

COAL AGE

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An Electric "Eye"

AT LAST it has been found possible to sort materials mechanically according to color. For the use of cigar manufacturers a machine has been perfected, which at the rate of sixty-per-minute, will sort cigars into thirty or more color grades. In this device each cigar is brought automatically before an electric "eye," consisting of a photoelectric cell, after which it is placed automatically in a certain compartment depending upon the current change produced in the cell by the particular shade of color which it possesses.

The same principle might be used in sorting the larger sizes of slate and rock from coal, that is when these impurities are of a lighter shade than that of the coal, though this is a possibility so far from present practices that this suggestion seems highly impractical.

There may, however, be a possible opportunity for immediate application of the photoelectric cell in coal cleaning. With the proper arrangement it should be possible to build a device that would automatically adjust the "cutters," "fingers" or "wings" separating the coal, middlings, and refuse, as they leave a dry cleaning table, provided, of course, the refuse is of a generally lighter shade than the coal.

Usually there is a much greater difference in color between the coal and refuse when air rather than water is used as the separating agent. This of course is in favor of the application of such a device to dry cleaning. Automatic adjustment would result in better separation and a further reduction in labor charge.

Forestalling Roof Falls

IN ORDER TO PREVENT ACCIDENTS from falls of roof and coal, many schemes have been devised in Great Britain that are little used here, perhaps because our roof pressures are not as great. For instance, in undercutting or "bannocking," to use a British term, sprags or short props are placed under the coal. These not only hold up the coal seam but also the roof. Except in longwall, the coal is, of course, a beam which stretches from rib to rib and tends to support both itself and the roof. But sometimes it is insufficient and then the sprag with the coal above it acts as a composite prop supporting the roof and thus reducing the span between the foremost prop and the back of the undercut. The coal may not fall, even though no sprag be used, but the roof is nevertheless under strain and the sprag may reduce that load considerably.

Another precaution is to set temporary posts as is done at the Stonega mines in this country and in a few other places. The British call them "catch, advance, watch or safety props." They bear part of the weight when the sprags have been removed. Cap pieces or "lids" are used over these props.

Permanent posts are usually made to sustain cross bars which connect them in pairs. They are placed

parallel to the general face line. But this is not all, light timbers or "bars" are laid from crossbar to crossbar and other sticks known as "benk bars" are placed like forepoling out toward the coal resting not far from their midlength on one of the foremost cross bars and braced behind by inserting a cap piece over the end between the cross bar and the roof. Sometimes the benk bars rest on notches cut in the coal, thus receiving support on both ends and not being dependent on leverage to hold them to their work.

These precautions, it should be remembered, are taken in a country where timber is more expensive than here, where it has been necessary to recover posts in order to reduce expense, and where collapsible steel props are being introduced to save the waste that is inevitable where wood posts are used. Where necessary to use such abundant timbering it should be economically more feasible here than in Great Britain and other European countries. Accidents might be avoided if in many collieries some such methods were used, and some mines now closed because of difficulties encountered in supporting the roof could be reopened. Perhaps, however, for the present it is just as well that such mines as need the more elaborate provisions should not be operated till those better suited to the use of mechanical loaders and requiring less timber are more generally exhausted.

The Road to Peace

UP TO A CERTAIN POINT delay in resuming negotiations between Central Competitive Field operators and miners may be viewed as a good thing. After the clash of preconceived opinions at Miami it was wise that both sides should withdraw from the heat of joint conference to reflect individually upon the facts which must be faced if collective bargaining is to continue to be a constructive force in the bituminous coal industry. To prolong this period unduly, however, can serve no good purpose.

On the contrary, unseasonable prolongation invites a dangerous transformation of reflection into belligerent determination to establish programs by the employment of economic force. Such a metamorphosis is wholly undesirable. There is too much at stake, both for the operators and for the members of the United Mine Workers, to justify a trial of strength so long as there is a possibility of reaching a settlement through the free play of reason. Regardless of which side might be able to impose its will upon the other as the result of a long strike, both sides would lose.

The situation, even today, is far from hopeless. Fundamentally both sides are in accord on basic principles. Obviously the United Mine Workers is anxious to preserve its present power unimpaired and to recover, if possible, the ground lost since 1919. It is equally obvious that a rehabilitation of union influence can come only through a restoration of the competitive

position formerly held by producers who work under union contracts.

Union leaders recognize that the best guarantee of the maintenance of American living standards is in a prosperous industry. Far-seeing union operators have no desire to batter down these standards. And, despite some of the declarations of divorce wrung from desperate coal-mine owners, few operators in the Central Competitive Field have any wish to part company with the union. They may feel compelled to take such action next month, but there will be no joy in the separation.

Where disagreement comes is in the determination of how practical application shall be given to these basic principles. Both sides, filled with the thoughts of their own necessities, went to Miami with fixed programs for such application—and got nowhere. Another joint conference conceived in the same inflexibility of opinion would be useless. But a conference ready to face the larger issues in a spirit of genuine partnership, a conference that, were nothing better offered at the outset, would take Mr. Lewis' plan for a continuing body as a starting point for unprejudiced discussion, could accomplish real results.

Eventually such a conference must be held if sound labor relationships and industrial prosperity are to be promoted. There is no other way out if constructive progress is to be the goal. Why postpone it until friends become embittered adversaries more bent upon winning a sweeping victory than negotiating a just and lasting peace?

Clarification of Water By Mine Effluents

PYRITE in the presence of oxygen forms ferrous sulphate. By further oxidation, the ferrous salt is changed to the ferric. So both these salts are probably constituents of mine effluents. Ferric sulphate, be it noted, is used for clarifying water supplies and sewage.

In all natural waters are bodies known as colloids which are not really in solution nor can they be deposited as sediments merely by letting the water stand. These colloids, however, are deposited when the water is acidulated, by the addition, for example, of ferrous or ferric sulphate or free acid. Moreover, the ferrous and ferric sulphate form a gelatinous colloidal precipitate known as ferrous hydroxide. This type of colloid assists in carrying down other colloids from suspension and so causes sedimentation and clarification of water. It has been used in practice for this express purpose. This ferrous hydroxide is the dominating constituent of the ochreous deposit so abundantly found in the mines.

The sulphates also act on the bicarbonate of lime that the water contains to form calcium sulphate or gypsum. This also settles so that the clarifying action is three-fold and quite effective.

In view of the larger quantities of sediment and dissolved chemicals now to be found in the waters that would not have been found prior to the settlements along the Allegheny and Ohio rivers, the presence of the sediments and solvents being due to the tilling of the soil, perhaps it is not unfortunate that some clarifying agent like mine water has been available to remove the mud and cast down the lime salts.

No one blames the farmer for muddying the streams and adding bicarbonate of lime to them. No one requires him to remove sediment or precipitate the lime

in the water. After all he must till the land where he finds it, just as the miner must mine coal where it lies. The farmer who puts earth and solvents into the water has not brought them to the farm (as certain industries bring tanning extracts or sulphuric acid) any more than the operator brings pyrites to the mine. The earth and solvents are a part of the ground the farmer tills; the pyrite is a part of the mineral the operator mines.

Miners become farmers and farmers become miners in suitable seasons, and it is interesting to note that the bond goes still further, for farmer and miner serve in part to neutralize the impurities resulting from their respective operations.

Education and Industry

THAT THE COLLEGE PROFESSOR, in lieu of exchange fellowships, should temporarily substitute his chair for the desk of the business man was a suggestion recently made by a professor of philosophy in a leading metropolitan university. Others have at different times advocated such a transfer from the college hall to the factory and office. The realization that there was need of closer co-operation between the college and the world of affairs prompted the proposal. Although on first thought the idea seems radical it has, upon more deliberate examination and reflection, a distinctly practical aspect.

Conversely, might not the business executive find it advisable (during his vacation time at least) to exchange the continuous tension of his office for the more leisurely atmosphere of the campus? It is well known that a change of duties, even more than a change of environment, is the most restful of all vacations. Long-continued employment at the same work, no matter how varied or how pleasant its nature, is bound to result eventually in mental laziness and physical lassitude. The so-called vacation of the average business man usually gives him but little benefit, for it is generally of short duration and is most frequently spent under either physical or mental tension. As a result, he returns to his desk in essentially the same state of mind and body as he left it.

On the other hand, a change of mental contact is practically certain to be of real and lasting benefit. Speaking of the members of college faculties, the professor who made the proposal said: "He who has been fed on words and ideas must profit by a change of diet to the coarser food of people and facts." By the same token, he who has been living on this coarser food will surely find countless advantages in the more delicate viands of words and ideas. Industry and education, which are so vitally interdependent, stand in urgent need of better liaison, fuller understanding and closer co-operation. Reciprocal exchange fellowships, between our educators and executives, should do much to fill this want.

Though there are instances where such an exchange would be accompanied by insuperable difficulties there are other cases where the transfer could be effected to the great benefit of both the college and the business enterprise.

And, whenever and wherever possible, these exchanges should be for a year or more instead of for a period of days or weeks. Under these conditions, an efficient corps of individuals would be created that could render a real and lasting service to the colleges and to industry.



Mine Plant Undergoes Complete Reconstruction To Produce Fuel for Big Power Station

Rehabilitation Expenditure Will Approximate \$1,000,000 — Weakened Pillars Strengthened — Workings Reconditioned — Practically Entire Equipment and All Structures Replaced — Savings Effected Loom Big

IF A POWER COMPANY erects a central station near a big deposit of good coal why should it depend upon any outside source for its fuel supply? The Duquesne Light Co. asked itself this question some ten years ago concerning its Colfax plant on the Allegheny River about 16 miles northeast of Pittsburgh, Pa. It answered it in 1916, or four years before the power plant was put into commission by taking over the property of the Allegheny Coal Co. This consisted of a mine plant about a mile north of the power station and rights in fee to 3,800 acres of the Thick Freeport coal bed, most of which remained in the virgin state. This property is now operated under the name of the Harwick Coal & Coke Co.

In its day the old plant was large and modern, producing as much as 1,500 tons per shift. Judged by modern standards, however, it was little more than a hole in the ground. From the time of its acquisition until December of 1920 when the Colfax plant began generating power, production of the Harwick mine was gradually increased in anticipation of meeting the fuel requirements of the central station. For the time being, however, the output was shipped elsewhere. Eventually the Colfax plant will have a capacity of 300,000 kw. Its present capacity is 180,000 kw. and another 80,000-kw. addition is under construction.

As the size of the power plant was increased so also was the output of the mine until it was producing 2,500 tons per day. Both surface and underground facilities were inadequate for further increase beyond this limit. To meet the growing fuel requirements of the power plant, therefore, an extensive reconstruction program

was started at the mine in July of 1924. The major portion of this work was completed by August of 1925 and the plant resumed operation as a modern mine capable of producing 4,000 tons per day in December of the same year.

PINCHES AND WANTS WERE GRAVE HINDRANCES

Harwick is an old shaft operation, having been originally opened in 1901. Difficulties soon developed, in the shape of wants and pinches, of such magnitude that the projections had to be abandoned and the coal taken where the going was easiest. Barriers and pillars in the vicinity of the shaft bottom were consequently trimmed almost to the danger point.

Reconstruction undertaken by the new owners, therefore, involved not only a general rejuvenation of the underground operations but the reinforcement of weakened pillars and barriers. This latter portion of the work was all the more difficult because the layout at the shaft bottom was not suitable for handling trips at the desired speed. Several new through and connecting entries had to be driven in pillars that already carried about all the roof load they were capable of sustaining.

Layout of the new shaft bottom is shown in Fig. 1. This not only shows that the entries were originally driven without much apparent system but it also indicates the heavy reinforcing with concrete and steel that was necessary in the more important entries of the new layout. For the most part this strengthening consists of heavy concrete walls with I- and H-section roof supports, as illustrated in Fig. 4. Concrete arch construction was adopted at two points where the roof showed unusual weakness and had fallen to a considerable height. Thick walls and arches of plain concrete, thoroughly back-filled were here used. The entire job of reinforcing the shaft bottom cost approximately \$100,000.

Underground ventilation was improved by driving

An airplane view of the town of Harwick with the mine in the background is shown in the headpiece. This operation is located about 18 miles northeast of Pittsburgh, Pa., and approximately one mile from the Allegheny River. Both town and plant are nestled between rolling hills and surrounded by farms and cultivated fields. The group of houses in the lower right-hand corner comprise what is known as the Americanization Section. The main tippie appears in the center background.

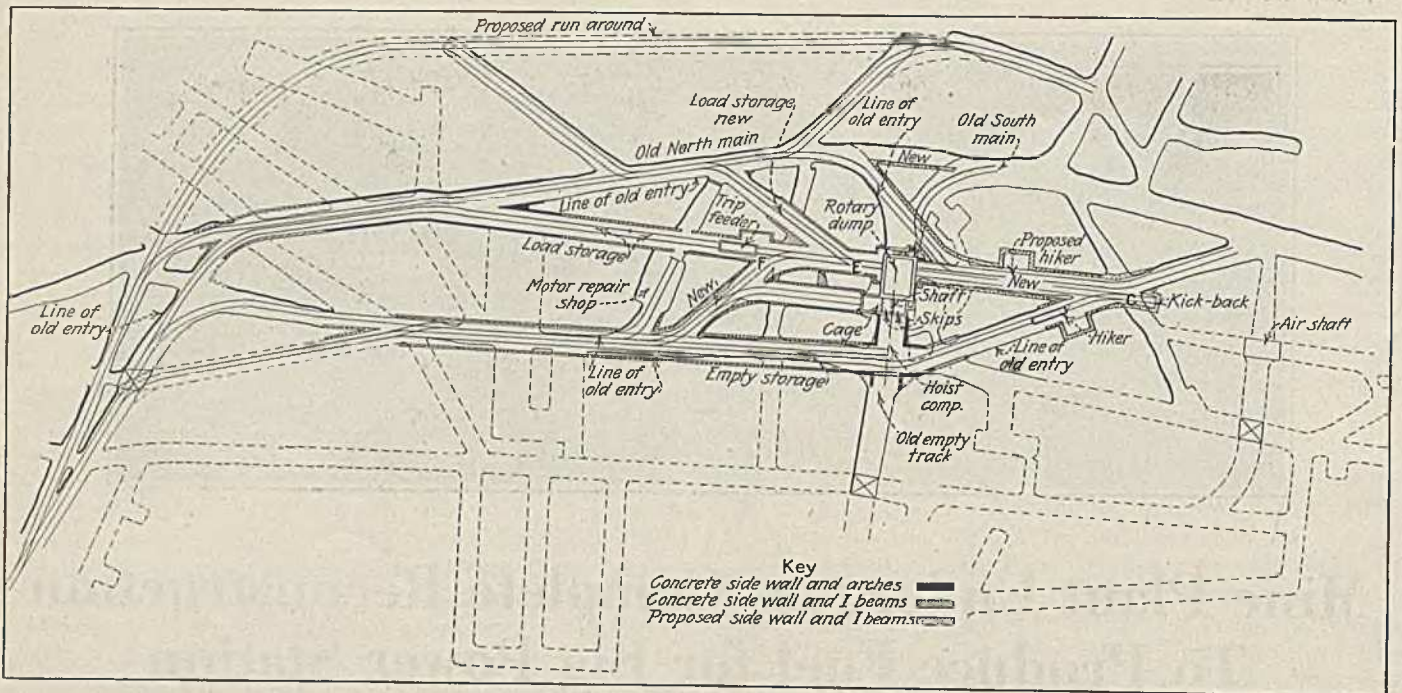


Fig. 1—Shaft Bottom Layout Showing the Concrete Reinforcing

It is no easy job to design an entirely satisfactory shaft bottom even in solid coal. The difficulties were much increased in revamping an old layout intended for cage hoisting to make it applicable to hoisting by skip. Furthermore the old barriers and pillars in the vicinity of the shaft were badly weakened by entries driven apparently without much purpose.

new entries, cleaning up old ones and by sinking a new air shaft in virgin territory two miles northwest of the hoisting shaft. This allows the air to course the new workings without traversing the old. The shaft measures 11x32 ft. and is provided with a slate hoist and escapeway. The old hoisting and air shafts were wood lined: both have been enlarged and lined with concrete.

Main haulageways have been largely reconstructed, much of the trackage being now laid with 60-lb. steel. The daily output per loader has been increased nearly

three tons through the substitution of 600 modern 3-ton cars for the old equipment of 2½-ton wooden cars.

The new cars are of the box type, 46 in. high above the rail and fitted with 14-in. roller-bearing wheels. The axles are extended so as to hold the car in the rotary dump during discharge. The bottom is of wood but the remainder of the car is of copper-bearing steel. The drawbar is solid.

Replacement of the old hoisting and preparation equipment, the steam-driven fan and hoist and the gen-



Fig. 2—Old Mine Plant now Practically All Gone

Complete remodeling of any old plant can only be accomplished in one way—a far-reaching program of reconstruction. At this mine the general rejuvenation and enlargement program called for a general electrification of all underground and surface equipment. The savings made were large but not in all cases measurable. In many instances the economies secured can only be estimated.

eral change-over from steam to electric drive called for an elaborate program of electrification. Power is now brought to the mine by transmission lines coming from two directions, thus assuring continuity of service. The main substation equipment, consisting of four motor-generator sets with a combined rated capacity of 950 kw., is housed in the hoist house. A second substation of 300 kw. capacity is located at the new air shaft and supplies current to the workings that are remote from the hoist shaft. Inasmuch as many of the grades are steep and the workings are far-flung, momentary power demands are heavy. The underground circuits are now being improved by the installation of 750,000-circ.mil weather-protected return feeders.

Following electrification the old boiler plant was abandoned as a regular operating unit. However, four of the old boilers are maintained and steam is carried in two of them to heat the buildings in winter and as a means of operating the old fan as a standby. A bath house will shortly be erected on the site once occupied by the boiler plant after which the standby fan will be driven electrically from an internal-combustion engine. This will also be arranged to drive the main hoist in emergencies.

Inasmuch as all coal from this plant is to be burned by means of the most modern equipment, including

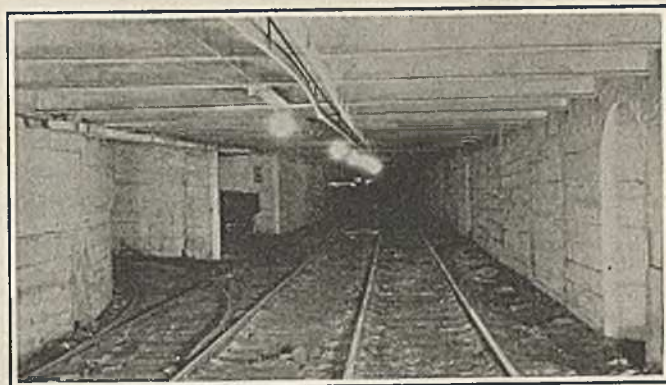


Fig. 4—Heavy Roof Supports on Main Haulage

At this point the roof is held by 14-in. I-beams pitched on 5-ft. centers. Heavy concrete side walls strengthen the coal pillars which were seriously weakened by trimming. It is now believed that no ground settlement will occur near the shaft.

The skips have a capacity of 8 tons each. They discharge into a 25-ton hopper from which the coal is delivered by feeders to a shaking screen. Lump, nut and slack can be prepared, the first going to either of two circular picking tables and thence by loading booms to railroad cars. This size is prepared for storage purposes. The two smaller grades are sent to car by chutes. Rock is diverted from the receiving hopper by a fly gate and sent to a 50-ton storage bin. When this becomes full its contents are dumped into a railroad car for disposal. Coal from the Harwick mine is transported to the Colfax power plant, a distance of about a mile by the Cheswick & Harmar R.R. This is another subsidiary company and serves no other traffic.

Many other improvements besides those affecting the shaft bottom have either been already made or are in contemplation. Thus, a lamp house connecting the two hoist houses is just being completed. A modern fire-proof warehouse has been built as well as a new sand house that is connected to the underground by a borehole. That a new bath house will be erected has already been mentioned. Unless present intentions are altered this will incorporate facilities allowing its use by the miners' families. Installation, under the same roof, of a laundry to handle family washings is being contemplated by the management. In the near future a shop building will also be erected.

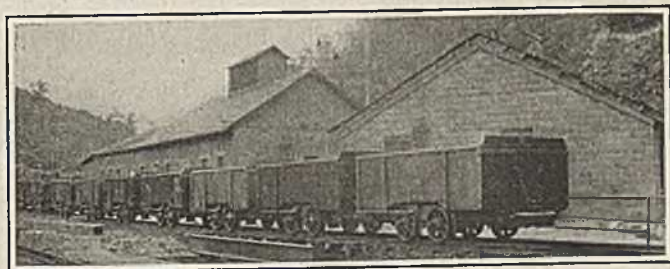


Fig. 3—Type of New Car Employed

This car is of a somewhat peculiar shape for use in the bituminous region. It is of composite construction with wooden bottom and copper-bearing steel box. It is fitted with 14-in. roller-bearing wheels and the axles project so as to hold the car in the dump during its rotation.

facilities for using pulverized fuel, breakage of coal in transit and handling means nothing. Rotary dumping and skip hoisting were therefore adopted without hesitation. The dump, which handles only one car at a time, is electrically driven by a 25-hp. flame-proof motor housed in a fire-proof chamber of concrete and steel. The trip feeder is also operated by a flame-proof motor. Both of these machines are totally inclosed but are not government-approved as permissible.

Two additional precautions against dust ignition are provided at this dump. A 12-in. galvanized steel tube leads from the dump to the air shaft, and removes much of the dust thrown into suspension in the air. That which escapes this suction arrangement is precipitated by two sprays which receive water from the 225-ft. level in the air shaft. The floor in the vicinity of these sprays is of concrete and periodically the settled dust is washed out by means of a hose.

From the dump the coal enters first a weighpan, passing thence to a 10-ton hopper that is fitted with a fly gate adjusted to discharge to either the right- or left-hand skip. All of these devices are interlocked. Thus the weighpan cannot be discharged until the hopper is cleared by the skip leaving the bottom landing. In turn, the dump cannot be rotated until the weighpan has been emptied.

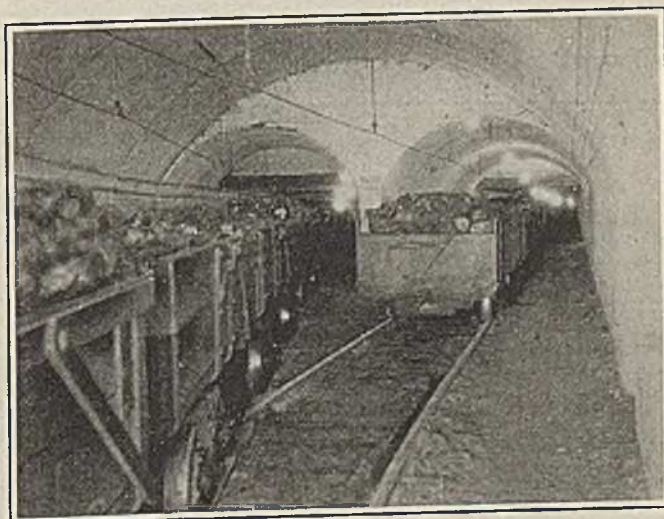


Fig. 5—Heavy Arching Where the Roof Had Caved

Arches of this kind are of plain concrete not reinforced in any way but carefully backfilled. The side walls are 24 in. thick and the top of the arch is 12 in. thick, the arch proper varying between these limits.

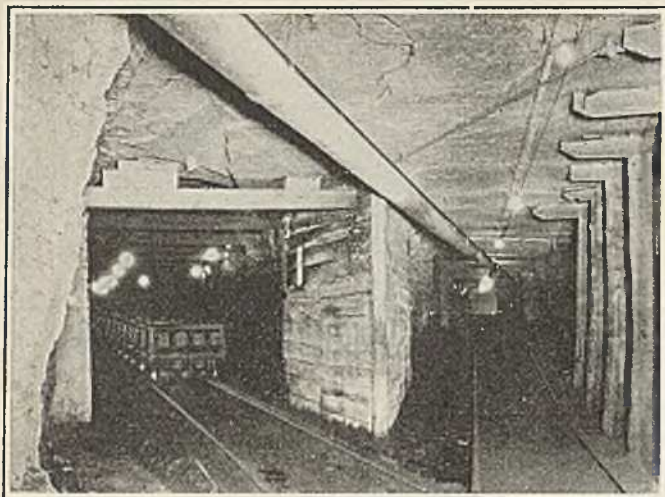


Fig. 6—Dust Conduit at Dump

This is a 12-in. galvanized steel pipe that shortcircuits air from the vicinity of the rotary dump to the air shaft. Its purpose is to carry away the dust that is formed in the dumping operation. In this it is quite effective but sole reliance is not placed upon it and two sprays are installed to allay all fine coal particles that do not pass through this tube.

Many improvements have already been made to the town and still others are to follow. In all 45 new dwellings have been constructed and 30 more will be built during the current year. Additional houses will be provided as the increasing output of the mine may necessitate. During the present year also a house-water system will be installed and a sewage disposal plant will be erected.

