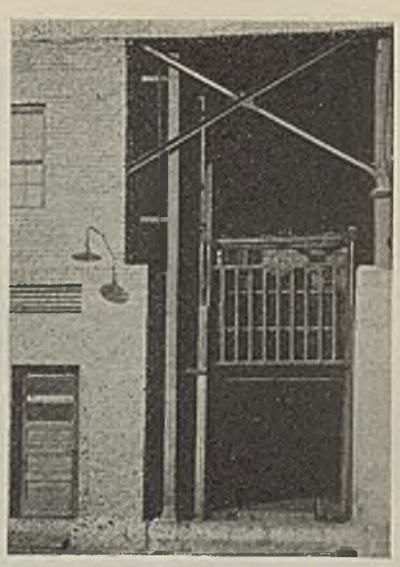
Fig. 5—Plan of Gaylord Colliery Stripping Work



OFFICE-TYPE ELEVATOR

+ Installed in Man Hoist

At Caples Mine in West Virginia



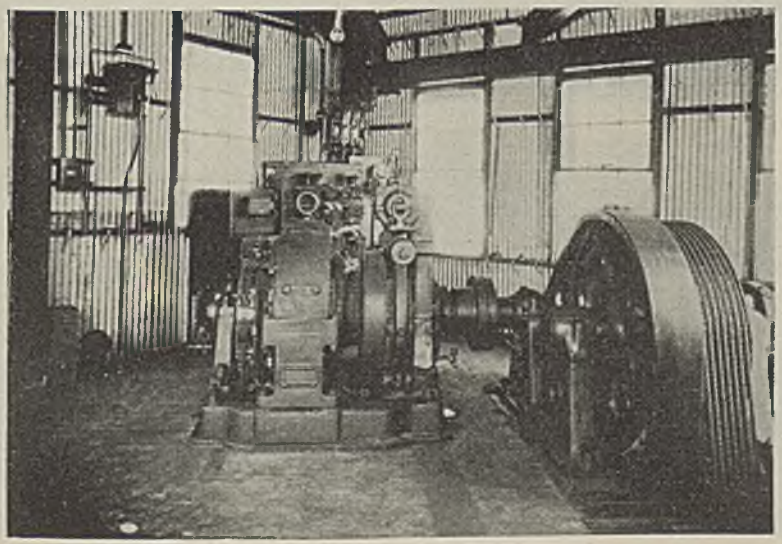
Cage at Ground Landing; Lamphouse at Left

SAFETY is the foremost consideration in selecting equipment for passenger elevators in buildings, and the same consideration holds true in equipment for man hoists at mines. In both cases, the problem is to carry men up and down at reasonable speed, at minimum expense and with maximum safety. Is there any reason why the standardized and highly developed office-building elevator equipment cannot be used at a coal mine? Officials of the New River & Pocahontas Consolidated Coal Co. decided the answer is "No," and installed a high-speed automatic-leveling passenger elevator at the Caples mine, near Welch, W. Va.

This mine, with a shaft depth of 347 ft., had been operated for many years without an auxiliary hoist. It was decided to enlarge the fan airshaft and install a hoist for handling men and materials. A conventional installation would have called for a headframe, a hoist house located 50 ft. or more from the shaft, and the usual hoist operation by an engineer stationed in the hoist house. With office-building elevator equipment the hoist could be located directly above the shaft, a lamp house built adjacent to the side of the shaft and the controller placed in the lamp house at a window commanding a view of the surface landing, so that the lamp house attendant could operate the elevator and supervise the loading during hours when traffic did not demand a second man. This plan was adopted and standard equipment of the Otis Elevator Co. selected for the job.

The elevator is of the traction type, has a capacity of 10,000 lb. live load, and operates at 450 ft. per minute. Equipment includes all of the safety and control features of the high-speed elevators in offices today. The landing and leveling are automatic; the control includes micro operation; and a speed-regulating governor takes care of safety features, including setting of the car safety dogs to grasp the steel guides and stop the travel within a few feet in case of overspeed. A flyball governor is located above the shaft in the elevator room and is driven by a separate cable with ends attached to top and bottom of the car and forming a belt or loop over stationary sheaves at top and bottom of the shaft.

Operating Machinery Is Located Directly Above the Shaft



The elevator hatchway is a compartment of the airshaft which was enlarged and concreted all of the way. Since it is used as an additional intake airway, the roof and floor of the car are built of subway grating to reduce air resistance. Dimensions of the cage platform are 6 ft. 8¾ in. postwise and 13 ft. 8 in. front to back. Built into the platform is a 48-in. gage track with dogs providing for handling mine cars. The tops of the rails are flush with the floor. As yet the elevator has been used only for handling men but it is the plan to build a surface track from the shop and supply yard to this auxiliary shaft to handle mine supplies.

Clearance from platform to top is 8 ft. 6 in. Two sides are inclosed with sheet steel to a height of 6 ft. Above these and across the top is a ½-in. mesh galvanized grille. Copper-bearing steel is used wherever practicable in the car construction and in the shaft itself. Ends of the car are protected by vertical-lifting counterbalanced metal gates. The same type of gate protects the ground landing when the car is below. Twenty men is the capacity as designated by the State Department of Mines. Electric limit switches located in the shaft are gasproof construction. All control switches, except the automatic leveling switches, are located at the top of the shaft.

Seven 1-in. ropes suspend the 12,000-lb. cage and the 18,000-lb. counterweight. These ropes have approximately 180-deg. contact arc on the elevator drum. To counterbalance the weight of the ropes, a pair of chains hang with ends connected to the bottom of the car and to the bottom of the counterweight.

The hoisting machine consists of a

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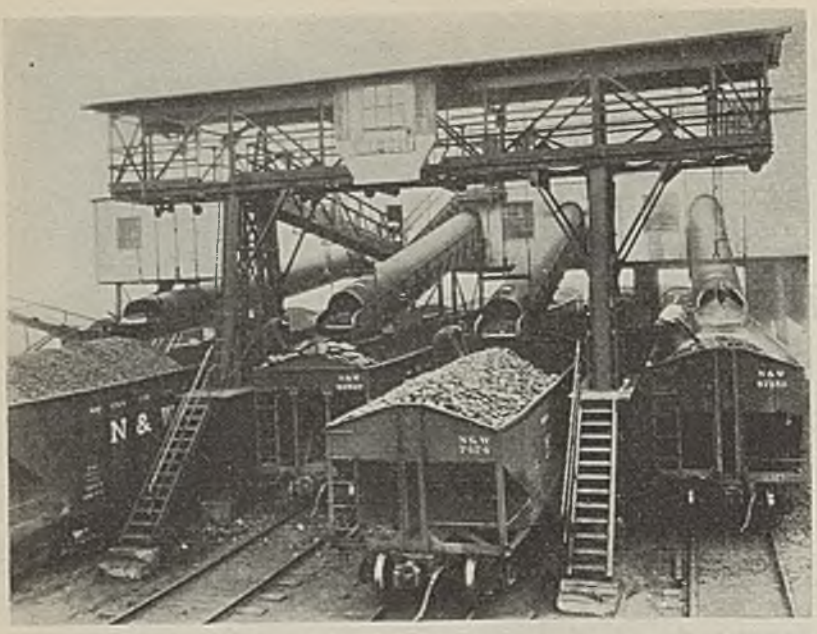
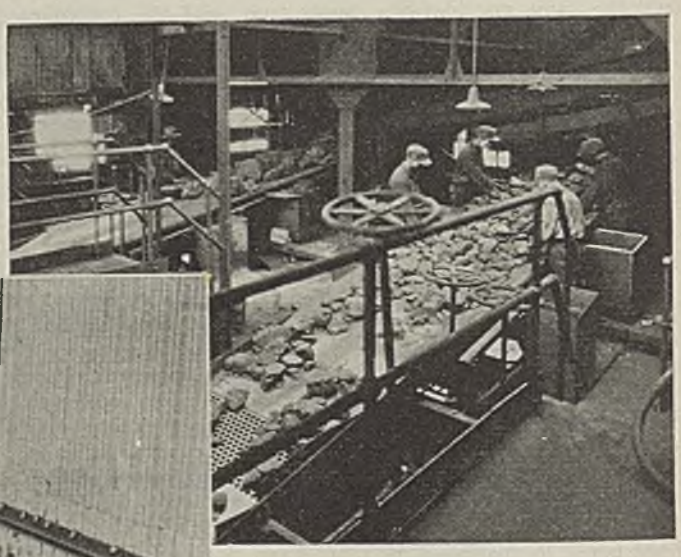
QUALITY

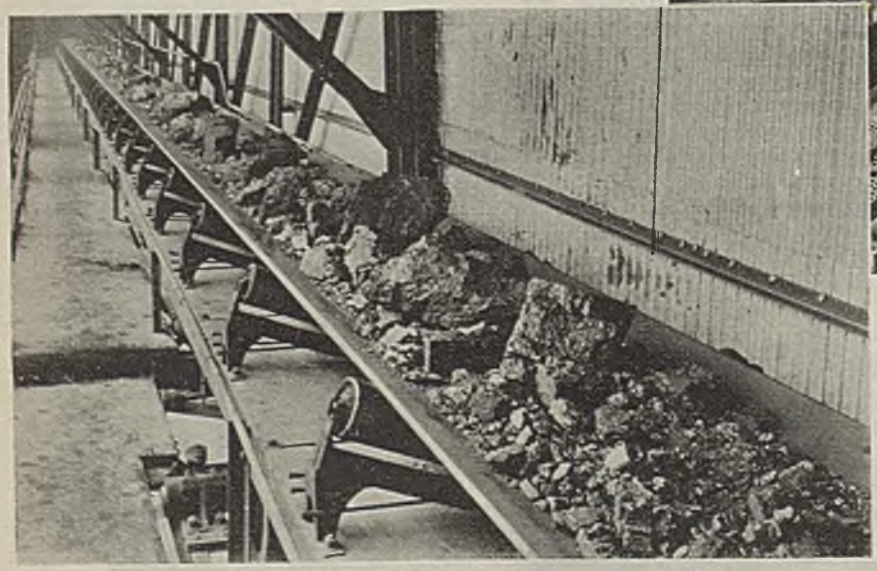


Even the Nut (Left) Is Loaded by Boom to Prevent Degradation. Dustless Treatment Is Being Applied to the "Stove" (Right).

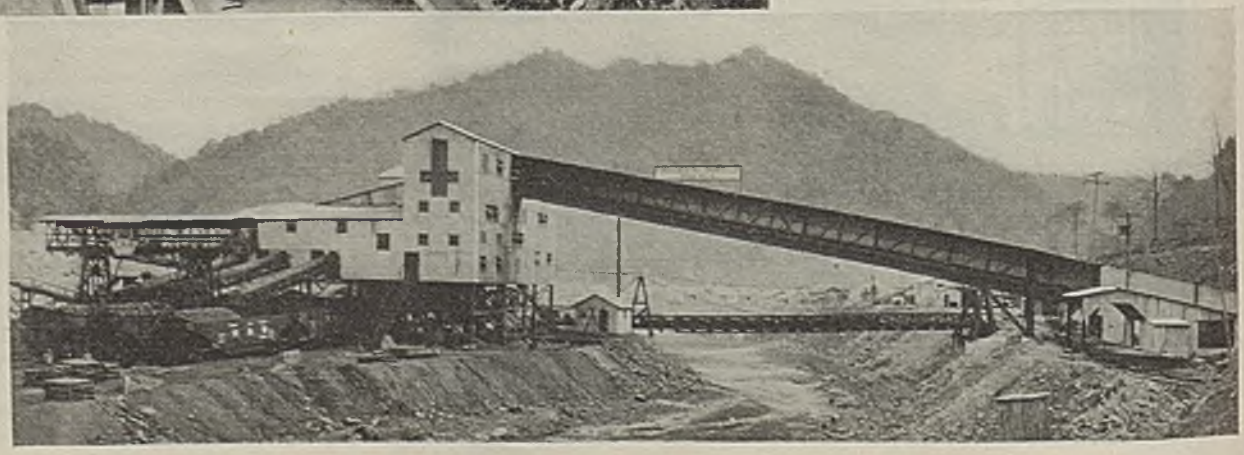
Lump and Egg Sizes Are Hand-Picked on Separate Tables and Degradation Is Removed on Rescreens at the Ends of the Tables.



"Flowing" Expresses This Noiseless and Vibrationless Transportation of Coal Out of the Mine and to the Preparation Plant.



General View of the $250,000 Preparation and Loading Plant.



AND UNIFORMITY

+ Are Watchwords at New Mine

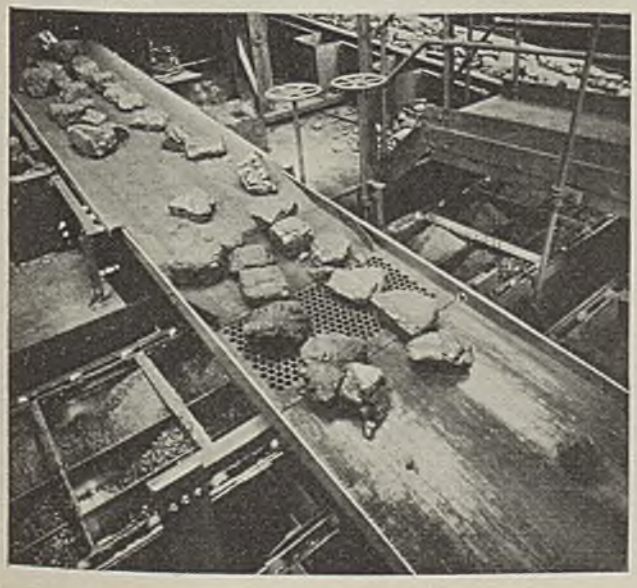
Of Pond Creek Pocahontas Co.

By J. H. EDWARDS
Consulting Editor, Coal Age

WHAT WERE the unusually favorable conditions and contemplated advantages that influenced an experienced company to open a new coal mine during 1932? It is certain that the coal buyer was given first consideration; hence the plan must have included a high quality and superior preparation. The No. 4 mine of the Pond Creek Pocahontas Co. was opened in March, 1932, and shipped from Bartley, McDowell County, West Virginia, 400,000 tons of Pocahontas coal during the first ten months of operation. Present capacity is 900,000 tons per year.

This company first started to operate in the Pocahontas field in 1923, and each year since then has increased production. In 1930, the output exceeded a million tons, and in 1932, with the new mine operating only a part of the year, total production was 1,500,000 tons. The coal is distributed by the Island Creek Coal Co., which was organized back in 1901 and now maintains offices in Cincinnati, Boston, New York, Detroit, Norfolk and Cleveland, and in addition has the Globe Coal Co. as sales representative for the Chicago district; C. H. Sprague & Sons Co., Boston, sales representatives for New England; and F. P. Weaver Coal Co., Ltd., Montreal and Toronto, sales representative for Canada.

The location of the new mine is on Dry Fork Branch of the Norfolk & Western Railroad and not over ten miles air line from Welch, W. Va. Here, in a valley guarded by pine-covered mountains, now stands a modern preparation plant and an employees' town in a spot which less than two years ago had remained as nature fashioned it. Approximately $900,000 has been invested to mine, clean and size the smokeless coal lying 150 ft. below the present level of the creek bottom. This coal, in the Beckley seam, averages 48 in. in thickness and is free of any regularly occurring impurities. High carbon and low volatile content make it an excellent domestic fuel.

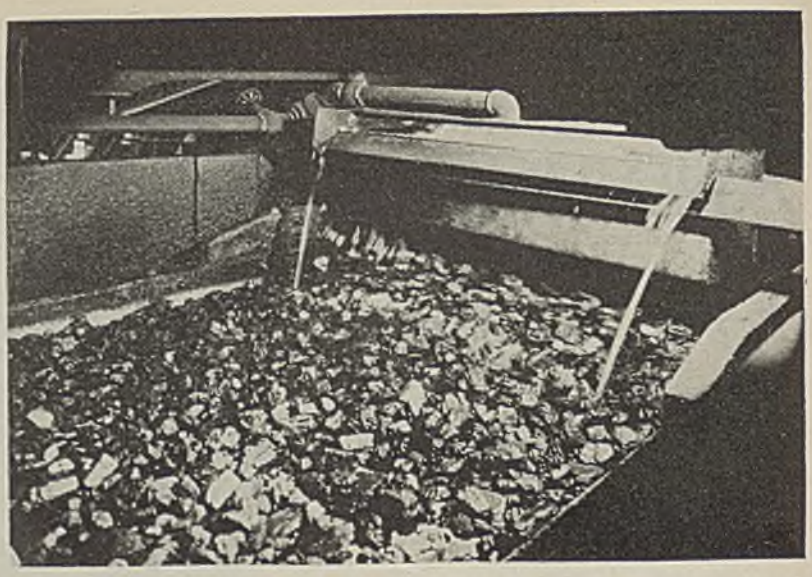


Another View Showing a Rescreen and, Below It, the Three-Compartment Conveyor Carrying Slack, Pea and Nut.

In planning the No. 4 mine, the company had the advantage of up-to-the-minute operating, preparation, and sales experience in an exactly similar coal, so that the management knew just how to proceed and knew wherein lay any possibilities for improvements and refinements in preparation methods and equipment. The coal from this similar development, the No. 3 mine, which was opened with a strictly modern plant in March, 1930 (see *Coal Age*, Vol. 35, p. 515), met immediate favor in the markets. In 1930, the No. 3 mine produced 450,000 tons; the next year, 700,000 tons; and in 1932, 765,000 tons, an average of 58,000 tons per month since the start.

The tract selected for the new mine immediately adjoins the earlier development and consists of 1,800 acres of coal purchased in fee from the Pocahontas Coal & Coke Co., a land-holding organization which leases to operating companies the land or mineral from which a large percentage of all Pocahontas coal is mined. Including the new tract, the Pond Creek Pocahontas Co. now has available for mining approximately 11,000 acres of Pocahontas coal.

To preclude any possibility of mistake, the No. 4 mine acreage was exceptionally well prospected by diamond-drill test holes. Approximately $50,000 was spent on this drilling. Below the coal bed, which lies practically level, is a firm material which provides a hard bottom—a very desirable characteristic for clean and efficient mining methods. Above the coal is a hard sandrock which forms excellent top and one which does not dribble impuri-



Every Vestige of Sludge Is Removed by the Curtain of Water on Sizing Screens.

ties into the coal. It was decided to conduct the mining according to the accepted room-and-pillar method, undercutting the coal with 50-hp. electric mining machines and hand loading into high-capacity modern steel cars.

