COAL AGE

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Problems of the Coal-Mining Industry

R. DAWSON HALL
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Big Men in Industry

TOO BAD it seems that the coal industry has never had an outstanding man. There have been clever men, but none who were wealthy enough to inflame the imagination like a Carnegie, who was both a big man mentally and morally and at the same time well-known by reason of his wealth and influence.

Thus what he did is a model and a moral for iron-workers. His homely Scotch virtues and maxims have been implanted in the steel industry. They are today beacon lights for the iron men.

William G. Clyde, president of the Carnegie Steel Co., speaking before the Chamber of Commerce at Pittsburgh said of Carnegie, April 5, "He never hesitated to scrap a perfectly good piece of machinery when something developed that was an improvement or an aid in cutting the cost of steel production."

His courage in this respect has made the iron-and-steel industry of today courageous. It does not hesitate to rip out obsolete equipment. It moves forward rapidly toward efficient product. It revolutionizes its methods enthusiastically. If only the coal industry had such an exemplar as that old iron master and was following his policies in the conduct of its business! A big man influences not only his own but many other generations.

Facing the Issues

IN THE PLAY for position which seems to have motivated most of the recent developments in the controversy between Central Competitive Field operators and miners, consideration of the fundamental issues involved has been thrust further and further into the background. Insistence by some that the Jacksonville basis of wages be preserved intact and the demand by others that the open abandonment of any claims to that scale be the condition precedent to a resumption of negotiations have encouraged a deadlock in which the interests of both parties are endangered by blind worship of set formulas.

Happily a more pleasing view is presented by the alternative decision reached by the Illinois operators at their meeting in St. Louis last Friday. This group, passing upon an invitation from the president of district 12 of the United Mine Workers, expressed, as an alternative to the demand for a reduction in wages, a willingness to meet with the miners to consider modifications in existing working arrangements which would lower the cost of production. In other words, as we understand it, Illinois producers do not insist upon a slash in the Jacksonville base rates if their competitive position can be improved by changes in other directions. They are interested not so much in what a man may receive for his day's toil as in what the production cost is per ton of coal.

This, after all, appears to be the only basis of discussion which holds any real promise of constructive results. The problem which confronts those groups in the Central Competitive Field who still desire to continue operations under contractual relations with the United Mine Workers is not one which can be solved by independent action. Solution does not lie in the surrender of either party to inflexible demands of the other. The way to a settlement which will be just to both employers and employees will be found in a spirit of co-operation which recognizes the interdependence of operators and miners and treats their problems as questions in which they have a common interest and a common stake.

In again reiterating the plea that conference take the place of combat in operator-union relationships, *Coal Age* is not unmindful of the difficulties to be overcome. The reconciliation of the demands of social justice and of economic necessity which must be made is not easy. From the standpoint of social justice the mine workers are strongly entrenched. Except for the $1.50 increase in day rates granted after a series of "wildcat" strikes seven years ago, the much criticized Jacksonville scale is nothing more than a continuation of the wages fixed by a government commission of arbitration in 1920. Those who attack this scale *per se*, therefore, must be prepared to prove that the cost of living has been so reduced in the intervening years that the Jacksonville levels now are extravagant.

On the side of economic necessity the operators can point to the growing output of the South where flexible, and generally substantially lower, wage scales prevail. There is nothing abstract about this. The pressure of Southern tonnage, not only on the markets of Ohio and Pennsylvania, but also in those of Illinois and Indiana is too real to be dismissed with any empty rhetorical flourish. Neither can the situation be evaded by saying that factors other than a disparity in wage rates are partially responsible. Co-operative effort in dealing with these other factors is, of course, highly desirable, but such effort cannot be put forward as a substitute for consideration of the factors directly in the control of the operators and the miners.

If the major issues of social justice and economic necessity are to be met fairly, fully and frankly, the question of wages must be integrated into the question of the cost of production and a common attack made upon that larger problem. Is it possible through greater efficiency, both in labor and in management, and through the development of a new sense of common interest to so reduce production costs that union operators can compete successfully against non-union tonnage without impairing established wage rates and American living standards or undermining the financial structure of the producing companies?

This is the crux of the situation. Obviously no progress can be made until joint negotiations between operators and miners are under way. It is equally

obvious that little progress will be possible if such negotiations are devoted to an interchange of generalizations on the inefficiency of labor and the incompetency of management. What is needed is a patient and painstaking examination and weighing of every suggestion for betterment in practice each side has to offer—and conclusions based on the requirements and in harmony with the spirit of 1927, not on the passions, prejudices or necessities of 1898. The door to such discussion has been pushed open a little further by the Illinois operators.

Eliminating the Universal Genius

IN RECENT MONTHS many coal companies in order to survive have been obliged to make extensive changes in their personnel and methods. Whether they were making small or no profits, or were marking deficits on their books, they were alike convinced that their former set-ups as to operation and selling were not such as would enable them to meet present-day and future problems satisfactorily.

Noting the multiplicity and complexity of the problems of operation and distribution, they have wondered if the old system which put men in immediate control of all the activities either of the whole company or of some geographical section of its operations could result in success. Could one man's brain adequately cope with all the problems of all the mines, of all those in a district or of all those even in a single mine? Was there not place for specialists who would study some given function—cutting and loading of coal, shooting, transportation, ventilation, electricity, mechanical devices, preparation, safety or industrial relations?

They argued that a mind ranging over such a variety of fields as just enumerated would be unable to make a thorough study of all of them. Such a man would be incapable of keeping a happy balance between them. He would have no breathing space in which to travel from mine to mine to see new equipment and examine new operating methods. He would be confronted with the fact that all his working day permitted him was the performance of routine work.

So specialization came in and was termed "functional control." Still, however, the new idea had to be kept in its place, for were not all functions more or less related? They could not safely be treated as if they were wholly distinct. They must be correlated and coordinated, or there would be chaos. There must be "line control," men who would take care of the business of operation, who would maintain discipline and regulate the various functions so as to make everybody work harmoniously.

In a chorus, there must be not only altos, sopranos, tenors and bassos, but there must also be a leader who may perhaps have no ability to fill any of the parts, but can regulate the whole. He also must follow a score written by some master mind that has planned and devised the wondrous harmony. Improvisation may have charm, but how much more certain, more likely, would a production be to create the effect desired if carefully planned away from the distractions of execution.

Thus division of labor today leaves the physical plane in which our fathers conceived it and finds its counterpart in the mental, or directional, plane. To our predecessors it meant that the cutter should dig the kerf, the loader put coal in the car, the shotfirer ignite the shot and perhaps load the hole, the driver haul coal, the dumper discharge it, the picker clean it and the trimmer see to its loading into railroad cars. That principle now is no longer applied solely to common labor but finds a place in the forces of control, without, however, ousting the line forces that co-ordinate the work.

At first the change came among the higher officials only. The president handled finance and labor; the treasurer the accounting system; the mining engineer, the designing and mapping of the mine and plant; the mechanical engineer, the machinery; the electrician, the electrical equipment; and these men had their subordinates, some of whom were attached to sections or to single mines.

Now, however, the specialization is going further, and the foremen have at the mines men who co-ordinate with them in the control of certain of the operations as carried on in definitely limited districts, men who are trained to direct certain types of work. At headquarters also new officials are found who train these men, plan their work and standardize it.

Experience is gathered; results are compared and at last the best way of doing certain work is determined and entered in a book of standards. Forthwith it is adopted throughout the whole organization, until a better way is found, which then succeeds it. Stress is now laid not only on the doing of jobs, but on the manner in which they may be done most economically, effectively, permanently and rapidly.

Most of this is not a new idea. The human race has sensed it since the beginning of recorded history, but today it is intensified and made a matter of more careful study and painstaking elaboration. It is the day of the charted course, of planning first, training men to execute the plans, and then following the latter to their destined conclusion.

Be Represented

LEADERS of the coal industry have a right to pride in the marked decrease in fatalities per unit of production. They should not, however, lose sight of the fact that, taking the country as a whole, there has been no decrease of fatalities per unit number of men employed. Changed conditions have increased the tonnage per man but similarly it seems to have increased the individual's liability to fatal injury. Mine safety, therefore, should receive more attention now than ever before.

Mine inspectors, engineers, and safety directors are facing new problems affecting safety, as a result of the new mining methods and equipment now being adopted. Most of these problems are of a general nature and consequently should be considered and discussed at meetings of representative bodies of mine safety men.

The regular convocations of such organizations as the Mine Inspectors Institute of America, which will meet at Charleston, W. Va., on May 3, 4, and 5, presents a wonderful opportunity for the exchange of tested ideas and for the formation of policies planned to reduce the accident rate. Every coal mining company that has a safety organization should be represented at that meeting and delegates from the mining department of every coal state should attend in the interest of increased safety for the industry.

High Coal Extraction Realized At Columbia

Although Natural Conditions Are Adverse and Coal Pitches Heavily, Pillars Are Drawn by Splitting Pressure of Roof Being Successfully Controlled

THE COLLIERY of the Columbia Steel Corp. is located at Columbia, Utah, and supplies the coal requirements of the corporation's blast furnace plant near Provo. The coal is converted into coke in by-product ovens and as these are steadily operated, this colliery works under the favorable condition of a uniform demand throughout the year. The output amounts to about 1,100 tons per day. The mine is a short distance southeast of Sunnyside at which place the Utah Fuel Co. operates its Sunnnyside mine.

The coal bed ranges from 10 to 16 ft. in thickness and lies in the Upper Cretaceous formation of the Book Cliffs coal field. The seam dips to the east 9½ to 12½ per cent and reaches an extreme inclination of 20 per cent in places. It is under considerable cover as the bold sandstone scarp of the Book Cliffs plateau rises immediately east of the mine adit or drift. Deep ravines cut into the range and access to the deposit was afforded through one of them that debouches close to the town of Columbia. The bed is characterized by a burned outcrop, this burned area extending to a considerable depth. Its width varies greatly, however, The mine was developed in 1923 and during the winter of 1923-24, the tipple was constructed a short distance from Columbia on a spur track constructed from the Sunnyside branch of the Denver and Rio Grande Western R.R. Production commenced in 1924, since which time the mine has been continuously worked, the total output to date being over 1,000,000 tons.

A gravity tramroad 3,550 ft. in length, connects the topple with the mine yard, on the hillside close to the mine entrance. At this point is placed the hoist (two 8-ft. drums and bullwheels, geared to a 500-hp. a.c. motor), a repair shop, change rooms, office, transformers, storage sheds and a waste rock revolving dump. The yard is provided with three tracks connected to the gravity tramway. An explosives magazine is placed between the mine entrance and the yard limits.

The mine adit, or rock tunnel, intersects the footwall of the bed at a distance of 1,600 ft. from the entrance. This passage is equipped with a single 42-in. gage track on 0.5 per cent grade in favor of the loads. A substantial concrete portal has been built at the entrance to the rock tunnel, while at its opposite end a pair of entries, first and second south, branch out to the southward following the strike of the bed. From the main entries panels are laid out at right angles or down the dip, each panel being served by a slope and one or two supplementary traveling-ways parallel with it. The layout of the mine is shown in Fig. 1.

The fan house is located on the outcrop a short distance above the yard level and not far from the mine entrance. The fan is of the Sirocco type, 7 ft. in diameter, with a maximum capacity of 110,000 cu.ft. per minute. At present a 35-hp. motor is driving this machine, the amount of air being 70,000 cu.ft. The present water gage is 0.4 in. The restricted area of the mine reduces air friction to a minimum. The ventilation layout was planned to take advantage of all natural conditions. As will be noted in Fig. 1, three air inlets are available but only two are used at present. One of these is the rock tunnel and the other the escapeway at the 8th west entry.

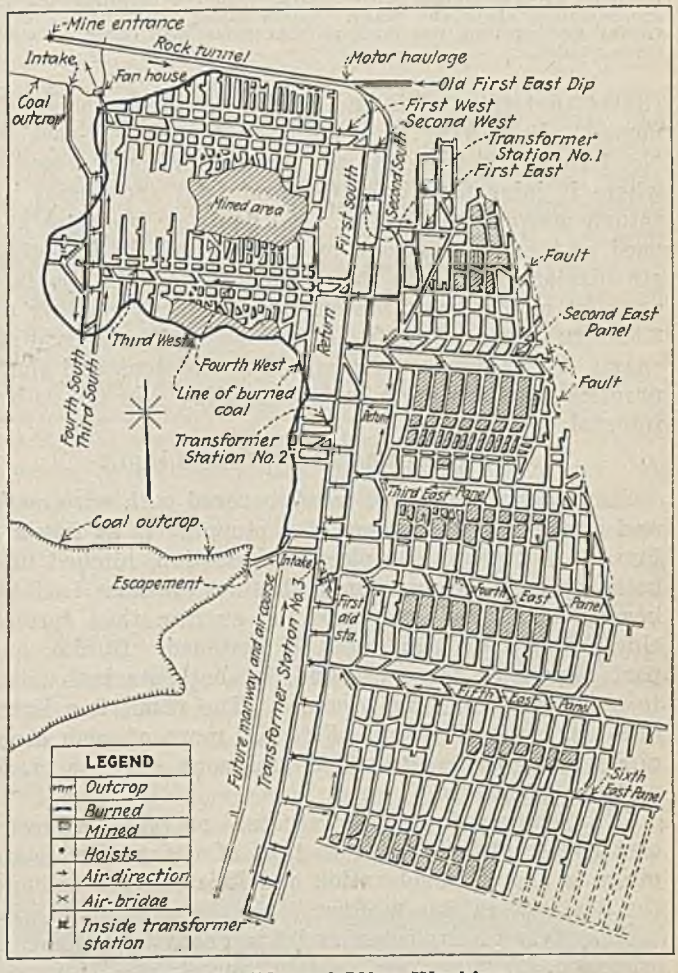
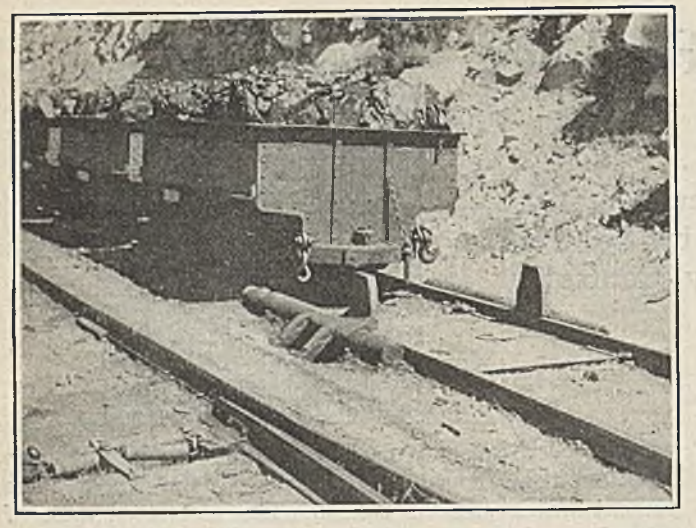


Fig. 1—Plan of Mine Workings

Like most mines worked on the room-and-pillar method this operation is laid out in panels. The means employed in drawing pillars by splitting from the crosscut to the end of the pillar and then coming back with the wings is also shown.

Air enters the mine at two separate points. One of these splits serves the first, second and third east panels, returning to a point near the second east. The other enters at the 8th west and passing along the first south, is diverted into the sixth east panel on the inside crosscut connecting with the second south. This split ven-

Headpiece:—From the headpiece an idea may be gained of the massive rock formations that characterize the coal measures in this region. This shows the entrance of the rock tunnel that intersects the coal bed several hundred feet underground. A slight grade favors the loads on this passageway.



Car Stops Above Gravity Plane

Runaways are here carefully forestalled. Not only are stops provided as here shown in the loaded yard but derailing devices are installed along the plane. These latter are remotely controlled and prevent the mishaps that sometimes occur on such steep grades.

tilates the sixth, fifth and fourth panels in the order named. It returns to a point on the second east in No. 1 room and thence to an overcast on the first south, where it joins the air of the first split and passes by return airways to the fan. No doors or brattices are used as the workings are on the dip and the incoming air displaces the foul mine atmosphere. At the last crosscut on the most distant entry, an air reading of 3,500 cu.ft. per minute is obtained. The recording charts of the fan are remarkably consistent and show practically no variation in gage reading over the 24-hr. interval.

Light and Durable Stoppings Built

Stoppings are built of wood, covered with wire mesh and gunite. Construction of a stopping is as follows: Four to six props are placed in position, hitched into both top and bottom. On both sides of these 1x12-in. boards are nailed and onto the surface thus formed chicken wire of 1-in. mesh is fastened. Gunite, one part cement to three of sand, is shot onto both sides to a thickness of 1 in. or more. The result is a light, durable, tight stopping. Fifty or more of such stoppings have been constructed and none shows a crack or signs of failure.

Overcasts are built of reinforced concrete. An overcast construction similar to that of the gunited stoppings is under consideration and it is planned to build the next one in this manner.

A system of explosion and fire doors is under construction. A steel door is set in concrete at each intake to the mine and is kept open at all times. In the event of an emergency, such as a fire or explosion, however, these doors can be shut and quickly sealed. As they are kept open and are set back into the ribs, the possibility of their destruction in the event of an explosion is remote.

The mine is divided into sections so that in the event of fire, any one section can be isolated from the others. The line of gunite stoppings is so placed that by closing a door on each section, the section in question can be cut off from the rest of the mine. As a precaution against fire, 12 "Foamite" extinguishers are placed at convenient points within the mine but removed from all pump or hoist stations where a fire is liable to start.

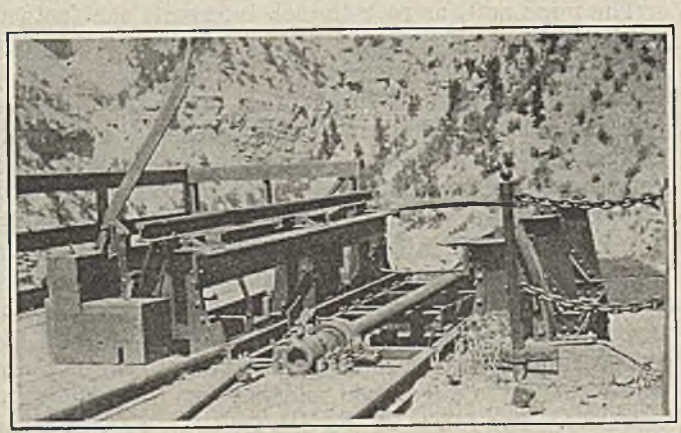
Rock dust barriers are placed at the entrances of all panels. All main haulageways are rock dusted and all rooms are provided with sprinkling lines and hose. Two men are continuously employed in sprinkling in addition to the miners wetting down coal before loading. Two men also are employed in building stoppings and in rock dusting. The material used for rock dust is Mancos shale. It is screened through a ¼-in. mesh and forced upon ribs and roof with a cement gun under 30-lb. pressure. By this procedure surfaces, cracks and crevices in the coal are covered and filled with a coating from ⅛ to ¼ in. in thickness which when dry gives off a fine dust much of which is picked up by the ventilating current. The motor road or tunnel is rock ballasted and covered with from four to six inches of earth. One man is employed in keeping motor roads free from coal spillage.

First Aid Station at Central Point

A first-aid station is centrally located within the mine. It is 12x20 ft. in plan and 8 ft. in height. It is equipped with two cots, mattresses, blankets and pillows, a table or work-bench in the center of the room with rubber mattress and coverings, two glass-paneled cabinets, one containing all necessary first-aid equipment and the other, surgical dressings and extra blankets. The room is warmed with two electric heaters and ventilated by a small short circuit split from the escapeway a short distance away. A 30-gal. hot water tank fitted with an electric heater, completes the equipment. At the top of each panel, in the hoist room, a first-aid outfit is placed. This consists of stretcher, blankets and first-aid dressings stored in a metallic container.

Three transformer stations are installed within this mine. Each is fireproofed and arranged to seal automatically in the event of a blow-up. This will prevent burning oil or fumes from entering the ventilating current. Two transformer stations are placed in breakthroughs between the first and second south entries. A third station of this kind is located near the 8th west on the 1st south entry. All transformers are of 75 kw. rating. The power line leading to the transformers carries a voltage of 2,300. This is a lead-covered cable about 3,500 ft. in length strung on permanent brackets suspended from the roof, on substantial carriers embedded in the ribs or supported by timbers placed for this special purpose. The motor roads are provided with overhead trolley wire.

Electric lights are strung throughout the mine, except



Waste Rock Dump

Inasmuch as the cars at this operation are built with solid bodies a revolving dump must be provided for the waste as well as for the coal. This picture shows the dump employed for discharging waste rock on the mountain side.

in rooms. They are liberally distributed so that a miner can, if necessary, travel anywhere on the haulageways without the aid of his electric safety lamp.

Rooms are driven 20 ft. wide and 350 ft. in length parallel with the strike and on 80-ft. centers. They are extended upon a ½ to 1 per cent grade in favor of the loads but this inclination in some instances is increased to 3 per cent. Neither mechanical nor animal haulage is required in the rooms. Slope hoists are of the single-drum type driven by a 75-hp. motor. On the advance the coal is undercut in 6-ft. lifts by shortwall machines. Only the lower part of the seam is taken out. Holes are drilled electrically, using alternating current at 440 volts, 60 cycles, 3 phase. Placement of the drill holes is shown in Fig. 2. All shots are fired by a circuit controlled from an outside firing switch.

As will be noted from the mine plan shown in Fig. 1. only one breakthrough is made about midway of the room length. Upon completion of the rooms in a panel, the pillar coal as well as all that left up to protect the roof is mined out. Pillar mining is commenced at mid rib and the pillar worked back to the traveling entry which parallels the panel slope. Chain pillars between slope and parallel entries are 75 ft. wide.

In working a pillar, a wide breakthrough is driven through it about 50 ft. from mid rib and a wide drift extended from this point to the mid-rib breakthrough.