LARGE BUILDING PROGRAM IS ON

The Harwick Coal & Coke Co., being a captive firm has a fixed market. This fact has enabled it to see its way clear to make broad-gage improvements. The investment already made and to be made is big but is fully justified by the large savings effected. The total cost of revamping this mine and its surface plant in accordance with modern facilities and requirements will closely approach \$1,000,000. Much of this, such as the housing program, will not yield any immediate or even direct return but will nevertheless pay handsome dividends through the increased productivity of men who work steadily because they live contentedly.

Already the money invested in mine and plant improvements is paying well. The modern coal handling equipment installed has effected labor savings amount-



Fig. 7—Modern Six-Room Houses

These dwellings are built of hollow tile covered with stucco. Each contains six rooms and bath, has electric light, furnace heat and running water. Mining folk today demand many if not even all of the conveniences enjoyed by their urban friends and relatives. Only by supplying these needs can the mining company expect to get and hold men.

ing to \$150 per day, yet this is only a small part of the total economies being effected. Other savings cannot readily be allocated to this or that individual piece of equipment as all are interdependent and each contributes its share. Some of these individual savings may be calculated, however. Thus, it is estimated that the new mine cars will pay for themselves within a year. The economies resultant upon electrification have been calculated, but the figures are not available for publication at the present time. Suffice it to say that the savings thus effected are substantial.

Quick Is Better than Slow Combustion In Buckwheat Anthracite Fires

Two kinds of combustion may take place in the same furnace when fired with anthracite buckwheat, declared Prof. E. H. Lockwood, of Yale University, addressing the Metropolitan Section of the American Society of Mechanical Engineers in New York City recently. What occurs depends on the way the fire is handled. The fuel may burn with a low temperature giving off a blue flame without enough heat to fuse the lumps of coal together. This kind of fire results from too deep a bed of fuel or too little draft. It is an undesirable kind of fire, because it gives out little heat and because the burning coal may slide through openings in the grate into the ash pit if the former is shaken.

"When started in a different manner, buckwheat coal will make a hot fire in which the coal particles fuse together forming a cake of burning fuel which will gradually turn into a soft ash. A layer of the coarse ash can easily be kept on the grate with the burning fuel above, forming a porous mass through which air can pass easily. The ash layer seems actually to have merit in aiding combustion, possibly acting as a preheater to the air as it passes upward to the combustion zone.

"Success in handling buckwheat depends on the ability to get the fire going at a temperature that will fuse the lumps of coal. This fire should be started before closing dampers, as effective combustion can then be obtained with a slow fire. Perhaps the chief advantage of coke in combination with buckwheat lies in the high temperature given by the coke part of the fire. If a small quantity of wood be used instead of coke to ignite the fire, it should not be left on the surface but should be completely covered by the buckwheat, where it will burn as a glowing lump of charcoal until completely consumed."

Co-operative Trade Associations Make Sales Grow Steadily

Industries have accepted the co-operative trade organization as the one medium through which improvements may be obtained. Group advertising and the application of the most improved methods of salesmanship, supplemented by individual advertising and the promotion of trade-marked lines, will prove the most economical method of warding off invasions by rival industries. Markets will be extended, consumption increased and individual companies will profit through increased sales, whether they are large or small units of the industry in question.—Charles F. Abbott, *American Institute of Steel Construction, Inc.*

Coke as Domestic Fuel Eliminates Smoke

The domestic smoke problem could be partially solved by the more extensive burning of coke in house-heating furnaces, suggests the Bureau of Mines in a recently issued bulletin. The manufacture of coke for residence purposes would not only help to eliminate the domestic smoke nuisance but conserve natural resources. Industrial plants may be made to operate smokelessly on bituminous coal, as it is easy to install the necessary equipment. For residences, however, an ideal fuel would be smokeless under all circumstances and could be burned by the average householder in the usual equipment. Coke is such a fuel. The time is not yet ripe for its use in industrial plants, although it seems likely that in a few decades no coal will be burned before it has been carbonized and the valuable by-products recovered.

Coking processes fall into two general classes—high temperature and low temperature. In the first class, coal is carbonized at temperatures of 900 to 1,200 deg. C., producing a coke of low volatile content which is correspondingly difficult to ignite. The low-temperature process, now receiving considerable attention from engineers, proposes to carbonize coal at temperatures of 450 to 600 deg. C. and produce a coke of higher volatile content that will be more readily ignitable.

Of the commercial coking plants in operation in the United States at present virtually all use high-temperature processes. They include beehive ovens, in which the by-products are not recovered; by-product ovens of the Koppers or Semet-Solvay type, and the ordinary gas retorts for the manufacture of illuminating gas. When one ton of coal is carbonized in a by-product oven at a temperature of 900 to 1,200 deg. C., the following products are obtained: Coke, 1,100 to 1,400 lb.; gas, 10,000 to 12,000 cu. ft. (measured at 60 deg. F. and at 30-in. pressure); tar, 8 to 12 gal.; and ammonia, as ammonium sulphate, 20 to 24 lb.

High-temperature coke usually contains only about 2 per cent of volatile matter, and for this reason is difficult to ignite or control in a domestic stove or furnace. However, with proper methods it can be made to give good results. Where a supply is available the public should be urged to buy coke and be educated in the proper methods of burning it.

New Gasification Processes Give Promise

Chemical & Metallurgical Engineering states that one new process of complete gasification which has been brought to the attention of American engineers during the past year is the Kreisa process which has been utilized at several European works with a wide variety of English and Continental gas coals, lignite, brown coal, etc. After a study of European conditions and successes an American company has taken over the American agency for this process and at the present time is working on designs suited to American conditions. Estimates of the applicability of this process to American fuels and American gas-works conditions have been made by this company; but the work has not progressed to the point of affording commercial trials or actual operating figures.

Complete gasification of bituminous coal has long been successfully accomplished by means of the gas producer. No variation in this process has, however,

yet been useful for public utility gas companies because of the low heating value of the gas. Even in the field of industrial supply the low investment cost and simplicity of operation have often been more than offset by the poor flame characteristics of producer gas or the high cost of regenerative or recuperative equipment necessary because of the high percentage of inerts in the gas.

When it was proposed that oxygen be used for producer-gas making, the public utility gas man again found interest in the gas producer, since when using an oxygen blast, the producer would make a gas from bituminous coal comparable in heating value and flame characteristics with blue water gas made from the same fuel. However, it was found that the cost of oxygen for gas making is likely to remain prohibitive for some time to come and this possibility in complete gasification again passes out of the field of economic interest.

COMPLETE GASIFICATION IS FACT

The greatest success in complete gasification of coal without the use of coal-carbonizing equipment has been attained through utilization of bituminous coal as water-gas generator fuel. The results now widely realized indicate that millions of tons of bituminous coal will undoubtedly soon be processed by this means. Thus complete gasification is being achieved in fact, if not in name.

The result of this method of treating bituminous coal is a gas which closely resembles in heating value and flame characteristics the form of blue water gas which has previously been well known. The product does contain substantial percentages of the gases resulting from low-temperature distillation of the coal, but with most efficient operating methods, the increase in heating value thus caused is offset by an increased amount of inert diluents, especially when the blow-run system is used. Because of the low heating value of the gas from this system of complete gasification the uncarburetted water gas from bituminous coal does not yet offer attractive prospects for city supply alone. Hence, despite the improvements which have been made in the operating cycle, such as the back run, the down-run, etc., and the advantages involved in the Pier process, such uncarburetted water gas from bituminous coal is not yet actively a candidate to replace other sources of city supply.



Headhouse that Served Many Years

The Nuttallburg mine was one of the first to be opened in the New River field. Since the Ford interests purchased this operation practically all of the old equipment this headhouse included has been replaced by new installations.

Machine Loading Time, Being of Great Value, Is Carefully Conserved

One Company Increases Its Productive Time by Sliding Entryloader From Place to Place—Room-and-Pillar Method Still "Old Reliable"—Influence of Time and Motion Study as an Aid to Management Seen

IN THE DEVELOPMENT of mechanical loading, on account of the size of the investment in equipment, it was early realized that production per unit must be great enough to pay for the machine and its necessary labor and upkeep if any advantage over hand loading was to be obtained. The only way to get this production is to keep the loading process going on throughout the day with the fewest possible interruptions. This result could be obtained with a long face, either by longwall methods or such modifications thereof as the Y and V systems, which lengthen the working face. But with the lengthening of the working face went the problem of roof control, and its attendant troubles. This in many instances defeated the gains made possible by the long faces.

When a few years ago the modern urge toward mechanization got well under way, a good many sound mining men declared the industry would shift from one fanciful idea to another but that it would eventually come back to old fashioned room-and-pillar methods of mining, no matter what sort of machines were used. They held that it was a mistake to make the system of mining conform to the machine employed. The machine, they thought, ought to conform to the most advantageous method of mining. This is exactly what the Harrisburg Coal Mining Co., of Harrisburg, Ill., has done. This firm is one of the pioneers in mechanical loading in a region in which mechanization has made great progress. It has experimented with long faces for increased production but under its roof conditions finds the room-and-pillar system best suited to high output per man and satisfactory operation. It was found that this method gives the least roof trouble, especially when a class of miners whose experience has been almost wholly under room-and-pillar methods is employed. In other words, this company believes in adapting itself to the method that best suits existing conditions.

TO ATTAIN PRODUCTIVE CONTINUITY

The big problem in mechanical loading is to get, as nearly as possible, continuous productive operations. Cutting and preparing the places and moving the loading machine are among the necessary interruptions which break up the loading continuity. When the same crew cuts the place and operates the loading machine this latter device is idle while cutting is being done; where they do only loading, time is lost in traveling from the cleaned-out place to the next one.

After deciding that the room-and-pillar system of operation was best adapted to its uses the Harrisburg Coal Mining Co. began to study and develop means for synchronizing the major operations, such as cutting and loading, so that it could closely approach a 100 per cent load-factor for the loading machine throughout its

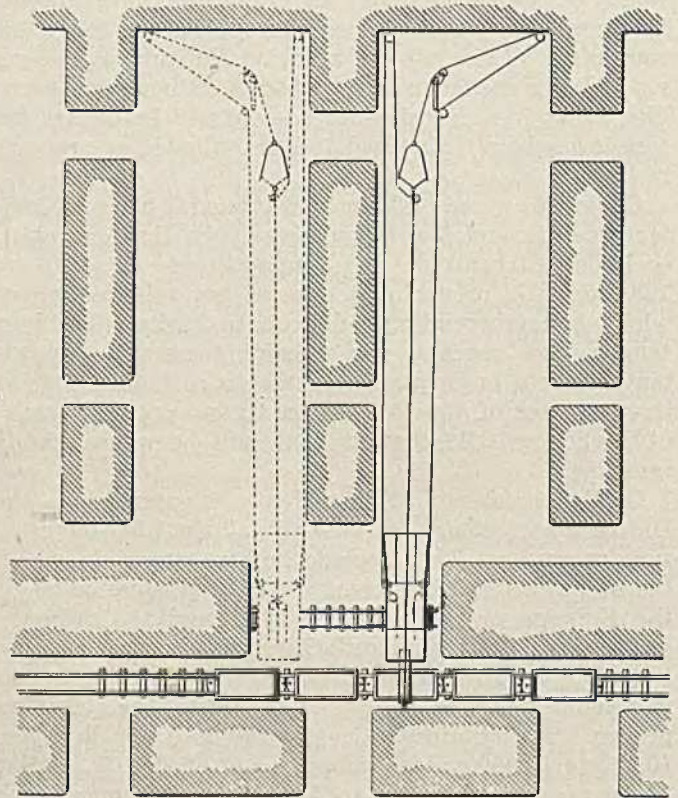


Fig. 1—Loading Time Only Pays Dividends

When a room is finished the scoop and its accessories are pulled onto the loader itself. This machine is then slid about 20 ft. until it is opposite the other place. This requires about five minutes. The ropes and blocks are then taken to the face of the new room and the machine is again ready to produce. In this way moving delays are reduced to a minimum, and this in turn increases the time available for loading, which after all, is the only time that pays dividends.

8-hr. day. Using the room-and-pillar mining system the company gets the equivalent of a 100-ft. face by loading out two 50-ft. faces. This is attained without incurring the disadvantages inherent to longwall. It should here be pointed out that under the method used and with the same machine this company could with the addition of one or possibly two more men, load out daily the equivalent of a 200-ft. face, but it is limited to only a single face per place per day by the blasting restrictions. Consequently the machine is now deliberately limited to five men.

It is on account of this restriction on blasting of coal with present explosive methods that the coal-mining industry in Illinois is anxiously awaiting the results of extensive experimental work and tests in "high power mining," employing a flameless gas cartridge. This will permit successive productive cycles of the loading machine throughout the day.

The machine here employed is a Goodman Entry-loader. It was developed with the idea of affording the facility of movement necessary in room-and-pillar work-

ings. Hoist and loading chute are combined in one self-propelled unit making the complete equipment self-contained. The scraper or scoop sliding over the mine floor, goes to the face and loads; returning, it slides up the chute over the hoist at the entry or haulageway and automatically dumps its load into the car. Empty, the scraper returns to the face and loads again. This scoop has a capacity of about 1,500 lb. and travels at a speed of 450 ft. per minute.

In developing a section of the mine where this plan is to be used three entries are driven, viz: a haulageway, an aircourse and the scraper heading. At present, rooms are being worked only from one side of the heading. Although they are normally driven 50 ft. wide with 15-ft. pillars between them, in order to obtain

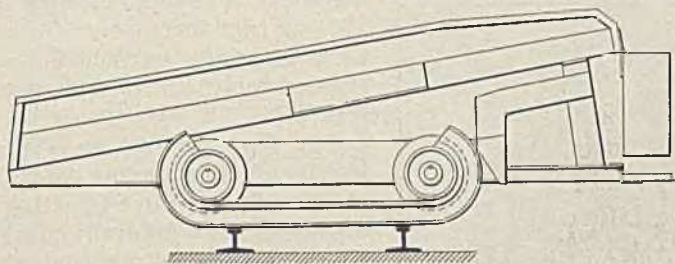


Fig. 2—Skids Facilitate Moving

With these skids the entryloader can be slid from one room to the other in about five minutes. This is a great saving of time as against where the machine has a greater distance to travel, as in other "styles" of room-and-pillar work.

the time- and motion-saving advantages of this method of installing the loader in a somewhat permanent location, these widths can be modified to suit conditions existing elsewhere.

The rooms are turned from the "scraper" entry. They are started at their full width as this does not jeopardize adequate protection to the haulageway. The loading machine is set in the crosscut between the scraper heading and the haulageway and opposite the pair of rooms from which it loads. As it remains in this location during the life of these two rooms this may be termed a semi-permanent setting.

As soon as one of the places, let us say the room to the right of Fig. 1, is cleaned up two men on the crew take down the jacks and rope blocks preparatory to moving out. The left hand place has in the meantime been cut and made ready for the loader. The cutting-machine crew then moves to the cleaned out face.

The scoop, rope and blocks are pulled to the loader and slid with it to the next place. It will be seen in Fig. 1 that the runway for the scoop is on the left of the first and on the right side of the second room. The position of the ropes in the second room is shown by the broken lines in the illustration. On account of this change of the runways in these two rooms it is necessary to alter the direction of the third or automatic rope and the tail rope. This is done by a change of the pulleys on the entryloader and is shown by the broken-line diagram of the machine to the left of Fig. 1.

As may be seen in Fig. 2 the entryloader is mounted on a set of skids that were made in the company's shops. The machine thus mounted is then set at a right angle to the track which is laid the full width of the crosscut and parallel to the loading track. By this means the machine can be slid from one room to the other. The saving in time that this effects as compared with the traveling done when following the usual room-

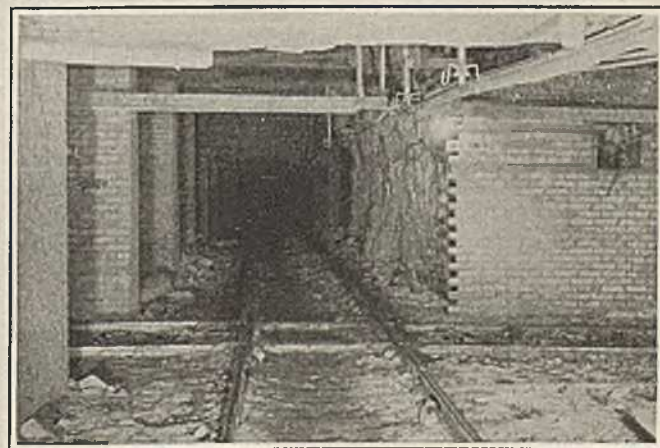
and-pillar practices can be readily perceived. With this arrangement it takes about five minutes to move the loader from one place to the other. It is necessary only to change the ropes and slide the machine approximately 20 ft. It is then ready to load from the second room. The cutting crew in the meantime goes through the crosscut to the room just cleaned out. Thus while one place is being loaded out the other is being cut.

The method adopted by the Harrisburg Coal Mining Co., and shown in Fig. 1, was chosen because loading out two 50-ft. rooms per day with one shooting for each on account of the height of the coal, which is 7 ft., furnishes enough tonnage for one loading machine and five men for a day of 8 hr. With this method these men average 140 tons per day. A crew consists of two men who timber the places and perform miscellaneous duties, a cutter, a scraper and a loading-machine operator.

The trend in machine practice today is noticeably toward the retention of, and in the case of the company mentioned in this article, a return to room-and-pillar methods. However, with a reversion to the room-and-pillar system of mining attention is being directed toward such modifications as will save time and motion. In other words, mining engineers and officials, as witness the case of the Harrisburg company, seem to be attracted by time and motion studies.

It might be pointed out here that the addition of the "scraper" heading to the regular double-entry room heading seems to offer some labor- and time-saving advantages. For instance, it allows the rooms to be turned from it at the full width at which they are to be driven, thus doing away with narrow room necks. The intervening pillar protects the haulageway. Another organization that now uses the scraper heading though not exactly with room-and-pillar mining, is the Union Pacific Coal Co.

The management of the Harrisburg Coal Mining Co. believes that greater concentration of operation can be secured by this method than by those ordinarily followed. It is therefore considering working the rooms on both sides of the loading heading by double tracking this passage.



Crossover Construction in a Pennsylvania Mine

Haulage is speedy in the No. 4 mine of the Pittsburgh Terminal Coal Corp. for which reason every step has been taken toward maintaining safe conditions at this mine crossover. In the first place the track work is rugged. In the second place the ribs of coal are reinforced by brick walls (one of which, as shown is not yet completed) and the roof is further supported by brick piers located along wide places. This type of construction forms the safest support to maintain the inherent strength of roof over a comparatively long span. Incidentally, this mine is rock dusted.

Drainage and Drying of Coal After Washing; Its Principles and Practice

By F. J. Warden-Stevens
London, England

HOW TO DRY COAL after it has been washed so as to prevent it from freezing in railroad cars, from destroying the linings of coke ovens, from reducing the temperature of such ovens unduly on charging, from increasing the coking time, from interfering with the efficient grinding of coal to dust, from causing the coal to cake after pulverization, from hindering briquetting and low-temperature carbonization processes has been a problem that has long vexed the coal industry.

After coal is washed, the surface water that it retains must be eliminated. This has usually been done by drainage, but the time required to dry the coal as well as the cost of the extensive bunkers required for this operation, have caused engineers to turn their attention to other methods of obtaining the same result.

The use of centrifugal machines for the draining of coal has met with varying degrees of success, so it will be of interest to compare the principles of some such machines. The subject may perhaps best be considered under the various headings which modify drainage by centrifugal action: (a) Centrifugal force, (b) time of action, (c) size of coal, (d) quality of fines (coal of dust size), (e) initial moisture, (f) mass of coal on which the centrifugal force acts.

(a) *Centrifugal Force*—This must be sufficient to insure that all the coal is kept against the screen and at the same time be powerful enough to drive the water through its perforations. Apart altogether from the limitations of mechanical strength no more than a certain force can be economically employed, because the greater the pressure the greater the difficulty with which moisture forces its way through the coal mass. This feature is intimately connected with the size of the coal and the percentage of fines. The smaller the coal, if it be of uniform size, the lower is this limit.

This has been confirmed by tests. It has also been shown that the quantity of moisture extracted is not proportional to the centrifugal force. Two tests were made on coal containing 21 per cent of moisture, each test being of 4-min. duration. In one the centrifugal force acting was 100 lb., and the final moisture content was 9 per cent; that is, about 12 per cent of moisture was removed. In the second test the force was 300 lb., and the final moisture content 4½ per cent. Thus about

16½ per cent of water was withdrawn. When, therefore, the force was tripled, the weight of moisture extracted was only increased by about 38 per cent.

In another test with an initial moisture of 15 per cent, other conditions being similar, that is, time of action, size of coal, etc., the results were, with 100 lb. centrifugal force the final moisture was 4.7 per cent, and with 300 lb., 3.2 per cent; or with a 200-per cent increase of force the moisture extracted increased only about 14½ per cent.

(b) *Time of Action*—The length of time during which the centrifugal force is acting doubtless has a different effect on the final moisture content with different types of machines.

With one type, in which the feed is continuous and the discharge intermittent, there is a tendency for the layer of coal to increase in thickness; whereas, with a type of machine having a continuous feed and also a continuous discharge, the longer the time of action the less the final moisture content, although the quantity of moisture extracted is doubtless less and less with every successive unit of time. This, of course, applies only to strictly centrifugal action without the effect of air; with an air blast the conditions are different.

(c) *Size of Coal*—Other conditions being equal—centrifugal force, time of action, initial moisture, etc.—

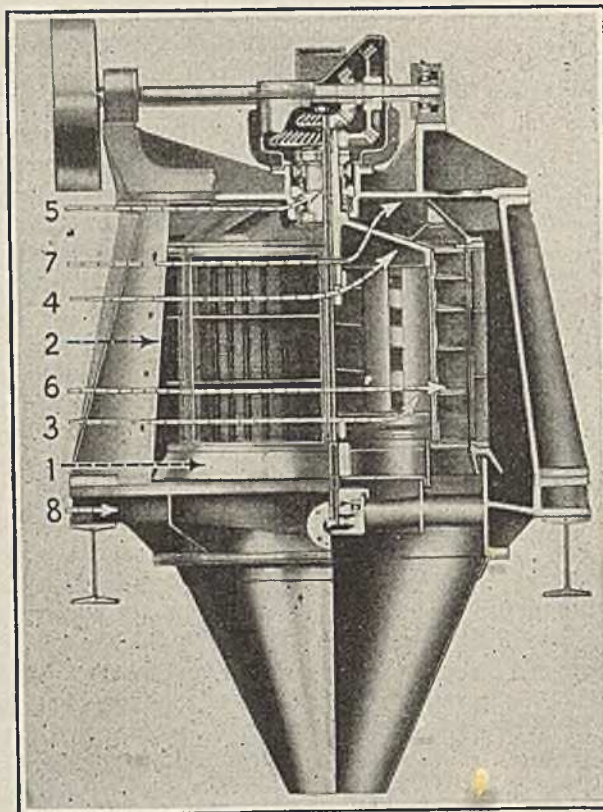
the final moisture percentage, speaking generally, varies inversely as the size of the coal; that is, the smaller the coal, the more difficult it is to dry or drain, because the particles pack more closely together.

(d) *Quantity of Fines*—This affects drying in much the same way as the size of coal, because, no matter what the size may be, the greater the percentage of fines, the more difficult it is to drain the coal.

In at least one type of centrifugal machine it is claimed that the moisture has been reduced to 2.8 per cent of the weight of the coal and that an increase of 10 per cent in the fines makes an increase of 1 per cent in the final moisture content.

(e) *Initial Moisture*—The final moisture content is greater with higher initial moisture, but more water is extracted when the initial moisture is higher; that is, the moisture becomes increasingly difficult to extract as its initial percentage is reduced.

(f) *Mass of Coal*—Naturally, the thicker the layer of



Drier with Vertical Screen

Type 2 machine in which 1 represents the spider by which the screen 2 is carried and 3 shows the fan blades attached to drum 4. The hollow shaft 5 has a disk supporting drum 4. The scroll is shown as 6. Air provided by fan blades 3 ascends through openings in cover 7 and the water drained from the coal falls into a trough in the base 8.

coal the more difficult it is for the moisture to force its way through the screen.

Summarizing: The final moisture content varies directly as the thickness of the coal layer, the percentage of fines and the initial moisture; and inversely as the centrifugal force, the time of action, and the size of coal (assuming good screening).

Three types of centrifugal machine used for coal drainage may now be described:

Type 1—This machine includes a receiving hopper, which feeds to rotating distributing chutes; the coal is thrown against an inclined rotating screen, the water passing through the screen perforations and away by a chute. Below the chutes and at a position about half way down the screen, is a horizontal platform containing about sixteen doors, which are periodically opened and closed by a pair of cams underneath. The chutes and cams rotate faster than the screen, the usual speed of which is 250 r.p.m., the speed of the chutes and cams being usually 251 to 252 r.p.m. The chutes and cams are carried on a vertical shaft and the screen by a loose sleeve on that shaft; the whole being inclosed in a cast-iron casing. The shaft is rotated by a set of bevel gears at the top, and the loose sleeve carrying the container by another set of bevel gears mounted on the same driving shaft, which

gives a slightly higher speed ratio. This ratio, and therefore the relative speeds of the screen and the cams, control the opening and closing of the doors. With speeds of 250 and 251 r.p.m. respectively, each door would open twice a minute, or every 30 sec.; whereas, with speeds of 250 and 252 r.p.m. respectively, each door would open four times per minute, or every 15 sec.