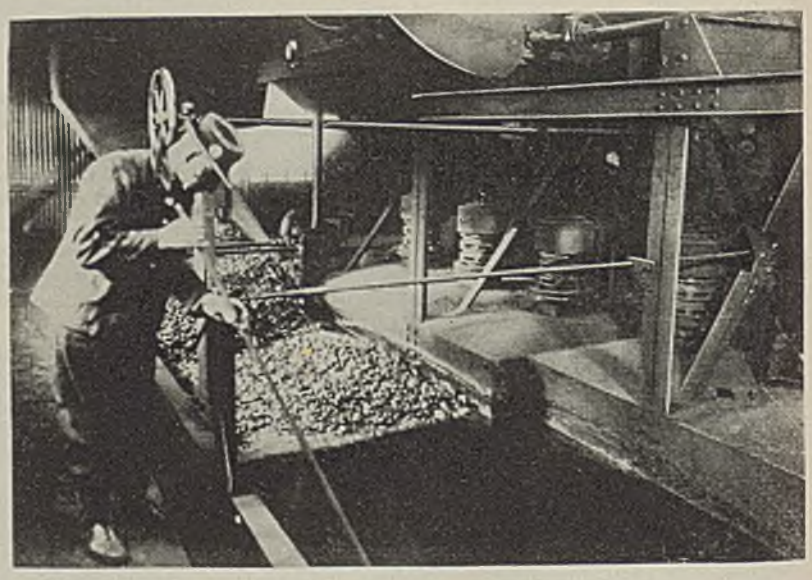
The coal is reached by a sloping tunnel driven down through solid rock. This slope dips at an angle of 18 deg. and is 509 ft. long. Haulage of the coal from the mine bottom to the preparation plant is by a belt conveyor installed on this slope, and represents one of the most efficient transportation methods known. Without noise and without being subjected to any vibration or wear, the coal is moved 800 ft. from the car-dumping point down in the mine up to the top of the preparation plant on the surface. The 1,600 ft. of rubber belt, 42 in. wide and $\frac{7}{8}$ in. thick, was shipped by the Cincinnati Rubber Co. in one length and weighed over 14 tons.

In planning the preparation equipment to fill every demand, it was decided to make six grades of coal, one more than is made at No. 3, although this would entail an elaborate and more costly screening equipment in order to

Cabinets for Oil Cans of Mining-Machine and Locomotive Crews (Left) and Cabinets for Electric Blasting Caps (Right).

screen properly and put into railroad cars a product free from slack. The six sizes now being shipped from the completed plant are: $7\frac{1}{2}$-in lump, $2\frac{3}{4}$x$7\frac{1}{2}$-in. egg, $1\frac{1}{4}$x$2\frac{3}{4}$-in. stove, $\frac{1}{2}$x$1\frac{1}{4}$-in. nut, $\frac{1}{4}$x$\frac{1}{2}$-in. pea, and $\frac{1}{4}$-0-in. slack.

Although the coal has no regular impurity, a washer was included in the plant so that the coal buyer would be assured of perfect uniformity in all shipments. Since the decision to invest in the development of this property was based on turning out a product of the best quality possible and maintaining its uniformity to create and sustain the necessary buyer demand, management considered there was no alternative—a washer and one of the best, would have to be installed. Following these exacting requirements, a plant was designed which cost $250,000 including the railroad tracks serving it. An investment of $250,000 is not to be sneered at at any time; considering the low construction cost period in which the plant was built—work began Sept. 1, 1931—this represented an expenditure for preparation facilities materially above the average.



Coal Too Small for Hand-Picking Is Cleaned in the Washer.

The coal-preparation plant, designed to handle 350 tons per hour, was planned by the coal company officials working with the engineering department of the Island Creek organization. Details of mechanical design, fabrication and erection were handled by the Link-Belt Co., which furnished the equipment. The washer installed, the Link-Belt-Simon-Carves, represents one of the best available for the duty involved and is a type imported a few years ago from England, where it has met with great success in coping with the exacting European cleaning requirements. The size range being washed at No. 4 is $\frac{1}{4}$x$2\frac{3}{4}$ in. and the washer capacity is 150 tons per hour with allowable peaks of 180 tons per hour. The washer is of the six-compartment type, using air pressure to control the water pulsations.

Run-of-mine coal from the slope conveyor passes onto main shaker screens which separate the $1\frac{1}{4}$x0-in., the $1\frac{1}{4}$x$2\frac{3}{4}$-in., the $2\frac{3}{4}$x$7\frac{1}{2}$-in. egg, and the $7\frac{1}{2}$-in. lump. The lump and egg sizes go to separate picking tables where they are hand-picked on their way to the loading booms. At the end of the picking table the coal is rescreened to remove slack, and again at the end of the boom is rescreened to remove any trace of degradation which may have occurred between the end of the picking table and

the actual delivery point into the railroad car.

The 1¼x0 and 1¼x2¾ in. from the main screen pass to the fine-coal coal screens, where the ¼x0-in. slack remaining therein is removed preparatory to travel of the product to the washer. The process is an elaborate one in which the coal is separated for thorough screening and then reassembled. This fine-coal-screen installation consists of six screens with a total of ten decks and cost approximately $11,000 excluding structure.

From the washer the cleaned product goes to triple-deck washed-coal sizing screens where each size passes through a curtain of clear water which washes off all trace of sludge. All degradation material which goes through the ¼-in. openings with the water passes onto two pairs of dewatering degradation shaker screens fitted with bronze wedgewire decks having ½-mm. openings.

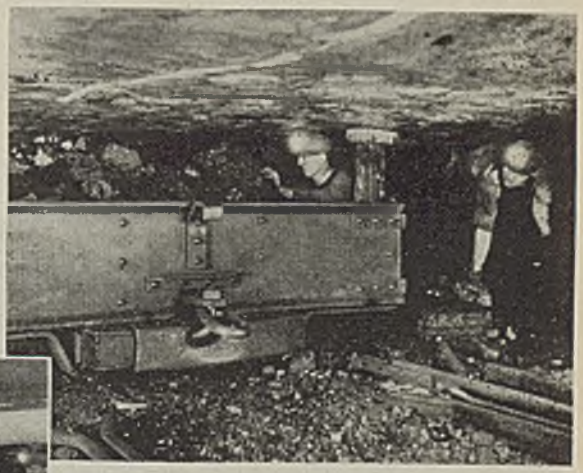
A notable feature lending simplicity to the plant is a three-compartment horizontal flight conveyor which carries the ¼x0-in. slack, the ¼x½-in. pea, and the ½x1¼-in. nut to the respective railroad-car loading points. This conveyor also carries the raw pea and raw nut from the primary screens to the raw-coal conveyor which empties into the washer surge bin. In addition, this same flight conveyor carries the degradation material from loading booms and picking tables to an elevator leading to the fine-coal screens. As a further duty, this conveyor can be utilized for certain operations in mixing sizes. There is, however, an additional horizontal mixing conveyor for assembling washed run-of-mine.

The three-compartment horizontal flight conveyor also may be used to carry the slack beyond the slack track loading chute and discharge this fine coal directly into a system of semi-portable extendible-type wood-frame belt conveyors leading to a 150,000-ton yard storage space paralleling the tracks. By use of an unloading plow on a main conveyor riding the storage pile, the pile is widened after being extended and built to height. With the exception of the main shaker screens, all screens of the plant are hung on ash boards and their driving arms also are of wood.

Control of the plant is handled by one man located in sight of all loading booms and chutes. He controls the movements of the cars and keeps the ends of the loading booms lowered to the minimum. An unusual feature and one typical of the great care exercised in preventing degradation is the use of a loading boom for the ½x1¼-in. nut, which size usually suffers degradation in chute loading. Not so at this plant. Even this small grade is babied in a fashion not dreamed of a few years ago. Two men are employed in topping off all cars other than those loaded with slack. To meet the demand of buyers who want dustless coal, each loading boom is equipped with spray nozzles for application of "Dustilize," a glycerine-base dustless chemical.

Methods and equipment on the inside of the mine are typical of the latest proved practices. The coal is undercut by five Jeffrey Type 35BB permissible electric shortwall mining machines. Transportation of the coal from the working face to the mine bottom is handled by 300 mine cars which stand only 28 in. above the rail but have a 100-cu.ft. capacity. These cars are the lift-endgate stub-axle type, all steel, 6x10 ft. inside dimensions, and are fitted with Timken bearings. One hundred of the cars were made by the American Car & Foundry Co. and the rest by the Enterprise Car & Foundry Co. Mine track is kept about a car length short of the working face and the car is run off the end of the track when spotted for loading, thus providing the maximum of convenience for the loaders. Rail ends are fitted with jumpers to guide the car wheels back onto the track when pulled away by the gathering locomotive.

Five Jeffrey 6-ton cable-reel gathering locomotives, only 23½ in. high and rated 4 miles per hour, gather the loaded cars and assemble them into



Loaded Car Ready for Pulling. Note Car Jumpers on Ends of Rails.

The Locomotive Has Arrived to Pull the Loaded Car From the Face and Replace It With an Empty.

Undercutting Is Done With 50-Hp. Electric Machines. The Mine Has the Natural Advantages of a Clean, Level Seam, Hard Bottom and Firm Top.

trips for the main line. The latter haulage is handled by one unit consisting of two 8-ton Jeffrey locomotives coupled in tandem and equipped with air brakes. The main-line tracks are laid with rails weighing 60 lb. per yard.

The mining at present consists entirely of driving headings and developing territory for the room-and-pillar extraction to follow. Two loaders work in each place and a new cut of coal is prepared immediately after the face is cleaned up; in other words, the cycles are continuous during the shift. Loaders average about 19 tons each per day, not as high as they would load if but one man were worked per place, but the system produces the high tonnage desirable from the limited territory available during development.

Meticulous and continuous inspection is one of the most important factors in turning out any superior product. To insure the maximum uniformity and quality, the Pond Creek Pocahontas Co. devotes special attention to an inspection of the coal in every step from the solid bed to the final loading into the railroad car. Two men, a shot fireman and a section foreman, visit each working place many times during a shift. Approximately twenty minutes is the longest time between visits by one or both. These men check the undercutting, handle the breaking down of the coal with permissible powder, and supervise the loading into the mine cars. Another man, termed an inside coal inspector, with duties extending over the whole mine, spends his entire time in general supervision and inspection of the first steps, including loading into the mine cars. Other officials, including the mine foreman, the superintendent of mines and the manager, make frequent visits to the working places.

Above ground at the mechanical preparation plant, there is another full-time coal inspector who supervises the hand picking and superintends the loading into the railroad cars. One of his set duties is to be present at the loading boom when cars of dustless coal are being loaded. He sees that a complete and effective treatment of the "Dustilize" is applied by the sprays located at the end of the boom. Still another man, the preparation plant foreman, spends much of his time on coal inspection. Nothing is left undone to supply the most exacting customer with the finest product possible and to insure complete uniformity from top to bottom of each car shipped.

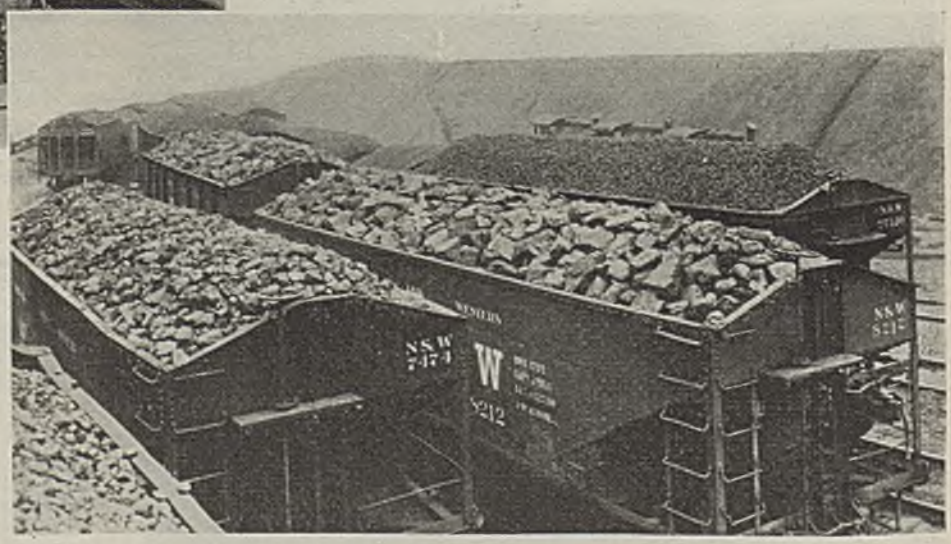
"Be careful" is the regular greeting between officials and men when officials visit the working places in the mine. As an official or any visitor approaches the working place the men there employed call out, "Be careful," and are answered in the same language by the one approaching. The same exchange forms the parting greeting. Safety is made a consideration in every operation. Edison permissible electric cap lamps with magnetic locks are used by all men entering the mine.

Air in large quantities is circulated to each working place, and by means of line brattices is forced to sweep to the very ends of the headings. The driving force is a Jeffrey 10x5-ft. fan located on the surface at an airshaft not far from the preparation plant. This fan and all other mine equipment is operated by power purchased from lines of a public service company. For the motors above ground, which are practically all Westinghouse, 440 volts and 2,200 volts alternating current are used. For the underground operations the power is 275 volts direct current, this supplied by a substation containing two General Electric 200-kw. synchronous converters.

It was mentioned that houses were erected for employees. The new town, post office named Raysal, contains 45 four-room houses and 35 two-room houses. The number suffices at present because the town is served by an all-weather road on which men can come from locations up and down the creek.

With No. 4 mine now in full swing, the Pond Creek Pocahontas Co. is producing 6,000 tons per day from the Beckley seam and 1,000 tons per day from the No. 1 mine, which works in the No. 4 Pocahontas seam. This puts the company in a position to supply a critical clientele with 2,000,000 tons of Pocahontas coal per year.

A Mine Car in the Cross-over Dump.



The Slack Storage, With Extensible Semi-portable Type Wood-Frame Belt Conveyor on Top, Is Seen in Background.

ANTHRACITE

+ Battling to Regain Lost Markets

Takes the Dealer Into Partnership—II

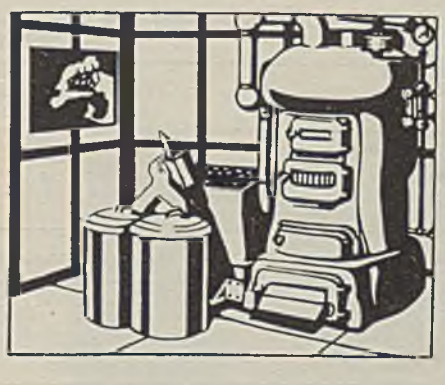
By IVAN A. GIVEN
Assistant Editor, Coal Age

IN THE first installment of this summary of the efforts of twelve anthracite producers and wholesalers to help their dealers sell coal, which appeared in the preceding issue (*Coal Age*, Vol. 38, p. 82,) two major activities were analyzed: (1) advertising and sales promotion work carried on by the producer or wholesaler as a background for the efforts of the individual dealer; (2) combustion, sales, engineering and management services made available to the retailer by the producer or wholesaler. The present, and last, installment deals with the third major activity of these concerns: advertising and sales promotion material developed by the producer or wholesaler for the use of the retail merchant.

The importance which anthracite producers and wholesalers attach to the preparation of sales promotion material for the use of the coal merchant is indicated in Table I, reproduced from the preceding article in this study, which shows in condensed form the salient points in the merchandising programs adopted by the twelve companies studied. Of the three classes of material supplied, newspaper advertisements and direct-mail pieces far outstrip the number of specially prepared radio programs for the dealer's use.

Out of the eight companies which supply newspaper campaigns to dealers, two limit their efforts to complying with requests from dealers. In these cases, each campaign is individual in itself, though one company has a few campaigns made up which it can supply when desired. One of these two companies requires the dealer to pay all the costs of the campaigns, whether specially prepared or supplied from the company's portfolio. This company also is one of the group which does not believe in tying the dealer up to the producer's trademark. All newspaper copy supplied by this company, therefore, emphasizes the fact that the coal which John Jones, the dealer, is selling is John Jones' coal. The other of the two companies shares the cost of such campaigns as it may prepare for its dealers.

Newspaper campaigns from the portfolios of the other six companies, as might be expected, vary widely in flexibility and scope, as well as in the number available. One wholesaler's campaign is based on weekly insertions for 30 successive weeks during the coal-burning season in communities where the company is represented by an exclu-



sive distributor. All advertisements are uniformly two columns wide and 6 in. deep. A second wholesaler has prepared three separate campaigns, each consisting of 30 advertisements and ten small spot ads or rate holders. Advertisements making up one campaign are of the "reader" type, either one or two columns wide and 4 in. deep, while the other two campaigns consist of "display" advertisements, generally two columns wide and 5 or 6 in. deep. This company also supplies special campaigns upon request, and makes recommendations to its dealers as to the conduct of their advertising programs.

Another company supplies two dealer campaigns, one containing twelve and the other 32 advertisements in sizes from 1 in. to one page. Special layouts are made for feature and seasonal use, and the company, when requested, makes recommendations as to the size and scope of the campaign or budgets the retailer's efforts for a period of six months in advance. Twenty advertisements, two, three, four or five columns wide and $13\frac{3}{4}$ to $5\frac{3}{4}$ in. deep, are supplied on request by another company, which expects dealers to conduct their own campaigns, though it supplies assistance when desired.

One large producer concentrates its efforts on the preparation of individual campaigns only, of which it supplies an average of 600 per year. Under this system, the company's advertising department assumes the responsibility of determining size of advertisements, number of insertions and other factors, basing its conclusions on the conditions in each retail territory.

While the majority of the newspaper advertisements are built around the product of the company which the dealer represents, with the exceptions mentioned earlier in this article, each campaign generally includes a number of advertisements devoted to summer buying. These stress lower prices as an incentive to prospective purchasers. Another equally large number of advertisements call attention to the dealer's service facilities, one of the main factors in assuring continued consumer satisfaction.

Two methods of dividing the cost of preparing and inserting newspaper advertisements are in general use. Under one system, the producer or wholesaler bears the entire expense of making up the advertisements and furnishes mats free to the dealer, who pays the cost of insertion. Under the other system especially where individual campaigns

are prepared, the entire cost is shared, usually on a "50-50" basis.