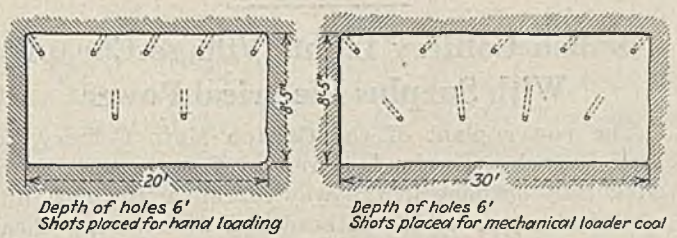


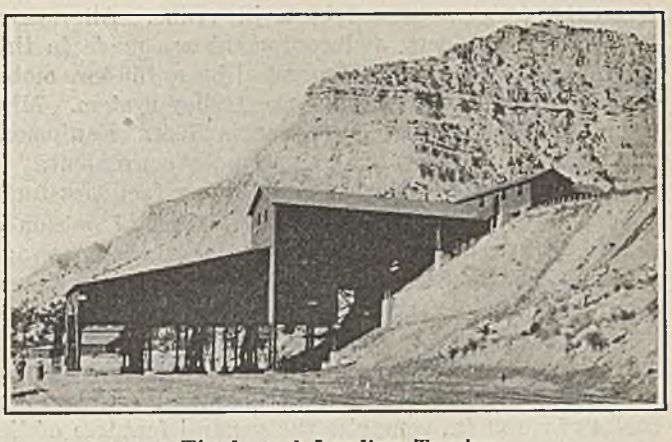
Fig. 2—Placement of Shot Holes

It will be here seen that the arrangement of holes in a face differs with the method employed in loading. It is well known that coal that is to be loaded mechanically should be well rolled out on the floor so that the loader can readily get hold of it. Picking down a face ahead of a loading machine loses much time.

The pillar end is drawn back by slicing on either side of the drift retreating to the breakthrough first mentioned. Props are used in the pillar working and the roof is caved in sections. When a 50-ft. rib end is finished, another breakthrough is driven and from this another drift, and pillar mining continued. Room pillar working begins at the top of the panel, or where a permanent break line is established.

Chain pillars on the main entries are 100 ft. wide. A barrier pillar about 150 ft. thick separates the first room on the dip from the main entries. This is usually only punctured by the dip slopes and where return airways are necessary. As will be noted in Fig. 1 the panel layouts differ in detail. It will also be noted that the present panel workings are limited upon the dip by a fault the strike of which is a little west of north. Main entries are about 12 ft. wide, rock tunnels 12 ft. and slopes 12 ft. The underground men average 110 at the face, of which 82 are loaders, 10 machine men, 8 drillers and 3 tampers or shot firers. All underground men are provided with Edison electric safety lamps. The mine makes sufficient water for all sprinkling purposes, but drainage is not at present an important feature.

The gravity tram is especially well guarded to prevent runaways. Derailing switches are placed at several points and heavy iron stops, lever operated, are installed



Tipple and Loading Tracks

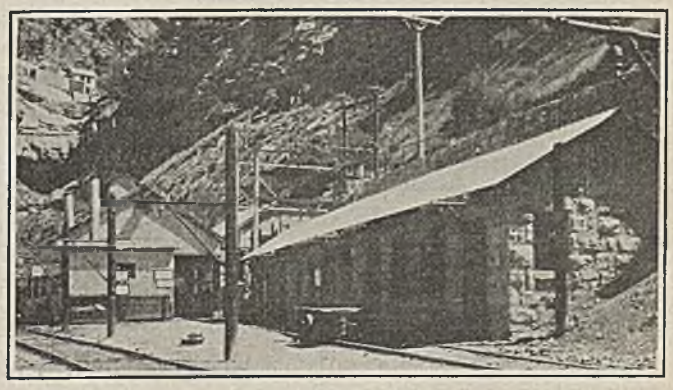
Although this is a "captive" mine careful provision is made for preparation of the mine product. Thus, shaker screens, picking tables and loading booms are installed. A roll crusher reduces the run-of-mine to a crushed product if this course is deemed advisable because of existing conditions.

at either end of the yard to hold trains while hooking on or uncoupling. In addition a supplementary track lock and brake is used to control loaded trips while making ready for lowering. A standard lay, steel rope, 1½ in. in diameter, is used on the gravity plain. At one point the tracks are supported upon a wooden trestle. This is provided with fire hydrants, hose, water barrels and buckets. The tipple end is a kite-shaped track with gravity return for the empties. Coal is handled in trips of 17 steel cars, holding 3½ tons each, by a single 20-ton trolley locomotive. Pin couplings and side hitchings are used on the cars which are without doors and of tight construction.

The steel tipple is equipped with rotary dump, two gravity and two inclined shaker screens, four picking tables and three loading booms. Run of mine can be crushed by 3-ft. rolls, 5-ft. long. Bone and waste rock are picked by hand and dropped into chutes which deliver to a tunnel below the loading tracks. These chutes are discharged from time to time into a car which is drawn to the waste dump.

Electrical Power Bought and Stepped Down

Electrical power is purchased. It is delivered at the mine at 44,000 volts and stepped down to 440 volts by transformers placed near the mine entrance. The repair shop is of steel frame and galvanized iron construction. It is equipped with a lathe, power shear, emery wheels, hack-saw, forges and accessories and is served by an overhead I-beam trolley and chain blocks.



Buildings Near the Mine Entrance

Year by year the practice of erecting mine buildings of a permanent nature is growing in favor. As may be seen the structures here shown are of steel or stone. Where native rock of suitable character cannot be readily obtained the steel-framed sheet-iron covered structure is justly popular.

A special forge is served by a jib crane. All repairs to mining machinery and equipment are made in this shop. Direct current is generated by a 150-kw. motor generator set which supplies the trolley system. Minimum clearance of trolley wires is 6 ft. Equipment and mine plant layout are exceptionally convenient.

The town of Columbia supplies living facilities for a population of about 600 people. It is laid out on a sloping site and is provided with an excellent sewage system. The housing unit adopted is a 4-room frame dwelling placed on concrete foundations. Each house is equipped with bath, range, boiler and accessories. A rooming house, mess hall, store, club house, and school building as well as an office and a swimming pool 40 by 100 ft., comprise the general features of the community. The corporation has adopted a generous policy in its scheme of town development with the result that comfortable, pleasant quarters are available.

Men and Women of the Mines
III—Certificates of Competency

By H. S. Geismer
Birmingham, Ala.

Once upon a time a certain superintendent decided that two of his rock bosses and one of his boss drivers would make better mine foremen than any of the assistant foremen next in line for advancement. Accordingly he "put it up to them to get busy" that they might be classed as available. The main stumbling block for each of them was the examination required by the board that issued the certificates of competency; the superintendent realized that they would have to have assistance in their preparation for that ordeal because they had had only limited educational advantages and knew little about the theory of mining.

After a few discussions with these men he came to the conclusion that he could not qualify as an instructor in the theory of mining so he requested the company's mining engineer to undertake that task. He did not wash his hands of the matter, however, and while interested learned quite by accident that one of his friends had access to inside advance information covering the forthcoming examination questions. He prevailed upon this friend to put him on the inside also.

The mining engineer felt uneasy about taking advantage of the leak when the superintendent mentioned its possibilities. He was finally persuaded, however, that the applicants were competent and would make good foremen so that no harm could result and his conscience need not be strained. He did not think it advisable to tell the applicants that favoritism had been shown so he covered all of the ground that he would otherwise have covered, endeavoring, however, to emphasize the questions that must be answered.

Half of the questions scheduled to be used dealt with mining experience and the remainder were concerned with formulas and computations. The engineer having himself had limited mining experience felt that his pupils did not require coaching from him on matters of mining so he hammered away on the questions that called for answers in figures.

When the three applicants presented themselves for examination, two of them failed to make a passing grade and the third just managed to pull through.

Here is the explanation. All applicants, as soon as they entered the room, were furnished with a complete set of questions and were instructed to answer them in any order that they preferred. The three men who had had the advance information realized at once that they had previously solved all of the problems requiring computations so they concentrated their efforts on these questions first and attempted to answer them. They ran into difficulties almost from the start but the fact that they had once gone through with the computations gave them courage and they struggled with the figures so long that when they completed these problems they had little time left for the practical questions about which they were sufficiently informed to have given satisfactory answers. The examiners being guided largely by the answers to the practical questions were not impressed by their papers; two of them did not obtain a correct answer to a single one of the problems but the examiners gave them credit for using the proper methods.

When the results became known to those who had had a hand in the struggle the mining engineer was the most disappointed man of all and the two applicants who had failed were the least disappointed. The following year both of them again presented themselves for examination and both passed with flying colors. Subsequently they became excellent mine foremen but they have never had much respect for figures, mining engineers, or certificates of competency.

British Colliery Lights Village Cheaply With Surplus Electrical Power

The power plant of the Carlton Main Colliery Co. near Barnsley, England, is regarded as an example of what may be done in the way of converting coal into electrical power at the pithead and distributing cheap current over a wide area. Its main purpose is the supply of power to the company's own group of collieries but the economy of the undertaking has proved such as to make it possible to supply current for domestic purposes at a very low price.

Over 3,000 houses have been wired by the colliery company free of cost to the tenants and under one system of charges the consumer pays 14c. a week in summer and 20c. a week in winter for four lights or less, rising to 30c. and 36c. a week respectively for six lights. Under another system which permits the use of current for domestic purposes other than lighting the charge for current is 2c. per unit plus a standing rate of from 16 to 25c. a week. For shops, hotels, farms and public places where the wiring is not done free the price is 6c. per unit for the first 1,000 units then falling by a sliding scale to 2c. per unit for 1,500 units. Supplying current is not the company's main business but it can furnish revenue nevertheless.

THE PRESERVATION of apparently worthless minerals which may become valuable through scientific discovery becomes more important since the remaining public domain is principally valuable for its mineral content. Much of the mineral land once owned by the Government has passed into the hands of private individuals, but there stiill remains large deposits of valuable minerals in the public domain. Our public lands are believed to contain two hundred billion tons of coal, eight billion tons of phosphate, and oil shale from which sixty billion barrels of oil may ultimately be produced.—*Secretary Hubert Work.*

Mechanization Necessitates Management Change*

Machine Loading Entails Same Problems as Were Faced by the Mechanic Industries in Attaining Mass Production—Careful Planning, Scheduling and Dispatching Form Key to Solution

By Jerome C. White
Pittsburgh Coal Co., Pittsburgh, Pa.

THE PROBLEMS FACING the coal-mining industry in mechanization are the same as those which the manufacturing industries faced and solved in the development of automatic and semi-automatic machines and other labor-saving devices. Just what these problems were and the methods that were used to overcome them successfully is well worth the study of the mining engineer and mine operating or directing officer. From such a study much can be learned. It will be here assumed that the work of the mining and mechanical engineers has passed the experimental stage and that these men are now ready to develop production on a scientific scale. It will be further assumed that the loading machine will load coal. The strictly technical phases of mechanization will, therefore, be here ignored, but an attempt will be made to develop a proposal that the engineer become interested in the economics and fundamentals of management. One prominent operator in the Pittsburgh district recently told me that "the mechanical loader is here to stay"; that his company had already spent thousands of dollars experimenting but were going to stick it out "as they were not discouraged." Another operator has been widely quoted as saying that "mechanical loading is 10 per cent machine and 90 per cent management!"

> Mechanization demands a new mental attitude on the part of labor and management. A machine that will—within the same space—load ten times as much as a hand loader requires, not 6 or 8 cars a day given when most convenient—but ten or even twenty cars per hour delivered on time. The imagination, vision and technique of management and the engineer as he enters into management, must enlarge to meet the requirements of mechanization—mass production.

Mechanization is new to the entire industry. It is new to the operators, the management, the engineer, and to labor. The solution of its problem will be forthcoming when some engineer or group of engineers functionalize their work and undertake the same intensive research into management methods and personnel that they have done in the purely mechanical and mining branches.

To date, as the result of an enormous amount of money spent in experimental work, the manufacturer has produced a workable and satisfactory loader; the engineer can devise a workable mining plan, whether it be a room-and-pillar method with special adaptations to the mechanical loader, or some other method suited to local conditions. The manufacturer has accepted the challenge and the loading machine needs no huge change in mining methods in order to render it usable.

This brings the industry face to face with the problem of co-ordination. So far, the progress of the loading machine, in its technical development, has outstripped some management plans for getting best results from it. No adequate technique has been developed to cope with changed requirements as to methods and labor. Therefore, it is proposed that the engineer tackle the problems of management and develop a new managerial technique that will give the loading machine a fairer chance and the operator more encouragement to go further. The problem in mechanical loading exactly parallels that of management in processing industries involving heavy, permanent, or semi-permanent machines. It is that of getting work to and away from the machines. Mechanical industries had labor problems. This was because the progress of mechanization moved faster than did either management or labor technique. Since the engineer was primarily responsible for this rapid mechanical progress, if he were not to be entirely discredited in his work he had to turn his methods of thinking, analyzing and planning to management. The result is what is now known as scientific management—once considered a fad and utterly impracticable, now the accepted way of doing work. Briefly, the job ahead of the coal industry is to plan, schedule and dispatch for control of production and costs. The early interest engineers in other industries took in these management problems led to such specialization as that of industrial engineering or management engineering as a profession. These men do nothing more than to take good, sound and proven business methods and apply them to production management. They are not theorists nor dreamers; just hard, cold analysts of facts and conditions upon which they build for better management methods.

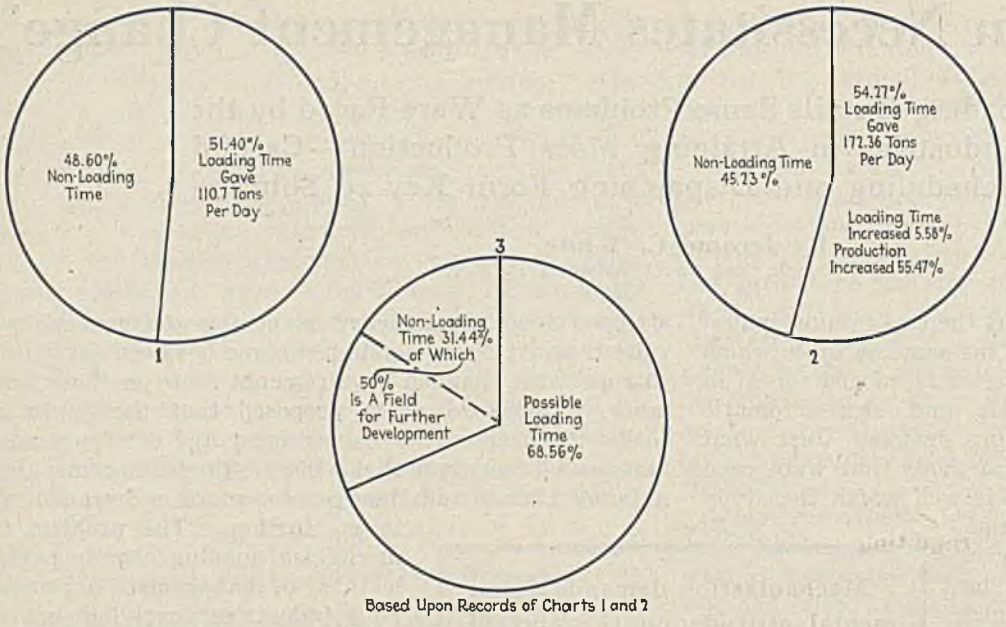
'Phone Is an Aid in Production Control

Relatively great distances and comparative isolation have always been a bugbear to more effective production methods in coal mining. The loading machine of itself will not greatly lessen this barrier. Centralized production control by means of telephone, based upon time standards, will help.

Therefore, this problem in mechanization will not be solved by the mere installation of machines. Almost as great a change in management technique must be made as is entailed in the change from hand to mechanical loading.

The coal industry is already asking how to develop better management methods. My present proposal is not so liable to be misunderstood as it would have been a few years ago. Several companies that I know of

*Abstract of a paper entitled "Management in Mechanization," presented before the meeting of the American Institute of Mining and Metallurgical Engineers, New York City, Feb. 14 to 17, 1927.



Where the Time Goes

In the first study, or chart 1, 51.4 per cent of the time was spent in loading, car change included; in the study made a few weeks later and represented by the second chart, loading time had been increased to 54.27 per cent of the total time. The production was 172.36 tons per day, representing an increase of 66.1 tons per day. The third chart is based upon the time consumed in specific operations performed during the two previous studies in which the best times were made. This chart indicates a possible non-productive time of 31.44 per cent, one half of which is a fertile field for further reduction of non-loading time.

are making a management approach to mechanization. Among these I might mention the Union Pacific Coal Co., the Powhatan Mining Co., and the Sheridan Wyoming Coal Co.

The set-up of the study of mechanization management in mining will be along the following general divisions: To control it is necessary first to plan:— (a) Conditions and standards, (b) to both make and use time studies, (c) time standards, (d) costs (what they are and how to use them), (e) production standards, (f) organization of both labor and management personnel. Second, it will be necessary to (a) make schedules against known times, (b) employ time standards in making schedules, and to form (c) cycles of operation. Third, it will be necessary to dispatch:— (a) For co-ordination, (b) haulage, power, equipment, etc., (c) make charts to control supervision and dispatcher telephones, (d) establish a foreman training course to teach newer management methods to foremen or supervisors.

> The problem in mechanical loading exactly parallels the problem of management in manufacturing industries in keeping machines busy and production regular—that of getting work to and away from them with clock-like regularity and precision. Planning accomplishes this.

1. *Planning.* The success of any installation depends so much upon how well it has been planned ahead of the actual time of execution that this is a necessary function. One of the most valuable aids to planning ahead is the use of time studies on present performances of existing installations as a basis of setting standard times. Time study is the miscroscope of operations. Once time studies have been taken correctly, so long as conditions do not change greatly, they can be used over a long period of time. When conditions change it is, of course, necessary to vary the time standards. A time standard is the gage against which performance is compared to ascertain a definite numerical degree of efficiency.

Time studies of this class may be termed production studies inasmuch as they deal primarily with delays and their causes. We are concerned principally with production but, to decrease or eliminate delays, it must be known accurately what such delays are, and in what degree they can or should be controlled. This control can be determined from their effects. For instance, the loading machine may represent a cost of $10 per hour, and this cost may properly determine the practicability of attempting to increase the machine's available loading time by removing the cause of some specific delay.

Setting standard times is the most effective way to use time studies. After the production study has been made and it has been decided what delays should be eliminated and what should be allowed for, a standard or an expected production is set, against which the actual performance is checked. It should be emphasized that a standard production based upon a standard time is not arrived at as a compilation of averages, but is based upon the machine's capacity plus the skill of the crew under existing local or coal-bed conditions. In other words, it represents that production which would be attained if all the avoidable delays were eliminated! The value of the "machine-hour" will determine how far it is practicable to go in eliminating avoidable delays. Such delays as cleaning coal and timbering to maintain safe conditions are allowable and should be credited to the machine. But such delays as waiting for trips, those arising from unusually long moves, inadequately prepared places, poor power supply, etc., are not allowable and are chargeable to management. As a general rule it might be stated that any delay is worth overcoming if its elimination adds to the available loading time, thus increasing the machine's production.

An illustration of the use of these management principles is given in the three accompanying charts. The first two show actual studies and the third is the built-up or standard production which it is possible to attain with existing physical equipment nd conditions. The third chart is built up of observed times in which the various operations have been performed.

In the first chart the loading time was 51 per cent of the total and the production was 110.7 tons per day. In the second the loading time was increased to 54.27 per cent and the output per day was 172.36 tons.

In detail, during the second period a reduction was shown over the first from 3.17 to 0.4 per cent for power interruptions; from 1.33 per cent to nothing for delay in cutting; from 1.77 to 0.46 per cent for shooting; from 2.29 to 1.70 per cent for cleaning coal; and from 9.44 to 5.71 for laying track. During the second period there were several increases in some of the delays. For instance, moving time increased from 9.59 per cent to 11.24 per cent and haulage delay increased from 11.5 to 14.6 per cent.

The third chart is used to show the method of arriving at a standard time by using the time in which work can be done and in which it should be done in order to set this time as the standard. The best time for a job should be used rather than an average time.

Allowance for Inevitable Delays

Using the results of several production studies to build up a standard for production there are certain delays which are unforeseen and not controllable by either labor or management. An allowance accordingly is made for them. But those delays which arise from car supply, cutting and moving, a decrease in which increases the available loading time, are the ones which offer the biggest field for management development. In the production study which showed 172.36 tons per day, waiting for cars and moving the machine accounted for 25 per cent of the possible working time.

After a certain length of time the number of cars required for a loading machine will be ascertained. When this is known specifically the number of cars required to load out a cut will also be known. The efforts of the management must then be centered on providing these cars, thus eliminating one big element of delay—"waiting for cars."

Studies of methods intended to decrease the moving time will prove profitable. One gain would result if the loader could be left in the same place continuously, cutting to be done on a time schedule based upon how long it took to load a place out, the cutter to be available at the right time. This is not so unreasonable as it may seem, because within recent months one of the large equipment companies announced a machine that will cut up to a 25-ft. place, from the track, in about ten minutes. The next step, then, is to decide if this saving in the moving time of one or several loaders is worth while. But as each place advances the moving time of the loader increases. An alternative would be to let the cutting machine do all the moving as it can travel faster than the loader. The value of the machine-hour rate aids in settling this.

So much for time studies and standards as a basis of planning for production. Just as in time study, the day has been broken up into minutes in order to build up standard times, so must the total cost be separated into its constituent elements so that standard costs may be evolved. Operating officials and engineers who are interested in management must know fundamental costs if they are to control total cost.

One of the heaviest single items in total cost and the one that usually is the most important lies buried in the accountant's or general-office books. This is "overhead," and is the "cost of owning" the machine. Labor, power, and a few other items, are, to a degree, controllable in that when the machine is idle labor can be laid off, or when natural conditions restrict the machine's output the crew can usually be kept to a reasonable cost within the given production limit. Overhead costs are not so easily controlled. The lowest cost-per-ton will be attained only with a maximum use of the machine. Overhead costs go on whether the unit operates or not, because time is here the controlling element. This is one argument for double-shifting the machine, or for otherwise crowding it to get the most production within the available time.

The easiest and most convenient method of handling overhead in the operating accounts is to resolve the total overhead charge into a "machine hour" rate. This will conform to any company's style of handling depreciation accounts and is susceptible to, and reflects the results of, any variation in working time. It presents in a most forcible manner the cost of idleness. Being a concrete unit composed of dollars and cents, it is a powerful incentive to management to work the loader as much of the time as possible in order to get all the production within the machine's capacity. It is also an incentive to decrease or remove contributing delays because the return is immediate and measurable. The value of the machine-hour rate is large enough to be interesting to owners, engineers, and management.

Management under mechanization requires vastly more imagination and vision than with hand mining. Within the same space a machine will load ten times more than a miner; a few cars a day will satisfy a miner and when he isn't loading he apparently does not cost the company any money. A machine must have, say, 25 cars an hour. Minutes mean little under hand loading; with mechanical loading they mean dollars. The imagination, vision and technique possessed by management, and the engineer as he enters into management, must change to meet the requirements of mechanization—mass production.

Foreman Training Courses Advocated

The foremen, and I may say also the superintendents, as that part of the mine management upon whom rests the ultimate success of all plans and projects, must move along with this management change as well as the engineer. The best way to keep the foreman in line with the increasingly difficult requirements of mechanical loading and high production methods, as well as to insure the success of engineering thought, is to develop his imagination, cultivate his vision, and lead him gradually. This can be most readily accomplished by foreman training courses designed with this specific end and aim in view.