The drained coal has to be passed through doors which open in aggregate 32 times per minute. If the capacity per hour is to be 50 long tons or 56 short tons the quantity discharged by each door each time it opens must be 58.3 lb. Assuming that each short ton occupies 32.1 cu.ft., 30 cu.ft. of coal per minute must be discharged, which is equivalent to a little less than one cubic foot each time a door opens.

Claims for this type of machine include: That coal has been reduced to 7 per cent of moisture content, that about 25 to 30 b.hp. is required to start up the machine, but that the working power required is only about 15 b.hp., that about 2 per cent of the coal passes through the screen, that a large proportion of fines in the coal does not modify the action seriously, which is attributed to the fact that only a small quantity of fine coal is produced by the action of the machine itself, that un-sized mixed coal has been dried down to 2.8 per cent moisture. It appears that the coal does not pass along the surface of the screen but is thrown from the chute into the acute angle formed by the intersection of

the inclined screen and the horizontal platform.

It remains in the same position on the screen until the door underneath opens, when, partly by the action of centrifugal force and partly by gravity, it passes down, the door being held open sufficiently long to allow of this movement.

Type 2—This machine consists essentially of a vertical rotating shaft carrying a cylindrical screen attached to a spider, with a sleeve on the shaft provided with an angle-iron scroll, the whole being contained in a cast-iron casing.

Coal is fed into a hopper and is thrown by the centrifugal force, first onto the top surface of the scroll, and then against the cylindrical screen. By means of two sets of bevel gearing, the scroll is driven by the main shaft at a speed of 500 and the screen at 450 r.p.m. The relative motion carries the coal downward along the surface of the screen.

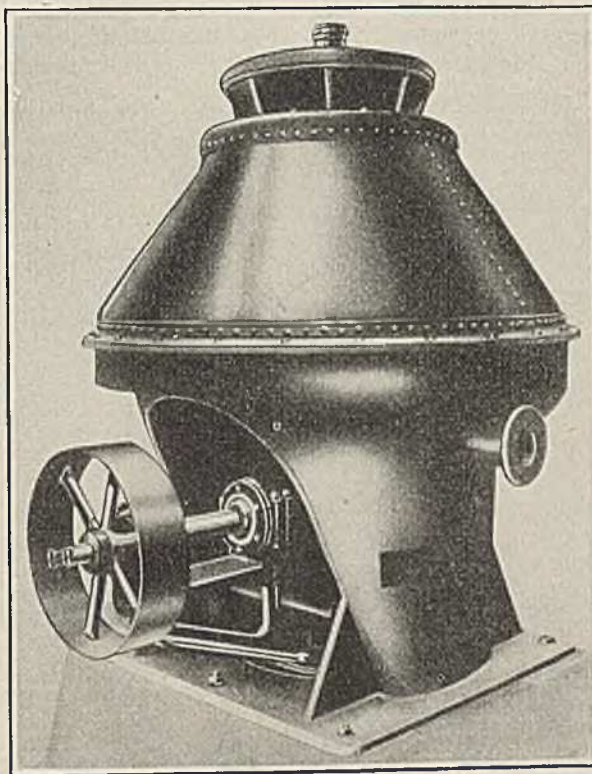
Toward the base the pitch of the scroll increases. This tends to spread the coal over a larger area of the screen, reducing the thickness of the layer and facilitating the separation of the moisture. At the base the coal falls into a hopper and is discharged. The water passing through the screen is collected in a chute. On the shaft underneath the scroll is mounted a fan which draws air into the casing; this air has to pass through the screen and so

through the coal layer on it. It may be either hot or cold; when hot it doubtless adds to the efficiency of the machine.

The capacity of the standard size of this type of machine is 28 short tons per hour, and the power required for starting is 20 to 25 b.hp., which is reduced to 15 b.hp. afterwards. Coal from a feldspar washer box has been reduced in moisture from 28 to 8 per cent without using air being forced through the screen; also without using air, the moisture in 3/8 to 0-in. coal has been reduced from 22 to 7 per cent.

Assuming 32.1 cu.ft. per ton of coal, the quantity dealt with per minute equals 15 cu.ft., and with speeds of 450 and 500 r.p.m. of the screen and scroll respectively, the relative velocity is 50 r.p.m. As there are five turns on the scroll the coal thus passes through the machine in 6 sec. The area of the screen surface equals 15.7 sq.ft. and at the rate of 15 cu.ft. per minute the volume passed in 6 sec. equals 1.5 cu.ft., which on an area of 15.7 sq.ft. gives a layer of an average thickness of 1.15 in. It appears reasonable to believe that a layer of this even thickness is obtained, for the coal passes out of the machine around the whole circumference of the screen, which has vertical sides.

Owing to the comparatively high velocity between the screen and the scroll, it appears likely that this drier is subject to more wear and tear than type 1. In all probability also more coal is fractured and ground by this action. Consequently, the screen is more likely to



Screen Inclined to Vertical

This has an underdrive. The centrifugal force is far more than is necessary to hold the coal on the screens. The drier is numbered type 3 in the article.

choke or block. Moreover, more of the very small coal is likely to pass through the screen with this type than with type 1 machine.

In general construction the two types are somewhat similar, as, for instance, in the arrangement of the shafts and drive, the collection of water, etc. However, they differ considerably in important details. Judging from the information available, it may be said that, speaking generally: In type 1 in order to obtain the desired capacity the coal is kept under the action of centrifugal force for a longer time and consequently lies in thicker layers; whereas in type 2 it is passed through quickly but only in thin layers.

Type 3, the third machine to be described, is constructed in two patterns; these are similar in principle, the chief difference being that one has an overdrive, and the other an underdrive. Both have a rotating screen of conical form mounted vertically; the vertical shaft is carried in ball and thrust bearings and is driven by a countershaft through bevel gearing.

On this shaft is a spur wheel which gears with another on a short countershaft carried in a gearbox. Another wheel on the countershaft gears with a fourth spur wheel keyed to a sleeve which rotates at a slower speed on the first shaft. This sleeve carries a distributing cone and a set of helical scrapers. The machine is totally inclosed, the spur gear being in a separate case.

The coal is fed by a chute to the cone and then thrown by centrifugal force against the underside of the screen. The scrapers, which rotate very slowly relative to the screen, move the coal slowly downwards over the screen to the hopper, the water being discharged through an opening in the side of the casing.

The other machine works in a similar manner but, as already mentioned, has an underdrive, the shaft and sleeve being given different speeds by means of two bevel wheels on the countershaft. These mesh with wheels on the main shaft and on the sleeve respectively. The coal on leaving the screen falls to two wide hoppers, one on each side, to clear the gearing. One of the sizes of the overdriven pattern has a capacity of about 95.2 short tons per hour. The underdriven pattern is made in three sizes—48, 36 and 24 in.—having capacities of approximately 84, 42 and 22.4 short tons per hour respectively.

The power required varies from 35 to 20 b.hp., or about 0.37 to 0.67 b.hp. per short ton. Dealing with washery slurry the moisture is reduced from about 33 to 14 per cent, and with the largest size, or 48-in., machine, it is claimed that coal up to $\frac{1}{2}$ -in. mesh mixed with the slurry can be treated and the moisture reduced from 22 to 8 per cent at the rate of about 84 tons per hour.

The differences of these machines may be indicated as follows: In type 1 the coal apparently does not pass over its inclined screen until just before it leaves the mechanism, being held up by its doors; it then passes out by centrifugal force. Type 2 is the only one with a vertical screen, the coal being passed through by a

scroll, having a low velocity relative to the screening surface. In type 3 the inclined screen has a series of scrapers which revolve at a low velocity relative thereto. Types 2 and 3 appear to spread the coal more evenly, in a thinner layer and over a larger area than does the type 1 machine.

If the screen is not designed so that centrifugal force will pass the coal through the machine some other means must be adopted. In the type 2 machine the centrifugal force is in excess of that which is required to hold the coal against the screen and in consequence some additional power is required to move the coal through the machine to the discharge point.

This additional power is a maximum when the screen is vertical and decreases uniformly with an increase of the slope until a point is reached where the downward component of the reaction due to centrifugal force together with the action of gravity are equal to the frictional resistance to motion. Any further increase in the slope of the screen results in a downward motion of the coal, without the application of external forces.

Comparing machines of types 2 and 3, both require a form of scraper to move the coal along the screen, but in type 2 the screen is vertical, and in type 3 it is inclined at about 20 deg. to that direction.

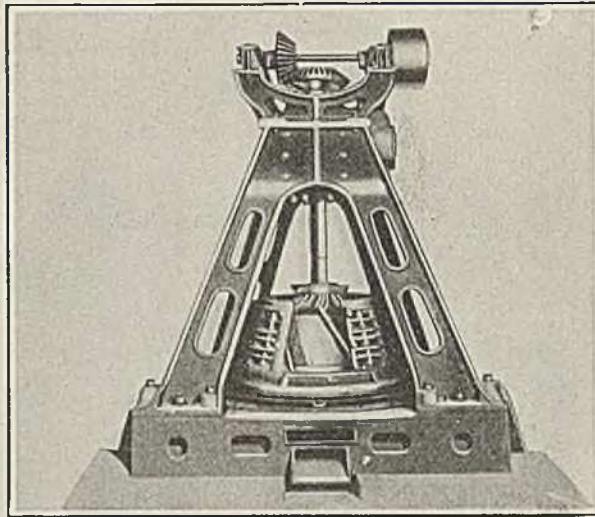
This means that the force required to carry the coal down the screen is only about 24 per cent of that necessary in type 2.

On the other hand, the inclined screen requires a greater centrifugal force to hold the coal against it, but this does not appear to be a disadvantage as greater forces for extracting the moisture than suffice to hold the coal against the screen are desirable.

For instance, assuming the coefficient of friction equals 0.5, a force of about 8 lb. is all that is needed for that purpose in the machine of type 1, and only 2 lb. in type 2; yet the mean centrifugal force in the type 3 machine is about 100 lb. and in the type 2 it is 128 lb.; the mean radius of screen in type 3 machine being 21 in. and the speed 400 r.p.m. With the inclined or conical screen the surface increases toward the base with a resulting tendency for the coal to spread, thus forming a thinner layer, as already mentioned.

Similar results with the vertical screen are claimed for type 2, these being obtained by the increasing pitch of the scroll by which the coal is carried down through the machine. On theoretical grounds, type 3 machine should actually attain this result more easily, as the coal spreads out horizontally and it is in this direction that the surface is increased; whereas type 2 has a greater surface from the heightened pitch of the scroll or from greater depth.

In view of the greater force necessary to move the coal along the surface, it would appear likely that it would keep up under the scroll, but it is claimed that in practice this does not occur. One advantage of the scroll or scraper machines, whether the screen is vertical or inclined, is that a more accurate control over



Same Drier with Overdrive

This shows the screens diverging from the top downward but the speed with which they are revolved makes the water drain away freely.

their operation can be maintained than when the coal is moved by centrifugal force, and the time the coal remains in the machine depends on the relative velocity of the screen and the scraper.

In the case of type 1 machine the control depends entirely on the centrifugal force and the slope of the screen. This slope cannot conveniently be altered, but the centrifugal force could be diminished by reducing the speed, causing the coal to be retained for a longer period; this, however, reduces the quantity of moisture extracted per unit of time, and so little or nothing is gained. The sloping screen may be a little more economical in power, but the energy actually expended in moving the coal is a small fraction of the total.

A later type of machine has recently been devised. This consists of an inverted stepped truncated cone supported and driven by a vertical shaft which is surrounded by a series of stepped screens, the whole being contained within a casing. This machine was described in *Coal Age* of Feb. 10, 1927, in an article by F. J. G. Duck, pp. 219-224.

Speaking generally, the disadvantage experienced with centrifugal machines for coal drainage is principally their high cost of maintenance, and their short life. Further, although by their use the cost of drainage bunkers and the space they occupy is largely saved, centrifugal machines are themselves costly, and require attention and power for their operation.

Reduction of moisture in washed coals to about 10 per cent by means of either drainage bunkers or the centrifugal machines just described is usually considered to suffice for general requirements, but, for the use of the coal for coking, briquetting, carbonization and combustion in metallurgical furnaces and steam boilers, a lower moisture content is advantageous.

Heat driers are objectionable chiefly because of their high cost and maintenance charges and because of the power required for their operation when the standard type of horizontal rotary machine is used. A vertical equipment has, however, been introduced, which is known as the "F.E." (Fuel Engineering) Gravity Dryer. In this drier waste gases from a boiler or furnace flue are utilized. They are drawn through a hollow wall, or walls, of the drier containing the coal.

With this equipment heat radiation losses are at a minimum. No power is required for their operation, as in the case of rotary or other types of driers, there being no moving parts except the delivery device and fan which must be operated also when other types of driers are used.

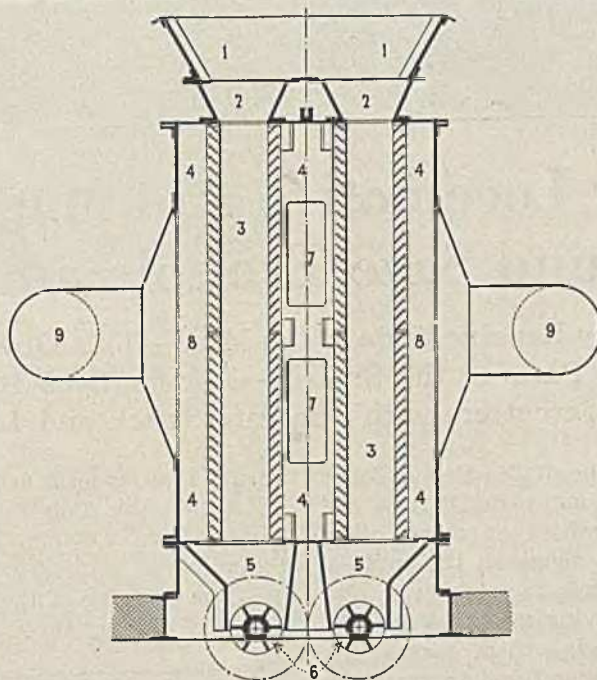
Facilities are provided whereby the temperature at which the drying is effected can be controlled, and consequently losses of the volatile constituents of the coal are avoided. Also, the rate of passage of the coal through the driers can be varied to suit the conditions

and the character of the material. The ground space occupied by these driers is small for their duty in comparison with other types of driers; moreover they are not complicated. A simple device controls the delivery, as already stated.

The form and construction of these driers depend upon the average quantity and character of the coals with which they must deal. Reduction of the moisture from 20 or more to as low as 2 per cent can be effected. These driers can be constructed in single units for duties of from 1 to 28 short tons per hour. The equipment can perhaps best be described by reference to the illustration.

Briefly, these devices consist of a hollow wall or walls,

depending upon the size or duty demanded, down which the coal passes by gravity, the construction of the sides of the wall allowing hot air or waste flue gases to be drawn through the coal by fan suction. They also serve for preliminary heating of the coal for combustion or carbonizing, the importance of which is likely to be overlooked. In steam boilers the heat necessary to evaporate the moisture in the coal when it is fired, and to raise its temperature, is reduced by drying and pre-heating the coal outside the boiler furnace, before it is fired; also the flame temperature and thereby the absorption of heat by the water in the boiler is increased. Furthermore, there is a reduction in the quantity of heat lost up the chimney. The saving in efficiency and economy would soon pay the cost of drying by



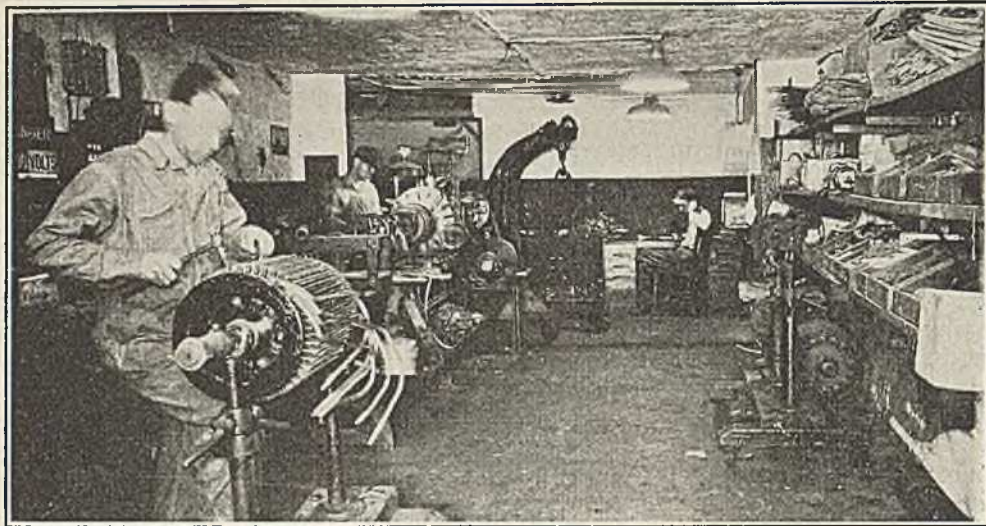
Vertical Gravity Drier Uses Waste Heat

(1) main hopper, (2) sectional hopper, (3) wall of coal, (4) lower grids, (5) discharge hoppers, (6) rotary star discharger, (7) hot-gas inlet, (8) exhaust space, (9) exhaust main.

this method. With metallurgical furnaces the moisture in the coal represents an appreciable loss in productive or heating capacity of the furnace. The magnitude of this loss will depend upon the quantity of moisture in the coal and on the type of furnace. Allowing, as an average, that 400 lb. of coal are used to heat a ton of metal, this figure becomes the approximate reduction in weight of metal heated per long ton of coal. This fuel contains 10 per cent of moisture. The loss in productive capacity of the furnace is thus about 18 per cent of the total weight of coal used.

Coke-oven practice frequently allows for reduction of the moisture in the coal used to 10 per cent, whereas it has been ascertained that the best results are obtained by a reduction of the moisture to about 3 per cent. This reduction shortens the coking time and increases the "throughput" of the oven.

WHY the copper conductors of high-grade rubber-covered wire are tinned is not generally understood by electrical men who are concerned principally with installation and maintenance work. The coating of pure tin is for protection of the copper from chemical action. Sulphur is generally used in vulcanizing rubber and this will react with copper. If it is not kept away from this metal, the wire will be eaten gradually away.



Facilities for Locomotive and Machine Repairs Underground Save Trouble and Expense

All but Heavy Repairs Made in the Mine—This Obviates Taking Machines or Parts to the Surface—Locomotives Provided with Pits and Undercutters with Separate Track and Light Trolley

AT THE ZEIGLER No. 2 mine of the Bell & Zoller Mining Co., Ziegler, Ill., many repair jobs are performed underground which at many other mines are ordinarily handled in shops on the surface. This arrangement saves both time and labor; it also obviates the inconvenience of moving machines or parts thereof to the surface and bringing them back again. Furthermore, where the time element is important the repair job is accomplished with greater dispatch, and interference with other phases of operation is reduced.

Another reason for this departure from common practice is that it enables the master mechanic the better to keep a watchful eye on the maintenance of underground equipment and at the same time supervise repairs. He is in direct charge of maintenance and upkeep on all equipment above and below ground, and spends most of his time within the mine where in comparatively poor light machines are more likely to be neglected. Here also service is severe.

A number of underground shops have been constructed at Zeigler No. 2 in such locations as to adjoin the motor barn and repair pits. Their general layout is shown in Fig. 1. Dimensions are not given because these are

varied to meet local necessities. However, it is well to know that the daily output of the Zeigler No. 2 mine ranges from 7,000 to 7,500 tons. The motor barn is composed of a number of stub turnouts which branch off from one side of the entry track like the limbs from a tree. Twenty-three gathering and three main-line

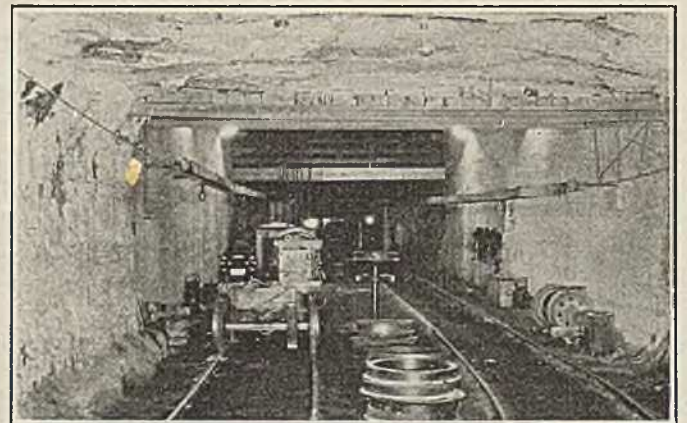


Fig. 2—Where Locomotives Are Repaired

Under each of these two tracks is a pit which is used in the repair of locomotives only. Cutting machines are repaired elsewhere. The floor is of fire clay without a covering of concrete or any other material. Many coal companies are of the opinion that the natural mine bottom when frequently scraped and swept gives better satisfaction adjacent to locomotive pits than a floor of concrete.

locomotives are stored in this barn, from two to three, depending upon their size, being placed on each branch.

Adjoining the motor barn are two repair pits, one under the straight track and another under the bypass or runaround that leads to the main haulway. The floor in these passages is of natural clay, but the side walls are of concrete, supporting I-section roof beams and cribbing. Each pit is served by a 10-ton traveling chain block.

Inby the runaround is a stub sidetrack, which is used exclusively for the repair of cutting machines. Travel-

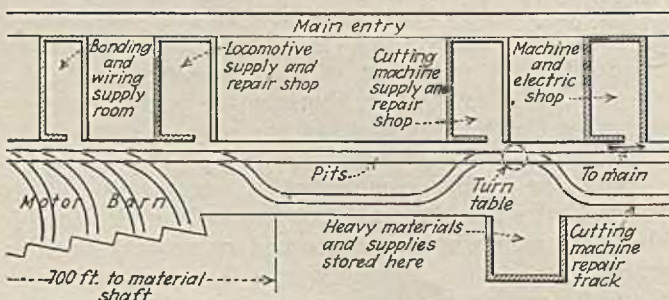


Fig. 1—Layout of Underground Shops

The arrangement of the shops in the Ziegler No. 2 mine is such that the repair of cutting machines and locomotives respectively can be simultaneously carried on without interference with each other. Two entrances to the motor pits and shops are provided.

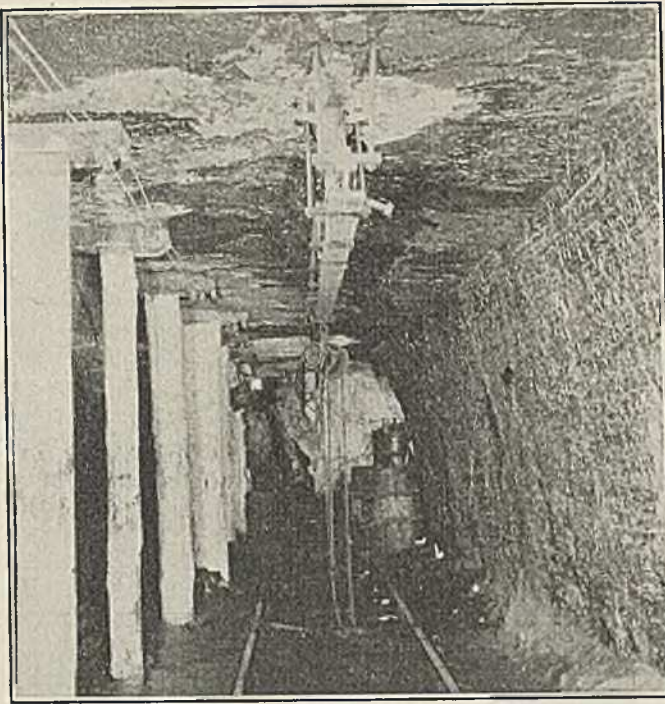


Fig. 3—Where Cutting Machines Are Repaired

This stub track is adjacent to the locomotive pits and is used exclusively for the repair of cutting machines. As the chain block is never required to lift more than half a ton, the rail on which it travels is anchored to the roof. This method of support has proved quite satisfactory.

ing on a 60-lb. lateral track rail hung from the roof above this sidetrack by rods and clamps, is a $\frac{1}{2}$ -ton chain block, as shown in Fig. 3. Particular attention is called to these provisions for machine repair because they do away with the confusion that results when an attempt is made to repair cutting machines and locomotives simultaneously on one track. Between this stub track and the motor-pit runaround is a turn table which is employed for turning locomotives and cutting machines end for end when such reversal is expedient.