Preparation of direct-mail pieces also is an important item in the promotional material supplied to dealers. The various campaigns, like the newspaper campaigns, are generally optional with the dealer, though several producers and wholesalers undertake to coordinate the dealer's direct-mail work with his newspaper advertising. As a general rule, the mailing pieces are made up by the companies and furnished to the dealer in series, though, in certain cases, the merchant is given an opportunity to select

his needs from a general list of folders, cards, blotters and pamphlets designed for separate mailing or inclosure in envelopes with statements or letters.

As an example of a standard list of mailing pieces, one producer furnishes a campaign of thirteen pieces each year on a cost-sharing basis, the dealer supplying the lists and paying a flat rate per name. This company employs a direct-mail expert to prepare and mail the pieces. A second company's campaign consists of fourteen pieces, supplied on order from the merchant. Cost of preparation is divided equally between the company and its customer, who prepares the lists and does the mailing. A third company will supply at cost a campaign of 25 pieces, and also prepares special campaigns on order.

With the idea of securing maximum flexibility from the standpoints of cost and suitability to conditions, another producer's portfolio includes six different campaigns. This company absorbs the cost of art work, typesetting and engraving, while the dealer pays the cost of printing and paper. In contrast to the general practice of establishing standard campaigns, one large wholesaler has developed several dozen mailing pieces, from which the dealer selects such items as he prefers, paying only the cost of printing.

Paralleling its practice in the preparation of newspaper advertisements, another producer supplies only individual direct-mail campaigns on order from the retailer. All in all, this company sent out 150,000 separate pieces in 1932. Half the cost was paid by the dealers, who supplied the lists and did their own mailing.

Like a part of the newspaper advertisements furnished the retailer, several items in the various direct-mail campaigns stress the price attraction of summer buying and urge the householder to take advantage of the dealer's service facilities. Competitive fuels, however, are an added topic around which a number of mailing pieces are built up. This subject, as yet, has figured but little in the newspaper advertising of anthracite producers, wholesalers and retailers.

As an example of the extent to which competitive fuels figure in the direct-mail work of some producers and wholesalers, the campaigns of one producer include six pamphlets and three blotters on this subject. Supplementing the direct discussion of the advantages of anthracite over competitive fuels, several wholesalers and producers include pamphlets stressing the economy and convenience of automatic heating with stokers.

So-called "consumer magazines," designed for free distribution to customers, have been playing an increasingly important rôle in the promotional work of chain stores—food chains especially. Taking a leaf out of the experience of these industries, one anthracite producer supplies an 8x10½-in. magazine for free distribution. This magazine, twelve pages in addition to the cover, carries the dealer's name on the front cover. Four pages are left open for advertising. Two of these are devoted to coal, and the merchant, if he so desires, can use the other two pages for any other products in which he deals.

Photographs are used liberally throughout the editorial pages, and the idea of coal is kept before the reader by two or three short articles on the history of the anthracite industry, mining, preparation, and utilization. The magazine is published quarterly, and approximately 30,000 copies were distributed when the first issue came out several months ago. Cost is approximately $50 per thousand with envelopes. This cost is paid by the dealer.

Two of the twelve companies studied stand ready to supply the dealer with assistance in preparing local radio programs, though in the case of one organization participation is limited to the preparation of continuity for local groups, which otherwise bear all the expense. The other company, however, supplies a series of electrical transcriptions for local use. Each program in the series is complete in itself, and runs for fifteen minutes. All charges for the preparation of the records are absorbed by the wholesaler, leaving only the cost of the station time to the coal merchant.

Table I—How Twelve Producers and Wholesalers Help the Dealer Sell Anthracite

Explanation of symbols: M, major plank in program for assisting dealers; L, special or limited advertising and consultative programs

	Company											
	A	B	C	D	E	F	G	H	I	J	K	L
Newspaper advertising			L	M					M			L
Direct mail	M						L	L				
Radio				M				L	M			

Advertising Material Supplied to Dealers

Newspaper	M			M			M	L	M	L	M	M
Direct mail	L			M			M	M	M	M	M	M
Radio				M			L					

Combustion, Sales Engineering and Management Services

Combustion service	M	M	M	M	M	M	M	M	M	M	M	M
Sales training				M				M			M	M
Stoker merchandising*	M		L	M							M	M
Stoker plant†								M				
Buying service‡				M					M		M	
Yard management	M			M			M	M	M		M	M
Cost-accounting	M			M			M	M	M		M	M
Credits and collections	M			M			M	M	M		M	M
Special advertising or merchandising help			M	M			M	M	M		M	M

*Limited to the following: special assistance to the dealer in the development of stoker merchandising plans for his own use; general information on stokers and stoker problems, usually derived in company's own research laboratory.

†Definite stoker sales program built around a stoker or stokers selected by the company, which shares financial and/or merchandising responsibility with the dealer.

‡Covers purchases by dealers at cost of the following: novelties, mats of advertising matter, uniforms, badges, stationery, weight tickets, coal bags, trestle signs, truck billboards, decalcomanias, electric signs, window display material, and similar items.

AERIAL TRAMWAY

+ Solves Refuse Disposal

At Octavia J Mine

By J. H. EDWARDS
Consulting Editor, Coal Age

AFTER the Octavia J Coal Mining Co., of McAndrews, Ky., had modernized the original steel tipple by installing new conveyor and loading-boom equipment, there remained the distressing and costly feature of plant-refuse disposal by team-and-wagon haul to the limited space available within reasonable distance in the narrow valley. In December, 1930, however, the dump wagon was displaced by a modern aerial tram which, together with the subway conveyor, elevators and bin serving the loading terminal, represents an investment of approximately $23,000.

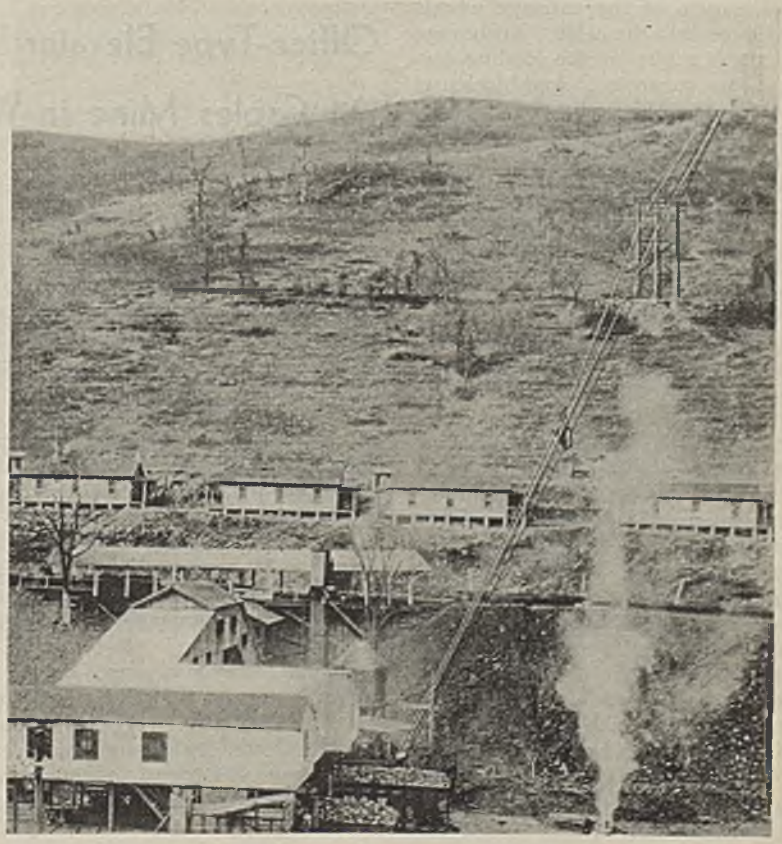
The mine is located "on Pond Creek" in Pike County, Kentucky, in what is known as the Thacker district of territory served by the Norfolk & Western R.R. It is a drift operation in the Pond Creek seam and is now shipping 1,100 tons per day. The main haul of 1½ miles underground and ¼ mile on the outside is handled by a 13-ton locomotive. The dump is on the hillside just across the creek from the tipple and is at a height which requires an elevating conveyor to the main screen.

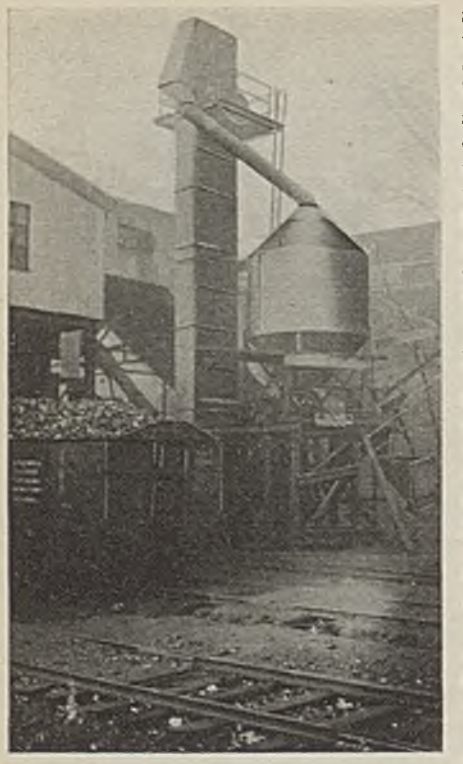
The problem at the tipple was to collect the tipple refuse from a picking table at the head of the elevating conveyor and from loading-boom picking stations and transport this refuse to the tram loading terminal. Ample disposal space is available just over the top of a hill facing the tipple, and the far side is sufficiently steep that it was deemed satisfactory to plan to dump the refuse at a fixed point at the top and depend on gravity to move the material away from the end of the chute.

For the hillside haulage a double-reversible two-bucket aerial tramway of the American Steel & Wire Co. was selected. This company handled the design, supplied all materials, including structural steel, and furnished an erection engineer to supervise the installation. Buckets have a capacity of 31 cu.ft. and the tramway is rated 25 tons per hour.

The horizontal length of the haul is 755 ft. and the vertical rise is 400 ft. At the intermediate tower the track cables are spread to 8 ft. to provide clearance for the buckets, but these cables converge so that one is directly above the other at the loading terminal, thus making it possible to load both buckets from one circular undercut gate. Because the cables slope upward at a steep angle, special construction is necessary so that the buckets will clear the gate upon entering the terminal and yet be close enough for loading without spillage. This construction consists of an extension piece or chute attached to the upper edge of the gate segment. When the gate is opened, the extension

Adding the Aerial Tram Has Solved the Refuse Problem Once and for All





Elevator, Tank and Loading Terminal With Bucket in Position at Gate

conducts or chutes the waste material into the bucket.

Bucket suspension consists of a two-wheeled carriage running on 1⅜-in.-diameter locked-coil track cable. Each carriage is fitted with a small tank which drops onto the cable for its entire length sufficient oil to provide proper lubrication. Pressure of the carriage wheels works the oil into the cable. Anchorage of the track cables at the loading terminal is in a concrete ground block and at the tail terminal is to the top of a self-supporting steel tower. At the ground anchorage bridge-socket take-ups are provided for adjusting deflection. Built into the tail tower is a steel chute into which the buckets dump. This chute discharges the material so that it clears the tower base and slides down the hill to its final resting place.

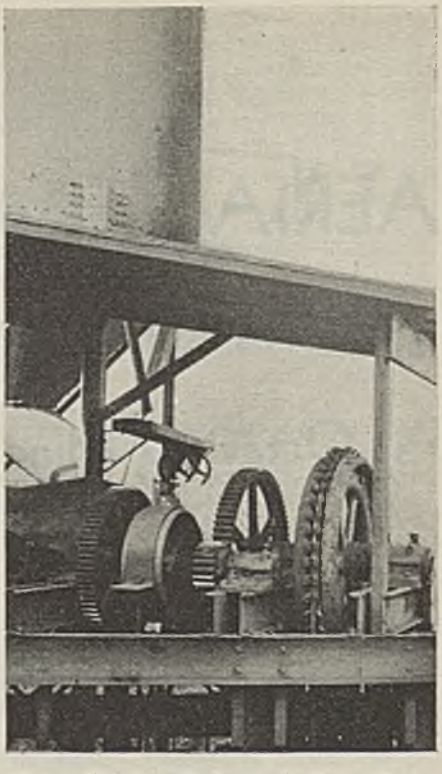
The traction rope is 6x19 special steel construction, ⅝ in. in diameter, and travels at 650 ft. per minute. It is driven by a 4-ft. grip sheave connected by open gearing to a 25-hp. slip-ring induction motor. Control is by a manual drum switch located on the operative's platform, which is adjacent to the undercut gate. Necessary driving tension of the traction rope is maintained by a floating counterweight at the tail tower.

Conveyor and elevating equipment at the loading terminal provides for handling of refuse of size 8 in. and down. A gravity chute brings material from the main conveyor picking table to the foot of the refuse-bin elevator. Material from chute pockets convenient to the loading booms drops into a subway conveyor which crosses below the tracks and also discharges to the vertical elevator. The latter elevates to a pipe chute leading to a 25-ton round steel bin. Track cleanings around the tipple are conveniently handled by shoveling or raking the material to openings above the subway conveyor. The chutes, conveyor, elevator and bin were furnished by the Link-Belt Co. Disposal of the refuse collected during an ordinary day's run is accomplished by the tram in less than an hour.

Octavia J mine is equipped to produce as high as 1,800 tons of coal per day. The four-track steel tipple is fitted with three loading booms. Inside of the mine, cutting equipment consists of three Goodman Type 124 mounted top cutters and two Jeffrey 35B shortwall machines. For gathering haulage the following cable-reel locomotives are available: three Jeffrey 6-ton, two Jeffrey 4-ton, four General Electric 6-ton, and one General Electric 4-ton. The 13-ton main haulage locomotive also is of Jeffrey manufacture. Mine cars are 80-cu.ft. wood construction and are fitted with Enterprise solid roller bearings.

The seam height in which the equipment must operate is 4½ to 7 ft. Operation of equipment is by purchased power and the conversion to direct current is accomplished by one 200-kw. 250-volt motor generator located in an outside substation.

Another improvement which has been made at the mine in the last two years is in the housing accommodations. Five new houses have been built by the coal company at a location convenient to the plant.



Motor, Gearing, Brake and Grip Sheave Are Above the Operative's Platform

▼

Office-Type Elevator Installed in Man Hoist At Caples Mine in West Virginia

(Concluded from page 115)

110-hp. 360-volt 164-r.p.m. special elevator type d.c. motor connected to the drum through a single gear reduction. Control is by unit multiple voltage supplied by a motor-generator set located in the same room with the hoist. The drive is an induction motor rated 135 hp., 2,450 volts, and the d.c. generator is rated 250 amp., 18 to 360 volts. Combined with the motor-generator is an overhung exciter, 10.5 amp. and 240 volts. Built into the hoist motor and acting on its armature shaft is a large solenoid brake which normally sets only at dead stop. Slowing is by regenerative braking.

Should there be a power-supply failure with men on the cage and the cage stalled in the shaft, emergency operation can be effected by a hand-crank-driven worm gear which can be connected to the hoist motor shaft by a jaw clutch, permitting slow but sure moving of the cage by man power. An electrical interlock prevents starting of the hoist motor unless the jaw clutch is disconnected.

Floor dimensions of the machine room containing the motor generator, the hoisting machine, incoming power panel, and contactor control board are 20x24 ft. The elevator operative's control station, located in the lamp house, is the standard control commonly seen in high-speed building elevators. On it is a key-operated switch by which the motor-generator is started or stopped, a red lamp indicating operation of the motor-generator set, an emergency stop button, a micro switch, and manual control handle.

Three hundred men are carried in and out of the mine on the elevator each day. With total trips now amounting to around 60 per day the power consumption is averaging approximately 2,000 kw.-hr. per month.

MINING VERTICAL SEAMS

+ By Longwall in Belgium

By F. C. CORNET
Mons, Belgium

BELGIAN engineers have recently devised what is believed to be an entirely new method for mining, at great depth, several almost vertical coal seams. Two such seams, *A* and *B*, are shown on the right of Fig. 1. Several similar seams have been intersected, or soon will be, by tunnels driven both north and south from the hoisting shaft. The seams have thicknesses varying from 35 to 55 in. All liberate gas freely and are under heavy pressure, a circumstance of which the designers of this new mining method took advantage, as also of the fact that, on removal of pressure, the coal frees itself readily from its slate walls.

The task of the designers was greatly facilitated by the fact that the coal did not need to be cleaned at the face, for the mine had at the surface a modern screening, picking and washing plant. In southern Belgium, about a third of the tonnage hoisted in coal cars is refuse, a small part of which is removed by hand in the preparation plant, and the rest by washing. Although mining conditions and the fact that the coal need not be cleaned underground simplified the problem, other conditions made that task difficult enough. For example, no "lift" between successive levels could be less than 328 ft. as measured on the full pitch of the seam. Moreover, no ladder, no matter how short, could be used in the workings; hence, the gradient at all points had to be kept such that men could travel without difficulty to and from their working places, either by the upper or lower level.

To enable miners to find their way out, even in the dark, communication with the working faces had to be limited to one opening at the bottom and one at the top, the way along the faces, from level to level, being made continuous and practically straight, so that a man without a light and fleeing danger could not follow any road but one leading to safety. Means had to be provided to prevent the coal which slides down to the bottom opening, where it is loaded into cars, from blocking the approaches to men or air.

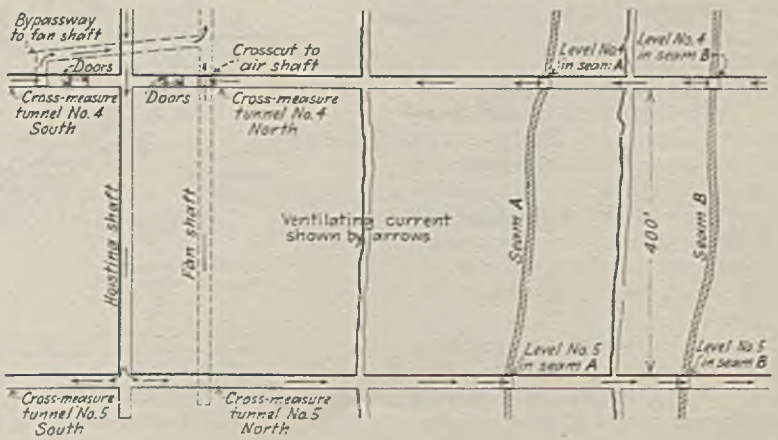
Some method had to be arranged by which all backfilling materials could be introduced into the workings without retarding the ventilating current or hindering the travel of the miners. Doors were absolutely prohibited. Air regulators could be installed, but only in the return airway; that is, in the upper level, and at a point in the latter not further than 10 ft. from the tunnel leading directly to the airshaft. Noisy tools and machinery, and electricity, alike were prohibited. In gassy coal, explosives are forbidden by law.