It should be here pointed out that planning is a continuous process. It embraces that function of management which executes *plans* that have been already carefully thought out and perfected. At all times the planning department must stimulate production by means of a personnel trained to schedule and dispatch, because, after all, plans are of no value unless carried out. The means available for their execution are scheduling, with regard to time, and dispatching, with regard to men and equipment.

The problems of production research here outlined present to the mining engineer, superintendent and foreman an opportunity and simultaneously a challenge. The progress of these men as well as that of the industry depends much upon how they rise to the issue.

Car Turn-Over of 2.5 Effected by Dispatching

Small Extra Expense Incurred Dwarfed by Savings Secured—Except for Car Distribution System Mine Might Be Classed as An "Average"—Output Amounting to 1,200 Tons Obtained with 325 Cars of 1½ Tons Capacity

AN INCREASE in mine car efficiency means vastly more than a mere corresponding decrease in the cost of coal per ton chargeable to the use of this equipment. It signifies rather that delays have been reduced, that the locomotives are doing more useful work, that the miners are loading more coal and that the output per man on an all-men-employed basis has been increased. All this may be summed up in the two words "lower cost."

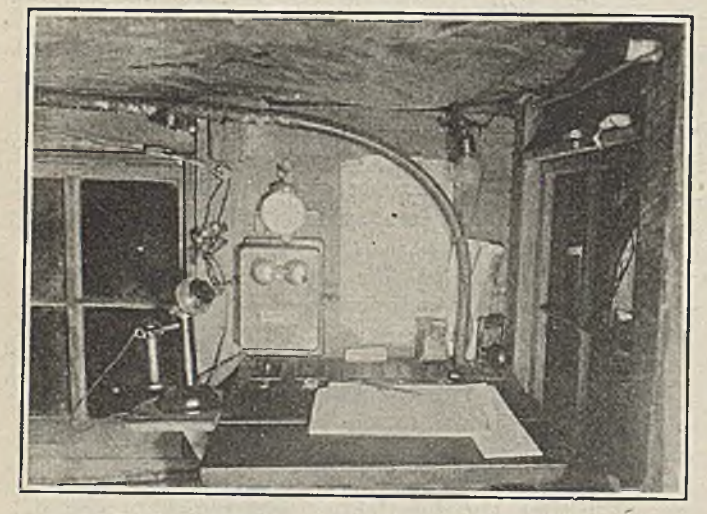
The manager, superintendent or foreman who sets himself to the task of increasing car efficiency at a mine where previously this has been nobody's "particular worry," soon finds that after tracks have been put in good shape and traffic signals installed the problem is still by no means solved. He then asks himself the question, "How should I go about figuring out a suitable schedule of distribution to the various sidetracks and how can such a schedule be kept up to date?" There are, of course, many other problems between the sidetrack and the face but they vary so widely with local conditions that helpful examples are difficult to find.

Dispatcher Necessary

In all mines except possibly those few that enjoy practically ideal natural conditions, the answer to the main haulage question is, a dispatcher. Each day starts with a different set-up, and usually brings conditions that cannot be foreseen.

As will be illustrated by the case of the Newcastle Coal Co., Newcastle, Ala., the employment of a dispatcher does not necessarily mean that another "salaried man" is added to the payroll or that a lot of red tape is introduced. In the Newcastle No. 2 mine, cars are dispatched in an extremely simple and effective manner.

The mine is in the Mary Lee bed and for the most part lies in a level area. The working height averages about 64 in., and as is characteristic of this measure the coal is divided by several partings. The output is brought to the surface by hoisting eight cars at a time up a slope that is 1,600 ft. long including the tipple approach.



Desk and Equipment in Dispatcher's Office

The office is only about 5x5 ft. in floor area, so it was necessary to ask the dispatcher to step out while this photograph was made through the doorway. On the wall above the desk is the sheet or table giving the tons per entry with the various numbers of loaders in rooms and narrow work. The flush-type tumbler switches controlling the signals can be seen on the desk next to the wall. The telephone which shows in the photograph is that on the inside line. On the left side of the office is another instrument connected with the outside line.

Empty Trip Passing Dispatcher's Office

The "trip" is the unit used in dispatching, therefore all regular trips consist of 24 cars. Only in extreme cases such as when it is necessary to "clean up" a side track at night are less than that number hauled. When the dispatcher illuminates a numeral directing the trip to a certain side track he simultaneously lights a red light at the entry warning the trapper that a trip is coming. In the photograph, the dispatcher's signal box is directly above the motorman's head.

From the three principal side tracks to the bottom of the slope, distances varying from 3,600 to 7,000 ft., haulage is by two 8-ton 250-volt trolley locomotives. The mine car equipment consists of 325 cars averaging 1½ tons each. Until quite recently all gathering was done with mules, but these animals are now being displaced by cable-reel locomotives. The mine production averages about 1,200 tons per day.

Small Office Provided

The dispatcher, or "turnkeeper," as he is locally designated, is provided with a small office built close to the track on the main haulway and at a point a few hundred feet outby from the first working entry. This office is large enough for only one man, and its equipment consists of two telephones, a clock, an electric heater, and a small desk on the back of which are mounted six flush-type tumbler switches. Windows in three sides give the dispatcher a view of both approaches, and a "close-up" of passing trips.

Mounted above the track near the office is a signal box containing five lamps separated by partitions so that the lighting of the proper lamp either illuminates the word "stop," or a numeral indicating a side track. On the main haulway opposite the entry leading to each side track is a red light which is wired in series with the respective numeral in the box at the dispatcher's office.

At each of the entry doors are two green lamps, both of which are lighted when the door stands wide open.

MINE NO. 2 Nov. 3, 1926 TURNKEEPER— A.M. Faucett

Side Track	Loaders — In Narrow Work	Loaders — In Rooms	Tons Estimated — From Narrow Work	Tons Estimated — From Rooms	Tons Estimated — From Narrow Work and Rooms	Motor Trips Estimated	Loads on Side Track at Start of Shift	Loads on Side Track at End of Shift	Time of Call and Time of Leaving—Each Motor Trip of Empties — 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
No. 1	25	37	200	444	644	18	17	21	7.35 / 7.33	8.21 / 8.21	8.46 / 8.46	9.00 / 9.00	9.33 / 9.33	9.47 / 9.47	10.00 / 10.00	10.46 / 10.46	10.59 / 10.59	11.19 / 11.19	11.45 / 11.45	12.18 / 12.18	12.42 / 12.42	1.03 / 1.03	1.20 / 1.20	1.43 / 1.43	2.03 / 2.03	2.27 / 2.27	2.43 / 2.43
No. 2	..	..	...	...	.....	..	..	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
No. 3	7	7	56	204	260	7	4	22	7.40 / 7.40	9.09 / 9.09	10.37 / 10.36	11.22 / 11.32	12.17 / 12.36	1.26 / 1.32	2.15 / 2.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
No. 4	13	14	104	168	272	8	17	12	8.00 / 8.00	8.24 / 8.24	10.16 / 10.16	11.10 / 11.10	12.02 / 12.02	12.53 / 12.53	1.44 / 1.52	2.51 / 2.51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
No. 5	...	...	...	...	.....	..	..	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
No. 6	...	...	...	...	.....	..	..	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	45	68	360	816	1,176	33	38	55																		

Delays Motor No. 1 .....
Delays Motor No. 2 .....
Delays Outside .....

Total net tons production during shift 1,199
Tons standing on side track at beginning of shift 60
Tons standing on side track at end of shift 82
Tons gain actual production over estimated production 43
Tons loss actual production under estimated production ....

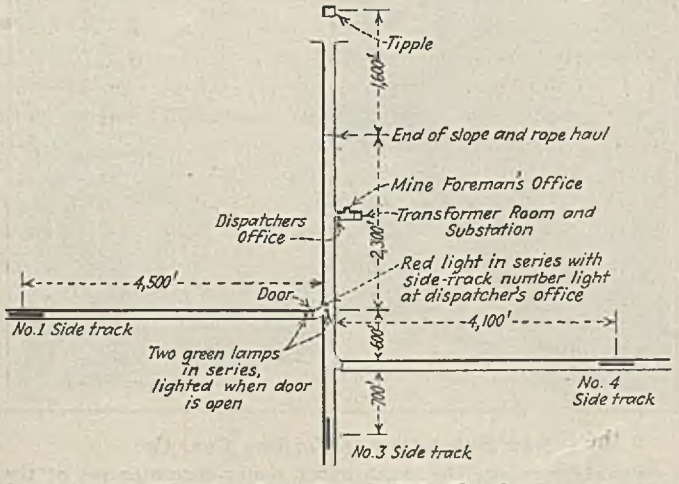
Specimen of Daily Sheet Made Up by Dispatcher

The chief object of this sheet is to simplify the dispatching, but it serves also as a record for countering "alibis" which the section foreman might put forward when production is not up to par. These section foremen are judged entirely by "tons per loader." On the day represented by this sheet the dispatcher predicted the total number of trips within one, and sent out all empty trips, except five, without waiting for a call. Forecasting the day's output and providing for it are thus easy problems.

One is located on the main haulage beside the red light, and the other inby of the door on the entry. The red light informs the trapper that an empty trip is on its way to his entry and the green lamps inform the motorman that the door has been opened. A telephone at each side track, so that the coupler and the dispatcher can communicate when necessary, completes the equipment.

The dispatcher has a printed form which he fills out each day. The primary purpose of this form is to aid him in the car distribution but it also serves as a valuable record of each day's performance. The "trip" is the unit of record, therefore all motor trips, loaded or empty, are made up of 24 cars, an even multiple of the 8-car hoist trips. Six to eight empty cars are kept at the tipple ready to fill into the hoist trip so that eight cars are always returned even though one or several cars of the loaded trip have to be shunted to the refuse dump or to the repair shop. Three hoist trips, then, always make a complete motor trip.

In the morning, as soon as possible after work time, the dispatcher finds out by phone from the couplers at each side track how many loaders are in narrow work and how many are in rooms. From a table based on 12 tons per man in rooms, and 8 tons per man in narrow work, he then calculates the expected production for the day from each section, and taking into account the number of loads that were left on the side track from the previous day, he estimates the number of motor trips that each section will need.



Showing Location of Side Tracks

The main hauls are 6,800 ft., 3,600 ft., and 7,000 ft., in length respectively, and lead to side tracks No. 1, 3, and 4. The record production of 1,400 tons in one day meant that each of the 325 cars of 1½ tons capacity was loaded 2.5 times. Data on the gathering is not included in this article because this work is now being shifted from mule to cable-reel locomotive.

These figures are then transcribed to the proper place on the daily sheet. When the dispatcher sees a locomotive coming with the first trip of 24 empties he may illuminate the "stop" signal, thus holding the trip at his office, or he may illuminate a numeral in which case the trip continues at full speed to the side track designated.

Which course he will take depends upon several conditions. If he has a telephone call from a coupler for empties, the trip is dispatched accordingly, and is recorded on the sheet by noting the time of call and the time of dispatch. If he has no call, he will probably send the trip to that section which experience and the morning set-up indicates will be the first to need cars. In this case of sending a trip without call, a record is made by noting the call and dispatch time as the same.

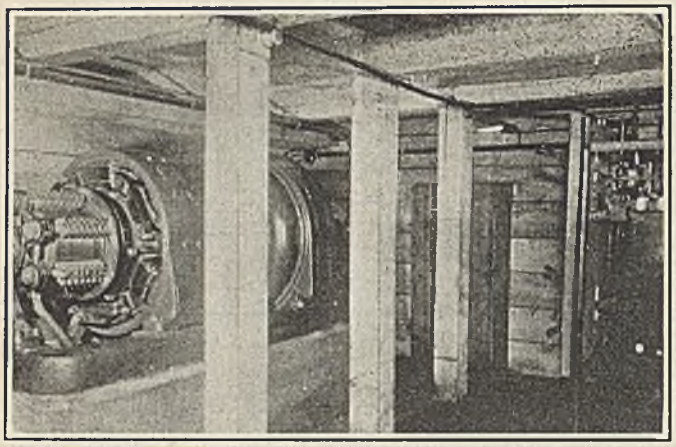
ONLY FIVE "CALLED FOR"

The sheet for Nov. 3 shows that of the 34 trips dispatched, but five were "called for." On that day the actual production was 1,199 tons, differing by less than 2 per cent from the 1,176 tons of estimated loading. The total number of motor trips was but one above the 33 estimated, and there were no delays at the side tracks for cars.

The following record, made on a day during a period of reduced production when but one locomotive was in use, indicates the efficiency of the dispatching system. Between 7:33 a.m. and 3:42 p.m. this 8-ton locomotive hauled 1,118 tons, and the total time lost in delays for cars was only 12 minutes.

The dispatcher is a man who previously worked many years as a blacksmith. Although he spends practically all of his time at the dispatching desk, he has several other duties, and it is therefore questionable how much of his wages are chargeable to dispatching. He restarts the substation in case of power failure, sees that supplies that come down the slope are sent to the proper sections, and answers phone calls on both inside and outside lines. Since he relays many messages, both verbal and those coming by phone, and knows the exact number of men working and the locations of the locomotives, he can handle many routine matters which otherwise would be a bother to the mine foreman.

To Frank Parker, mine foreman, goes much of the credit for the systematic methods followed in New-



Substation which Dispatcher Tends

This 200-kw. 2,300- 275-volt synchronous motor-generator unit is located about 80 ft. from the dispatcher's office. In addition to taking care of this substation, the dispatcher sees that supply materials which are sent down the slope are started to their proper destinations in the mine. According to the common practice in Alabama, even though this substation were of the full-automatic type, a man would be kept in attendance.

castle No. 2. When the gathering has been changed completely to cable-reel locomotives no doubt he will be able to show a modern system of handling and distributing cars between the side track and face which system also will be a model of simplicity and efficiency.

In Ordinary Furnace Buckwheat Should Be Used with Coke or Large Anthracite

"More care and skill are needed in the firing of buckwheat than when large sizes of anthracite are used. One important rule is that the fire must never be completely covered with the fine fuel on charging, for this layer will suppress flame for a period, finally igniting the gas from the coal with an explosion that may blow open the furnace door," said Prof. E. M. Lockwood, of Yale University, addressing the Metropolitan Section of the American Society of Mechanical Engineers in the Engineers' Societies' Building, New York City. He remarked that:

"Buckwheat anthracite can be burned in existing furnaces probably with better satisfaction than bituminous coal and with at least an equal reduction in cost. Users are advised, in starting to use buckwheat, to combine this fuel with gas coke, or if that is not available with larger sizes of anthracite. When the combination is used the two fuels should be kept in separate piles or bins, for varying proportions will be needed according to the weather and the demand for heat. Some users, starting with two fuels, have gradually found that the cheaper coal could be used alone practically all the time and with ordinary chimney draft.

"The safe rule in firing is to cover only part of the surface of the fire with fresh coal, allowing time for this to ignite before covering the remainder. This precaution is unnecessary when firing anthracite of large size, as the space between the lumps is large enough to let the flame travel through the fuel immediately after firing.

"The procedure in firing buckweat and coke may be described as follows: Assuming the ash to be shaken out leaving a kindling fire on the grate, add a layer of coke several inches deep and wait a few minutes for the flame to appear before adding buckwheat. Apply the buckwheat in two charges in the manner already directed with enough interval between the applications to let the first buckwheat kindle before adding the second.

"If buckwheat alone is used, one or two sticks of wood on the kindling bed will aid in promptness of ignition, after which two or three charges may be fired in succession with enough time interval for each charge to ignite. In this way a considerable depth of fuel bed can be built up, either of buckwheat or of buckwheat and coke combined, which will burn steadily and provide heat for several hours. This fuel is not as convenient as large-size anthracite, but is more satisfactory than bituminous coal.

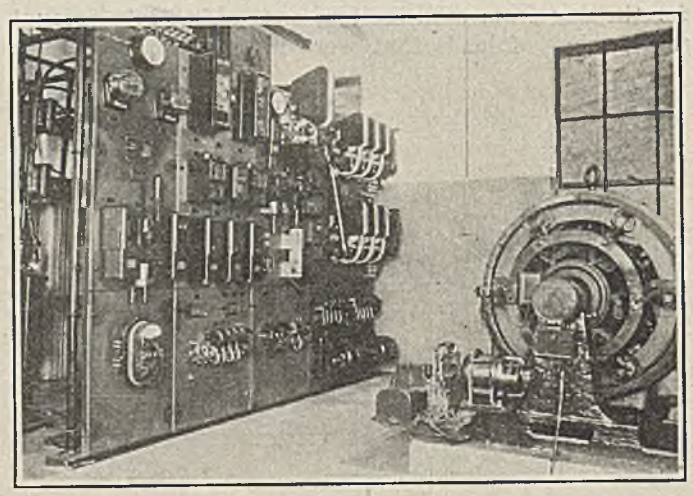
Keeping Firepot Full Is Good Practice

"Some have thought that, as buckwheat is small, the fire should be kept in a thin layer above the grates but in practice a fire of this kind is difficult to manage. A hotter fire and better combustion can be obtained by keeping the firepot full with the top of the fire at the level of the charging door and with plenty of ash between the grate and the burning fuel.

"Ash must be removed at intervals to lower the fuel bed and thus make room for fresh fuel. The need for this will be apparent when ash shows around the edges of the fire which will always occur after it has been burning a long time. Ash is best removed by shaking the grate lightly, then using a fire tool in spots where the ash shows. In this hand operation it will be noticed that the ash is in the form of a soft clinker, whereas the burning fuel forms a much harder mass and is sometimes fused together as a sheet or cake. With such a fire no unburned fuel need be lost during ash removal.

"The ash should be removed after parts of the fire have burned out; never after the coal has just been fired. The best tool for this purpose is a poker of the *L* type with the bent member about 9 in. long so that it will reach down through the fuel bed to the grate.

"After the disturbance of ash removal, the fire will have lost much of its heat although it will still be able to kindle the new charge of fuel. At this stage a little coke or wood will help it wonderfully, restoring it to an efficient temperature."



New Substation of Fordson Coal Co.

Several years ago the synchronous motor-generator set of the inside substation at the Nuttallburg (W. Va.) mine was changed over to full-automatic operation. Recently another substation was installed on the outside near the main portal. In this latter station an old rotary converter is used, but the full-automatic control equipment and transformers are new. These latter are located inside of the building, back of the switchboard. The converter is rated at 200-kw., 275 volts, 1,200 r.p.m., and the transformers at 73½ kva. each.

Study of Underground Fatality Rates Indicates Mountain States Have Poorest Record*

Utah, New Mexico, Wyoming and Colorado, in Order Named, Have Greatest Number of Fatalities per Million Man-Hours of Exposure Underground — More Stringent Laws and Regulations Should Be Adopted and Enforced

By Dan Harrington
Acting Chief Engineer, Mining Research Division,
U. S. Bureau of Mines

STATISTICAL DATA on the occurrence of accidents are among the many items that should be studied in all efforts to increase mine safety. One of the most interesting and instructive recent summaries of this character is given in Table I which compares the underground fatality rates in various coal mining states with the average for the entire country. Table II, which, like Table I, covers the five-year period of 1920-1924 inclusive, shows the approximate number of men employed in and about the coal mines of the various states. In Table I the average fatality rate for the United States has been taken as 100, and the records of the several states are shown in proportion to this index.

The accuracy with which accident data can be obtained, with reference to underground exposure in coal mines per million man-hours, has been questioned. It is probable that non-union districts have relatively more exposure than unionized fields as the regulations in the latter limit overtime, idle-day work, etc. On the other hand, there undoubtedly are other features in unionized areas which tend to equalize these conditions. Many, if not all, of the discrepancies or inaccuracies that enter into comparisons made on the basis of 1,000,000 man-hours of exposure underground are found in other methods of comparing accident statistics.

*Abstract of a paper entitled "Accident Record of Coal Mining States," presented before the meeting of the Rocky Mountain Coal Mining Institute, held in Denver, Colo., Feb. 23 to 25, 1927.

Under "Fatalities from Falls of Roof and Coal," Utah has the worst record of all the states, with an index of 219. Following in order come: New Mexico, 199; Wyoming, 186; Colorado, 172; Montana, 167; West Virginia, 155; Arkansas, 148; Ohio, 139; and Washington, 131. Thus, the four poorest records have been made in the states from which the membership of the Rocky Mountain Coal Mining Institute is largely drawn; the worst five records are held by Western states; and all six of the coal mining states of the West are among the first nine with the highest fatality rates from falls of roof and coal. Good records in this respect have been made by Illinois with an index of 75, which is approximately one-third that of Utah; and by Oklahoma with an index of 78 or less than one-half that of Wyoming—both of these states have essentially the same coal-mining population. Pennsylvania, anthracite and also bituminous, Indiana and Kansas with indices of 86, 81, 83 and 85, respectively (all about one-third that of Utah), have relatively good records.

