COAL AGE

McGRAW-HILL PUBLISHING COMPANY, INC.
JAMES H. McGRAW, *President*
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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

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Engineering Editor

Volume 29 | NEW YORK, APRIL 22, 1926 | Number 16

Rock Handling

ONE OF THE MOST important of mine problems is rock disposal. We have no difficulty in dumping coal, because as fast as it is dumped the railroad hauls it away, but rock when dumped into a pile grows in bulk, and the dump has to be moved forward repeatedly, the rock being laboriously prepared for the reception of the track extension by hand. There have been many ways provided of disposing of rock to better advantage, by the use of a bin for transference to slate lorries, cableways, conveyors and other means of transportation; but many think the cheapest installation good enough.

If they would calculate the cost of thus placing rock, duly considering the time lost in mine operation, they would find that a good rock-disposal plant would pay good interest on the investment and make it profitable to remove the rock cluttering airways. In many cases the wedging or shooting of drawrock would not only reduce air resistance, but would make the maintenance of roadways and airways less costly. In any thin seam the same care should be taken of the problems of rock disposal as is given to the dumping of coal and in some mines more care should be given to rock than to coal handling. Because rock is waste and coal is the profitable product it is difficult to induce the management to see that both are engineering problems to be solved in the most economical manner. For this reason, the rock problem is usually attacked by strong-arm methods with their accompanying waste of effort. In some mines this rock-handling is a bigger problem than coal handling, and far more costly, because of the lack of railroad co-operation.

Bigger Cars, Larger Profits

IN FOUR YEARS the railroads have increased the average capacity of their cars from 42.5 to 44.7 tons. This is one of the important sources of railroad economy. This fact should not be forgotten by the coal industry. Nothing holds back mine operation more than its pigmy equipment, especially as coal is now being loaded mechanically and without the meticulous care that used to be shown in building up the car by the use of lumps.

As cars are now moved by power over heavy rails and long distances they can and should be made bigger than they were when they were propelled by hand or animal power over wood rails and for short distances. Heavier equipment will inevitably replace light, and until it does mechanical loading will be placed at a disadvantage. Only those who recognize that a new era in loading methods means a new era in the transportation equipment will prosper. We are prevented from developing by the narrower standards of earlier years, which we find difficult to outgrow.

A pension list for antiquated cars is much needed. "The class 1 railroads in 1925 retired 117,021 freight cars, having an average capacity of 38.77 tons or an aggregate of 4,537,287 tons, and installed 125,760 cars, having an average capacity of 47.37 tons or an aggregate capacity of 5,956,930 tons. The net gain in car units," says the Bureau of Railroad Economics, "was only 8,739 cars, but the net gain in aggregate capacity was 1,419,643 tons." This is an increase in the size of the new cars as compared with those they replaced of 22.2 per cent. The older cars at the mines are not only deficient in capacity but in type of construction, and many even if not worn out, should be relegated to the scrap heap.

Will Use Coal to Generate Gas in California

IN RECENT YEARS petroleum has been the sole source of the commercial gas production in California although before the intensive development of petroleum deposits coal was used for gas manufacture, as it is now used in those regions where petroleum is at a disadvantage on account of cost. Gas plants in which petroleum and its products are used admit of a relatively simple and economically operated unit, and the gas produced is low in cost where "cheap" petroleum can be obtained. The fluctuating price of petroleum and the prospect of a gradually increasing price are now definitely turning the attention of the important gas-producing companies in California to a consideration of the future and the probability of having to rely upon coal as a source of gas.

Although no official announcement has been made it is understood that one of the large gas companies supplying many of the communities in California is experimenting with California coals in an endeavor to use them in gas manufacture. Two new gas generators that will produce 3,000,000 cu.ft. of gas per day are to be erected in one of the interior towns. They are to be designed for the utilization of coal. Certain coal deposits in Shasta County are now supplying the fuel for experimental purposes.

The return to coal as a more stable commodity is especially significant in a state like California, for petroleum has displaced coal for most purposes and has reduced the demand for this fuel to relatively small dimensions. It means no doubt that in California and other Western States is being seen the beginning of the end of the dominance of petroleum for gas and fuel purposes. In time a greater utilization of coal is to be expected.

Dangers of Negation

THE COAL INDUSTRY has been in the shadow of government regulation more than a decade. During the Frelinghuysen and the Calder investigations and in the days immediately preceding the creation of the United States Coal Commission the shadow bulked so large that to many it seemed the herald of impending reality. Whether the hearings now going on before the House committee on interstate and foreign commerce at Washington will again give the shadow the touch of immediacy appears doubtful. The desire for an early adjournment and a Congressional program which leaves little time for extended consideration of new legislative proposals are working for the coal industry.

It would be poor policy, however, to treat the situation lightly merely because the danger is a future rather than a present peril. The agitation of the past ten years cannot be put out of mind. That agitation has been symptomatic of conditions which the industry must face squarely if it is to find the remedy that will end the demand to broaden the field of federal activity. Political ambitions, false theories of the function of government, unsound economics and out-and-out demagogism have contributed to this agitation and have helped to keep it alive. But there also has been an intermittent public insistence that some action be taken.

To protect itself from the threatened assaults upon its business independence the industry has relied largely upon a program of negation. It has, for the most part, devoted its energies to laying bare the constitutional weaknesses of the various legislative schemes offered. Some attention, it is true, has been given to demonstrating the impracticability of the legislative remedies. By and large, however, the spokesmen for the coal trade have contented themselves with arguing that suggested governmental activities would be an invasion of the rights of the industry and would contravene the organic law of the land.

The Constitution of the United States is an instrument which should command universal respect. Representatives of the industry would be failing in their duty if they did not point out the constitutional pitfalls in the path of federal regulation of the coal trade. And yet an appeal to constitutional guarantees is at best an uncertain defense. Eminent counsel disagree. The scorned *obiter dicta* of yesterday are frequently the fixed precedents of today. Where the public is determined to take control, the skill of the lawyer in explaining how the statutes conflict with the Constitution only leads to a reframing of the laws to cure the defects disclosed. That was the history of the development of the Act to regulate commerce. There is no reason to believe that history cannot be repeated.

The comforting thought that it was never supposed that the coal miner and the wood chopper, along with the butcher, the baker and the candlestick maker, were to be drawn under the cloak of governmental regulation is less comforting than it was when some of the more recent decisions of the Supreme Court of the United States are examined.

Chief Justice Taft's opinion in *Stafford vs. Wallace*, in which the constitutionality of the Packers and Stockyards Act of 1921 was sustained gave to the implications of the interstate commerce clause a breadth which a few years ago would have been considered revolutionary. In *Avent vs. United States*, 226 U. S. 127, and in the still more recent companion case, *Koenig Coal Co. vs. United States* (decided April 12, 1926), the power of Congress to regulate the distribution of coal through a regulation of the instrumentalities of transportation was held not inconsistent with the Fifth Amendment. Moreover, *Wilson vs. New*, 243 U. S. 332, referred to in the first Kansas Industrial Court decision, *Wolff Packing Co. vs. Court of Industrial Relations*, 262 U. S. 522, as on the border line in upholding government interference, becomes only one of several cases cited in affirmation of federal power in the *Avent* case.

The real task confronting those who would keep business free from unreasonable interference is to teach the public the unwisdom of such restrictions. The successful accomplishment of that task calls for more than the establishment of the unconstitutionality of specific legislative proposals. It calls for more than a demonstration, however convincing, that these proposals, even if legal, are no adequate solution of the problems they purport to attack. The coal industry must be ready to offer a constructive program which will meet, insofar as it is humanely and legally possible, the problems which form the basis for the demand for legislative action. The coal industry should not only claim the right to self-government: it must be prepared to prove that it has the organization, the machinery and the program for the exercise of that right in the interest of the public—and the will to so exercise it.

"Open Confession—"

SOME HOMELY TRUTHS were told by C. Willing Hare, vice-president and general manager of the Anthracite Coal Service, in a recent talk to New England retailers. Discussing the competitive situation, he declared that other fuels, notably oil, had been making inroads upon anthracite, not because of any intrinsic superiority, but because of superior engineering salesmanship. It was to overcome that handicap that the Anthracite Coal Service was established. The fact that in the first nine months of its existence it was able to hold or regain 900,000 tons of business, stamps the wisdom of the undertaking.

Modern merchandising demands that the buyer shall receive the greatest possible value for his money. In coal that means selling him the size and grade best adapted to his plant and operating conditions. That, of course, presupposes an accurate knowledge of these conditions. But knowledge alone is not enough. To this the seller must add the engineering skill which can interpret the facts and the merchandising courage to apply them for the buyer's benefit. Sometimes that means recommending a cheaper coal, carrying a smaller profit to the seller.

Simple and elemental as these principles are, there has been a reluctance in some quarters to recognize them. There have been coal-company executives and subordinates who have clung to the theory of *laissez-faire* as the only workable rule. Fortunately the number who still insist that whatever was is right is diminishing and the number who, like Mr. Hare and his associates, are ready to frankly confess that outmoded ideas must yield to modern methods, is increasing. This change is a hopeful sign in a troubled industry.

Battery in Big Four mine holds voltage even despite peak loads and keeps mine running for short periods regardless of any power failure

A storage battery is a sort of chemical flywheel, but one that can absorb, store and distribute energy over a much longer period of time

Storage Battery Lowers Motor-Generator Peaks

Draws Current When Demand Is Low, Returning It When Peak Is Reached—Charging Method Almost Ideal—Power Cost per Ton Lowered—Battery Will Perform Light Duty When Substation Is Idle

By J. H. Edwards
Associate Editor, *Coal Age*,
Huntington, W. Va.

MOMENTARY PEAKS rather than average loads usually limit the tonnage-producing capacity of direct-current generating equipment. It is not at all uncommon to find substations which are subjected to peaks 200 to 300 per cent above the nominal capacity and yet have an average day load less than one-half the rated capacity.

This condition has caused many engineers to dream of installing a battery to float across the line, taking energy from the substation when the mine load is below the generating capacity and discharging to the line during times of high demand, thus assisting the substation to carry the load. The ability of a battery to deliver energy at a tremendously high rate appeals to the imagination as a method of "chopping off" the high spots of the substation load curve.

In a few instances batteries have been utilized in this way, but for the most part, such installations were of a temporary nature using comparatively small batteries. Though the idea makes a strong appeal from one standpoint, it has never gained headway, because of two outstanding factors. First, there is a loss of approximately 20 per cent, or more, of the energy supplied to the battery, and second, every cycle of charge and discharge reduces the remaining battery life, and therefore, in a definite degree, destroys its value.

Despite these inherent disadvantages a large battery has been in regular use since last October, at Big Four, McDowell County, W. Va. This is arranged for taking the peaks imposed by the direct-current mine load. This mine is operated by the By-Products Pocahontas Co., a subsidiary of the Pond Creek Pocahontas Co., which latter firm has one of the few wireless or battery-operated mines of the country.

Escapes New Demand Charge

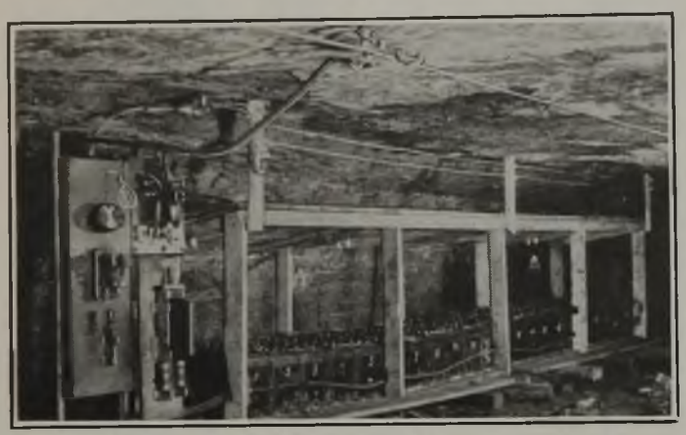
The conditions which prompted the installation of a "line-floating" battery at Big Four were: (1) The substation was overloaded, that is, it would not handle the peaks. It could, however, sustain a much higher average day load. (2) It was desirable to delay the installation of a new substation as long as possible in order to determine more definitely what size of unit to install and what would be the best location. (3) The mine served is of a limited size and production. (4) A new 110-cell cutting-machine battery was available from an associated mine and could be utilized there later, if desired. (5) It was estimated that if an additional substation unit was to be installed it should be of 200-kw. capacity. This would automatically add over $3,100 per year to the demand charge of the power company. The rate in this territory is $1.92 (less 10 per cent for cash) per month per half of the connected horsepower.

Other conditions, not influencing the decision to install a battery but having a bearing on the results obtained, were as follows:

(1) The opening is a slope. On account of the hoisting and pumping loads this mine requires inherently more power per ton of coal produced than does the

average mine in southern West Virginia. (2) The substation, which contains one 100-kw. induction motor-generator set, is located above ground. (3) All coal is undercut, the cutting being done at night with electric machines. Gathering is performed with cable-reel locomotives and haulage with 10-ton trolley locomotives. (4) The larger pumps are operated on alternating current, but several small gatherers are connected to the direct-current circuit.

The accumulator used is a 31-plate lead battery, having a capacity of approximately 91 kw.-hr. It is installed in a wide place on the main haulway and is connected to the 4/0 trolley (the main feeder from the



Battery Acts as Flywheel to Reduce Peaks

The 110-cell 31-plate battery is installed in a wide place on the main haulageway about 1,750 ft. from the substation. It is connected between the trolley line and the rail. Due to its closer proximity to the load than the substation, it relieves the motor-generator of the high peak demands and automatically recharges whenever the mine load drops below the full rated load of the substation.

substation) at a point 1,750 ft. from the motor-generator. W. F. Hossfield, chief electrician of the company, explains as follows his reason for setting this distance in seeking the proper location of the battery:

"The full-load rating of the generator is 365 amp., so it was decided to allow it to carry 400 amp. continuously. The open-circuit voltage of a 110-cell lead battery is 220. This subtracted from 275, the full-load generator voltage, leaves 55 volts as the approximate drop desired between the generator and battery. The length of 4/0 copper circuit which gives this drop at 400 amp. is 1,450 ft. But as the battery voltage decreases as the rate of discharge increases, it evidently was necessary to have a drop somewhat greater than 55 volts. Twenty per cent was estimated as the increase necessary, so this added to the 1,450 ft. gave the distance as 1,750 ft.

Breaker Opens in Case of No Voltage

The accompanying diagram shows the wiring arrangement. To the substation panel was added a voltage-failure relay *C* which causes the generator reclosing circuit breaker *A* to open in case of no voltage on the motor leads. This prevents motoring of the substation from the battery.

On the battery panel is mounted a relay *E* which prevents automatic reclosing of the breaker *B* in case of no voltage on the motor leads. The object of this is to prevent the draining of the battery at a high rate if the substation stops during the period of heavy load during the day.

As now arranged, the battery will continue to feed the mine if the motor-generator stops, but in case battery breaker *B* is opened by an overload it will have to be reclosed by hand unless in the meantime the motor-generator has been started, in which case this breaker will close automatically.

If the motor-generator stops, the relay *D* in the substation causes a bell to ring in the hoist house, 2,500 ft. distant. This provision is necessary because it might be some time before the men in the mine became aware that the motor-generator had stopped, and consequently the battery would lose an excessive quantity of energy before they could phone to the hoistman to have the substation started.

The only new equipment purchased for the control was the reclosing circuit breaker in the battery circuit. The relays, *C*, *D*, and *E* were made from old contactors, and the battery panel was assembled from old parts. The range of the volt-ammeter on this panel was changed and the current scale recalibrated with a zero center so as to indicate the rate of charge and discharge.

Voltage Drops a Little as Load Increases

On the motor-generator, several strips of German silver were added to the series-field shunt to reduce the tendency toward compounding. The voltage drops somewhat as the load increases. If the potential is adjusted to 275 volts at no load, it drops to approximately 265 volts at 400 amp., which is about 10 per cent overload.

As can be seen from one of the illustrations, the battery was installed in an inexpensive manner. The twenty-two trays of five cells each were placed side by side on a platform 36 in. wide by 24 ft. long. A wooden canopy cover was placed over this platform to protect the battery from small slate falls. The total installation cost was roughly $4,300.

This may seem like a large sum to put into a piece of equipment, the life of which is definitely determined by the quantity of work performed. The results obtained, however, have more than justified the installation

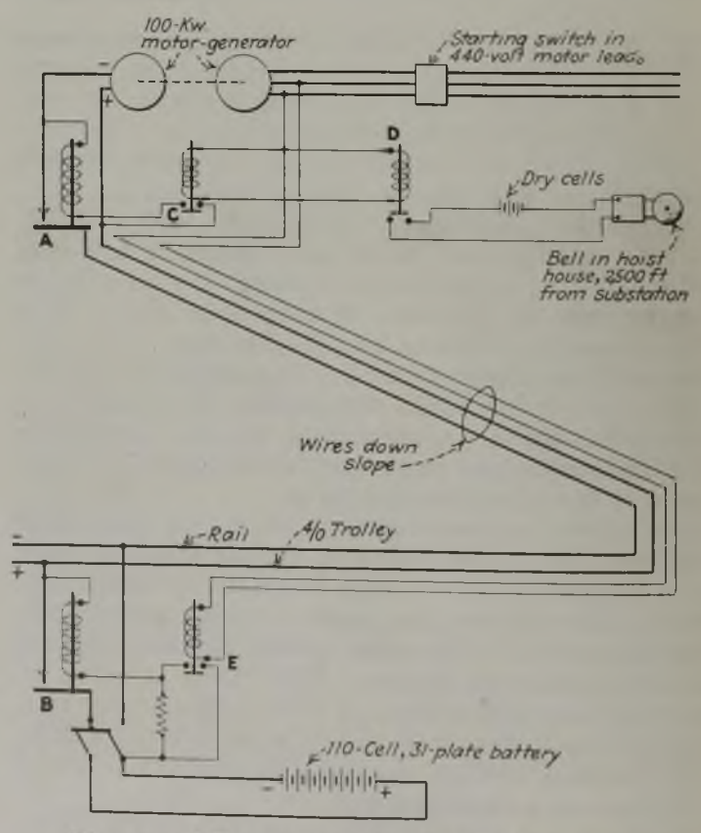


Diagram of Battery and Substation Connections

The only additional lines installed were those of the control circuit of the relay *E*. The battery is 1,750 ft. from the substation by way of the 4/0 feeder circuit. This provides sufficient voltage drop so that the battery will take the peak loads.

to the management of the mine. It is not known what will be the life of the battery in this service, but should it last only 17 months from the date of installation it will have paid for itself in the saving of the $3,100 per year extra demand charge which was in prospect.

Garner Fletcher, manager of the company, states that the 5 months of operation with this battery has revealed many advantages. There are few interruptions to the power supply on the direct-current mine circuit. The average voltage is greatly improved with the same quantity of copper in use, and this is reflected in a higher tonnage produced with the same equipment and at a relatively lower cost for maintenance.

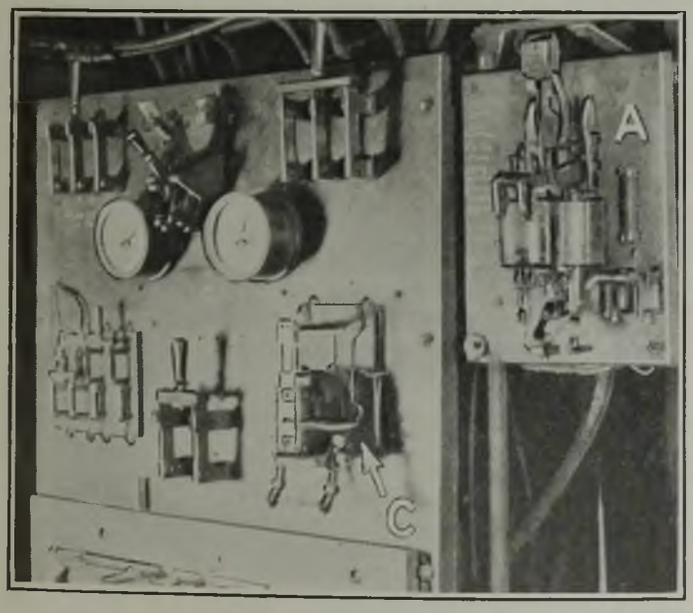
Power Failed, So Cut Coal with Battery

On two occasions prolonged failures of purchased power both occurring at night failed to prevent the cutting of all of the places for the next day's run. In one of these instances, however, before the cutting was finished the battery was discharged to a point far below that recommended as good practice.

Power and Production Data Before and After Installation of Storage Battery

1924	Kw.-Hr.	Production Tons	Kw.-Hr. Per Ton
October	98,760	13,753	7.2
November	96,850	12,298	7.9
December	105,350	12,410	8.5
1925			
January	104,964	12,288	8.5
February	109,230	12,828	8.5
July	107,150	14,929	7.2
August	118,930	16,619	7.1
September	113,710	15,923	7.1
October	112,210	17,859	6.3
(Battery put into use Nov. 1, 1925)			
November	123,340	18,212	6.8
December	127,860	18,976	6.7
1926			
January	135,230	20,968	6.5
February	127,160	18,709	6.8

The fact that a sizable proportion of all energy furnished to the battery is lost in heat, or by evaporation of the electrolyte, would indicate that perhaps the mine might require more power per ton of production after the battery was installed. The accompanying table

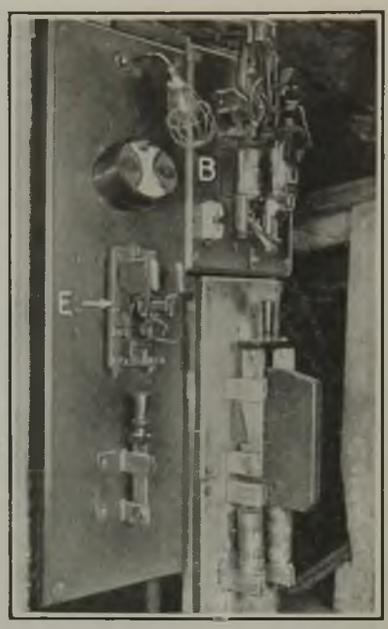


Motor-Generator Switchboard in the Substation

The only change made to the switchboard was to add the relay *C* in the right center which was built from an old contactor. In case of failure of the alternating current or in case the motor-generator starting switch is opened, this relay opens the reclosing circuit breaker on the little switchboard at the right, thus preventing the "motoring" of the power unit from the battery.

Battery Control

If the circuit breaker, *B*, has opened by reason of an overload, the relay *E*, will prevent it from closing if at the same time the substation stops. In such a case if the mine is to be operated from the battery, the breaker must be closed by hand.



indicates that this has not been the case at Big Four. The months of battery operation show a noticeable reduction in kilowatt-hour consumption per ton.

It should be stated here that whenever a higher production is obtained from any given equipment, a decrease in power per ton can be expected. For this reason it is difficult to say just how much effect the battery has had in the reduction shown, especially as the months of battery operation are in the season of heavy pumping and lighting load, which condition tends to counteract any showing favorable to the accumulator.

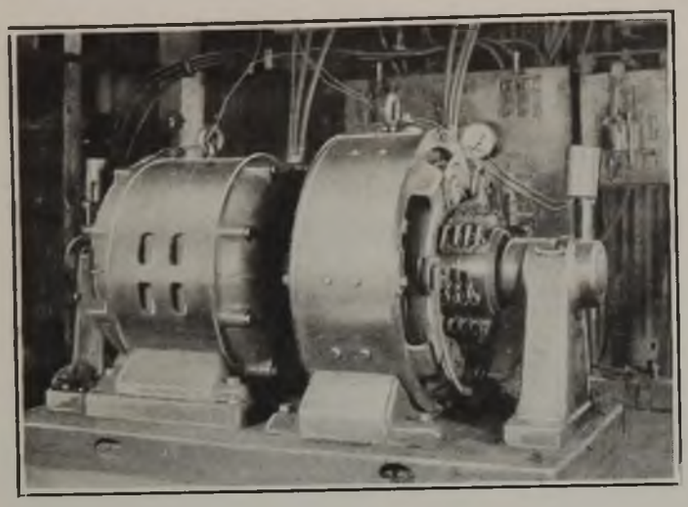
The ammeter charts taken at the mine show the division of load between the substation and the battery. They show considerable similarity from day to day. Thus during an afternoon and evening, at about 4:15 p.m. when the day mine load falls off the battery begins to take a charging current sometimes amounting to as much as 180 amp., but by 6 p.m. this has decreased to about 60 amp.

The night load consisting as it does of pumps, mining machines and a few locomotives indicates that the battery is surprisingly active. It would appear that a more ideal arrangement would be to so adjust the installation at night as to make the substation take a larger part of the peaks, thereby somewhat relieving the battery. However, inasmuch as the loads are well proportioned during the day, it is presumed that to secure a different distribution at night would require the addition of expensive automatic apparatus or frequent hand adjustment.

Shut Down Sunday and Use Battery

Somewhat of a variation to the normal is introduced by the advent of Sunday which naturally is a day of little or no activity in the mine. By 6 a.m. the decreasing mine load allows the battery to charge to a point such that the voltage rises to approximately that of the substation, causing the battery to float on the line taking little current.

From 7 a.m. until about 9 a.m. the gathering-pump and mine-lighting load of 45 amp. is supplied by the motor generator. The presence of the battery makes it possible to shut the substation down on Sunday. This is done at about 9:20 a.m., after which time the small mine load is supplied by the battery. Being able to shut the substation down during periods of light load



This Unit Supplies All the Direct-Current

The 100-kw. generator is driven by a 440-volt squirrel-cage induction motor. When the mine was producing 17,000 tons per month, overloads caused the circuit breaker to open frequently. After the battery was connected to the line the breaker seldom came out even though the equipment in the meantime had been speeded up to a production of 21,000 tons.

is an advantage from the standpoint of substation maintenance as well as from that of power consumption. Battery deterioration and loss is less than is incurred in operating the substation at extremely light loads.