The headpiece shows the underground machine and electric shop where light work is done and ordinary electric repairs, such as armature winding, are made. This shop is 14 ft. wide and 30 ft. long. The walls and floor are of concrete and the roof is plastered with this same material. All electric wires are carried in conduits and reflectors are used on the lamps to throw light effectively to the points where it is most needed. Along the left-hand longitudinal wall are two work benches;



Fig. 4—Locomotive Supply Room

Locomotive parts are here partially assembled. The bins consist of powder boxes set in concrete. When a suitable place is provided for the storage of spare parts, orderliness results.

one is utilized for electrical repairs and the other for machine work. The largest machine tool in this shop is an 18-in. lathe. In one corner is a small room where armatures, coils, etc., are dried after being dipped.

REPAIR SHOP DESIGNED FOR CONVENIENCE

The locomotive supply and repair shop, see Fig. 4, differs somewhat in its design from the machine shop. On two sides are numerous concrete bins in which are stored spare locomotive parts. The bins themselves consist of powder boxes set in concrete. In the middle of the floor is a heavy plank bench, on which locomotive parts are adjusted and partially assembled. This is equipped with a vise. A second bench forms the cover to the lowest tier of bins on the left-hand side of the shop. In the bins under it are stored tools and accessories. This shop is 13 ft. wide and 39 ft. long. The cutting machine supply and repair shop is similarly constructed and arranged, as is also the room in which bonding and wiring supplies are stored. Heavy materials and supplies of the kind not kept under lock and key are stored separately in a large open-front room.

This group of underground shops enables the mine management to keep its equipment "up to snuff." The facilities provided eliminate much of the practice, so prevalent at many operations of temporarily "fixing" equipment that is badly in need of permanent repairs.

Testing Explosives Photographically

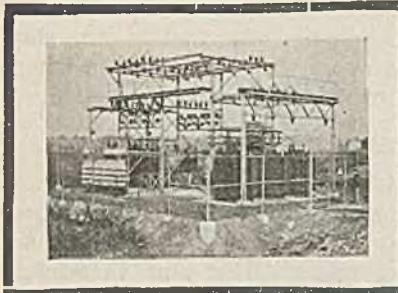
An investigation to determine by photographic methods the effect of the physical and chemical properties of explosives on the flames produced, and the influence of different methods of loading and different kinds of stemming on the character of the flame, together with the relation of flame properties to the limit charge as determined in a testing gallery, is being conducted by the Bureau of Mines at Pittsburgh, Pa.

Photographs on a rapidly moving film have shown that secondary flames are produced by most explosives when an air space exists between the explosive and bore-hole or between explosive and stemming. Photographs on a fixed plate have shown coal-dust stemming to produce a large bright flame, much larger than with fire-clay stemming, and that addition of water to ordinary dry fireclay stemming reduces the size of flame. Results are in qualitative agreement with gallery tests.

TO DETERMINE MODE OF IGNITION

The purpose of another investigation being conducted at Pittsburgh is to determine the mode of ignition of gas and dust by a charge of explosive fired into a steel gallery. The gallery contains a horizontal slot covered by plate glass windows through which the flames may be photographed on a rapidly moving film. The gallery has been constructed and a camera designed and built which has a 6-in. drum capable of revolving at peripheral speeds up to 50 m. (152 ft.) per second. It is hoped by means of this apparatus to obtain more definite knowledge as to the mechanism of mixtures of air with gas or coal dust.

Another study undertaken is for the purpose of determining the rate of detonation of explosives by a new method, namely, photography of a detonating column of explosive on a rapidly moving film. Rates of detonation of typical mining explosives have been determined by this method, and the propagation of the shock wave over an air gap between two cartridges also has been studied.



Practical Pointers For Electrical And Mechanical Men

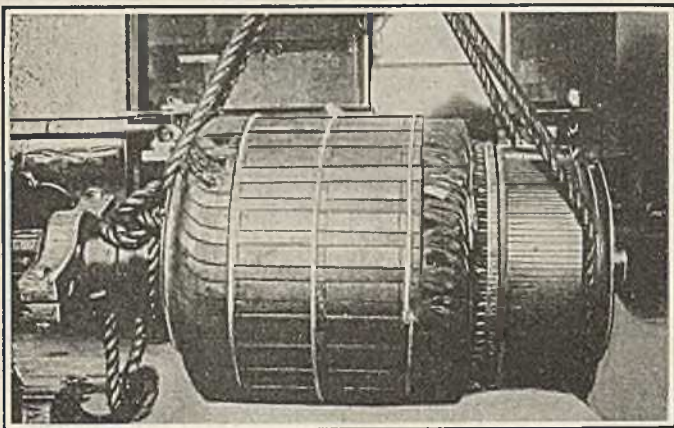


Armature Accident Reveals Advantage Of Asbestos-Insulated Coils

Recently an armature came into our shop for repairs that strikingly demonstrated the advantage of asbestos-insulated coils. In common with many other companies we are using this type of coil insulation on equipment where armature burnouts are frequent. We have found it highly successful. Coils insulated with asbestos compound are considerably higher in first cost than those insulated in the ordinary manner, yet when once they have been installed burnouts and repairs therefor usually cease, for it takes an enormous overload to cause

Asbestos insulation should also be used on switchboard wiring. The advisability of employing this type of insulation in places of this kind was recently demonstrated to me by water getting into the trench in rear of an automatic switchboard. A short circuit, caused by this water, resulted in a blaze that completely destroyed all wiring insulation on the rear of the board. If this job had been connected with asbestos-insulated wire, as all such installations should be, the damage would have been confined to that actually done in the trench.

F. FRASER MACWILLIAMS,
Power Dept., Pennsylvania Coal & Coke Corporation,
Cresson, Pa.



Damaged Armature in Shop for Repairs

Asbestos-insulated wire is finding increased favor for use on mining equipment. If combustible insulation had been used on this armature complete rewinding would have been necessary. This armature has now been running for over a year since the damaged coil was repaired by splicing new conductors into place. Furthermore, the cost of this repair was only a fraction of that which would have been necessary for completely rewinding the armature.

any damage. Some conductors thus insulated have been known to fuse without injury to the insulation.

In the accompanying photograph is shown the armature of a 10-ton locomotive that was rewound with asbestos-insulated coils some time ago. While it was in service a band wire came loose and wedged between the armature and a pole piece, completely cutting through one coil and effectively grounding the entire armature. Had it been insulated in the ordinary manner there is no doubt but that the entire winding would have been burned or charred beyond repair.

When this armature was brought to the shop the damaged part of the coil was removed by cutting at the back and disconnecting from the commutator. New conductors, with the same insulation, were then spliced on and reconnected. The cost of the entire repair was only \$10 as against the \$150 that it would have been necessary to expend in rewinding the entire armature. After a year of service this armature, repaired as above described, is still in use.

Socket Similar to Wire-Rope Type Used for Cable Suspension

Many ways of suspending armored cables are in use at coal mines. A commercial type of suspension clamp which requires special serving of the armor is perhaps the most generally employed. One of the many other types is shown in the accompanying photographs which were made at the Summerlee mine of the New River Co. in Fayette County, W. Va.

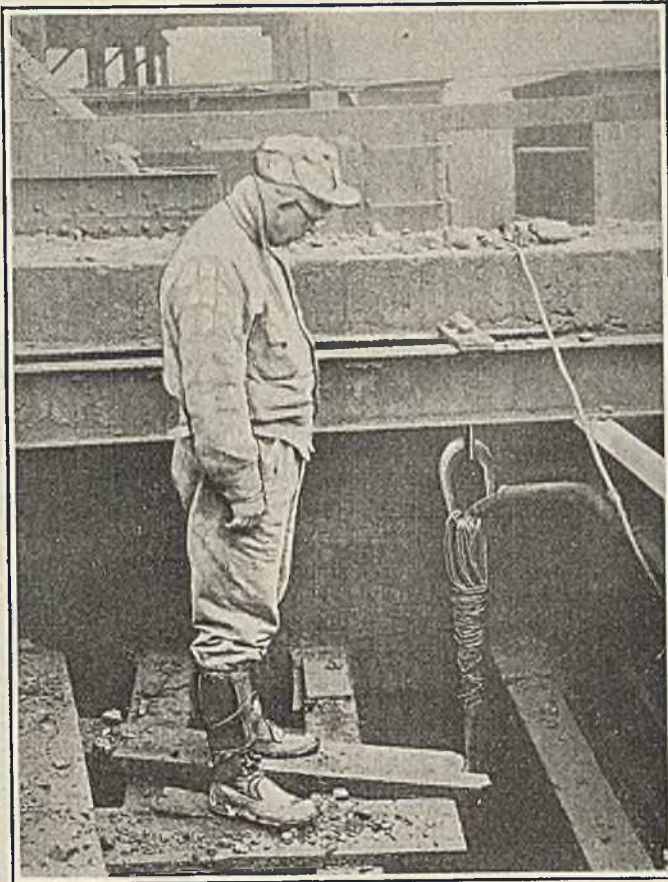
This is the suspension of a 6,600-volt 3-conductor No. 4 cable in a compartment of the 690-ft. main hoisting shaft. The cable is of the standard lead-sheathed and armored type, and is used to carry current at 2,300 volts into the mine for operating two 35-hp. pump motors.

The suspension socket was hand forged in the company's central shop at MacDonald. This socket is tapered on the inside like those used with wire rope.



**Close-Up of Cable
Suspension**

The socket, which was hand forged in the central shop, is tapered on the inside. Babbitt was poured around the cable and the armor wires turned back and served around the cable below the socket. At the right is the end of an iron conduit leading to the substation. This is a 3-conductor, No. 4, cable insulated for 6,600 volts.



Inspecting the Cable Suspension

W. A. Mann, of Scarbro, chief electrician of a division consisting of half of the mines of the New River Co., is making the inspection. The cable is suspended in a compartment of the main shaft which is 690 ft. deep.

Babbitt is poured around the cable in the thimble and the armor wires are turned back and served around the cable below the socket. This type of suspension is standard at the New River Co.'s mines.

Continued Use Is Proving Worth Of Trolley Shoe in Mine

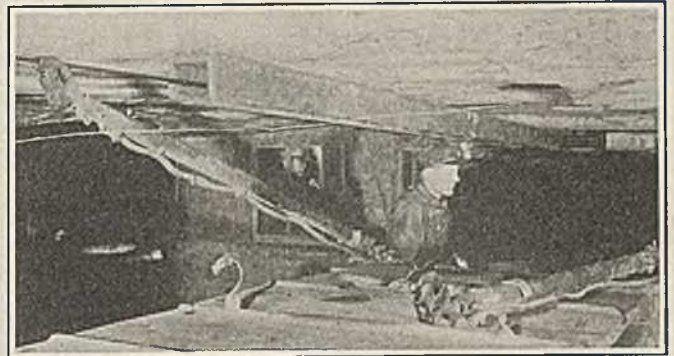
To hear that after service of a year or so, an innovation which during the first few months was loudly acclaimed by the user, has been replaced by standard equipment is not unusual. This, however, is not the case with the trolley shoes used in the No. 2 mine of the Newcastle Coal Co., Newcastle, Ala. It is now more than 18 months since the trolley wheels of the 10-ton locomotives were replaced by shoes, and the mine management is highly pleased with the service rendered as compared to that obtained from trolley wheels.

The accompanying illustration showing two trolley shoes on a 10-ton locomotive in the No. 2 mine is from a recent photograph. Records in the mine office show that the shoes have a life several times as long as that of wheels. To reduce the wear the trolley wires on main haulways are greased once a week with engine oil. The greasing equipment consists of a shallow box a few inches square stuffed with cotton or wool waste and with part of this waste sticking out of the top. The box is filled with oil and then slid along with the saturated waste against the trolley wire.

In answer to the inquiry: "Has the shoe any disadvantages as compared to a wheel?" the mine foreman replied: "None, except that the locomotive can't

be back-poled, and that is against our safety rules." A motorman ventured to explain that it is possible to back pole the shoes in case of necessity.

Even when the 10-ton, 250-volt locomotives are pulling far above their rated capacities there is practically no arcing at the trolley shoes. That a sliding contact is often preferred to a rolling contact is also indicated by the fact that the present-day practice with heavy locomotives at a number of mines is to "spike" the trolley wheel, then turn it a part of a revolution after it



Trolley Shoes in Use on a 10-Ton Locomotive

Trolley wheels lasted less than 10 days on this main haul of the Newcastle Coal Co. The average life of trolley shoes in the same service during more than 18 months, has been 100 working days. The trolley wires are greased once a week with engine oil.

has been worn to the practical limit in the original position.

The shoes, complete, being used by the Newcastle Company do not fit the standard pole heads, so are adapted at the mine by welding. These shoes were purchased from the Miller Trolley Shoe Co., 295 Columbia Road, Boston, Mass.



Keep 'em Tight

Many wrecks of mine-car trips are avoided where care is taken to keep fish-plate bolts tight. When these bolts are loose the joint between adjoining rails is liable to work out of line. The impact of wheels on the offset thus established gradually loosens the spikes of the rail and spreading of the track results.



News Of the Industry



Indiana Miners Broach District Pact; Open-Shop Threat in Pittsburgh Field And Ohio; Snags in Outlying Regions

District settlements as the way out of the Central Competitive Field wangle muddle again came to the fore in the developments in the labor situation in the bituminous industry last week. The idea was directly broached at the district convention of Indiana mine workers at Terre Haute on March 16, when the district scale committee was instructed to endeavor to obtain such an agreement.

The chances for immediate action along such lines, however, do not appear to be very bright. In Ohio and western Pennsylvania the prospects of an early resumption of joint negotiations on any basis seem remote. Operators in the first state reiterate their determination to enter into no agreement which does not embody the continuously competitive wage program of the Toledo meeting and make it plain that little consideration will be given to an invitation to another conference unless such conference promises favorable consideration of their plan. According to a report from St. Clairsville, Ohio, some eastern Ohio operators propose to go a step farther and start open-shop operations shortly after the expiration of the Jacksonville agreement.

Pittsburgh is even more open in its declarations to run the mines in that district without the formality of a union contract. It has been rumored that F. E. Taplin, chairman of the board of the Pittsburgh Terminal Coal Corporation, will head the movement for open-shop operation in western Pennsylvania among the group that met with the union representatives at Florida last month. Mr. Taplin, however, on March 22 categorically denied that he had served any notice on the union that he would run his properties open-shop after April 1. No statement has been issued as to the policy to be pursued by the National Mining Co. The Vesta Coal Co. has been accumulating immense storage reserves in anticipation of a protracted suspension. At the same time, the Jones & Laughlin interests have been developing a non-union property.

Some Outlying Fields Lined Up

In the campaign to line up the outlying districts to continue work on the Jacksonville scale pending the negotiation of a new agreement in the Central Competitive Field, the United Mine Workers appears to have been successful in central Pennsylvania and the Far

West. Michigan, too, has fallen into line. Late reports from Iowa, however, indicate that producers in that state are not yet ready to join in the movement and there is some talk that a definite break with the union is in the making.

The Lewis organization also has struck a snag in its negotiations with the Southwestern operators. Joint conferences started at Kansas City, Mo., last week. Operators from Kansas and Oklahoma proposed a return to the 1917 scale. This proposal, of course, was promptly rejected by the representatives of the union. More significant, perhaps, was the action of the association operators in refusing to acquiesce in the union program for a continuance of operations after April 1 on the Jacksonville basis pending a new agreement. Operators and miners were still in joint session when this issue of *Coal Age* went to press.

Western Kentucky Flouts Union

Western Kentucky producers have informed the miners who held a district convention at Central City on March 14 that the operators will refuse to recognize the union and will decline to meet a district wage scale committee of the men. The position of the coalmine owners was set forth in a letter from J. A. Smith, president of the Western Kentucky Coal Operators' Association, to W. D. Duncan, president; M. F. Chumley, secretary, and R. J. Beard, chairman of the wage scale committee of district 23. Mr. Smith acted as chairman of a committee of operators in Muhlenberg and Ohio counties. Union organizers claim that approximately half the miners in this district are dues-paying members of the United Mine Workers.

Among the other developments in the semi-organized and open-shop fields last week was the announcement that northern West Virginia operators would be invited to meet with the miners to negotiate a wage agreement and the report that southern Colorado workers affiliated with the United Mine Workers would demand an increase in rates of pay. Neither announcement appears to have been taken with undue seriousness by the producers in the territories affected.

"The cry that West Virginia has been used as a pawn for the Central Competitive Field," said Van A. Bittner, chief representative of the international union in northern West

Virginia, "has never been the policy of the United Mine Workers, and we assure every coal operator in northern West Virginia, as well as the general public, that a contract can be negotiated with the coal operators of northern West Virginia by the United Mine Workers of northern West Virginia without any interference whatever from any other district or coal field under the jurisdiction of the union. Peace in the coal fields of northern West Virginia depends entirely upon the attitude assumed by the coal operators."

International headquarters of the union at Indianapolis continues to preserve an unusual silence. The nearest approach to a formal statement was the report that a meeting of the policy committee created at the last convention probably would be called before the first of next month. It was intimated that this committee will have the say as to how general the suspension which will come April 1 shall be. In this connection, an official of the union pointed out that it was within the scope of the power of the committee to go so far as to direct the miners to remain at work pending the negotiation of a new agreement. Provision for working already has been made in the outlying districts. Whether there is a possibility that a like arrangement will be suggested in the Central Competitive Field was not stated.

"Feeler" on District Conferences

Discussing the possibility of district conferences, the report of the scale committee of the Indiana operators, adopted at the Terre Haute meeting last week, said:

It will be our desire and we will endeavor to try to arrange for a conference for the mine workers and operators in the district, but we recognize that it now is very uncertain as to what can be done along this line. We, therefore, recommend that the convention proceed to select its scale committee as provided by our constitution and that, if a district conference is arranged, that the scale committee be empowered to formulate their demands after considering all the scale resolutions presented by this convention, and that a conference be secured with strip operators, if possible, to consider district questions and the same be handled in harmony with our past procedure, and any negotiations be subject to a reconvened district convention.

"The position of the Illinois operators," declared Rice Miller, president of the Coal Operators' Association, after a meeting of that organization at Chicago last Friday, "is exactly as stated following the adjournment of the Miami conference. The operators unanimously feel that the present wage contract forces an unnecessarily high cost of producing coal and crucifies the operator by rendering his cost non-

competitive, without benefiting the miner, who, under the Jacksonville contract, has taken a drastic reduction in annual wages through the loss of working time."

The Chicago meeting, after listening to the report of the scale committee which was in joint conference with the miners at Miami, approved the actions of that committee. The question of further negotiations with the miners was left in the hands of the same scale committee.

The first threat of government intervention in the situation comes from Iowa. Acting upon the request of State Supreme Court Justice F. F. Faville, who is chairman of the Governor's industrial and agricultural commission, Governor John Hammill announced that he would ask George Heaps, Jr., president of the Iowa Coal Operators' Association, and Joseph Morris, president of district 13 of the United Mine Workers, to meet with him in conference in an attempt to forestall a shut-down of the Iowa mines on April 1.

"We shall go at this problem seriously and with the expectation of solving it," the Governor is quoted in a despatch from Des Moines, Iowa. "First will be a thorough study of the situation and then the formation of a program that will take care of the situation, at least as far as Iowa is concerned, and prevent the creation of unemployment that might arise because of a strike."

Would Wind Up Besco Affairs

The financial difficulties of the British Empire Steel Corporation, which operates practically all the coal mining and the steel manufacturing industries of Cape Breton and the adjoining mainland of Nova Scotia, culminated last week in an application to the Supreme Court of Halifax for winding up the affairs of the company. The National Trust Co. of Toronto, which has for some time been receiver for the Dominion Iron & Steel Co., one of the subsidiaries of the corporation, made the application on March 15. Justice Chisholm reserved decision.

Cancels Coal-Mine Insurance

The Associated Companies decided last week to cancel all coal-mine insurance now on the members' books with the exception of a few located in Colorado. Since the Associated Companies a few months ago decided to discontinue the writing of coal-mine risks the business has been dwindling and the volume had reached a point where the expense of properly handling became burdensome, so it was decided to cancel.

The executive board of the Coal Mining Institute of America, with twelve members present, met March 12 at Pittsburgh, Pa., and selected Dec. 7, 8, 9 as the dates for the 41st annual meeting of the Institute. The program was outlined for the coming sessions and David Young, state mine inspector, Freeport, Pa. (recently deceased), was elected as an honorary member of the Institute. The Institute was organized in 1887, Mr. Young joined in 1888.

Hoover Urged to Push Distribution Census To Aid Trade Interests

Herbert Hoover, Secretary of Commerce, has been urged to extend to a number of cities the census of distribution now being made in Baltimore by the Domestic Commerce Division of the Department of Commerce as an experiment to determine the value of this line of investigation. Chambers of commerce and other organizations have made the request, it was stated last week by Secretary Hoover in discussing the work.

Inauguration of a census of distribution has been agitated for a number of years by census officials and business interests as a corollary to the biennial census of manufactures. It being pointed out that while the latter affords an index of the country's production, there is no data as to where the commodities produced are distributed, this was undertaken in Baltimore by the Domestic Commerce Division some months ago in an experimental way. Since then the

department has received many requests for similar studies in other cities.

"It is probable that there are in the United States over 1,000,000 independent enterprises engaged in distribution and many of them distribute their products direct to the consumers," it was declared by William M. Steuart, Director of the Census, in discussing the need for this data. "Under these conditions a census of distribution is essential to a proper analysis and understanding of the manufactures data and to a definite knowledge concerning the number and importance of independent enterprises engaged in the two main branches of our industrial and commercial development."

No additional surveys will be undertaken, however, it was said by Secretary Hoover, until the results of the Baltimore investigation have been carefully studied and the possibilities of such data fully determined.

Retailers Bemoan Inroads On Hard-Coal Trade

Inroads made by other fuels on the domestic anthracite market was the burden of discussion at the ninth annual group meeting of the New York State Coal Merchants' Association at the Hotel Pennsylvania, New York City, March 15. Retailer after retailer told how installation of fuel-oil burners, a growing demand for coke and gas and, here and there, a switch to bituminous had been depriving the anthracite industry of tonnage. Special stress was laid upon the losses to oil because those losses robbed the retailers of some of their most desirable customers.

Spokesmen for the anthracite producers who were present at the meeting vigorously denied that the situation was as bad as it had been painted by some of the retailers. Daniel T. Pierce, vice-chairman, Anthracite Operators' Conference, for example, pointed out the domestic market for No. 1 buckwheat had been expanding rapidly in the past five years, without involving a decrease in the tonnage of the larger sizes. Eliot Farley, president of the Delaware, Lackawanna & Western Coal Co., emphasized the new spirit of the operators in attacking their sales problems, but criticized the dealers on the score of weakness in their own merchandising programs.

Answering the operators' criticism of retailers who had taken a pessimistic view, Roderick Stephens, chairman of the meeting and a former president of the National Retail Coal Merchants' Association, said:

"The dealers today have told of the situation fearlessly and as they have found it. It may not be pleasing to the

operators present, but the facts have been given. We have been told of a paltry 10 per cent growth of buckwheat-size use in normal anthracite-burning cities, but we all know of the building expansion in those cities in the last five years. We know that a 10 per cent greater use of anthracite in five years in such cities really indicates that we have not obtained the normal expansion that our business should have."

Frank Carpenter, New Rochelle Coal & Lumber Co., stated that oil-burner installations in his city up to Jan. 1 had displaced 10,000 tons of anthracite coal and he estimated that 1926 sales of oil burners throughout the country had taken away annual business totaling 2,000,000 tons. Edward Schmidt, Birdsall Coal Co., Mineola, and Hiram Blauvelt, who spoke for Lawrence Beckerle, Comfort Lumber & Coal Co., emphasized domestic and industrial coal losses in Rockland County and on Long Island. Upstate conditions were pictured by C. Solon Kellogg of Rochester and M. T. Bannigan of Utica. Mr. Bannigan thought fuel-oil competition had passed its peak, but saw coke as a more dangerous rival to anthracite.

As typical of what had been done in widening the market for No. 1 buckwheat, Mr. Pierce said that shipments to Hartford, Conn., had jumped from 1,175 tons in 1921 to 14,920 tons in 1926; to Atlantic City, N. J., from 87,715 to 165,708; to Baltimore, Md., from 2,600 to 23,000; to Washington, D. C., from 2,000 to 6,000; to Buffalo, N. Y., from 6,300 to 24,100; to New Rochelle, N. Y., from 1,300 to 9,400; to Syracuse, N. Y., from 25,900 to 42,200 tons. Sales of buckwheat-burning equipment in Eastern states also were showing unusual gains.

Coke Output in 1926 Close to Record Total; Byproduct Sets New Mark

Production of byproduct coke in the United States in 1926 set a new record and the production of all coke—beehive and byproduct—nearly equalled the high marks of 1918 and 1923. The output of byproduct coke was 44,550,000 net tons, as against 39,912,159 tons in 1925, an increase of 12 per cent. The production of beehive coke is estimated at 11,486,000 tons, or 1 per cent greater than that of 1925. The production of all coke showed an increase of 4,769,000 tons, or 9.3 per cent, and amounted to 56,036,000 tons.

The figures for byproduct coke are based on monthly reports from each producer, received currently, and are subject to very slight revision in the light of final detailed reports for the year as a whole. The figures for beehive coke are estimates based on shipments reported by 23 of the principal railroads serving beehive coke ovens.