It was decided that the lifts should be 400 ft. high and that the coal should be worked at an angle of 35 deg. to the horizontal, on three successive faces each about 230 ft. long, the lowest face being kept 15 ft. in advance of the one above and this also 15 ft. in advance of the uppermost of the three (see Figs. 2 to 6). As may be seen, gob is stowed up to the prop row left on the last previous advance. Upon these timbers, against one of the walls, the lower one in this case, a steel-plate chute, *A* (see Fig. 4), is laid. This is turned up on one flank and made in 8-ft. lengths which overlap one on the other. As Figs. 5 and 6 show, the turned-up side of the chute rests against one wall. Covering the space between the other wall and the steel chute, planks *B* are laid and spiked down on the same timbers as the chute.

All the coal mined drops indiscriminately on the chute and planks. That which falls on the steel chute may slide downward readily, the slope amply permitting that movement. The coal which falls on the wooden planks will be slow to follow, friction of coal on wood being greater than on steel. After a short time, however (see Fig. 5), the coal on the planks will so slope toward the steel chute that all coal will feed in that direction. Coal accumulated on the planks and moving downward, of course, at a greatly reduced speed, will act as a drag on the coal moving on the chute, and exert upon that coal an effective lateral pressure. This so greatly retards the flow of coal that an 8-in. plank or a man's foot placed across the chute at its lower end will hold the coal in place for the full length of the face, and this almost instantly and without any more than a sight buckling here and there of its immobilized bed.

The proper angle on which to mine the coal was determined by many long months of actual mining experience, in the course of which the inadvisability

Fig. 1—Elevation Showing Manner of Approach to Coal Beds.



of attempting to mine a 400-ft. lift along a single, continuous face was convincingly established. That is why a three-face layout was adopted, the idea being that an occasional coal slide would then affect only a third of the workings.

It was found that a 15-ft. flat between faces would prevent the runaway coal on any chute from sliding down on the one below it. Short conveyors, *C* (Figs. 2 and 3), of a chain type transfer the coal from one chute to another over the 15-ft. flats. The carrying capacity of these conveyors is limited, that of the upper conveyor being double that of the lower. They are driven by silent compressed-air turbines and may be started and stopped by the boss of the loading station in the lower level as well as at close range. The air pipe feeding them, which is carried up from the lower level, is laid for protection along the wall, behind the turned-up rim of the steel chute, as shown in Fig. 6. A valve is placed in this pipe handy to the loading boss, who can thus control the rate at which coal is transferred over the flats.

When the miners come to work in the morning, conditions are much as represented in Fig. 2. On the planked side of the gangway, along the wall (see Fig. 6) are aligned the timbers needed for the shift. Every 10 or 11 ft. upon these timbers, a plank, *E*, is laid, indicating the spot where one man will begin work.

Besides two or three short-handled picks and a hatchet, also short-handled, each man is provided with a 5- or 6-ft. bar of 1-in. steel pointed at one end and flattened, chisel-like, at the other, with which to pry coal loose without getting dangerously close to it. No other tools are needed, for the coal, crushed and cracked, falls down to the gangway on being relieved of pressure. Removal of the wedges driven between the coal and the timbers permits some of the coal, mostly slack, to fall down. But this soon stops, and the miner proceeds to loosen coal methodically and progressively with his bar, keeping himself out of harm's way. As he reaches further into the seam, he finds that it is more and more difficult to pry the coal loose and that such an operation provokes smaller and smaller falls of coal. The bar then gives way to the pick. Lack of adherence of coal to walls greatly facilitates this operation.

Placing their individual planks successively in the positions marked *F*, *G* and *H*, the miners soon dig themselves into the coal above the timbers. As soon as a man gets his plank in position *G*, he places alongside it the timbers he will need in the course of his day's work, taking them out of the freshly mined coal with which they have recently become covered.

Either astride his plank or crouching, sitting or standing upon it, the miner endeavors to gain height until, reaching the line of next face, *LM*, he sets a timber there: for example, at *I*. Having thus provided for his immediate safety, the miner digs away in a downward direction while reaching upwardly, toward line *LM*. Reaching this line, he sets timbers *J* and *K*, etc., and continues to dig until his job comes to an end where the next man below began his. The latter, by this time, has also ended, or is ending, his own work, connecting it with that of the man below. An even number of men having been assigned to each face, they are able to work in pairs. In digging, miners work alone, there being no room, in those thin seams, for two to work side by side. However, when one of them desires to set timber, he calls on his buddy to help him. In fact, when one man of a pair is ready to set timber, the other also needs assistance for the same purpose.

Noisy tools and machinery being absent, only the picks and falling coal disturb the quiet of the working places. Thus, the men in the several places can talk to each other and hear and interpret groanings of strata or creaking of timbers under suddenly increased pressure. Thus is safety promoted, the men being enabled to judge for themselves, in good season, whether it is safe to stay in the workings. This mining method has not thus far been tried in seams subject to outbursts.

The miners are followed by the so-called "timbermen," whose main job is to move the steel chute, planks, transfer conveyor, compressed-air pipe, and coal-loading hopper at the lower level to their next location upon what has become the last set of timbers but one. They also move the equipment in the upper level, which is to serve a little later for introducing backfilling into that part of the workings recently robbed of its coal, directly under the set of timbers now supporting the steel chute and the transfer conveyors. The men who do all this work must, while so doing, rectify and strengthen, if need be, the timbering which the miners have set. An important item in this part of the timberman's job is to complete the wedging of the new face, which the miners in the regular course of their work, can perform only imperfectly.

After the timbermen come the so-called "slate men," who, in the space lately robbed of its coal, stow backfilling which mine cars bring in on the upper level. Most of this filling is sent down the steel chute and transfer conveyors, only a small part of it being dumped direct from cars. Filling being completed, the slate men distribute, along the new faces, the timbers that the miners will need in the course of their coming shift. This distribution also is

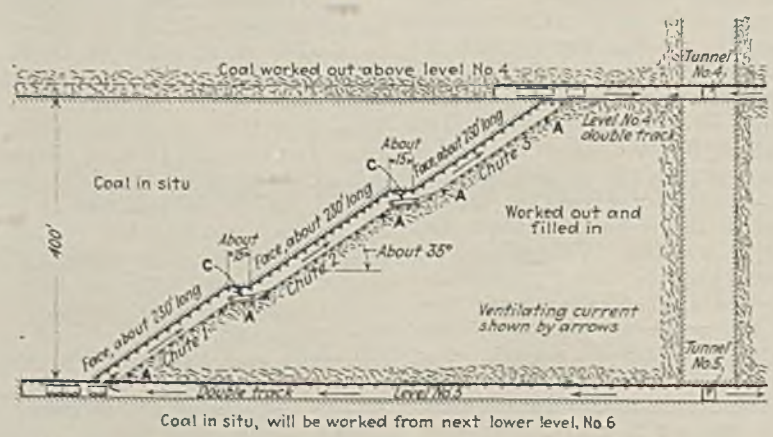


Fig. 2—Elevation Showing Panel With Longwall Face. Seam Vertical and Mined Advancing.

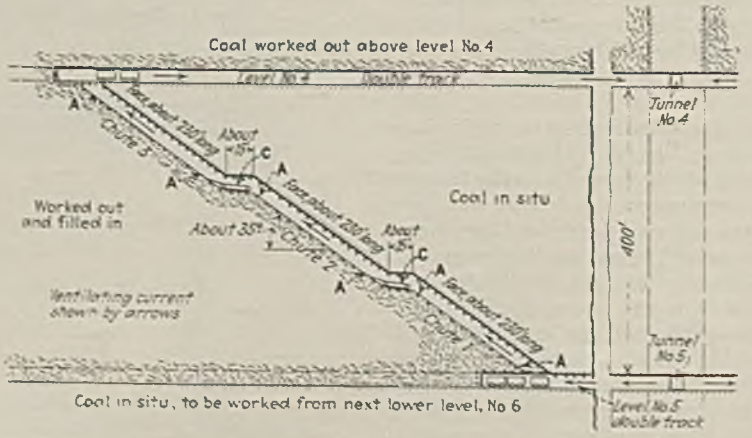


Fig. 3—Elevation as in Fig. 2 but With Mining on Retreat.

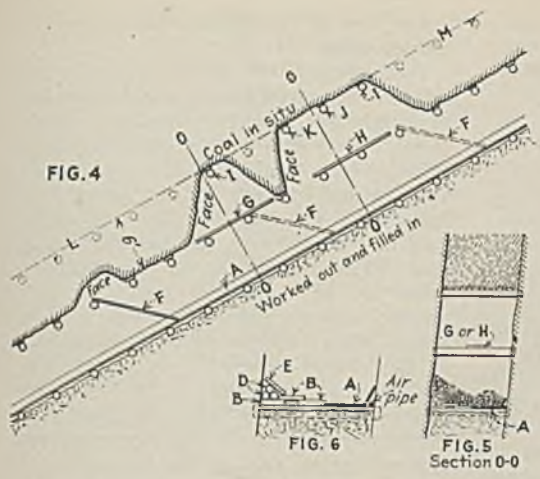


Fig. 4—Elevation of Workings Showing Detail of Upraising.

Fig. 5—Elevation as Viewed From Plane of Seam.

Fig. 6—Similarly Viewed, Showing Arrangement of Timber Supply, Chutes and Air Pipes.

made from the upper level, through the steel chute and transfer conveyors.

It is customary in Belgium and the north of France to mine coal advancing. As shown in Fig. 2, this custom was followed in introducing the system above described. It has the drawback that a part of the ventilating current is short-circuited through the gob to the detriment of the ventilation of the working faces, because days, even months, pass before subsidence tightens the gob to air, thus leaving, in the rear of the faces, a zone more or less wide through which air will find its way between levels. In most cases, more air is short-circuited than passes along the working faces. With the retreating system (see Fig. 3) the air is compelled to pass along the faces.

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Entry-Driving Machines Advance 50 Ft. a Day At New Orient Mine

(*Concluded from page 112*)

sectional circuit breakers set at 600 amp. The load on each machine is about 200 amp. at 240 volts when the advance is at the rate of 50 ft. in eight hours.

Curves can be turned with the entry drivers with almost as much facility and smoothness as in advancing of straightways. In the earlier years of operation no curve smaller than one of 125-ft. radius was attempted. More recently, however, curves have been turned on a radius of 80 ft. The practicability of turning a curve so sharp has broadened the utility of the machines, for, whereas at first the machines were utilized only for main and cross entries, they can now be used for developing panel entries. When a curve less than the minimum radius possible to drive with the entry drivers is desirable, then the turn into the panels may be driven by other means and the entry drivers moved as described previously, whereby the panels may be driven economically and with great speed.

Both machines are operated by joint night crews of nine men, composed of two operators, two helpers, two motormen, two tripriders and one tracklayer. The tracklayer lays temporary track behind the machines and keeps the blower tubing extended.

The day shift is composed of 13 men, viz.: two cutting machine men; two repairmen; one electrician, who extends trolley wire, bonds and track and attends to the blowers and extends the tubing; one bratticeman; six men who lay the track permanently, load coal and generally make ready for the night shift; and one man who cleans road, etc.

Cars are spotted behind the machine, one at a time. Sidetracks for the loads and empties are established between the last open crosscut and the two crosscuts directly behind it in an arrangement shown in Fig. 2. The cars are gathered by a cable-reel locomotive.

Several major advantages aside from those already mentioned have been derived from the use of these machines. For one, the straight ribs and top left by the machines offer much lower resistance to the flow of air than the surfaces resulting from the usual development methods. Tests and calculations place the coefficient of friction for the entire mine at 0.00000005; that for the entries developed by the entry drivers at 0.00000000003.

The straightness of the entries may be judged by the result of a check survey made of a 3,900-ft. stretch; at no point was the entry found to be off more than 2 in. in the entire distance. Sights, incidentally, are extended every other day. The operator guides the machine accurately by keeping points on the center line of the machine lined up with the chalked sight line on the roof.

These machines also yield a higher percentage of plus 2-in. coal than could be obtained by the usual hand methods. Screen tests made to determine this point showed that 51 per cent of the coal produced by the machine passed over a screen with 2-in. square openings.

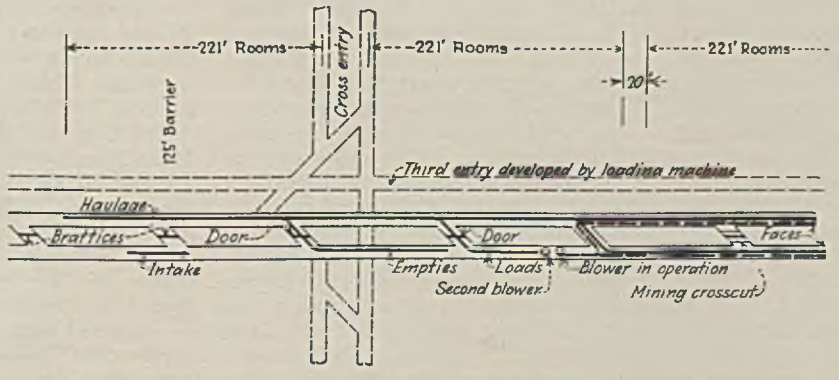


Fig. 2—Arrangement of Ventilation and Haulage in a Pair of Advancing Headings.

NOTES

. . . from Across the Sea

FEW, if any, coal regions are more wedded to steel supports than the South Wales and Monmouthshire (England) district, which, out of a total of 3,143 miles of underground roads, has perhaps 660 miles, or 21 per cent of the whole, supported by steel arches, and had in use in June, 1932, 115,124 steel props, 94.55 per cent of which were rolled-steel joist sections and 4.77 per cent tube sections. Thus 99.32 per cent of the props were so constructed as not to yield to subsidence. Only 0.68 per cent were of the telescopic or yielding type. Of all the props in use, only 0.25 per cent were fitted with a releasing device, every one of which used a wedge of some kind for this purpose.

These figures are taken from the third report of the British Colliery Owners' Research Association, which is entitled "Use of Iron and Steel for Underground Support," J. S. Carson, the author, declares that the South Wales operators formerly were ardent advocates of the yielding prop and thought that it should provide for a cushioning effect of not less than 9 in., but today nearly all of them favor a prop that will hold the roof firmly in place.

British mines use a large quantity of props. The costs given in cents per ton in the accompanying table are based on the former value of the pound, $4.866.

Cost of Roof Supports, Ties and All Mine Wood Used in South Wales and Monmouthshire District

	Pence per Long Ton of Coal	Cents per Short Ton of Coal
1921 to 1927 (average cost)	16	29
1928 (including a few arch girders)	16	29
Ten months to July, 1930 (including steel arches)	16.4	29.7
August, 1930, to July, 1931 (including steel arches and steel props)	8.4	15.2
August, 1931, to March, 1932 (including steel arches and steel props)	7.8	14.1

Mr. Carson declares that the best results were obtained when the props used in the longwall face were all of one size; when the caps were at least as wide as the props and were cut without any wedge and when arrangements were made so that the roof would break just back of the conveyor. The total output from South Wales and Monmouthshire in 1931 was 38,545,698 tons, and of this total 8.23 per cent, or 3,160,839 tons, was at faces supported by steel props. As the total length of steel-arched roads is estimated at 3,143 miles, Mr. Carson took the 21 per cent as significant of the whole area and computed the length of steel-arched roadways as 660 miles. On this basis, the South Wales and Monmouthshire coal field has in use approximately 175,000 tons of steel arches and 6,200 tons of steel props.

Practically all the arches are of rail steel 2x2½x4-in. section in weights of 30, 32, 34, 36 or 38 lb. per yard, the commonest weight being 34 lb. per yard for arches up to 12 ft. span and 38 lb. per yard for arches of 12 ft. span and over. Some of the fishplates by which the arch sections are joined are curved and have four holes, some are straight and unflanged and have two holes and some straight and flanged also with two holes. The horseshoe arch has been discarded for the arch with straight legs, and in a few places these legs are arranged to slant so that they will resist the horizontal pressures near the floor. Such slant-leg arches have to be provided with steel stilts, for wood stilts are likely to be broken by such pressure.

Until the last two or three years, the girders were strutted or lagged with timber, but now other methods are used. Because of the cost, the use of concrete or brickwork lining all around the arch has not found much favor. Some arches are still thus lagged below the spring of the arch, but a type of interlocking brick which can be set without mortar has been introduced, and these are used to lag the arches all around. On one side and at the ends, this brick has a tongue 1 in. wide and projecting 1 in., and, on the other side and end, a groove of similar dimensions. But, in many collieries, 20-gage corrugated steel sheets are used for lagging. Small material is put between the lagging and the natural arch, the space left for that purpose being nowhere less than 6 in.

Corrugated straps or crossbars are rarely used, but, of those in use, some are of W-pattern, which gives a better distribution of metal and greater strength than can be obtained from the more usual and sinuous cross-section.

At one mine the saving from the introduction of steel props was 53 per cent; at another, over a period of two years, 14.3 per cent; at a third, 24.66 per cent; at a fourth, a new face is equipped every month with steel props with the economies made from the use of such equipment; at a fifth, despite rapid extension of steel support, the entire cost of all supports has decreased 17 per cent.

According to P. M. Macnair, in an address delivered before the Institution of Engineers and Shipbuilders, blast-furnace cast iron can be converted into foundry iron by the use of a rotary pulverized fuel furnace, the air being preheated to 450 deg. C. for anthracite coal and to 350 deg. C. for bituminous coal. The revolution of the furnace once in 1½ minutes turns over the charge, exposes fresh surfaces to the flame, allows the lining to radiate heat to the charge where it is above the charge, and to conduct heat to the charge where it is below it, thus preventing excessive lining temperatures and militating against the formation of a permanent slag line with heavy corrosion at that point. The cost of fuel is half that with cupola operation using coke, coke price per ton being figured at 2⅓ times that of pulverized coal. This probably means little to American producers of high-grade bituminous coal, who already supply the coal that is used to make coke for foundry purposes, but may be of much importance to anthracite operators with low-ash coal, for all anthracite has a low sulphur content.