Normally the substation is started at about 5:30 p.m. From this point onward the battery-charging current tapers off to zero. By about 8 p.m. both the battery and generator curves indicate the existence of a small fluctuating load in the mine.

Because of the resistance of the 4/0 circuit between the generator and battery, charging is accomplished practically by the modified constant-potential method, often recommended as being ideal. This condition coupled with the fact that the battery is located where it will require less attention and is more accessible than if it were installed in a locomotive or mining-machine power truck, point to the possibility of greater life.

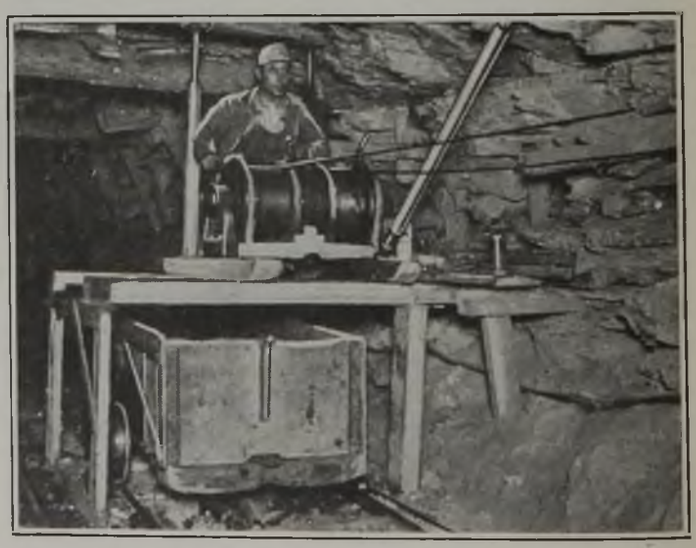
Still another condition indicating greater longevity is that the battery is stationary and therefore free from jolting and vibration. Batteries of this size have lasted 20 to 24 months in every-day service on mining-machine power trucks where the rated capacity, or more, is put in and taken out every day.

Although the battery at the Big Four mine was not installed as a permanent substitute for an additional substation, its performance to date indicates that its use will be continued for an indefinite time. It is seldom that a new item of mine equipment has "taken" so well as has this battery. Machinemen, motormen, the mine foreman, and in fact all concerned are loud in their praise of the better voltage and fewer interruptions experienced since its installation.

Gallup Coal District Half Century Old

THE COAL DEPOSITS and other mineral resources of the Gallup-Zuni Basin, in New Mexico, are the subject of a geologic report just issued by the Department of the Interior as Bulletin 767 of the Geological Survey, by J. D. Sears. This basin, which lies in McKinley and Valencia counties, has great economic value as well as geologic interest. Its commercial importance is at present centered in the Gallup coal district, the natural wealth of the rest of the basin having been almost untouched. The Gallup district, in which active mining has been carried on for nearly half a century, is now the second largest producing district in the State, and owing to the adaptability of the coal to certain uses, the convenient shipping facilities, and the nearness of the coal beds to the mining camps of Arizona it is one of the most important coal mining districts in the Southwest. The Gallup-Zuni report describes the geology and mineral resources of the whole basin in a general way, and the coal beds of the Gallup district and the Zuni Indian Reservation in greater detail.

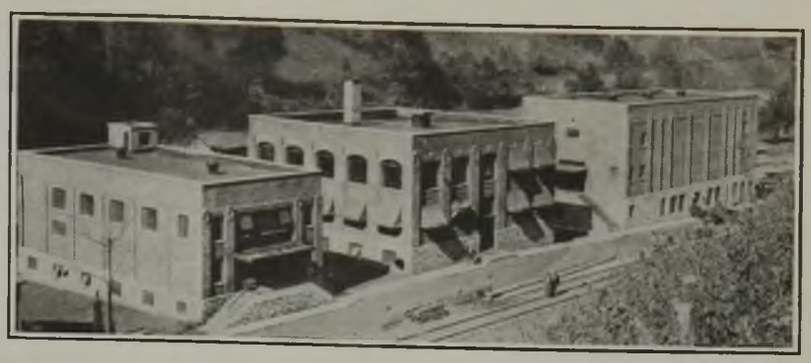
GOLDEN AGE FOR COCKROACHES.—Sixty species of insects have been found in British coal measures, of which nearly twenty are cockroaches similar to those of today. Dr. Herbert Bolton has published a monograph on the fossil insects of the Carboniferous era.



Running the Hutch Conveyor in the Thin Coal of Spring Valley, Ill.

The picture at the left was taken along the conveyor—a trip of flat steel sheets on wheels, the sheets having 9¾-in. back plates, and coupled so closely as to constitute a continuous jointed surface—which was developed by the Spring Valley Coal Co. and used for a period with mechanical success, but without the co-operation of labor. The conveyor, on 19-in. track, was operated back and forth, shuttle-like, along a 400-ft. longwall face, discharging its load into cars on a depressed track at the midpoint. At the right is shown the hoist, located above the empty track of a double haulage line leading up to a turntable at the loading point. This installation was described in the Feb. 11, 1926, issue of *Coal Age*, Vol. 29, pages 225-229.

Ford Provides for Entertainment Of Employees



WHEN THE management of the Fordson Coal Co. decided to erect a new recreation building at its Stone plant in Kentucky, the following points were considered as bearing upon the design finally adopted and executed: Stone is the location of the general offices of the company, and the community included some forty officials' and office workers' families which might be expected to make use of the facilities of the recreation center to some extent, if it served the purpose for which it was planned. It was intended to be a meeting place for all the employees of the company where they could have amusement and relaxation and feel at home, whether they came in their Sunday best or in overalls.

At the Pond Creek mines of the company about 1,300 men were employed, the houses extending from Stone some four miles up the creek. The building had to accommodate everyone when necessary, though two smaller buildings of similar nature located on Pond Creek above Stone, were being used at the time.

In addition to the employees of the Fordson Coal Co. those of two other mines within half a mile employing about 425 men had to be considered, for the building was to be constructed not only for Fordson employees but also for the public in general.

The location available was alongside of, and in line with, recently constructed office and commissary buildings; hence the general type of structure and the style of architecture had to be in harmony. The two older buildings are fireproof—of concrete, brick and steel with the lower story of stone masonry. The demand, therefore, was for a theater of fireproof construction seating some 500 people with the usual auxiliary rooms on the lower floor and so designed that it could, and would, be kept absolutely clean.

Place for Correspondence

In addition to the theater, it was decided to include, on the lower floor, space for a post office, a two-chair barber shop and a writing room with desks where some place would be available at which stationery could be obtained and letters written. Such facilities for correspondence are usually not available in mine camp boarding houses. Furthermore, a lobby was to be provided with lounging chairs and a soda fountain, serving tables for ladies, places for selling magazines, candies and tobacco and a pool room, besides toilets, storage rooms and a room to hold the ventilating apparatus.

Much juggling was done with the lower floor to get a satisfactory arrangement of the rooms listed, and finally the plan shown was adopted. With this arrangement one man behind the fountain is able to handle everything in slack hours and has at all times everything under easy control.

The poolroom which has ample room for four tables is open to the lobby, yet it has the appearance of being separate. Being thus under full view the conduct of the players and spectators can be kept under proper control should any tendency toward rowdyism be manifested. The smoke also is kept out of the lobby by the location of the poolroom and by installing a ventilator so that the air will be drawn away instead of toward the lobby. "Old Hickory" furniture was installed in both lobby and poolroom, for all purposes. The serving tables of the soda fountain were, however, of another design. The writing room was furnished with three double desks, such as hotels use.

Dry and Clean Electric Refrigeration

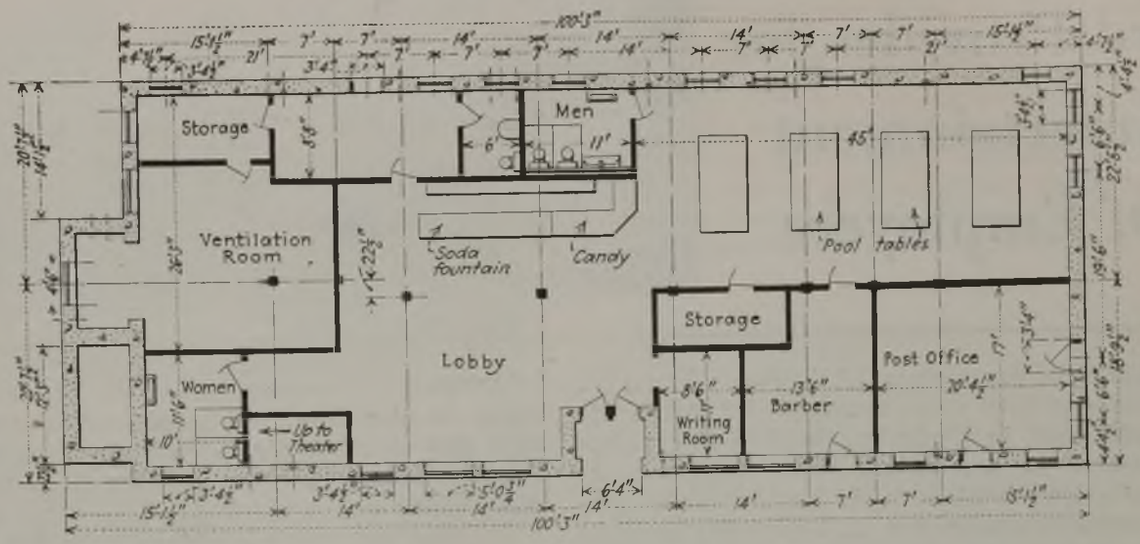
The soda fountain, all white, was provided with electric refrigeration, thus the disorder consequent on the packing of cream was avoided. At the fountain everything is served which can be bought at similar places elsewhere. The floors of this lobby are made of tile in a combination design of brown, buff and ivory. The wainscot on all walls is of 4-in. ivory tile for a height of 56 in. above the floor. The toilet rooms have tile floors and glazed-tile wainscot. All radiators are placed near the ceiling so that the entire floor can be washed with a hose if necessary; thus there is no place to hold dirt.

When the design of the theater was discussed some proposed making the floor level with removable seats so that the room could be used as a gymnasium, but this idea was abandoned in favor of an elevated floor with easy vision from all seats, which were spaced for comfort rather than for maximum seating capacity. A stage was provided, of sufficient size to accommodate small companies, such as lyceum entertainers, lecturers, and such home-talent performances or church meetings as might need the theater from time to time. Two toilets and two dressing rooms were provided, one on each side above the stage. On this floor of the main auditorium are three hundred and eighty-two seats, as well as a manager's office and ticket seller's booth and a stairway to the balcony.

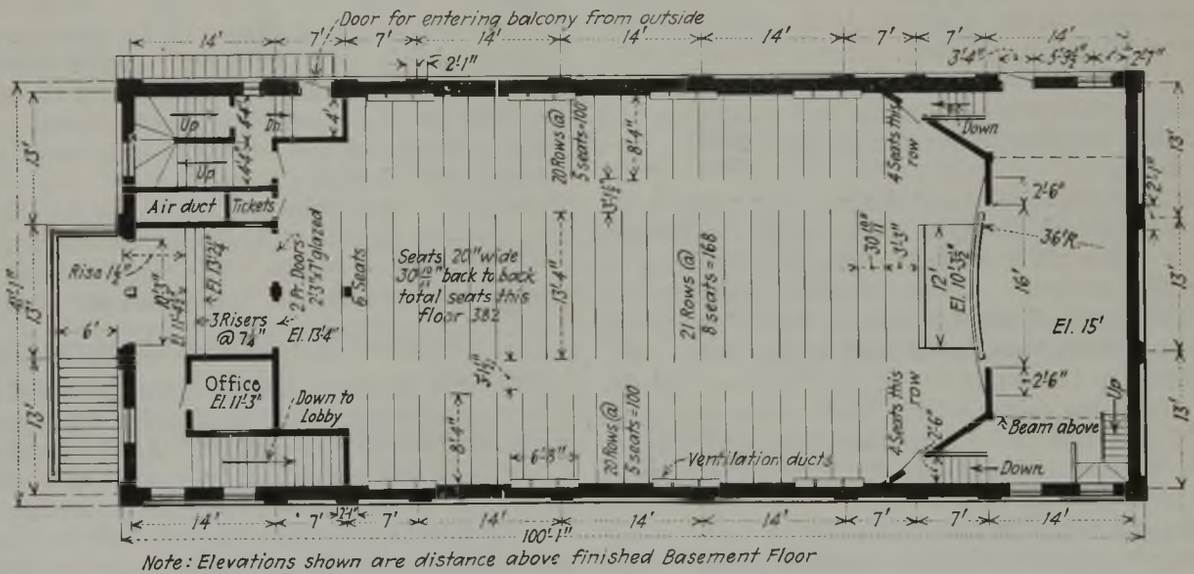
The balcony, having sixty-seven seats, is used for colored people, with a separate entrance at the side, but with provision for buying tickets from the one ticket seller. The projection booth has two motion-picture machines. The entrance to the theater is from

The headpiece shows, from left to right, the commissary, general offices and recreation building of the Fordson Coal Co., at Stone, Ky. Here is located the main operating office of the four divisions of the company.

Plans of the Fordson Coal Co.'s Recreation Building

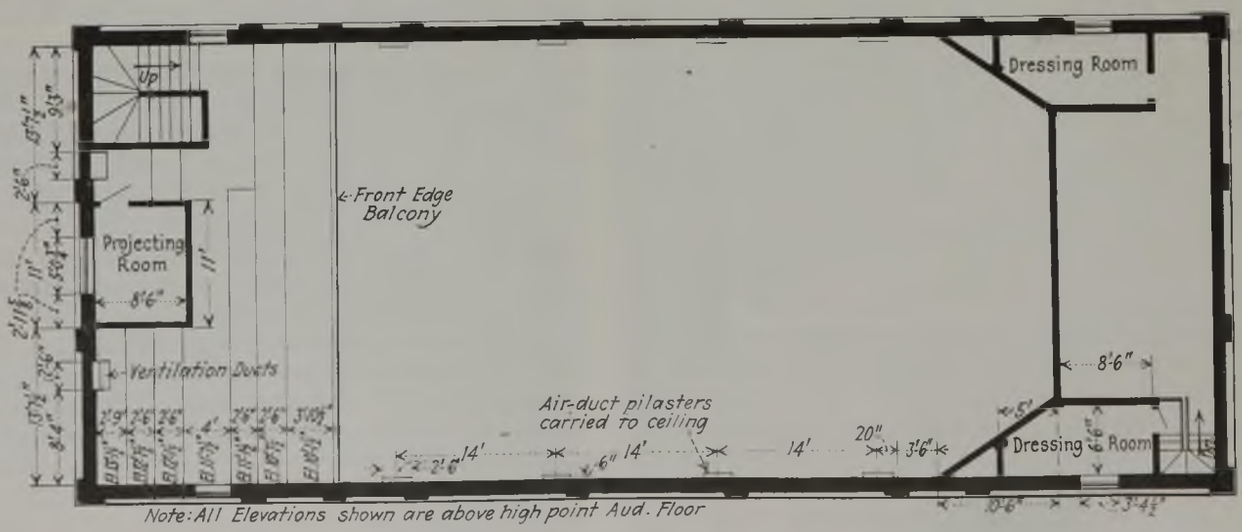


Basement Floor



Note: Elevations shown are distance above finished Basement Floor

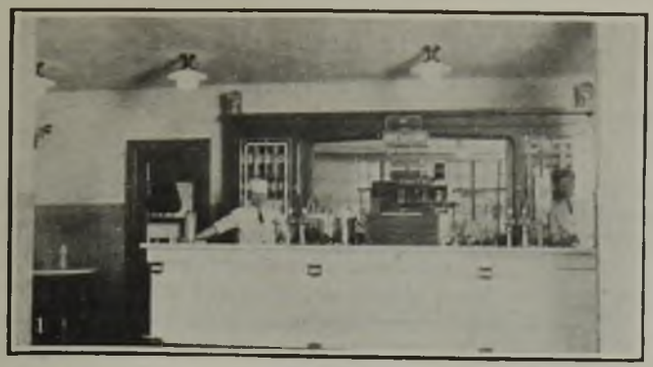
First Floor

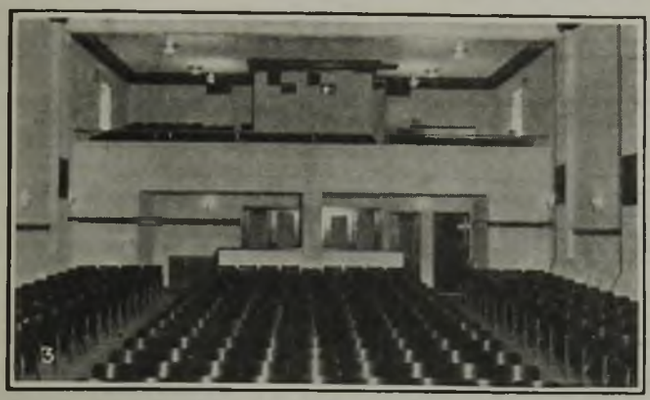


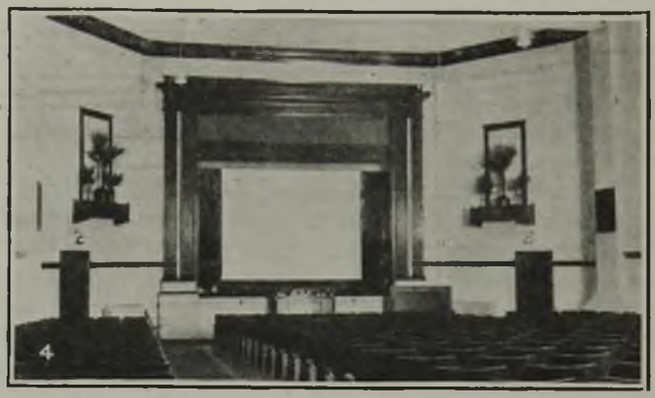
Note: All Elevations shown are above high point Aud. Floor

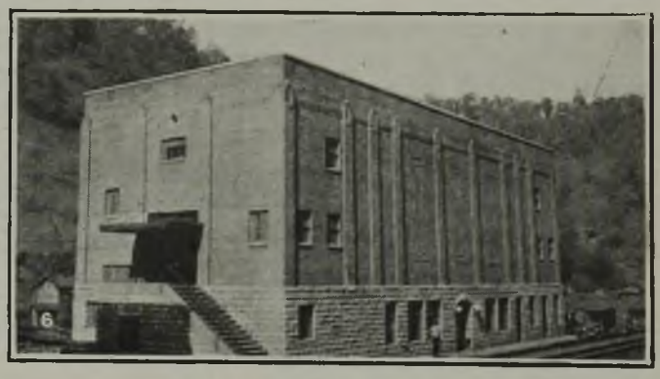
Upper Part Auditorium

The theater, which at one time was intended to serve as a dance hall, was finally given a pitch so as to make it better suited for use as an auditorium. In the ventilation room are installed two 5,000-cu.ft. multiblade fans and radiators for indirect heating of the theater. On the upper floor above the storage wings are located two dressing rooms and toilets.









Community Center Erected by the Fordson Coal Co. for Its Mining Force

(1) Electrically refrigerated soda fountain, all white. By eliminating the necessity for packing ice cream with salt and ice the slop and disorder is avoided that is so general in such places. All the newest sodas, drinks and combinations served at this fountain. (2) Pool hall with soda fountain and lobby in background. Note radiator at ceiling and tile wainscot 56 in. high. (3) Theater from stage. On main floor are 382 seats, spaced for comfort and in the balcony 67 seats for the colored population. Heating and ventilating provide for change of air every 10 min. (4) Theater from back. Back of motion-picture screen is a stage 15 ft. deep to accommodate lecturers and others. On the pilaster on right is one of ten openings to admit warm air when heat is necessary. Stale air is exhausted through 18 openings 6 in. above floor. (5) One side of lobby with pool room visible in background. Door at extreme right leads to writing room. Pool room is visible but seems separated from lobby. One man, in slack times, can tend the whole building. (6) Rear view of recreation building. The fire escape at the left serves also as a stage entrance and the door on right, which is on a level with the village street, is used for the handling of supplies at the soda fountain.

the end of the building or from the lobby by an inside stairway.

The auditorium is provided with sufficient direct radiation which heats the room when not being occupied. This is placed in locations away from the patrons and where dirt will not be collected. The remainder of the heat and ventilation is supplied by two multivane fans, each having a capacity of 5,000 cu.ft. per minute, one supplying fresh air and the other exhausting air which has become stale. The fresh air, being arranged to pass over steam coils and thus supply the additional heat needed, enters the auditorium through ten openings 8 ft. from the floor, each 24x30 in. The stale air is exhausted through eighteen openings 6 in. from the floor, each 14x22 in. The ducts are carried between the floor of the auditorium and the ceiling of the first story to the fans on the lower floor, and thence to the exterior of the building. The floors in the auditorium are of concrete, with rubber runners on the aisles. The stage floor is of wood resting on concrete. Lights are controlled from either the projection booth or the stage. Music is furnished by an ordinary player piano.

One manager and two men at the fountain operate the building. They devote their entire time to this work. In addition, a ticket seller, musician, ticket taker and operator are employed who are kept on duty only when shows are in progress.

The entire building was designed in the engineering department of the company and the building was erected by employees of the company under the supervision of the company's engineers except that contracts were let for the tile work, heating and ventilation. It was opened Aug. 1. The attendance at the building shows that the community is much pleased with the arrangements that have been made by the Fordson Coal Co. for its entertainment, comfort and convenience.

Why Don't Engineers Land Executive Positions?

Topic of Founder Societies—Not All Students Are Virtuosos—Engineers Have Their Full Proportion of Jobs—Some Won't Take Them When Offered

"TELLING THE STUDENT of engineering that executive ability is inborn and cannot be created out of nothing will no more discourage him than it does to tell a student of music that unless he has talent for music he cannot become a virtuoso or an operatic star," according to E. M. Herr, president of the Westinghouse Electric & Manufacturing Co. at a meeting of the Founders Societies in the Engineers' Societies' Building, New York City, April 14. Mr. Herr said that too materialistic and technical an education was dangerous, but colleges cannot build character without the student has the groundwork on which such a structure can be erected.

H. A. Guess, managing director, American Smelting and Refining Co., said that he believed that as engineers were not very numerous they were getting their due share of executive positions. Perhaps the engineers numerically are not as predominant as they would like to be. Still they did well enough as percentages ran. He assumed that there are three doctors to one engineer in this country and asked whether there were as many doctors in executive positions as engineers. He estimated that there were two lawyers to one engineer, yet he questioned if the number of lawyers in executive offices exceeded the number of engineers. He said that many business men who arrived at executive positions in companies were often college graduates themselves. On the whole he thought the engineer had more than his share of executive authority.

Character Is Inborn

Dr. F. B. Jewett, vice-president, of the American Telephone & Telegraph Co., said that character comes into the world with the man himself. It is part of his heritage. After all the fuss about the lack of recognition from which engineers are suffering, it must be admitted that some men don't want to leave technical work, but the number of engineers in executive positions is greater than the number of those from many of the other walks of life. Said Mr. Jewett, if a chief executive wants to train executives he must steer his technical assistants out of purely technical work. He believed that college too often laid too little stress on fundamentals and put too much emphasis on details. As many of the answers to business difficulties lay in the physics of the problems and not in business principles, the head of a large engineering corporation should be an engineer rather than a business man. A man had no chance if he had no knowledge of what might be at any time a matter of vital and major importance in solving his problems.

John C. Parker, vice-president and chief engineer, Brooklyn Edison Co., said that junior engineers were disposed to question whether engineers became executives because when the transformation took place it was so complete that the rank and file questioned whether the man so translated really ever had been an engineer; he no longer looked like one.

If engineers had no recognition, the fault was their own. They could, at least as a class, blame no one but themselves. Yet he thought engineers should make good executives, for an engineer could solve, by the processes he applied to technical questions, the economic problems with which he was confronted as an executive. Among those speaking extempore were, S. H. Libby, consulting hoist engineer, General Electric Co., and George L. Ray, chief engineer, Delaware, Lackawanna & Western R.R. The latter said that railroad practice varied greatly, some railroads advancing their engineers into all executive positions and others being disposed to leave them out of their calculations almost together. The operating men, who get in contact with the people have the best chance for advancement. He had in his employ a good railroad man, "who could lay out a switch so an engine could go over it without a derailment." He decided that this man should get away from the engineering department and he gave him a supervising job over the road foremen. The young man positively feared the job, and one year after he got it pleaded to be let off. But Ray made him stick it out, and he now is on his way up. Many technical men dread a transfer from the drafting room and the job of laying out tracks to a job of supervision, but therein lies the road to an executive position.

Even Coal Ash Has Its Industrial Uses

Dr. Lessing, in the Cantor lectures of the Royal Society of Arts, for 1925, "discoursed with his 'wonted fire' on his favorite topic" [the industrial wastes due to the presence of ash in coal], says *Fuel*. "He calculated that every year the [British] railway system is burdened with 25,000,000 tons of this useless material. It is indeed sad to think of so much waste labor but there are a few redeeming features about the situation even today. In the Portland cement industry, the coal ash increases the weight if not the quality of the product. Boiler clinker is useful for such purposes as making paths and on occasion as an ingredient of concrete. In the blast furnace any iron oxide or lime in the ash are turned to account and the slag is often converted into slag wool, which is useful as a heat-insulating material. Increasing quantities of quick-setting slag cement are also being made from it. Who knows what the future may bring forth? Perhaps the day will come when coal will be mined for the sake of its ash alone."

Main Office of Mines at Kemerova, Siberia

This property is owned by the Autonomous Industrial Colony, Kuzbas, a description of whose operations appeared in *Coal Age*, Nov. 26, 1925, and Jan. 28, 1926.

Consultation

How Many Small Pipes Will Reservoir Keep Full?

A reservoir in the mine with which I am connected has a head of about 6 ft. with a 12-in. pipe taking the water off as fast as it enters. I want to replace this pipe with enough 2-in. pipes to carry this water for sprinkling purposes. How many such pipes will it supply? I estimate that it will fill 88 pipes basing my estimate on the fact that this is the square root of the fifth power of the ratio 6 between the pipes specified.