The year 1926 was further notable for the high percentage of the total output coming from byproduct ovens. In spite of the heavy demand for coke, the proportion contributed by the beehive ovens was the lowest on record—only 20.5 per cent of the total. This is a remarkable shift since 1918, when 54 per cent of the supply came from beehive ovens, or even since 1923, when they furnished 34 per cent. In a year of active demand the beehive ovens supplied even less than they did in 1921, a year of acute depression.

Output of Byproduct and Beehive Coke in the United States, 1913-1926

Year	Net Tons Produced			Per Cent of Total Output	
	Byproduct	Beehive	Total	Byproduct	Beehive
1913	12,714,700	33,584,830	46,299,530	27.5	72.5
1915	14,072,895	27,508,255	41,581,150	33.8	66.2
1917	22,439,280	33,167,548	55,606,828	40.4	59.6
1918	25,997,580	30,480,792	56,478,372	46.0	54.0
1919	25,137,621	19,042,936	44,180,557	56.9	43.1
1920	30,833,951	20,511,092	51,345,043	60.0	40.0
1921	19,749,580	5,538,042	25,287,622	78.1	21.9
1922	28,550,545	8,573,467	37,124,012	76.9	23.1
1923	37,597,664	19,379,870	56,977,534	66.0	34.0
1924	33,983,568	10,286,037	44,269,605	76.8	23.2
1925	39,912,159	11,354,784	51,266,943	77.8	22.2
1926	44,550,000	11,486,000	56,036,000	79.5	20.5

Coke output tends to follow the production of pig-iron, but the influence of the demand for household fuel caused by the anthracite strike is evident in the record for January, February and March.

Estimated Monthly Production of Byproduct and Beehive Coke

Month	(In thousands of net tons)	
	Byproduct Coke	Beehive Coke
Monthly average 1924	2,832	857
Monthly average 1925	3,326	946
January, 1926	3,811	1,380
February	3,506	1,402
March	3,787	1,158
April	3,618	982
May	3,739	887
June	3,628	811
July	3,786	787
August	3,757	752
September	3,654	820
October	3,814	867
November	3,744	860
December	3,706	780
Total, 1926	44,550	11,486
Average	3,712	957

That beehive coke has come to occupy the position of an auxiliary source of supply, chiefly called upon to supple-



Entrance to New Virginia Mine

Portal of Faraday operation of the Pocahontas Fuel Co. Located in Tazewell County, Virginia, this modern plant, which is still in process of development, is expected to have an output of 6,000 tons per day.

Estimated Output of Beehive Coke, By Groups of States, 1923-1926

States	1923 a	1924 a	1925 a	1926 b
Pennsylvania and Ohio	16,588	8,611	9,730	9,329
West Virginia and Virginia	1,597	815	912	1,127
Ala., Ky., Tenn. and Ga.	587	374	299	595
Colorado, Okla. and New Mexico	337	295	230	256
Washington and Utah	271	191	184	179
	19,380	10,286	11,355	11,486

a Final figures. b Estimated from railroad shipments.

Rochester, N. Y., fired 37 of its battery of 60 ovens, the remainder going into operation in September. In April the Jones & Laughlin Steel Co. put into operation its new plant at Aliquippa, Pa. During November the Consolidated Gas Co. of New York City started making coke. Besides these new plants there were about 520 ovens added to plants already in existence. At the close of the year there were in the neighborhood of 900 ovens under construction, 65 of which were at two new plants.

With the addition of more than 650 new ovens during 1926, the potential coking capacity of byproduct plants at the close of the year, at 100 per cent operation and all conditions favorable, amounted to about 50,500,000 net tons. If all of the ovens now under construction are put into operation during 1927 as contemplated, the coke plants will be capable of turning out, at 100 per cent operation, more than 56,000,000 tons. At this rate the plants in existence have a coal-carbonizing capacity of 72,000,000 tons of bituminous coal, which will be later increased to 81,000,000 tons through the addition of new ovens.

Output of Byproduct Coke, by States, 1925 and 1926

State	(In thousands of net tons)		Increase, 1926 Per Cent	
	1925 a	1926 b	Tons	Per Cent
Alabama	4,582	4,780	198	4
Colorado	490	593	103	21
Illinois	3,012	3,338	326	11
Indiana	5,142	5,954	812	16
Maryland	1,019	1,122	103	10
Massachusetts	535	633	98	18
Michigan	1,751	1,827	76	4
Minnesota	518	629	111	21
New Jersey	904	928	24	3
New York	2,220	2,669	449	20
Ohio	7,105	7,428	323	5
Pennsylvania	9,853	11,617	1,764	18
Tennessee	89	119	30	32
Utah	168	185	17	10
Washington	41	41	0	0
West Virginia	1,056	1,118	62	6
Ky., Mo., R.I. and Wis.	1,427	1,569	142	10
	39,912	44,550	4,638	12

a Final figures. b From monthly reports furnished by operators.

U. S. Chamber of Commerce To Study New Business Era

Under the general heading, "The New Business Era," problems of current interest to American business will be considered at the fifteenth annual meeting of the Chamber of Commerce of the United States to be held at Washington, May 3-5. The new competition, with entire groups battling for markets; hand-to-mouth buying, installment selling, improved business standards, trade relations committees, more adequate statistical information, simplification, elimination of waste and a score of other modern developments in business will be discussed.

In connection with the annual meeting it is planned to hold a joint general session with the business men and officials from Latin America, who will be in Washington for the third Pan-American commercial conference. The program also provides for a meeting of the American section of the International Chamber to discuss world trade problems, particularly barriers hindering the free flow of commerce among the nations.

ment the production of the byproduct ovens, is becoming increasingly apparent. The highest percentage from the beehive ovens—28.6—occurred in February, when the demand for anthracite substitutes was at its height, and the lowest percentage—16.7—in August.

Pennsylvania, as always, was the largest producer of beehive coke, but its output decreased slightly as compared with 1925. In the Middle and Southern Appalachian States, on the contrary, an increase occurred, while west of the Mississippi there was little change.

Pennsylvania, of late years, has also become the largest producer of byproduct coke, and since 1924 has produced more byproduct than beehive coke. The output of its byproduct ovens in 1926 was 11,617,000 tons. As a producer of byproduct coke Ohio ranks second, Indiana third, Alabama fourth, and Illinois fifth.

Three new byproduct plants started production in 1926. During March the Rochester Gas & Electric Co. of

Impression Growing in Washington That There Will Not Be a General Strike of Bituminous Coal Miners

By Paul Wooton

Washington Correspondent of *Coal Age*

The growing impression that there will be no general strike of union bituminous miners on April 1 is given further impetus by the signature of temporary agreements, in the outlying fields, extending the Jacksonville scale until such time as wages can be fixed in the Central Competitive Field.

Recently the operators of central Pennsylvania voted to suggest that such an extension be allowed in that region. Now comes the text of the agreement for the State of Wyoming. It follows:

"It is hereby mutually agreed between district No. 22 of the United Mine Workers, acting under the instructions issued by the International Policy Committee at Miami, Feb. 23, and the Northern Wyoming Coal Operators' Association and the Southern Wyoming Coal Operators' Association; respectively, that the agreement in effect at this date and which expires by limitation March 31, 1927, shall be extended and remain in full force and effect until a new basic wage agreement is arrived at and made effective and that mines located in Wyoming, members of the two above mentioned coal operators' associations, will continue in operation under what will be termed an extension of the existing wage agreement, commonly referred to as the Jacksonville agreement. It is further agreed that after such new basic wage agreement is arrived at representatives of District No. 22 and the two coal operator associations will, as soon as possible thereafter, meet in Cheyenne to establish a wage scale predicated on said new basic wage agreement, the mines to continue working in the interim."

Similarly there has been an understanding, or one shortly will be signed, in the other districts west of the Mississippi River.

This leads some to think that President Lewis has done the statesmanlike thing and has avoided a general conflict in which no one but the non-union operator could have profited, but in which the union itself stood to lose more territory.

In fact the definite conclusion of agreements in the outlying fields has

EDITOR'S NOTE—The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and COAL AGE editorial policy; neither do they necessarily represent Mr. Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically stated.

made it much less likely that there will be any general suspension of production even in the Central Competitive Field. By this action the miners have indicated their desire to settle with all who will agree to continue the status quo. Forty per cent of the Illinois operators are understood to be willing to sign. Practically the same situation exists in Indiana. Indications, therefore, are increasing that the only strikes will be at individual mines and even those may be confined to eastern Ohio and western Pennsylvania.

That the union organization with most of its present membership at work could pay strike benefits and keep its members out of mines refusing to sign, is apparent. Regardless of how long drawn out or how disastrous to the operators and the miners involved, it seems practically certain that no shortage of coal will be created and that there will be small, if any, price increase over the country as a whole.

In this connection it is pointed out that the time seems to be passing when a single group can pinch the public and force some one to do something. Increasing significance is attached in Washington to the part which five years of soft coal peace has played in keeping the country on a high plane of prosperity. The curve of business climbed to its present high level in 1923. With few fluctuations it has stayed on that level for four solid years. The consensus of opinion seems to be that the absence of any major labor disturbance during the period has had an important bearing on the maintenance of this highly desirable condition of business.

Coal Conference Next Year At Carnegie Tech

A second International Conference on Bituminous Coal will be held at the Carnegie Institute of Technology, Pittsburgh, Pa., in November of 1928, according to an announcement by Dr. Thomas S. Baker, president of the institution. The statement is contained in recently issued volume of proceedings of the first conference held Nov. 15 to 18 of last year.

The first conference, which was called by President Baker, was for the purpose of finding new uses for bituminous coal and especially to discuss the problem of liquefying coal to supplement the petroleum oil supply of the world. More than 1,700 delegates, including representatives of thirteen different countries, attended. President Baker stated that the second conference will be planned to uncover whatever new information is made available during the coming two years regarding various problems in the use of soft coal.

British Engineer Urges Powdered Coal Tests

Experimentation with powdered coal as a means of reducing operating costs of steamships was recommended by C. M. Burls, president of the British Society of Consulting Marine Engineers and Ship Surveyors, at the annual dinner of the society in London.

When Dr. Diesel built his first engine, Mr. Burls said, it was run on coal dust, and he ventured the prediction that eventually internal-combustion engines may be run entirely on the same fuel. "If our engineers had spent as much time in experimenting with powdered coal and high pressure steam as they have done with the internal-combustion engine," he added, "we should now have a turbine, with powdered coal and high pressure, running a very close race with the Diesel engine."

"What could be better than experimenting with British coal? In America they have achieved a high pressure with steam of 650 lb.; in Germany they have got 560 lb.; in this country, I believe, they have only gotten 350 lb."

"I very sincerely hope the trial ship King George V. will prove a very great success, and that many others will follow. One of the important things needed to help that work to progress," he said, "is to find new metal alloys which will stand the superheated gases."

Will Canvass Foreign Trade At National Convention

The fourteenth National Foreign Trade Convention will be held in Detroit, Mich., on May 25-27. The chairman, James A. Farrell, president of the United States Steel Corporation, in issuing the call for the convention, stated that the object is "to afford opportunity for thoughtful examination of the present condition and future possibilities of our foreign trade; to stimulate co-operation in the best use of our resources and to secure the judgment of practical and experienced traders on the problems that confront us."

The program includes general and group sessions. The general sessions will cover only subjects affecting foreign trade as a whole, the addresses dealing with economic fundamentals applicable broadly to all international commerce. The group sessions will give intensive consideration to specific questions affecting a particular phase of foreign trade.

Participants will include many concerned in the development of foreign trade, including agriculture, commerce, finance, industry, transportation and education, as well as chambers of commerce, boards of trade, national and state associations and other industrial and commercial organizations.

Remarkable Efficiency In Use of Fuel Achieved By Utility Power Plants

Efficiency in the utilization of fuels by electric public-utility power plants throughout the United States has shown a remarkable increase in the few years since the World War, according to the Geological Survey. This efficiency was forced primarily by the large advance in the cost of fuel brought about by the war and the continuance of the high costs in general during the intervening period. A summary of the report follows:

"The electric utilities, with these tremendous increases in items representing more than 80 per cent of the cost of operation, were faced by a public opinion which was hostile to any increase in rates, and on this account no relief could be obtained through appeal to the public utility commissions. The power companies were therefore forced to seek methods of reducing costs of operation, and they soon found a broad field for such reduction in the better utilization of fuels. From 1919 to 1925 they have shown an increase of efficiency in the average utilization of fuel amounting to 52 per cent, as measured by the average number of kilowatt-hours generated by the consumption of a ton of coal, with the result that electricity is one commodity in common use which is costing the consumer less now than before the war.

"Improvement in design and increase in size of plants, interconnection, and increase and betterment of load have all helped to reduce the fuel rate, but the spur back of all these improvements was the increased cost of fuel that threatened profits. Coal is the dominant fuel used in the production of electricity, and the increase in efficiency of coal utilization has been general. The average consumption of coal per kilowatt-hour of electricity in 1925 was about 2.1 lb.

Economy Limit Reached

"During the last year or so the best coal-burning plants have produced a kilowatt-hour of electricity with about 1 lb. of coal, and at the same time gas and oil burning plants have been built that produce a kilowatt-hour with about 13 cu.ft. of gas and between 425 and 450 kw.-hr. to the barrel of oil. These figures mean that a kilowatt-hour of electricity is now being produced with about 14,000 B.t.u. by the use of each of the three fuels—coal, oil, and gas—an accomplishment which of course should always have been possible and probably would have been attained except for the abundance and consequent relative cheapness of oil and gas in the regions where they are used.

"The limit in the reduction of fuel rates under present conditions apparently has been nearly if not quite reached, as the capital charges for fuel-saving equipment about equal the gain they effect in fuel saving. The public utility companies might well bend their energies to making the average of all plants nearer that of the best plants. For example, if only a quarter of a pound of coal had been

Consolidation Coal Output Breaks Record

Besides reporting the best earnings since 1923 last year the Consolidation Coal Co. made a new record for output with 15,058,804 tons. Of this, 11,901,437 tons was produced by the company and 3,157,367 tons by lessees. The total was 40 per cent greater than the 10,794,903 produced in 1925 and 23 per cent greater than previous high of 12,201,850 tons produced in 1915.

In 1922, the year of the five-month miners' strike, Consolidation Coal produced 6,599,085 tons. In the following year, before non-union production attained anything like its present importance, production reached 11,444,584 tons. But in 1924 non-union operations offered increased competition in a period of declining industrial activity and output fell back to 10,075,068 tons.

Nearly \$3,000,000 was invested in replacements and improvements to the property during the last year.

saved for each kilowatt-hour of electricity generated by the use of fuels in public utility power plants in 1926, the saving of coal would have amounted to about 6,000,000 tons, which represents about \$25,000,000."

Labor Bodies May Co-operate In Legislative Program

Possible attempt to align the mine workers of Indiana with the Indiana Farm Bureau Federation, the State Federation of Labor and the four big railroad brotherhoods in the selection of state Representatives and Senators as well as for co-operation on a program of future legislation was forecast in two addresses made recently at the biennial convention of District 11, United Mine Workers, at Terre Haute. Edward Livingston, miner Representative from Knox County, who introduced the rock-dusting bill in the state Legislature, asserted that the Legislature was more important to the miners than the joint wage conference because it regulated practically all the phases of their work and life.

Livingston said that the only reason the rock-dusting bill passed was that the representatives of the State Federation of Labor, the four railroad brotherhoods and the mine workers "went down the line" together and "co-operated" on an agreed program of legislation.

The annual meeting of the Canadian Retail Coal Association is to be held in June. The regular meeting place for a number of years has been the King Edward Hotel, Toronto, but this year a departure is under consideration, and the association may meet at Rochester, N. Y.

Medals and Diplomas Awarded Heroic Miners By Holmes Association

Recognition of outstanding instances of courageous and resourceful action on the part of American miners in time of emergency has been given by the Joseph A. Holmes Safety Association in the awarding of medals and diplomas to Thomas Hislop, Wyoming, Pa.; Grover Wilson, Eccles, W. Va., and Thomas Trewartha, Ironwood, Mich.

The award to Thomas Hislop, assistant mine foreman of the Mt. Lookout mine, Temple Anthracite Coal Co., Wyoming, Pa., was made in recognition of meritorious service in the saving of the lives of 63 men on the occasion of a fire in that mine on May 27, 1926. Hislop deliberately took the risk of losing his own life when he changed the course of the mine ventilation current, which was necessary to protect the imprisoned miners. Although his escape seemed quite improbable, the fire was ultimately brought under control and Hislop was able to conduct the 63 men to the surface, after 5 hours of imprisonment.

The diploma and medal awarded Grover Wilson, miner in the No. 5 mine of the Crab Orchard Improvement Co., Eccles, W. Va., were in recognition of heroism performed in an effort to save the life of L. C. Blair, a fellow workman, on March 9, 1926. An explosion occurred in this mine on March 8, resulting in the death of 19 men. In a part of the mine not affected by the explosion, a number of miners who were unable to escape by reason of the presence of afterdamp between them and the shafts, built a barricade, behind which they took refuge. In company with the foreman, Wilson and Blair undertook an exploration in an effort to reach the shaft. These two, while a considerable distance in advance of the foreman, encountered the poisonous afterdamp and fell. Wilson, however, had sufficient strength to crawl and drag the helpless Blair for 200 ft. back, but was too weakened to complete the rescue. Wilson was subsequently rescued, but Blair unfortunately died.

Trewartha, shift foreman at the "G" Pabst shaft of the Oliver Iron Mining Co., Ironwood, Mich., was imprisoned with 42 other men by a cave of roof material on Sept. 24, 1926, and held without any avenue of escape for 130 hours. The initiative and resourcefulness of Trewartha in caring for the men in his charge and in directing the construction of a bulkhead across the shaft, which prevented the caved material from falling farther down the shaft, and which contributed to the safety of the rescuers who ultimately reached the imprisoned men, was accorded high commendation by the association.

Ten anthracite cargoes had been loaded by one company at Buffalo at the middle of March and the eleventh cargo was loading. Other companies are expected to start loading soon.



News Items From Field and Trade



ILLINOIS

February Output Declines. — There was a decline of nearly 300,000 tons in coal output in Illinois during February as compared to January, according to a report by the state Department of Mines and Minerals. The short month was the principal cause of the decrease. Production in February from 227 mines totaled 8,096,303 tons with the mines working an average of 19.3 days and employing 72,102 men. Production in January from 226 mines totaled 8,391,428 tons with the mines working an average of 20.2 days and employing 72,259 men. In February 18 mines in Franklin County hoisted 1,796,568 tons, 27 mines in Williamson County mined 981,331 tons and 17 mines in Saline County produced 480,214 tons. Fourteen strip mines produced 314,331 tons, working an average of 16.2 days and employing 10,006 men.

To Electrify Consolidated No. 7. — No. 7 mine of the Consolidated Coal Co., located at the east edge of Herrin, is to be electrified. The Central Illinois Public Service Co. is running high-tension lines to the mine. Old No. 7, sunk 34 years ago, was the first coal mine at Herrin. The Big Muddy Coal & Iron Co. sunk No. 7 as well as No. 8 mine, at Clifford, four miles northwest of Herrin. The Consolidated bought out the Big Muddy several years ago. It has been two years since No. 8 worked, but since that time it has been electrified and will hoist coal again as soon as conditions allow. About five hundred men are employed at No. 7, and the mine has worked practically every day since last September.

Large Strip Mine Planned. — The Mississippi Coal Corporation has negotiated options for the purchase of the Solar Coal Co., two and a half miles south of Freeburg. If the deal is closed the new owners will convert the mine into one of the largest strip operations in southern Illinois. The Mississippi Coal Corporation has filed for record options on a total of 16,700 acres in Freeburg Township. The Solar Coal Co. holds 400 acres.

Zeigler No. 1 Going Strong. — Bell & Zoller No. 1 mine, at Zeigler, recently set a new hoisting record of 8,986 tons, against the previous high mark of 8,851 tons made on Dec. 30, 1926. The mine also set a new mark by employing 1,396 men on the work. The hoist represented 2,224 pit carloads or enough to fill 171 railroad coal cars. It required 937 skips. There was a delay of but 17 minutes during the day's work.

Extensive Stripping Planned. — The Apex Coal Corporation, capitalized at

\$1,050,000, plans extensive stripping operations in Williamson County soon. The mine is expected to be one of the largest strip operations in the United States when completed. George G. Haas is president, and A. M. Oliver, secretary-treasurer. Mr. Haas was formerly with the Worth-Husky Coal Co., Chicago, and Mr. Oliver was identified with the Sola-Sturgis Manufacturing Co. of Chicago. The mine is in the southeastern part of the county.

The Malcomson Corner Coal Co., Pleasant View, has struck coal on an incline depth of 100 ft. A tippie will be erected at once.

The Hilltop mine, Farmington, has closed down due to labor trouble and slackening demand.

INDIANA

Indiana mine workers, who recently held their convention in Terre Haute, passed a resolution calling upon the grand jury in Gibson County to make a thorough investigation of the recent explosion in the Francisco mine, where 37 men were killed and 21 injured. The action supports a resolution adopted by the Indiana mining board a month before. The convention defeated a large number of resolutions brought to the floor from committee, one of which provided for a district funeral benefit fund.

Ignited by an explosion caused by a gas feeder, the Ferris coal mine, near Oakland City, caught fire a few days ago and the mine has been sealed in order to smother the flames. The fire had gained great headway and it will require several weeks to extinguish the flames it is said.

The Diamond Coal Co., of Evansville, has filed a preliminary certificate of dissolution.

KENTUCKY

Mining operatives and sales representatives of the Blue Diamond Coal Co. gathered at the Hotel Gibson, Cincinnati, March 7 and 8 for the annual conference to thresh out problems of interest to the collective organization. Talks were made by James Bonnyman, president; Fred Gore, vice-president of sales, and Vice-Presidents H. C. Williams of Middleboro, Ky., and W. H. Seinknecht of Blue Diamond, Ky. It was reported that last year's output was 3,000,000 tons. These get-togethers of the heads of departments are annual affairs.

U. S. District Judge Charles I. Dawson, of Louisville, is expected to approve the receivership decree in the Carbondale Coal Co. bankruptcy case within a few days, when the property

will be offered for sale, according to information from Madisonville. The company has been under the jurisdiction of the federal court since March 26, 1926. Cecil H. Smith of Birmingham, Ala., and Allen W. Mason, of Baltimore, Md., were appointed receivers by Judge Dawson. Mr. Smith has been the active receiver, with headquarters at Madisonville.

The Fordson Coal Co., a Delaware corporation, having large holdings in eastern Kentucky, has filed an appeal with the U. S. Court of Appeals, from decision of Federal Judge A. M. J. Cochran of the Eastern Kentucky District court. Judge Cochran dismissed a suit of the company to gain possession of several hundred acres of coal land on the Kentucky River in Clay County, holding that D. M. Bingham, of Pineville, an heir to George V. Turner, former owner, was entitled to the property.

It is reported from Jenkins that the Consolidation Coal Co. will do considerable building this season, starting at once. It is said the company will build at least 500 modern miners' houses at the four plants at Jenkins, McRoberts, Burdine and Dunham. The company at this time is completing extensive improvements to store buildings in the several districts.

The North Jellico Coal Co., Louisville, has completed negotiations for leasing the mining plant at Wilton, Knox County, to Adkins & Culp, Knoxville, and Green of Harlan. At one time this plant was the largest coal operation in Kentucky. The new owners take over approximately 2,000 acres around the Wilton plant and all equipment and houses. They will organize a company to operate the plant. The Wilton mines were opened two years ago and coal unmined will assure several years' additional run. The North Jellico Coal Co. will confine its operations to its Harlan and Bell county mines and to prospective development of Leslie County holdings, which are expected to be reached within the next two years by a railroad extension.

The Nashville Coal Co., Louisville, has renewed an arrangement with the Louisville Gas & Electric Co. whereby it operates that company's mines at Echols, and in turn supplies it with steam coal for operation of its big power plant at Louisville, under contract.

Elk Horn Earnings Mount. — The Elk Horn Coal Corporation reports net earnings for 1926 of \$479,780, after taxes and charges. These earnings are equivalent to 35c. a share on the com-

mon stock, after preferred dividend requirements, and compare with \$311,802, or \$2.36 a share on the preferred stock in 1925. Gross earnings were \$5,270,841, against \$5,033,971. The surplus in each year was the same as the net earnings, no dividends having been paid in either year.

After litigation lasting since last July, the federal court at Louisville has decided that the fire insurance companies operating in Kentucky could increase fire insurance rates by 12½ per cent, provided the money obtained from the increase is impounded, or bonded, so that it can be paid back, in the event similar suits in Missouri and Arkansas, now before the U. S. Supreme Court, are decided against the companies.