Water sprays are said to trap only the larger dust particles which are suspended in the air and not the finer dust that does so much havoc to the lungs; the dust that is between 1 and 5 microns, or, in other words, the dust that is between 1/25,000 and 1/5,000 in. diameter. Pyrene, which has been used for fighting fires, is now being used on the Rand for fighting dust, and an equipment for this purpose was approved recently by the Mines Department of Great Britain.

This foam-forming liquid is a vegetable product and non-corrosive. The froth from it can be passed 120 ft. through a ½-in. or ¾-in. diameter hose to the drill without losing its bubble formation, thus making it possible to provide foam to more than one drill, or to place the container back some feet from the face to be shot. Only a gallon of foam liquid is needed per hour, whereas a gallon of water would be needed per minute to protect the driller against even the larger particles of dust. The dust particles are trapped by the Pyrene foam at the point of production and are bound by it into a sludge, which is pushed with its load of dust out of the hole by following clean foam.

The Germans also are using Pyrene. The suggestion has been made that, with a spray nozzle, foam may be blown on the floor, roof and sides of the working place, and on the material being loaded. In the driving of rock tunnels in the anthracite region, such provisions should shorten the time in getting back to work and reduce the hazard to health involved in rock-tunnel driving. However, the distance, 120 ft., might with advantage be even further extended. It may well be that, in Great Britain, where so much objection has been taken

to sprinkling as damaging to the mine floor, Pyrene might be used to spray the bits of coal cutters in place of water, many of the cutters being already driven by air, making compressed air available for the production of foam.

Addressing a meeting of four British associations, Prof. H. E. Armstrong declared that from the systematic work done under Prof. Bone's supervision, in which balance sheets have been prepared using alkaline permanganate to show the various oxidation products of carbon and their relative quantities, it had been learned, with more than surprise, that in most coals apparently over 60 per cent of the carbon was in phenol form. Prof. Armstrong does not draw the conclusion from that statement that coal ground fine and mixed with formaldehyde might, under extreme heat and pressure, form a sort of bakelite, but the thought nevertheless is intriguing. Prof. Armstrong also stated that "of all plant materials, resin alone gives, in oxidation, a product comparable with that obtained from coal." He adds that some have questioned whether only the resin is left of all the original peat constituents, but he suggests that much of the content of the bog may have been converted into resinoid materials.

R. Dawson Hall

On the ENGINEER'S BOOK SHELF

Requests for U. S. Bureau of Mines publications should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C., accompanied by cash or money order; stamps and personal checks not accepted. Orders for other books and pamphlets reviewed in this department should be addressed to the individual publishers, as shown, whose name and address in each case is in the review notice.

The Lake Cargo Coal Rate Controversy, by Harvey C. Mansfield. Columbia University Press, New York City. 274 pp. Price, $4.25.

In the annals of the Interstate Commerce Commission, bulging with records of bitter competitive contests for bigger places in the economic sun, no battle—not even the prolonged struggle of the intermountain country—has exceeded the lake-cargo coal case in intensity and bitterness. Rival railroads, competing producing fields, canny consumers, courts, commissions and politics in its uglier aspects have all played parts in the strife. In telling the story of this famous controversy up to January, 1932, when the Commission dismissed a complaint of the Northern operators, Dr. Mansfield has done an admirable job of concise reporting, alive with the drama and passion which has colored this case since formal litigation started in 1909.

The author, in subtitling his work "A Study in Governmental Adjustment of a Sectional Dispute," raises the question whether the government can direct the course of economic development from one section of the country to another by adjusting freight rates. In developing his study, Dr. Mansfield devotes the first half of the book to a sketch of the economic background for the lake-cargo controversy and a review of the litigation in which this rate adjustment has been in issue. The concluding chapters cover the personnel of the Commission, the changing views of the Commission with respect to the extent of the responsibility of individual railroads for the maintenance of discriminatory rate adjustments and commercial conditions in rate making.

Students of rate structure will find much of interest in Dr. Mansfield's analysis of responsibility for discrimination and commercial conditions in rate making. But the chapter on the personnel of the Commission should be genuinely disturbing to every reader. The considerations which dictated the appointment of earlier Commissioners left much to be desired. Despite these handicaps, the Commission in the twenty years following the enactment of the Hepburn law established a place in public confidence second only to that held by the Supreme Court of the United States. Since the War, sectional politics and the pleadings of special interests have offered an open and formidable challenge to the maintenance of that position.

Attempts to exercise political pressure upon the Commission were not wholly unknown before certain Congressmen defiantly raised their voices in a demand for sectional representation. For the most part, at least, these attempts were perfunctory, and their failure led to no reprisals against the Commission. Not so in the political reverberations over the Commission's decisions in the lake-cargo cases from 1925 to 1928. Dr. Mansfield minces no words; the disgraceful story of the campaign of Congressmen from both the Northern and the Southern fields to put political pressure upon the Commission—a campaign that culminated in the Senate's refusal to confirm the reappointment of Commissioner Esch—is related in all its hideous ugliness. With the field of government regulation through commissions steadily expanding, the implications in the political situation which centered around the lake-cargo decisions ought to be of grave concern to every citizen.

Dr. Mansfield, it must be confessed, hardly seems any more successful in disposing of the lake-cargo controversy than the Interstate Commerce Commission has been. Whether the government can direct the course of economic development by control over freight rates is truly a vital question, but we search Dr. Mansfield's pages in vain for a definite answer. Possibly the reason for this failure to live up to the theme announced on the jacket of the book lies in the fact that the Commission itself repeatedly has denied any such intention or right.—S. A. H.

* * *

Year Book on Coal Mine Mechanization, 1932, by G. B. Southward, Mining Engineer, American Mining Congress, Washington, D. C. 263 pp., 6x9½ in.; cloth. Price, $3.

As usual, this volume contains the most recent figures on the production of coal loaded by mechanical means, broken down into states and into types of machines, and showing the progress of mechanization. Montana leads with 65.9 per cent of mechanized production and Illinois ranks second, with 59.4 per cent. The book also contains information as to coal-mine mechanization in Europe—that is, in Great Britain, Germany, France and Belgium. Chapters on experience in safe operation follow, and the book concludes with specific instances of operating methods in bituminous and anthracite mines. Various types of machines are illustrated and described. Some attention is given to the removal of slate bands in coal and to the treatment of machine bits.

* * *

Analyses of Montana Coals. U. S. Bureau of Mines, Technical Paper 529; 12 pp. Price, 10c.

Several have contributed to this little volume; C. E. Dobbin provides a geological map and a description of the fields, with bibliography of the Montana monographs of the U. S. Geological Survey, to which he is attached; C. W. Owings discusses mining methods and surface equipment of Montana; F. G. Tryon and W. H. Young have a chapter on production, distribution and use; and N. H. Snyder and L. N. Plein follow with a chapter on the vexed question of relation of mine samples to commercial shipments and the analyses of delivered coal. A. C. Fieldner, H. M. Cooper and F. D. Osgood close with analyses of mine samples. In the Bull Mountain field, the richly endowed Tongue River member has 22 seams and one commercial bed in the Lance formation, which fact partly explains why the coal resources of the state are about 381 billion tons.

OPERATING IDEAS

From Production, Electrical and Mechanical Men

Slack Storage at Prescott Mine Follows Dirt-Moving Lines

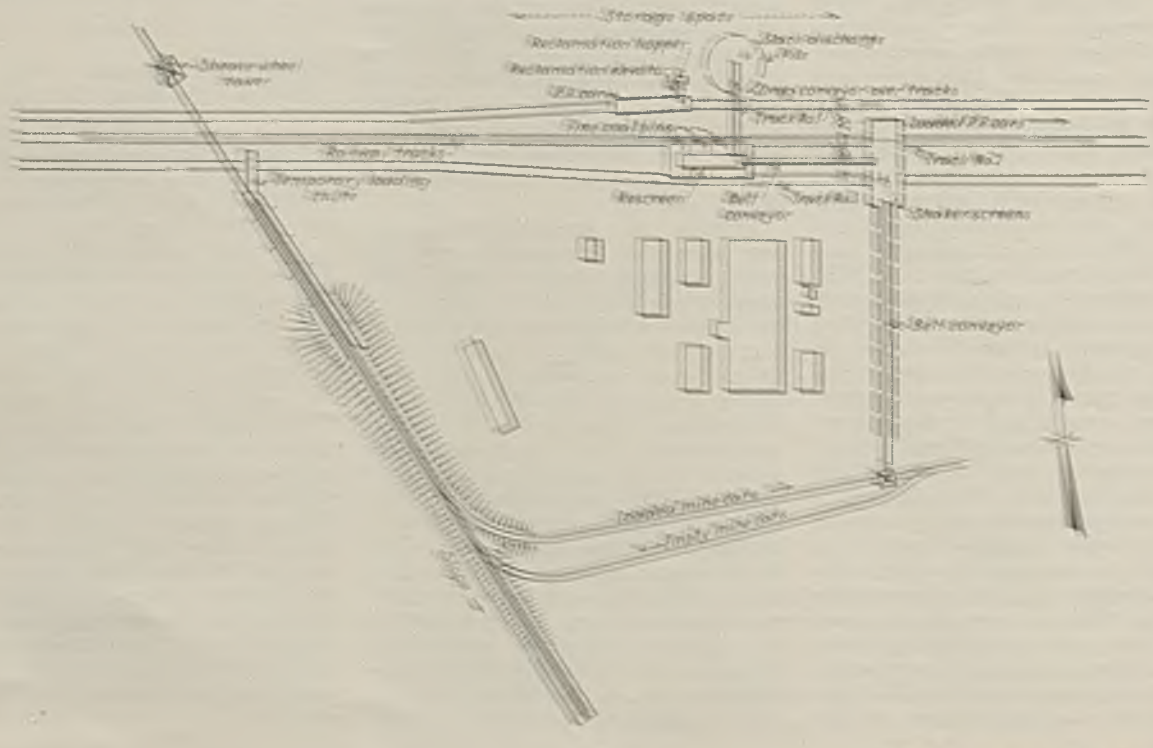
Taking a leaf out of the dirt movers' book, the Blair-Collins Co. is using a caterpillar tractor and "tumble-bug" scoop for storing and reclaiming slack at its Prescott mine, Roundup, Mont. Coal from the mine is dumped over a Phillips cross-over dump and is transported to the tipple on a 48-in. Link-Belt conveyor equipped with a Goodrich belt. Preparation methods at the Prescott mine, according to R. D. Chamberlain, secretary, are arranged so that all coal under 2 in. is moved on a 24-in. Link-Belt belt conveyor to storage bins built between the railroad tracks about 75 ft. west of the tipple, as shown in the accompanying illustration.

At times when this size is in demand, it is loaded directly from the bins after passing the rescreen. The bins are set partially over the tracks and are arranged for loading either open-top or box cars. When seasonal influences result in a slackening of demand for the minus 2-in. coal, it is bypassed around the bins to a drag conveyor by opening a gate in the chute to the rescreen. The drag conveyor clears the tracks and carries the slack to the dumping point north of the tracks.

A "Caterpillar 50" tractor ordinarily is used around the yard for moving railroad cars, and by attaching to it a 1½-yd. tumblebug scoop it was converted into a slack spreader. Usually, it requires but little time for the combination unit to spread the day's excess of slack in rows about 5 ft. high parallel to the tracks. Size of the piles is varied where necessary to avoid the possibility of firing. To make reclamation possible, a bucket elevator was erected north of the tracks and west of the discharge end of the drag conveyor. When reclaiming the slack, it is scraped into a hopper which feeds into the elevator boot, from which it is lifted up and discharged into the car. Operation of the tractor and tumble-bug is a one-man job.

In the course of the past season, the

Surface Plant and Slack Storage System at the Prescott Mine



company stored 4,000 tons of slack in this manner, 90 per cent of which was reclaimed. Cost per ton did not exceed 10c. Investment was small, inasmuch as the drag conveyor and elevator were salvaged from another mine and the caterpillar tractor had already been installed as part of the plant equipment.

Tracing Stray Detonators

The explosion of a detonator in the furnace is not an unknown experience to coal users, and to eliminate as far as possible the presence of stray caps in coal shipments, the Susquehanna Collieries Co. adopted a year ago an identification system by which unexploded detonators found in the breaker can be traced back to the miner. Knowledge that this is possible goes a long way toward the elimination of handling or blasting practices that might result in live detonators being loaded out with the coal.

The identification system is based on the inclusion of a cellophane strip, on

Exploded Detonator Split to Show Numbered Strip

which is stamped a number, in the sealing material at the wire end of the detonator. A record is kept of the numbered caps issued each miner, and when a live cap is found in the breaker it is exploded and the numbered strip recovered. These detonators, supplied by E. I. duPont de Nemours & Co., are used only at the Short Mountain and Williamstown collieries, where the coal flows out of batteries into the cars. Where hand loading prevails, opportunity is afforded for the inspection of the coal and the removal of any foreign material, such as unexploded detonators.

Cleaning Conveyor Belts

One drawback to the use of belt conveyors has been the cleaning of the belt after the load is discharged. Unless the material is entirely removed from the return run, several operating difficulties may be encountered, such as the building up of material on the bend pulleys, causing the belt to run off, or the formation of unsightly or troublesome dribble piles under the conveyor. At the St. Nicholas central breaker of the Philadelphia & Reading Coal & Iron Co., these objections have been eliminated by the installation of the "wiper" cleaners shown in the accompanying illustration. These cleaners were developed by the Stephens-Adamson Mfg. Co., Aurora, Ill., after two years of experimental work.

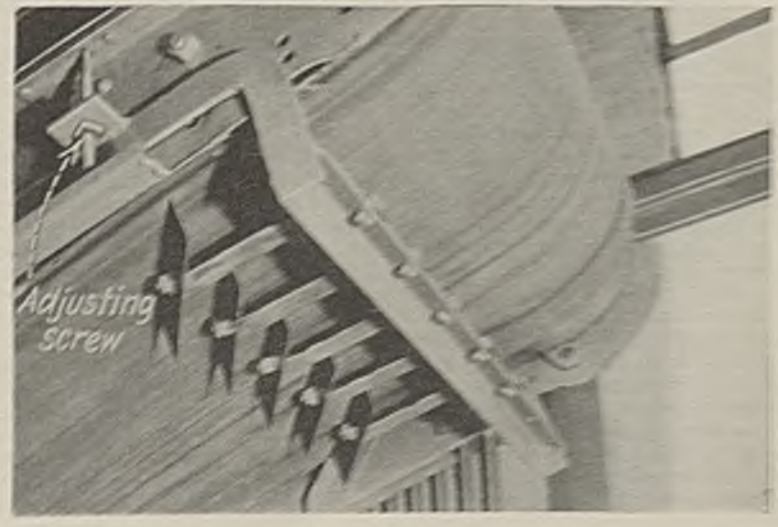
Here's the Place

If you have a practical solution for a safety, operating, electrical or maintenance problem, here's the place to shout about it. These pages are the clearing house for time- and money-saving short cuts developed by practical operating men. The editors of *Coal Age* will welcome your contribution and, if acceptable, will pay you for your time and trouble, and for the help that the idea will be to others. Include all essential details and a photograph or sketch if it will help to make the idea clearer. The editors will do the rest. Acceptable ideas are worth $5 or more each to the contributor.

In operation, the cleaner is placed just back of the discharge end on the return run of the belt. It consists of a row of thin steel spring plates set perpendicular to the surface of the belt and diagonally to the direction of travel. Each plate is mounted on an individual spring, which presses it firmly against the belt. A pivot connection to the spring insures a firm seating on the surface. As the dirty belt surface moves past the plates, adhering material is plowed off. Every particle follows a definite path from the belt surface, across the cleaner plate and down into the discharge chute, thus eliminating bunching or clogging.

Experience at St. Nicholas has shown that the wiper will prevent all dribbling of water and dirt along the return run. Other advantages include a reduction in belt wear arising from the presence of dirt and adaptability to various arrangements of conveyors and supports. Wipers at the St. Nicholas breaker have been in use for more than six months on belts handling refuse, sand and various sizes of coal of widely differing moisture contents. The conveyors range from 48 to 60 in. in width, and several handle more than 2,500 tons per hour.

Spring Wiper in Position Under Discharge Pulley



Derail Protects Inside Slope At Spring Canyon

Safety equipment at the No. 1 mine of the Spring Canyon Coal Co., Spring Canyon, Utah, includes an electric derail on the main slope, which is operated by the trip rider without slowing down the descent of the trip. The seam at this mine dips 8 to 10 per cent in a northeasterly direction, and is developed by two parallel main slopes approximately two miles long and an additional slope and aircourse 3,100 ft. to the west. Sixteen-car trips are hauled on the main slope, hoisting speed varying from 1,180 ft. per minute for loaded trips to 1,475 ft. per minute for empty trips, according to D. J. Parker, district engineer, U. S. Bureau of Mines, Salt Lake City, Utah, who describes the Spring Canyon safety work in Information Circular 6675.

The derail on the main slope is located in the right rail at 10 Left Entry, and is operated by two electromagnets, one for opening the derail and the other for closing it. Two bare contact wires carrying 250 volts, d.c., are strung along the roof at the right of the track about 250 ft. above the derail. Length of the exposed wires is about 30 ft. A similar contact system is installed about 250 ft. below the derail, and both systems are on the opposite side of the track from the regular signal and telephone circuits.

To operate the derail, the trip rider, without any slowing down of the trip in descent, short-circuits the pair of

wires above the derail, which closes instantly and stays closed until the wires below are short-circuited. A T-shaped copper conductor with an insulated handle is used to short-circuit the wire. If for any reason the triprider should fail to complete the short-circuiting operation, he would still have time to signal the hoist operative before the trip reached the derail. If the power fails on the circuit controlling the derail, the hoistman is signaled automatically. As the derail is spring-connected to the throw, ascending trips trail it without further attention. The floor for 150 ft. below the derail is covered by about 6 in. of a mixture consisting mainly of adobe, sand and rock dust to decrease the possibility of a dust explosion in case a loaded trip should be derailed.

The general safety program adopted by the company for reducing transportation accidents is based on the following principles: ample clearance and safety holes; guarded trolley wires, where necessary; maintenance of track and rolling stock in good condition; safety chains on all cars; rigid daily inspection of haulage equipment; heat-treatment of pins and links at least every six months; periodic inspection of hoisting ropes; red lights on the rear of all underground trips; proper blocking of cars at the face; prohibition of flying switches; and pulling instead of pushing trips.