CHARLES J. LEWIS.
Reynoldsville, Pa.

Your method of calculating is quite correct providing your pipes are of the size stated. It must be remembered, however, that though a standard 12-in. pipe is exactly of 12-in. diameter, a standard 2-in. pipe has an actual inside diameter of 2.067 in.

$$\text{Ratio of capacities} = \sqrt[5]{\frac{12^5}{2.067^5}} = 81.2$$

Thus 81.2 standard 2-in. pipes would carry as much water under the same conditions as a 12-in. pipe when made of the same material. It is needless to say that the sprinkler discharge would greatly modify the resistance. Of course, if that resistance is sufficient there is no limit to the pipes that could be filled.

How Close May Head Sheave Be to Drum of Hoist?

Please advise the method of obtaining the distance a hoisting engine must be placed away from a sheave wheel in order to take care of the fleet of the rope, (1) when the top of the sheave wheel and the top of the drum are on the same level and (2) when they are on different levels?

The distance of the hoist drum from the sheave wheel should be the same whether the rope is horizontal or inclined. Experience has shown that the total angle between the two positions of the rope when leading toward the two extreme ends of the hoist drum should not exceed 3 deg. and this angle should be equally divided upon either side of the line between the center of the drum and the sheave wheel.

If the length of side travel on the drum is represented by l and the distance from the sheave center to the drum center by d and the fleet angle is 3 deg., then

$$\tan 1\tfrac{1}{2}^\circ = \tfrac{1}{2}\, l \div d$$
$$\text{or } 2d \tan 1\tfrac{1}{2}^\circ = l.$$

as $\tan 1^\circ 30' = 0.0262$; $d = 76.33$ ft., if the fleet of the rope is 4 ft.

Hydric Sulphide from Blasting Coal

What gases are formed by an explosion of powder and permissible explosive when fired in a borehole?

G. St. J. Perrott, assistant chief explosives chemist of the U. S. Bureau of Mines, answers this question as follows:

"The following is a typical analysis of the gases formed by the explosion of F granulation of black powder in the Bichel pressure gage:

		Per cent
Carbon dioxide	32.3	17.2
Carbon monoxide		8.6
Hydrogen		3.1
Nitrogen		30.4
Hydric sulphide		7.2

"The products of explosion of a permissible explosive may contain a trace of hydric sulphide, which comes from the sulphur in the electric detonators, as sulphur is not used in permissible explosives. The following analyses of samples from the Bichel gage show the variation in the gaseous products for different types of permissible explosives:

	Type A Per cent	Type B Per cent
Carbon dioxide	32.3	17.2
Carbon monoxide	3.5	36.3
Hydrogen	4.4	31.8
Methane	0.6	0.7
Nitrogen	59.2	14.0

"There are not sufficient data available to give the exact relation between gases formed in the greater confinement in mining operations and that obtained in the pressure gage.

"There is so little iron sulphide present in coal that the possibility of an appreciable amount of hydrogen sulphide being formed with the small charges of explosives that are used, is very remote.

"We have not found oxides of nitrogen in any of our tests. Some observers have reported noting the odor of these oxides after large blasts, but there are no data available showing a measurable quantity present after blasting operations in coal mines."

It may be added that if the explosion takes place near a "sulphur ball" or a mass of pyrite or marcasite a small quantity of hydrogen sulphide conceivably might be formed, though apparently no tests which might bear on this supposition, other than some with gelatin dynamite and in the metal mines of Arizona, have been made by the U. S. Bureau of Mines.

Coke Breeze Also Is Bettered By Air Cleaning

Do you know of any instance in which coke breeze is being cleaned by air or other dry method of separation?

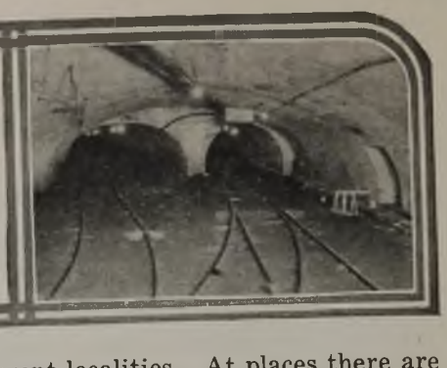
Coke breeze has been treated by the regular pneumatic process on a coal-cleaning table at a testing plant and also at the Semet-Solvay Company's plant at Detroit, Mich. This commercial installation, we are informed has been in operation two years. It is believed to be giving entire satisfaction.

In treating, at the testing plant, coke breeze as received without any sizing and with the middlings mixed with the product, the ash was reduced from 17.37 to 9.34 per cent; that is, 47.2 per cent of the ash was removed. The refuse contained 75.23 per cent of incombustible.

In another instance in which coke breeze was received without sizing, the middlings were not returned and the following result was obtained: The ash was reduced from 17.12 to 9.06 per cent; that is, 47.1 per cent. The middlings contained 17.26 and the refuse 82.62 per cent of ash.

Coke breeze sized between $\frac{1}{2}$ and $\frac{3}{8}$ in., with the middlings returned, had its ash content reduced from 16.87 to 9.24 per cent or 45.2 per cent. The ash in the refuse ran 81.96 per cent. With the material passing through a $\frac{3}{8}$-in. mesh, with the middlings returned, the ash was reduced from 21.06 to 9.26 per cent or 56 per cent. The refuse contained 76.76 per cent of ash. These figures were obtained from a manufacturer of air-cleaner equipment, but are believed to accurately set forth the possibilities of air treating this material.

Underground Operation



Roof Control, the Big Problem in Mining; Some Factors in Its Solution

If the Mine Roof Rested on Red-Brick Masonry, If Its Thickness Was Not Less Than 100 Ft. and If the Open Area Was Half That of the Whole Mine Any Building Inspector Would Condemn the Structure

By Edward O'Toole
General Superintendent, U. S. Coal & Coke Co., Gary, W. Va.

To be successful in arranging that the pressure of the mine roof will break the coal loose from the seam of which it forms a part, the roof must be kept constantly under control. Roof control is the most difficult problem in mining and one of the most expensive and dangerous. It may be defined as holding up the roof of the mine during the process of mining and letting it down when its support is no longer necessary.

The problem is difficult of solution because the roof varies in composition and texture. The operation is dangerous, because at times the roof gets beyond control and falls without warning and injures the workmen. The control of roof is expensive because when the roof gets beyond control, it comes down before the mining of the coal is completed, and has to be moved or the covered coal is lost, adding to the expense. An additional expense is the cost of timber or other supports used for the roof control and the labor cost of placing and removing timber and other supports.

The strata overlying coal seams generally weigh about 160 lb. per cubic foot. Therefore, with a cover 100 ft. thick, the load on each square foot of the coal seam is 160x100 lb.; that is 16,000 lb., or 8 tons. This load would be increased in inverse proportion to the percentage of the coal left in the first workings. Thus if one-quarter of the coal is taken, three-quarters is left and this has to support the same weight as before, so the pressure is $\frac{4}{3}$ as great as at first; that is $\frac{1}{3}$ greater than its original value. If one-half of the coal in the bed is left in these preliminary operations this load will be doubled, which will give an average load of 16 tons per square foot, which exceeds the safe load for red brick in the wall of a building.

Safe Load Allowed on Brickwork

(Based on Chicago building ordinance quoted in Hool and Johnson's "Handbook of Building Construction," Vol. 1, page 611.)

Ordinary Construction	Lb. per sq. in	Tons per sq. ft.
Portland-cement mortar	175	12.6
Good lime and cement mortar	125	9.0
Good lime mortar	100	7.2

In operation the weight on the pillars left to support the roof becomes greater as mining progresses. The pressure per square foot on that portion of the coal seam adjacent to the open area will vary in proportion: (1) With the thickness of cover; (2) with the strength of the overlying strata; (3) with the distance between the pillars, for the pressure is carried from pillar to pillar, just as the weight of a bridge is carried on the piers and becomes greater as the length of the span or the distance between the supports becomes longer.

Like Bridge Girders

The layers of the overlying strata are to the mine roof as the girders are to a bridge. They carry the weight from pillar to pillar over the excavated portion of the mine just as the girders of a bridge carry the weight and load of the bridge over the unsupported space between its abutments.

The strength of the strata overlying coal seams varies greatly in different localities. At places there are layers of massive sandstone 200 ft. thick overlying the coal seam. Where these occur a large area of the coal bed must be extracted before the weight of the stratum and the weight above it will break it down. The space between the mine pillars may have to be extended until it is three times as great as the thickness of the strongest band of rock in the overlying strata before the stratum will break and come down sufficiently to relieve the adjacent pillars from the weight of the roof above the excavated area.

Three for One

For example: If the strongest band of rock overlying the coal is 200 ft. thick, the workings in the seam will have to be excavated for a width of about 600 ft. before the rock will break. If the thickness of the cover in such a case is 300 ft., the rupturing load on the coal pillars adjacent and surrounding the excavation would be as follows: 160 (the weight of strata per cubic foot) x300 (the thickness of the cover) x300 (one-half the distance from pillar to pillar) ÷ 2,000 lb. (one ton) = 7,200 tons, less the weight of the more friable portion of the strata lying between the coal seam and the predominating or load-carrying band of the overlying strata. This more friable material will fall to the height of the load-carrying band in the course of excavating in the seam an opening of the dimension stated.

When the girders of a bridge come to the rupturing point, the girder ruptures at, or about, the center, the ends bearing on the abutments rising in the air and drawing towards the center, so as to let the center go down; but in the rupturing of the roof of a coal mine, when the load on the stratum which is carrying the weight to the pillars becomes too great and reaches its rupturing point, the stratum cannot move towards the center of the opening as a bridge girder does, because it is held fast in place at both ends by the overlying strata on the unexcavated portion of the seam. As it must

Part of an address entitled "An Experiment in Combined Cutting, Mining and Loading in Coal Mines" delivered in New York City, March 11, at a meeting of the American Society of Mechanical Engineers, under the direction of the Materials Handling Section, the National Coal Association co-operating.

fracture when the stress becomes too great for its strength, the moment the load on the center produces a deflection at or near the edge of the pillar, the load-bearing stratum comes down, and the pressure on the pillars adjacent is then reduced to about what it was before operation commenced.

No Vertical Break

Just before the stratum breaks is the critical moment in roof control. Thereafter, the pressure will be approximately that due to the thickness of the overburden. It would be reduced to exactly that pressure were it not for the fact that the strata will not break vertically, but generally at an angle about 15 deg. from the vertical, and overhanging the open area.

It is under this overhang of the pillar that the O'Toole cutting-and-loading machine works, and it is the pressure due to this overhang that brings down the coal, at times fracturing it even before it is undercut. Thus it falls ahead of the coal cutters, and the only work the cutters of the machine have to do is to square up the bottom.

Roof control, more or less, affects all the branches of mining. If the roof can be controlled, all the pillars can be removed in their turn, thus reducing the open workings of the mine to a minimum. When this is done the territory to be ventilated, drained, timbered, etc., will be reduced. All the coal in the seam can be extracted and this complete extraction can be accomplished with slight damage to the surface ,as it will be let down more evenly and with fewer fractures.

Mud-Capped and Open Shots Dangerous in Coal Mines

I agree with Thomas F. Hoye that the method of shooting "coal bottoms" which he describes in his article in the "Underground Operation" department, March 25, entitled "Hazardous Way of Shooting Coal Bottoms," is ill-chosen and dangerous. In the first place there is no excuse for using a dynamite or any explosive other than a permissible in coal mines, because from among the various permissibles available one can be selected which will perform any specific job encountered in coal mines.

The U. S. Bureau of Mines has frequently pointed out the importance of property confining permissible explosives. This can be done only by charging the explosive in a hole and tamping it with clay or other non-combustible stemming. The explosive, even if mudcapped, cannot be properly confined in a notch cut in the bottom.

Shots Unsatisfactory

Much greater safety and efficiency can be attained by drilling holes and placing not more than half a stick in a hole and tamping the remaining portion of the hole with the non-combustible stemming. It is almost impossible, however, to place these holes so as to obtain high efficiency, because the average thickness of bottom is hardly ever greater than 6 in., but even so, at least 90 per cent of the explosive used by the other method will be saved. As a general rule as much of the bottom as possible should be pried loose with pick or bar, and the coal should be shot only in the tight places.

Now, a word as to the gases produced by permissible explosives and dynamites when detonated. The Bureau of Mines places on its list of permissible explosives only those that produce less than 158 liters (5½ cu.ft.) of permanent poisonous gases, as determined by tests in the Bichel pressure gage. Carbon monoxide is the most common poisonous gas produced by permissible explosive but sometimes small quantities of hydrogen sulphide are formed.

On the basis of the volume of poisonous gases, permissible explosives are placed in classes A, B. and C, in which the poisonous gases do not exceed 53, 106, and 158 liters respectively. They are also classified in accordance with their characteristic ingredient. The class of permissible explosive now largely used is of the ammonium-nitrate type, which comes within class A or B.

The quantity of poisonous gases produced by a dynamite would depend upon its class and grade. For example, gelatin dynamites produce small quantities of poisonous gases, whereas the grades of straight dynamite now manufactured rarely exceed 158 liters per 1½ lb. of explosive, the limit set by the Bureau of Mines for permissible explosives.

J. E. Tiffany,
Explosives Testing Engineer
U. S. Bureau of Mines,
Pittsburgh, Pa.

By Monthly Mapping Check Loss of Coal Pillars

Distinctive crayon colors should be applied to mine maps to indicate progress on pillar extraction from month to month—say, yellow for one month, red for another, and so on. By this means coal pillars and stumps left in or abandoned cannot readily be camouflaged on the map as extracted coal. Not a few underground mine officials desirous of temporarily making a good showing abandon such pillars as can be recovered only at greater-than-average cost.

The failure to show clearly what coal is mined and what left makes it difficult for the company to justify the reported tonnage for royalty purposes where payment is made on the basis of actual coal mined. Where, on the other hand, payment is by the tonnage in the coal bed, the leaving of pillars involves the payment of royalty on coal left in the ground. The management should know just how much is left and why, so that it can enforce more complete extraction if that is desirable.

Moreover, the leaving of pillars causes an undue pressure on the pillar line if the abandoned pillars left are large enough to prevent the roof in the mined area from entire collapse. In consequence when pillars are left the management should have knowledge of that fact. Lost coal is not only a waste of coal and of development but often a source of further loss of coal and sometimes a menace to the section of the mine in which the pillars are abandoned.

Slope, Kemerova, Siberia

This slope is being sunk diagonally across the dip of the coal seam to the second level of the Central Shaft, a distance of 1,600 ft. on a grade of 25 deg.

Practical Pointers For Electrical And Mechanical Men

How to Install Shaft Cables Without Unequal Loading

Lowering electric cables down a mine shaft and fastening them in place is always a ticklish operation inasmuch as the cable sheathing should not be strained and consequently each support should take only the weight of cable between it and the next lower one. Where possible, it is advisable to place the cable reel on the cage allowing it to unwind as the cage is raised or lowered, a stop being made at each support while the cable is fastened securely in place.

In many instances, however, the electrical conductor must be installed in some other passage than the cage compartment and must accordingly be lowered from the top. In such a case, as described by the *Iron and Coal Trades Review* it is advisable to lower the electrical conductor by means of a steel rope, the two being lashed together at intervals of about 30 ft. The lashings are usually composed of rope yarns, and care must be taken to see that they bind properly on both cables. If the steel rope is greasy it is advisable not only to clean it but to chalk it as well so that the marline or twine lashing may secure an adequate, non-slipping grip. By this means each lashing supports only that length of the electrical conductor lying between it and the one next lower down.

The electrical cable may be paid out from its reel under suitable tension. The steel cable, on the other hand, may well be wound upon the drum of a hoisting engine or capstan and be unwound therefrom either under the action of the driving engine or on the brake.

Fastening the Cable

When the electrical cable has been lowered to place it may be fastened in its supports successively beginning from the bottom and proceeding upward. If the lashings are properly spaced they should come immediately above or below the points of anchorage. As the cable is made fast to each permanent support the adjacent lashing may be cut loose. It has been found advisable to limit the weight of electrical conductor sustained by any one support to approximately 1,000 lb. By this means excessive weight is not thrown on the cable sheath which accordingly is not strained.

In leading the cable away from the top of the shaft also it has been found advisable to avoid sharp bends as well as sharp projections or corners in its holders. If handled and anchored carefully a cable of this kind will give excellent service and last almost indefinitely. If on the other hand it is handled roughly and installed carelessly it may give no end of trouble.

Sets Transformers in Tank Mounted on Wheels

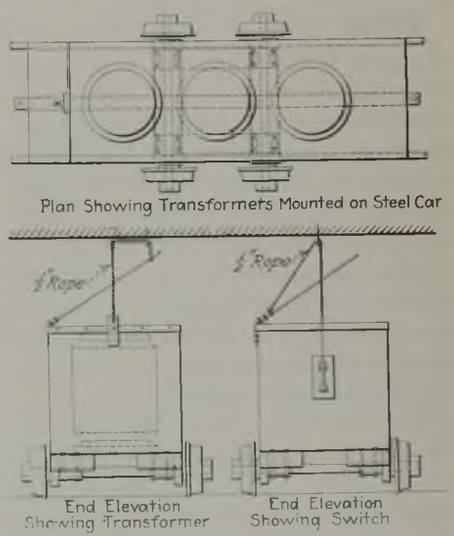
In the accompanying illustration may be seen the portable transformer station installed at Mine No. 2 of the Francisco Mining Co., of Princeton, Indiana. This is a steel box fitted with a hinged cover and employed as a container for a set of three 15-kva. 2,500- to 250-volt, 60-cycle transformers and one 2,500-volt 200-ampere oil switch.

Mounted on a Truck

This box is 9 ft. long, 32 in. wide and 35 in. deep. It is mounted on an ordinary mine car truck. The bottom of the box consists of two 4x6x$\frac{3}{8}$-in. angle bars 9 ft. long forming the sides, and two 4x6x$\frac{3}{8}$-in. angle bars 32 in. long for ends. Upon this frame is placed a $\frac{3}{8}$-in. boiler plate 32 in. wide and 9 ft. long. A 2x2x$\frac{3}{8}$-in. angle 35 in. in length forms each of the four corners, the sides, ends and cover being made of $\frac{1}{4}$-in. boiler plate. A $\frac{1}{2}$-in. manila rope is attached at one inside end of the box extending directly over the top of the oil switch and transformers and then upward to the roof where it passes around a pulley, then down to the center of one side of the lid. Under normal conditions this lid is raised about 12 in. so as to allow ventilation over the transformers and switch. In case of fire the rope will burn in two, thus allowing the lid to fall inclosing the fire within the steel box where it will be smothered.

Switch Automatically Pulled

Another detail making for safety in this device is a steel rope attached to the oil switch lever. This extends over a pulley in the roof and thence downward, being fastened to the lid of the box in such a way as to cause the switch to be pulled out in case the lid falls. Dry sand to a depth of 2 in. is placed in the bottom of the box to absorb any oil that may leak from the transformers. This sand acts as a fire deterrent rather than a preventive.



Portable Transformer Station Has Steel Walls in Case of Fire

Three 15-kva. transformers are here shown inclosed in a steel box mounted on wheels. As may be seen the arrangement is such that should fire start within the box a manila rope will be burned off permitting the cover to fall. This not only totally encases the equipment and smothers the fire, but instantly jerks out the switch cutting off the current supply.

The chief advantages of this transformer station lie in its portability and durability. Thus it may be easily and quickly moved from place to place and its first cost is practically its last.

Six Motor Combinations for Six Reservoir Levels

An interesting system of pump-motor control was recently devised by the General Electric Co. It was developed for controlling three squirrel-cage pump motors used to maintain the water level in a reservoir. It was desired that standard automatic starting compensators be used, with an auxiliary control that would give six combinations of the pump motors at six different levels of the water in the reservoir. It was further desired that but one of the pumps operate during certain periods, the other two automatically shutting down to start again only at the end of a predetermined period.

In view of the fact that ice would foul the mechanism of a float switch during the winter months, it was decided to use a Ruggles-Klingemann regulator panel having six control points, each point to represent a definite level of the water in the reservoir. On this panel were mounted the regulator, a dial switch, a control circuit switch, a time switch and seven double-pole control relaying contactors. Rather than make up a new dial switch with six points, a field control switch with twenty-one buttons are utilized, the six points being obtained by wiring the twenty-one buttons into seven groups of three buttons each.

Pumps Start Successively

In use, a recession of the water in the reservoir causes the regulator to operate, moving the dial switch to the first control point, actuating contactor No. 1 and starting pump motor No. 1 by means of the first automatic compensator. As the water level continues to drop, additional contactors up to the sixth are actuated. The first pump motor is rated at 60 hp., the second at 100 hp. and the third at 150 hp. As each pump goes into operation on the first three points of the dial switch, the preceding one drops out. Pump No. 3 continues to operate on the fourth, fifth and sixth points, upon each of which additional pumps are picked up. On the fourth point, pump No. 1 is added; on the fifth this pump drops out and pump No. 2 is picked up, but on the sixth point, all three pumps go into operation.

In order to provide operation of but one of the pumps during certain periods, a time switch and one of the control relaying contactors were used. The normally closed tips of the time switch [illegible] in the coil circuit of the contactor. The control circuits of the two automatic starting compensator panels were likewise wired through this contactor. During normal operation this device is closed and all the pump motors start on their respective points. During the period of shut-down, however, the tips of the time switch open and the contactor drops out. As a result, only one pump motor operates, regardless of the position of the dial switch.

Interpoles Must Correspond With Required Rotation

In the "Practical Pointer" section of the Feb. 25 issue of *Coal Age*, J. A. Shaw describes safe practice in connecting the interpoles of direct-current motors. I am of the opinion that he has gone about the method backwards. He tells how to produce the proper rotation in relation to the interpole connections. The more practical need is to make the proper connections of the interpoles to correspond with the required rotation.

The more usual method is to connect the shunt and series fields properly, as determined by magnetic test if necessary, and then connect the interpoles in respect to the shunt and series field to correspond to the direction that the armature must rotate. Then, if on a trial, the armature does not rotate in the right direction, this can be corrected without disturbing the field relation, by reversing the two leads running to the brush holders.

R. R. WEBSTER,
Chief Electrician.
Elkhorn Piney Coal Mining Co.,
Weeksbury, Ky.

Coil Shop Should Be Clean, Light and Private

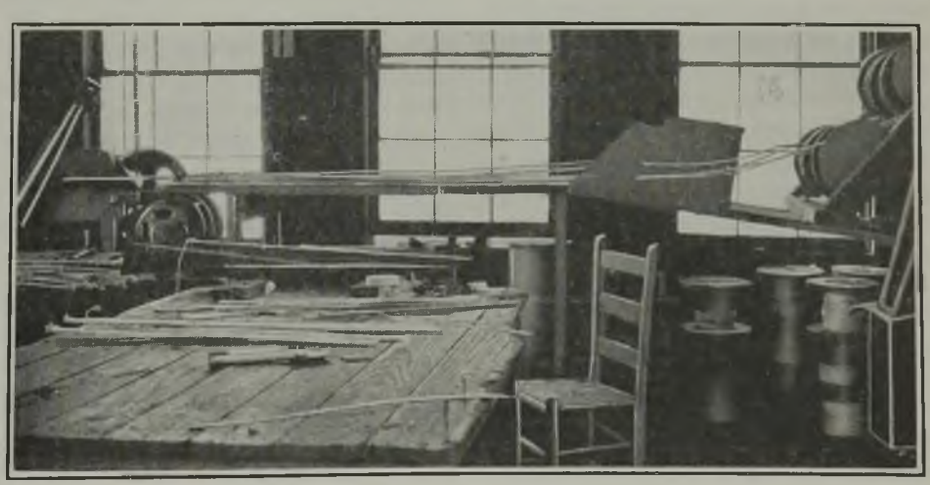
Coal companies in the last few years have shown a marked tendency to do less and less coil making in the mine repair shops. The smaller companies are, as a rule, sending their armatures away for rewinding, and the large companies which have their own winding shops are in many cases buying factory-made coils in preference to those of their own make.

An exception to the common practice is the Montevallo Coal Mining Co., of Aldrich, Ala. This mine produces only 600 tons per day, yet the armature winding is done at the mine and the coils are made there.

The coil shop is a room 16x20 ft. which forms the second story of a small store house. Windows on three sides let in an abundance of natural light. The equipment consists of a homemade motor-driven coil-winding machine, a homemade paper shear and a small dipping tank for individual coils. After being dipped in shellac the coils are pulled to shape by hand in a bench vise.

Light and Privacy Assured

The men at the mine state that this coil shop is, in a manner, a makeshift and that it is hoped that room will be provided in a proposed new repair shop for the work. Granted that it is a makeshift, this small coil shop has several desirable features. It is far enough away from the repair shop so that the man making coils is not bothered continually by visitors. The location is such that the place can be kept fairly clean, and the exposure and window location provides for an abundance of natural light.



Coil Shop of the Montevallo Coal Mining Co.

At the left is a homemade motor-driven winding machine. Mounted on the end of the bench is an improvised paper shear and at the lower right is a small tank in which the individual coils are dipped in shellac before being taped and pulled. The room, which is 16x20 ft. and is the second story of a small supply house, has windows on three sides.

Viewpoints of Our Readers

Is the Fan with Backward-Curved Blades The Best Ventilating Unit?

Must Distinguish Intrinsic Resistance from That Due to Increased Volume — Laid-Back Blade Fan Has Twice Weight and Cost of One with Forward-Blades

By W. A. ROWE
American Blower Co., Detroit, Mich.

Several statements from which an entirely erroneous impression may be gained appeared in the article entitled "Operating Characteristics of Centrifugal Fans and Use of Fan-Performance Curve" delivered before the American Institute of Mining & Metallurgical Engineers and reprinted in *Coal Age*, March 18, pages 393 to 398. The first of these is that a fan with a forward-curved blade is so unstable that a "slight change in operating conditions when it is running at its point of maximum efficiency will cause the fan to operate very inefficiently." This is not so.