MISSOURI

May Reopen Bevier Mine.—The Central Coal & Coke Co. is reported to be considering reopening its mine at Bevier. The mine employed from 500 to 600 men when active. It shut down March 31, 1924, when the Jacksonville scale was signed and has not been opened since. It is situated over a coal bed from 4 to 5 ft. thick running from Macon to Bevier. Mine No. 24, owned by the same company, was abandoned some time ago and has been dismantled. That mine employed from 300 to 400 men when working. The Star, a co-operative just north of Bevier, is working 36 men affiliated with the United Brotherhood of Miners. The outcome of negotiations between the United Mine Workers and operators of the Central Competitive Field may determine whether the Bevier mine will again become active.

Strip Mine to Produce Soon.—The largest strip mining activity in Missouri is under way at Russell and in a short time actual production of coal will be started. The Winston-Dear company has spent hundreds of thousands of dollars in its preliminary work and it is expected that at an early date the daily production will be from 500 to 1,000 tons, depending on the thickness of the seam where the shovel is working. Equipment already

purchased includes one steam shovel costing \$118,000, a smaller shovel, two locomotives, a 120-hp. Diesel engine, several hundred feet of railroad track, 10,000 ft. of narrow-gauge track, 30 four-ton cars for hauling the coal from the mine to the railroad, several flat cars, and a giant tippie for the crushing and the screening of the coal. One hundred and twenty men are employed at the mine now. The Howard County Coal Mining Co. owns the project, which was conceived by Arthur Marriott of Moberly and Evan Jones of Higbee.

NORTH DAKOTA

Lignite shipments within North Dakota and outside the state are growing, according to figures compiled by the State Railroad Board. For the seven weeks ending Feb. 19 there were 25,989 tons of lignite shipped out of the state and 223,316 tons shipped within the state. For the same period of 1926, which was the biggest year of lignite production, the shipments out of the state totaled 20,415 tons and within the state 171,460 tons.

NEW YORK

Denies Cut in Burns Dividends.—Following a sharp decline in the A and B shares of Burns Brothers on the New York Stock Exchange last week there was a report in Wall Street that there might be some readjustment in the 10 per cent dividend now being paid on the A shares and in the 2 per cent dividend on the B shares. Sanders Wertheim, president of the company, immediately denied the report, saying: "There has been no discussion of a reduction in the dividends on our stocks, and at the April meeting we will declare the regular payments of \$2.50 a share on the Class A and 50c. a share on the Class B stock." The latest statement of the corporation was that for the twelve months ended on Dec. 31, 1926, when the net income was shown to be \$2,420,000, equal to \$15.17 earned on the Class A common and \$7.17 on the Class B common.

The movement of anthracite up the

lakes from Buffalo this year will exceed that of last year, in the opinion of J. H. Davis, president of the Lackawanna Coal Co., who was in Buffalo the other day, accompanied by W. W. Inglis, president of the Glen Alden Coal Co.

OHIO

The mine of the C. A. Mullen Coal Co., near Crooksville, has resumed operations after a shutdown of six months. About 75 miners are employed.

Bondholders of the Vulcan Coal Co., near Middleport, have purchased the property of the company at receiver's sale for \$50,000 and are making preparations to start operations.

PENNSYLVANIA

Urges Safety Survey.—A joint resolution providing for the appointment by the Governor of a commission of seven members to investigate the geological formation and strength of bituminous coal for the purpose of recommending legislation to safeguard the health and lives of coal miners, was passed finally by the House March 15 and sent to the Senate. The measure, by Representative Rieder, Beaver, further provides that the commission draft legislation to provide safe and practicable thickness of barrier pillars between adjoining mining properties. An appropriation of \$10,000 for expenses of the commission is provided. The commission would report to the 1929 Legislature.

The Hazleton school district has been informed by the Lehigh Valley Coal Co. that unless it wants the vocational school there damaged by mine caves it had better arrange to purchase the coal beneath the building. It is understood the pillar coal under the school is worth around \$50,000 and the coal company says it intends to take out this coal unless the school district arranges to buy it. The coal company claims a legal right to mine beneath the school, lawyers have said.

To Take Action on Cave-ins.—Due to the fact that operations of the Barron Coal Co. in South Scranton have endangered public highways, the District Attorney's office is preparing to take action against the firm under the Kohler law. Under this law coal companies are forbidden to mine under streets unless waiver clauses are included in contracts of title. Prospect Avenue in South Scranton has been virtually ruined by caves.

Bandit Round-up Near.—One of the participants in the \$104,000 payroll robbery of the Pittsburgh Terminal Coal Co., near Coverdale, March 11, has been captured. He has confessed, implicating five others, who also are said to have been responsible for a number of other payroll robberies. About \$32,000 of the loot has been recovered, and the authorities hope to capture the other bandits soon.

Administration Men Opposed.—Rinaldo Cappelini, president of District 1, United Mine Workers, will be unopposed for re-election June 14 unless an anti-administration candidate enters the field at the last minute. George Isaacs,



View at Gary, W. Va.

Here are located the central repair shops and power plant of the West Virginia operations of the United States Coal & Coke Co. The shops are in the foreground. Bone coal running as high as 40 per cent in ash is shipped from several of the company mines to Gary, where it is pulverized and utilized as fuel in the central plant. In the upper right of the photograph are several of the official houses.

of Wilkes-Barre, has announced his candidacy for vice-president, opposing Michael Kosik, incumbent; Walter Harris will oppose Enoch Williams for secretary-treasurer, and Alex Campbell is in the field for international organizer against Dennis Brislin. So far the board members have no opposition. They are John Boylan, first inspection district; James Gleason, second district; John Ruane, third district, and John Kmetz, fourth district.

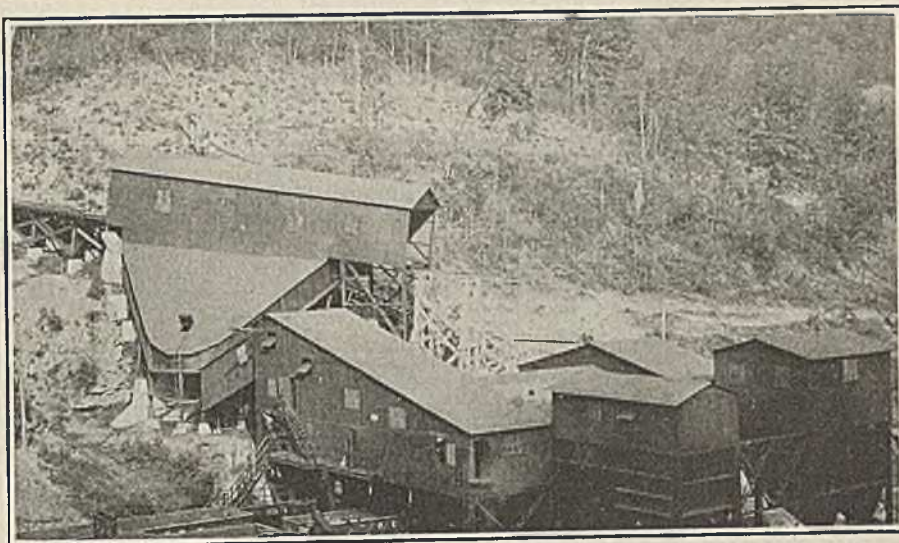
Coal companies in Luzerne County recently won a fight to oust school directors in Hanover township against whom graft charges had been filed. Ninety per cent of the taxes in the community are paid by coal companies.

Plans Full-Time Operation.—A. B. Jessup of Hazleton, general manager of the Jeddo-Highland Coal Co., has worked out details of a plan for full working time at his mines. He hopes, it is said, to submit the idea to other hard-coal operators. The Hazleton operator proposes that the mines be worked steadily and the coal stored if necessary. The miners would be paid for the fuel that is mined and shipped and would receive due bills for the coal stored. These due bills would be turned into cash in the late fall when the coal reserves were sent to the markets. Just what action will be taken on the proposal by the miners' union remains to be seen.

To Modernize Banner Plant.—Hall Bros. & Co., Inc., who bought the property of the Banner Coal Mining Co., at Osceola Mills, has been operating the mine since about the first of this year. A reorganization of the company has been effected and officers elected as follows: Charles F. Kerchner, president and general manager; Charles F. Kerchner, Jr., vice-president; J. O. Knight, secretary and treasurer. The principal office of the company is now at 701 Continental Building, Baltimore, Md. The company owns about 400 acres of the best "B" Seam coal in central Pennsylvania. The plan is to modernize the operation and increase the output.

VIRGINIA

To Train Safety Teachers.—A class for training teachers in mine safety and accident prevention began its sessions March 14 in the Federal Building, Norton, with 23 members enrolled. The men composing the class came from Dunbar, Pardee, Derby, Roda, Stonéga, Toms Creek, Cranes Nest, Blackwood, Linden, Colvin, Imperial, Clinchco, Dante, Norton, Wilder, Drill, Dooley, Benedict, Kemmerer, Gem Dorchester and Jewell Ridge. E. H. Graff, in charge of the Norton Station, U. S. Bureau of Mines, is directing the work, assisted by D. M. Borum, conference leader, Virginia Department of Industrial Education. This initial step has been taken as a result of a careful study made of the subject by a special committee of the Virginia Coal Operators Association headed by G. M. Thorn, general manager, Blackwood Coal & Coke Co. The U. S. Bureau of Mines, J. J. Forbes, supervising engineer, instruction section, and the Virginia Department of Industrial Education, B. H.



Tipple at Bonny Blue Mine of Bonny Blue Coal Co.

This mine, in Lee County, Virginia, was opened in 1924. The monitor dumping bin at the left holds 150 tons. The tipple loads on four tracks, and is equipped with picking tables and shaker screens. At the right are the refuse and domestic coal bins.

VanOot, state supervisor, are co-operating in this work.

C. E. Bockus, president of the Clinchfield Coal Corporation, Dante, stated in a report to stockholders that operations in 1926 averaged 294 working days, and that production aggregated 2,163,245 tons, or 18,352 tons less than in the previous year.

Many coal agencies are preparing to bid for 70,000 tons of Navy Standard low-volatile coal to be supplied to the institutions of the State of Virginia, from April 1, 1927, to April 1, 1928. Bids will be opened by the State's purchasing department in Richmond March 25.

Castner, Curran & Bullitt of Norfolk and New York have been awarded a contract by the City of Danville for 50,000 tons of Navy Standard Pocahontas coal, to be delivered over a period of 12 months, at \$1.90 f.o.b. mines. It is the first contract of any importance awarded in this section this spring.

Mining has been resumed at the Big Vein coal mines, at McCoy, after a shutdown of several weeks. The closing of the mines was made necessary on account of the installation of a large, modern breaker and other important improvements at the plant.

Preparatory to the opening of the Great Valley Coal Co.'s mines, at McCoy, the necessary work is being pushed to completion, and it is expected that a large force of miners will be employed in the very near future. The management is preparing for production on a large scale. All work is being done under the direction of the superintendent. Special attention is being paid to safety features.

WEST VIRGINIA

Island Creek on \$4 Basis.—The Island Creek Coal Co. has declared a quarterly dividend of \$1, placing the recently increased stock on a \$4 annual dividend basis. The last dividend on the old stock, which was split five for one, was a quarterly distribution of \$6,

declared last December, and in the previous three quarterly periods \$4 a quarter was paid. The dividend is payable April 1 to stock of record March 24.

Consolidation Net Higher.—Net income of the Consolidation Coal Co. for 1926 amounted to \$1,037,298, after charges and taxes, equal to \$10.37 a share earned on the \$10,000,000 cumulative 7 per cent preferred stock, on which back dividends amount to 7 per cent. This compares with \$225,606, or \$2.25 a share, earned in 1925.

H. L. Bailey of Iaeger has acquired the mining property of the B. B. & D. C. Coal Co. near Williamson in Mingo County for a consideration of \$17,500. For some time the company has been producing about 400 tons a day but it is indicated that the new owner will increase the output in the near future.

CANADA

The Hamilton By-product Coke Ovens, Ltd., will expend \$1,500,000 on harbor development at Hamilton, Ont., to improve shipping facilities. The plans call for a slip on the company's plant 3,000 ft. long and 200 ft. wide. The company is asking the city to sell a portion of Stipes inlet and if this can be obtained the slip will be continued through this area. Two bridges which will cost \$500,000 are included in the plans. Approval of the federal government has already been obtained.

J. E. McLurg, vice-president of the British Empire Steel Corporation, wired the Department of Mines at Halifax that it had been decided to bank 30,000 tons of coal from the Princess and Florence collieries. The decision follows a conference held at Sydney Mines recently, when representatives of the company, the miners and the Department of Mines discussed ways and means of relieving distress growing out of the seasonal slackness in the northern coal area. The scheme, it is anticipated, will tide over the situation until the reopening of navigation.

Among the Coal Men

John L. Lewis, international president of the United Mines Workers, and Harry Fishwick, president of the Illinois miners' union, will be the principal speakers April 1 when a \$3,000 monument is unveiled over the grave of Frank Bilyeu, who was killed in the Virden riot. Bilyeu is buried in Taylorville. Lewis will discuss the national strike situation. A crowd of 25,000 is anticipated.

D. J. Parker has been appointed district engineer of the U. S. Bureau of Mines with headquarters at San Francisco. He will have immediate charge of the Bureau's contact with mine operations in the five states comprising the district. Mr. Parker is a mining engineer of wide experience and acquaintance.

Lafayette Tuck has been appointed general superintendent of the Cosgrove-Meehan Coal Corporation's mines in Pennsylvania. He was formerly superintendent of the company's mine at Homer City, where he also is president of the Chamber of Commerce. He will continue for the present to make his headquarters in Homer City, moving to Johnstown in the near future.

Howard N. Eavenson, of Pittsburgh, Pa., well-known engineer, president of the Sullivan Pocahontas Coal Co., of Tralee, W. Va., member of the National Coal Association and chairman of the coal and coke committee of the American Institute of Mining and Metallurgical Engineers, will represent the bituminous industry on the program of the annual meeting of the Izaak Walton League of America in Chicago on the afternoon of April 8, in an address on "Mine Water."

P. C. Thomas, division superintendent of the New River division of the New River & Pocahontas Consolidated Coal Co., will have direct supervision of the Ephraim Creek Coal & Coke Co. property, at Thayer, W. Va., recently acquired by the Berwind-White interests. Mr. Thomas' headquarters are at Fayetteville.

Harry A. Crichton, who has been associated with the Johnstown Coal & Coke Co., Johnstown, Pa., since his graduation from Lehigh University, has joined the New York offices of the company, where he will assist his brother in sales activities. The Crichton interests have operations in Pennsylvania, West Virginia and Maryland.

F. C. Menk, who for several years has been in the engineering department of the Island Creek Coal Co., has been promoted to chief of the department, vice H. B. Turner, resigned. Mr. Menk will continue to make his headquarters at Huntington, W. Va.

George R. Schneider, for some time past special representative of the Central Pocahontas Coal Co., with headquarters in Cincinnati, Ohio, has resigned to join the forces of the West Virginia Coal & Coke Co. in Indiana with Indianapolis as headquarters.

Edward Bottomley, the new president of the Rocky Mountain Coal Mining Institute, who was elected at the recent meeting in Denver, Colo., made his start in the coal industry at Oglesby, in the northern Illinois field,



Edward Bottomley

about thirty years ago. Several years later he transferred his activities to Montgomery County, in central Illinois, where he remained until about six years ago, when he joined the forces of the Sheridan-Wyoming Coal Co. in Wyoming. He is general superintendent of that company's operations.

G. H. Merryweather, president of the American Wholesale Coal Association, visited Toronto recently and conferred with Director Charles G. McGill and the officers and committee of the Toronto Wholesale Coal Association relative to the plans and program for the forthcoming annual convention of the American Wholesale Coal Association to be held in Toronto June 1-3. Mr. McGill has accepted the chairmanship of the convention committee, which will be composed of Roscoe B. Starek and members of the Toronto association upon whom Mr. McGill may see fit to call for specific duties. It has been agreed that the banquet will be held at the King Edward Hotel on the evening of June 1, and the principal speaker will be Noah H. Swayne of Philadelphia.

Governor W. J. Fields, of Kentucky, has named seven Kentuckians and one Tennessee man to represent the state at the second annual Industrial Development Congress in Birmingham, Ala., March 21 to 22. The Tennessee man is R. E. Howe, Knoxville, of the Southern Appalachian Coal Operators' Association, which has a number of members in eastern Kentucky. Winston Conley, Pikeville; C. J. Neekamp, Northeastern Kentucky Coal Operators' Association, Ashland; Joe Johnson, Hazard Coal Operators' Exchange, Lexington; E. R. Clayton, Harlan Coal Operators' Asso-

ciation, Harlan, Ky.; T. Russ Hill, Middlesboro; W. G. Duncan, Greenville, and C. F. Richardson, Sturgis, constitute the balance of the delegation appointed by the governor.

Fred G. Koper, tippie engineer and designer, recently embarked for Russia to aid the Soviet government in the introduction of some American methods in coal mining. Three other engineers were in the party, which will be gone between three and four months. The Russian government has set aside a large tract of rich coal land for development, and in seeking for expert advice representatives in this country were attracted to West Virginia coal fields, getting in touch with Mr. Koper through the Kanawha Manufacturing Co., Charleston, where he has been employed for the past fifteen years. He will be associated with the New York firm of engineers, Stuart, James & Cooke.

L. S. Skeem, formerly general superintendent of the Kentonia (Ky.) mines of the Fordson Coal Co., has been promoted to the post of general manager. His headquarters are at Stone, Ky., which is near Williamson, W. Va. The promotion fills the position left vacant by the death of Abner Lunsford.

Obituary

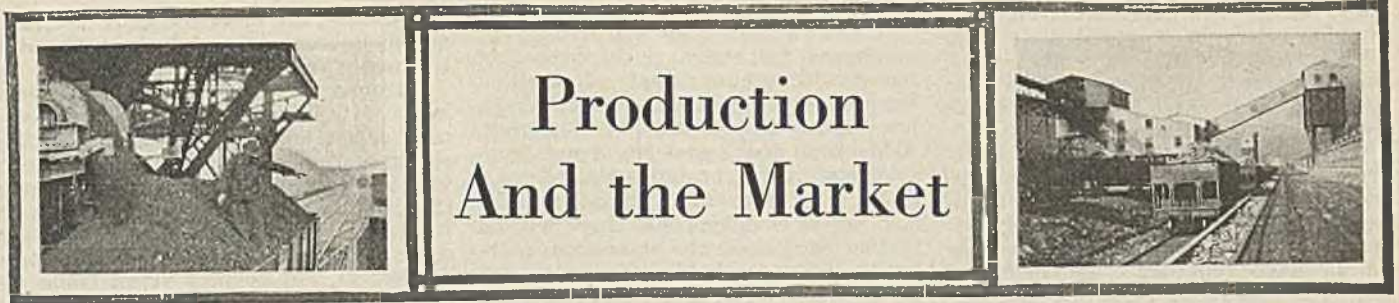
John Lochrie, Jr., general superintendent of the Reitz mines, in Somerset County, Pennsylvania, died at his home in Windber March 15 following a five weeks' illness of heart disease and pleuro-pneumonia. He was the son of the president of the Reitz Coal Co., one of the best known operators in the central Pennsylvania field, with whom he had been associated in the coal business for the last seven years.

James L. Cooley, 42, traveling auditor for the United Mine Workers in district No. 25, died at St. Joseph Hospital, Kansas City, March 14. Cooley was active in the district organization many years and was widely known in the bituminous coal fields of the United States.

Bernard Murphy, 62 years old, a member of the Illinois State Board of Mine Examiners, died at his home in Pana, Ill., of heart disease on March 16. He was appointed to the mine board by Governor Len Small three years ago, and was recognized as one of the state's leading mine authorities. His wife, five sons and three daughters survive him.

Edward E. Girod, state coal-mine inspector in the twenty-third (bituminous) district, Pennsylvania, died at his home in Masontown, Pa., March 12, at the age of 61. He was one of the best known figures in the mining industry of the Connellsville district, where he had been an inspector for fourteen years.

Joseph W. Small, 77 years old, for many years a well-known mine superintendent in southern Indiana, died at the Daviess County Hospital at Washington, Ind., on March 17. He was the father-in-law of Arthur H. Greenwood, member of Congress from the second Indiana congressional district.



Bituminous Prices Weaken on Eve of Suspension; Anthracite Market in Doldrums

Record production and receding price levels tell the story of the bituminous coal markets of the country as the day set for the suspension of production in the Central Competitive Field draws nearer. Evidence of consumer anxiety is not to be had. In some sections, it is true, there has been enough bidding for steam tonnage to bring about modest increases in going spot quotations, but such changes have been the exception and their force is swallowed up by the declines in other directions.

Possibly the most striking evidence of consumer indifference is to be found in the course of prices in the Central Competitive Field. In Illinois and Indiana there have been some sharp open reductions on steam sizes, including Franklin County screenings, and the entire price structure is weak. All sizes of No. 8 Ohio registered advances last week and southern Ohio screenings also were slightly higher. Western Pennsylvania prices were unchanged and the volume of new spot business was nominal.

Non-Union Prices Softer

Non-union operators as a whole are having hard sledding in the matter of sales realizations in the spot market. Smokeless was distinctly weaker in the Midwest and gains made in the New England market reflected no real increase in business. West Virginia and eastern Kentucky prepared sizes of high-volatile coal were off 10 to 25c.

and Kentucky mine-run and slack moving through the Cincinnati gateway softened. The soggy in prices and demand for coals for household consumption was countrywide.

The tidewater markets were uneven. Most of the Atlantic seaboard tonnage handled during the week was applied on contracts or old standing orders. In the day-to-day spot trading, Philadelphia quotations did not suffer, all pools at Baltimore weakened and only pool 1 escaped decline at New York. Boston offered a steady but extremely limited outlet for all-rail coal. In the mining fields, central Pennsylvania coals jumped 5 to 50c., the greatest advance being on pool 1 quality.

Storage Piles Grow

The soft-coal mines continue to pour out tonnage at a rate which promises to place the stockpiles of the consumers on April 1 at the highest point in history. Eighty million tons has become a conservative estimate. Production during the week ended March 12 was estimated by the U. S. Bureau of Mines at 13,800,000 tons—the largest outturn for any week this year. Preliminary reports for last week indicated no very marked decrease.

The effect of this production upon price levels is seen in a further decline in *Coal Age* Index of spot bituminous prices. On March 21 the index number was 169 and the corresponding weighted average price was \$2.05. Com-

pared with the figures for March 14 this was a decline of 2 points and 2c. The levels on Monday of this week were only 2 points and 3c. above the figures for March 22, 1926, when the bituminous trade was suffering the aftermath of the anthracite strike.

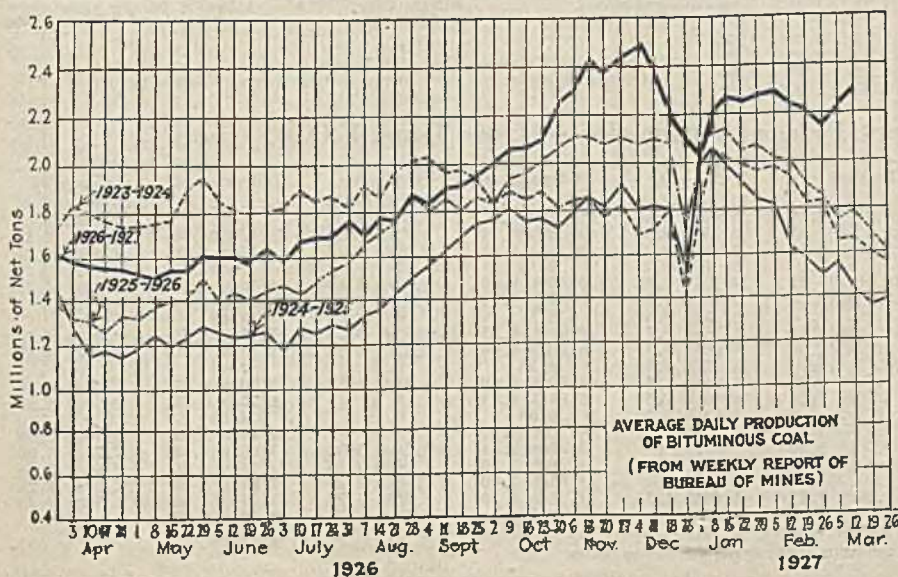
Anthracite Trade Draggy

Reductions in the circular prices on domestic anthracite have had not stimulating effect upon the market. In general retail distributors are more interested in cleaning up old stocks than in adding to their inventories and the weather has not prodded the householder into action. Production increased 22.9 per cent the second week in March, but the total quantity raised—1,488,000 net tons—was below normal. Hard-coal tonnage has been diminishing since last October. The steam market no longer commands attention.

In the coke division domestic byproduct trade is lagging and ovens are beginning to bring dealer prices in line with the reductions announced on anthracite. Foundry coke is fairly active in the Connellsville market, but spot furnace offerings are sluggish.