In rooms and entries, cars are blocked by placing a tie or timber against the ends, the opposite end of the tie or timber resting against a tie securely spiked to the rails. At the face of the slopes, cars are blocked with ties fastened together with wire rope. The rope (½-in.) has a loop in both ends, these loops being made by splicing the ends into the rope. A loose tie is passed through one loop and is placed under the rails several feet above the car. Another tie is inserted in the other loop, and rests on the rails against the lower pair of wheels.

Steel Pipe and Arc Welding Build New Bridge

Used steel pipe, scrap rail and wire rope, plus arc welding, furnished the most economical answer to the Kemmerer Coal Co.'s need for a new bridge in making improvements at its Frontier and Sublet (Wyo.) mines last summer. In view of the fact that haulage distances at the No. 5 mine, Sublet, had grown so long that economical operation was impossible, it was decided to tap the seam at another point by driving an 80-ft. rock tunnel. This point was approximately 9,300 ft. from the No. 5-A tipple, at Frontier, and about three miles from the old No. 5 tipple. As the 5-A plant was not being used to capacity, the company drew up a plan for bringing coal from the new opening to this point. This plan involved the construction of 9,300 ft. of mine track, but eliminated the cost of moving the No. 5 tipple and building a mile of new track, storage yards and other facilities.

Pipe Bridge Built by the Kemmerer Coal Co. at Its New Opening

The most serious drawback was the necessity for crossing a gully, at the bottom of which was a creek and the main highway from Kemmerer to Yellowstone National Park. However, a survey showed that by building a bridge it would be possible to construct a good mine railway track from the opening to 5-A tipple with a grade of 0.65 per cent in favor of the loads. The cost of the conventional type of bridge was a serious obstacle, and in an attempt to avoid this cost the company decided to resort to an accumulation of 10-in. steel pipe and rails from mines previously closed down.

The bridge was designed by coal company engineers and was built with a General Electric welding set and 135 lb. of Type F electrodes. Individual bents were made up of pipe, cross-braced with rail, and the bents were tied together by tension members made of wire rope. Wire rope also was used to anchor the bridge against side thrust. Span is 353 ft. 4 in., and maximum height over the highway is 52 ft. As all of the metal used in the bridge already had been charged off on the books, total cost represented little more than the cost of labor and electrodes.

Auxiliary Contactor Stops Arcing In Starting Rheostats

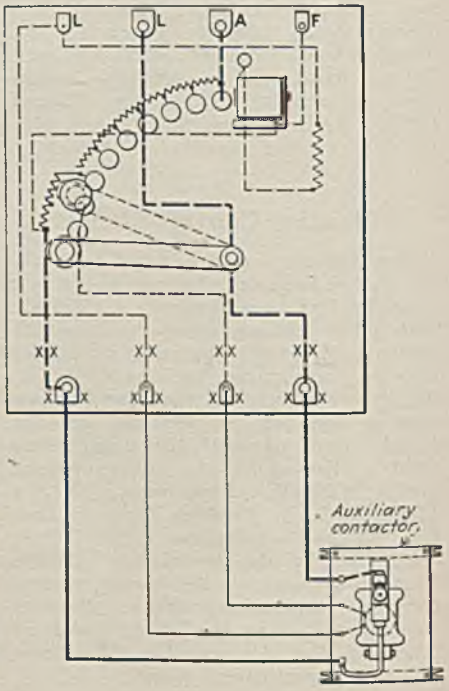
Installation of auxiliary contactors on manually operated starting rheostats for d.c. motors to reduce arcing between the shoe on the operating arm and the first button of the controller is described by John J. Nolan, Terre Haute, Ind., who submits the wiring diagram shown herewith.

In installing the auxiliary contactor, the first two segments are disconnected from the resistance and are bridged together and connected to one terminal of the contactor holding coil, as shown. When the operating arm is moved to the first button, the holding coil is energized, closing the contactor and starting the motor. In case the first segment is dead, which is a characteristic of some types of rheostats, this segment can be bridged to the next two, thereby causing the contactor to close sooner and increasing the time for motor acceleration.

Points marked *XX* in the sketch show the additional wiring and buttons which must be installed in making the alterations in the rheostat. Wires are crossed inside, instead of between the rheostat and the contactor, to simplify outside connections. The rating of the contactor need not match the horsepower of the motor, Mr. Nolan says, as it is in service only momentarily until the operating handle reaches the third segment.

The chief field of application, according to Mr. Nolan, is on starters for d.c. motors of 10 hp. or more. Revisions have been made in a number of rheostats of this type under his direction, and he reports good results.

Wiring Diagram for Installation of Auxiliary Contactor



WORD from the FIELD

General Rate Investigation Ordered by Commission

A general investigation to determine "whether and to what extent, if any," reductions in freight rates should be made was announced by the Interstate Commerce Commission on April 1. This action follows arguments heard late last month on the petition of the National Coal Association and allied agricultural and lumber interests for a general downward revision in the transportation charges on basic commodities *(Coal Age,* Vol. 38. pp. 63, 69). The order of the Commission instituting the investigation, however, puts no limitation on the commodity scope of the inquiry.

That the Commission had been impressed with the demand of the coal association and its allies was indicated in dissenting opinions to the decision in the surcharge case handed down on March 7. The pendency of the petition was referred to a number of times by Commissioners opposed to a continuance of the surcharge. The majority report in that case, however, authorized the railroads to continue the charge for another six months after the expiration of its former order, March 31. The only modification as far as coal was concerned was a direction prohibiting the collection of a double surcharge on lake-cargo coal. Complaint had been made that the surcharge was collected on shipments from the mines to the lower lake ports and again on rail movement from the docks at the Head of the Lakes.

Members of the Presidents' Traffic Conference of the Eastern Railroads, meeting in New York City, March 31, adopted a resolution for a general investigation of coal rates in Eastern territory. Rates on anthracite to New York and other Eastern points and coals from southern West Virginia, Kentucky and Virginia to the seaboard were specifically discussed. Railroads represented at the meeting were: New York Central; Pennsylvania; Lehigh Valley; Delaware, Lackawanna & Western; Chesapeake & Ohio; Baltimore & Ohio; Norfolk & Western; New York, New Haven & Hartford; Wheeling & Lake Erie and the Pittsburgh & West Virginia.

Push Convention Plans

Plans for the annual convention of practical coal operating men and exposition of coal-mining equipment, to be held at the William Penn Hotel, Pittsburgh, Pa., in May, under the auspices of the Manufacturers' Section, Coal Division, American Mining Congress, went rapidly forward in March. Seven technical sessions, covering economic and administrative problems and all phases of operation, are scheduled for May 8-11, inclusive. The program is in charge of regional committees throughout the country, with L. N. Thomas, vice-president, Carbon Fuel Co., Carbon, W. Va., as general chairman.

L. N. Thomas

Washington Discusses Coal

The coal question again came to the front in Washington last month when leaders of the United Mine Workers joined President Roosevelt and Secretaries Perkins (Labor) and Ickes (Interior) in a discussion of the industry's problems on March 27. Possible methods of improving conditions were discussed, according to an announcement following the conference, together with a number of suggestions put forward by the miners' representatives. Further conferences with the President will be held, it was announced.

Utah Coal Bill Vetoed

In spite of its indorsement by many producers and retailers, the Utah coal control bill was vetoed by Governor Blood last month on the ground that it would be an additional state service adding to the cost of government. The measure, introduced by Senator Miller, of Carbon County, and approved by the State Attorney General, was designed to eliminate unfair trade practices, establish sizing standards and assure a fair price both to the coal industry and the public through control of the industry in all its branches by the Public Utilities Commission of the state.

New Plant Construction

New contracts for topworks construction at various coal operations were reported as follows in March:

Hazle Brook Coal Co., Hazle Brook colliery, Jeddo, Pa.; contract closed with the Hydrotator Co. for two Hydrotators for rice, barley and No. 4 buckwheat; capacity of the two machines, 90 tons per hour; to be installed by May 1.

Hatfield-Campbell Creek Coal Co., Cincinnati (Ohio) yard; contract closed with the Morrow Mfg. Co. for apron feeder, three-track four-grade shaker screen installation, loading booms, conveyors and steel supporting structure; capacity, 125 tons per hour; to be completed early in May.

Linton-Summit Coal Co., Terre Haute, Ind.; contract closed with the McNally-Pittsburg Mfg. Corporation for auxiliary screening equipment for the Twin mine, capacity, 250 tons per hour. The plant will separate 2x0-in. coal from a 3½x0-in. feed.

Philadelphia & Reading Coal & Iron Co., Bear Valley colliery, Shamokin, Pa.; contract closed with the Hydrotator Co. for Hydrotator for cleaning No. 4 buckwheat; capacity, 30 tons per hour; to be installed by April 20.

Sherman Coal Corporation, Pottsville, Pa.; contract closed with the Koppers-Rheolaveur Co. for headhouse and breaker at the new Indian Head property, near Tremont, Pa. The breaker will contain both sealed- and free-discharge Rheolaveur units for cleaning egg to No. 2 barley, inclusive, and will have a minimum capacity of 1,000 tons per day of eight hours. It is expected that the plant will be in operation in September.

Indiana Company Organized

As a result of an agreement between the Lafayette Coal Co., Chicago, and the United States Fuel Co., a subsidiary of the United States Steel Corporation, a new operating company, the Universal Coal Corporation, has been organized and has acquired a 20-year lease on 2,800 acres of Fourth Vein coal lands of the United States Fuel Co. in Indiana. Operations, it was announced, will begin at once, with headquarters at Clinton, Ind. William E. Brandt, president, Lafayette Coal Co., the sales agent, is president of the Universal company. A. L. Millward and A. D. Spears are secretary-treasurer, and vice-president and general manager, respectively. Ultimate production of the property is expected to be 1,200 tons per day.

L. & N. Imposes Trucking Curb

Lousville & Nashville R.R. last month moved to curb the sale of coal to trucks at the mines for distribution to consumers or retail yards on the carrier's lines by announcing that in the future it would not place orders with mines selling to truckers.

Regional Sales Plan Upheld by High Court In Decision in Appalachian Case

SWEEPING ASIDE previous condemnations of sales agreements among competing producers—notably in the *Addystone Pipe* and *Trenton Potteries* cases—as inapplicable to the case at bar, the Supreme Court of the United States, in an 8 to 1 decision handed down on March 13, declared that there was nothing contrary to the provisions or the spirit of the Sherman anti-trust law in the plan of Appalachian Coals, Inc. The decree of the trial court enjoining the operation of this joint selling agency of 137 producers in the Southern high-volatile fields of Kentucky, Tennessee and the Virginias was reversed.

The only crumb of comfort given the Department of Justice, which instituted the injunction proceedings, was a provision in the order of reversal directing the lower court to retain jurisdiction of the cause with the right to "set aside the decree and take further proceedings if future developments justify that course in the appropriate enforcement of the anti-trust act." This provision, it was explained, was made because the case had been tried in advance of the operation of the plan and "without the advantage of the demonstrations of experience."

What some critics have condemned as vagueness in the language of the law is vigorously defended in the opinion of the court by Chief Justice Hughes. "As a charter of freedom," he asserts, "the act has a generality and adaptability comparable to that found to be desirable in constitutional provisions. It does not go into detailed definitions which might either work injury to legitimate enterprise or, through particularization, defeat its purposes by providing loopholes for escape. The restrictions the act imposes are not mechanical or artificial. Its general phrases, interpreted to attain its fundamental objectives, set up the essential standard of reasonableness. They call for vigilance in the detection and frustration of all efforts unduly to restrain the free course of interstate commerce, but they do not seek to establish a mere delusive liberty either by making impossible the normal and fair expansion of commerce or the adoption of reasonable measures to protect it from injurious and destructive practices and to promote competition on a sound basis.

"Only such contracts and combinations are within the act as, by reason of intent or the inherent nature of the contemplated acts, prejudice the public interests by unduly restricting competition or unduly obstructing the course of trade. In applying this test, a close and objective scrutiny of particular conditions and purposes is necessary in each case. Realities must dominate the judgment. The mere fact that the parties to an agreement eliminate competition between themselves is not enough to condemn it. The question of the application of the statute is one of intent and effect, and is not to be determined by arbitrary assumptions."

The findings of the trial court, declared the Hughes decision, leave "no room for doubt" that the economic condition of the bituminous industry "for many years has been indeed deplorable." With capacity far in excess of normal demand, the coal market has suffered a steady shrinkage from the competition of other sources of energy and from increased efficiency in fuel combustion. The situation has been further aggravated by uneconomic trade practices within the industry itself. Organized buying agencies and large consumers taking substantial tonnages, in the opinion of the trial court, also "constitute unfavorable forces."

Reviewing the genesis of Appalachian Coals, Inc., and its plan of organization (*Coal Age*, Vol. 36, pp. 605, 648; Vol. 37, pp. 34, 85 and 123), the opinion, quoting from the court below, points out that, while the movement was part of a general plan to organize a number of regional agencies, the formation of Appalachian Coals, Inc., was not made dependent upon the formation of other agencies nor was there any evidence of agreement or understanding involving a division of markets or price fixing between the different regional sales groups. In the case of Appalachian Coals, Inc., it was decided that the plan would not become operative unless 70 per cent of the tonnage in the high-volatile districts joined and that membership would be limited to 80 per cent of the tonnage. "The maximum of 80 per cent was adopted because a majority of the producers felt that an organization with a greater degree of control might unduly restrict competition in local markets. The minimum of 70 per cent was fixed because it was agreed that the organization would not be effective without this degree of control."

From its review of the evidence, the Supreme Court reaches three major conclusions:

1. The defendants were engaged in a fair and open attempt to aid the industry in a measurable recovery from its plight. "The unfortunate state of the industry would not justify any attempt unduly to restrain competition or to monopolize, but the existing situation prompted defendants to make, and the statute did not preclude them from making, an honest attempt to remove abuses, to make competition fairer, and thus to promote the essential interests of commerce. The interests of producers and consumers are interlinked. When industry is grievously hurt, when producing concerns fail, when unemployment mounts and communities dependent upon profitable production are prostrated, the wells of commerce go dry."

2. Whether, despite the objective of the defendants to aid the industry in a measurable recovery from its plight, "the inherent nature of their plan was such as to create an undue restraint upon interstate commerce" presents a question which chiefly concerns the effect of the plan upon prices. "The contention is, and the court below found that, while defendants could not fix market prices, the concerted action would 'affect' them—i.e., that it would have a tendency to stabilize market prices and to raise them to a higher level than would otherwise obtain.

"But the facts found do not establish, and the evidence fails to show, that any effect will be produced which in the circumstances of this industry will be detrimental to fair competition. A cooperative enterprise, otherwise free from objection, which carries with it no monopolistic menace is not to be condemned as an undue restraint merely because it may effect a change in market conditions, where the change would be in mitigation of recognized evils and would not impair, but rather foster, fair competitive opportunities.

"Voluntary action to rescue and preserve these opportunities, and thus to aid in relieving a depressed industry and in reviving commerce by placing competition on a sounder basis, may be more efficacious than an attempt to provide remedies through legal processes. The fact that the correction of abuses may tend to stabilize a business, or to produce fairer price levels, does not mean that the abuses should go uncorrected or that cooperative endeavor to correct them necessarily constitutes an unreasonable restraint of trade. Putting an end to injurious practices, and the consequent improvement of the competitive position of a group of producers, may be entirely consonant with the public interest, where the group must still meet effective competition in a fair market and neither seeks nor is able to effect a domination of prices."

3. There is no ground for holding defendants' plan illegal merely because they have not integrated their properties and have chosen to maintain their independent plants, seeking not to limit but rather to facilitate production. "We know of no public policy, and none is suggested by the terms of the Sherman law," declares the court in disposing of the contention that large corporations may do as individuals what groups of smaller companies acting in concert

Three major points were made by the Supreme Court in its favorable decision in the Appalachian Coals case:

1. Participants in the formation of the agency were engaged in a fair and open endeavor to aid the industry in a measurable recovery from its plight.

2. The agency plan does not contemplate or involve price fixing, though the tendency would be to stabilize prices and raise them to a higher level. Where, however, a cooperative group does not seek a monopoly it is not to be condemned for undue restraint of competition because its efforts to correct abuses may result in a change in market conditions.

3. There is no ground for holding defendants' plan illegal merely because they have not combined their properties and have chosen to maintain their independent plants with the object of facilitating, rather than limiting, production.

HOWARD N. EAVENSON
Chairman, Appalachian Coals, Inc.

dare not, "that in order to comply with the law those engaged in industry should be driven to unify their properties and businesses in order to correct abuses which may be corrected by less drastic measures. Public policy might indeed be deemed to point in a different direction.

"If the mere size of a single, embracing entity is not enough to bring a combination in corporate form within the statutory inhibition, the mere number and extent of the production of those engaged in a cooperative endeavor to remedy evils which may exist in an industry, and to improve competitive conditions, should not be regarded as producing illegality. The argument that integration may be considered a normal expansion of business, while a combination of independent producers in a common selling agency should be treated as abnormal—that one is a legitimate enterprise and the other is not—makes but an artificial distinction. The anti-trust law aims at substance.

"Nothing in theory or experience indicates that the selection of a common selling agency to represent a number of producers should be deemed to be more abnormal than the formation of a huge corporation bringing various independent units into one ownership. Either may be prompted by business exigencies, and the statute gives to neither a special privilege. The question in either case is whether there is an unreasonable restraint of trade or an attempt to monopolize. If there is, the combination cannot escape because it has chosen corporate form, and, if there is not, it is not to be condemned because of the absence of corporate integration."

Justice McReynolds, the lone dissenter, filed no formal opinion expounding his views.

Inspectors Meet May 15-16

The twenty-fourth annual meeting of the Mine Inspectors' Institute of America has been scheduled for May 15 and 16 at the William Penn Hotel, Pittsburgh, Pa., instead of the date previously announced.