Greater Volume of Air

The point which possibly has been overlooked is that a 10 per cent drop in the static pressure against which the fan is operating is not the same as a change of 10 per cent in the resistance of the mine. The author further states that it is guesswork to estimate the resistance a mine will offer to a certain volume of air within at least 10 per cent of the actual resistance and because that 10 per cent figure has been used, it is assumed that it was the intent of the author that the change in the mine resistance was 10 per cent *for a given volume* of air.

Take, for example, the first instance where it is stated that a 10 per cent drop in pressure would cause 26 per cent increase in volume and take also the example cited in the article of a fan designed to deliver 100,000 cu.ft. of air per minute against a 2-in. static pressure. A 26 per cent increase in the volume would represent 126,000 cubic ft. per minute at 1.8-in. water gage. We know from our mathematics of ventilation that the pressure necessary to cause ventilation varies directly as the square of the volume when conditions causing resistance remain unchanged.

No Small Miscalculation

If the mine in its changed condition would handle 126,000 cu.ft. per minute at 1.8 in. water gage, it may be readily calculated that the resistance of the mine based on 100,00 cu.ft. per minute only being passed through it would correspond to a water gage of 1.13 in. This is not a 10 per cent change in the mine resistance. Had the actual resistance been 1.13 in. for 100,000 cu.ft. and the operator had calculated that the resistance would be 2 in. for that volume, he would have overestimated the mine resistance 77 per cent. It would not be correct to call that a "slight" difference in the resistance.

For an actual drop of 10 per cent in the resistance, it is easy to determine the condition at which the fan will operate by plotting the characteristics of the *mine* through a point corresponding to 90 per cent resistance for 100 per cent of capacity. Using the same fan characteristic charts of the forward-curved blade and the full backward-curved blade, which illustrate the author's article, we can plot the mine characteristic curve for that condition. This is marked *A*.

Where this mine characteristic curve crosses the static-pressure curve of the fan will establish the operating point, which is where the volume that a mine will pass at a given water gage equals the quantity of air a fan will handle against the same static pressure. This, it is apparent, will represent approximately 5 per cent increase in volume on the forward-curved blade, and 3 per cent increase in volume on the full backward-curved blade, with approximately 6 per cent and 2 per cent increase in the horsepower, respectively, for the two types.

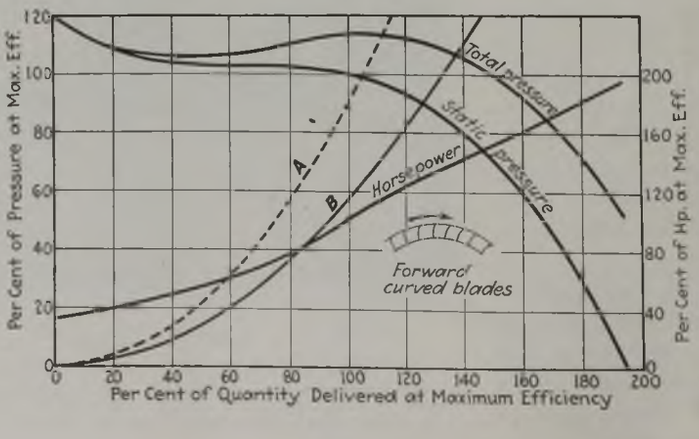
The figures given in Table I, page 396, should show the effect of 10 per cent increase or decrease in resistance *for a given volume* of air and should be revised in accordance with these figures or an entirely erroneous impression will be conveyed.

If, for both types of fans mentioned, we plot the characteristics of the mine for a condition where the water gage at the fan at constant speed has dropped 10 per cent, then it will represent with the forward-curved blade a new condition in the mine where the mine would pass the original volume at approximately 57 per cent of the original water gage, whereas in the case of the full backward-curved blade, it will represent a water gage of 77 per cent of the original, the equivalent orifice being different in each case. These two conditions are shown by the solid characteristic line *B*.

Wide Range of Efficiency

It is to be regretted that the efficiency curves were not also plotted as it would have been readily possible to show by the above means that with the forward-curved blade the efficiency of the fan is maintained over a much wider range of capacity than with the full backward-curved blade.

The second point in which it is impossible to accept the author's conclusions concerns the claim for high



Forward-Curved Blade Fan

Graphs show results obtained when the larger or lesser quantity of air delivered at the changed pressure is taken into due consideration.

mechanical efficiency on fans having a full backward-curved blade. In Fig. 5, on p. 397 of the article quoted, is shown what purports to be a test of a high-speed fan, showing the mechanical efficiency above 80 per cent. Repeated tests of fans of the leading manufacturers of that type of equipment have never yet confirmed claims for efficiencies as high as this. The efficiency of this type of fan is more likely to be under 70 per cent than over 80 per cent and it is not as high as has been obtained with well-designed proportions of the fan with the forward-curved blades.

The characteristics which have been discussed have been unfortunately those of an academic rather than of a practical nature. Instead of focussing all our attention on the performance characteristics, it would be wise to give thought to the operating every-day characteristics of the different types of fans discussed.

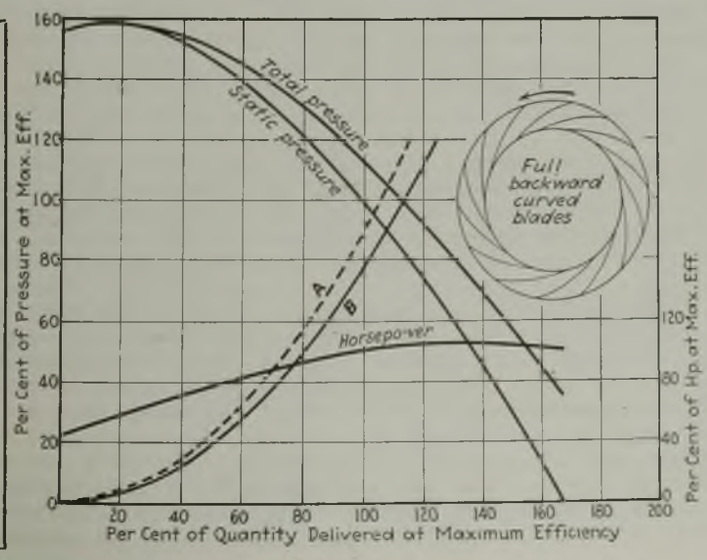
Tip Speed Excessive

The full backward-curved blade type of fan is not a new machine. It was described in text books over a generation ago. Though it is a good fan, its laid-back blades give a low manometric ratio, requiring an excessively high speed for a given water gage. For example, in the case of the fan duty previously mentioned, having a water gage of 2 in., this high-speed fan would have to operate at a peripheral velocity, or tip speed, of 7,000 ft. per minute. For the same duty the well-designed forward-curved blade would operate at a tip speed of 4,000 ft. per minute. Though the speed, first-mentioned, for the laid-back blade might not be considered objectionable for a 2-in. water gage, there are many of our mines today which are compelled to operate at water gages much higher than this. It is easy, therefore, to appreciate that when we apply such a fan to these higher water gages, the speed of this fan may be so high as to make its use seriously questionable. The preference of many mine operators for low speeds is therefore based on real reasons. If this is a "relic of the old days" it is a sample of good judgment used by the old timers founded on long practical experience.

Another disadvantage of the backwardly laid blade is that fans of that design are low in volumetric capacities. It is necessary to use a much larger fan in all its dimensions than with the forward-curved blade, for the maximum of efficiency of the high-speed fan occurs at a relatively much lower outlet velocity. The proportional dimensions for efficiencies anywhere near comparable would show lineal dimensions over 25 per cent greater than for the forward-curved blade. Experience has shown that the weight would be about double that of the forward-curved blade fan, and the cost in the same proportion.

Backward-Curved Blade Fan

Where the mine characteristic graph crosses the static-pressure curve of the fan establishes the operating point, which is where the volume that a mine will pass at a given water gage equals the quantity of air a fan will handle against the same static pressure. This shows for a curve of this type a 3-per cent increase in volume, with a 2-per cent increase in horsepower.



Snubbing More Effective Than Shearing

In the issue of March 11 Thomas Stroup comments on my article in your issue of Dec. 31, 1925, Mr. Stroup's comments being under the head "Shooting More Important Than Shearing." Among other matters he refers to a statement in the article to the effect that it is questionable if snubbing the face will be as efficient in increasing the percentage of lump coal as center shearing. I agree with him this is a surprising statement and was surprised when I read it. In the article as I wrote it I merely described different ways of obtaining larger coal, the important one of which was the snubbing of the face.

The title of my article was "Mining Lump Coal," and I described various ways and means of obtaining results, the more important of which was snubbing. The title of the article as printed reads, "Center Shearing Increases the Percentage of Lump," and so much was omitted from my article that by reading what was printed one would think my intention was to say that center shearing was the thing to do.

Snub Face and Save Powder

The article as I wrote it read in part as follows:

"Another method of mining coal so that it can be shot with a small quantity of explosives and few holes is to snub the face. After the undercut is made by an arcwall cutter the machine is pulled out from under the kerf, the cutterbar raised and a snubbing cut made.

"If desirable, the snubbing can be made higher [than immediately over the undercut] leaving some coal between the two kerfs. This coal will break into good-sized lumps, and in some coal it is desirable to make the snubbing cut rather high. The same kind of cut can be made when the machine is used for slabbing on long faces. When the snubbing cut is made the coal rolls more freely from the face, requires less power to shoot, and a larger quantity of lump is obtained.

Turret Cutter Preferable

"The arcwall machine is probably the best adapted of all machines to make a snubbing cut. There are no extra complications required on the machine to accomplish this. The standard machine will do the work.

"In some coal seams the saving in drilling holes and in powder will more than offset the cost of making the extra cut and whatever increase there might be in the percentage of lump coal is a clear gain.

"The shortwall machine has been equipped with a double cutter bar. The upper one, being shorter, does the snubbing. This type of shortwall machine has the disadvantage as compared with ordinary shortwall machines, that it is higher, heavier and a little more difficult to handle, and it is not recommended where there is sulphur, hard cutting or a rolling bottom." N. D. Levin.

Columbus, Ohio.

News Of the Industry

Union Balks at Arbitration in Any Form; Permanent Fact-Finding Bureau Conditionally Approved, Says Murray

Washington, D. C., April 20.—Unalterable opposition to any legislation "which spells arbitration" and conditional acceptance of the proposal to establish a permanent government fact-finding coal bureau mark the attitude of the United Mine Workers. This was made clear here yesterday when the House committee on interstate and foreign commerce resumed its hearings and invited Philip Murray, international vice-presdent, and Thomas Kennedy, international secretary-treasurer of the union, to present their views.

"Any kind of system" which has arbitration as its purpose would be unwelcome, declared Mr. Murray. This opposition extends not only to arbitration as a continuing policy but to any system of emergency control which would authorize the President to create a board that could investigate and report upon the issues in the wage controversy which gave birth to the emergency. If, however, the government should decide to set up some scheme of arbitration, then the union demands that the program be broadened to include government fixing of profits and prices as well as wages, and complete control of the industry.

The union will not oppose a compulsory fact-finding bureau provided the union has adequate representation in that bureau "in order that the American coal miner can rest assured that the statistics and information gathered shall be compiled from the standpoint of aiding in correcting the abuses and basic evils existing in the bituminous coal industry." Such a bureau should collect facts on:

(1) "The elimination of uneconomic and unscientific freight rates" on coal;

(2) Railroad coal purchases and alleged conspiracies to beat down prices on locomotive fuel;

(3) Alleged boycotts of union-mined coal by certain railroads and public utilities;

(4) Relative efficiency of all soft-coal mines;

(5) Physical conditions of mines as bearing upon introduction of new machinery and financial ability of producers to reduce costs by mechanization of such mines;

(6) Capital necessary to launch mining projects "based upon the utilization of modern mine practices in line with sound engineering principles";

(7) Sales costs, interlocking relationships of producers and sales agencies and actual profits;

(8) "All other facts which will enable collective bargaining and scientific management to remedy the evils of overproduction, unprofitable sales prices, promote efficiency and continuity of operations and in turn the lowest possible coal price to the consuming public, consistent with a wage rate to the miner compatible with American standards and a fair return upon the investment to the operator."

Congressman Lea wanted to know whether the fact-finding agency should not be empowered to compel the production of union records and testimony. Mr. Murray replied that the union did not want such power lodged with the fact-finding agency, but did not see how it could be avoided if such powers were exercised over the operators.

"The coal miner," asserted Mr. Murray, "has been the innocent victim of destructive mismanagement" and has learned by experience that it is unwise to take pot-luck in chance arbitration experiments.

Recounts Soft-Coal Evils

"Unprecedented overdevelopment, inequitable and unscientific freight rates, obsolete mining equipment, abrogation of wage contracts by cheating operators, halting of increased consumption and the inexpert management that persists throughout bituminous coal have all contributed to a period of cut-throat competition that is dissipating large pools of capital, wrecking entire mining communities and demoralizing the basic structure of the soft-coal industry."

Several times during the course of his testimony Mr. Murray attacked the companies which have broken away from the Jacksonville agreement. That agreement, he declared, had been made "at the behest of representatives of the United States Government" and the government has done nothing to brand those operators who repudiated their pledges.

Complete unionization, said the witness, would be a great stabilizing factor. Although closely questioned, he did not explain to the committee, however, how such complete unionization would eliminate the problem of the surplus mines and the surplus miners. His nearest approach was the contention that, with wages and working conditions equalized, the inefficient operation would be driven out of business by economic pressure. When asked how far the government should go in protecting the public against an interruption to its coal supply, Mr. Murray at first answered that he did not know and then parried by inquiring how far the government would go in interesting itself in the victims of contract "repudiation" in West Virginia and Pennsylvania.

Philip Murray

He admitted that if the government had emergency control powers and fixed wages high enough to induce strikers to return to work, there might be a willingness on the part of the workers to favor continued government operation. If, on the contrary, it "meant the same kind of wage regulation as in the postal service, the workers wouldn't be for it." He was not willing to concede that union and operator representation on the fact-finding agency would detract from the value and weight of such an agency's labors.

Mr. Murray accused the railroads of a deliberate campaign to break down coal prices in the union fields and to encourage non-union production to the detriment of roads serving union territory and the business and social life in that territory. President Atterbury of the Pennsylvania R.R., he said, was a leader in this movement. The purpose of this campaign, he insisted, was to wreck the Jacksonville agreement and force all wages down to $2.50@$3.50 levels. Discriminatory rate adjustments also are hurting the union fields.

Concluding the examination of Mr. Murray this morning, committee members again pressed him for an explanation of his statement that complete

unionization would be a stabilizing factor. The witness answered that the Central Competitive Field, paying a high wage rate, had efficient labor, skilled management, large operating units and lower production costs. He contended that these conditions were reversed in non-union West Virginia, although the physical conditions as to coal seams were comparable. The better relationships developed under union control would curb ruinous competition and promote mergers to eliminate uneconomic mines.

Mr. Murray denied that West Virginia coal was superior in quality to that mined in the Central Competitive Field and said operators in the latter territory had fallen down in salesmanship. The mine workers believe, he told representatives here, that the fact that the Southern fields were non-union has been considered in fixing rates to the Lakes. Increasing the differential in favor of Pittsburgh and eastern Ohio to 53c. would enable the union mines to compete against the lower wage scales in non-union districts. It might also have a tendency to close down some of the Southern mines.

Asked his authority for the statement that the Jacksonville agreement had been made at the request of the government, Mr. Murray said: "Prior to February, 1924, a joint call was issued for a conference of operators and mine workers in the Central Competitive Field. The Pittsburgh Coal Co. refused to participate. As a result of that refusal it seemed that there would be no conference, as other operators were about to decide on the same course. Mr. Hoover, in his anxiety to have industrial peace and to prevent an additional strike, asked W. K. Field to be represented at Jacksonville. Mr. Field then authorized Messrs. Donaldson and Armstrong to attend the Jacksonville meeting and participate on behalf of the Pittsburgh Coal Co.

Operators' Wants Differ

"During the conferences some of the operating interests were opposed to a three-year extension of the old agreement; some wanted a wage reduction, others wanted a one-year agreement, some two years, but Messrs. Donaldson and Armstrong insisted on a five-year contract at the old rates. Asked why, they said it was the desire of the government."

"But the government did not attempt to dictate the terms," said Mr. Herch.

"No, except that Mr. Hoover told the mine workers that it was the desire of the government that the contract be continued three or four years."

"All the government did was to urge an agreement," persisted Mr. Herch.

"It was suggested in a private conference between Mr. Hoover and Mr. Lewis, not at Jacksonville, that the old rates be continued," retorted the witness. There was, he admitted, no formal record of the government's interest except the annual report of the Department of Commerce and a letter from President Coolidge complimenting Mr. Lewis on the arrangement effected at Jacksonville.

Mr. Murray reiterated his opposition to compulsory arbitration and said the question of voluntary arbitration should be left to the industry. For that reason he rejected the suggestion that a bill along the lines of the Parker-Watson railroad labor bill would be a good thing, notwithstanding the fact that that measure makes the acceptance of arbitration optional. The union, he said, had no objection to mediation and conciliation. He declined to venture a prediction of what might happen at the expiration of the Jacksonville agreement.

Kennedy Launches Shafts

Mr. Kennedy, calling attention to bills providing for mediation and conciliation, testified that such powers already were lodged with the Department of Labor. To go beyond those powers, he argued, would in itself be creating some form of compulsion.

Expanding further on the union distaste for arbitration, Mr. Kennedy said that both the public and the anthracite operators wanted cheaper coal and continuity of supply. This meant that the representatives of the public and of the operators on an arbitration board would be arranged against the mine workers regardless of the justice of the mine workers' contentions.

The witness would not commit himself on the question of whether he favored legislation which would permit examination of the private records of industry in general, but said that was necessary in the coal industry to establish the facts. If the government could attack the royalty problem, it could reduce the price of coal. Mr Kennedy also assailed the state anthracite tax as put over by the selfish interests of manufacturers to avoid paying their proper share of taxation. He repeated the charge that the operators had encouraged the last anthracite suspension to destroy the union.

The committee adjourned the hearings this afternoon and will resume on April 26. Harry L. Gandy, executive secretary of the National Coal Association, probably will be the first witness heard next week.

Insurance Company Insists On Rock-Dusting

The Associated Companies, of Hartford, Conn., which write a large volume of compensation insurance business on coal mines throughout the United States, have come out strongly for rock-dusting. Carrying risks on gaseous as well as non-gaseous mines, the organization has been advocating rock-dusting of bituminous coal mines for the last two years, and a large number of operations have adopted the practice.

G. B. Butterfield, general manager of the Associated Companies, announced on April 10, however, that beginning Oct. 1, next, this organization will not insure any gaseous or dusty coal mine that is not rock-dusted, and in the event that any gaseous or dusty mine on the books has not adopted the practice by that time, its policy will be cancelled.

Penna Resigns, Then Accepts Another Term

After declining to accept another term as secretary of the Indiana Bituminous Coal Operators' Association at the regular election, April 17, Phil. H. Penna, who has held the office since 1900, consented to accept the position again Monday when the executive board met in an all-day session in Terre Haute and prevailed upon Mr. Penna to withdraw his resignation. While there were no comments Monday upon the situation which led Mr. Penna to refuse to accept the office at the annual meeting of the board, it was said that all difficulties had been satisfactorily settled and that Mr. Penna had been chosen by unanimous vote of the board.

David Ingle, of Evansville, Ind., president of the association, declared that Mr. Penna's name had been the only one under consideration by the executive board and in a statement following the meeting declared that "Mr. Penna's election was unanimous."

Mr. Penna first came into prominence in the mining industry when, as a miner, he was active in the organization of the present District No. 11, United Mine Workers. As a result of his activity he was elected in 1887 as the first president of the district organization and continued in his service with the miners' union until 1900.

His ability as an organizer brought an offer from the operators which was accepted by Mr. Penna in August, 1900. In the interim Mr. Penna not only has taken an active part in the development of the Indiana bituminous field but has become recognized nationally as a leader in the coal industry.

Montour 9 Opens; 2,200 at Work for Pittsburgh Co.

With the opening of Montour No. 9 mine, of the Pittsburgh Coal Co., at McDonald, Pa., on April 20, one-third of the mines of the company in the Pittsburgh district are operating on an open-shop basis. Montour No. 9 is the eleventh mine of the company to begin work on the November, 1917, scale, independent of the United Mine Workers. The company has a total of 33 mines in the Pittsburgh district, 22 of which are still idle. More than 50 men went to work at Montour No. 9 the first day. The company now has a total of almost 2,200 miners at work in the Pittsburgh district on the 1917 scale. Montour No. 9 had been closed since April 22, 1925.

Industrial Coal Stocks Ebb

Coal supplies on hand in various industries on March 1, according to the National Association of Purchasing Agents, were as follows: Steel plants, 24 days; electric utilities and goal-gas plants, 47 days; railroads, 23 days; by-product-coke plants, 21 days; miscellaneous industries, 42 days. This compares with these estimates by the government as of Feb. 1: Steel plants, 26 days; electric utilities and coal-gas plants, 50 days; railroads, 25 days; by-product-coke plants, 23 days; miscellaneous industries, 37 days.

Urges Subsidy to Encourage Nova Scotia Coal Industry

Establishment of coking plants in Montreal and other large central cities for converting Nova Scotia slack into domestic coal and the granting of a subsidy by the federal government for each ton of Nova Scotia coal sold to Montreal and points west, and for each ton of Alberta coal sold east of Winnipeg are suggested by Major Hume Cronyn, K. C., as means to enable Canada to become independent of the United States for coal supplies and to bring about relief from a perilous coal situation in Nova Scotia. These were submitted at a meeting of the Young Men's Canadian Club in the Windsor Hotel, Montreal, April 12. Mr. Cronyn, who is president of the Huron & Erie Mortgage Co. and the Mutual Life Insurance Co., was a member of the Duncan commission appointed to investigate Nova Scotia coal conditions.

Opposition was voiced against raising the Canadian tariff against American coals and against a reduction of rates for the transportation of coal east and west. The sale of byproducts, such as gas, from the coal converted in central coking plants, the speaker said, would lessen the cost of such fuel to the consumer. Expenses of establishing such plants would be heavy, he admitted, and he thought that the government should contribute.

Major Cronyn declared no betterment will come until the industry in Nova Scotia is placed on a firm economic basis and operators and miners forget their past bitterness and differences and prepare to co-operate in harmony for mutual benefit.

Break Off Wage Parley on Kansas Shovel-Mine Labor

Negotiations on a wage scale between District 14, United Mine Workers, and operators of half a dozen steam-shovel mines near Mulberry, Kan., were broken off the night of April 13. After the mines involved had been "marched" upon by union miners in motor cars several weeks ago, a truce was effected by entering negotiations for a contract. It was agreed at a preliminary conference that the miners should submit a written proposal. This was done and terms were presented similar to those of the Jacksonville agreement together with a tonnage rate on wagon hauls from the strip mines. The operators proposed a tonnage rate for a large part of the work in the pits, and the miners rejected this. The controversy hinges on wages for the common labor in the mines, as the cranemen, engineers and other skilled workers are paid the union scale.

Elk Horn Sells Oil Rights

All the undeveloped oil and gas rights in Kentucky and West Virginia belonging to the Elk Horn Coal Corporation have been sold to the Louisville Gas & Electric Co. for approximately $700,000. Elk Horn retains, under the terms of the sale, one-eighth interest in all oil found on the territory sold, without bearing any costs of development.

Thomas Kennedy

Miners' secretary-treasurer, who presented his views on coal legislation at the House hearing this week.

Alaska Colliery Destroyed In $500,000 Fire

The Alaska colliery of the Philadelphia & Reading Coal & Iron Co., at Mt. Carmel, Pa., was destroyed by fire last Saturday night, entailing a loss estimated unofficially at about $500,000. The fire broke out about 8 o'clock and had wrecked the structure within two hours. A night watchman who discovered the fire said there had been no explosion.

The colliery, which was comparatively new, was one of the largest in this section of the anthracite region and employed about 950 men. Officials said they were unable to explain the cause of the fire pending an investigation.

Since the resumption of hard-coal mining after the strike, the colliery had been operating at normal capacity.

C. & O. to Acquire Stock Of Island Creek R.R.

The Interstate Commerce Commission on April 16 authorized the Chesapeake & Ohio Ry. to acquire control of the Island Creek R.R. in Logan County, West Virginia, by purchase of its capital stock.

Since 1912 the Chesapeake & Ohio has been operating the Island Creek line under a 20-year lease. The main line of the Island Creek R.R., which was completed in 1904, extends from near Logan to Holden, a distance of about five miles, with several short branches which have an aggregate length of ten miles. The proposed purchase is to include the branch mileage.

The Logan & Southern R.R., a feeder line, owned by the Chesapeake & Ohio connects with the main line of the Island Creek at Monitor Junction, near Logan.

Commissioner Eastman, of the Commerce Commission, dissented from the report of the majority, declaring the acquisition of involved consolidation of roads into a single system for ownership and operation beyond their authority to approve. He also thought the price to be paid was too high.

Minto Board Report Tabled

The report of the Royal Commission appointed by the government to investigate the causes leading up to the troubles in the Minto (N. B.) coal field between the Minto Coal Co. and its miners was tabled in the Provincial Legislature April 9 by Dr. H. I. Taylor.

The Commission in the course of its duties acted as a board of conciliation and succeeded in bringing about an amicable and satisfactory settlement of the strike of the miners. The members of the Royal Commission were E. R. Teed, of Woodstock; Geo. A. Stone, of Moncton, and Luke S. Morrison, of Fredericton.

American Federation of Labor Opposes Plan For Federal Industrial Court to Settle Strikes

Discussion of proposal to establish a federal industrial court to settle strikes and other problems between capital and labor featured the hearing last week before the committee on commerce, trade and commercial law of the American Bar Association at 65 Liberty St., New York City. Chairman Province M. Pogue, of Cincinnati, presided.