RECORDS SHOW SOMETHING IS WRONG

It would appear that something is radically wrong where coal mining states such as Utah, Wyoming, Colorado and Montana, with comparatively good roof conditions, have such unenviable accident records from falls of roof when compared with Illinois, Tennessee, Oklahoma and Pennsylvania where much of the roof

Table I—Coal Mine Fatality Rates*

(Index numbers, comparing rates per 1,000,000 man-hours, underground, for different states, with the average rate for the United States, 1920-1924)

Falls of Roof and Coal		Haulage (Underground)		Gas or Dust Explosions		Miscellaneous (Underground)		Total Underground (Including Shaft)	
State	Index Number	State	Index Number	State	Index Number	State	Index Number	State	Index Number
Alaska	...	Ark.	...	Mo.	....	Ga. & N. C.	...	Alaska	...
Calif., Ida., & Nev.	...	Ga. & N. C.	...	Md.	....	Alaska	...	S. Dak.	...
S. Dak.	...	Alaska	...	Mont.	....	Cal., Ida. & Nev.	...	Oreg.	...
Oreg.	...	Calif., Ida. & Nev.	...	Tex.	....	S. Dak.	...	Tex.	29
Tex.	15	S. Dak.	...	Mich.	....	Oreg.	...	Ga. & N. C.	59
Mich.	58	Oreg.	...	Ga. & N. C.	....	Md.	26	Mo.	60
N. Dak.	67	Mo.	20	Alaska	....	Iowa	55	Mich.	62
Ill.	75	Kans.	24	S. Dak.	....	Va.	55	Iowa	64
Tenn.	77	Tex.	29	Oreg.	....	Mo.	58	Md.	66
Okla.	78	Md.	35	Iowa	4	Kans.	59	Pa. (bit.)	73
Pa. (bit.)	81	Iowa	40	Ohio	8	Pa. (bit.)	62	Tenn.	74
Ind.	83	Va.	74	Va.	15	Ill.	74	Va.	77
Kans.	85	Pa. (bit.)	76	Tenn.	36	Tenn.	82	Kans.	77
Pa. (anth.)	86	N. Dak.	76	Ky.	50	Ohio	89	Ill.	80
Mo.	92	Pa. (anth.)	79	Pa. (bit.)	51	Tex.	96	N. Dak.	89
Iowa	93	Okla.	79	Pa. (anth.)	61	U. S. (0.336)	100	Pa. (anth.)	91
Ala.	95	Tenn.	88	Ill.	66	Mich.	100	Ind.	99
U. S. (1.045)	100	Ala.	90	Ind.	92	Ala.	102	U. S. (2.046)	100
Va.	102	Mich.	92	N. Dak.	94	Ky.	107	Ky.	102
Md.	108	U. S. (0.367)	100	U. S. (0.298)	100	W. Va.	108	Ohio	105
Ky.	112	Ohio	103	W. Va.	117	Wyo.	111	Ala.	115
Ga. & N. C.	116	Ind.	103	Kans.	134	Colo.	112	Okla.	125
Wash.	131	Ill.	111	Wash.	149	Utah	145	Calif., Ida. & Nev.	126
Ohio	139	Ky.	114	Colo.	157	Pa. (anth.)	146	Mont.	136
Ark.	148	Wash.	121	Ark.	203	Ind.	150	Wash.	143
W. Va.	155	N. Mex.	132	Ala.	231	Mont.	160	Ark.	145
Mont.	167	Mont.	135	Okla.	274	N. Mex.	165	W. Va.	147
Colo.	172	Wyo.	169	Calif., Ida. & Nev.	867	N. Dak.	166	Colo.	163
Wyo.	186	W. Va.	182	Wyo.	965	Okla.	188	Wyo.	284
N. Mex.	199	Colo.	187	N. Mex.	1,532	Wash.	203	N. Mex.	375
Utah	219	Utah	296	Utah	2,225	Ark.	240	Utah	519

* From U. S. Bureau of Mines Reports of Investigations, Serial No. 2767.

is poor. During the five-year period 1921-1925, inclusive, deaths from falls of roof and coal in the states which chiefly comprise the membership of the Rocky Mountain Coal Mining Institute were: Colorado, 154; New Mexico, 55; Wyoming, 83; Utah, 59; making a total of 351, or an average of 70 per year. If the economic value of a human life is placed at $6,000, the annual loss from this one cause in these four states is $420,000. Even though no thought is given to its humanitarian aspects, it would seem to be advisable to exert particular effort to lessen this economic drain.

It is probable that the Institute can be of no greater benefit to the industry which it serves than by financing an inquiry, with reference to the prevention of accidents from falls of roof and coal, in the four states of the Rocky Mountain region that have the highest fatality rate from this cause. It would appear expedient to have at least one well-qualified and experienced investigator assigned to whole-time research on the subject. The Bureau of Mines has begun a nation-wide investigation of the problem and if the Rocky Mountain Institute should decide to make a similar study, it would be desirable to have the work done in co-operation with the Bureau.

Table I further indicates that Utah, with an index of 296, also has the highest fatality rate from underground haulage. Colorado follows with an index of 187. After these come: West Virginia, with 182; Wyoming, 169; Montana, 135; New Mexico, 132; and Washington, 121. Six Western coal mining states are among the seven with the poorest haulage-accident records. Again it may be said that the situation is undeniably serious. Why should Maryland, with essentially the same coal mining population as Utah or New Mexico, have less than one-eighth the haulage fatalities of the former, and fewer than one-third those of the latter, state? Or why should Iowa, with about the same number of men employed in mining coal, have less than one-fourth the haulage fatality rate of Colorado? Why should Missouri have but one-eighth the rate of Wyoming when both states employ essentially the same number of men in coal mining? It would seem that haulage practices in the coal mines of the West need considerable revision. This statement is made with the knowledge that there undoubtedly are some conditions in the Western states that would make it difficult, if not impossible, to attain the much better haulage-accident records made in many Eastern mines.

Utah, with an index of 2,225, New Mexico with 1,532 and Wyoming with 965, have decidedly the worst fatality rates from gas and dust explosions. Colorado, with an index of 157, has the eighth poorest record, and Washington with 149 has the ninth. Montana, having been free from explosions during 1920-1924, inclusive, has an index of zero. Although it is true that the black records of Utah, New Mexico and Wyoming are due to one or two major disasters in each state—as a consequence of which loss of life was heavy when compared with the relatively few man-hours of exposure—nevertheless, the records of these states, as well as those of Colorado and Washington, are bad whether considered during the past five or twenty-five years. Therefore, the coal mine operators of the Western states should put into effect, and keep in operation, all precautions known or believed to aid in the prevention of gas and dust explosions.

Table II—Number of Men Employed*

(Approximate average number employed in and about coal mines in the United States, by states, for the years 1919-1924)

State	Average No. Men Employed
Alabama	27,000
Alaska	260
Arkansas	3,700
California, Idaho and Nevada	65
Colorado	13,300
Georgia and North Carolina	240
Illinois	92,100
Indiana	31,700
Iowa	12,000
Kansas	8,700
Kentucky	53,800
Maryland	4,400
Michigan	2,000
Missouri	8,100
Montana	3,700
New Mexico	4,000
North Dakota	1,300
Ohio	50,900
Oklahoma	7,800
Oregon	
Pennsylvania (anthracite)	155,600
Pennsylvania (bituminous)	170,400
South Dakota	40
Tennessee	10,900
Texas	2,800
Utah	4,400
Virginia	12,900
Washington	4,500
West Virginia	104,900
Wyoming	7,900
Total, United States	800,000

*Compiled from U. S. Bureau of Mines. Bulletin 275, "Coal-Mine Fatalities in the United States, 1925."

In line with this policy, every coal mine in the West should use closed lights exclusively; should employ nothing but permissible explosives; all blasting should be done by electricity; all explosives should preferably be kept outside when the working shift is in the mine; the methane content of the mine air should be maintained below 1 per cent at all faces and below 0.5 per cent in all main returns; any accumulation of explosive gas having a volume greater than 100 cu.ft. should not be moved while the working shift is in the mine; all mines should use only permissible electrical equipment, if such can be obtained, for each of the various operations to be performed; electrical installations should be even more carefully placed and safeguarded, and kept in better repair, than in surface work because failure of such equipment in a mine may cause a large loss of life whereas defective surface work usually results only in property loss; every mine should have water lines to all faces and sufficient hose to supply water to the cutter bars of all mining machines when in operation; all coal faces and their immediate vicinity should be kept thoroughly watered; every dry mine, or part thereof (excepting the working faces previously mentioned), should be kept so well rock dusted that the material on the ribs, roof and floor of all open sections will always contain at least 65 per cent of non-combustible matter; in brief, every Western state should have, in constant effect and thoroughly enforced, laws and regulations even more drastic than those of Utah. These suggestions may seem radical but surely no one can study such records as those set forth in Table I and not realize that the black records, both past and present, of western coal mining states with reference to explosions are such as to make radical remedies imperative.

West Has Poor Record Underground

The miscellaneous underground fatalities shown in Table I include deaths resulting from explosives, electricity, falls in shafts, etc. The fatality record of the Western coal mining states in respect to accidents of this class is not so uniformly bad as from other causes. Even here, however, every one of these states has a higher index than the average for the entire country.

During the five-year period, 1920 to 1924, inclusive, the index of total fatalities in Utah was 519—by far the worst of any of the states. New Mexico, with an

index of 375, ranks second and then follow in order: Wyoming, 284; Colorado, 163; West Virginia, 147; Arkansas, 145; Washington, 143; and Montana, 136. Thus, of the eight states with the poorest underground safety records, the first four are situated in the West. Two other Western states rank seventh and eighth.

Utah with 4,400 men employed and New Mexico with 4,000 have indices of 519 and 375 respectively, whereas Maryland, with essentially the same number of mine workers, has an index of 66 or about one-eighth that of Utah and nearly one-sixth that of New Mexico. Wyoming, with approximately 7,900 men employed in or around coal mines, has an index of 284 and Missouri, with slightly more than the same number of workers, has an index of 60. Hence Wyoming's fatality rate per 1,000,000 man-hours underground is more than 4½ times that of Missouri. Colorado, with about 13,300 mine workers, has an index of 163 whereas Iowa with 12,000 men similarly employed has an index of 64. That is to say, this latter state with approximately the same coal mining population as Colorado, has much less than half the fatality rate per 1,000,000 man-hours of exposure underground.

Most Productive States Stand High

With the exception of West Virginia, the indices of the larger producing states are fairly good. Pennsylvania (bituminous), with about 170,000 men employed, has an index of 73 or one-seventh that of Utah; Illinois with 92,000 mine workers has 80 as an index or nearly one-sixth that of Utah; and Pennsylvania (anthracite), with approximately 155,000 mine employees, has an index of 91 or about one-fifth that of Utah.

Probably the most significant feature of Table I is that it shows that not only in total underground fatalities, but also in fatalities resulting from falls of roof and coal, from underground haulage, from gas and dust explosions and, to a lesser extent, from miscellaneous causes, the records of each of the Western states (Utah, New Mexico, Wyoming, Colorado, Washington and Montana) are consistently among the poorest of all of the coal-producing states of the country. It must be reiterated, however, that Montana has a "clean slate" with reference to fatalities from gas and dust explosions during the period studied.

Practice of Pillar Drawing Decried

It is probable that much of the higher fatality rate from falls of roof and coal in Western mines is attributable to the fact that pillar drawing is much more frequently practiced in the West than in many sections of the East. There is no doubt but that danger from falls is greater in drawing pillars than in other types of underground work. The high coal found in some of the Western states also occasions a much greater hazard from falls than where the coal bed is thinner and roof conditions are consequently more readily examined and maintained in a state of safety. In many sections of the West it is a practice to permit pillars to stand for long periods of time, frequently several years, before extraction is begun. This policy is practically certain to produce dangerous conditions because these pillars, as well as the roof between and over them, gradually become weakened through weathering and other agencies. Furthermore, timbers which have been in place for several years will probably be seriously weakened if not wholly destroyed.

Where pillars are being drawn under the heavy cover found in some Western mines, it is advisable to establish and maintain a definite break line. If this is not done, "bounces" are almost certain to result. When pillars are not drawn "clean," trouble is likely to occur. The same is also true if props are not drawn or shot out to aid caving where strong heavy timbers, particularly if gobbed material is piled around them, are used.

The high rate of haulage fatalities in Western coal mining states seems particularly difficult to explain as the natural conditions that affect underground haulage appear more favorable in the West than in many, if not most, of the mines of the East and Middle West. A company in Wyoming has vigorously attacked this problem and has recently expended a large amount of thought, money and energy on establishing proper clearance between the cars and the ribs or props. Another company in New Mexico has done some experimentation with storage-battery locomotives for both main-line haulage and gathering purposes.

One of the greatest of haulage hazards in the West consists in handling large numbers of men (frequently more than 100 at a time) in man trips on steep grades, almost, if not entirely, without safety devices that will stop or derail the trip in event of accident. This hazard is forestalled in at least two mines in Wyoming and, although no serious accidents have recently resulted from runaway trips, there is a possibility of a multiple disaster occurring at any time.

Hopping Freights Is Condemned

In nearly all of the Western coal mining states the more or less indiscriminate riding on locomotives, loaded cars, trips, cages, etc. (a procedure largely practiced by the bosses and then copied by the men) has caused, and will continue to cause, many fatal accidents. "Flying switches" that require a man to run ahead of cars or locomotives result in many fatalities. The use of mules or horses and the loading of excessive quantities of coal into cars on steep grades (greater than 5 or 6 per cent), also results in many accidents. Failure to block cars, or careless and incorrect methods of chocking, at faces going either to the rise or to the dip (or on turnouts), and even on practically level room or entry track, cause numerous fatalities. It would, therefore, certainly appear that haulage fatalities in the Western states should be reduced at least to the same rate per 1,000,000 man-hours of exposure as that of Middle Western or Eastern mines operating under essentially the same haulage conditions.

Explosion Hazard Greater in West

It is generally understood that the explosion hazard in the mines of the West is greater than in other parts of the country. This is due largely to the dryness of the climate, the highly flammable nature of the coal and other conditions. Nevertheless, there are precautionary measures which will either eliminate or greatly reduce the number of these explosions. The most essential of these precautions have already been indicated and the unusually high fatality rate from explosions in Western states would seem to demand that *all* available safety measures be taken in *all* mines of those states having poor records in this respect.

In view of the foregoing, it would appear advisable for the coal operators of the West to take definite steps toward the adoption of all measures that will tend to remove the stain that now rests on the coal mining industry of this region.

Underground Operation

Some Underground Railroad Practices In Coal Mining

At a mine in West Virginia the grades are such that a push motor is used in getting trips to the shaft bottom. On the approach to the bottom side track is a curve that prevents the rear motorman from seeing the front end and the grade being against the loads it is necessary that the rear motor push on the trip. Beyond this grade the haulway levels out.

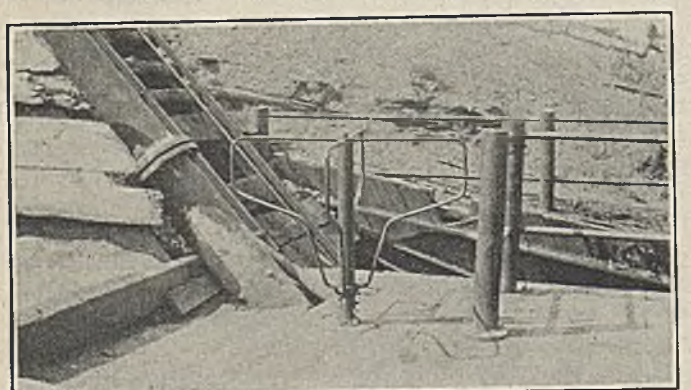
With the regular motorman no trouble had been experienced, but it was noticed that whenever a new man was substituted much time was lost while he "learned the road." To obviate this trouble the roof and ribs were marked at the places where the rear motorman should shut off his power.

In another instance a motor was used to pull the empties away from the bottom and it was necessary for him to make the correct stop corresponding to the number of cars in the trip. In order that this could be correctly done the rib was marked "Stop 10 cars," "Stop 15 cars" and "Stop 20 cars." This reminds one somewhat of the practice followed by city subways, elevated roads and similar passenger carriers in marking stops at stations.

Must Enter Gate Without Crowding

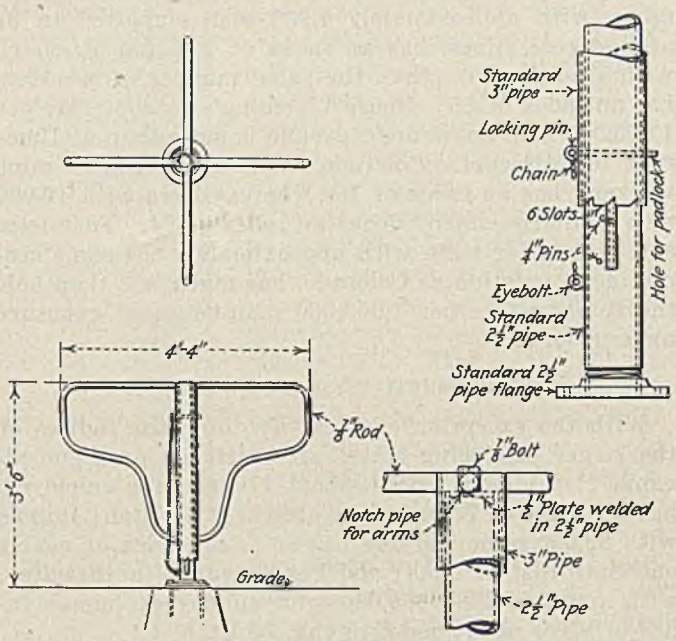
At the National Safety Congress, J. J. Forbes described a turnstile of the type erected by the Harleigh-Brookwood Coal Co., a subsidiary of Madeira Hill & Co., of Philadelphia, Pa. This device is particularly adapted to shaft and slope landings. It is designed for the purpose of admitting only one person at a time, thus preventing crowding onto the cage.

The turnstile post consists of two pipes, one inside the other, one of 2½-in. diameter screwed to a standard 2½-in. flange and the other of 3-in. diameter. The wings of the turnstile are attached to the outer pipe and can



Turnstile Keeps Order at Cage and Slope Landing

Men rushing to get on cages or slope trips are the cause of many accidents. This turnstile makes for order. Only enough men are admitted to furnish the required load and they can only enter one by one.



Details of Turnstile Design

The turnstile revolves only in one direction and can be locked by pin and padlock. This one was made at the mines, but standard turnstiles of somewhat heavier construction can be purchased by those who do not wish to make their own.

be prevented from turning by the introduction of a locking pin which passes through both pipes. A hole in this locking pin can be used to attach a padlock that will prevent its withdrawal and therefore the use of the turnstile.

The lower edge of the outer pipe carries six notches which fit over a tooth set in the side of the lower pipe. These notches are beveled on one side but vertical on the other. The tooth being of similar shape to the notch, the turnstile can only be revolved in one direction.

When a man wishes to pass through the stile, he removes the pin, turns the stile through an angle of 60 deg. and then replaces the pin. The eyebolt which holds the lower end of the chain is set in the inner 2½-in. pipe below the bottom of the 3-in. pipe.

Dangers of Using Booster Fans

Where brattices are tight booster fans are not harmful provided there is no gas, the only difficulty being that in case of an explosion the recovery of the mine is likely to be delayed. As a rule, however, a mine that needs a booster fan, because it is so large, has arrived at the point that it is generating gas or if it needs a booster despite its smallness, it needs it because the brattices are poorly constructed.

Suppose by the time the air reaches *A* it is traveling so sluggishly as to have no ability to perform useful work. A booster fan is introduced into the circuit but instead of forwarding the air received from the outside it recirculates the air through the leaky brattices *BB*

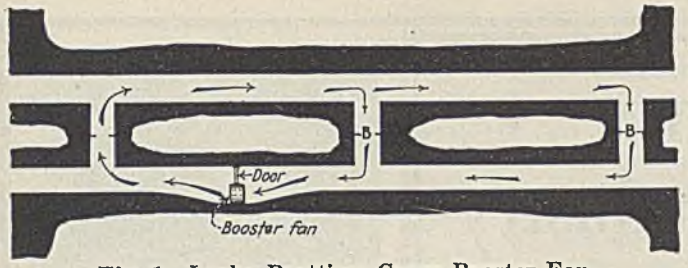


Fig. 1—Leaky Brattices Cause Booster Fan To Recirculate Air

A booster fan builds up a high pressure in a roadway where the pressures created by the main fan are low. Consequently if the brattices are leaky the air in the return may come out into the intake and proceed back to the face.

and others like them. The theory of the booster is that it draws on the entering air, and if the brattices or stoppings were absolutely tight and all doors were closed that is what it would do. Instead it is likely to set up a little world of its own, circulating the atmosphere of that little world.

The auxiliary fan can and will do the same. It is perhaps not as objectionable as a booster under the same conditions because it creates far less depression.

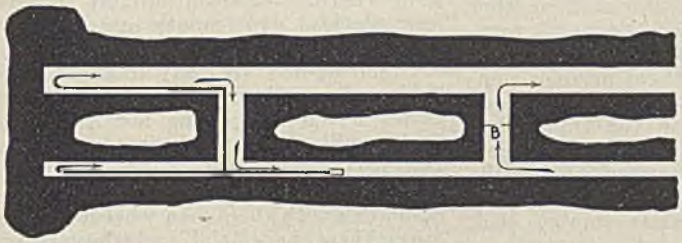


Fig.—Where Brattices Behind Auxiliary Fans Leak Air May Be Recirculated

Unless the normal air current at the last crosscut is enough to be effective and the brattices in the crosscuts back of it are tight the auxiliary fan may recirculate air.

Still, given leaky brattices it can recirculate air. In the second illustration is shown an example of what will happen where the crosscut *B* has been left open or the brattice is so poorly constructed as to leak the entire current of air reaching it. In that case all the air at the face is recirculated air.

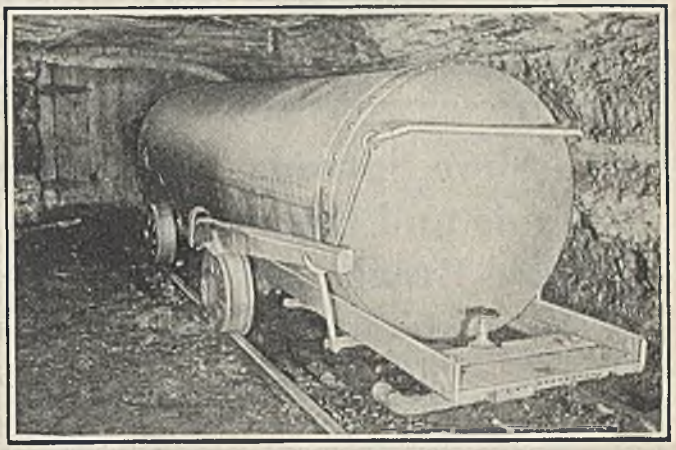
The booster fan has rarely any proper function. It merely reinforces the main current that should not normally in our present mines need reinforcement. In this, it does not resemble the auxiliary fan which distributes air that otherwise could be properly directed to the coal faces solely by the use of doors, curtains and line brattice, which have disadvantages. Only where the brattices are tight in the rear of the auxiliary fan can recirculation be guarded against. The importance of this factor is likely to be overlooked.

Safety Defense Includes Rock Dusting, Bottom Wetting, and "System"

For several years the Newcastle Coal Co., of Alabama, has rockdusted its mines. Tests of road samples, taken at regular intervals, have indicated, however, that with the present type of mine-car equipment it is difficult to keep the incombustible dust on the bottom to a safe percentage. For this reason the bottom on roadways is sprinkled regularly, although rock dust is used exclusively on ribs and roof.

For wetting the bottom the sprinkling car shown in the illustration has been provided. The tank of this car consists of the 38-in. x 14-ft. drum of a water-tube boiler, and holds about 825 gal. The sprinkling pipe is of 1½-in. diameter and has elbows and 3-in. capped nipples at each end. The diameter of the holes is $\frac{5}{16}$ in.; these holes are 1 in. apart.