Appalachian Coals Organizes; Other Agencies Planned

With both the directors and stockholders meeting in Cincinnati, Ohio, March 22 and 23, Appalachian Coals, Inc., laid plans for beginning the full-scale operations allowed by the favorable decision of the Supreme Court. James D. Francis, Huntington, W. Va., vice-president, Island Creek Coal Co., was elected president; Howard N. Eavenson, Pittsburgh, Pa., president, Clover Splint Coal Co., chairman of the board; E. C. Mahan, Knoxville, Tenn., president, Southern Coal & Coke Co., vice-president; C. C. Dickinson, Charleston, W. Va., president, Dickinson Fuel Co., chairman of the executive committee; R. E. Howe, Knoxville, president, Premier Coal Co., secretary; and T. J. Davis, chairman, First National Bank of Cincinnati, treasurer. General offices will be established in Cincinnati.

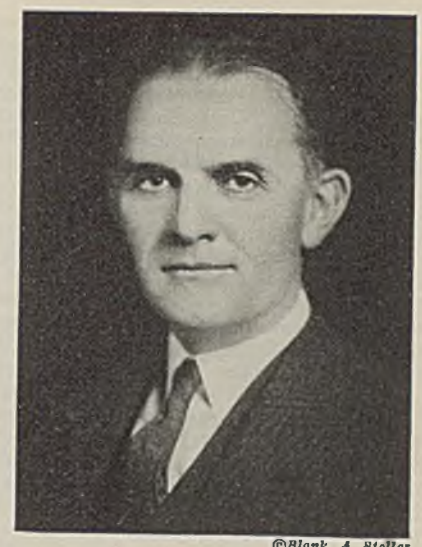
The following temporary committee of eight sales managers was chosen to serve pending election of a permanent list: J. H. Baker, Western sales manager, Elk Horn Coal Corporation; V. F. Carraher, vice-president, West Virginia Coal & Coke Corporation; W. A. Ellison, president, Mahan-Ellison Coal Corporation; Calvin Holmes, president, Holmes-Darst Coal Co.; Venable Johnson, Detroit manager, Island Creek Coal Co.; W. R. Kernohan, sales manager, Glen Alum Fuel Co.; W. J. Magee, vice-president, Carbon Fuel Co.; and A. D. W. Smith, president, North East Coal Co.

The Appalachian decision revived plans for similar agencies in a number of other producing districts. Northern West Virginia operators met at Fairmont, W. Va., March 21, and drew up plans for the organization of an agency, and similar steps were taken by southern West Virginia smokeless operators at meetings in Washington and New York, March 21 and 29. In Ohio, an organization committee, at a meeting in Cleveland, March 17, recommended that the organization of Northern Coals, Inc., be completed, and a general meeting of eastern Ohio operators was called for April 4 to receive the plan.

Operators in southern Ohio considered the alternatives of joining with Northern Coals or setting up a separate agency, but arrived at no decision in March. The board of directors of the Central Pennsylvania Coal Producers' Association met with a group of operators on March 31 and decided in favor of the formation of an agency. A committee was appointed to study the question of organization. Alabama and west Kentucky operators also took up the question in March, and meetings were scheduled in Kansas and the Rocky Mountain states.

Carter Again to Operate Mines

Properties of the Carter Coal Co., including the Caretta and Coalwood shaft mines in the Pocahontas district, have been turned back to the company by the Consolidation Coal Co. In the transaction, the entire amount owed to Consolidation and its receivers by the Carter company was cancelled, and the bonds



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JAMES D. FRANCIS
President, Appalachian Coals, Inc.

on the property were extinguished; the liability of Consolidation in the retirement of the preferred stock of the Carter Coal Co. also was cancelled. The latter company, James L. Carter, president, has opened an office in Washington, D. C., and is making plans for the continued operation of the properties.

Torrence Plan Urges Dictators To Revive Business

Direct action in the reconstruction of business through the appointment of federal dictators to control agricultural crops and the bituminous coal, lumber, oil, and iron and steel industries is advocated in a plan announced by George Paull Torrence, president, Link-Belt Co., Chicago, on March 17. Raw material industries, he declared, are just as much in need of firm handling as agriculture. Bituminous coal has suffered since the war from the evils growing out of excess capacity, but can be made a good industry for owners, workers and public by exempting it from the provisions of anti-trust laws and giving the Federal Trade Commission full power to pass on any rules and regulations governing the industry before they are put into effect. The rules should be made binding on the industry—with the proviso that they can be appealed to the Supreme Court—by licensing or some similar system.

The rules would include limitation of output, cooperative sales agencies, coal specifications, prices and terms of sale, labor rates, consolidations, closing of mines and other factors entering into the orderly conduct of the industry. Responsibility for the establishment of the rules should be placed in the hands of an association of producers, representing 75 per cent of the industry, as the most reliable source of knowledge on matters concerning the industry. In addition to the supervision of the Federal Trade Commission, competition from other fuels and sources of power would insure equitable prices.

Lumber could be aided in the same

way as coal, and oil should be given a chance to improve present regulation under Federal Trade Commission supervision. The only manufacturing industry that should be included at once is iron and steel, inasmuch as it is the largest basic manufacturing industry, and therefore affects a large number of other industries using its products. Extension of the plan to other industries should wait upon the results of operation in the industries named.

Much could be done in advance of such extension, however, if the management of these other industries would recognize that there is not an unlimited market and that it is unsocial as well as unprofitable to run a business at a loss. Development of new products selling at a profit is the only way to utilize excess capacity, but it is possible to operate at half capacity or less and still make a profit. Industry and business, he declared, are social enterprises to be operated for the mutual benefit of owners, employees and the general public.

Bailey Heads West Virginia Department of Mines

Ernest L. Bailey, general superintendent, Davis Coal & Coke Co., has been appointed chief of the West Virginia Department of Mines. Mr. Bailey's appointment climaxes a long career in coal mining in West Virginia. Starting as a mining engineer with the United Pocahontas Coal Co., he became superintendent in 1916 of the Solvay Collieries Co., now a subsidiary of the Allied Chemical & Dye Corporation, and later was made general superintendent of all the Allied mining interests (Edgewater and Kingston-Pocahontas coal companies). In 1929, he joined with F. R. Wadleigh to form the consulting mining engineering firm of Wadleigh & Bailey. Early in 1931, he joined the Davis Coal & Coke staff as general superintendent.

Mr. Bailey succeeds Robert M. Lambie, who was first appointed chief of the department on Feb. 14, 1920, after a number of years spent in the mines and as an official of the McKell Coal & Coke Co. and the New River Co., followed by a two-year term as district mine inspector.

George T. Watson, Fairmont, W. Va., succeeds Lee Ott as West Virginia State Compensation Commissioner. Mr. Watson has been connected with coal mining in northern West Virginia for a number of years and was at one time general manager of the Consolidation Coal Co.

Kelly Reintroduces Coal Bill

Representative Clyde Kelly, Pennsylvania, last month reintroduced his coal control bill in Congress. He stated that he preferred his measure, which is identical with the amended Davis bill which figured in the last session of the national legislature, over a bill invoking the taxing power of Congress submitted to him by Henry Warrum, counsel for the United Mine Workers. The latter bill, in Representative Kelly's opinion, would be proved unconstitutional.

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ERNEST L. BAILEY

1932 Financial Reports

American Coal Co. of Allegany County, for 1932, reports a net loss of $246,767 after taxes, depreciation, depletion and other charges, against a net loss of $37,142 in 1931.

Consolidation Coal Co., according to the receivers' report, showed a net loss of $1,105,919 in 1932 after all charges, including depreciation and depletion, and also a profit of $677,445 on bonds redeemed. Prior to the receivership on June 2, the net loss was $987,332; during receivership to the end of the year, the net loss was $118,587. Net loss in 1931 was $2,275,013.

Franklin County Coal Co., Inc., and subsidiaries report a net loss of $173,791 in 1932 after depreciation, depletion, amortization, interest and other charges.

Hatfield-Campbell Creek Coal Co. and subsidiaries, for 1932, report a net loss of $64,412 after expenses, interest and other charges, compared with a net profit of $5,035 in 1931.

Island Creek Coal Co. and subsidiaries report a net profit of $934,650 in 1932 after depreciation, depletion, federal taxes and other charges, equal, after preferred dividends, to $1.30 a share on 593,865 common shares, $1 par. Net profit in 1931 was $1,520,348, or $2.28 per common share.

Lehigh Coal & Navigation Co. and its subsidiaries, for 1932, report a net income of $942,369 after all expenses, including provisions for workmen's compensation, bad debts, depreciation, depletion, minority interest, taxes, interest and other charges, equal to 48c. a share on 1,930,065 capital shares. Net income in 1931, before minority interest, was $2,062,977, equal to $1.07 per share. Operations of the Lehigh Navigation Coal Co. and the Greenwood Corporation and their affiliates resulted in a net loss of $1,332,918 in 1932, after taxes, sinking fund payments, depletion and depreciation.

New River Co. reports a net profit of $37,535 in 1932 after depreciation, depletion, federal taxes and other charges, equal to 53c. a share on 70,354 6-per cent preferred shares. This compares with a net profit, exclusive of $33,019 realized from settlement of a suit, of $156,758 in 1931, equal to $2.13 a share on 73,769 preferred shares. Including realization from the suit settlement, net profit in 1931 was $189,777, or $2.57 per preferred share.

Pacific Coast Co. and subsidiaries, excluding Pacific Coast Cement Co., report a net loss of $170,490 in 1932 after taxes, interest, depreciation, depletion and other charges, compared with a net loss of $316,428 in 1931.

Pikes Peak Fuel Co. reports a net profit of $344,074 in 1932 before depreciation, depletion and deductions for bad accounts.

Pittsburgh Terminal Coal Corporation and subsidiaries report a net loss for 1932 of $724,982 after interest, depreciation, depletion and other charges. This compares with a net loss of $755,999 in 1931.

Pond Creek Pocahontas Co. reports a net profit of $218,280 in 1932 after interest, depreciation, depletion and federal taxes, equal to $1.72 a share on 126,404 no-par shares. Net profit in 1931 was $107,939, or 85c. per share.

Truax-Traer Coal Co. and subsidiary, for the nine months ended Jan. 31, report a net loss of $192,117 after depreciation, depletion and other charges. This compares with a net loss of $73,131 before allowing for a discount of $47,411 realized on debentures retired in the nine months ended Jan. 31, 1932.

Westmoreland Coal Co. reports a net loss of $341,106 in 1932 after taxes, depreciation and other charges, against a loss of $7,315 in 1931.

Westmoreland, Inc., reports a net profit of $49,248 in 1932 after taxes, depreciation, depletion and other charges, equal to 25c. a share on 200,000 no-par shares. Profit in 1931 was $49,620, or 25c. a share.

Join Anthracite Institute

Seven more anthracite mining companies joined the Anthracite Institute late in March, bringing the total tonnage of institute members up to 83 per cent of the output of the industry. The new members are: Susquehanna Collieries Co., Penn Anthracite Mining Co., Madeira, Hill & Co., Weston Dodson & Co., Wyoming Valley Collieries Co., East Bear Ridge Colliery Co. and the Lytle Coal Co.

Coming Meetings

American Mining Congress; annual convention and exposition, May 8-11, Pittsburgh, Pa.

Mine Inspectors' Institute of America; annual meeting, May 15 and 16, William Penn Hotel, Pittsburgh, Pa.

Indiana Coal Producers' Association; annual meeting, June 6, Terre Haute, Ind.

National Coal Association; annual meeting, June 15-17, Chicago; annual dinner, June 16.

American Society for Testing Materials; annual meeting, June 26-30, Chicago.

Ohio Coal Conference; annual meeting, July 10-12, Cedar Point, Ohio.

Competitive Position of Illinois Coal Industry Outlined at Mineral Industries Meet

THE competitive position of Illinois coal and clay products in their natural geographical area and researches for their improvement were the chief subjects of discussion at the First Annual Mineral Industries Conference of Illinois, held at Urbana, Ill., March 3 and 4. The conference was sponsored by the Illinois Geological Survey and the departments of ceramic engineering and mining engineering of the University of Illinois, in cooperation with the Illinois Coal Operators' Association, Illinois Clay Manufacturers' Association, Illinois-Indiana Division of the American Face Brick Association, Illinois Mining Institute, Western Society of Engineers, Illinois Society of Engineers, and the Illinois Chamber of Commerce.

Summarizing the work of the Illinois Geological Survey at the Saturday morning session, M. M. Leighton, chief of the Survey, said that during its 27 years' existence the Survey has acquired an immense amount of information on the geographic distribution of the various seams, their thickness, structure and roof and floor conditions, and also on their proximate and ultimate analyses. Three fundamental projects remain to be worked out: botanical and mineral constituents of the coal beds, and the properties of the organic compounds that make up the botanical constituents.

At the present time, the coking, gas-making and byproduct properties of Illinois coals are being determined in the light of their constitution. Calorific values of Illinois coals also are being investigated with the utimate objective of assembling sufficient information to enable producers to guarantee within a tolerance of 200 B.t.u. the quality of their product. Transforming slack, which constitutes about 50 per cent of the state's production, into a marketable product is another project of the Survey which probably will be completed this coming winter.

Research, said A. C. Callen, head of the department of mining engineering, University of Illinois, is not commercial testing or invention. While research may lead to invention or to the lowering of cost of production, the results are not necessarily practical ends in themselves. Their value lies only in later application to future problems, and their dollars and cents value can be determined only through such application over a period of years.

As indicative of the value of research results when applied to actual mining operations, Prof. Callen detailed the ventilation work at one Illinois mine. The research work had indicated that cleaning airways would have a major influence on power cost, and it was found that at the time this would result in a power saving of $1,000 per year within the first 100 ft. of air travel. A 2,400-ft. length of main aircourse beyond this zone was cleaned up, showing an additional saving of $4,500. Total expenditure was $3,700, and allowing for a maintenance charge of 20 per cent of the original cost, net saving was $4,700.

Basing his conclusions on a brief summary of a detailed analysis not yet published, W. H. Voskuil, mineral economist, Illinois State Geological Survey, discussed the competitive position of Illinois coals in the market territory comprising the states of Illinois, Indiana, Missouri, Iowa, Minnesota and Wisconsin, the eastern cities of Kansas and Nebraska, and a small section of the Dakotas. The boundaries of this territory, in which 90 per cent of the Illinois output is sold, have been determined by the competition of fuel oil and natural gas in the Southwest; the eastward movement of coal from Colorado, Wyoming and Montana into Kansas, Nebraska and the Dakotas; ex-lake coal in the shore counties of Minnesota and Wisconsin; and Indiana and Appalachian coals in the territory east of Illinois. Consumption of energy in the Illinois market territory in 1929—a year when the total Illinois output was 60,658,000 tons—is shown in the following table.

SUMMARY OF ENERGY CONSUMPTION IN ILLINOIS MARKET AREA IN 1929
(GASOLINE EXCLUDED)

	Quantity	Coal or Coal Equivalent, Tons
Bituminous coal, tons	102,858,155	102,858,155
Coke, tons	4,580,764	4,580,764
Briquets, tons	687,377	687,377
Anthracite, tons	2,705,946	2,705,946
Fuel oil, barrels	28,871,165	6,880,000
Natural gas, 1,000,000 cu.-ft.	95,410,000	3,816,400
Water power, 1,000,000 kw.-hr.	2,814,435	2,388,000

Low-cost transportation to lake territory offers a difficult problem for Illinois producers, but in the case of Appalachian coals, the preference engendered by the special qualities of some of these coals and the lower prevailing wages do not offer insuperable difficulties. The situation with respect to fuel oil may be expected to improve when the output of crude is controlled and the price raised sufficiently to make more cracking profitable. Markets in the states producing natural gas are becoming saturated, and future development means that outside outlets must be found, of which the Illinois market territory is the most important. Eventually these competitive interests, Mr. Voskuil believed, must enter into closer cooperation to obtain for each a fair share of the market on the basis of scientific distribution.

The Illinois coal industry must look to the future and forget the past if it is to succeed, declared J. G. Bently, combustion engineer, O'Gara Coal Co., in discussing the viewpoints of sales and combustion engineers on the needs of the industry. Study of the coal business must be extended to take in distribution and use, in addition to production. The major problem of the Illinois producer today is not one of taking business away from his immediate neighbor but the meeting of competition from other districts and substitutes.

Maumee Stripping Under Way

With development practically completed, the new No. 20 strip mine of the Maumee Collieries Co., located at Keller station on the Chicago, Milwaukee, St. Paul & Pacific Ry., ten miles south of Terre Haute, Ind., reached its maximum production of 3,000 tons per day in March. The seam mined is the Premium No. 5, with a minimum thickness of 5 ft., and stripping equipment consists of a Marion 5480 electric shovel with a 100-ft. boom and a 14-cu.yd. dipper. The hard, dense overburden, varying in thickness from 30 to 50 ft., is drilled with two electric Clipper drills and blasted with dynamite. After removal of the overburden, the coal is cleaned with a "bulldozer," hand shovels, wire brushes and air, and is loaded with a 3¼-cu.yd. Marion 490 shovel.

Preparation facilities consist of a five-track, all-steel tipple with a maximum daily capacity of 5,000 tons. Equipment consists of shaker screens, vibrating screens for stoker coal, picking tables, loading booms, mixing conveyor, degradation screens, crusher and rotary breaker for preparing and loading six major sizes and mixtures thereof. The coal moves to the market under the trade name "Maumee Chieftain."

Illinois Insurgents Approve Pact; Anthracite Closings Argued

A new wage agreement embodying basic scales of $5 per day and 58c. per ton was approved by members of the Progressive Miners of America, insurgent Illinois union, in a referendum vote on March 25. The contract was drawn up at a conference at Hillsboro, March 18, and, except for certain concessions on working conditions, is the same as that previously in force. The agreement runs for two years and is reported to affect about 6,000 men. The United Mine Workers also announced the addition of sixteen independent companies in Illinois to the roster in March. These companies employ 4,188 men.

Flushed by their success in obtaining the new agreement, the Progressive Miners' union announced that an organization campaign in Franklin County, one of the major strongholds of the United Mine Workers, would start on March 27. Peace officers reiterated their ban on interference with the operation of the county's mines. On March 25, a clash between Progressive pickets and miners at the Derco No. 2 mine of the Rex Coal Co., Eldorado, Saline County, resulted in the wounding of three pickets by gunfire.

Interest in the anthracite region in March centered on the probable effects of the wage decision on colliery operation. No definite plan of closing down high-cost operations was announced by the producers, though the Susquehanna Collieries Co. declared that its Short Mountain colliery, Lykens, Pa., probably would be closed down permanently because the present wage scale prevents competition with other fuels. The proposed closing of the Pine Knot colliery, Pottsville, by the Philadelphia & Reading Coal & Iron Co. aroused a storm of protest among miners and citizens in the region. These interests, at a meeting on March 20, voted to carry the fight on closing to a finish to prevent it from serving as a precedent for other shutdowns in the region.