Several bills are before Congress for establishment of a court of this sort, but the bar committee, it was learned, wants to formulate a bill of its own. The hearing was to study the various angles of public opinion as regards the formulation of such a bill, which would be equitable to both employer and employee.

The American Federation of Labor went on record as being unqualifiedly against establishment of such a court. Matthew Woll, vice-president of the federation, who appeared before the committee, declared such a measure "would destroy freedom of collective bargaining" between employer and employee and would furthermore be "unconstitutional as well as impracticable."

Murray T. Quigg, editor of *Law and Labor*, joined with Mr. Woll in the view that a national industrial court is unnecessary to settle strikes. He favored a Congressional bill to "define more clearly the private rights of disputants" and to provide changing of contracts by agreement in order to avoid strikes without "outside" interference in industry.

State Senator William R. Eaton of Colorado was the only advocate of the industrial court idea who was heard at the session. He favored a federal body similar to the Colorado Industrial Commission which, he said, has resulted in only two strikes being called in that state in three years.

Cabinet Confers with British Miners And Operators as Strike Impends; Commission Report Roundly Scored

When the situation in the British coal industry seemed likely to take an even more serious turn the government intervened. The Minister of Labor on April 14 had a conference with the representatives of the operators and the Prime Minister, Stanley Baldwin, interviewed the industrial committee of the General Council of the Trades Union Congress. The Premier did not commit himself to any action, but a special meeting of the Cabinet this week was expected to consider the matter.

The outlook seemed darkest at the close of the conference between the colliery owners and miners on April 13. Replying to the recent report of the Royal Coal Commission, the miners' representatives emphatically opposed several of the report's principal clauses, which were drafted by members of the commission as essential to bringing about peace and prosperity for the British coal industry.

The miners' leaders declared that no settlement would be acceptable that did not provide at least a wage enabling the miners to get a decent standard of living. The suggestion that "the minimum percentage" on wages should be settled in the various mining districts and not nationally also was objected to. Redistribution of present daily hours of labor over a week of five days instead of six, they pronounced impracticable.

The announced intention of the operators to endeavor to open district negotiations on the wage issue was construed by the miners as definite abandonment of the national wage negotiations. It brought the Industrial Committee of the General Council of the Trades Union Congress definitely into line behind the miners' executive.

Announce End of Old Contracts

In explaining their action the operators said that it would be necessary for them to terminate the existing contracts, and that notices to that effect would be posted at the pits this week, but this, they pointed out, did not imply termination of the negotiations. On the contrary, the mine owners were preparing a draft of a national wage agreement to embody the principles which they thought could appropriately be settled nationally.

Hope of an amicable settlement before May 1 has been held in some quarters because of the resistance on both sides to letting things get to the breaking point. It has been apparent all along that the miners, though objecting to portions of the Coal Commission's report, have not wished to go on record as repudiating it entirely.

The same is true regarding the coal owners. The extremists among them who are willing to go to the mat with the miners have so far been kept in the background by cooler heads, preferring argument to action.

Secretary Cook, of the Miners' Federation, announced that he had received a letter from the secretary of the International Transport Workers Federation promising all possible support to the miners should the conflict actually break out between them and the mine owners.

Support by every possible means, in the event of a strike, was promised April 16 by a committee of the International Miners' Federation at a meeting in Brussels. The decision means, according to the International Federation, that not only will efforts be made to stop the exportation of coal to Great Britain but the possibility of a general sympathetic strike on the Continent also is contemplated.

The support of the International Federation was gained only after concessions by the British leaders. It was agreed that in the event of a sympathetic strike on the Continent the direction of the British strike would pass from the British leaders to the international committee and that there should be no separate settlement in Britain.

Prime Minister Baldwin is devoting his energy to a plan for the settlement of wages, which is the most contentious point. It is expected that the operators will reluctantly consent to a national wage negotiation proceeding, but it is not known whether they will still desire to reserve some control of the wage settlements by districts, to which the miners are violently opposed.

Resumes Work of Unifying Electrical Terms

Nearly one hundred delegates with members of their families arrived on the "Andania" from Hamburg, Southampton and Cherbourg to attend the annual sessions of the International Electrotechnical Commission. Col. R. E. B. Crompton, of England, the honorary secretary of the commission, who is 81 years of age, was the official spokesman of the party. The commission will continue the work of the international standardization of electrical terms and ratings.

At the meeting of official welcome, held in the auditorium of the Engineers' Societies Building, New York City, April 13, John W. Lieb, vice-president of the New York Edison Co., acted as chairman of the meeting. Prof. Elihu Thompson welcomed the delegates on behalf of the U. S. National Committee, and Dr. H. T. Barnes, president, Canadian National Commission, added his felicitations. The principal speaker at the session was Guido Semenza, president of the commission. Others were E. Genissieu, of France; A. F. Enstrom, of Sweden; Carl Strecker, of Germany, and Prof. V. List, of Czechoslovakia. Thomas A. Edison sent a telegraphic greeting from Florida and Lord Balfour a cablegram from London. In his address Prof. Semenza declared that unifying the nomenclature in electrical science and manufacture and establishing unified ratings for machines will simplify production.

Open-Shop Miners Earn More Than Union Men

The claim that under what is known as the American plan, the coal miners are better paid in southern West Virginia than in union fields elsewhere, appears borne out by figures compiled by A. O. Wilson, statistician of the Kanawha Coal Operatives' Association.

A federal survey of fourteen states showed daily average pay of workers in 599 mines was $6.56. There were 198 working days in the year and it was possible to average $1,300 in twelve months. In the Kanawha district the average was $10.23 daily, working days 170 in the year, and the average earnings of 3,136 men was $1,739.93. Mr. Wilson points out that in 1921, when the Kanawha district was 100 per cent union, the average pay of 4,976 miners was $1,387.26.

Offer Coal Fellowships at University of Washington

The College of Mines of the University of Washington offers five fellowships for research in coal and clay in co-operative work with the U. S. Bureau of Mines. The fellowships are open to graduates of universities and technical colleges who are properly qualified to undertake research investigations. The value of each fellowship is $720 to the holder, for the twelve months beginning July 1. Fellowship holders pay tuition and laboratory fees, but are reimbursed for the amounts so expended; they register as graduate students and become candidates for the degree of Master of Science in the proper subject, unless an equivalent degree has previously been earned.

The following coal investigations have been selected for 1926-1927: (a) Beneficiation: Coal washing; application of ore dressing principles to cleaning of coal. (b) Utilization: Briquetting of low grade coals.

Each applicant should send a copy of his collegiate record from the registrar of the college where he has graduated, or will graduate in June. He also should send a photograph and a detailed statement of his professional experience, if any. Applications should be submitted as early as possible in order to allow ample time for consideration, and should be addressed to Dean Milnor Roberts, College of Mines, University of Washington, Seattle, Washington.

Will Report Fuel Sold to Ships

Coal totaling 304,946 tons, valued at $1,644,040, and bunker oil to a total of 3,231,616 barrels, valued at $4,904,974, was furnished at American ports during February to vessels of all nations engaged in foreign trade, according to a report issued by the Department of Commerce. This report is a new service of the department and will be issued monthly, it was stated.

Petroleum Institute Figures Reveal Influence of Oil Competition on Worldwide Slump in Coal Industry

By Paul Wooton
Washington Correspondent of *Coal Age*

A flood of light is thrown on the worldwide depression in the coal industry by the estimates of the American Petroleum Institute on oil output.

The world production of petroleum in 1925 was 1,066,220,000 barrels, a new high record and a total of 54,000,000 barrels larger than that of 1924. The figures show that the competition of fuel oil, which is such a factor in the United States, is worldwide and is the great underlying cause of the depression in the fields of Great Britain and the Continent.

In 1925 the world production of coal was 1,368,000,000 tons, only 26,000,000 tons greater than 1913. Prior to that time the average normal growth was 38,000,000 tons per year. Thus in a twelve-year period there has been less than one year's normal growth.

Some loss of coal consumption is chargeable to the industrial depression which has followed the war and to the fuel economies which were stimulated by higher prices, but these influences have not had a proportional influence on the consumption of energy. The production of natural gas has doubled since 1913, while the production of oil is 177 per cent greater. In 1913 oil and gas furnished only 7 per cent of the oil derived from mineral fuels. In 1925 they furnished 17 per cent.

Another factor which has had an influence is the increased use of waterpower. Scarcity of power during the war and the high price of coal stimulated waterpower development so that in 1920 this form of power was displacing 91,000,000 tons of coal. By 1923 further hydro development was resulting in the displacement of 116,000,000 tons of coal. Between 1913 and 1925 oil and waterpower displaced more than 200,000,000 tons of coal.

Use of Coal Reduced by Economy

At the same time that oil and waterpower have been obtaining a larger share of the total business, economies in the use of coal have reduced the quantity consumed. The electric utilities have reduced their unit consumption per kilowatt hour by 40 per cent. The railroads and steamship companies also have increased efficiency.

Had the bituminous coal industry in the United States been a static one like anthracite it could have met the decline with less difficulty. It had grown accustomed to rapid expansion and was so geared that it has been hard to adjust itself to the lessened demand.

Another study of current interest, using the statistics of the Engineering Valuation Committee of the Fuel Administration and of the Geological Survey, indicates that the industrial use of fuel oil in New England has reached and passed its maximum. Though it is expected that the relatively few remaining unutilized waterpower sites in that section of the country will be harnessed, coal operators do not expect much more competition than exists today. New England is expected, however, to increase its use of bituminous coal for industrial purposes as well as for domestic fuel. An extract from the report reads:

"According to the estimates of the U. S. Geological Survey the states of Pennsylvania, Maryland and West Virginia, from which New England draws bituminous fuel by both rail and water, contained deposits of coal amounts to no less than 285,193,000,000 net tons.

"The total quantity of low-volatile coal in reserve in West Virginia, Pennsylvania and Maryland is estimated to be 68,310,000,000 tons. These deposits all are within normal transportation radius of New England either by rail or water.

"Low-volatile coal is fragile in texture and frequent handling tends to reduce the quantity of lump. For that reason insistence upon low-volatile coal in domestic sizes has reduced greatly the percentage of the total output at the mines which can be used for household purposes. During the strike the Commission on the Necessaries of Life soon abandoned its emphasis upon sized smokeless coal and came out squarely for the use of run-of-mine. Sized smokeless coal has no advantage over run-of-mine coal and any preference shown for it by domestic users must be set down as almost entirely a matter of prejudice.

Low-Voltage Could Meet Demand

"The normal consumption of coal of all kinds in New England is 30,000,000 tons a year. Of that amount 10,000,000 tons have been anthracite. Even if anthracite were replaced entirely by bituminous coal, not all would be low-volatile, but even on the assumption that New England's entire fuel requirements were to be met with low-volatile coal the low-volatile mines would experience no difficulty in adapting themselves to that enlarged demand.

"As nearly as can be estimated, the output of low-volatile coal from Pennsylvania, Maryland and West Virginia in 1925 totaled 83,000,000 net tons. Of this 83,000,000 tons not less than 12,000,000 went to New England. Deducting this last quantity from the 30,000,000 tons annually required in New England the net addition to the output of low-volatile coal which would be required to meet New England's entire coal needs, would be only 18,000,000 tons. The best estimate that has been made of the equipped capacity of low-volatile mines is not less than 115,000,000 tons, which is 32,000,000 tons in excess of the 1925 output, which excess in turn is 14,000,000 tons more than the quantity necessary to replace New England's present consumption both of anthracite and of high-volatile coal."

Further Hearings Ordered in Lake Cargo Rate Cases

Further hearings in the Lake Cargo rate cases were ordered by the Interstate Commerce Commission on April 19. The dates and places at which such hearings will be held will be announced later.

The question of the relative adjustment in rates from the Northern and Southern producing districts to Lake Erie ports for transshipment to the Northwest has been a subject of controversy for many years. In the most recent attack upon the adjustment the tentative opinion of the examiners of the Interstate Commerce Commission recommended a revision of rates which would have widened the spread between the transportation charges from Ohio, western Pennsylvania and northern West Virginia on the one hand and southern West Virginia and eastern Kentucky on the other. The Commission, however, refused to indorse those recommendations and dismissed the complaints.

Since that time the case has been the subject of heated discussion by Congressmen from the affected districts and by officials of the United Mine Workers. Senator Reed of Pennsylvania used the decision as a text in his drive to force the appointment of a Keystone State man to the Commission. On March 2 the commission announced that it would consider whether the case should be reopened for additional testimony and called upon the parties at interest to state their views.

The Northern railroads which, with the exception of the Wheeling & Lake Erie, had stood with the Southern lines in opposing any change when the original case was heard, abandoned that alliance.

Hearing on Permanent Rates From South to Northeast

The question of the establishment of permanent rates on bituminous coal from the Virginias, Pennsylvania, Maryland and eastern Kentucky and on coke from ovens in that territory to points in the New England and Middle Atlantic States where no joint through all-rail rates are now in effect will be considered by the Interstate Commerce Commission at a hearing before Examiner Koch at New York on June 7. The proceedings are part of the same docket under which the Commission established permanent rates on prepared low-volatile coal to part of the northern territory and emergency rates on high- and low-volatile coal to all destinations in the Northeast. The emergency rates expire on April 30 and the Commission recently refused the petition of the New England Governors' fuel committee and associated industrial interests to continue those rates until the question of permanent rates had been decided.

In a hearing before the same examiner, at Syracuse on June 28, the Commission will take up the adjustment of anthracite rates to stations in upper New York. The central and upstate New York rate structure on hard coal has been a bone of contention for several years.

News Items From Field and Trade

ALABAMA

The Tennessee Coal, Iron & Railroad Co., it is understood, will in the near future sink a shaft or slope in the Pratt division near its present No. 2 mine, which will be driven into the workings of the Hamilton slope.

The Alabama By-Product Corp. has been making a number of improvements in its Flat Creek division lately, 250 new houses of modern construction having been built for its employees. It is also stated that consideration is being given to the driving of a new slope at Praco, an extension is being made to the tipple building at Wegra and other improvements are under way to arrange for the handling of a larger tonnage at this mine. Installation of conveyor belts at some of the Flat Creek operations for bringing the coal to the surface also is contemplated.

Reports from New Orleans are to the effect that E. A. Martinez, of that city; A. A. Fendley, of Oneonta, and Messrs. Gay and Gillespie, of Biloxi, Miss., have taken over the properties of the Birmingham Coal & Iron Co. in Blount County, near Oneonta. J. O. Gillespie succeeds I. E. Boyette, of Birmingham, as president. Mines at Inland were developed a number of years ago, but have not been in operation in the past six years.

ARKANSAS

Thirty-two local unions of District No. 21, United Mine Workers, are enjoined permanently from interfering with employees or properties of the Bernice Anthracite Coal Co. at Russellville in a pro confesso decree issued in U. S. District Court at Little Rock by Judge Jacob Trieber. The order is directed against locals in Sebastian, Franklin, Logan, Johnson and Pope counties, which revolted against employment under the wage scale of 1917 placed in effect at the expiration of the 1924 scale.

ILLINOIS

The Consolidated Coal Co.'s Mine No. 7, at Herrin, has posted notice of an indefinite suspension of operations. Slack market and the need for a considerable amount of repair work are reasons assigned for the shutdown. Normally the mine employs 600 men.

The Cosgrove-Meehan Co. has announced that, due to new contracts, Franco mine No. 3, located at Paulton, seven miles east of Marion, will reopen at once and employ 300 men who have been idle two months.

The St. Louis & O'Fallon Coal Co. has discontinued the sale of coal from its own mine in Illinois. It will be handled in the future through the Meteor Coal Co., of St. Louis.

The Black Servant Coal Co., of Danville and Elkville, have established their own sales office in St. Louis under the name of the Black Servant Coal Sales Co.

The By-Products Coke Corp., Chicago, reports March net earnings of $292,633 before depreciation and federal taxes, against $150,642 in March, 1925. Net earnings for the first quarter of 1926, before depreciation and federal taxes, were $886,818, compared with $169,864 in the first quarter of the previous year.

The State Mine Examining Board, of which William Hall is president and John Mulligan is secretary, has announced its schedule for May as follows: Belleveille, 10th; Harrisburg, 11th; Herrin, 12th; Benton, 13th; Duquoin, 14th; Centralia, 15th; Staunton, 17th; Springfield, 18th; Taylorville, 19th; Danville, 20th; Farmington, 21st; Peoria, 22d.

INDIANA

The Carlisle mine, at Carlisle, owned by the Carlisle Coal Mining Co., has reopened after a two-months shutdown. It was closed about the middle of February when it failed to meet its payroll. Under the present arrangement whereby it was reopened miners will receive half their back pay and the remainder in instalments, money to be furnished by subscription of Carlisle business men. Three thousand dollars is on hand at present. By a new contract with the Carlisle Fifth Vein Coal Co., owners of the mine will buy its output from the Fifth Vein company, which will operate the pit. Will Cooper will be local superintendent under Wesley Harris, general superintendent of the Carlisle Coal Mining Co.

The Indiana Coal Co., of Sullivan, has filed a certificate of dissolution. Following the filing of this certificate, the same incorporators filed incorporation papers for the Indiana Coal Co., giving a capital stock of 300 shares of no par value. The company is formed primarily to enter the production end of the business. Among the incorporators are Will H. Hays, motion picture czar and former Postmaster General, whose home is in Sullivan, and his brother, Hinkle C. Hays, attorney of Sullivan. Joseph E. Hitt is given as the other incorporator.

KANSAS

Postpone Rescue Meet.—The Kansas mine-rescue and first-aid meet that was to have been held in Pittsburg on May 22, has been indefinitely postponed, it was announced after a meeting of the general arrangements committee. While the meet may be held in the late summer or early autumn it is probable that it will be deferred to next year, members said. The great expense of sending the winning team to the international meet in San Francisco, together with other outlays for the meet made it impossible to finance it at a time when the coal industry in this region is inactive, members of the committee stated.

Examinations of applicants for certificates as mine foremen, hoisting engineers, gas men and shotfirers were held in Pittsburg, on April 17 by the state mine examining board.

Jackson-Walker Lease 10 Mines.—The Jackson-Walker Coal & Mining Co. announced on April 5 that leases had been signed on ten of its mines in the Pittsburg district to ten different companies as follows: Pittsburg, Crawford County, Cayuga, Victor, Star, Wolfe & Linthicum, Moore, Wilbert & Schreeb, Dittman & Wachter and Gubbio coal companies. The leases run to March 31, 1927. The Jackson-Walker no longer operates any mines, leasing all its properties to operating companies and handling the greater part of their output.

Sixty-two miners who had completed their night class work in Scammon and West Mineral in the extension course in mining offered by the State Teachers College received their certificates April 6, short addresses being made by President W. A. Brandenburg, Prof. G. E. Abernathy and Prof. J. A. Yates, of the Teachers College; Matt L. Walters, president of District 14, United Mine Workers, and James Sherwood, state mine inspector. Similar exercises were conducted in Arma the night of April 8 for a large class of miners completing the course there.

KENTUCKY

William A. Schanzenbacher, manager of a Louisville yard of the St. Bernard Mining Co. division of the West Kentucky Coal Co., is in a serious condition at a local hospital as a result of having been shot by two would-be bandits on the evening of April 3. The gunmen trailed him in another machine from the coal company office to his home, and started shooting, one of the five bullets striking him in the abdomen. After the shooting the bandits jumped into their car and fled, without taking a box from him which contained nearly $300. In their excitement they failed to change a set of license tags, and were later picked up, and acknowledged the

plot. Schanzenbacher has a fair chance of recovery, the bullet having been removed in an operation the following day.

Work of stripping the Canoe Creek mine, located in Henderson County, has been started by A. D. Reed. The mine formerly was operated as a shaft mine. All cutting machines, motors and rails will be brought to the surface and sold at private sale, it was announced.

The Eastern Kentucky R.R., operating thirty-six miles of track from Webbville to Riverton, near Ashland, Ky., has petitioned the Interstate Commerce Commission for permission to abandon the road, which has lost money for several years. This road some three years ago was frequently mentioned in reports regarding an extension of the Detroit, Toledo & Ironton R.R. owned by Henry Ford, traffic men figuring that it might be bought up and used as a link in a proposed road to reach the eastern Kentucky coal fields.

Following the recent announcement that the Old Ben Coal Corporation, Chicago, had closed contracts for eastern Kentucky and western Kentucky coals it has been learned that the company arranged with the Hart Coal Corporation, Providence, for supplying western Kentucky fuel.

MINNESOTA

The Zenith Furnace Co., of Duluth, has awarded a contract for complete re-equipment of the section of the coal dock destroyed by fire last January. The dock uses the cable-drawn coal car system in which the cars dump into pockets for delivery to coke ovens or for outgoing car shipments.

MISSOURI

Miners of Bevier have reached an agreement to operate the Star coal mine on a co-operative basis, and will put the plant in shape to work soon. About 50 men will be given employment, the number to be increased as the demand develops. The mine suspended April 1, 1924. A co-operative coal mine at Macon has been doing well and from 75 to 100 men have found steady work there right along. It is operated in conformity with the union laws and union men have at all times been working in the pit.

The St. Louis Coal Club last week elected the following officers: President, Louis C. Meid; first vice-pres., Harry K. Pilkington; second vice-pres., Edw. D. Houlle; secretary, Joseph J. Harding; treasurer, Gregory W. Daues; directors, Geo. H. Martin, Arthur M. Hull, Henry C. Frier and Carl Stiefel.

Horace Whetsel, treasurer of the Home Coal Co., Macon, has announced that the company will open Mine No. 1 at once to supply the needs of patrons of the company and the Mulkey Block Co. The Mulkey Block company closed down March 31 to add some equipment to its mine.

NEW MEXICO

Form Institute Chapter.—At a recent meeting of foremen and officials of the Phelps Dodge Corp. held in Dawson, a chapter of the Rocky Mountain Coal Mining Institute was organized with twenty-five charter members. W. C. Holman, chief engineer, was elected president and Wm. Moorehead, assistant underground superintendent, was named secretary of the new organization. Various phases of the coal mining industry will be discussed at the monthly meetings of the chapter and membership will be open to all foremen, department heads and other executives.

NEW YORK

The city water works department of Buffalo on April 10 opened bids for furnishing three-quarter slack coal to the pumping station for a year, beginning July 1. The tenders were as follows: On $2.25 rate, Lake Erie Fuel Co., $1.44; Theo. Krug, $1.53; M. Balber & Son (Avella slack), $1.44; on $2.39 rate, Agnew-Smith Fuel Co., $1.30; Theo. Krug, $1.39. The Balber bid is regarded as irregular, making the Lake Erie Fuel Co. lowest, by one cent. No action was taken by the department.

NORTH DAKOTA

Records of the state Railroad Commission of North Dakota on lignite shipments show a slight gain for the first three weeks of March, 1926, as compared with the same month in 1925. Interstate shipments were 5,472 tons against 4,615 and intrastate were 53,289 against 51,285.

OHIO

Upon the application of John McMillen, president of the Big Bailey Mining Co., the Carr Run Coal Co., and the North Hill Coal Co., R. H. Jackson, of Nelsonville, was named receiver of the three companies by the common pleas court recently. The three companies have been operated by Mr. McMillen and C. C. Sharp, of Nelsonville, on property leased from the Sunday Creek Coal Co., upon a royalty and sales contract basis.

The Harbison-Walker Refractories Co., which has headquarters at Pittsburgh, has taken options on the clay rights of four large tracts of coal lands in Jackson County, and steps have been taken to make extensive tests for fine clays for refractories manufacture. Drilling machines will be used to determine the quality of the various clay seams. The company obtained the options from the Superior Colliery Co., of which U. S. Morris, Detroit, is president. In all about 6,000 acres are to be tested. In the mining operations in No. 2 seam the men exposed many fine clay seams.

Several thousand forest trees are being planted on the property of the Wayne Coal Co., near New Lexington. The reforestation is being supervised by F. W. Dean, of the Forestry Department of the Ohio Agricultural Experiment Station.

The Black Diamond, mines, near Glouster, will soon suspend operations, unless some change is made in the wage scale. The company has just completed the driving of a new entry 300 ft. long to open a new body of coal. About 250 men are habitually employed at the mine.

The Board of Education of Columbus will receive bids May 13 for approximately 15,000 tons of mine-run or lump coal and 2,000 tons of nut, pea and slack to be delivered to the various public schools of the city. The specifications provide for analysis of the coal offered by the various bidders.

PENNSYLVANIA

Plant 300,000 Trees.—The Berwind-White Coal Mining Co. and the Wilmore Coal Co. are each planting 100,000 trees on lands in Somerset County. The Wilmore Real Estate Co. also is planting 100,000 trees in the vicinity of Windber.

The sixth quarterly meeting of the Pittsburgh Coal Mining Institute was held in the Pittsburgh Chamber of Commerce, April 17. The institute is engaged in a general educational program involving the several successive steps

Official House or Club House of Carbon Fuel Co. at Rains, Utah

Though Rains is not named in recognition of the precipitation of moisture locally, but after L. F. Rains, of Salt Lake City, it shows clearly the advantage which rains afford. Much of Carbon County is arid and Rains itself is perhaps semi-arid, but the hills are clad with scrub vegetation.

in the operation of a coal tract from the optioning, testing and prospecting to full development. The largest session dealt with the modern development stages. A. W. Hesse, chief engineer of the Buckeye Coal Co., Nemacolin, was the chief speaker. B. L. Lubelsky, explosives engineer of the Pittsburgh Coal Co., discussed the several types of explosives with respect to several methods of blasting coal. A question box was in charge of Hunter Klingensmith, safety director of the National Mining Co., Morgan, Pa.

The U. S. Engineer's report for March showed that 1,594,624 tons of coal and 30,224 tons of coke moved on the Monongahela River, 370,352 tons of coal moved on the Ohio and 64,100 tons of coal moved on the Allegheny River.