Weakness in Midwestern Markets

There was nothing in prices and little in demand in the Chicago market last week to suggest that a general suspension of production was only a few days away. Spring weather ahead of schedule left the domestic side of the



Estimates of Production

(Net Tons)

BITUMINOUS

	1926	1927
Feb. 26	10,890,000	12,763,000
March 5 (a)	10,460,000	13,262,000
March 12 (b)	10,690,000	13,800,000
Daily average	1,782,000	2,300,000
Coal yr. to date (c)	512,256,000	566,474,000
Daily av. to date	1,757,000	1,943,000

ANTHRACITE

Feb. 26	1,609,000	1,374,000
March 5	1,789,000	1,211,000
March 12	1,966,000	1,488,000
Coal yr. to date (c)	46,407,000	88,881,000

BEEHIVE COKE

Feb. 26	321,000	189,000
March 5 (a)	265,000	187,000
March 12 (b)	262,000	195,000
Cal. yr. to date (c)	3,261,000	1,892,000

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

trade badly disorganized. Nominally circular prices on prepared coals from Illinois and Indiana were unchanged, but movement at those figures was light. In many cases concessions broke the blockade of unbilled loads.

The situation with respect to Eastern coals seeking a Western market was much worse. Third vein Pocahontas lump and egg were freely offered at \$2.25 and some sales as low as \$2 were reported. Shipments of mine-run smokeless sent into the district on open billing were unloaded at \$1.60@1.75. Spot high-volatile West Virginia egg was as low as \$1.25, with 4-in. lump offered at \$1.75. In one case extra large eastern Kentucky block could be had for stocking at \$2.

In common with Eastern markets, anthracite quotations also were revised downward at Chicago last week. Reductions ranged from 50 to 75c. No change was announced in byproduct coke prices by the local ovens but an early readjustment is expected.

Steam Coals Slower

Demand for steam sizes, instead of rising with the approach of April 1, has been growing weaker. Screenings, heretofore the leader, are dragging. Aside from No. 3 and No. 4 nut from southern Illinois no industrial offering shows any buoyancy. Some middlemen are so confident that there will be further declines in the steam coal market that they are holding up orders for 3,000 cars of western Kentucky coal for delivery between April 1 and July 1, sold to consumers at \$1.50@1.65, in the belief operators will shade prices.

"No bills" are increasing in the Illinois and Indiana mining fields. With the average steam plant carrying a 90 days' supply of fuel in storage, there seems little chance for moving the unbilled mine loads at profitable figures in the next ten days. Shaft operations in Franklin, Saline and Williamson counties are not working over four days a week and much of the tonnage raised

is crowding the mine sidings. The situation in Duquoin and Jackson County is equally unpromising.

Railroad tonnage is holding up better in the Mt. Olive district, but this business is not heavy enough to free that sector of "no bills." Only a few mines working in the Standard district are running full time. Prices are unsettled. In the St. Louis local market there is some stocking of southern Illinois coal by dealers, but country retail trade is quiet. St. Louis yard stocks of domestic coal are estimated at 150,000 to 200,000 tons; steam coal stored by consumers, approximately 500,000 tons.

Kentucky Market Uneven

Further weakness in prepared sizes and no upturn in spot prices or demand for steam coals characterized the Kentucky market last week. Retailers in states using Kentucky coal turn a cold shoulder to urgings that they augment their stocks. Quite a tonnage of mine-run has been placed in storage by in-

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

Table with columns for Market Quoted, dates (Mar. 22 1926, Mar. 7 1927, Mar. 14 1927, Mar. 21 1927), and categories: Low-Volatile, Eastern; Midwest; High-Volatile, Eastern; South and Southwest. Includes various coal types like Smokeless lump, Pool 1, etc.

*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

Table with columns for Market Quoted, Freight Rates, and dates (March 22, 1926; March 14, 1927; March 21, 1927). Includes categories like Broken, Egg, Stove, Chestnut, Pea, Buckwheat, Rice, Barley, Birdseye.

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

dustrial consumers, but there are operators who question whether the output of screenings is doing much more than cover current requirements.

Western Kentucky screenings are still quoted at \$1.30@ \$1.60, with little tonnage to be had under \$1.35 and no great quantity selling above \$1.50. In the eastern field it is hard to buy much slack under \$1.40 although some is quoted at 15c. less. Contract customers seem willing to keep free slack off the market. Large consumers also haggle less over prices when contracts are presented for their signatures.

Indifference of retail distributors to further buying is beginning to make its influence felt at the Head of the Lakes. This has been most marked, perhaps, in prepared smokeless; two of the docks, discovering their sales over-estimated, have shaded prices to \$9 to increase their bookings. The rest of the price list, however, is unchanged, although the undertone is softer since it was reported that dock stocks of bituminous on March 1 approximated 2,000,000 tons.

Northwestern Industrial Demand Good

Industrial demand over the Northwest holds up surprisingly well. In view of the uncertain outlook in mining after April 1, dock men at Duluth and Superior are watching the situation closely to guard against entering into commitments for large blocks of tonnage which they might find difficult to deliver. Despite the falling off in domestic trade, the total volume of business is fully up to normal for this season of the year. The outlook for anthracite is brighter; stocks on March 1 approximately 250,000 tons.

Balmy weather has flattened demand at Milwaukee to minimum requirements and made an already featureless market a listless proposition. No improvement is looked for until dealers begin an active canvass for spring fill-up business. Industrial consumers are paying no attention to strike threats in the unionized bituminous fields. The trade at the Twin Cities, both steam and domestic, is featureless.

Prices on Kansas lump, nut and mine-run slumped 25c. in the Kansas City market last week. Slow domestic demand, with heavy accumulations of unbilled coal at the mines, forced the decline. Screenings, however, continued scarce and prices on this grade were firm. Producers of Arkansas semi-anthracite struggled unsuccessfully to clean up accumulations of "no bills"; many mines in that state shut down.

Colorado Market Colorless

There has been no improvement in the sale of domestic sizes in the Colorado market and unbilled lump and nut loads are piling up. During the second week of March the number of "no bills" increased 150 cars. Nevertheless, in view of the labor situation, it is doubtful if the usual reductions in prices will be made on April 1. Current quotations on both Colorado and Wyoming coals are unchanged.

Colder weather gave a temporary boost to the Salt Lake City market last week. The slowing up in produc-

tion which has been forced upon the operators in recent weeks has had the effect of stiffening the slack situation. General steam buying is on a seasonal basis. The metal mines, smelters and railroads are the heaviest purchasers at this particular time, but mines still are bothered by an accumulation of unbilled intermediate sizes. Prices, however, are steady.

The Cincinnati trade has given up hope that any immediate relief from a glutted market can come from a strike next month. Aside from inquiries from regular customers who want to increase their month-to-month contract allotments of smokeless coal, there are no signs of anxiety on the part of any buyer. Purchasing agents as a whole are indifferent; demand is moribund, prices are falling and tonnage is backing up on the shippers.

Steam Sizes Command Attention

High-volatile nut and slack and straight slack still command some attention from consumers. Prepared sizes and mine-run, however, are in the worst position they have been in in eight months. Some distress 4- and 6-in. block has sold down to \$1.45 and it is possible to place orders for shipment at \$1.65. At the same time, there are Kanawha operators asking \$2.50@

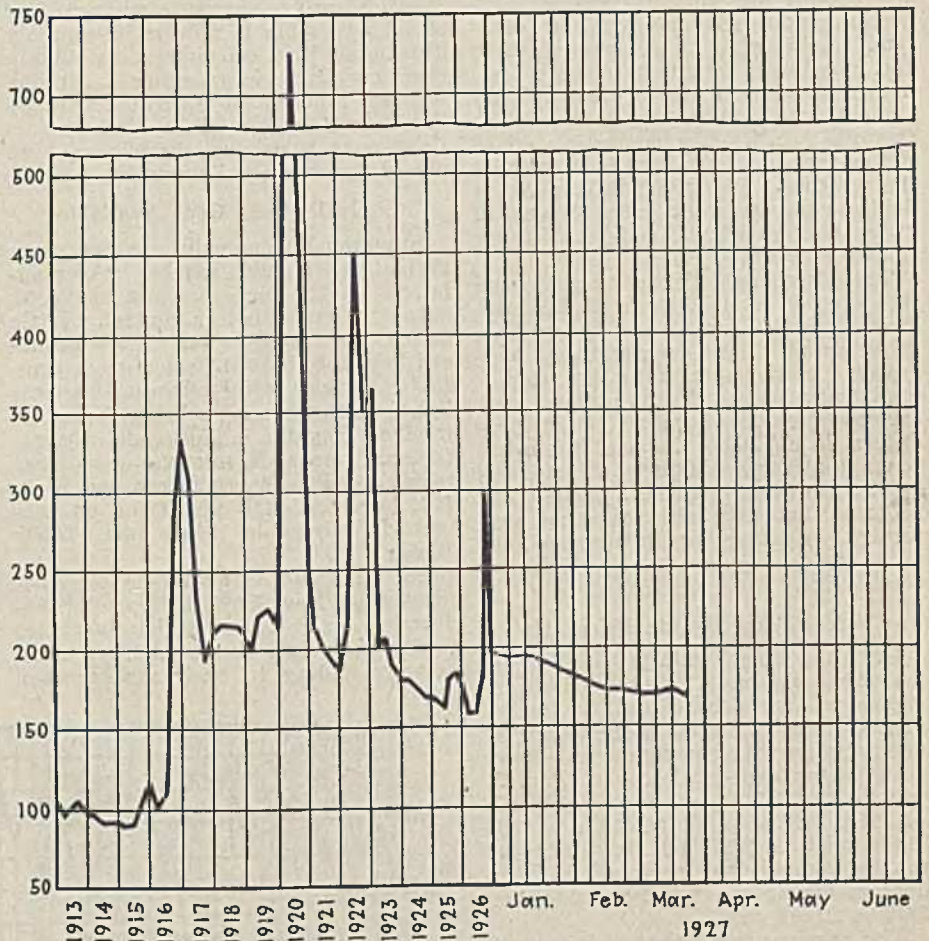
\$2.75 and at least one Elkhorn shipper holding out for \$3.

Producers selling to the lake trade have developed a sudden interest in signing up tonnage. For several weeks many of them turned a deaf ear to proposals made by dock buyers, but a few days ago there was a trek to Cleveland and other lake headquarters to line up business. A report was current in Cincinnati last week that the Norfolk & Western Ry. was offering \$1.85 for mine-run and \$1.65 for slack on its new contracts. These figures represent an advance of 10c.

Coal traffic through the Cincinnati gateway showed another increase last week. The number of loads interchanged rose to 14,499, an increase of 1,075 cars over the preceding week and 3,479 cars over the corresponding week in 1926. Movement via the Louisville & Nashville R.R. increased 433 cars; via the Chesapeake & Ohio, 706 cars. The number of empties en route to the mines increased from 11,497 to 12,798 cars.

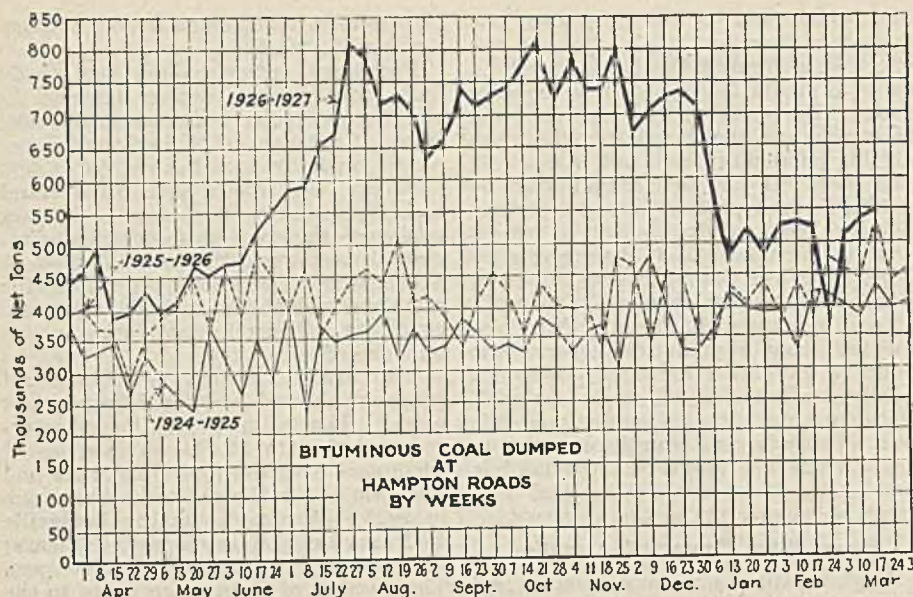
No Upturn at Columbus

Nothing reminiscent of former pre-strike periods is to be found in the Columbus market. Warm weather has hit current domestic buying, but some of the larger retailers are increasing



	1927				1926	1925
	Mar. 21	Mar. 14	Mar. 7	Feb. 28	Mar. 22	Mar. 23
Index	169	171	170	171	167	163
Weighted average price	\$2.05	\$2.07	\$2.06	\$2.07	\$2.02	\$1.97

This diagram shows the relative, not the actual, price on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportion 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.



Car Loadings and Supply

	Cars Loaded	
	All Cars	Coal Cars
Week ended Mar. 12, 1927	1,005,715	220,179
Week ended March 5, 1927	994,931	213,442
Week ended Mar. 13, 1926	967,411	188,834
Week ended March 6, 1926	965,009	182,443

	Surplus Cars		Current Shortages	
	All Cars	Coal Cars	All Cars	Coal Cars
March 8, 1927	267,616	82,203		
Feb. 28, 1927	275,153	83,253		
March 8, 1926	202,432	72,949		

their yard stocks at summer storage prices. The steam business is quiet. Many of the larger consumers have supplies sufficient to last them 60 to 120 days. Smaller plants feel the spot market will meet their needs. There is little distress tonnage to be picked up.

A midmonth revival of interest in No. 8 coals brought advances of 10 to 20c. in quotations on slack in the Cleveland market and an increase of 10 to 15c. on lump. There was some last-minute buying of steam sizes by consumers who wanted to add to their storage stocks. The domestic side of the market, however, was held back by the weather. Production in the No. 8 field during the week ended March 12 approximated 372,000 tons, or 53 per cent of capacity.

The Pittsburgh district settled back into a quiet rut last week. Little new business is being done at the advanced prices established a fortnight ago. Operators responsible for the earlier break now have all the orders they care to take at such prices. Other producers do not seem disposed to tie up tonnage at the new figures. Some contracts, however, have been made, it is reported, but only with long-time customers. Contracting in nearby non-union fields, on the other hand, has been active.

Central Pennsylvania Prices Up

Central Pennsylvania prices went up 5 to 50c. last week. The sharpest increase was on pool 1 coal, which advanced from \$2.30@2.50 to \$2.50@\$3 in sympathy with the tighter tidewater situation on high-grade coals. Pool 71 was \$2.25@\$2.50; pool 9, \$2.10@\$2.25; pool 10, \$1.95@\$2.10; pool 11, \$1.75@\$1.90; pool 18, \$1.65@\$1.70. Prices on the last-quoted pool increased 5c. Production during the week ended March 12 was 20,812 cars.

The announcement that union mines in central Pennsylvania would continue operations after April 1 has had a disturbing effect upon the Buffalo trade and has further strengthened the opinion that the next few weeks will be extremely slow. Lake shipments, it is felt, will help three-quarter prices, but weaken slack. Youghiogheny slack now is down to \$1.55@\$1.65; steam lump is

\$2.15; mine-run, \$1.65@\$1.85; slack, \$1.40@\$1.50. Fairmont mine-run is \$1.50@\$1.60; Allegheny Valley, \$1.75@\$1.90.

Midsummer dullness characterizes the trend of the New England steam-coal market at the present time. There is no special demand for fuel discernible; buyers are apathetic and any fear of labor trouble is now so thoroughly discounted that consumers are taking their own time in reaching a decision on the renewal of yearly contracts. Some contracts have been closed on an f.o.b. mine basis, but these have been placed through usual channels.

Little Distress Coal Available

Hampton Roads conditions are about normal for a quiet market. Accumulations at the piers are not heavy as output is under better control. Little is heard of distress coal. Navy Standard brings \$4.50@\$4.75 per gross tons, f.o.b. vessels, with offshore business light. Less tonnage is being forced on the New England inland trade. Quotations on cars at Boston are down close to \$6 and Providence prices are 10 to 15c. less. All-rail quotations on central Pennsylvania coals are fairly steady.

Soft coal moved slowly in the spot market at New York last week. Industries under contract, however, are taking their full quotas and are occasionally adding to their stocks when

prices are attractive. Accumulations at the piers have been well controlled so that there has been no undermining of spot quotations. On the other hand, there has been no betterment. Consumers with limited storage space hailed the announcement that there would be no suspension in central Pennsylvania on April 1.

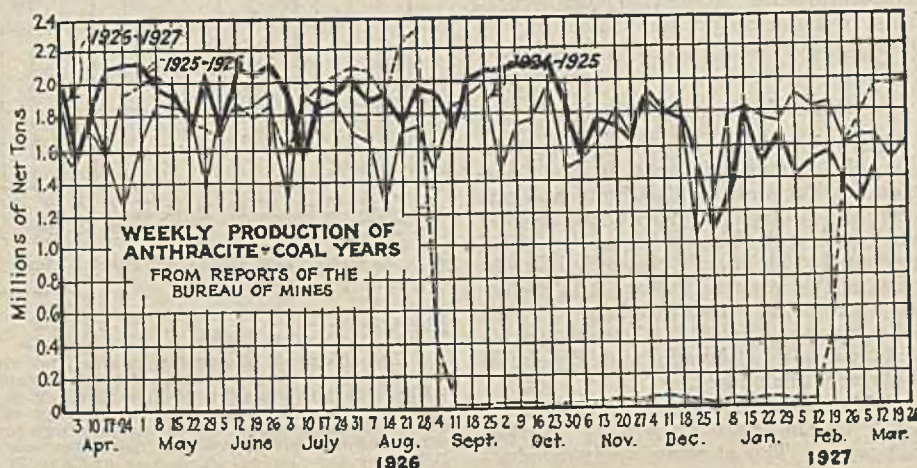
Calmness pervades the bituminous trade in Philadelphia. Large consumers appear to have completed their storage programs; most of the pending contracts have been closed. Prices are unchanged but firm. No radical change either up or down is expected until there has been some chance to appraise the labor situation after April 1. The Baltimore market drags; prices are weaker on all pool classifications.

Alabama Trade Drags

Trade in the Birmingham district still is marking time, with spot buying subnormal. Railroads generally again have cut down their contract quotas to normal tonnages. Spot orders for domestic sizes are few and far between. Both producers and distributors are waiting for the announcement of spring schedules before making an active drive. Much of the coal ordinarily going to the domestic trade is being diverted to steam channels to prevent undue accumulations at the mines. Foundry coke demand is satisfactory; domestic sizes are moving slowly.

Neither retailers nor consumers are rushing to take advantage of the lower anthracite prices announced in the New York market last week. The former are working hard to clear their bins of high-priced coal and the latter see no reason why they should hasten to place new orders. Independent coals were slow last week. On the domestic side, egg is moving better than either nut or stove. The steam sizes are dragging.

Circulars put out on Lehigh Valley



and Hanna coals last week showed the former at \$8.25 for broken, egg and nut; \$8.85 for stove and \$6.50 for pea, and Hanna at \$8.25 on egg and nut, \$8.85 on stove and \$6 on pea. The Lehigh Coal & Navigation and the Lehigh & Wilkes-Barre Coal companies are asking \$2.50 on No. 1 buckwheat; Hudson, \$2.50@\$.3; Lehigh Valley and Reading, \$3. Hanna and the Lackawanna ask \$2.75 on steam buckwheat and the latter company is quoting \$3.50 on domestic buckwheat.

New Prices on Steam Sizes

The Navigation and Reading companies are quoting \$2.25 on rice; the other companies mentioned, \$2. With the exception of the Reading, which is asking \$1.75, barley is held at \$1.50 by all the companies listed. The domestic prices represent reductions ranging as high as 90c. New York retail merchants cut their prices to the household consumer this week.

Philadelphia was no more fortunate than New York in the matter of attracting new business through the reductions which became effective last week. Weather was not conducive to buying for immediate consumption and retail stocks did not encourage further storing by distributors. There is talk of a cut of \$1 in retail prices, but nothing official was announced last week. The steam business is not overly active.

Neither Baltimore nor Buffalo showed any great interest in the publication of the lower price bases on domestic anthracite. As at New York and Philadelphia, the first concern of the retail distributors seems to be the reduction of existing stocks. Buffalo retail prices probably will be cut about 40c. on April 1.

Prestrike Influences Mixed

The effect of the threat of a Central Competitive Field strike on the Connellsville coke market is mixed. Spot furnace trade is unaffected; if anything that market is a shade weaker, with quotations \$3.25@\$.350. Spot foundry coke, on the other hand, has been active and the market is strong at \$4.50@\$.5. Ovens are asking \$4@\$.425 on second-quarter furnace contracts and \$5 and

**Cites Loss from Illness
And Postponable Deaths**

Preventable sickness and postponable deaths cost workers of this country at least \$1,800,000,000 annually, according to a recent statement by Dr. Walter L. Niles of the Cornell University Medical College.

In discussing public health problems before a group of New York business men, Dr. Niles said the average annual loss per person through illness was between eight and nine working days and that probably one-half of the 500,000 deaths of workers could be classed as "postponable" by adequate medical provision.

"I venture the opinion," Dr. Niles continued, "that this loss could be cut to a point where, over and above the costs of prevention, a balance of \$1,000,000,000 annually could be left in the pockets of the working population and industries of the United States."

upward on contract foundry business. There is some talk of settling furnace contracts on a compromise basis of \$3.75.

Production of beehive coke in the Connellsville and Lower Connellsville region during the week ended March 12 was 135,250 net tons, according to the Connellsville *Courier*. Furnace-oven output for the week was 65,200 tons, an increase of 3,400 tons over production during the week ended March 5. Merchant-oven output was 70,050 tons, a decrease of 1,690 tons.

State mine inspectors and coal company officials of West Virginia will have the opportunity on May 3-4-5 to act as hosts for safety men from all coal-producing states. On that date the annual meeting of the Mine Inspectors Institute of America will be held at Charleston.

**Byproduct Coke Output Gains
In February; Beehive Falls**

Production of byproduct coke in the United States during February declined from a total of 3,700,000 net tons in January to 3,435,000 tons. This apparent decline, however, was entirely due to the shorter month, the daily rate rising from 119,347 tons for the 31 days of January to 122,682 tons for the 28 days in February, a gain of 2.8 per cent. There were 76 active plants and one idle one, the same as in January, and these produced 88 per cent of capacity.

Beehive coke output also declined during February, the estimated total being 754,000 net tons. The daily rate was, however, more than 1,000 tons in excess of that of January. Output of all coke was 4,189,000 tons, of which 82 per cent was contributed by byproduct ovens and 18 per cent by beehive ovens.

**Byproduct and Beehive Coke Output
In the United States by Months***

	(In Thousands of Net Tons)		Total
	Byproduct Coke	Beehive Coke	
1924 monthly average	2,833	806	3,639
1925 monthly average	3,326	946	4,272
1926 monthly average	3,712	957	4,669
November, 1926.....	3,742	860	4,603
December, 1926.....	3,706	780	4,486
January, 1927.....	3,700	787	4,487
February, 1927.....	3,435	754	4,189

* Excludes screenings and breeze.

Coal used for the manufacture of coke amounted to 6,124,000 net tons during February, 4,935,000 tons being consumed in byproduct ovens and 1,189,000 tons in beehive ovens.

**Estimated Coal Consumed Monthly
In Manufacture of Coke**

	(In Thousands of Net Tons)		
	Byproduct	Beehive	Total
1924 monthly average	4,060	1,272	5,332
1925 monthly average	4,759	1,452	6,211
1926 monthly average	5,334	1,509	6,843
November, 1926.....	5,379	1,356	6,735
December, 1926.....	5,325	1,230	6,555
January, 1927.....	5,316	1,241	6,557
February, 1927.....	4,935	1,189	6,124

Of the total production of byproduct coke during February, 2,801,000 tons was made in plants associated with iron furnaces, and 634,000 tons in merchant or other plants.