Three hundred miners employed by the Bertha-Consumers Co. at the Bertha mine, near Burgettstown, Pa., struck March 21 for a wage increase and revisions in working conditions.

Safety Awards Made

Twenty-eight Certificates of Merit and six personal awards were voted to coal mines, mining companies and individuals at the annual meeting of the Joseph A. Holmes Safety Association last month. Mine and company awards included the following:

American Coal Co. of Allegany County, Crane Creek mine, West Virginia.
Bell & Zoller Coal & Mining Co., Zeigler No. 1 mine, Illinois
Butler Consolidated Coal Co., Wildwood mine, Pennsylvania.
Calumet Fuel Co., Somerset mine, Pennsylvania.
Colonial Colliery Co., Pennsylvania.
Consumers Mining Co., Steubenville mine, Ohio.
Davis Coal & Coke Co., Orenda mine, Pennsylvania.
Ellsworth Collieries Co., No. 51 mine, Pennsylvania.
Jamison Coal & Coke Co., No. 20 mine, Pennsylvania.
Kemmerer Coal Co., Elkol mine, Wyoming.
Pacific Coast Coal Co., New Black Diamond mine, Washington.
Peale, Peacock & Kerr, Inc., Pennsylvania.
Penn Run Coal Corporation, Victor No. 45 mine, Pennsylvania.
Philadelphia & Reading Coal & Iron Co., Hammond colliery, Pennsylvania.
Rockhill Coal & Iron Co., Rockhill No. 9 mine, Pennsylvania.
St. Clair Coal Co., Pennsylvania.
South Union Coal Co., South Union mine, Pennsylvania.
Springfield Coal Corporation, Springfield No. 1 mine, Pennsylvania.
Stonega Coke & Coal Co., Roda and Imboden mines, Stonega coke works, Virginia.
Union Pacific Coal Co., Wyoming.
Youghiogheny & Ohio Coal Co., Dorothy mine, Ohio.
Youngstown Mines Corporation, Dehue mine, West Virginia.

Individual awards went to the following: W. B. Davis, doctor, and Lonnie Carter, loader, Koppers Coal Co., Powellton, W. Va.; Andreas Samaripa, miner, Jones mine, Albuquerque & Cerrillos Coal Co., Madrid, N. M.; Joseph Fennick, miner, No. 9 mine, Carrolltown Coal Co., St. Benedict, Pa.; Harry Roush, Monroe Coal Mining Co., Revloc, Pa.; and Felipe I. Gonzales, mule driver, No. 5 mine, Gamerco, N. M.

Coal-Mine Exhibit

Construction of a full-sized bituminous coal mine is being completed as one of the exhibits of the Museum of Science and Industry, which will open its doors at Chicago May 1. The museum was founded by Julius Rosenwald, and the model mine will be housed in the Fine Arts building, at Jackson Park. The mine is designed to show coal storage and handling, preparation, pumping and drainage, ventilation, hoisting, haulage, cutting, loading and timbering, safety and similar activities, and other exhibits will show the geology and distribution of coal.

Oppose Pennsylvania Coal Tax

Representatives of the anthracite and bituminous industries in Pennsylvania were called in late in March by state legislators to assist in the fight on the proposed tax of three mills per ton. The campaign of the opponents will be directed by a committee of six legislators and six coal men. Anthracite men appointed to the committee are: E. H. Suender, vice-president, Madeira, Hill & Co.; A. M. Fine, vice-president, Hudson Coal Co.; A. B. Jessup, general manager, Jeddo-Highland Coal Co. Bituminous representatives are: B. M. Clark, president, Rochester & Pittsburgh Coal Co.; Charles Albright, H. C. Frick Coke Co.; and H. F. Bovard, president, Keystone Coal & Coke Co.

Anthracite Mine Reopened

The old Hadley anthracite mine at Sugar Notch, Pa., has been reopened after an idleness of two years by the newly organized Hadley Anthracite Co. About $30,000 has been spent in reconditioning the mine and surface plant, and the new owners expect to produce from 500 to 700 tons per day, according to reports. Hadley officers are as follows: president, Dever C. Ashmead, Kingston, Pa.; vice-president, John Lloyd Davis, New York; secretary, Frank G. Saunders, Kingston; treasurer, Edward Welles, Jr., Wilkes-Barre, Pa.

Mine Fatalities Down

Coal-mine accidents caused the deaths of 61 bituminous and 13 anthracite miners in February, 1933, according to information furnished the U. S. Bureau of Mines by state mine inspectors. This compares with 59 bituminous and 26 anthracite fatalities in January, and 116 bituminous and 20 anthracite deaths in February, 1932. The death rate at bituminous mines rose slightly to 2.25 in February, against 2.18 in January, while the death rate at anthracite mines dropped from 6.83 to 3.04. Comparative figures are shown in the following table:

BITUMINOUS MINES

	Feb., 1933	Jan., 1933	Feb., 1932
Production, 1,000 tons	27,134	27,060	28,013
Fatalities	61	59	116
Death rate per 1,000,000 tons	2.25	2.18	4.14

ANTHRACITE MINES

Production, 1,000 tons	4,275	3,807	4,019
Fatalities	13	26	20
Death rate per 1,000,000 tons	3.04	6.83	4.98

Comparative fatality rates for the first two months of 1933 and 1932, by causes, are given in the following table:

FATALITIES AND DEATH RATES AT UNITED STATES COAL MINES, BY CAUSES*

Cause	Bituminous: Number Killed	Bituminous: Killed per Million Tons	Anthracite: Number Killed	Anthracite: Killed per Million Tons	Total: Number Killed	Total: Killed per Million Tons
January — February, 1932						
Falls of roof and coal	96	1.717	24	3.031	120	1.880
Haulage	28	.501	6	.758	34	.533
Gas or dust explosions:						
Local explosions	7	.125	...	....	7	.110
Major explosions	38	.680	...	....	38	.595
Explosives	2	.036	2	.253	4	.063
Electricity	8	.143	1	.126	9	.141
Machinery	2	.036	...	....	2	.031
Surface and miscellaneous	17	.304	2	.253	19	.298
Total	198	3.542	35	4.421	233	3.651
January — February, 1933						
Falls of roof and coal	69	1.273	23	2.846	92	1.477
Haulage	22	.406	6	.742	28	.450
Gas or dust explosions:						
Local explosions	3	.055	4	.495	7	.112
Major explosions	...	....	...	....	...	....
Explosives	7	.129	...	....	7	.112
Electricity	9	.166	1	.124	10	.161
Machinery	2	.037	...	....	2	.032
Surface and miscellaneous	8	.148	5	.619	13	.209
Total	120	2.214	39	4.826	159	2.553

* All figures are preliminary and subject to revision.

Personal Notes

R. L. Ireland, Jr., vice-president, Hanna Coal Co., Cleveland, Ohio, was reelected president of the Eastern Ohio Coal Operators' Association at the annual meeting held last month.

Harry Mines has been appointed superintendent of the New Waterford district mines of the Dominion Steel & Coal Corporation, Ltd., Glace Bay, Nova Scotia, succeeding the late Alexander S. McNeil.

Obituary

E. L. Bailey, Bluefield, W. Va., vice-president, Home Creek Smokeless Coal Co., died at Home Creek, Va., March 30, while on a business trip to the mine.

Charles Parrish Hunt, 90, retired coal operator, iron manufacturer and banker, died at his home in Wilkes-Barre, Pa., March 23. Mr. Hunt started in the coal business with the Hillman Vein Coal Co. in 1882, and in 1902 organized the Langcliffe Coal Co., of which he was treasurer until it was dissolved in 1932.

J. A. Eichelberger, general manager, E. Eichelberger & Co., and a director of the Broad Top Coal Operators' Association, died at his home at Saxton, Pa., last month.

Industrial Notes

Somers, Fitler & Todd Co., 325 Water St., Pittsburgh, Pa., has been appointed distributor and direct representative of the E. I. duPont de Nemours & Co. line of mine ventilation equipment, which takes in Ventube and brattice cloth.

Chain Belt Co., Milwaukee, Wis., has opened a new branch office in Kansas City, Mo., in charge of A. S. Kennedy.

Northern Equipment Co., Erie, Pa., has appointed J. W. Murphy Co. as the Chicago district representative for Copes feed water regulators, differential valves, pump governors and similar equipment.

James Inglis has been elected chairman of the board, Detroit Blower Co., Detroit, Mich., and is succeeded as president by Clark T. Morse, formerly vice-president. H. E. Barth has been appointed general sales manager.

WHAT'S NEW
IN COAL-MINING EQUIPMENT

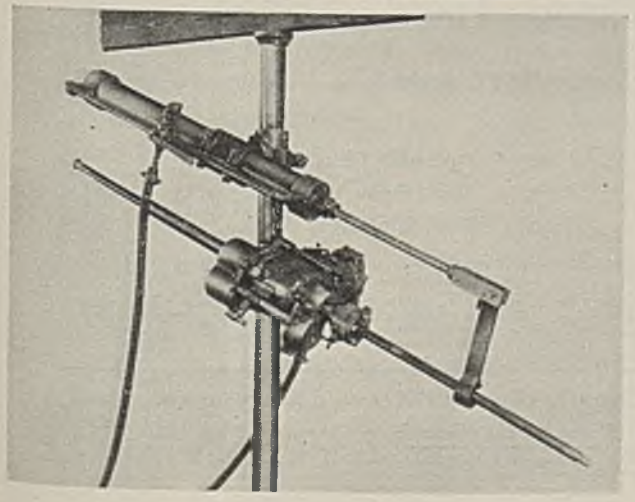
One-Man Diamond Drill

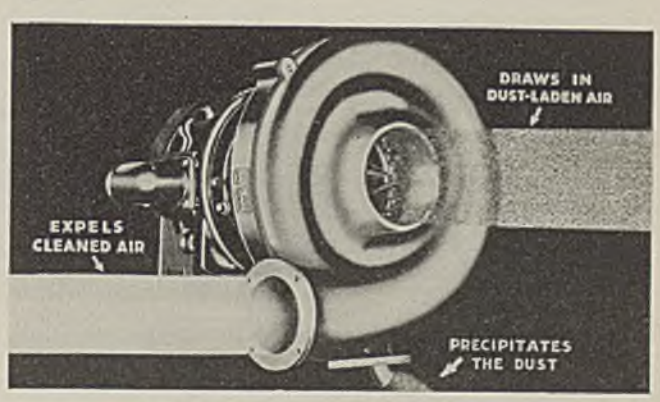
Sullivan Machinery Co., Chicago, now offers the new one-man diamond drill to meet the need for a light, compact machine of relatively small capacity for shallow exploration in advance of faces in underground work. The drill, known as No. 6, is designed with a double-grip clamp for mounting on a mining column or crossbar, and uses standard diamond-drill fittings, size "E" ($1\frac{5}{16}$-in. core) or "EX" ($\frac{7}{8}$-in. core), and will accommodate fittings with an outside diameter of $1\frac{1}{2}$ in. Capacity is 50 to 150 ft., though still greater depths are possible under favorable conditions, and the machine will drill, according to the company, at any angle from vertical to horizontal.

Weight of the drill complete is 231 lb.; weight of the swivel head of the guide is 127 lb., and weight of the "Turbinair" compressed-air motor which furnishes power is 80 lb. The motor may be detached from the swivel head to facilitate handling. Three sets of feed gears are supplied with the swivel head to provide drilling speeds of 200 to 600 spindle revolutions per foot.

Sullivan also has developed a pneumatic rod puller for withdrawing diamond-drill rods from down holes when the drill is not equipped with a hoist. The puller consists of a cylinder and piston equipped with a valve for admitting air to either side of the latter. A fork screwed to the piston rod carries on its outer end an arm with a handlike grip, which is slipped over the rod. When the cylinder moves, the grip takes hold of the rod and pulls it from the hole. Maximum capacity of the puller is 370 ft. of "E" rods or 330 ft. of "A" rods per hour. The puller may be mounted on the same support as the drill. Over-all length is 55 in. Weight is 114 lb. This excludes the saddle, which weighs 34 lb.

Sullivan No. 6 Core Drill With Pneumatic Rod Puller





"Turbo-Clone" Dynamic Precipitator

Dust Precipitator

American Air Filter Co., Inc., Louisville, Ky., offers the "Turbo-Clone" dynamic precipitator for separating dust from air in industrial or coal-preparation plants. The equipment is said to combine an exhauster and dust separator in a single unit no larger than a standard exhauster of the same capacity. A turbine-like impeller creates the necessary forces for drawing in the dust-laden air, precipitating the dust and expelling the clean air. Design of the machine is such, the company says, that it will remove 60 to 80 per cent of the particles below 325 mesh, in addition to the coarser particles ordinarily recovered.

Advantages pointed out by the company are: reduction in space requirements and elimination of much of the piping ordinarily necessary through compact design and adaptability to mounting on the machine or near the work; lower power consumption; simple construction (only one moving part); and easy installation by reason of the unit construction. The equipment, which comes in several sizes, may be connected directly to the motor or driven by a belt, and may be mounted directly on the dust-collecting hopper.

Reduction Gears

DeLaval Steam Turbine Co., Trenton, N. J., has developed a new line of double-reduction gears. The company declares that the simplicity of the combined double-reduction design has been retained, with the high-speed gear wheel mounted on the slow-speed worm shaft, but with added flexibility in the use of separate housings for the high- and low-speed gears. As an example, a unit with a vertical slow-speed shaft, in combination with the high-speed shaft, gives six different drives, both vertical and horizontal. Worms can be rotated either clockwise or counter-clockwise, with the worm faced either way. Standard gear sets are cut with right-hand threads.

Double-Reduction Worm Gear With Vertical Slow-Speed Shaft

The splash system is employed for lubricating tooth and worm surfaces and bearings, and the high-speed gear and slow-speed worm dip into an oil bath in the casings. Ball bearings are employed on the high-speed worm shaft and on the shaft which carries the high-speed gear wheel and slow-speed worm. Plain sleeve bearings are used on the slow-speed shaft, which carries a large load, though tapered roller bearings are available when the slow-speed shaft is horizontal.

Detachable Bit

Timken Roller Bearing Co., Canton, Ohio, is now marketing the Timken detachable bit to replace the conventional bit which is forged on the end of drill steel. This bit is held tightly against an upset shoulder by means of a special thread designed for strength and easy removability. A left-hand thread keeps the bit tight against the shoulder when drilling, and thus transmits the entire force of the hammer blow to the cutting edges.

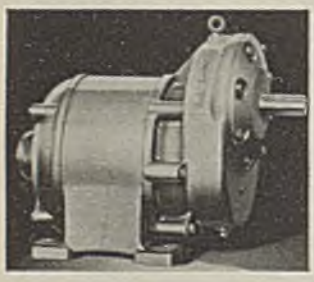
According to the company, the new bit will drill farther, and at the same time eliminates the expenses growing out of large investments in drill steel, sharpening equipment, labor and transportation. The bits are forged from a special alloy of

Timken Detachable Drill Bit

fine-grained electric-furnace steel, the company says, to insure maximum strength, life and resistance to wear. Thus, when a bit becomes too dull for further use, it is removed and replaced with a new one in a few seconds. The long life and other advantages, it is asserted, make it more economical to throw the bit away after one use than to resharpen a conventional bit.

Motor-Reducer

Falk Corporation, Milwaukee, Wis., has brought out the geared-head "Motoreducer," which it describes as a combination motor and gear unit especially designed for relatively low ratios—both speed reduction and speed increase. It is



Falk Geared-Head "Motoreducer" Assembled With Motor

said to make possible the use of high-speed motors instead of more costly low-speed types, and provides any desired speed from one-ninth to two-and-one-half times motor speed. The unit is said to be very quiet and highly efficient.

Welders

An improved line of P & H Hansen welders is offered by the Harnischfeger Corporation, Milwaukee, Wis., including "two-operator" units, gasoline-engine-driven stationary or portable units, and a complete line of arc welders. Innovations designed to increase welding efficiency, according to the company, include the following: new magnetic bridge and short-circuiting winding to extend welding range and improve arc recovery and stability and new dead-front control (voltmeter, ammeter, and similar instruments are inclosed in a single compact cabinet). Single-operator electric-motor-driven types are available in 100-, 200-, 300-, 400-, 600-, and 800-amp. sizes. Variants in both the stationary and portable sizes are designed for either alternating or direct current. Motor and generator are mounted as a single unit in sizes up to 300 amp. Larger sizes are four-bearing units, with the generator and motor direct-coupled. A.C. welders have inclosed pushbutton starters and protection against extreme undervoltage and overload. D.C. units have starters with no-voltage releases and overload protection.

Localized Hardening

Mackintosh-Hemphill Co., Pittsburgh, Pa., offers the "Wearprooft" process for localized surface hardening of many types of steels. According to the company, this process can be used on gears, pinions, coupling boxes, spindles and similar parts subject to wear. These parts, it is declared, can be taken from stock for treatment. The hardness and toughness obtained, it is asserted, are in proportion to the base properties of the metal. The company also points out the following features: no stresses in processing or distortion afterward; accurate control of penetration; and hardnesses from 60 to 90 scleroscope.

Stoker Unit

Combustion Engineering Corporation, New York City, has placed on the market a new underfeed stoker for use with both heating and industrial boilers. The fuel-feeding mechanism comprises a ram and auxiliary pushers, all mounted on a sliding plate which moves back and forth in the retort. The grate surface is composed of stationary bars with moving elements to agitate the fuel bed and insure better distribution of air. Dead plates on either side of the active grate surface are standard equipment, but sectional shaking dump grates are optional.

The drive is operated by a constant speed motor, and a special timing device regulates fuel feed by varying the number of plunger strokes per minute. Total speed range is eight to one. The control system is said to provide continuous adjustment of fuel feed and air supply over a wide range of load, and automatic "on-and-off" control during banking periods.

Tool Closes Hopper Cars

Trumbull Mfg. Co., Warren, Ohio, offers the Prescott safety tool for closing the doors of hopper-bottom cars without injury to the men engaged in this task. The tool is adaptable, it

Prescott Safety Tool in Place for Closing Hopper Door

is said, to any car equipped with the Wine or similar type of latch, and eliminates smashed fingers, strained backs, ruptures and other injuries. Ease and speed of closing doors also are pointed out by the company.

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