Open-shop miners of the Pittsburgh Coal Co. in the Pittsburgh district established a new record for a week's production during the week ended April 10, when 39,026 tons of coal was dumped through the tipples of 10 mines. This is the largest coal output in one week since the first mine was reopened independent of the United Mine Workers, in August, 1925. A new maximum number of men at work on any one day was reached during the week with 2,156, and a new daily output record was reached with 7,200 tons.

TENNESSEE

Tennessee mined 846,243 more tons of coal in 1925 than in 1924, at an increased value of $1,724,723, according to O. P. Pile, chief mine inspector. The average price was $1.90 or 14c. lower than 1924, while the wages increased $200,000.

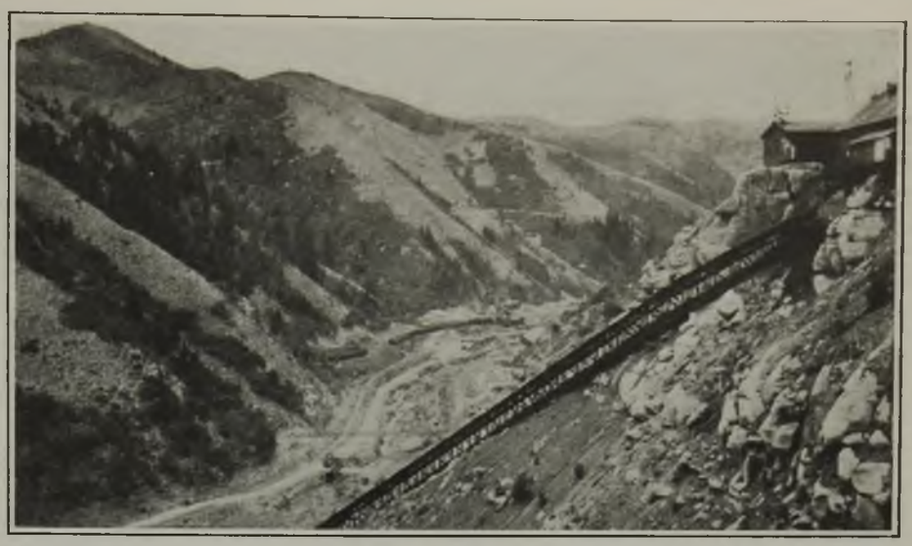
UTAH

The Columbia Steel Corp., with offices in Salt Lake City and a plant at the new town of Ironton, Utah County, has taken up another 116 acres of land for the purpose, it is understood, of extending its coal operations.

WEST VIRGINIA

After an inspection trip covering their mines in Boone County, stockholders of the Coal River Collieries Co., controlled largely by members of the Brotherhood of Locomotive Engineers, held their annual meeting in Huntington, on April 6 but did not elect their directors at that time owing to the fact a majority of the stock was not represented at the meeting. The election was therefore deferred until May 15, and it is believed that the election will be conducted by ballots. At the conclusion of the two-day meeting stockholders heard the report of President J. T. Dunigan and discussed it informally.

It is reported in coal circles that J. S. Thurmond, son of the late Capt. W. D. Thurmond, has disposed of the three-fifths interests of the Thurmond heirs in 3,500 acres of smokeless coal land in the Minden section of Fayette County to the New River-Pocahontas Consolidated Coal Co. The company formerly owned a two-thirds interest. The sale followed action in federal courts, according to reports.



Scraper Conveyor at Rains, Carbon County, Utah

To the left can be seen Spring Canyon. Rains, operated by the Carbon County Coal Co., is the most northern of all the plants on the canyon except Mutual, which is operated by the Mutual Coal Co., of Salt Lake City.

The Black Betsy and Otto Marmet Coal Co. properties in the Black Betsy and Raymond City sections, respectively, in Putnam County, have been taken over by the Otto Marmet Coal Mining Co., the original company, it is reported. This followed federal court action in which the Johnson McKinley interests released the properties. It is reported that the company is considering a plan to consolidate the properties and probably spend from $100,000 to $200,000 in improvements.

Within six weeks the new rope and button conveyor being installed by the Forsdon Coal Co. at Nuttallburg mine, Nuttallburg, Fayette County, will be completed. The conveyor is 1,500 ft. long and will cost approximately $100,000.

Mines Nos. 5 and 6 of the Crab Orchard Improvement Co., at Eccles, Raleigh County, will be rock-dusted beginning this week.

J. D. Stoots and James Keath, who were among the entombed miners rescued March 8 from mine No. 5 of the Crab Orchard Improvement Co. at Eccles, addressed a meeting of the Fayette Mining Institute at Mount Hope Saturday night, April 10. Robert M. Lambie, chief of the state department of mines, also spoke.

Ground has been broken in Belle, 10 miles east of Charleston, for the new plant of the Sharpless Solvents Corporation, and W. H. Mason, formerly of the Winifrede Coal Co., is in charge of the work.

Rock-Dusting Spreads. — The state Department of Mines reports that these mines in southern West Virginia are being rock-dusted: Lake Superior mines Nos. 1 and 2 of the Lake Superior Coal Co., at Superior, McDowell County; the mine of the Landstreet Downey Coal Co. at Delbarton, Mingo County; a mine of the Elkhorn Piney Coal Mining Co. at Stanaford, Raleigh County; mines Nos. 21 and 22 of the Island Creek Coal Co., at Holden, Logan County.

Three prosecutions were made recently by the state Department of Mines against men charged with short-fusing, improper tamping, storing powder in the mine and other offenses. Each miner was fined $50 and costs by justices of the peace. The alleged offenses occurred at the Kingmont mine of the Virginia & Pittsburgh Coal Co. near Fairmont, and the J. D. Boone Coal Co. at Boonedale, Kanawha Falls, Fayette County.

The Paisley interests, of Cleveland, have issued instructions to the management of the company's four operations in the Monongalia field to keep the mines closed indefinitely instead of operating on a non-union basis. The management states it can buy non-union coal to fill orders at a lower price than it can be mined in Monongalia County.

CANADA

The British Empire Steel Corporation's coal mines produced 268,582 tons in March. Of this amount, 167,794 tons was hoisted in the Glace Bay and New Waterford district; 13,121 at Sydney Mines; 38,602 at Acadia Mines, and 49,065 at Springhill.

Bituminous coal has been discovered at Long Rapids, on the Mattagami River, northern Ontario, but whether it exists in commercial quantities has not as yet been ascertained. The occurrence of lignite in the locality has been known for some years, but a borehole through the lignite revealed a seam of bituminous coal. Work is now under way on the sinking of a shaft to the bituminous seam.

Coal operators of British Columbia are meeting with keen competition owing to large importations of British coal. This is due to the increase of grain exportations by the Pacific route, the grain-carrying ships bringing from England return cargoes of coal. The British coal can be sold on the western Canada market cheaper than the home product. This is made possible by the policy of the British government in subsidizing coal production in order to keep the British miner at work.

Among the Coal Men

Samuel W. Parr, professor of chemistry in the University of Illinois, who will receive the Chandler gold medal for 1926, will deliver a lecture on "The Constitution of Coal" in connection with the presentation, at Havemeyer Hall, Columbia University, New York City, at 8:15 p.m., April 23.

A. G. Johnson has been appointed as general superintendent of the Greenbrier Coal & Coke Co. in McDowell County, West Virginia, to succeed Charles L. Logan, who resigned. The appointment became effective April 1. **Mr. Logan** became superintendent of the Killarney Smokeless Coal Co., operating in Raleigh County, W. Va., on April 1.

Walter R. Thurmond, head of the Thurmond Consolidated Coal Co., with headquarters at Logan, W. Va., has announced the appointment of **H. A. McAllister**, formerly general superintendent of the Logan Division of the West Virginia Coal & Coke Co., as general manager of mines for the Thurmond interests.

J. B. McCune, of Bentleyville, Pa., general superintendent of the Bethlehem Mines Corporation in that district, was the principal speaker at the weekly luncheon of the Charleroi (Pa.) Rotary Club last week.

Charles O. Fowler, formerly of the Southern Coal Co., Chicago, distributors of western Kentucky coal, has become president of the Abbott-Irwin Coal Co., Chicago. Mr. Fowler was one of the first Illinois coal men to enter the western Kentucky field. He began in 1916 as vice-president of the Bickett Coal & Coke Co. In 1920 he went to the Monro-Warrior Coal Co. and two years later became president of the Southern Coal Co., selling coal which was recently taken over by the Peabody Coal Co. This change brought about Mr. Fowler's connection with the Abbott-Irwin Coal Co.

W. H. Grady, of New York, was recently appointed as consulting engineer of the West Virginia Coal & Coke Co., and is giving much attention to the operating affairs of that company. He also is consulting engineer for a number of other coal companies operating in different sections of West Virginia.

V. Y. Dallman, editor of the Illinois *State Register*, has been appointed receiver for the St. Louis Coke & Coal Co. by Federal Judge Fitz Henry. Mr. Dallman succeeds F. O'Donnell, Bloomington, who died recently. The new receiver says he will wind up the affairs of the receivership by disposing of claims pending.

Don D. Walker, manager in Louisville, Ky.; New Albany, Ind., and Jeffersonville, Ind., for the St. Bernard division, West Kentucky Coal Co., was recently elected a director of Post Q, Travelers Protective Association, at New Albany, Ind.

John Hays Hammond

When John Hays Hammond, eminent engineer and former chairman of the U. S. Coal Commission, arrived in New York last week after a trip to Europe he learned that a celebration had been arranged in honor of his seventy-first birthday, which occurred in March, when he was abroad. Mr. Hammond told some friends who met him at the pier that eating and drinking when he felt like it, and even worrying a little, had not proved a handicap in living to be 71.

Obituary

Abner Lunsford Succumbs To Pneumonia

Abner Lunsford, general manager of the Fordson Coal Co. (Henry Ford interests), with headquarters in Stone, Ky., who was well known to the coal trade of southern West Virginia, died in the Good Samaritan Hospital in Cincinnati, April 12, of the effects of an attack of pneumonia, following an operation for appendicitis.

Mr. Lunsford formerly was general manager and part owner of the Banner Fork Coal Co. at Harlan, Ky., and when Mr. Ford purchased the mines he made Mr. Lunsford general manager with extended duties. Two of these mines are located in southern West Virginia, the Nuttallburg mine at Nuttallburg, Fayette County, and the Twin Branch plant at Twin Branch, McDowell County, along the Norfolk & Western Ry.

At one time Mr. Lunsford was connected with the Virginia Iron, Coal & Coke Co. in the Clinch Valley at Norton and at St. Paul. He was especially well known in operating circles in Charleston, and was highly regarded as a mining man.

John F. Fuller, 33 years old, part owner of the Sunflower Coal Co., Scammon, Kan., was killed by a fall of rock in the company's mine, near Columbus, Kan., on the afternoon of April 7. Mr. Fuller was working alone in a room when a 1,000-lb. slab fell on his shoulders, pinning him to the floor. His brother, Harry Fuller, associated with him in the company, heard the crash, but it was ten minutes before the rock could be broken by sledgehammers and the man removed. Mr. Fuller had lived in the southeastern Kansas field seven years.

David William Jones, brother of John E. Jones, safety engineer of the Old Ben Coal Corp., Chicago, Ill., was fatally injured April 16 in a mine accident. The younger and only brother of the safety engineer was engaged in operating a small mine with his father, and according to the information received the wheel in the headframe broke, and Jones was killed outright. The shaft is 40 ft. in depth and is located at Spara, Ill. He is survived by a widow and two children.

George P. Pattison, 75 years old, a coal operator identified with the Piedmont field of West Virginia for 60 years, died suddenly April 6, as he was about to leave his home for Baltimore on business. Mr. Pattison had apparently recovered from grip. His wife died about three weeks ago. He leaves three sons, Carroll and Russell Pattison, well-known coal operators of Bloomington, and Dorsey Pattison of Westernport, manager of the Pattison store at Bloomington.

Traffic News

To Study Coke Rates from South

The Coal, Coke & Iron Ore Committee, Central Freight Association Territory, announces a public hearing on coke rates in general from Birmingham, Ala., to destinations in the State of Michigan. Application for extension of the basis covered by Committee Information Circular No. 1373 beyond April 30, 1926, for an indefinite period having been made by Southern coke producers and shippers through the Southern Freight Association, the committee will hold a session at Room 606 Chamber of Commerce Building, Pittsburgh, Pa., April 29, 1926, at 10 A.M., daylight saving time.

The Kanawha Coal Operators' Association was an intervener at the hearing of the Kalbaugh Coal Co. case, which was heard by an examiner of the Interstate Commerce Commission at Cumberland, Md., on April 16. The Kalbaugh Coal Co., which operates a mine at Barnum, Mineral County, W. Va., along the Baltimore & Ohio R.R., seeks to have its rate lowered under the so-called Myersdale (Pa.) group rate on the ground that as the coal from its mines does not have to be hauled over the Allegheny Mountains it should have a lower freight rate to the east than mines in the Preston County fields of northern West Virginia. The State of Maryland filed an amended complaint with the Commission designed to protect the several coal fields of that state. Southern West Virginia wants the present relativity to remain intact.

Production And the Market

Soft-Coal Market Suffers from Stand-Off Policy; Anthracite Demand Disappointing

Developments in the bituminous coal trade during the last week, as far as any approach to a firm footing is concerned, brought comparatively little comfort to anyone. Domestic business, it is true, felt the stimulus of a quickened demand brought about by unseasonably low temperatures, but orders were fitful, unevenly distributed and only in sufficient volume to tide over immediate requirements.

Steam-coal demand shows but little change, particularly in the contract situation. Large industrial consumers are reluctant to enter into agreements, the belief in some quarters being that the bottom of the market has not been reached. Some business is being closed quietly, of course, but most of the orders that are placed in the open are practically "bargain counter" deals. This condition does not seem to be confined to any section, a waiting game apparently having been adopted as the ruling policy. The utilities and railroads in all districts likewise are in no hurry to cover.

Lake Shipping Further Delayed

The backwardness of the lake season has been the chief unsettling influence, continued congestion between the mines and the docks at Toledo and Sandusky having made it necessary for the railroads to continue the embargo on shipments until the tracks have been cleared. The movement of a large tonnage of western Kentucky coal into channels served by Illinois and Indiana producers seems to be helping the general market situation in the Middle West. Price competition, which of late has been ruinous, will be less keen, it is hoped, and a further stabilizing influence is seen in the reports of more mergers.

Although production continues above the seasonal average of the preceding two years, the downward course of spot prices came to a halt this week. *Coal Age* Index on April 19 stood at a fraction over 158 and the corresponding price was $1.92. This was an advance of about 1c. compared with the preceding week.

Bituminous coal production during the week ended April 10 was estimated by the Bureau of Mines at 9,429,000 net tons. Output was partly curtailed by the observance of Easter Monday, though the total was 389,000 tons higher than for the preceding week.

Weak Retail Demand for Hard Coal

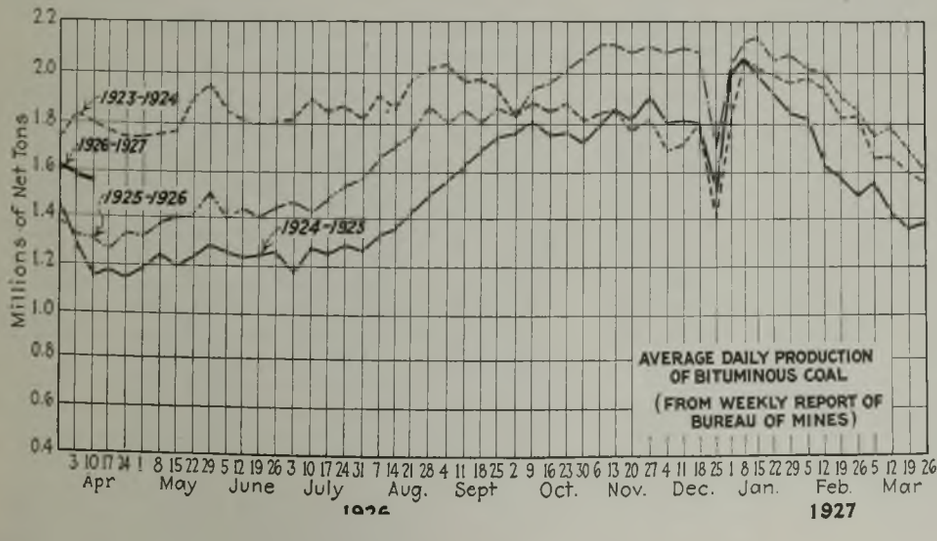
Domestic sizes of anthracite from company mines are moving with comparative freedom, pea continuing to show the greatest strength. Retail distributors, particularly in New York and Philadelphia, find the demand a distinct disappointment. Consumers in most cases are indifferent to efforts to induce them to place orders for next winter. The cool spell served to bring in only small orders for immediate consumption. Baltimore householders, on the other hand, are placing orders promptly for season's requirements, lest prices be increased later.

Considerable uneasiness has been expressed by retail distributors lest the anthracite operators reduce the prices on domestic sizes later in the season. The likelihood of any such action being taken is so extremely remote, however, that it may be ignored.

Premium prices on the larger domestic sizes are largely nominal as the market refuses to absorb any substantial tonnage at prices above company circulars.

The steam sizes are quiet, some industrial consumers holding out for lower prices on contracts.

In the Connellsville coke market there is practically no spot demand for any grade and output is declining slightly.



Estimates of Production

(Net Tons)

BITUMINOUS

	1925	1926
March 27	8,353,000	9,626,000
April 3 (*a*)	7,547,000	9,040,000
April 10 (*b*)	7,843,000	9,429,000
Daily average	1,307,000	1,571,000
Cal. yr. to date (*c*)	138,844,000	159,747,000
Daily av. to date	1,637,000	1,882,000

ANTHRACITE

March 27	1,640,000	1,991,000
April 3	1,438,000	1,549,000
April 10	1,672,000	1,793,000
Cal. yr. to date (*c*)	24,059,000	13,303,000

BEEHIVE COKE

April 3 (*a*)	234,000	234,000
April 10 (*b*)	212,000	231,000
Cal. yr. to date (*c*)	3,457,000	4,288,000

(*a*) Revised since last report. (*b*) Subject to revision. (*c*) Adjusted to equalize number of days in the two years.

Railroads Reluctant to Contract

Middle Western railroads still play a waiting game in the matter of contracts. Few, if any, of the big systems have covered for their requirements and the little buying being done is at low prices. One belt line, for example, closed for April delivery of western Kentucky coal at $1,10 for mine-run. A number of large industrial consumers also are fighting shy of contracts. Spot business is quiet, but fairly strong.

Another cold snap last week put life into the demand for domestic sizes, but orders are unevenly distributed. In the southern Illinois field, Carterville operators complain that business is backward, except at mines supplying railroad tonnage. Duquoin working time is down to three days a week and the number of idle mines is increasing. On the whole, steam business exceeds domestic in the Mt. Olive district. The only coal in the Standard district that is not backing up on producers is slack.

Eastern Kentucky and West Virginia are pounding the Chicago territory for tonnage. Coke also is making a drive to hold its position against anthracite. The failure of the anthracite producers to make the usual spring reduction has helped the coke market and many dealers are pushing the latter product much more actively. Aside from a weather domestic movement of the cheaper coals, the St. Louis local market is featureless.

Kentucky Competition Less Menacing

The passing of such a large tonnage of western Kentucky coal into the hands of Illinois and Indiana producers is having a favorable effect upon the general market situation in the Middle West. Ruinous price competition, the optimists believe, will be lessened. Talk of additional consolidations in the Middle Western fields also is looked upon as a stabilizing influence. Mines in western Kentucky are now operating at about one-third capacity.

The Louisville view of the railroad contract situation is happier than that prevailing at Chicago. However, the optimism rests more upon contracts that may be placed than on actual orders. The Illinois Central is reported to be buying in the open market at around $1.50, mine-run; the Louisville & Nashville, says rumor, is paying $1.40@$1.50 for western Kentucky coal and up to $1.60 for southeastern Kentucky and Tennessee mine-run.

Troublesome accumulations of "no bills" in the eastern Kentucky districts have disappeared. There is considerable dickering on lake business, but the situation is by no means clear as the late opening of the season relieves buyers of the necessity of closing. Utilities are contracting at a fair rate, but industrial consumers are holding back.

Western Kentucky Prices Firmer

On the whole, the tendency in western Kentucky prices is toward greater firmness. Actual realizations are ap-

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	April 20 1925	April 5 1926	April 12 1926	April 19 1926
Smokeless lump	Columbus	$2.60	$2.85	$2.85	$2.75@$3.00
Smokeless mine run	Columbus	1.95	1.95	1.90	1.85@ 2.00
Smokeless screenings	Columbus	1.40	1.15	1.10	1.00@ 1.25
Smokeless lump	Chicago	2.85	2.60	2.60	2.50@ 2.75
Smokeless mine run	Chicago	1.95	1.80	1.80	1.65@ 2.00
Smokeless lump	Cincinnati	2.60	2.75	2.75	2.50@ 3.00
Smokeless mine run	Cincinnati	2.00	2.00	1.90	*1.75@ 2.00*
Smokeless screenings	Cincinnati	1.50	1.35	1.35	1.25@ 1.50
*Smokeless mine run	Boston	4.30	4.15	4.20	**4.25@ 4.40**
Clearfield mine run	Boston	1.90	1.85	1.85	1.75@ 2.00
Cambria mine run	Boston	2.25	2.15	2.10	2.00@ 2.25
Somerset mine run	Boston	2.00	2.00	1.95	1.80@ 2.10
Pool 1 (Navy Standard)	New York	2.60	2.70	2.65	2.50@ 2.85
Pool 1 (Navy Standard)	Philadelphia	2.60	2.80	2.80	2.65@ 3.00
Pool 1 (Navy Standard)	Baltimore	2.00	2.05	2.05	2.00@ 2.10
Pool 9 (Super. Low Vol.)	New York	2.05	2.25	2.25	*2.10@ 2.30*
Pool 9 (Super. Low Vol.)	Philadelphia	2.00	2.35	2.35	2.20@ 2.50
Pool 9 (Super. Low Vol.)	Baltimore	1.85	1.90	1.90	1.85@ 1.95
Pool 10 (H.Gr.Low Vol.)	New York	1.80	1.85	1.85	1.70@ 2.00
Pool 10 (H.Gr.Low Vol.)	Philadelphia	1.65	2.05	2.05	1.90@ 2.25
Pool 10 (H.Gr.Low Vol.)	Baltimore	1.70	1.75	1.75	1.70@ 1.80
Pool 11 (Low Vol.)	New York	1.50	1.65	1.65	**1.55@ 1.85**
Pool 11 (Low Vol.)	Philadelphia	1.55	1.70	1.70	1.55@ 1.85
Pool 11 (Low Vol.)	Baltimore	1.45	1.60	1.60	1.60@ 1.65
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.45	1.45	1.45	1.35@ 1.55
Pool 54-64 (Gas and St.)	Philadelphia	1.45	1.45	1.45	1.35@ 1.55
Pool 54-64 (Gas and St.)	Baltimore	1.65	1.30	1.30	1.30@ 1.35
Pittsburgh sc'd gas	Pittsburgh	2.40	2.40	2.40	2.35@ 2.50
Pittsburgh gas mine run	Pittsburgh	2.00	2.05	2.05	2.00@ 2.15
Pittsburgh mine run (St.)	Pittsburgh	1.80	1.95	1.95	1.90@ 2.00
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.55	1.55	1.50@ 1.60
Kanawha lump	Columbus	2.10	2.05	2.05	1.85@ 2.25
Kanawha mine run	Columbus	1.40	1.55	1.55	1.40@ 1.70
Kanawha screenings	Columbus	1.10	1.10	.85	.75@ .95
W. Va. lump	Cincinnati	1.85	1.85	1.85	1.75@ 2.00
W. Va. gas mine run	Cincinnati	1.35	1.50	1.45	**1.40@ 1.60**
W. Va. steam mine run	Cincinnati	1.25	1.40	1.30	1.25@ 1.40
W. Va. screenings	Cincinnati	1.20	.90	1.00	*.75@ 1.00*
Hocking lump	Columbus	2.25	2.35	2.35	2.25@ 2.50
Hocking mine run	Columbus	1.40	1.55	1.55	1.40@ 1.70
Hocking screenings	Columbus	1.15	1.10	1.05	1.00@ 1.15
Pitts. No. 8 lump	Cleveland	2.30	2.25	2.20	**1.85@ 2.65**
Pitts. No. 8 mine run	Cleveland	1.75	1.85	1.80	1.80@ 1.85
Pitts. No. 8 screenings	Cleveland	1.35	1.55	1.60	*1.35@ 1.45*