The truck has a brake lever on each side; the one shown bearing on one of the rear wheels and the lever



Sprinkler Car at a Filling Station

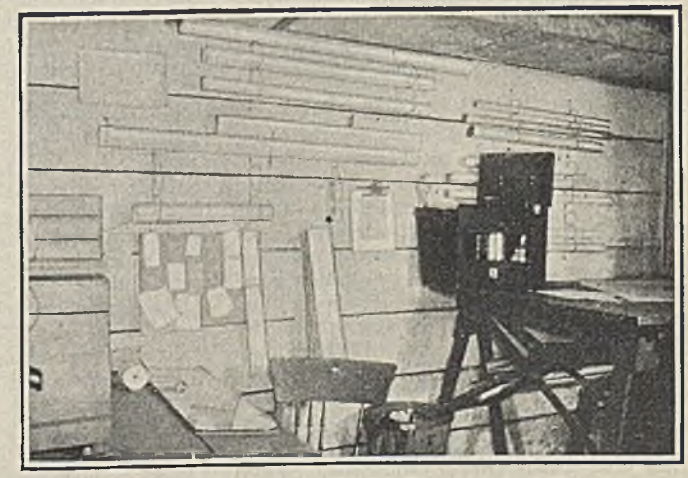
The Newcastle mine is rockdusted regularly but tests indicate that it is difficult to keep the bottom of the roadways safe, therefore the floor is kept wet. The sprinkling car holds 825 gal. and wets 4,000 ft. of entry at one filling.

on the opposing side bearing on one of the front wheels. The car is pulled by a mule or by a locomotive. Approximately 4,000 ft. of bottom is wetted at one filling. During the winter, it is not found necessary to sprinkle the floor more than twice a week.

Another illustration accompanying this article shows the underground office of Frank Parker, the mine foreman, and the dust-analyzing equipment provided. The neatness of this office is interesting and characteristic of the order and system ruling throughout the mine.

The table of heavy plank which serves as a desk is not littered with papers, torn maps and old reports as is too often the custom. Information for future reference is contained in several day books, written in pencil, and kept in the box on top of the desk. Blueprints of mine maps and current reports are filed in various ways on the wall.

Short lengths of stiff copper wire formed into loops hold the blueprints in place. The outside corner of each roll carries a caption which is in plain sight.



Dust-Analyzing Outfit in Foreman's Office

This outfit is contained in the box on the table at the right. The walls and desk in this underground foreman's office are of rough boards but everything is "as neat as a pin." Blue prints of mine maps are kept in orderly manner by wire loops attached to the wall.

News Of the Industry

Open Shop Spreads in Pittsburgh Area; Illinois and Ohio Operators Unshaken; More Breaks from Union in Southwest

Spreading of the open-shop movement in western Pennsylvania, a restatement of the terms upon which Illinois operators will consent to enter into district negotiations with the union and inconclusive joint conferences in the Southwest and with the Indiana stripping interests are the outstanding features in the developments of the second week of the bituminous suspension brought about by the expiration of the Jacksonville agreement.

The Vesta Coal Co., a subsidiary of the Jones & Laughlin Steel Corporation, declared its intention of joining the open-shop ranks in a statement made by Joseph Edwards, general superintendent of the mines, on April 7. Three operations in Washington County, Pennsylvania, will be affected. Just when the start will be made has not been disclosed. The company accumulated large stockpiles prior to April 1 and probably will reduce these considerably before any attempt is made to reopen.

In explaining the position of the company, Mr. Jones said:

"The Jones & Laughlin Steel Corporation has enough coal in storage and on contracts from outside non-union mines to keep its mills going indefinitely. The Vesta mines are not commercial mines. They produce coal only for Jones & Laughlin. For 25 years they have given steady, dependable work to a large number of men. They operate continuously year in and year out. They are not affected by coal market prices or by railroad rates.

Gradual Drift to Open Shop

"The Vesta mines have in the past accepted conditions and terms imposed by union officials and have gone along producing coal under conditions made difficult and costly by the union. All the other coal mines producing coal for the steel industry have gradually gone to the open-shop basis of production. This has left Jones & Laughlin in the position of having to face higher costs of production on steel through higher costs on coal and coke than its competitors. It is plain to be seen that the Vesta Coal Co. cannot continue producing coal under these handicaps. When our mines operate again it will be upon an open-shop basis."

The Vesta company employs about 3,000 men. Production in 1925 was approximately 3,750,000 tons. In addition to the Washington County mines, the steel company recently opened a non-union operation in Greene County under the name of the Shannopin Coal Co.

The Clyde Coal Co., with a mine at Fredericktown, Washington County, normally employing 350 men, is another recruit to the open-shop ranks. A number of other companies are said to be preparing to follow them into the non-union list. No intimation has been given, however, as to the time when these mines and the Pittsburgh Terminal Coal Corporation, which led the break on the expiration of the Jacksonville contract, will start mining coal.

Pittsburgh Co. Output Gains

In the meantime the Pittsburgh Coal Co. and the Bethlehem Mines Corporation, which parted company with the United Mine Workers in 1925, continue operations. The first-named is still the storm center in the district. According to C. E. Lesher, executive vice-president of the Pittsburgh Coal Co., the 18 mines operating had 4,080 men at work on April 1, 4,185 on April 2, 4,339 on April 4, 4,707 on April 5, 4,837 on April 6, 4,924 on April 7, 4,953 on April 8 and 4,783 men on April 9. Production rose from 14,103 tons on April 2 to 19,228 tons on April 8.

Union officials challenge the figures put out by the Pittsburgh Coal Co., charging the company with padding the production records. During the week ended April 2, said Philip Murray, international vice-president, the Pittsburgh company produced 81,227 tons, as compared with 124,000 tons a month earlier. The reduction in tonnage is attributed to the fact that the international officials of the union have taken over the fight against the company. The Pittsburgh Coal Co., on the other hand, asserts that production for the week ended April 2 was 90,355 tons.

The question of picketing has become more acute. Following the restrictive regulations promulgated by Sheriff Braun of Allegheny County, Mr. Murray and Patrick T. Fagan, president of district 5, journeyed to Harrisburg to interview Governor Fisher. The Governor, however, declined to take any action. On Saturday coal and iron police in the employ of the Pittsburgh Coal Co. arrested four union pickets. Union representatives announced that they would waive hearings before a justice of the peace of Washington County and ask the courts to determine the rights of the pickets.

The Connellsville coke region is quiet but apprehensive. There are rumors that the men will walk out at the independent operations unless wages are increased. Should such a walkout occur, the Frick operations would not be affected, as these plants are paying better than the union scale. Operating interests in the region, however, are inclined to discount any reports of early disturbances. Some fear is expressed, however, that the situation may become less peaceful next month and possibly reach a critical stage in June.

Union agents are busy in the Clearfield region trying to bring some of the mines which are paying less than the Jacksonville basis back into the fold. During the past three years a number of operators have entered into understandings with their men whereby rates lower than the official scale have been enjoyed. The union is anxious to break up these arrangements and force all mines not openly non-union to observe the strict letter of the agreement. Success in that direction, however, is considered doubtful.

Endurance Test in Ohio

There are no signs of weakening in the Ohio deadlock over the basis upon which district negotiations shall be inaugurated. Operators still hold out for a continuously competitive scale and district union officials cling to the Jacksonville basis. Both sides appear to have settled down to a contest of endurance. In some cases operators have declared that the credit privileges usually extended the miners during suspensions will be withdrawn. The Sunday Creek Coal Co. has ordered miner tenants to vacate 200 houses at San Toy, Perry County, within 15 days. The company store at that place has been closed and the company declares that the operations there will be permanently abandoned.

Indiana stripping operators met with district union officials at Terre Haute last week and appointed a subscale committee to endeavor to negotiate a new agreement. This committee was still in session when this issue of *Coal Age* went to press. The committee consists of Harvey Cartwright, president of district 11; James Terry, vice-president; William Mitch, secretary, and R. F. Farris and Claude S. Ehrnhardt for the miners; Fred S. McConnell, president of the Indiana Coal Producers' Association; Michael Scollard, secretary; R. H. Sherwood, J. Melville, Wick Dickson, J. D. Moorman and George Enos, for the operators.

Mr. Cartwright announces that 29

companies not members of the Indiana Bituminous Coal Operators' Association have accepted the union terms to continue work. No action has been taken by members of the Indiana Bituminous Coal Operators' Association and no action is likely until Phil H. Penna, secretary of the organization, who is now confined to a hospital in Terre Haute, has resumed his duties. In the meantime small local banks in the southern part of the state are taking advantage of the fact that their big rivals are down.

Members of the Illinois Coal Operators' Association, at their meeting in St. Louis, Mo., last Friday, instructed President Rice Miller to inform Harry Fishwick, president of district 12, United Mine Workers, that it would be useless to enter into district negotiations, as suggested by Mr. Fishwick, unless the union was willing to consider either a reduction in wages or changes in working conditions which would lead to lower production costs.

Small Operations Capitulate

In addition to the companies mentioned in the preceding issue, a number of smaller operations in various parts of the state are reported to have agreed to continue work under the Jacksonville scale. Several of these are in the Belleville district. Although the association mines, in the St. Louis meeting, presented a united front on the proposal to enter into district negotiations, there are rumors of dissatisfaction on the part of some operators with the present policies of the organization.

While a subcommittee representing union officials and members of the Southwestern Interstate Coal Operators' Association wrestles with the problem of a new agreement, more breaks from union ranks are reported. The Marriott mine near Moberly, Mo., has reopened under the co-operative plan with a force of 30 men. Normally the mine employs 75. Notices have been posted at the Spring Creek and Kansas City Midland mines at Novinger, Mo., that operations will be resumed May 1 under the 1917 scale.

A recent canvass of the Southwestern situation shows only a few co-operatives employing a small number of men at work in Kansas. Few mines are running in Missouri, but in the Bevier section an organization known as the United Brotherhood of Miners has been launched for the purpose of dealing separately with the operators. Oklahoma operations are hampered more by lack of demand than by union control. Only a few mines in Arkansas are active; there, too, lack of demand is as important as the labor tie-up. In Iowa, the Economy Coal Co. mine in Polk County, employing about 125 men, has joined the ranks of operating companies under the Jacksonville scale.

Western Kentucky operators are in full control of the labor situation in their section of the country. There have been a few local strikes which ended in the defeat of the strikers and the discharge of those who led them. Nothing approaching a general organized movement, however, has appeared, Eastern Kentucky also is quiet although union organizers have not been idle in that area.

Sherman Anti-Trust Act Assailed by Lawyers; F. H. Levy Calls It Anachronism

Urging a law that would not prevent beneficial co-operative agreements intended to avert uneconomic competition, Felix H. Levy, a member of the New York Bar, who spoke recently at a meeting of the committee on commerce of the American Bar Association in the Chamber of Commerce Building, New York City, assailed the Sherman anti-trust act as an anachronism and an outworn statute. Gilbert H. Montague, also of the New York bar, joining in the attack, said that "peace, rather than renewed discussion of the anti-trust laws that may lead to worse rather than better anti-trust laws, is what the American business world desires."

Mr. Levy, who also is chairman of the special committee on uniform state laws of the New York Bar Association and a former special assistant to the U. S. Attorney General in the prosecution of the tobacco trust from 1905 to 1907, declared that the Sherman act "does not conform with sound principles of political economy."

"While retaining so much of it as constituted its original purpose," he said, "namely, as a deterrent and preventive of trusts and monopolies, it should be amended so as to deprive it of its present power of prohibiting sensible and beneficial agreements of co-operation which are designed to prevent ruinous, uneconomic, ruthless and cut-throat competition. As now interpreted, the Sherman law forbids all co-operative agreements, no matter how good their motives or how good their results."

Mr. Montague declared that amendments to these laws and to the Federal Trade Commission law have been suggested, but that "so contrary in principle to one another are all these amendments, and so slight has been the popular support that any of them has attracted, that they have resulted only in demonstrating how complete is the present lack of interest, and how abysmal is the present division of opinion, as to what, if any, steps should be taken in withdrawing from or in advancing beyond the existing anti-trust laws."

Spokesmen for the operators in northern West Virginia, while admitting that output the first few days of the month was cut to 70 per cent of what it had been prior to April 1, say that the situation is again normal. Larger producers, such as the Consolidation Coal Co., the New England Fuel & Transportation Co. and the Bethlehem Mines Corporation, report no shortage in men. In some cases workers who stayed away the first two or three days in April found their places had been filled by other men.

Union representatives are busy denying statements appearing in West Virginia papers charging the United Mine Workers is hostile to the prosperity of that state. John L. Lewis, president of the union, in an article sent to the Charleston *Gazette* last week, asserted that "the coal regions of West Virginia enjoyed their greatest prosperity when the United Mine Workers flourished in that state, even though the union is not organized for the sole purpose of furthering the ambitious program of West Virginia operators to fuel the world."

The Pittsburgh Coal Co. claims the honor of loading the first lot of bunker coal at the Head of the Lakes this season. A tug ran a mile through the ice to its No. 7 docks at Duluth on March 28, and took on a load of dock-run coal. The North Western Fuel Co. loaded out a steamer at its No. 4 dock at Duluth on the following day and cleared for a trip along the north shore of Lake Superior. The first coal cargo from the East is expected to be received at Duluth about April 18 or 19.

D. L. & W. Files Plan to Shift Glen Alden Holdings

In accordance with a plan of reorganization adopted by the Delaware, Lackawanna & Western R.R. at a meeting of its board of directors on March 23, the road on April 7 asked the Interstate Commerce Commission for authority to transfer $92,006,000 of its assets to a newly formed holding company to be known as the Lackawanna Securities Co.

The railroad company set forth in its application that it had on Feb. 28, 1927, a surplus of $137,861,350, and that after transferring $92,006,000 to the securities company it would still have a balance of $45,855,350, which, it represented, is ample for the purpose of maintaining its credit and enabling it to fulfill its public carrier obligations and for any other purpose for which a surplus should be accumulated.

The securities company is to take over and operate the Lackawanna's coal properties.

The chief item of which the railroad intends to divest itself is $58,500,000 of Glen Alden Coal Co. bonds, and the step will finally divorce the road from direct connection with anthracite mining operations. At the same time the distribution plan calls for placing the Glen Alden bonds, together with other miscellaneous securities which the Lackawanna has held in its treasury, to the total of $92,006,000 in the securities corporation. The shares of the securities corporation will then be distributed by giving one share of stock of the new corporation to each holder of two shares of the present railroad stock.

Supreme Court Enjoins Strike To Hamper Use of Product

Strikes called by labor organizations to prevent the use after passage in interstate commerce of commodities produced by corporations or individuals with which the labor organizations are engaged in controversy violate the anti-trust act and legal relief may be sought by injunction by Section 16 of the Clayton act, the U. S. Supreme Court held April 11 by a divided decision.

Through an opinion by Justice Sutherland, the majority of the Court reversed the Circuit Court of Appeals for the Seventh circuit, which had sustained the federal District Court for Indiana in dismissing for want of equity an injunction appeal filed by the Bedford Cut Stone Co. and 23 other corporations engaged in quarrying or fabricating limestone against the Journeymen Stone Cutters' Association of North America and various locals of that organization and various officers of the union. Justice Brandeis filed a vigorous dissenting opinion. Justices Stone and Sanford filed separate opinions concurring with the majority but on different grounds.

In the majority decision it is declared that the strikes, ordered and carried out with the sole object of preventing the use and installation of the products of the complaining corporations in other states, necessarily threatened to destroy or narrow their interstate trade by taking customers from them. The Court held that it is beside the point that the labor organizations in general purpose and in and of themselves are lawful and that the ultimate result aimed at may not have been illegal in itself. It held that the means adopted by the labor organizations are unlawful and that in such a case the innocent general character of the organizations and the lawfulness of the ultimate end sought fail as justification.

New York Purchase Board Receives Coal Bids

Twenty bids were received by the Department of Purchase of New York City on April 7 for furnishing and delivering to various departments approximately 284,990 tons of anthracite and 179,000 tons of bituminous coal during the period ending March 31, 1928. The largest bid was from Burns Bros., amounting to $3,300,000, and the next largest was from Martin F. Shea, totaling $2,181,182.80.

For 143,100 net tons of No. 1 buckwheat for use on the Municipal Ferries Burns Bros. and Marton F. Shea bid $6.95 and $6.69 respectively.

Other tenders received were: 10,000 net tons of bituminous coal for delivery at Riker's Island, $5.58 and $5.64; and 10,780 tons bituminous mine-run to various departments, $5.14, $5.23 and $5.56.

For 29,000 tons of barley coal to Bellevue Hospital the bids were $4.24, $4.37 and $4.39, and for 7,700 tons of rice coal for other hospitals the figures were $5.42, $5.54, $5.59 and $5.63.

The requirements of the Department of Water Supply, Gas & Electricity at two Manhattan pumping stations in the Borough of Manhattan amounting to 14,255 tons of No. 1 buckwheat coal can be supplied at $5.64, $5.95 and $6.25.

For supplying the Department of Public Welfare hospitals with 42,000 tons of mixed coal, two-thirds No. 2 buckwheat and one-third bituminous mine-run, the bids ranged from $5 to $6.12 depending upon place of delivery.

Bids for supplying various lots of George's Creek Cumberland coal ranged from $8.40 to $9.95 per ton.

For various tonnages of egg and chestnut coals in the various boroughs of Greater New York bids received showed the following range: Manhattan, $10.83 to $13.23; Brooklyn, $10.83 to $12.97; Queens, $12.78 to $12.97; Bronx, $10.83 to $13.25, and Richmond, $11.27 to $13.24.

For various amounts of stove coal to various points in the same boroughs the prices showed the following range: Manhattan, $12.50 to $13.98; Brooklyn, $11.71 to $13.22; Queens, $13.03 to $13.22; Bronx, $11.14 to $13.98, and Richmond, $11.34 to $13.71.

Bids opened on April 5 for furnishing and delivering to the Tompkinsville (Staten Island) Lighthouse Board 500 tons of bituminous coal showed the following tenders: E. F. Murphy, $4.59 per ton, alongside; W. A. Marshall & Co., $4.68; Commercial Coal Co., $4.61; Transocean Coal & Transport Corp., $5.35; Johnstown Coal & Coke Co., $4.67; H. B. W. Haff, $4.56, and Cambria & Lackawanna Coal Co., $4.69.

Proposals will be opened May 12 by the Government Fuel Yards, Washington, for furnishing 293,100 net tons of bituminous coal and 7,400 gross tons of anthracite during the fiscal year beginning July 1.

Cites Railroad Efficiency Under Private Control

Reorganization of the transportation system so as to eliminate car shortages has been an important contribution to the high prosperity of the country, Secretary of Commerce Hoover said in a speech at the luncheon of the Shippers' Regional Advisory Council in Washington, April 5. Adequate transportation, he added, also has contributed to the stability of price levels. It has enabled business and industry to reduce stocks and so has released an abundance of capital.

The car shortages of 1919-1920 cost the country half as much as the actual freight bill for transportation of merchandise, Mr. Hoover estimated. Condemning government ownership, he pointed out that the railroads now are handling 20 per cent more business than at the time they came out from government control and are doing it with 200,000 less workers.

N. C. A. Urges Increased Soft-Coal Research

Recommending the holding of a conference of interested organizations, including governmental bureaus, the research committee of the National Coal Association, in session at Pittsburgh, April 4, unanimously went on record as favoring an effort to devise ways and means for co-ordinating and increasing bituminous coal research. This recommendation followed a general discussion on a report as to research activities in coal by Dr. A. C. Fieldner, chief chemist of the U. S. Bureau of Mines and superintendent of the Pittsburgh Experiment Station, to which Dr. O. P. Hood, chief of the technologic division of the U. S. Bureau of Mines, had offered a highly interesting foreword.

Dr. Fieldner's statement was a digest of replies received to a National Coal Association questionnaire regarding bituminous coal research activities which went world-wide to commercial, governmental and educational institutions known to be carrying on such research. Dr. Fieldner divided this research into that pertaining to the constitution of coal and coke, mining and safety, preparation and storage, combustion of solid, liquid and gaseous fuels, gasification, carbonization and processing of coal, and industrial analyses and tests. This general statement of bituminous coal research activities will be available in the printed report of the meeting, which the committee instructed be mailed to the industry generally.

The research committee also recommended that the research fellowship at Carnegie Institute of Technology which has been maintained by the National Coal Association for the past two years, on the study of the composition of tar and oils from the distillation of coal at low temperature, be continued another year.

Shipping Board Receives Bids

Bids for furnishing and delivering coal to the vessels of the U. S. Shipping Board in New York harbor during the fiscal year beginning May 1, opened in Washington on March 31, resulted the following tenders being received:

J. H. Weaver & Co., passenger vessels, $6.37 t.i.b.; freight boats, $6.02; Cambria & Lackawanna Coal Co., passenger boats, $6.39; freighters, $6.04, less 1 per cent for cash, and Davis Coal & Coke Co., passenger boats, $6.72, and freight boats, $6.47.

The specifications call for 12,000 tons of coal per month.

The Dominion-American Coal & Fueling Co., owner of a large wharf and coal storage plant at Cape Vincent, N. Y., at the east end of Lake Ontario, will fuel vessels of the Eastern Steamship Co. there this season. This line carries grain and coal from Lake Erie ports to Montreal. The fueling will require the handling of 75,000 to 100,000 tons of coal during the navigation season.

Progress Toward Peace May Be Put Off By Heavy Stocks, Is Washington View; Indiana and Illinois Hold Attention

By Paul Wooton
Washington Correspondent of *Coal Age*

Because of the extraordinary amount of coal in storage observers in Washington expect developments in the strike to be slow. The attitude of the strip-pit operators in Indiana and of the highly mechanized mines in Illinois is being watched with most interest this week. Reports reaching Washington are that these operators are threatening to secede. These operators fear that their claims for consideration will be given second place when the scale eventually is negotiated and are convinced that postponement will leave them in a less advantageous position than at present.

While the strip-pit operators and the mechanical loading men constitute a small minority of the operators in Indiana and Illinois, it is recognized that the secession of the substantial tonnage which they do produce would influence captive mines and certain other substantial operators to sign the scale, provided a favorable loading scale and certain other concessions could be obtained from Mr. Lewis.

It is known that efforts have been made in Chicago to arrange a conference with President Lewis at which the wage question would be passed for the time being, so that there might be discussion of other concessions. Some here believe that Mr. Lewis would yield many other points if he could say that the Jacksonville scale has been maintained. As both sides are much interested in seeing a reduction in stocks great deliberation is expected to characterize any moves that are made.

While officials are glad that the public is in a position where it will not have to be punished as a result of the large amount of coal above ground, they recognize as an unsound practice the policy of the railroads in allowing a large addition to storage through the loading of thousands of cars which cannot be billed. One company in Illinois is said to have loaded 5,000 cars of unbilled coal. Illinois operators are said to have gone to great lengths to encourage the storage of large quantities of coal by their customers.