Estimated Monthly Production of Soft Coal by States in 1926

	(In Thousands of Net Tons)												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Alabama.....	2,117	1,801	1,864	1,707	1,554	1,638	1,731	1,780	1,855	2,008	2,201	2,100	22,356
Arkansas.....	163	117	118	110	84	104	123	128	150	194	218	211	1,720
Colorado.....	1,079	750	791	806	620	592	666	778	941	1,058	1,180	1,318	10,579
Illinois.....	7,341	5,440	5,892	4,806	3,852	4,166	4,405	4,935	5,377	6,683	8,153	8,650	69,700
Indiana.....	2,353	1,733	1,981	1,683	1,356	1,324	1,394	1,730	1,879	2,132	2,609	2,665	22,839
Iowa.....	509	411	421	378	334	332	335	331	394	485	553	586	5,069
Kansas.....	449	334	336	319	260	272	316	326	390	390	524	524	4,531
Kentucky:													
Eastern.....	4,183	3,649	3,828	3,488	3,688	3,995	4,117	4,200	4,227	4,200	4,358	3,973	47,906
Western.....	1,642	1,164	1,268	1,018	875	1,050	1,052	1,230	1,396	1,550	1,595	1,584	15,424
Maryland.....	333	303	268	245	225	258	265	283	294	329	346	338	3,487
Michigan.....	77	59	70	53	28	20	23	42	49	73	80	75	649
Missouri.....	283	202	207	189	143	159	180	193	228	286	313	314	2,697
Montana.....	275	235	221	171	152	166	166	214	271	345	352	346	2,905
New Mexico.....	283	219	227	203	205	215	214	213	233	266	284	287	2,866
North Dakota.....	104	97	88	61	56	60	61	71	100	160	158	140	1,156
Ohio.....	2,745	2,539	2,464	1,998	1,793	1,814	1,842	2,056	2,379	2,973	3,346	3,021	29,150
Oklahoma.....	229	174	171	179	148	146	169	168	201	235	252	267	2,339
Pennsylvania.....	13,982	13,369	12,269	10,444	10,258	10,728	11,268	12,003	12,523	14,085	15,213	14,977	151,119
Tennessee.....	543	499	501	440	405	430	455	477	487	523	598	539	5,897
Texas.....	85	68	68	68	67	71	83	89	104	119	122	117	1,061
Utah.....	457	306	280	286	308	391	331	374	378	432	425	466	4,434
Virginia.....	1,179	1,080	1,105	988	964	1,087	1,116	1,127	1,151	1,222	1,297	1,177	13,493
Washington.....	221	201	209	168	155	168	164	191	234	285	280	272	2,548
West Virginia.....	12,290	11,286	10,894	9,764	11,135	12,421	12,551	12,902	13,080	13,724	14,453	12,709	147,209
Wyoming.....	724	526	580	472	381	378	428	495	642	727	794	821	6,968
Other States a.....	16	15	16	16	15	16	17	16	13	17	17	14	188
Total bituminous production...	53,662	46,577	46,137	40,079	39,059	41,992	43,472	46,352	48,976	54,592	59,721	57,671	578,290

a Includes Alaska, Georgia, California, Oregon and South Dakota. Estimates by U. S. Bureau of Mines.

Foreign Market And Export News

British Marketing Outlook Greatly Improved

London, England, March 7.—The Welsh coal market has improved during the past week. Inquiries are more plentiful and operators are confident that March will be the best month for the past year. A factor of importance now is the strike threat in America. Collieries are in a better position for orders, although the larger trade on rising output is not reflected in better prices. There is little forward selling, however, as advances are asked which buyers are unwilling to pay, so that business is restricted largely to current movement.

The demand from Europe is steady. South American trade is moderate. The business from the coaling depots is good. Inquiries are arriving from the United States for April-August deliveries of sized coals.

The North Country market also is in better shape. Producers have been successful in their bids for Scandinavian business and orders for substantial tonnages have been placed by Norwegian and Swedish railways at 15s. 6d. to 18s. 2d. The Danish State Rys. recently placed an order for 65,000 gross tons at the same rates.

Best Admiralty large coals are going easily at 22@23s.; smalls are steady at 15s. 3d.; best gas coals are 17s. 6d. and best bunkers are 17s.

A continued shortage of prompt shipping restricted exports from Wales last week. The total dumpings on foreign account were only 402,424 gross tons, as compared with 440,548 tons the preceding week and 482,810 tons a year ago. The distribution of the week's exports was as follows: To France, 135,886 gross tons; Italy, 36,591; South America, 60,981; Spain, 47,900; Portugal, 6,947; coaling depots, 50,139; Belgium, 3,125; Holland, 9,420; Irish Free State, 7,484; United States, 8,606; other countries, 35,435 tons.

Production during the week ended March 5 totaled 5,318,600 tons, with 1,015,000 persons employed in the mines during the week. This was a decline in output and an increase in employment as compared with the preceding week, when 5,371,000 tons were produced and 1,012,700 persons employed. This is the first break in the steady rise in production since the end of the strike.

British Coal Moving to Basel Via Rotterdam

Consul E. W. Dow, Rotterdam, in a recent report states that the Dutch press announces that the resumption of British coal exports has made possible the renewal of shipments of British gas coal through Rotterdam and the Rhine to Basel, Switzerland. Rotterdam's competitor in this traffic

is the port of Rouen, from which port coal is carried to Basel, a distance of about 410 miles at the rate of around \$1.72 a ton. Rotterdam-Rhine vessels take such coal from Rotterdam to Strasbourg at about \$1.40 a ton, the remainder of the distance from Strasbourg to Basel being covered by rail at the rate of \$0.86 a ton. Notwithstanding this higher cost, the business is retained by Rotterdam chiefly because the Associated Swiss Gas Works is financially interested in the Rhine Transport Association.

Franco-Belgian Coal Markets Marking Time

Paris, France, March 3.—Month-end developments in the French and Belgian coal markets were devoid of startling changes. In this country, while consumption is falling off in some directions, the total reduction in the volume of production probably does not exceed 3 or 4 per cent. In Belgium the demand is steadily narrowing, but the process of contraction proceeds at a leisurely pace.

In both countries pithead stocks are growing because of easier demand from industrial consumers. Locally the market for domestic fuels also is weak. Retail prices in the metropolitan district were cut sharply the first of the month, but both householders and retail distributors are holding back on purchases in expectation of still greater reductions on April 1.

March schedules of the Sarre mines covering the sale of coal to consumers in the territory under mandate show declines of 4 to 22 fr. on coal and 22 to 30 fr. on coke. Lorraine collieries have announced cuts of 16 to 20 fr. Neither district has readjusted wages recently, but it is now felt that labor soon will be called upon to contribute something to the cause of lower prices by accepting smaller returns.

The O. H. S. schedules effective March 1 make reductions of 5 and 6 fr. in the list prices of coal at the French frontier or on barges at French Rhine ports and 10 fr. in the price on coke. These prices are subject to zone rebates of 4 to 8 fr. on industrial coals moving beyond the upper and lower Rhine, Belfort and Montbeliard districts.

Further declines in prices also were registered in Belgium last week, with increasing pithead stocks in the Borinage area. Household coals, coke and patent fuel were all weaker. The Belgian Syndicate set the March figure on metallurgical coke at 230 fr., but business was placed under that figure. Industrial beans were comparatively firm.

January production of coal in Belgium was 2,345,740 metric tons, as compared with 2,376,480 tons in December, 1926. The monthly average in 1925 was 1,927,710 tons and in 1913

it was 1,903,460 tons. Stocks at the end of January showed an increase of 181,820 tons over December, but the total—350,410—tons was considerably below that at the end of 1925, when 1,667,920 tons were in storage, and 1913, when the year-end stocks were 925,890 tons.

German Coal Output Slumps; British Competition Keen

Coal production by German mines is declining, the average daily Ruhr output in the last reported week having fallen below 40,000 tons for the first time since last autumn. The Rhenish Westphalian Syndicate reports increasing British competition, to counteract which the Railroad Corporation has reduced freight rates to the North Sea coast from Ruhr, Saxon and Silesian mines. Coal exports in January, however, were 2,145,200 tons, against 1,005,400 in January, 1926.

Export Clearances of Coal, Week Ended March 17

FROM HAMPTON ROADS		Tons
For Italy:		
Ital. Str. San Giuseppe, for Portovecchio	9,175	
Ital. Str. Montello, for Genoa	1,713	
For Cuba:		
Nor. Str. Sagaland, for Havana	3,849	
Amer. Str. Fort Armstrong, for Havana	4,781	
For Brazil:		
Br. Str. Clarissa Radcliffe, for Santos	7,436	
For Barbados:		
Nor. Str. Edvard Munch, for Bridgetown	3,969	
For Danish West Indies:		
Br. Str. Wellpar, for Curaçao	2,778	
For British West Indies:		
Dan. Str. Cornella Maersk, for Castries	2,734	
FROM PHILADELPHIA		Tons
For Cuba:		
Br. Str. Nordstjereen, for Havana	—	
Nor. Str. Gunny, for Antilla	—	
For Brazil:		
Nor. Str. Mathias, for Rio Janeiro	—	

Hampton Roads Coal Dumpings*

	(In Gross Tons)	
	Mar. 10	Mar. 17
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week	172,378	195,687
Virginian Piers, Sewalls Pt.:		
Tons dumped for week	145,494	116,890
C. & O. Piers, Newport News:		
Tons dumped for week	167,843	177,876

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

Pier and Bunker Prices

(Gross Tons)			
PIERS			
	March 10		March 17†
Pool 1, New York	\$5.75@	\$6.00	\$5.75@
Pool 9, New York	5.25@	5.50	6.20@
Pool 10, New York	4.85@	5.20	4.80@
Pool 11, New York	4.50@	5.00	4.26@
Pool 9, Philadelphia	5.15@	5.30	5.15@
Pool 10, Philadelphia	4.85@	5.05	4.85@
Pool 11, Philadelphia	4.45@	4.55	4.45@
Pool 1, Hamp. Roads	4.85@	5.00	4.85@
Pool 2, Hamp. Roads	4.55		4.50@
Pool 3, Hamp. Roads	4.00@	4.15	4.00@
Pools 5-6-7, Hamp. Rds.	4.30@	4.50	4.20

BUNKERS			
	March 10		March 17†
Pool 1, New York	\$6.00@	\$6.25	\$6.00@
Pool 9, New York	5.50@	5.75	6.45@
Pool 10, New York	5.10@	5.45	5.05@
Pool 11, New York	4.75@	5.25	4.60@
Pool 9, Philadelphia	5.40@	5.55	5.40@
Pool 10, Philadelphia	5.10@	5.35	5.10@
Pool 11, Philadelphia	4.70@	4.80	4.70@
Pool 1, Hamp. Roads	5.00		5.00
Pool 2, Hamp. Roads	4.65		4.65
Pools 5-6-7, Hamp. Rds.	4.35@	4.55	4.35

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

Coming Meetings

Smoke Eaters' Association. Dinner, followed by meeting, at Cupp's Cafeteria, Johnstown, Pa., April 2, at 6 p.m. Secretary, C. O. Roberts, California, Pa.

American Society of Civil Engineers. Spring convention, Asheville, N. C., April 20-22. Secretary, George Seabury, 29 West 39th St., New York City.

American Welding Society. Annual meeting, April 27-29, at Engineering Societies Building, 29 West 39th St., New York City. Secretary, M. M. Kelly, 29 W. 39th St., New York City.

California Retail Fuel Dealers' Association. Fourteenth annual convention, Sacramento, Calif., May 5-7. Chairman of Convention Committee, George Burns, 19th St. between V and W, Sacramento, Calif.

International Railway Fuel Association. Nineteenth annual convention, Hotel Sherman, Chicago, Ill., May 10-13. Secretary, L. G. Plant, Railway Exchange Bldg., Chicago, Ill.

American Mining Congress. Annual convention May 16-20, Cincinnati, Ohio. Secretary, J. F. Callbreath, Munsey Bldg., Washington, D. C.

American Society of Mechanical Engineers. Spring meeting, May 23-26, at White Sulphur Springs, W. Va. Midwest regional meeting at Kansas City, Mo., April 4-6. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Society of Industrial Engineers. Fourteenth national convention, Hotel Stevens, Chicago, Ill., May 25-27. Executive secretary, E. Van Neff, 17 E. 42d St., New York City.

American Wholesale Coal Association. Annual convention June 1-3, Toronto, Canada. Secretary-treasurer, R. B. Starek, Chicago Temple Bldg., Chicago, Ill.

National Retail Coal Merchants Association. Annual convention June 6-8, Detroit, Mich. Resident vice-president, Joseph E. O'Toole, Washington, D. C.

Association of Iron and Steel Electrical Engineers. Annual convention in conjunction with the Iron and Steel Exposition, at Pittsburgh, Pa., June 13-18. Secretary, John F. Kelly, Empire Bldg., Pittsburgh, Pa.

New England Coal Dealers' Association. Annual meeting June 14-16, Hotel Griswold, New London, Conn. Executive secretary, E. I. Clark, Boston, Mass.

Colorado and New Mexico Coal Operators Association. Meeting at Boston Building, Denver, Colo., June 15. Secretary, F. O. Sandstrom, Denver, Colo.

National Coal Association. Annual meeting June 15-17, at Edgewater Beach Hotel, Chicago. Assistant secretary, J. C. Crowe, Washington, D. C.

American Institute of Electrical Engineers. Summer convention, June 20-24, at Detroit, Mich. Regional meetings, April 21-23, Bethlehem, Pa., and May 25-27, Pittsfield, Mass. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

Michigan-Ohio-Indiana Coal Association. Annual convention at Cedar Point, Ohio, June 28-30. Secretary, B. F. Nigh, Columbus, Ohio.

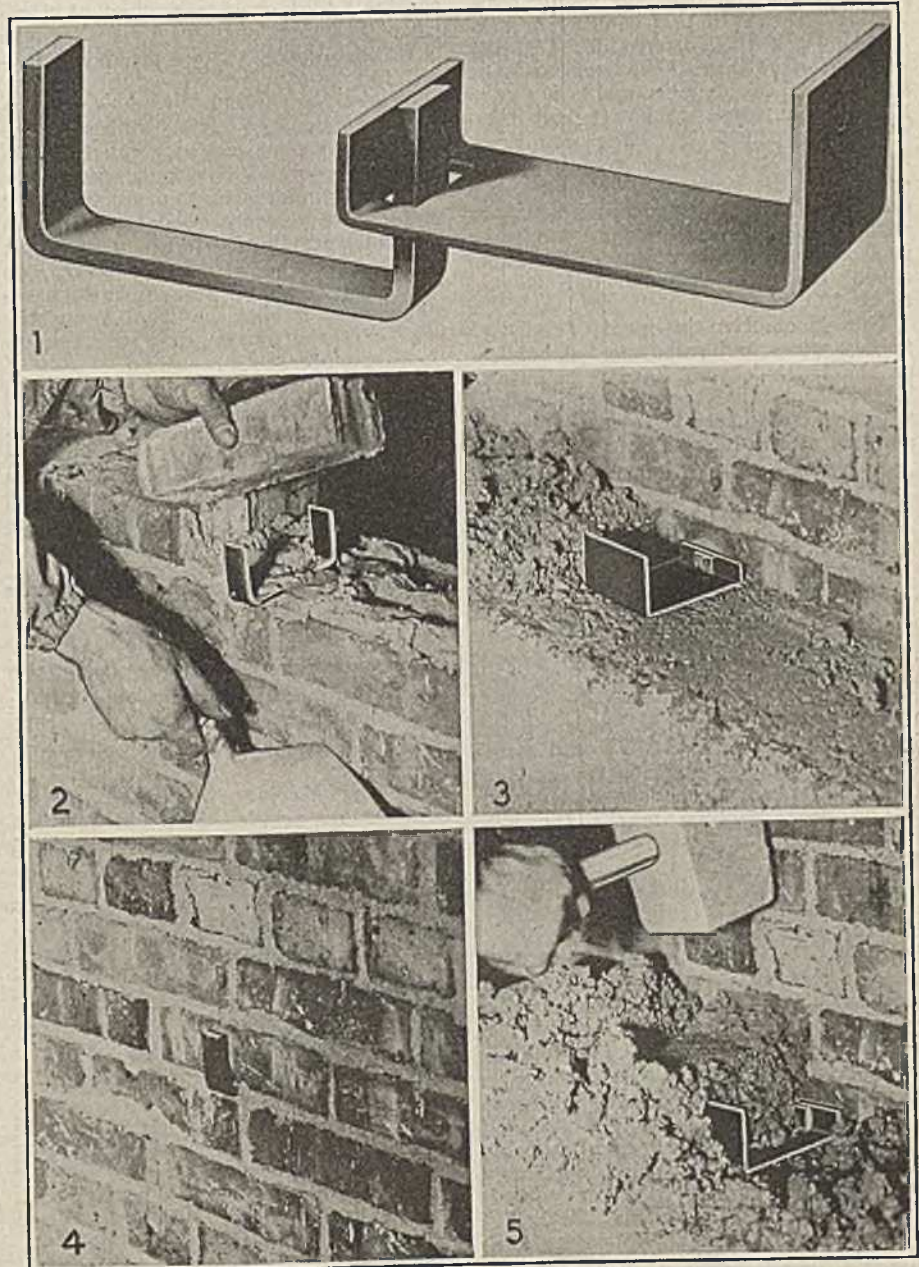
New Equipment

Furnace Wall Anchoring Plan Prevents Bulging

The flexo-anchor is a device that allows a one-piece monolithic furnace wall to move in any direction with expansion and contraction, thereby providing for the difference in these movements between the common brick and the refractory lining. It is claimed also that this device at the same time anchors the refractory to the common brick wall, effectually preventing bulging. It is being manufactured by the

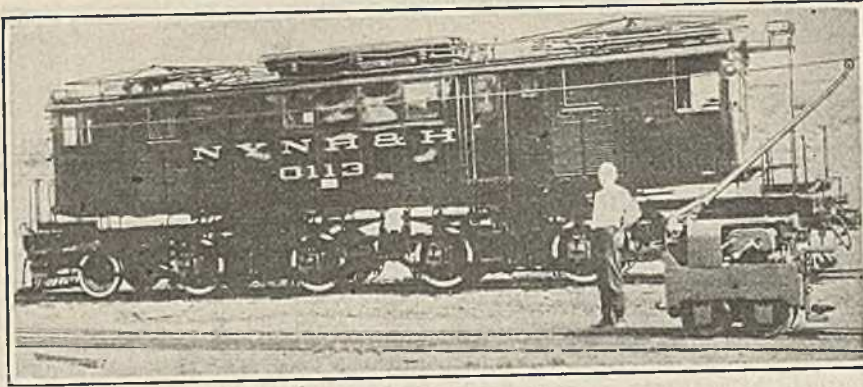
Plibrico Jointless Firebrick Co., Chicago, Ill., manufacturers of plastic Plibrico furnace lining.

The new anchor is a simple device; the hook is secured in the common brick wall. Then as the wall of plastic Plibrico is built up the anchor is placed over the hook. As the wall rises the anchor is embedded in the Plibrico. This new anchor is used in both new settings and repair jobs. On old work a brick is first pried loose; the hook is then inserted in the wall and finally the brick firmly wedged back into place.



Can Be Used in Repair Work or New Construction

This flexo-anchor, it is stated, provides for the difference in expansion and contraction between common brick and a refractory furnace lining. At 2 in the above illustration is shown the method of securing the hook in the common brick. At 3 the Plibrico wall is built up and the anchor is in place. At 4 the wall with the anchor inserted is ready for its protective coating and at 5 the plastic covering is being applied around the anchor. The anchor itself is shown at the top of the illustration.



Gargantuan and Lilliputian

Mine locomotive of the type and size which is used at Park Utah mine seems to be quite a pigmy compared with an electric railway locomotive.

A Small Trolley Locomotive

One of the smallest trolley-type locomotives in use in this country is used by the Park Utah Consolidated Mines, of Keetley, Utah. This was built by the General Electric Co. and is designed for an 18-in. gage track. It has a total weight of 3,296 lb. The couplings, steps, and trolley are removable, in order that the locomotive may be taken down small mine cages. It is equipped with coupler sockets, so that it may be used in tandem with others of the same type. The rated drawbar pull is said to be 400 lb.

The locomotive is operated on two trolley wires and rails are not bonded, as the track is very hard to maintain. These locomotives operate in sections where it is impossible to use mules on account of the lack of water.

Simplicity Is Increased In New Motors

A new type of induction motor which, with its control, it is claimed, is even simpler to operate than the ordinary squirrel cage machine and compensator, is announced by the General Electric Co., Schenectady, N. Y. A complete line of these motors, bearing the type designation FT and ranging in ratings from 7½ to 50 hp., has been placed on the market.

The new machine marks the culmination of several years of investigation, development and research in the endeavor to meet the demand for a motor embodying simplicity, reliability, low cost and line switch control involving full voltage starting. While large numbers of high reactance motors of somewhat similar characteristics have been built and applied during the period of development, this, it is stated, is the first co-ordination of a complete line for general purpose application.

The FT motor is in general suitable for application wherever the ordinary squirrel cage induction motor with a compensator has been used. It is designed to start on full voltage giving slightly higher starting torque but approximately the same starting current as the ordinary squirrel cage induction machine started with the compensator connected to the 80 per cent tap.

In appearance the new motors are the same as the ordinary squirrel cage induction machines. Rotors are of the

cast aluminum type with bars so shaped and located in the punchings as to give a high reactance effect at starting. Starting current is within the N.E.L.A. limitations up to and including the 30-hp. size.

Control apparatus required is extremely simple. An ordinary line switch of proper capacity can be used, but, in order to obtain proper overload and undervoltage protection, the motors are recommended for use with magnetic starting switches using push button control. Where necessary, on the larger sizes, a compensator or resistor starter may be used as in the case of the ordinary squirrel cage induction motor.

The advantages of these new machines include low cost, simplicity, reliability, low starting current permitting the use of a line switch, elimination of the possibility of abuse by inexperienced operators, and ready adaptation to automatic control by pressure governor, float switch, etc.

Recent Patents

Lamp Clip for Miners' Caps, 1,615,900. Wm. J. Brown, Dunlevy, Pa. Feb. 1, 1927. Filed April 29, 1926; serial No. 105,556.

Loading Machine; 1,615,640. J. M. London, Brookville, Pa., assignor of one-half to George M. Crawford, Pittsburgh, Pa. Jan. 25, 1927. Filed July 28, 1923; serial No. 654,340.

Mining Machine Chain Link and Bit; 1,615,738. Newton K. Bowman, Bowdill, Ohio. Jan. 25, 1927. Filed Feb. 2, 1925; serial No. 6,411.

Drilling Machine; 1,616,486. George H. Gilman, Belmont, Mass. Feb. 8, 1927. Filed Jan. 6, 1923; serial No. 611,171.

Mine Car; 1,616,564. Leopold Almquist, New York, N. Y., and Victor Willoughby, Ridgewood, N. J., assignors to the American Car & Foundry Co., New York City. Feb. 8, 1927. Filed July 17, 1926; serial No. 123,169.

Mine Car; 1,616,573. Henry P. Field, Berwick, Pa., assignor to the American Car & Foundry Co., New York City. Feb. 8, 1927. Filed Jan. 14, 1926; serial No. 81,256.

Mining Machine; 1,616,597. Thomas E. Pray, Chicago, Ill., assignor to the Goodman Mfg. Co., Chicago, Ill. Feb.

8, 1927. Filed Dec. 30, 1924; serial No. 758,938.

Coal - Handling Plant; 1,617,117. George S. Jaxon, Huntington, W. Va., assignor to Link-Belt Co., Chicago, Ill. Feb. 8, 1927. Filed Dec. 7, 1925; serial No. 73,588.

Coal-Mining Apparatus; 1,617,401. Nils D. Levin, Columbus, Ohio, assignor to the Jeffrey Mfg. Co., Columbus, Ohio. Feb. 15, 1927. Filed Oct. 7, 1922; serial No. 593,094.

Loading Boom; 1,617,490. Glen Knox, Gunn, Wyo., assignor to the Link-Belt Co., Chicago, Ill. Feb. 15, 1927. Filed March 22, 1923; serial No. 626,744.

Mine-Car Coupler; 1,617,628. Charles H. Gage, Washington, D. C., assignor to Linn W. Searles, Chevy Chase, Md.; W. A. Faison, Chester, Pa.; and Wm. D. Riter, Washington, D. C. Feb. 15, 1927. Filed July 24, 1925; serial No. 45,926.

Mining Apparatus; 1,617,941. John H. Crawford, Harrisburg, Ill. Feb. 15, 1927. Filed Jan. 10, 1925; serial No. 1,539.

Process for Briquetting Coal; 1,618,029. S. R. Wagel, New York City, assignor to the Lehigh Coal & Navigation Co., Philadelphia, Pa. Feb. 15, 1927. Filed Sept. 30, 1924; serial No. 740,839.

Industrial Notes

G. N. Bull, formerly with the Washington Pump & Machinery Co.'s Washington (D. C.) office, has been made district manager of the New York office of the Lincoln Electric Co. C. S. Freeman, formerly in charge of the Lancaster office of the Lincoln Electric Co., has been transferred to the Buffalo office and made district manager. S. W. Shultz, formerly of the Philadelphia office, has been put in charge of the Lancaster office. Ed. J. Pfister, formerly of the Buffalo office, has been transferred to the Philadelphia office.

Link-Belt Company, of Chicago, Philadelphia and Indianapolis, has opened a new branch sales office at 229 Brown-Marx Bldg., Birmingham, Ala. W. H. Norton, for many years connected with the company's Chicago sales department, is manager of the new territory.

New Companies

The Best Pomeroy Coal Land Co., of Sandusky, Ohio, has been chartered with a capital of \$25,000 to mine, sell, ship and deal in coal. Incorporators are O. A. Adrian, J. S. Best, H. E. McFadden, C. H. Poole and L. W. Adrian.

The Bluff View Coal Corporation, Collinsville, Ill., has been incorporated with a capital of \$50,000. The company will own and operate mines. The incorporators are Henry Rissi, Harry Paul, Samuel Davis, Wm. Schoeck, August Schiller and Henry Siebecke.

The Carol Mining Co., Rush, Ky., capital \$60,000, has been chartered by J. E. Rhodemeyer, S. J. Whitt and R. F. Rhodemeyer.