Midwest	Market Quoted	April 20 1925	April 5 1926	April 12 1926	April 19 1926†
Franklin, Ill. lump	Chicago	$2.60	$2.60	$2.60	$2.60
Franklin, Ill. mine run	Chicago	2.35	2.40	2.40	2.35@ 2.50
Franklin, Ill. screenings	Chicago	2.10	1.85	1.85	1.75@ 2.00
Central, Ill. lump	Chicago	2.35	2.30	2.30	2.25@ 2.40
Central, Ill. mine run	Chicago	2.10	2.05	2.05	2.00@ 2.10
Central, Ill. screenings	Chicago	1.90	1.30	1.30	1.25@ 1.40
Ind. 4th Vein lump	Chicago	2.60	2.40	2.40	2.25@ 2.60
Ind. 4th Vein mine run	Chicago	2.25	2.15	2.15	2.10@ 2.25
Ind. 4th Vein screenings	Chicago	2.05	1.70	1.70	1.65@ 1.75
Ind. 5th Vein lump	Chicago	2.25	2.15	2.15	2.00@ 2.35
Ind. 5th Vein mine run	Chicago	1.95	1.95	1.95	1.85@ 2.10
Ind. 5th Vein screenings	Chicago	1.70	1.30	1.30	1.25@ 1.35
Mt. Olive lump	St. Louis	2.50	2.50	2.50	2.50
Mt. Olive mine run	St. Louis	2.25	2.15	2.15	2.15
Mt. Olive screenings	St. Louis	1.75	1.40	1.40	1.40
Standard lump	St. Louis	2.25	2.50	2.50	2.50
Standard mine run	St. Louis	1.80	1.80	1.80	1.75@ 1.85
Standard screenings	St. Louis	1.70	1.15	1.15	1.15@ 1.20
West Ky. block	Louisville	1.85	1.85	1.75	1.65@ 1.85
West Ky. mine run	Louisville	1.35	1.30	1.25	1.15@ 1.35
West Ky. screenings	Louisville	1.30	1.00	1.00	.90@ 1.15
West Ky. block	Chicago	1.85	1.75	1.75	1.65@ 1.85
West Ky. mine run	Chicago	1.30	1.15	1.15	.80@ 1.50
South and Southwest					
Big Seam lump	Birmingham	2.25	2.00	2.00	1.75@ 2.25
Big Seam mine run	Birmingham	1.75	2.00	2.00	1.75@ 2.25
Big Seam (washed)	Birmingham	1.85	2.25	2.00	1.75@ 2.25
S. E. Ky. block	Chicago	2.10	2.25	2.25	2.00@ 2.50
S. E. Ky. mine run	Chicago	1.55	1.65	1.65	1.50@ 1.85
S. E. Ky. block	Louisville	2.10	2.00	2.05	1.85@ 2.25
S. E. Ky. mine run	Louisville	1.30	1.55	1.55	*1.35@ 1.60*
S. E. Ky. screenings	Louisville	1.10	1.00	1.05	1.00@ 1.10
S. E. Ky. block	Cincinnati	2.10	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run	Cincinnati	1.40	1.50	1.45	**1.25@ 1.75**
S. E. Ky. screenings	Cincinnati	1.30	.95	1.00	*.65@ 1.10*
Kansas lump	Kansas City	4.25	4.35	4.25	4.00@ 4.50
Kansas mine run	Kansas City	3.00	2.75	2.85	2.75@ 3.00
Kansas screenings	Kansas City	2.75	2.50	2.50	2.50

* Gross tons, f.o.b. vessel, Hampton Roads.
† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	April 20, 1925 Independent	April 20, 1925 Company	April 12, 1926 Independent	April 12, 1926 Company	April 19, 1926† Independent	April 19, 1926† Company
Broken	New York	$2.34	.....	$8.00@$8.50	.....	$8.15@$9.25	.....	$8.15@$9.25
Broken	Philadelphia	2.39	.....	9.15	$9.25	9.00@ 9.25	$9.25	9.00@ 9.25
Egg	New York	2.34	$8.50@$8.75	8.25@ 8.50	9.25@10.25	8.75@ 9.25	*9.25@ 9.75*	8.75@ 9.25
Egg	Philadelphia	2.39	8.50@ 9.20	8.30@ 8.50	9.25@ 9.85	9.15@ 9.25	9.25@ 9.85	9.15@ 9.25
Egg	Chicago*	5.06	7.76@ 8.40	7.42@ 8.08	8.75	8.13	8.75	8.13
Stove	New York	2.34	8.75@ 9.00	8.50@ 8.90	9.25@10.25	9.25@ 9.50	9.50@10.00	9.25@ 9.50
Stove	Philadelphia	2.39	9.10@ 9.55	8.75@ 8.90	9.60@10.10	9.35@ 9.50	9.60@10.10	9.35@ 9.50
Stove	Chicago*	5.06	8.12@ 8.50	7.82@ 8.00	8.88	8.58	8.88	8.58
Chestnut	New York	2.34	8.50@ 8.75	8.25@ 8.50	9.25@10.25	8.75@ 9.15	*9.25@10.00*	8.75@ 9.15
Chestnut	Philadelphia	2.39	8.50@ 9.35	8.40@ 8.50	9.25@ 9.75	9.00@ 9.15	9.25@ 9.75	9.00@ 9.15
Chestnut	Chicago*	5.06	7.94@ 8.25	7.59@ 8.00	8.88	8.33@ 8.53	8.88	8.33@ 8.53
Pea	New York	2.22	4.50@ 5.25	5.00@ 5.50	6.25@ 7.50	6.00@ 6.35	6.50@ 7.25	6.00@ 6.35
Pea	Philadelphia	2.14	5.00@ 5.75	5.25@ 5.30	6.50@ 7.00	6.00@ 6.50	6.50@ 7.00	6.00@ 6.50
Pea	Chicago*	4.79	4.91@ 5.36	4.69@ 5.00	5.65	5.65@ 5.80	5.65	5.65@ 5.80
Buckwheat No. 1	New York	2.22	2.00@ 2.50	2.50@ 3.00	2.00@ 2.50	3.00@ 3.50	*1.75@ 2.25*	3.00@ 3.50
Buckwheat No. 1	Philadelphia	2.14	2.00@ 2.75	2.50	2.50@ 2.75	3.00	*2.25@ 2.75*	3.00
Rice	New York	2.22	1.75@ 2.10	2.00	1.50@ 2.00	2.00@ 2.25	1.50@ 2.00	2.00@ 2.25
Rice	Philadelphia	2.14	1.75@ 2.00	2.00	2.25	2.25	*2.00@ 2.25*	2.25
Barley	New York	2.22	1.40@ 1.50	1.50	1.25@ 1.50	1.60@ 1.75	1.25@ 1.60	1.60@ 1.75
Barley	Philadelphia	2.14	1.50	1.50	1.50@ 1.60	1.75	1.50@ 1.60	1.75
Birdseye	New York	2.22	1.40@ 1.60	1.60	1.60@ 1.75	2.00	*1.25@ 1.60*	2.00

*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**; declines in *italics*.

proximately 25c. per ton better than a year ago although the price ranges show little change. Screenings are selling at 85c.@$1.15, with little tonnage moving under 90c. Some lots of mine-run have gone at $1.05 or less, but the average is $1.15@$1.35. Some eastern Kentucky mine-run has sold at $1.20; most shippers, however, ask $1.35@$1.60.

Cold weather came to the rescue of the trade at the Head of the Lakes last week and kept retailers over the Northwest busy delivering small lots to improvident consumers. As a result some of the accumulations of smokeless coals, domestic coke and briquets put in stock during the hard-coal strike have been diminishing. There is a fair demand for anthracite, but no great pressure to buy. Dock men, however, hold to the belief that the market will absorb 1,000,000 tons in 1926-27.

There has been practically no contracting for soft coal by industrials and public utilities. Activity in that direction waits upon the announcement of the new season prices. Owing to ice conditions, actual receipts from the East are not expected before the first week in May. In the meantime quotations on stocks now on the docks are steady except upon coals which have degraded badly in storage.

Northwestern Consumers Indifferent

Fluctuating temperatures have created an air of uncertainty in the domestic coal trade at Milwaukee, but business thus far this month has been good. Results in March were comparatively satisfactory. The call for steam coal has been surprisingly strong and dealers expect to see the docks pretty well cleaned up by the time navigation opens. Prices are steady and unchanged. Despite uncertain weather conditions, business in the Twin Cities is characterized by evasive tactics on the part of consumers. Demand has been only moderate. Prices now named are considered tempting, but consumers show no interest.

Kansas mines did not catch up with their orders until last week. There is still enough cold-weather business on the books of the companies working to assure steady operation for some days. The increase in domestic demand has made the screenings situation easier and there has been a slowing down in the crushing of mine-run for steam consumption.

Colorado, too, is still enjoying a heavy demand for domestic sizes and running time has increased approximately 15 per cent. One of the largest producers has been so swamped with orders that it is now accepting business only for future delivery. Lump and nut are the sizes most called for, but there also is a fair movement of steam sizes.

Spring and summer storage prices have been announced. On Walsenburg domestic lump the base price is $4.25; on nut, $4; on anthracite, $6.75. These prices will be advanced 25c. per ton each month until August, making the August prices $1 higher. Trinidad coking coal is quoted at $2.75 for April delivery, $2.85 for May, $2.95 for June, $3.05 for July and $3.15 for August.

Utah mines again are complaining of poor business. Sales of prepared sizes are so small that it is difficult to take care of the orders for slack, which is firm at $1.50. "No bills" of lump and stove are waiting for buyers. The only real activity reported in the industrial field is in the buying by the smelters and the metal mines.

Smokeless Prices Continue Downward

Prices at Cincinnati continue on a downward course. Smokeless lump and egg were offered last week at $2.50, though the spread ranged up to $3. Mine-run dipped to $1.75. Screenings, however, maintain a firm front at $1.50.

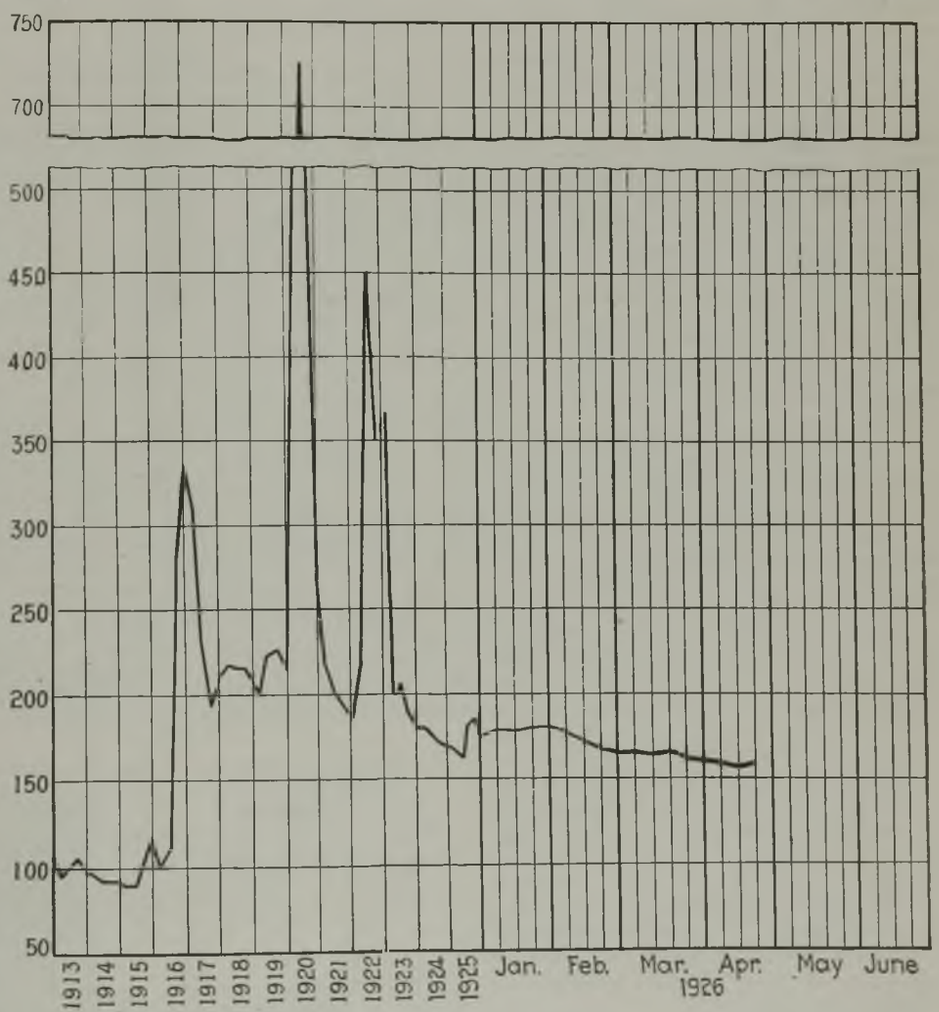
High-volatile mine-run is unsteady with a tendency to softness; 2-in. and egg are shaky, and screenings, which had been notably steady, are wobbling. Prepared lump sizes, on the other hand, are fairly firm, due to a decrease in the "make."

Overproduction is the principal cause of the difficulty, the latest report of coal movement through the Cincinnati gateway showing an increase of 1,545 carloads. Delay in the opening of lake navigation and embargoes at Toledo and Sandusky have intensified the dilemma.

Dealer demand is light, despite continued cold weather, buyers showing a disposition to "shop around," which is discouraging to sellers. Utilities and other large consumers are reluctant to close contracts, apparently being hopeful of a lower market. Retail trade has been unusually good for April on account of low temperatures.

The coal business in central and southern Ohio continues in a state of flux. There is little contracting by industrial consumers and the majority of the railroad contracts have not yet been placed. The slow start of the lake season also adds to the uncertainty and intensifies the pressure from the non-union fields. Lake business probably will be closed at $1.35@$1.50, mine-run. The bright spot in the lake situation is the possibility of a broader market for slack coal. Domestic trade is quiet.

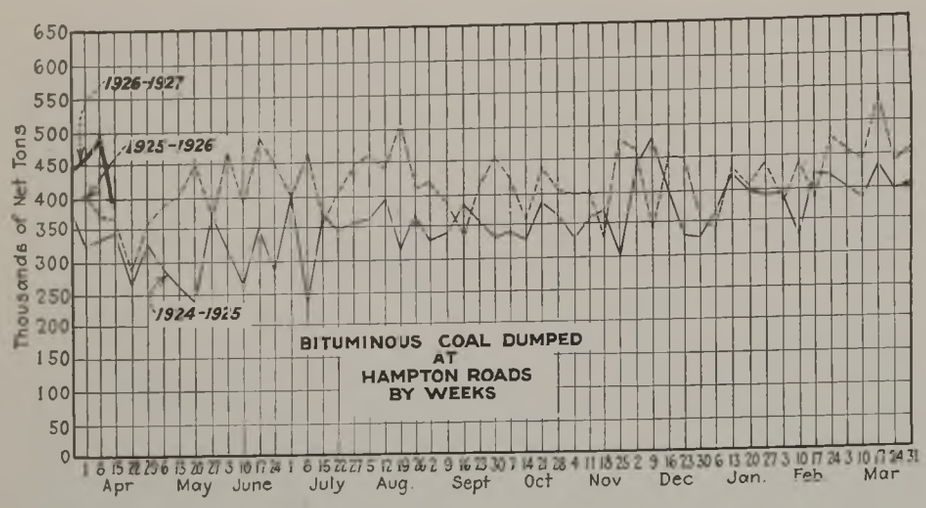
At Cleveland an oversupply of bituminous coal from practically all fields that ship to this market coupled with an easing off in consumption of both steam and domestic grades has caused a pronounced depression. Slack and nut-and-slack are no longer scarce and prices have declined 5 to 15c. per ton in the last week.



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926				1925	1924
	Apr. 19	Apr. 12	Apr. 5	Mar. 29	Apr. 20	Apr. 21
Index	158	158	160	163	161	169
Weighted average price...	$1.92	$1.91	$1.93	$1.97	$1.95	$2.04

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.



Output in eastern Ohio during the week ended April 10 was 199,000 tons, or 28 per cent of capacity, compared with 191,000 tons in the preceding week, which was a 5-day week, and 211,000 tons in the corresponding week a year ago.

Price Slide Continues at Pittsburgh

Very little coal is moving on the open market in the Pittsburgh district. Prices are more or less nominal. There are 18 or 19 mines now running open-shop and their output probably represents half of the commercial production of the district. Output for the field as a whole is less than 25 per cent of capacity.

With 2,400 "no bills" in the field, central Pennsylvania is experiencing the dullest market so far encountered this year. Loadings for the first ten days of the month were approximately 34 per cent less than for the same period in March. Quotations have declined 5 to 40c. in a week. Pool 1 dropped to $2.40@$2.60; pool 71, $2.20 @$2.40; pool 9, $2@$2.15; pool 10, $1.75@$2 and pools 11 and 18, $1.65 @$1.75.

With the exception of some small-lot domestic business due to cold weather, the Buffalo market is as dead as ever. Nominal quotations on mine-run and lump are unchanged, but it is not unlikely that these figures could be shaded. Slack is 5@10c. stronger. All-rail demand for anthracite still is so heavy that lake loading may not begin for several weeks. In Buffalo local territory coke alone is proving an active competitor of hard coal.

New England Trade Inert

In New England there is practically no buying of steam coal in any quantity. Consumers feel it is much too early to take on supplies even for summer consumption, and present prices afford no inducement. Shippers report extremely light tonnages in every direction and the market seems certain to be more or less glutted for months to come.

Rehandling factors here have again modified prices for Pocahontas and New River for inland delivery; $5.50 is quoted as a top figure now per gross ton on cars, and at Providence spot coal can be covered at as low as $5.25. Even the smaller purchasers are counting upon lower prices later on.

On the other hand the Hampton Roads situation is under slightly better control than a week ago. Accumulations are not heavy; there appears more co-ordination on the part of producers, and in consequence there is less talk of distress prices. The agencies maintain $4.25 as a minimum f.o.b. vessel per gross ton for No. 1 Navy Standard, but naturally all the weak spots are not yet eliminated.

Coals from central Pennsylvania show no favorable signs whatever. Output is extremely light and prices are at production cost.

New York Situation Slightly Better

There was a slight improvement in the bituminous situation at New York last week, although the distress tonnage still is uncomfortably large. Some high-volatile coal was offered at $2.25 @$2.75 alongside. Buyers, for the most part, are deaf to pleas for contract renewals. Local exporters are watching the British situation closely.

The one show of seasonal activity in the Philadelphia market has been the solicitation of bids by various public institutions. Competition on this business has been so keen that some bargain-counter prices have been named. The railroads have not changed their policy of dictating prices and feign indifference as to the future. Prices are weak. Baltimore is another market where the situation is flat and uninteresting, with tonnage highly competitive and buyers getting the best of the bargain.

There has been no material change in the Birmingham situation. The spot market in steam coals is slightly stronger and there are no troublesome surpluses to depress prices. Industrial operations throughout the territory are on a good basis. A little spot tonnage of high-grade domestic coal is available, with demand negligible. Most of the output, however, is covered by contracts. Foundry coke is strong at $5.50@$6.50, spot or contract; egg and nut coke is weak at $4.50@$5, f.o.b. ovens.

Hard-Coal Buying Disappoints

April buying of anthracite at New York has been disappointing. Retailers find it hard to induce consumers to place orders for next winter's supply. Company domestic sizes are moving fairly well, but there is practically no market for premium coal, except pea, and quotations have been shaded. The maximum premium is 50c. and it is no secret that tonnage can be had at approximately company prices. Steam sizes are dragging and prices are weaker.

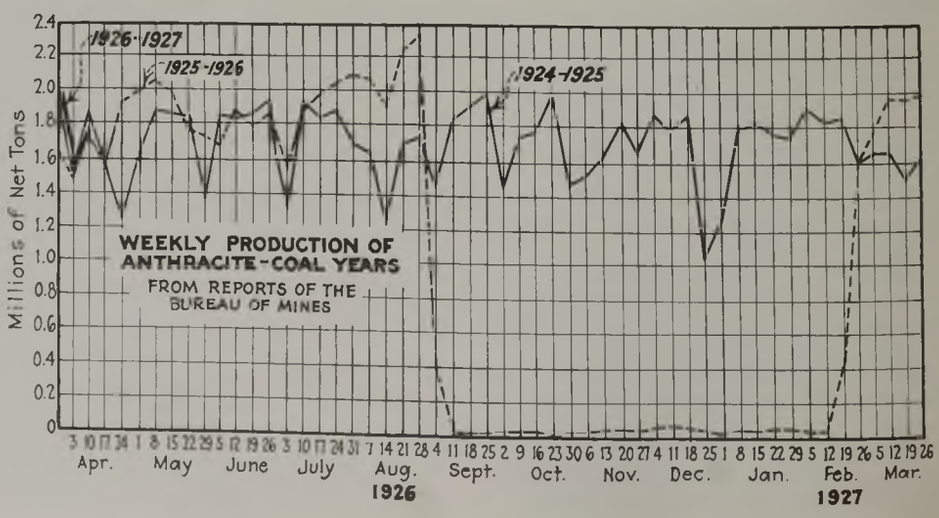
Were it not for the demand for coal for immediate consumption, the Philadelphia anthracite market would be weaker than it is. Some independents are experiencing difficulty in moving nut and some premium orders placed with middle houses have been canceled. In so far as movement at premium prices is concerned, pea coal is the strongest member of the hard-coal family.

The steam coal situation in unsatisfactory. Certain industrial consumers are holding out for lower prices on contracts. Independent No. 1 buckwheat has been offered for contract at $2.25. Buyers have no difficulty in picking up rice and barley at less than company circulars and the big producers are putting coal in storage.

Unlike the consumer at New York and Philadelphia, Baltimore householders are eager to place orders for their season's requirements. Some of the more forehanded are asking for April delivery, fearing an increase in prices later in the year.

Connellsville Coke Market Stagnant

Stagnation characterized the Connellsville coke market last week. There was no real spot demand for any grade. Operating furnaces are well protected by contracts and the condition of the pig-iron market offers no incentive for the blowing in of additional furnaces. The spot market is $3@$3.15, as com-



Freight-Car Loadings

	Cars Loaded—All Cars	Coal Cars
Week ended April 3, 1926	928,092	156,909
Preceding week	967,838	171,413
Week ended April 4, 1925	861,990	123,403

pared with $3@$3.25 a fortnight ago. Spot foundry coke is weak at $4.25@$4.75.

The decline in merchant-oven production which began with the end of the anthracite strike continues, but furnace-oven output during the week ended April 10 showed a sharp increase. The total output, according to the Connellsville *Courier*, was 179,730 tons, as compared with 180,850 tons in the preceding week and 148,490 tons a year ago. Furnace-oven output increased 4,300 tons over the preceding week and merchant-oven output declined 5,420 tons.

Coal Consumption by Utilities Continues to Decline

Public utility power plants in the United States consumed 3,357,808 net tons of coal in February, according to the U. S. Geological Survey. This compares with a consumption of 3,730,371 tons in the preceding month and 3,803,633 tons in December, 1925. Fuel-oil consumption by utilities in February totaled 703,947 barrels, as against 1,014,245 barrels in January and 810,980 barrels in December.

The daily production of electricity by public-utility power plants in February surpassed all previous records with an average rate for the month of 199,700,000 kw.-hr. The average daily production of electricity by the use of water power also exceeded all previous daily rates, with an average for the month of 67,600,000 kw.-hr.

The total output for January and February of this year was about 11 per cent larger than for the same months in 1925 and the output in 1925 was only 5½ per cent larger than the output for the same months in 1924.

Dutch Production Increases

Coal production in the province of Limburg, which produces practically all of the Netherlands coal output, was 6,848,000 metric tons in 1925, as compared with 5,882,000 in 1924, an increase of 16 per cent. In addition slack coal was produced to the amount of 269,000 tons in 1925, a decrease of 10 per cent from the production of 299,000 tons in the preceding year.

The greatest increase took place in the third quarter of 1925, when the output was 17 per cent more than in the previous quarter. The increase is attributed to several causes, chief among which are the gradual exploitation of one of the state-owned mines (Mannits), the extension of two other mines and the installation of improved mechanical devices underground.

On Jan. 1, 1926, 22,610 underground and 8,421 surface workers were employed in the Netherlands coal mines. The average number of workers during 1920, 1922, 1924 and 1925 was 24,944, 26,766, 29,957 and 30,390, respectively. The increase in the average number of workers is proportionately less than the increase in output.

Production of Briquets In 1925 Gained Impetus From Anthracite Strike

A marked increase occurred in the manufacture of fuel briquets during 1925, according to reports received by the U. S. Bureau of Mines. Production totaled 839,370 tons, an increase over 1924 of 258,900 tons, or 45 per cent. This is the highest production figure for the fuel briquet industry in this country, indicating not only substantial progress in the capacity of the operating plants but the possibilities in times of fuel shortage.

Fuel briquet manufacturing in 1925 received its great impetus from the suspension of the production of anthracite, which began Sept. 1 and continued through the end of the year. For the period January-August, 1925, the average production per month was 48,726 tons, as against 34,856 tons in the corresponding period in 1924. During September-December, 1925, however, when no domestic sizes of anthracite were being produced, briquet production per month averaged 112,780 tons. Some of this was due, obviously to the increased autumn and winter demand, but during the same four months in 1924 the average monthly production was only 77,905 tons.

The increased production for 1925 was general in the three grand subdivisions of the country. It was greatest in the Eastern States, where the tonnage was more than double that for 1924; increased 37 per cent in the Central States, and 8 per cent in the Pacific Coast States. The United States production and value of the fuel briquets for the years 1918-1925 is summarized in table I.

Table I—Fuel Briquets Produced in the United States, 1918-1925

Year	Net Tons	Value—Total	Value—Per Ton
1918	477,235	$3,212,793	$6.73
1919	295,734	2,301,054	7.78
1920	567,192	4,623,831	8.15
1921	398,949	3,632,301	9.10
1922	619,425	5,444,926	8.79
1923	696,810	5,898,698	8.47
1924	580,470	4,986,622	8.59
1925	839,370	7,128,404	8.49

The character of the raw material used as a fuel constituent by the 17 plants reporting production during 1925, is summarized in Table II.

Table II—Materials Used in Manufacture of Briquets in 1925

	Number of Plants
Anthracite culm	7
Semi-anthracite	1
Semi-anthracite and carbon	1
Mixture of anthracite fines and bituminous slack	2
Bituminous slack and sub-bituminous	1
Semi-bituminous slack	1
Semi-coke	1
Carbon residue from the manufacture of oil gas	3
	17

The total quantity of raw coal used was 844,590 net tons, an increase over 1924 of 261,225 net tons, or 45 per cent. Of the total used, 46 per cent was anthracite and semi-anthracite coal, 40 per cent semi-bituminous and bituminous slack, coke and semi-coke, and 14 per cent sub-bituminous coal and oil-gas residue.

During the year one plant in Pennsylvania, which had been idle during all of 1924, went out of business. There were added, however, during 1925 five others, located in California, Maryland, New Jersey, Pennsylvania and West Virginia.

Breaks Coal Loading Record At Curtis Bay Pier

In a space of 3 hours and 1 minute 11,353 tons of coal was put aboard the Str. "Lemuel Burrows" at the Curtis Bay coal pier of the Baltimore & Ohio R.R., at Baltimore, on April 13, according to the railroad company officials. This was an average of 62.7 tons a minute, or a little more than a ton a second.