With thousands of unbilled cars behind that storage the tendency of the majority naturally is to think that negotiations should be deferred until stocks have been reduced. The mechanical loaders claim, however, that the majority is unfavorably disposed toward mechanization and for that reason they want negotiations begun at once looking to an agreement on a satisfactory mechanical loading scale. This, they point out, in no way interferes with the plan of holding up production while storage is being reduced.

As the legal difficulties of non-union operation are less in Pennsylvania and Ohio, expansion of non-union production is expected there, although many of the Ohio operators would rather deal with the union than attempt to fight it. The consensus of opinion seems to be, however, that little chance exists of their being able to effect an agreement on a scale based on the level of non-union wages.

Another phase of the situation which pleases Washington is that little pressure can be brought looking to political interference and that the cost of the strike is going to be borne largely by the parties to the quarrel.

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.*

Pittsburgh & West Virginia Plans New Link

The Pittsburgh & West Virginia R.R. has applied to the Interstate Commerce Commission for authority to construct 38-mile extension to its line in Pennsylvania. The proposed line will be known as the Connellsville extension and will run from a point near Cochran's Mill to Connellsville. According to the application the line will traverse a portion of Pennsylvania now inaccessible to railroads and which is not now directly served by any road; will provide a means for the exchange of freight traffic between the Wheeling & Lake Erie and Western Maryland, and will provide a new route for freight between Baltimore, Toledo and other lake ports; will furnish the Pittsburgh & West Virginia, a non-competitive connection via the Western Maryland to traffic east of Pittsburgh.

The cost of construction of the new line will be financed through the issuance and sale of bonds, in such an amount, bearing such rate of interest, and having such maturity as may hereafter be determined subject to the approval of the commission.

Industrial Waste to Blame for Low Wages, Loss Of Life and Unemployment, Says Green

Labor's interest in the elimination of industrial waste, whereby it is hoped to obtain higher wages, better working conditions, reduction in the loss of life and solution of the problem of unemployment, was the subject of an address by William Green, president of the American Federation of Labor, at Philadelphia on April 10. He spoke before the Conference on the Elimination of Waste in Industry, under the auspices of the Central Labor Union of Philadelphia and the Labor College of Philadelphia.

"The difference between industrial success and industrial failure is many times found in the wasteful processes which often attend industrial operation," said Mr. Green. "The unwarranted destruction of raw materials, natural resources and finished products, the uneconomic use of means of production, negligence in the care of machinery and mechanical devices, indifference to the saving and protection of property and the failure to utilize all facilities available which make for economic production fall within the category of material waste.

"Furthermore, labor realizes that indefensible waste takes place when labor's industrial efforts go for naught or are unnecessarily duplicated through the failure of management to systematize and intelligently direct the working forces of industry. Practically all of this character of industrial waste can either be prevented or materially reduced.

"The desire of labor to interest itself in the problem of waste is based upon its wish to secure higher wages and to enjoy improved conditions of employment. So long as industry is only partially efficient labor believes that the wages paid can be substantially increased through an increase in industrial efficiency and the elimination of waste. By the same process the cost of manufactured articles to the public can be materially reduced.

"The most tragic feature of our industrial development is connected with the loss of human life and the mental and physical suffering caused by industrial accidents and unemployment. While industrial accidents cannot be absolutely eliminated, the fact is that both fatal and non-fatal accidents can be greatly reduced.

"A stabilized, continuous policy of employment is within the range of human possibilities. Unemployment is waste of the most vicious kind. It constitutes a waste of human opportunity, of effort and of human creative capacity. It is a lamentable state of affairs when industrial plants fully equipped, modern and up-to-date in every respect, are idle, and many working people are suffering from unemployment. The trade and commerce of entire communities become stagnant and the financial strain imperils the existence of banks and all lines of business. We could render no greater service to the people of this generation than to find the solution of the problem of unemployment."

Travelers Urges Rating Plan On Coal-Mine Risks

A new plan for handling coal-mine compensation insurance risks which the Travelers company is considering proposes that, in addition to a base risk, special charges, either by way of credits or penalties, according to merit, be added for the roofing, tunneling and haulage features of a mine risk, the reasonableness or the reverse of the final rate to be determined by experience, which would be carefully recorded in the case of each individual mine.

The scheme is the outcome of a meeting held several weeks ago in New York City at the request of Commissioner Joseph Button of Virginia, chairman of a committee making a study of coal-mine risks, which have been a source of much dissatisfaction to the carriers. The plan will be reviewed by a special committee of underwriters and the conclusions submitted to the National Convention of Insurance Commissioners, at Richmond, Va., May 2-4.

Mine Products Contribute Heavily to Freight Traffic

The mines of the country during the last quarter of 1926 contributed 211,562,242 tons to the revenue freight forwarded on the Class 1 railroads. This was nearly 60 per cent of the total amount of freight tendered the principal railroads of the country. It was an increase of 22.88 per cent over the products of mines carried during the last quarter of 1925. The showing for the entire year was not as good, but products of mines shipped during 1926 were 11.75 per cent greater than those shipped in 1925. This is greater than the average gain on all commodities, which was 7.16 per cent.

The detailed figures, which are those of the Interstate Commerce Commission, for the last quarter of 1926 folloy: Anthracite, 21,917.196 tons; bituminous coal, 118,774,125 tons; coke, 5,037,623 tons; iron ore, 15,843,928 tons; other ores and concentrates, 3,237,500 tons; base bullion and matte, 225,678 tons; clay, gravel, sand and stone, 40,180,810 tons; crude petroleum. 3,031,704 tons; asphaltum, 820 234 tons; salt, 830,689 tons; other products of mines, 1,662,755 tons.

To Test New Mining Method

A new method for the recovery of anthracite, for which its sponsor claims numerous advantages over present practice, has been submitted to the Lehigh Coal & Navigation Co. by Martin Martinchak of Nesquehoning, Pa., a contract miner. Some of his proposals are:

(1) Gangways, chutes and stairways to be driven in coal only. (2) Breast next to tunnel pillar to be driven directly up the pitch from the gangway to the airway; coal to be drawn and a concrete mixture to be poured in, forming a concrete pillar. This process to be continued along the gangway. (3) Tunnel pillars to be removed and replaced with the concrete mixture; air connection between gangway and airway to be made in new concrete pillar. (4) Coal pillars between the concrete pillars to be entered by driving up a center chute to level above and robbing down. (5) Above airway first breast to be driven 10 to 12 ft. wide 80 ft. inside of tunnel pillar to the upper level; coal to be drawn and concrete mixture poured in from upper level; mine refuse being used.

The contractor contends his plan would reduce drainage costs, would improve car yield, would mean cleaner coal and a reduced use of explosives. The coal company, it is said, has agreed to experiment with some of the ideas, at the same time letting it be known that certain officials do not fully agree with some of his ideas while admitting the advantages he claims for others.

Scramble Seen as $1 Year Coal Lease Expires

Lawyers, coal company officials and forty heirs of the late Samuel Callendar are looking forward with much interest to the developments that will follow the expiration on Oct. 1, 1928, of the lease made 90 years ago by Mr. Callendar in which he gave permission for the mining of hard coal under a 400-acre farm for the payment of $1 annually. The land is located in Peckville borough, near Scranton, Pa., and at present mining operations on the land are being carried on by the Temple Coal Co.

Thomas Meredith drew up the "sharp" bargain with Callendar. However, Meredith did not benefit personally from the contract as actual removal of coal from the land did not commence until forty years after the lease had been signed. Title to the lease has changed hands fourteen times since Meredith got possession of the valuable piece of paper.

While a great volume of coal has been taken from the land since operations began on the tract more than a half century ago much coal still remains there and mining men declare that despite the speed which operators may show at the workings between now and October of next year, there will remain enough wealth in the unmined anthracite product over which to stage a legal battle.

Powdered Coal for Barge Line?

Experiments with powdered coal on the Mississippi River barge line have been so successful that the advisory board of the Inland Waterways Corporation, at a meeting in Washington on April 8, voted to halt towboat construction plans with the idea that structural changes may be ordered to facilitate the regular use of that form of fuel. The experiments indicate a saving of 50 per cent of the fuel bill and 25 per cent of the total operating costs.

Mining Program Planned By Safety Council

Discussion will dominate the sessions of the Mining Section of the National Safety Council on Sept. 27-29, so that the experiences of those present will be made available for all attending the meeting. "Statistics and Their Effect on Accident Prevention" will be presented by H. G. Hensel, safety director, Youngstown Sheet & Tube Co., Chicago, Ill. Written discussion will be presented by W. W. Adams, U. S. Bureau of Mines, Washington, D. C., and R. V. Ageton, Tri-State Zinc & Lead Ore Producers' Association. R. D. Hall is scheduled to make a review of the work of the Mining Section since its inception, as an introduction to a general consideration of the future work of the section. A luncheon will follow with J. T. Ryan, Mine Safety Appliances Co., Pittsburgh, Pa., as chairman.

At the second session McHenry Mosier, superintendent of mines, Phelps Dodge Corporation, Morenci, Ala., will discuss "Foremanship Training Conferences and Their Bearing on Accident Prevention"; Joseph M. Hall, regional agent, Federal Board of Vocational Education, Washington, D. C., and C. A. McDowell, assistant manager, Pittsburgh Coal Co., Pittsburgh, Pa., will discuss the subject. Eugene McAuliffe, president, Union Pacific Coal Co., Rock Springs, Wyo., will present a paper entitled "Accident Prevention in Its Broader Phases." A luncheon will follow with A. J. Curtis as chairman. In this luncheon the Quarry and Cement sections will participate.

The third session will be opened by Dr. F. V. Meriweather, U. S. Bureau of Mines, Miami, Okla., with a paper entitled "Effects of Mine Dust on Health." J. L. Boardman, safety director, Anaconda Copper Mining Co., Butte, Mont., and Daniel Harrington, chief mining engineer, research division, U. S. Bureau of Mines, Washington, D. C., will further amplify the subject.

Discussions will follow on ventilation, blasting, haulage and any other subjects that members may care to introduce. Frank Pollack, safety engineer, Oliver Iron Mining co., Eveleth, Minn., will lead this discussion.

The meeting of the National Safety Council of which the foregoing sessions will form a part will be held at Chicago, Sept. 26-Oct. 1.

Check-Off Question Up?

Whether the clause in the anthracite wage contract calling for "reciprocal co-operation and efficiency" provides for the adoption of the check-off in the hard-coal regions will be considered at a meeting of the Anthracite Board of Conciliation at Philadelphia, Pa., next Thursday, according to the *Illinois Miner*. International President Lewis and District Presidents Cappellini, Mattey and Golden will lead the fight for that interpretation. Operators deny that any assurances that the check-off would be granted ever have been given.

News Items From Field and Trade

ALABAMA

The DeBardeleben Coal Corporation has increased the production of its Corona division about 500 tons per day by the opening of a new drift mine, designated as Corona No. 16.

Hamilton mine of the Tennessee Coal, Iron & Railroad Co., near Birmingham, will be improved and the annual output increased to approximately 1,300,000 tons of coal. Work has already commenced on sinking a large new shaft. A new washer, embodying the latest features, is now under construction for the slope. Electrically driven hoists will be used and additional trackage will be laid. About 300 new houses will be built and approximately 1,000 additional miners will be employed. This mine has been producing about 300,000 tons of coal annually. Increase in coal production is made necessary by an increase in the coke capacity at the company's Fairfield plant.

The Yolande Coal & Coke Co. is sinking a shaft into the bituminous coal stratum at Connellsville, near the Jefferson County line, the cost to be in the neighborhood of $500,000. The shaft will be one of the most modern in the South. Coal is already being taken out as the development proceeds.

ARKANSAS

Coal of high quality has been discovered on the farm of S. E. Bangs, two miles northwest of Booneville and a company has been organized to start a mine. Machinery has been purchased and will be installed within a few weeks.

Chisolm Reed of Paris has been named receiver for the Blue Ribbon Coal Co.'s mine at Paris. The receivership was granted in the Sebastian County Chancery Court by Chancellor J. V. Bourland following an agreement of parties in the suit of Estep against the Blue Ribbon Mining Co. brought at Fort Smith for trial.

Mine No. 2 of the Western Coal & Mining Co., at Denning, has begun hoisting coal for the first time in nearly three years.

ILLINOIS

The Florida mine of the St. Louis Coal Co. hoisted 1,803 tons of coal in an eight-hour shift on March 21. In making this record 983 mine cars were handled by one eight-ton haulage locomotive and 14 mules. The mine has four partings, none of which is less than half a mile from the bottom. Superintendent E. H. Larsen is in charge of the mine.

The largest strip mine in southern Illinois is being planned by the Mississippi Coal Corporation, incorporated under the laws of Delaware. The company is negotiating with the Solar Coal Co. for the possession of property totaling 400 acres near Freeburg. The company already has options on 1,670 acres.

INDIANA

Fails to Meet Payroll, Arrested.—Martin E. Liwish of Indianapolis, co-receiver with Fred I. Conyers of the Pike County Collieries Co., Princeton, was arrested April 8, at Evansville, on a bench warrant citing contempt of court, asked by Conyers. Lowish, it is charged, has failed to meet a payroll of approximately $24,000 due employees of the mining company. When Lowish was questioned it developed that the output of the coal company had been sold to the Dixie Vein Coal Co., a selling corporation. Lowish admitted that until March 15 he had been president of the latter company, resigning in favor of E. T. Franklin, a fugitive on a bench warrant.

The cave-in of a roof constructed about the shaft at Bon Ayr mine No. 2, north of Jasonville, recently resulted in the injury of fifteen miners and the suspension of operations at the mine. The accident occurred as the men were being lowered into the shaft.

Taking advantage of the strike of union miners, the owners of the Standard Coal Co., Wheatland, have announced that the mine is to be sealed preparatory to sinking another shaft a half mile east of Wheatland. The closing of the mine throws out of employment 225 men living in Knox County and about 75 additional men who live in Daviess County. F. L. Oliphant is president of the company and his son, Earl Oliphant, is general manager.

KENTUCKY

Consolidation Opens Big Stores.—Two large department stores were formally opened by the Consolidation Coal Co. April 1 and 2 at Jenkins and McRoberts, respectively. A style revue and dinner dance were among the attractions provided for the occasion. There also were displays of the wares of numerous companies that supply the needs of the coal towns. Brooks Fleming, general manager of the allied operations, and other company officials welcomed the more than three thousand persons attending the openings. Completion of these stores, which marks the formal abandonment of the old company store scheme, meant the realization of the first part of a definite movement by the company to improve living conditions and entertainment facilities for employees. In recent months $250,000 has been expended in such work in the Elkhorn field.

Officers and directors of the Elk Horn Coal Corporation were re-elected at the annual meeting of stockholders on April 7.

The Gibraltar mine of the Brown Coal Co., in western Kentucky, is conveying refuse from the picking tables to a crusher, whence it is taken to the boiler-room bunkers and burned in producing power for the plant.

Ezra L. Gillis, registrar, the University of Kentucky Senate, has announced resolutions adopted by that body, in connection with the recent death of Prof. C. J. Norwood, head of the Department of Mines and Metallurgy in the College of Engineering, University of Kentucky. Mr. Norwood for many years was active in coal development work in the state, and at various times was state geologist, chief of mine inspectors, engineer for the St. Bernard Mining Co., and much of Kentucky's coal development history was intertwined with his work.

J. A. Adair, W. L. Clapp and James A. Green, who recently obtained a one-year lease on the mines of the North Jellico Coal Co., at Wilton, have incorporated the Wilton Mining Co. as an operating company to run the mines. The property is owned by the North Jellico Coal Co., Louisville, one of the companies controlled by U. S. Senator Fred M. Sackett, of Louisville, and W. S. Speed, who control the Byrne & Speed Coal Co., a Louisville jobbing and retail concern, and several mines in eastern and western Kentucky. The mines were among the early eastern Kentucky operations, being about 25 years old.

A coal strike at the plant of the Beech Creek Coal Mining Co., Beech Creek, a few miles from Central City, is still on. The company fired one of its workers for participating in a union meeting to the extent of being named a member of a district wage scale committee. Some 300 miners walked out over the discharge. The worker was discharged for being away without permission.

The Phoenix Coal Mining Co. plant, at Drakesboro, which was flooded some months ago by high pond waters, has finally been pumped dry, and is again shipping coal.

The South Chicago Coal & Coke Co., Chicago, Ill., has purchased the

plant and mines of the Dudley Coal Co. at Lower Rockhouse Creek, Letcher County, including 4,000 acres of coal lands, and also is negotiating for additional coal property in that section. The company probably will open new mines, construct a new tipple and erect miners' houses.

MISSOURI

Output Higher in 1926.—Coal mines of Missouri produced 2,849,884 tons, valued at $8,799,893 in 1926, Frank Fenix, State Mine Inspector, has reported. The 1925 production totaled 2,542,449 tons, valued at $7,411,162.31. Barton County, in the southwestern section of the state, led in 1926 with an output of 1,120,048 tons valued at $3,088,017; Ray County produced 462,075 tons valued at $1,813,996. However, Ray employed the most miners, 1,347, while Lafayette County was second in that respect with 1,074 workers. Barton County mines are principally of the strip type although an overburden of 18 ft. must be taken off to get to the seam, which is 36 to 52 in. thick. A total of 224 companies are producing coal in Missouri.

NEW YORK

A talk on the soft-coal situation was given to the members of the Buffalo Wholesale Coal Association on March 29 by P. D. Fahnestock, the representative of a press association, who has made a careful study of the strike prospects, having interviewed many operators as well as the miners' representatives, including John Lewis and the presidents of the various state organizations.

The Continental Coal Co. has opened a branch office at 1827 Liberty Bank Building, Buffalo, with George J. Mechau, a well-known member of the Buffalo wholesale trade, as resident manager. This company's general sales office is in the Oliver Building, Pittsburgh, and the mines and accounting offices are at Fairmont, W. Va. It owns and operates the Brock, Sands and Liberty mines, located on the Scott's Run R.R., with an output of 6,500 tons a day.

Twenty anthracite cargoes have been loaded in Buffalo in advance of the opening of navigation, one company having loaded all but six of this number. No more loading is expected to be done until navigation starts, which should be within a week or ten days.

OHIO

The Columbus Board of Education will receive bids May 4 for furnishing and delivering 15,000 tons of run of mine or lump coal and 2,000 tons of nut, pea and slack for the public schools of the city. Cecil J. Randall is president of the board and W. V. Drake is clerk.

Cramped for room to take care of its expanding business since it opened a wholesale branch in Cincinnati about a year ago, the Old Ben Coal Corporation has moved its offices from the Dixie Terminal Building to the Traction Building.

The Mountain States Coal Co. has opened for business at 832 Dixie Terminal Building, Cincinnati, with Sid Hosmer in charge. He formerly was in charge of the Cincinnati branch of the Landstreet Downey Co. of Huntington, W. Va. In addition to coals handled by that company the output of the Mountaineer Pocahontas Coal Co. also will be handled by the new corporation. This organization is said to be still in a formative stage and may include other wholesale concerns in Cincinnati,, Ashland, Ky. and Huntington, W. Va., before it is completed.

Amended Code Up to Governor.—House Bill No. 207, which amends the Ohio mining code, sponsored by Representative Roberts of Belmont County, has been passed by both houses of the Ohio Legislature and is now awaiting the action of Governor Donahey. The bill was passed in its original form, with the exception of a few minor changes, agreed upon by operators and miners representatives in conference with Jerome Watson, head of the Ohio Mining Department. The changes are principally along the line of greater safety to miners and include provisions for rock dusting mines, restrictions on the voltage on underground motors, restrictions on the number of men to be carried on cages and regulations for the opening or closing of wells in mines. It is believed that the governor will approve the measure.

W. C. Leibner, vice-president of the Elkhorn Piney Coal Mining Co., is authority for the statement that there will be no change in the sale arrangement with the M. A. Hanna Co. for the marketing of Weeksburg coal. Various changes of ownership of mines in which Mr. Leibner's company was concerned gave rise to rumors to the effect that the Weeksburg product was to be diverted.

Mortgagees Sue Maher Company.—The Citizens Title & Trust Co., Uniontown, Pa., as trustee for mortgage holders, many of whom live in Fayette County, Pennsylvania, has entered suit in Monroe County, Ohio, for $2,475,000 against the Maher Collieries Co. and the Marcoll Coal Co. of Bridgeport, Ohio. The sum sued for represents the face of the mortgage and accrued unpaid interest. The property consists of 15,270 acres of Pittsburgh coal along the Ohio River and about 400 acres of surface, into which the Pennsylvania R.R. has extended a track. The coal was originally assembled by Albert Gaddis and several business associates and was eventually sold to the big Cleveland operating concern.

PENNSYLVANIA

Lower Soft-Coal Rates Sought.—State Senator C. W. Parkinson, Greene County, introduced in the Senate last week a joint resolution calling upon Governor Fisher, the Attorney General's department and the Public Service Commission to investigate the subject of the commission's rights to fix intrastate freight rates. The purpose of the investigation is to obtain lower rates for bituminous coal within the state. It is provided that if it be found that the Commission lacks the power to do the rate fixing the necessary legislation be prepared and offered for introduction in Congress or in the Legislature, or both.

With the closing of the Sykesville mine of the Cascade Coal Co. all the mines of importance at DuBois, Clearfield County, are now idle. The several mines of the Northwestern Mining Co. closed previous to April 1. The Cascade company stated that the mine was closed because of the big stock of coal on hand, the approaching warmer weather and the high cost of operating.