This achievement by the pier broke the world's record for fast loading of coal into vessels, which it had held since 1920. The previous speed recorded was at the rate of 61.2 tons a minute, when the Str. "Malden" was loaded with 7,222 tons of coal in 1 hour and 58 minutes.

During the first hour and 58 minutes while the Str. "Lemuel Burrows" was being loaded, 73.5 tons a minute was the average speed at which the coal was handled on the pier, which was 12.3 tons a minute more than the "Malden" loading.

Strike Boosts C. & O. Profits

The cessation of operations in the anthracite mines during the latter half of 1925 enabled the Chesapeake & Ohio Ry. to report a gain of more than $8,000,000 in 1925 net income. After deductions of taxes and fixed charges net totaled $20,152,269, compared with $12,222,042 in 1924. This was equivalent to earnings of $21.32 a share on 906,912 shares of outstanding common stock, compared with $16.95 a share on 672,657 shares of common stock outstanding in 1924.

As the Chesapeake & Ohio serves some of the principal bituminous mines of West Virginia it came in for a good share of the bituminous coal traffic necessary to supply the Eastern markets during the anthracite strike. As a result the increase in net reported is the third largest of any railroad in the country, being exceeded only by the Pennsylvania and Norfolk & Western. Gross operating receipts were larger by $15,000,000 than in 1924.

Table III—Raw Fuels Used in Making Briquets in the United States, 1921-1925

In Net Tons

	1921	1922	1923	1924	1925
Anthracite culm and fine sizes and semi-anthracite	190,964	254,563	331,102	224,539	387,454
Semi-bituminous and bituminous slack, coke and semi-coke	a121,925	a235,542	a225,508	a297,814	a341,161
Sub-bituminous coal and oil-gas residue	85,352	123,339	125,880	b61,012	115,975
Total	398,241	613,444	682,490	583,365	844,590

aIncludes no semi-coke in 1921 and 1922, no coke or semi-coke in 1923 and 1924, and no coke in 1925
bIncludes no sub-bituminous coal.

Foreign Market And Export News

Sharp Pick-Up in Orders For Welsh Steam Coals; Spot Quotations Stiffen

London, England, April 6.—Conditions in the Welsh steam coal trade are stronger at the moment than at any time during the past two years. Inquiries from foreign buyers are very frequent and tonnage is arriving freely. More coal is being shipped now than at any time since the beginning of last year and the output is the highest for two years. Several pits which have been closed down since the end of 1924 are now reopening.

Buyers had been holding back to watch the action of the government over the Coal Commission report, but have now booked heavy quantities throughout April and into early May. Prices have stiffened a little and in some cases have advanced by a shilling or so.

According to the audit the actual loss per ton of coal for the quarter ended Dec. 31, 1925, was 3s. 3d., and operators are doing all they can to make selling prices cover as much of this loss as possible, though they cannot hope to retrieve all their losses on sales alone. At present most of the coal being delivered is on the low price rate and on contracts placed some weeks back, so there is little chance of any immediate cutting of losses.

The Newcastle market shows some improvement and European gas plants continue to favor British gas coals. Aside from these orders, which are mostly for comparatively small quantities, there is not very much doing.

Output by British collieries during the week ended April 3, according to a special cable to *Coal Age*, totaled 4,635,000 gross tons, compared with 5,415,000 tons the preceding week.

Belgian Market Quiet

Brussels, Belgium, March 31.—The Belgian coal market is devoid of a startling change. With the exception of greater firmness in quotations on fines for lime and brick-making, 70 fr., and coking smalls, 87 fr., prices are colorless. Industrial demand is far from satisfactory. The decline in the value of the Belgian franc has paralyzed foreign competition for local trade. Holland alone is meeting with success in the Belgian market.

During February Belgian mines produced 1,894,470 metric tons of coal, as compared with 1,976,320 tons in January and a monthly average of 1,928,000 tons in 1925. The pre-war monthly average was 1,902,460 tons. Coke output last month was 347,900 tons, as compared with 324,220 tons in January and monthly averages of 346,650 tons in 1925 and 293,480 tons in 1913. Briquet production, 203,370 tons, was approximately 36,000 tons greater than the 1925 average, but 14,000 tons less than the pre-war average.

Spring Reductions in Effect on French Coals

Paris, France, March 31.—The new schedule of prices effective April 1, published by the O. H. S., shows the following increases:

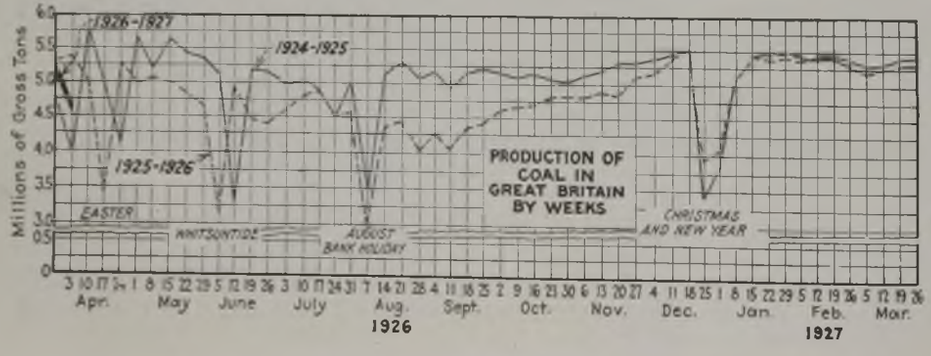
(1) For shipment by sea to French domestic and colonial ports, 5 fr.; (2) on trucks at the Franco-Belgian frontier, 15 and 10 fr. for anthracite, lean and semi-bituminous domestic coals; (3) on truck or canal barges in French ports of the Rhine, 5 fr. on industrial sizes, 10@15 fr. on sized coal and 20 fr. on lignite briquets.

A discount of 10 fr. will be given on April-May orders of coal, 6 fr. in June and July and 4 fr. in August. On lignite briquets a discount of 15 fr. will be made on April, May and June shipments and 10 fr. on July business.

The current market, particularly on industrial coals, is considered satisfactory. Stocks are low and the decline in the franc has helped the French producers by erecting a barrier against foreign competition.

As a result of the recent changes, April prices in the Paris district show reductions of 10@28 fr. when compared with March quotations on kitchen coals, 15@16 fr. on briquets and ovoids and 13@18 fr. on flaming coals. Belgian anthracite prices at retail are down 24 @30 fr.; British nuts and cobbles, 10@ 15 fr. and central heating coals, 22@ 28 fr.

During February the Custom House at New York reported imports 115,814 tons of anthracite valued at $1,273,452; 5 tons of bituminous coal and slack valued at $100 and 1,900 tons of coke valued at $9,404.



Export Clearances, Week Ended April 15

FROM HAMPTON ROADS

	Tons
For Brazil:	
Br. Str. Baron Fairlie, for Rio de Janeiro	8,914
Br. Str. Ethelaric, for Para	4,699
Br. Str. Catherine Ratcliffe, for Rio de Janeiro	7,737
Nor. Str. Ramsdalshorn, for Rio de Janeiro	8,472
Grk. Str. Rokos Vergottis, for Rio de Janeiro	7,063
Br. Str. Jamerson, for Pernambuco	5,217
Br. Str. Ventura de Larrinaga, for Rio de Janeiro	6,704
For Trinidad:	
Nor. Str. Sneland I, for Port of Spain	2,500
For Mexico:	
Nor. Str. Ebro, for Frontera	1,104
Br. Str. Baron Garioch, for Vera Cruz	1,818
For Nova Scotia:	
Br. Str. Fred Cleeves, for Halifax	2,004
For Italy:	
Span. Str. Arno Mendi, for Porto Ferrajo	7,240
Ital. Str. Clam, for Venice	3,223
Ital. Str. Clara Camus, for Fiume	1,347
Ger. Str. Sile, for Genoa	9,007
Ital. Str. Columbia, for Trieste	4,347
For Argentina:	
Swed. Str. Falco, for Rosario	3,921
For Jamaica:	
Nor. Str. Vika, for Port Antonio	104
For British West Indies:	
Br. Str. Tullochmoor, for Castries	3,481

FROM BALTIMORE

For Cuba:	
Br. Str. Kelsonian, for Daiguiri	4,141
Am. Str. Delfina, for Guanica	106

FROM PHILADELPHIA

For Cuba:	
Nor. Str. Songa, for Havana	——
Br. Str. Vittoria, for Havana	——
Nor. Str. Evenson, for Havana	——
For San Domingo:	
Nor. Str. Anders, for San Pedro de Macoris	——

Hampton Roads Coal Dumpings*

(In Gross Tons)

	Apr. 8	Apr. 15
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week	169,964	128,020
Virginian Piers, Sewalls Pt.:		
Tons dumped for week	107,355	86,978
C. & O. Piers, Newport News:		
Tons dumped for week	168,578	124,063

* Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS

	April 10	April 17†
Pool 1, New York	$5.50@$4.75	$5.50@$5.75
Pool 9, New York	5.10@ 5.25	5.10@ 5.25
Pool 10, New York	4.75@ 5.00	4.75@ 5.00
Pool 11, New York	4.50@ 4.75	4.50@ 4.75
Pool 9, Philadelphia	5.10@ 5.40	5.10@ 5.40
Pool 10, Philadelphia	4.80@ 5.15	4.80@ 5.15
Pool 11, Philadelphia	4.25@ 4.50	4.25@ 4.50
Pool 1, Hamp. Roads	4.40@ 4.50	*4.35@ 4.40*
Pool 2, Hamp. Roads	4.20@ 4.30	*4.10@ 4.15*
Slack (Pool 1 and 2 grade)		3.90@ 4.15
Pools 5-6-7, Hamp. Rds.	4.00@ 4.10	*3.90@ 4.00*

BUNKERS

Pool 1, New York	$5.75@$6.00	$5.75@$6.00
Pool 9, New York	5.35@ 5.50	5.35@ 5.50
Pool 10, New York	5.00@ 5.25	5.00@ 5.25
Pool 11, New York	4.75@ 5.00	4.75@ 5.00
Pool 9, Philadelphia	5.35@ 5.65	5.35@ 5.65
Pool 10, Philadelphia	5.05@ 5.40	5.05@ 5.40
Pool 11, Philadelphia	4.50@ 4.75	4.50@ 5.75
Pool 1, Hamp. Roads	4.50	*4.40*
Pool 2, Hamp. Roads	4.30	*4.15*
Pools 5-6-7, Hamp. Rds.	4.10	*4.00*

Current Quotations, British Coal, f.o.b. Port, Gross Tons

Quotations by Cable to *Coal Age*

	April 10	April 17†
Cardiff:		
Admiralty, large	24s.6d.@25s.	**25s.6d.**
Steam smalls	14s.6d.	**16s.6d.**
Newcastle:		
Best steams	18s.	*17s.*
Best gas	20s.@22s.	**20s.6d.@22s.**
Best bunkers	17s.	**17s.6d.**

Advances over previous week shown in **heavy type**; declines in *italics*.

Coming Meetings

Chamber of Commerce of the United States. Fourteenth annual meeting, United States Chamber of Commerce Bldg., Washington, D. C., May 10-13.

Mine Inspectors' Institute of America. Annual meeting, Seventh Avenue Hotel, Pittsburgh, Pa., May 11-13. Secretary, G. B. Butterfield, Hartford, Conn.

International Railway Fuel Association. Eighteenth annual convention, Hotel Sherman, Chicago, Ill., May 11-14. Secretary, J. B. Hutchinson, Omaha, Neb.

National Retail Coal Merchants' Association. Ninth annual convention, New Willard Hotel, Washington, D. C., May 17-19. Resident vice-president, Joseph E. O'Toole, Transportation Bldg., Washington, D. C.

The American Mining Congress. Annual Exposition of Coal Mining Equipment, May 24-28, at Cincinnati, Ohio, in conjunction with the annual meeting of practical operating officials. Assistant secretary, E. R. Coombes, Washington, D. C.

International Geological Congress. The fourteenth congress will be held in Madrid, Spain, commencing May 24, 1926. Secretary of the organizing committee, Enrique Dupuy de Lome, Plaza de los Mostenses, 2, Madrid, Spain.

Midwest Retail Coal Merchants Association. Annual meeting, May 25 and 26, at Kansas City, Mo. Secretary, James P. Andriano, St. Joseph, Mo.

Pennsylvania Retail Coal Merchants' Association. Annual meeting, York, Pa., May 27 and 28. Secretary, W. M. Bertolet, Reading, Pa.

Western Canada Fuel Association. Annual meeting at Winnipeg, Manitoba, Can., May 27 and 28. Secretary, W. H. Morrison, Winnipeg.

West Virginia Coal Mining Institute. Annual meeting, June 1-2, Bluefield, W. Va. (tentative). Secretary, R. E. Sherwood, Charleston, W. Va.

American Wholesale Coal Association. Annual meeting at Toledo, Ohio, June 7-9. Treasurer, R. B. Starek, Union Fuel Bldg., Chicago, Ill.

Association of Iron & Steel Electrical Engineers. Exposition and convention at Hotel Sherman, Chicago, Ill., June 7-10. Secretary, J. F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

National Coal Association. Ninth annual meeting, June 9-11, at Drake Hotel, Chicago, Ill. Executive secretary, Harry L. Gandy, Southern Bldg., Washington, D. C.

American Institute of Electrical Engineers. Annual convention, White Sulphur Springs, W. Va., June 21-25. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

Illinois Mining Institute. Annual summer meeting on board steamer "Cape Girardeau" to some point in Illinois on the upper Mississippi River, leaving St. Louis, Mo., June 24 and returning to St. Louis about noon, June 26. Secretary, Frank F. Tirre, Central

New Equipment

Carbon-Dioxide Recorder Is Motor-Driven

After many experiments, a new motor-driven carbon-dioxide recorder has been perfected and introduced on the market by the Republic Flow Meters Co., 2240 Diversey Parkway, Chicago, Ill. This recorder is shown in the illustration.

As it does not operate by water power, water conditions at the place of installation need no consideration whatever, the manufacturer claims. The mechanism of the instrument is completely submerged in oil, thus reducing wear to a minimum and eliminating corrosion, said to be the chief difficulty found in water-driven carbon-dioxide recorders.

The case of the instrument is dirtproof. It has been designed for appearance and easy vision as well as for accuracy and ruggedness. It is arranged so that it is easy to change both the oil and potash. All parts are interchangeable. A small motor is used to operate the instrument, and, though small, it is capable of handling a load two or three times that required.

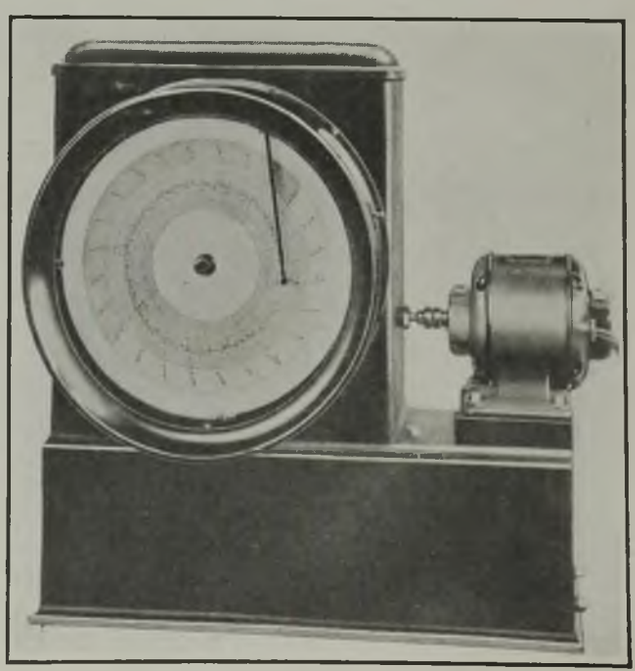
The operation of the recorder is as follows: When the gases are drawn through the furnace into the instrument they pass through a brass tubing immersed in oil. They then go through the pump and more brass tubing before passing to the measuring chamber. The gas in passing through the pump is divided into very fine particles and comes into close contact with the metal. This gives it the temperature of the pump and the surrounding oil. It then passes into the measuring chamber, which is immersed in the same oil and measured at a specific temperature. Next the gas passes through the potash chamber and then into the final measuring chamber, this last also being immersed in the same oil as in the first measuring chamber.

The oil chamber is directly above and in contact with the potash chamber, so that the oil and potash are at the same temperature or nearly so. If there is a difference in the temperatures of the oil and the potash, corrections will be made in the final measuring chamber, which also is surrounded by the oil. Therefore, no error can be caused by temperature irregularities.

The instrument requires about two gallons of ordinary machine lubricating oil, which should be changed every six months or every year. The potash chamber holds about three gallons and requires 12 lb. of dry potash. This will last from four to six months.

Mechanism Submerged in Oil

As no water is used corrosion is avoided. Ordinary machine lubricating oil is used which needs changing only once in six months or a year. Oil keeps potash at same temperature as measuring chambers so no error can be caused by irregularities of temperature. Other recorders are driven by water power and, hence, have trouble from rust.

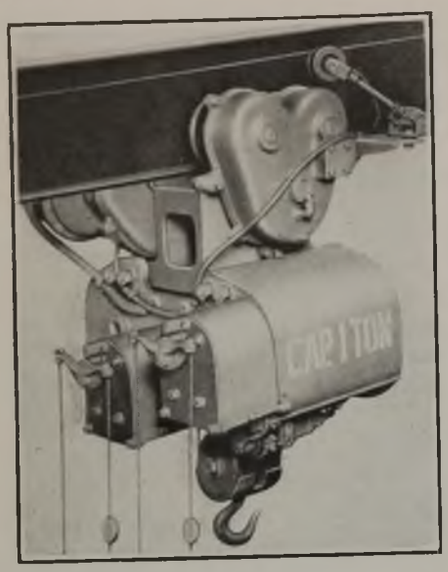


Motor Trolley for Spotting Work Over Machine Tools

A new motor-driven trolley has been developed by the American Engineering Co., Philadelphia, Pa., for use with its ½-ton and 1-ton Class A, "Lo-Hed" electric hoists, which have been built, heretofore in bolt-suspension and plain trolley types only.

This trolley can be supplied with a travel speed of either 80 or 120 ft. per minute, so that the unit provides an inexpensive overhead system for handling loads of one ton or less at high speed, both in lifting and moving. Its accurate control makes it highly efficient in spotting work for machine-tool operations. It can be arranged for remote control, if desired. Any hoist of the type named now in service can be easily converted into a motor-trolley hoist by adding the new trolley.

Only 22-in. headroom is required for both hoist and trolley, which is small for a motor trolley hoist. The trolley is ruggedly built, and maximum traction is obtained by driving all four



Speedy Trolley Hoist

Around many plants, particularly machine and electric shops a unit of this kind is extremely handy. It may be built in either ½- or 1-ton capacity and the traversing speed may be made as much as 120 ft. per minute.

wheels. The three main castings, from which the hoist and the load are suspended, are made of steel. The spur-gear drive is totally inclosed and runs in an oil bath. Roller bearings are used on all shafts. The motor also is totally enclosed and has high-grade ball bearings. All parts are completely accessible and the motor can be removed readily when necessary. It can be furnished for either direct or alternating current, the latter either 2- or 3-phase.

Two Graphic Records Drawn Side by Side

The new "Twin-Type" graphic meter of the Esterline-Angus Co., Indianapolis, Ind., represents a logical development in meter construction. This model contains two metering elements which are mounted side by side and are driven by a common mechanism. The distinct advantages of the new meter are, (1) two quantities can be recorded simultaneously and on charts that are perfectly synchronized, (2) much less switchboard space is needed than when two single instruments are used, and (3) either daily or long-strip charts can be used.

The first feature will be specially useful in recording simultaneously the load in kilowatts and the voltage, the load and power factor, the line amperage and power factor, or other similarly related quantities, in a power plant, substation, or at any convenient metering point of a distribution system. The meter can be equipped with almost any combination of two of the various electrical measuring elements or with other units such as pressure and vacuum recorders.

The 12- or 24-hr. duplex charts are 11½x26¼ in. overall. They are punched at one end so they can be placed in a standard loose-leaf file, and are of such dimensions that when folded, they will fit a standard letter-size drawer file.

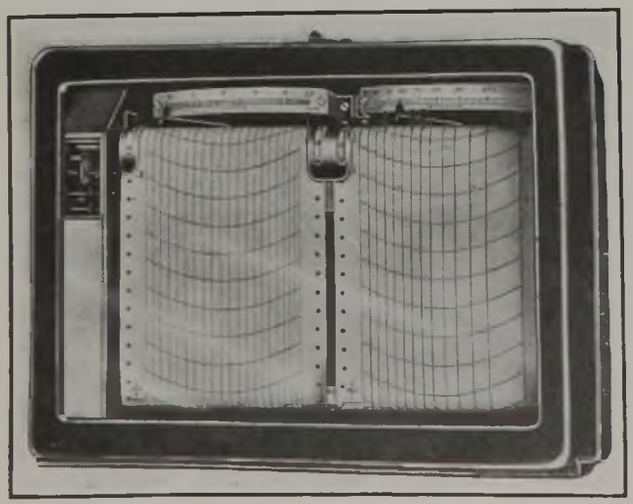
In addition to the two standard types of clock drive, the instrument can be furnished with either an impulse-system electric drive or with a motor. The latter is recommended only when high chart speeds are desirable. While regularly made in the switchboard and wall types, instruments of this kind can be built in portable models for special requirements.

Affords Better Illumination

Recently the U. S. Bureau of Mines granted to the Koehler Mfg. Co. of Marlboro, Mass., an extension to Approval No. 17 covering improvements in the Wheat electric safety mine lamp. The principal feature of the improved lamp is a new higher candlepower bulb. This operates at 4 volts, has successfully passed the 300-hr. life test of the Bureau and when used in the improved mine lamp gives the greatest amount of light of any bulb having passed this test.

To produce this increased candle power a new design of battery plate has been used. This new plate is so constructed as to give not only increased power but longer life as well.

A new design of non-spilling device is also used. This employs tubes that carry the fumes produced by charging to the outside of the battery case free and clear of all working parts. The improved battery may be charged in the regular Wheat electric mine lamp charging equipment. In outward appearance the new lamp outfit is practically identical with the older equipment which has become familiar to most mining men during the past few years. It is not illustrated for this reason.



Meter Fitted with Strip Charts

The two scales can be printed on a single wide sheet and two graphs drawn simultaneously. The meter shown is fitted to record kilowatts and power factor side by side.

Recent Patents

Handling and Feeding of Pulverized Coal; 1,560,510. Arthur V. Adamson, Hempstead, N. Y., assignor to Combustion Engineering Corp., New York City. Nov. 10, 1925. Filed Nov. 19, 1924; serial No. 750,731.

Feeder for Coal Breakers; 1,560,301. Frank Pardee, Hazelton, Pa. Nov. 3, 1925. Filed Oct. 24, 1922; serial No. 596,570.

System of Arresting Mine Explosions; 1,568,281. John E. Jones, West Frankfort, Ill. Jan. 5, 1926. Filed Nov. 22, 1924; serial No. 751,565.

Automatic Mine-Car Coupler; 1,569,012. B. E. Gildersleeve, Lynchburg, Va. Jan. 5, 1926. Filed Oct. 17, 1923; serial No. 669,158.

Loading Machine; 1,569,209. Charles W. Shanaberger, Indiana, Pa. Jan. 12, 1926. Filed June 9, 1925; serial No. 36,034.

Combination Blasting Method and Means; 1,569,222. Dent Ferrell and Arthur W. Helmholtz, Harrisburg, Ill. Jan. 12, 1926. Filed March 16, 1925; serial No. 15,728.

Drag Scraper; 1,569,925. Wm. E. Hale, Fort Washington, Pa., assignor to R. H. Beaumont Co., Philadelphia, Pa. Jan. 19, 1926. Filed March 4, 1923; serial No. 622,835.

Method of Treating Coal Products; 1,570,103. Walter E. Trent, New York, N. Y., assignor to Trent Process Corp., Wilmington, Del. Jan. 19, 1926. Filed Sept. 23, 1919; serial No. 325,632. Renewed July 18, 1925.

Double-Dump Skip Hoist; 1,570,302. Wm. E. Hale, Fort Washington, Pa., assignor to the R. H. Beaumont Co., Philadelphia, Pa. Jan. 19, 1926. Filed March 5, 1923; serial No. 622,836.

Electric Time Fuse for Blasting Cartridges; 1,570,733. Wilhelm Eschbach, Troisdorf, Germany. Jan. 26, 1926. Filed July 12, 1922; serial No. 574,594.

Loading Machine; 1,570,829. John A. Forsyth, Nemacolin, Pa. Jan. 26, 1926. Filed Jan. 13, 1922; serial No. 528,976.

Inclined Coking Retort Oven; 1,570,871. Joseph Van Ackeren, Pittsburgh, Pa,. assignor to the Koppers Co., Pittsburgh, Pa. Jan. 26, 1926. Filed Sept. 29, 1921; serial No. 504,142.

Longwall Conveyer; 1,571,009. Hiram A. Holzer, Kansas City, Mo., assignor to United Iron Works, Kansas City, Mo. Jan. 26, 1926. Filed Aug. 4, 1924; serial No. 729,959.

Blasting Cartridge; 1,571,122. Ernest Hutton, Fairmont, W. Va. Jan. 26, 1926. Filed July 24, 1924; serial No. 727,973.

Coal-Cutting Machine; 1,571,162. Gilbert Rimmer, Radford, England, assignor to Sullivan Machinery Co., Chicago, Ill. Jan. 26, 1926. Filed Jan. 10, 1925; serial No. 1,687.

Coal Elevating and Conveying Apparatus; 1,563,387. Roderick MacEachen, Washington, D. C. Dec. 1, 1925. Filed Aug. 7, 1923; serial No. 656,188.

Coking Process; 1,563,595. Frederick W. Sperr, Jr., Pittsburgh, Pa., assignor to the Koppers Co., Pittsburgh, Pa. Dec. 1, 1925. Filed July 18, 1919; serial No. 311,810.