Compensation Amendment Passed.—The House, which passed finally the Huber bill amending the workmen's compensation act of 1915, has also passed the Sordoni bill which was passed by

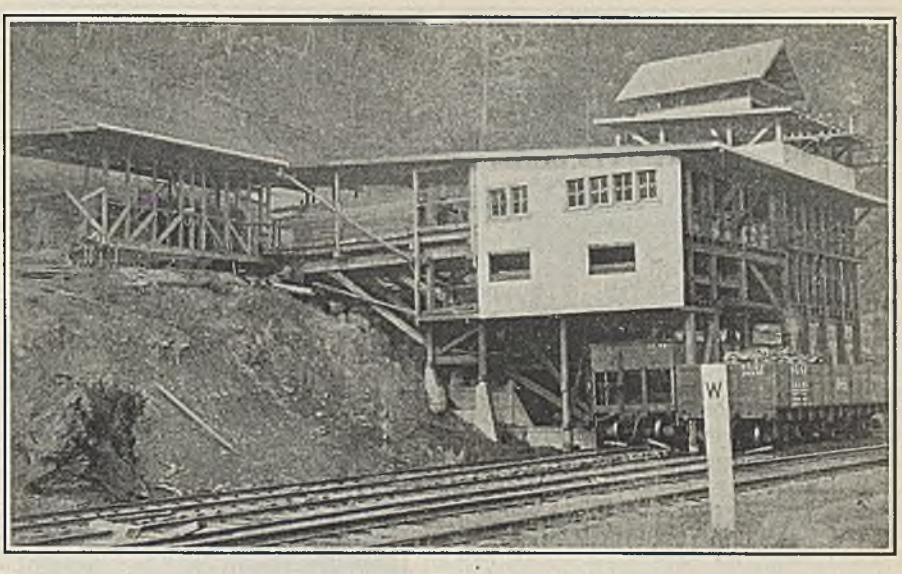
Island Creek's Newest Labor Saver

W. A. Hunt of Holden, W. Va., general superintendent for the Island Creek Coal Co., expects this caterpillar gasoline shovel to pay for itself in a few months. Here the shovel is loading dirt from the roadside near No. 21 mine for filling around some new houses at Holden. The principal duty of the shovel is to load blasting clay. Another important use is as a portable crane for unloading heavy materials and new equipment such as mine cars. When the shovel is to be moved long distances it is loaded by its own power onto a low trailer that is pulled by a motor truck.

the Senate. These bills are identical, and when the Huber bill reached the Senate it was sent to committee to remain. The bill of Senator Sordoni was then known in the House as the Sordoni-Huber measure and it was this which was sent to Governor Fisher. The bill has the support of the state organization and the administration. It increases the minimum weekly compensation payments from $6 to $7 and the maximum payments from $12 to $15 and reduces the waiting period from ten to seven days.

Carnegie Bonds Sold.—When 560 first-mortgage bonds of the Carnegie Coal Co. were offered at auction in Pittsburgh April 6, Delinquent Tax Collector Walter J. Christy, holder of the bonds, bought them back for $225,000. A committee of bondholders is attempting to effect a reorganization of the company.

The Cascade Coal & Coke Co. has reopened its mine at Sykesville, after a week's suspension. It expects to increase its force of employees and output during April.



Thin Bed Coal Tipple in Alabama

This tipple of the Cedrom Coal Co., Townley, Ala., is not yet complete but is being used in coal preparation. As may be seen, the siding is not yet in place on part of the structure. The opening to the mine may be seen through the studding of the shed toward the left of the picture. The bed worked is only 27 in. thick.

UTAH

To Issue Fleming Stock.—The Fleming Coal Co., organized recently by local interests, with a capital of $1,000,000 and 500,000 shares of stock, to develop coal lands in Utah, has received permission to offer for sale 25,000 shares of 7 per cent cumulative non-voting preferred stock at $1 per share. A bonus of one share of common stock with each share sold is to be given by the company. It is planned to expend approximately $300,000 in building a 4-mile spur track from Woodside on the Denver & Rio Grande Western R.R. The property includes 1,800 acres in Emery County, which is declared to be rich in coking coal deposits. The officers are Frank O. Chase, president; D. K. Moffat, vice-president; John E. Holden, treasurer; Wallace B. Kelly, secretary, and J. R. Fleming, Fred C. Matthews and R. B. Kennelly, directors.

The Denver & Rio Grande Western R.R. Co. has lost its rights in Salina Canyon, Utah, on appeal of the government to the Circuit Court. The government brought suit to cancel two right-of-way permits held by the railroad on the ground that it had made no effort to begin construction within the specified time. Judge Tillman D. Johnson of the federal District Court denied cancellation on the ground that there was no provision for courts to cancel such rights of way except on equity grounds where it is shown that cancellation is in the public interest.

VIRGINIA

Decision to grant authorization to the Clover Splint Coal Co., Inc., of West Virginia, to issue $20,000 of stock in Virginia has been reached by the Virginia State Corporation Commission. At the same time and in the same certificate, Howard N. Eavenson of Pittsburgh, Pa., was granted authority to sell the stock in Virgania. The stock is fixed at $100 per share for preferred and $5 a share for common. The company is authorized to issue the stock on the basis of 10 per cent upon subscription and the remainder at intervals within eighteen months.

Castner, Curran & Bullitt, Inc., of Norfolk and New York, got half of the State of Virginia's award of 60,000 tons of Pocahontas Navy Standard coal for use during the ensuing year. The bid was $1.90 per net ton mines. The remainder of the award has not been made, because of certain analyses which have not been completed.

Mine Idle Three Years Reopens.—George E. Thorn, general manager of the Blackwood Coal & Coke Company, has announced that he is reopening the No. 1 Pardee mine, which was closed early in 1924. The No. 1 mine is across the hollow from the No. 4 Pardee mine, and will increase the tonnage of the Pardee operation about one-third.

WEST VIRGINIA

J. B. Coghill, salesman with the General Electric Co. at Charleston, W. Va., was one of the twenty-seven employees to receive the Charles A. Coffin award for 1926. Shopmen, engineers, commercial men and administrative employees were included in the list. Each award consisted of a certificate of distinction and four shares of General Electric common stock. Mr. Coghill, who is well known by many coal operators, was honored for working out the details of a comprehensive sales plan which increased the company's sales in West Virginia.

New Richland Mine on Way.—Work has begun on the opening of a new mine on Big Wheeling Creek, owned by the Richland Coal Co., and H. C. Morris of Moundsville has been appointed to have charge of the mine. Mr. Morris was for some years connected with the state and federal prohibition departments and of late has been with the New York Central R.R. The Richland mine is the first to be opened on Big Wheeling Creek in the section where it is located and may be the precursor of several others. With the contemplated railroad which it is thought will be built by the Pennsylvania R.R. through the Creek Valley the section is expected to come into more prominence in coal circles. The tipple for the new mine has been placed near the second bridge about a mile and a half up the creek.

Map Disease Prevention Program.—An elaborate health program involving the expenditure of almost $1,000,000 has been mapped out by officials of the Consolidation Coal Co. The program will cover all the company's operations in Pennsylvania, Maryland, Kentucky, Virginia and West Virginia. Two supervisory sanitary engineers, 22 nurses and a general director have been appointed under the program, which will be preventive rather than curative. The services to be rendered by the company under the new program will be those of sanitation, infant welfare, social disease control, school health service, water supply improvement as well as ideal waste-eliminating systems. The nurses whose services have been retained have all had public-health training in addition to hospital experience.

CANADA

Nova Scotia Mines Hum.—The Nova Scotia coal industry is showing great activity, due to some extent to the strike of bituminous coal miners in the United States. During March the collieries operating in Cape Breton and the Nova Scotia mainland produced 402,317 tons of coal, the largest March output ever made by the Dominion Coal Co. To take care of this output 223,025 tons was banked at Sydney and Glace Bay, which constitutes a record for banking operations. It is expected that by the time navigation opens on the St. Lawrence about half a million tons will have been banked and ready for shipment. All the collieries in Cape Breton and on the mainland are producing at capacity, and the outlook is that operations at capacity scale will be continued throughout the year.

Among the Coal Men

Ganson Depew, former president of the Buffalo & Susquehanna Coal & Coke Co. and prominent in the business and social life of Buffalo, has been elected a director of the Buffalo & Susquehanna Railroad Co. Mr. Depew is a nephew of Chauncey M. Depew, of New York, and was a director of the above railroad years ago when it was built by Frank H. Goodyear to tap the coal and lumber resources of northwestern Pennsylvania.

H. H. Gardiner, president of the Pittsburgh & Shawmut Coal Co., has resumed business at his office in Pittsburgh, after an illness of about two months.

Senator White L. Moss, of Pineville, Ky., prominent coal and insurance man, has announced that he will be a candidate for Governor on the Republican ticket.

John Brophy, for many years president of District No. 2, which includes most of central Pennsylvania, relinquished the position to his successor, James Mark, on March 29. As there was no convention, following the failure to agree on a wage scale in the Central Competitive Field. Mr. Brophy prepared only a brief report printed in pamphlet form, which he distributed to local unions. In this he dwelt principally upon the Jacksonville scale and on his efforts to have the operators live up to the agreement. Mr. Brophy moved his family from the headquarters of the United Mine Workers in Clearfield to Pittsburgh, but did not intimate what he would follow after his retirement from the presidency. James Mark assumed his duties on April 1.

J. W. Paul, representing the U. S. Bureau of Mines in a co-operative study with the West Virginia Department of Mines respecting falls of roof and coal, expects to confer with officials of the Virginia Coal Operators' Association within a few weeks. It is possible that one of the field men under Mr. Paul will be assigned to co-operative work with the Virginia operators. Mr. Paul now has the services of two field men and is hopeful that a third can be added to his force during the next fiscal year, beginning July 1.

At annual stockholders' meeting of the Consolidation Coal Co., W. Bladen Lowndes, vice-president of the Fidelity Trust Co. of Baltimore, was elected a director, succeeding Van Lear Black, and other directors were re-elected. Two new officers were elected: H. H. Snoderly, vice-president, and C. E. Beachley, secretary.

C. S. Wardley, secretary and treasurer of the United States Fuel Co., has been made auditor of the H. C. Frick Coke Co., United States Coal & Coke Co. and associated companies.

L. R. Taylor, president of the Micajah Coal Co., of Micajah, W. Va., owing to continued ill health, has found it necessary to enter a Baltimore hospital.

Keith Butler, an official of the Broken Hill Iron & Steel Works, Newcastle, Australia, is making a study of coal mining in this country. He told a representative of the National Coal Association last week that Australian operators are particularly interested in low-temperature carbonization.

Dr. Thomas Baker

Dr. Thomas Baker, president of Carnegie Institute of Technology, Pittsburgh, Pa., will visit the leading research centers of Great Britain and the Continent this summer with a view to obtaining data that will be helpful in developing the coal-research facilities of the Institute. A laboratory for such work will be established at Carnegie Tech, and Captain Edward Steidle, secretary of the advisory board of the Institute, says that ambitious plans are under way to make it an outstanding plant. Carnegie is now working on coal research in co-operation with the U. S. Bureau of Mines.

The board of governors of the Alabama Mining Institute, Birmingham, Ala., held a meeting recently and decided to designate Vice-President Hugh Morrow, president of the Sloss Sheffield Steel & Iron Co., to direct the activities of the association until the regular date for the annual election of officers next autumn, when a successor to the late president, Frank Nelson, will be named.

Harvey Cartwright of Terre Haute, Ind., president of district No. 11, United Mine Workers, has been appointed to a place on the state mining board of Indiana. Cartwright succeeds Tyler Lawton, former president of the district, who resigned effective April 1. An agreement exists whereby the miners in Indiana are represented on the board by their president and secretary.

Chas. Petrie, who has been well known in the Canadian coal trade for many years, has been placed in charge of the new office opened in Montreal, Quebec, April 1 by Dickson & Eddy, New York City. This agency was established for the direct sale of anthracite and bituminous coal, specializing in anthracite produced by the Scranton Coal Co., Price-Pancoast Coal Co. and the West End Coal Co.

Hugh MacLeod, state mine inspector of Wyoming, will retire from that office on April 21. He will continue to make his home in Rock Springs.

Association Activities

Nine hundred retail coal dealers of Minnesota, Iowa, Nebraska, North Dakota and South Dakota have organized the Northwestern Retail Coal Dealers' Association, with headquarters at 320 Fawkes Building, Minneapolis. Charles T. Taylor of Mankato, Minn., was elected president of the association; B. A. Webster of Mason City, Iowa, first vice-president; H. Loonan of Sioux Falls, S. D., second vice-president, and E. W. Dobson of Minneapolis, treasurer. R. D. Cutter of Minneapolis was named secretary in charge of the headquarters office. The principal objectives of the association, as explained by the president, will be assistance to retail dealers in matters of traffic, marketing and business practices.

Industrial Notes

The Monroe Calculating Machine Co., Inc., Orange, N. J., announces the appointment of William G. Zanglein as sales production manager. Mr. Zanglein joined the Monroe sales organization in 1920.

The Heine Boiler Co., a subsidiary of the International Combustion Engineering Corporation, established new offices March 1 in the International Combustion Building, 200 Madison Ave., New York City.

Obituary

Mrs. Jennie Wilson, 56 years old, who was one of the few women coal operators in Kentucky, died at her home at Owensboro, Ky., on March 28, after an illness of only a few days. She was well known in northern Kentucky. Mrs. Wilson had been engaged in operating four coal mines in the Bon Harbor section, near Owensboro, since the death of her husband several years ago. She also owned a 1,200-acre farm, which she looked after. She is survived by four children. Burial took place in Elmwood Cemetery at Owensboro.

Isham W. Richardson, 49, superintendent and general manager of the Splash Dam Coal Co., Splash Dam, Va., died unexpectedly in a hotel at Charleston, W. Va., March 31. Death was attributed to acute indigestion. The body was removed to Johnson City, Tenn., and burial, it was thought, would be made at Spartanburg, S. C., where he formerly was a cotton broker.

Will Edwards, coal-mine operator, of Centertown, Mo.. died March 30. He was 43 years old. He is survived by his widow and three children.

Production And the Market

Coal Trade Only Superficially Affected by Strike; Sharp Drop in Car Loadings

Unconcern still characterizes the consumer's attitude toward the bituminous wage controversy which has tied up commercial soft-coal production in Illinois, Indiana, Ohio and a large part of western Pennsylvania, Iowa and the Southwest. In many communities directly dependent upon these fields for industrial fuel the buying public feels itself so well fortified with stocks that it has not even taken the trouble to draw heavily upon the coal carried in storage at the mines.

Superficially prices have advanced in the past week. *Coal Age* Index of spot bituminous prices on April 11 tentatively stood at 178 and the corresponding weighted average price was $2.15. Compared with the figures on April 4 this was an increase of 6 points and 6c. Primarily the increase was due to higher quotations on storage coal in Illinois and Indiana and to a general leveling up in Pittsburgh district prices. Ohio averages receded.

Actual Trading on Lower Levels

Generally speaking, however, the coals in which there was active trading showed no such strength. Western Kentucky, the best situated field geographically to replace Illinois and Indiana in the steam coal markets of those two states, reached higher levels, particularly on screenings, which showed an advance of approximately 20c. On the other hand, spot quotations on Eastern and Southern coals registered no advances and in a number of cases showed actual declines.

Aside from the apathy of both domestic and industrial buyers in all-rail territory in the Middle West, the chief contributing factor to this weakness was an embargo against shipments to Toledo for lake loading by the Hocking Valley Ry. last week. Sharper breaks would have followed this action were it not for the fact that the early opening of navigation promises a quick clean-up of congestion. Tidewater markets shared the indifference of the Midwest. The Southwest and the Rocky Mountain states were equally apathetic.

Suspension Takes Toll of Output

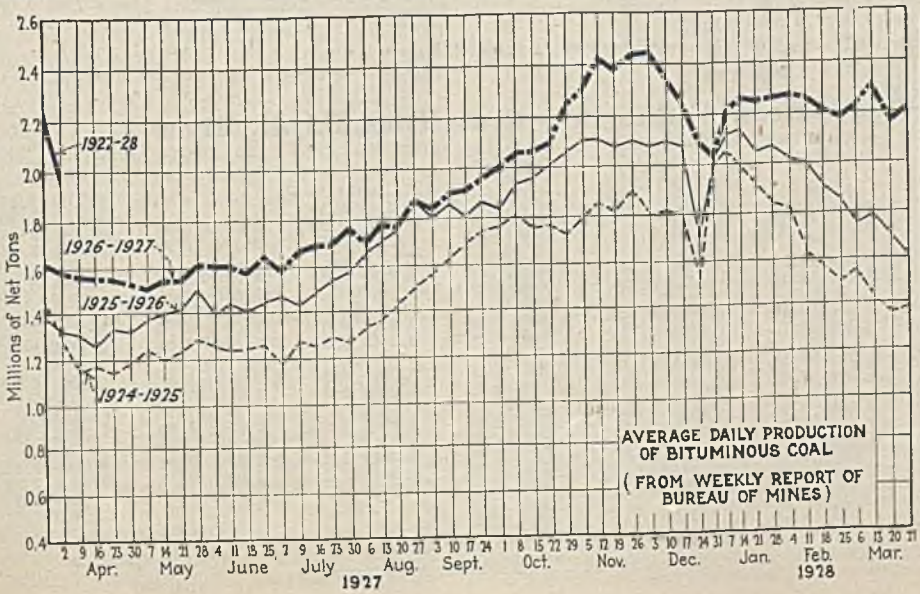
It is not yet possible to do more than approximate the effect of the suspension. During the week ended April 2 production dropped to 11,097,000 net tons—a decrease of 17 per cent. Preliminary reports on car loadings for April 4 and 5 show 48,197 cars, as against 81,092 cars for the first two days in the preceding week. This was a decrease of over 40 per cent and if consistently observed for the remainder of the week would pull production far below previous estimates.

How much of this reduction has been due to lack of market and how much to the efforts of the union to cripple open-shop operations in western and central Pennsylvania and in northern West Virginia will not be known for several days. It is significant, however, that car loadings on Monday and Tuesday of last week showed an increase of less than 36 per cent over the combined loadings on the Friday and Saturday preceding, when holiday celebrations and the first flush of the suspension might be expected to give an abnormal aspect to the week-end decline in tonnage.

Anthracite Picking Up

The outlook in the anthracite industry has brightened in the past few days. Retailers have been buying more freely and some of the more important producing interests are talking full-time operating schedules. An active campaign for business is on in such widely separated markets as Detroit and Montreal, Chicago and New York. Recent reductions in company circulars have stimulated trade. Retailers in the Canadian cities have given a further impetus to buying by making reductions in their own gross margins.

Another favorable factor in the anthracite situation is the early opening of navigation. Several cargoes are awaiting clearance from Buffalo this week and the Head of the Lakes talks optimistically of the new season's demand. Coke, of course, is fighting for the anthracite market. Metallurgical coke is quiet. The labor situation in the Connellsville region seems peaceful



Estimates of Production

(Net Tons)

	1926	1927
BITUMINOUS		
March 19 (a)	10,263,000	13,020,000
March 26 (a)	9,626,000	13,373,000
April 5 (b)	9,040,000	11,097,000
Daily average	1,586,000	1,957,000
Cal. yr. to date (c)	148,499,000	172,051,000
Daily av. to date	1,907,000	2,209,000
ANTHRACITE		
March 19	1,963,000	1,432,000
March 26	1,991,000	1,172,000
April 5	1,549,000	1,127,000
Cal. yr. to date (c)	11,503,000	18,642,000
BEEHIVE COKE		
March 19	263,000	205,000
March 26 (a)	251,000	200,000
April 5 (b)	234,000	196,000
Cal. yr. to date (c)	4,008,000	2,497,000

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

enough, but operators are apprehensive of developments in the next two months.

Middle West Unmoved by Tie-up

The Middle West has accepted the shutdown of Illinois and Indiana mines with undisturbed calm. Prices outside of southern Illinois proper on coal held at the mines are stiffer, but there is no rush of buyers to snap up tonnage. The Chicago market on western Kentucky fuel has been active and quotations are firm. Most of the buying, however, has been by wholesalers who hope for a quick turnover.

Here and there a mine in Illinois and Indiana has made temporary peace with the union, but the commercial production thrown on the market by such operations is too small in the aggregate to leave any impress upon trends. With thousands of cars under load in the mining districts added to the coal already in the stockpiles of consumers and liberal offerings of non-union tonnage from the South there is no excuse for feverish activity. Domestic trade is insignificant and spot buying of steam sizes is held back by the higher prices on storage coal.

Competition for steam business in the Chicago market, of course, comes principally from western Kentucky. In the domestic market there has been some improvement in the status of West Virginia smokeless. Choice mine-run now commands $2.10@$2.25 and lump and egg bring $2.75@$3. Eastern high-volatiles, however, are very weak, with 4-in. block ranging from $1.75 to $2.50. There is a slightly better storage market for anthracite and domestic coke.

Weather Helps St. Louis Market

Local retail trade at St. Louis was quickened by inclement weather last week. Most of the orders, however, were for small lots and for the cheaper grades of coal. On the whole retail yards are well stocked with reserve tonnage and there is considerable tonnage in transit. Local and country industrial buying is inactive; no great spurt is looked for before 30 or 60 days have elapsed.

This time estimate also is made in the Louisville market. Nevertheless there has been a slight tightening up in current quotations on both eastern and western Kentucky mine-run and slack. Some Harlan operators have carried the movement over to the prepared sizes and fixed a minimum of $2.25 on block; ten days ago they were accepting orders at $2. Nobody, however, expects that a runaway market will develop.

Up to the time an embargo was placed, there was a healthy movement of eastern Kentucky coal to the lakes. With an early opening of navigation, producers are discounting the effects of pre-season embargoes. Lake mine-run is selling at approximately $1.65. Some railroad business has been placed at $1.55, according to late reports. On the whole, the situation in the Kentucky fields is considered very promising, al-

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

Low-Volatile, Eastern	Market Quoted	Apr. 12 1926	Mar. 28 1927	Apr. 4 1927	Apr. 11 1927†
Smokeless lump	Columbus	$2.85	$2.60	$2.60	$2.50@$2.75
Smokeless mine-run	Columbus	1.90	2.10	2.10	2.00@ 2.25
Smokeless screenings	Columbus	1.10	1.60	1.65	*1.50@ 1.75*
Smokeless lump	Chicago	2.60	2.60	2.85	2.75@ 3.00
Smokeless mine-run	Chicago	1.80	1.80	2.10	2.00@ 2.25
Smokeless lump	Cincinnati	2.75	2.60	2.75	**2.75@ 3.00**
Smokeless mine-run	Cincinnati	1.90	2.00	2.10	2.00@ 2.25
Smokeless screenings	Cincinnati	1.35	1.85	1.95	*1.85@ 2.00*
*Smokeless mine-run	Boston	4.20	4.40	4.35	4.25@ 4.50
Clearfield mine-run	Boston	1.85	1.80	1.80	1.65@ 2.00
Cambria mine-run	Boston	2.10	2.10	2.15	*1.90@ 2.10*
Somerset mine-run	Boston	1.95	1.95	1.95	**1.75@ 2.25**
Pool 1 (Navy Standard)	New York	2.65	3.00	3.00	2.75@ 3.25
Pool 1 (Navy Standard)	Philadelphia	2.80	2.95	2.95	2.75@ 3.15
Pool 1 (Navy Standard)	Baltimore	2.05	2.55	2.35	2.25@ 2.50
Pool 9 (Super. Low Vol.)	New York	2.25	2.25	2.10	**2.00@ 2.35**
Pool 9 (Super. Low Vol.)	Philadelphia	2.35	2.30	2.30	2.15@ 2.45
Pool 9 (Super. Low Vol.)	Baltimore	1.90	2.10	1.90	1.80@ 2.00
Pool 10 (H.Gr.Low Vol.)	New York	1.85	1.95	1.75	1.65@ 1.90
Pool 10 (H.Gr.Low Vol.)	Philadelphia	2.05	2.00	2.00	1.80@ 2.20
Pool 10 (H.Gr.Low Vol.)	Baltimore	1.75	1.85	1.85	1.80@ 1.90
Pool 11 (Low Vol.)	New York	1.65	1.75	1.65	*1.60@ 1.75*
Pool 11 (Low Vol.)	Philadelphia	1.70	1.65	1.65	1.55@ 1.80
Pool 11 (Low Vol.)	Baltimore	1.60	1.65	1.65	1.60@ 1.70
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.45	1.45	1.45	**1.40@ 1.60**
Pool 54-64 (Gas and St.)	Philadelphia	1.45	1.45	1.45	1.35@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.30	1.55	1.55	1.50@ 1.60
Pittsburgh sc'd gas	Pittsburgh	2.40	2.40	2.40	**2.50@ 2.60**
Pittsburgh gas mine-run	Pittsburgh	2.05	2.15	2.15	**2.15@ 2.25**
Pittsburgh mine-run (St.)	Pittsburgh	1.95	2.05	2.05	**2.10@ 2.25**
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.65	1.65	**1.65@ 1.75**
Kanawha lump	Columbus	2.05	2.25	2.25	*1.85@ 2.35*
Kanawha mine-run	Columbus	1.55	1.55	1.55	1.40@ 1.75
Kanawha screenings	Columbus	.85	1.35	1.35	*1.00@ 1.35*
W. Va. lump	Cincinnati	1.85	2.05	2.05	1.65@ 2.50
W. Va. gas mine-run	Cincinnati	1.45	1.60	1.60	1.50@ 1.75
W. Va. steam mine-run	Cincinnati	1.30	1.35	1.45	*1.35@ 1.50*
W. Va. screenings	Cincinnati	1.00	1.45	1.50	*1.15@ 1.50*
Hocking lump	Columbus	2.35	2.35	2.35	*2.00@ 2.50*
Hocking mine-run	Columbus	1.55	1.70	1.70	*1.60@ 1.75*
Hocking screenings	Columbus	1.05	1.40	1.40	*1.25@ 1.50*
Pitts. No. 8 lump	Cleveland	2.20	2.35	2.40	*2.00@ 2.75*
Pitts. No. 8 mine-run	Cleveland	1.80	1.85	1.90	1.85@ 1.95
Pitts. No. 8 screenings	Cleveland	1.60	1.45	1.50	**1.50@ 1.60**

Midwest	Market Quoted	Apr. 12 1926	Mar. 28 1927	Apr. 4 1927	Apr. 11 1927†
Franklin, Ill. lump	Chicago	$2.60	$3.15	$3.15	$3.15
Franklin, Ill. mine-run	Chicago	2.40	2.60	2.60	2.50@ 2.75
Franklin, Ill. screenings	Chicago	1.85	2.25	2.25	2.50
Central, Ill. lump	Chicago	2.30	2.55	2.55	**2.75@ 3.00**
Central, Ill. mine-run	Chicago	2.05	2.10	2.10	**2.25@ 2.50**
Central, Ill. screenings	Chicago	1.30	1.85	1.85	**2.00**
Ind. 4th Vein lump	Chicago	2.40	3.05	3.05	3.00@ 3.15
Ind. 4th Vein mine-run	Chicago	2.15	2.45	2.45	2.40@ 2.50
Ind. 4th Vein screenings	Chicago	1.70	2.35	2.35	**2.50**
Ind. 5th Vein lump	Chicago	2.15	2.50	2.50	2.40@ 2.65
Ind. 5th Vein mine-run	Chicago	1.95	2.15	2.15	2.00@ 2.35
Ind. 5th Vein screenings	Chicago	1.30	1.75	1.75	**2.00@ 2.25**
Mt. Olive lump	St. Louis	2.50	2.85	2.85	**3.00**
Mt. Olive mine-run	St. Louis	2.15	2.50	2.50	**3.00**
Mt. Olive screenings	St. Louis	1.40	1.65	1.65	**2.00**
Standard lump	St. Louis	2.50	2.45	2.45	**2.75**
Standard mine-run	St. Louis	1.80	1.80	1.80	**2.00**
Standard screenings	St. Louis	1.15	1.35	1.35	**1.75**
West Ky. block	Louisville	1.75	1.85	1.85	1.75@ 2.00
West Ky. mine-run	Louisville	1.25	1.55	1.55	**1.50@ 1.75**
West Ky. screenings	Louisville	1.00	1.45	1.45	**1.50@ 1.75**
West Ky. block	Chicago	1.75	2.00	2.00	1.75@ 2.25
West Ky. mine-run	Chicago	1.15	1.60	1.60	1.50@ 1.75
South and Southwest					
Big Seam lump	Birmingham	2.00	2.00	2.00	1.75@ 2.25
Big Seam mine-run	Birmingham	2.00	1.75	1.75	1.50@ 2.00
Big Seam (washed)	Birmingham	2.00	2.00	2.00	1.75@ 2.25
S. E Ky. block	Chicago	2.25	2.25	2.25	2.00@ 2.50
S. E. Ky. mine-run	Chicago	1.65	1.65	1.65	1.60@ 1.75
S. E. Ky. block	Louisville	2.05	2.00	2.00	1.75@ 2.25
S. E. Ky. mine-run	Louisville	1.55	1.50	1.50	**1.50@ 1.75**
S. E. Ky screenings	Louisville	1.05	1.40	1.40	**1.35@ 1.60**
S. E. Ky. block	Cincinnati	2.10	2.10	2.25	2.00@ 2.50
S. E. Ky. mine-run	Cincinnati	1.45	1.55	1.60	1.35@ 1.85
S. E. Ky. screenings	Cincinnati	1.00	1.50	1.50	*1.10@ 1.50*
Kansas lump	Kansas City	4.25	4.35	4.35	4.25@ 4.50
Kansas mine-run	Kansas City	2.85	2.85	2.85	2.75@ 3.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

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

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

	Market Quoted	Freight Rates	April 12, 1926 Independent	April 12, 1926 Company	April 4, 1927 Independent	April 4, 1927 Company	April 11, 1927† Independent	April 11, 1927† Company
Broken	New York	$2.34	.....	$8.15@$9.25	.....	$8.25@$8.35	.....	$8.25@$8.35
Broken	Philadelphia	2.39	$9.25	9.00@ 9.25	.....	8.25@ 8.50	.....	8.25@ 8.50
Egg	New York	2.34	9.25@10.25	8.75@ 9.25	$8.00@$8.35	8.25@ 8.35	$8.00@$8.35	8.25@ 8.35
Egg	Philadelphia	2.39	9.25@ 9.85	9.15@ 9.25	8.25@ 9.00	8.25@ 8.35	8.25@ 9.00	8.25@ 8.35
Egg	Chicago*	5.06	8.75	8.13	7.63		7.63	7.63
Stove	New York	2.34	9.25@10.25	9.25@ 9.50	8.40@ 8.85	8.75@ 8.85	**8.50@ 8.85**	8.75@ 8.85
Stove	Philadelphia	2.39	9.60@10.10	9.35@ 9.50	8.85@ 9.50	8.85	8.85@ 9.50	8.85
Stove	Chicago*	5.06	8.88	8.58	8.08	8.08	8.08	8.08
Chestnut	New York	2.34	9.25@10.25	8.75@ 9.15	8.00@ 8.35	8.25@ 8.35	8.00@ 8.35	8.25@ 8.35
Chestnut	Philadelphia	2.39	9.25@ 9.75	9.00@ 9.15	8.25@ 9.00	8.25@ 8.35	8.25@ 9.00	8.25@ 8.35
Chestnut	Chicago*	5.06	8.88	8.33@ 8.53	7.63	7.63	7.63	7.63
Pea	New York	2.22	6.25@ 7.50	6.00@ 6.35	5.50@ 6.50	6.00@ 6.50	*6.00@ 6.50*	6.00@ 6.50
Pea	Philadelphia	2.14	6.50@ 7.00	6.00@ 6.50	6.25@ 6.75	6.00@ 6.50	*6.00@ 6.75*	*6.00*
Pea	Chicago*	4.79	5.65	5.65@ 5.80	6.03	6.10	**6.10**	6.10
Buckwheat No. 1	New York	2.22	2.00@ 2.50	3.00@ 3.50	2.50@ 3.00	2.50@ 3.00‡	**2.65@ 3.00**	2.50@3.00‡
Buckwheat No. 1	Philadelphia	2.14	2.50@ 2.75	3.00	2.50@ 3.00	2.50	2.50@ 3.00	2.50
Rice	New York	2.22	1.50@ 2.00	2.00@ 2.25	1.75@ 2.00	2.00@ 2.25	**1.85@ 2.00**	2.00@ 2.25
Rice	Philadelphia	2.14	2.25	2.25	2.00@ 2.75	2.00@ 2.25	2.00@ 2.75	2.00@ 2.25
Barley	New York	2.22	1.25@ 1.50	1.60@ 1.75	1.25@ 1.50	1.50@ 1.75	*1.15@ 1.50*	1.50@ 1.75
Barley	Philadelphia	2.14	1.50@ 1.60	1.75	1.50@ 1.75	1.50	1.50@ 1.75	1.50
Birdseye	New York	2.22	1.60@ 1.75	2.00	1.35@ 1.60	.....	1.35@ 1.60	.....

*Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**; declines in *italics*. ‡Domestic buckwheat (D. L. & W.), $3.50

though complaint is made of union activities.

Dock operators at the Head of the Lakes are playing close to the boards in the matter of new contracts until the labor situation in the mining fields becomes less uncertain. At the same time, however, salesmen are continuing an active canvass for spot orders. Higher prices are predicted on domestic coals because the docks will be compelled to draw all their supplies from the more distant non-union fields this season.

Current quotations, however, are unchanged. Earlier fears of a shortage in smokeless coal have proved to be unfounded. Pocahontas lump and egg is held at $9@$9.50; mine-run, $6@$6.25, and slack, $5. March shipments of coal from Superior and Duluth totaled 14,646 cars, as against 21,091 cars in February and 14,836 cars in March, 1926. April movement to date has been a little ahead of last year.

Trade at the Twin Cities is still marking time. All-rail bituminous prices are unchanged and little attention is paid to the suspension of mining in Illinois and Indiana. Aside from the usual spring shading of prices, the Milwaukee market is featureless. Mild weather has curtailed season-end buying by improvident householders. Dock operators are looking forward to receiving their first cargoes of the new season some time next week.

Southwestern Demand Slow

Neither demand nor prices have been speeded up in the Kansas City market as the result of the suspension in the unionized areas of the Southwest. Practically all of Kansas is tied up and most of Missouri. Oklahoma is making a good showing in the matter of production as that state now is largely open-shop. Semi-unionized Arkansas is producing little, but the curtailment in output is due more to lack of demand than to the labor situation.

"No bills" have been increasing at an unpleasant rate in the Colorado fields since the first of the month. Domestic demand drags despite the recent reductions in prices on lump. Threats of price-cutting by Utah mines augment the indifference of the retail trade to current Colorado offerings. No labor troubles are reported and mines are averaging about three and one-half days per week.

Breaks in the prices on Utah domestic coals the past fortnight have resulted in reductions of 75c. to $1.50 per ton in mine quotations. Lump now is quoted at $3.25; stove, $2.50, and nut, $2.25. Screened slack, however, is still held at $2.25. Ordinary slack is quoted at $1@$1.50, with the bulk of the tonnage going at $1@$1.25. The labor situation appears calm. Mines are averaging two to two and one-half days per week.

Cincinnati Steam Market Weakens

Although Cincinnati traders express no great concern over the embargo against shipments to Toledo for the lakes, prices on steam coals reacted unfavorably last week and even smokeless slack was forced to give ground. High-volatile lump and gas mine-run held, but steam mine-run weakened. Prepared smokeless, on the other hand, was stronger, with most factors demanding $3 for spot shipments, or 25c. over the contract figure.

There was a sharp drop in the volume of coal moving through the Cincinnati gateway last week. The number of loads interchanged was 12,036, a decrease of 2,930 cars. The Chesapeake & Ohio was the chief sufferer, with a loss of 2,850 cars. The number of empties en route to the mines also declined, the total dropping from 13,004 to 12,193 cars. Empty movement to the Chesapeake & Ohio decreased 570 cars and there was a drop of 299 in the number moving to the Louisville & Nashville.

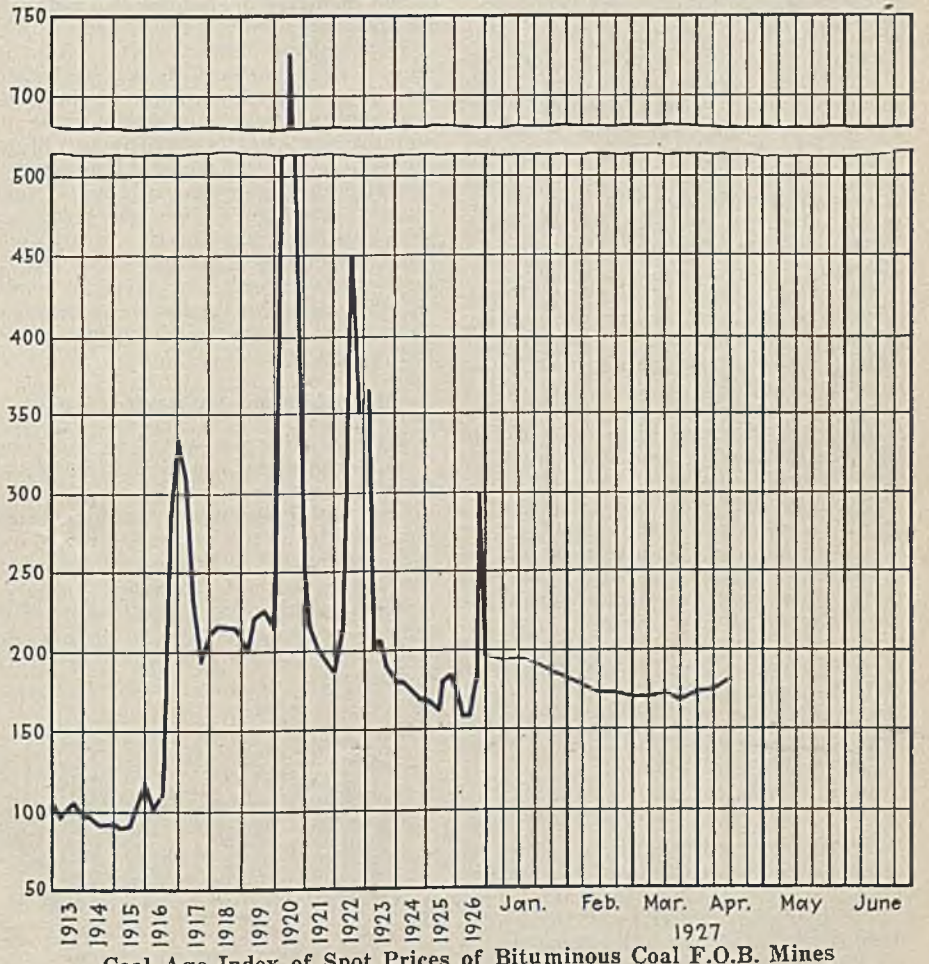
Central Ohio continues dull. All grades of coal are in weak demand in the Columbus market. Quotations on Hocking actually declined last week and Kanawha lump and slack were easier. With retail and industrial stockpiles well built up, steam consumers and retail distributors seem content to join the producers in playing a waiting game. Southern Ohio production is now limited to a large stripping operation in the Hocking Valley, open-shop mines in Pomeroy Bend and a few captive pits.

In many respects conditions in the Cleveland market last week duplicated those prevailing in Columbus. No. 8 lump was weaker, but the average price on eastern Ohio slack was up 5c. West Virginia coal competitive with No. 8, however, has been boosted to the No. 8 basis. Canny purchasers are able to pick up odd lots of distress tonnage and until these have been cleaned up little upward movement in general price levels is anticipated.

General Pick-up in Pittsburgh

Commercial tonnage from mines in the Pittsburgh district picked up all along the line last week, with the sharpest increase in steam grades. At the same time competitive non-union coal from West Virginia found hard sledding in western Pennsylvania and prices on that coal were weaker. Pittsburgh steam slack is up to $1.60@$1.70; mine-run, $2.10@$2.25; lump, $2.35@$2.60. In the gas-coal division, three-quarter lump showed the largest increase in price.

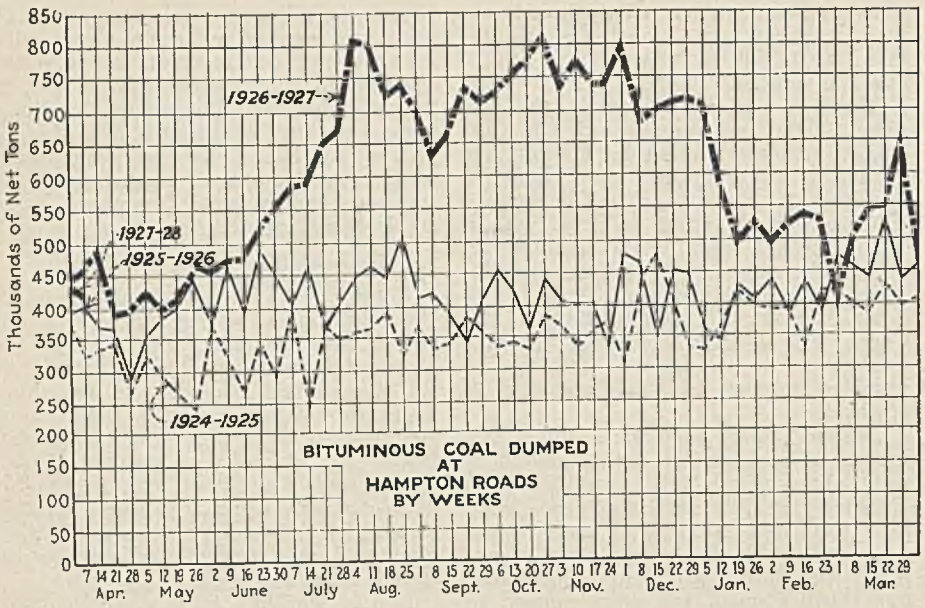
March loadings in central Pennsylvania rose to 89,910 cars, but current demand will not support such a volume this month. Prices are a shade easier. With both West Virginia and Pennsylvania seeking business in the Buffalo market, the situation there shows little change except a disposition in some quarters to limit the tonnage offered on



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

	1927				1926	1925
	Apr. 11	Apr. 4	Mar. 28	Mar. 21	Apr. 12	Apr. 13
Index	178	172	171	170	158	161
Weighted average price	$2.15	$2.09	$2.07	$2.06	$1.91	$1.95

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. Owing to the suspension of operations in certain unionized fields the figures for April 11 are *tentative* only.



Car Loadings and Supply

	Cars Loaded—All Cars	Coal Cars
Week ended April 2, 1927.....	992,745	175,176
Week ended March 26, 1927.....	1,008,888	206,999
Week ended April 3, 1926.....	928,092	156,909
Week ended March 27, 1926.....	967,838	171,413

	Surplus Cars—All Cars	Coal Cars	Car Shortages—All Cars	Coal Cars
March 31, 1927.	248,477	68,417	.....	.....
March 23, 1927.	252,751	71,677	.....	.....
March 31, 1926.	246,549	104,280	.....	.....
March 22, 1926.	213,780	79,551	.....	.....

a contract basis. Fairmont three-quarter lump is quoted at $1.65@$1.75; mine-run, $1.50@$1.60; slack, $1.40@$1.50.

Few New England Inquiries

New England inquiry for steam tonnage is almost lifeless. Most lines of manufacturing enterprise are going through a period of dullness and consider their present stockpiles ample insurance against any possible interruption to supply for some weeks to come. At Hampton Roads prices on Navy Standard f.o.b. vessels hang around $4.25@$4.50, with spot movement offshore and coastwise light. Little distress tonnage, however, is offered.

On inland delivery, Boston, Providence and Portland factors are quoting $5.90@$6.15 on cars. Conservative buyers are paying approximately $6 for the small lots of coal now being purchased in the open market. The delivered price of steam coal at retail in the Boston market was fixed at $8.50 per ton on Monday of this week.

The New York bituminous market is "flat." Inquiry is dead and there is plenty of coal available to meet all requirements. In fact, there is some distress tonnage in the harbor which has been offered at low prices to save demurrage charges. Pocahontas and New River mine-run is quoted at $1.65@$1.80 mines, and $4.25@$4.40, Hampton Roads, for delivery to Eastern inland points, as against $1.75@$2 mines for Western shipment.

Operators Withdraw Quotations

Temporary withdrawal of contract offers by some shippers and discontinuance of spot quotations by a number of mines mark the reactions of the Philadelphia market to the bituminous strike. At the same time there seems to be no apparent lack of coal to meet any demand which may arise and some producers complain of the difficulty of moving present output. Spot quotations, however, are firm and contract consumers are eager to take their full allotments of tonnage.

The Baltimore market is colorless. There has been some contracting, but the volume is reported subnormal and the drift toward open-market buying is unchecked. With plenty of coal above ground, ample stocks at tide and large tonnages on wheels, purchasing agents are cold to suggestions that the suspension in some union fields is a factor to be considered in shaping fuel policies. Competition for business is keen.

Birmingham district steam trade is slow. Spot business is so backward that it gives little support to the general market and is of little value in maintaining operating schedules. Shipments against contracts, while steady, are slightly under the volume of last month. Buying of domestic sizes, on the other hand, has shown a gratifying gain although contracting is not up to last year's record and there is some surplus coal even in the better grades. Production on the whole, however, is well controlled.

More Life to Anthracite Trade

More activity was noted in the New York anthracite market last week. Company shippers are receiving more orders and independent producers report a better outlook. Quotations show little change. No. 1 buckwheat is in fair shape and the best independent grades now bring full company circular. The market in pea coal also is looking up. Independent rice is stronger, but barley is weaker.

Cold weather and reduced prices have created a stronger demand in the Philadelphia market. As a result mine operating schedules have been increased. Retail prices are badly unsettled, with quotations showing a variation of 75c. Mine prices also are less stable. Company pea has been dropped to $6 by all shippers to the Philadelphia market and little independent tonnage is moving at higher prices. Steam sizes are moved without difficulty.

Baltimore retailers are making an active drive for summer business on the basis of the recent reductions in anthracite prices. There has been some improvement in demand at Buffalo. Toronto reports a marked increased in consumer buying following a reduction of $1 per ton in retail prices. Montreal dealers have cut prices $1@$1.25, but also continue to offer Scotch and Welsh anthracite. A comparison of prices follows:

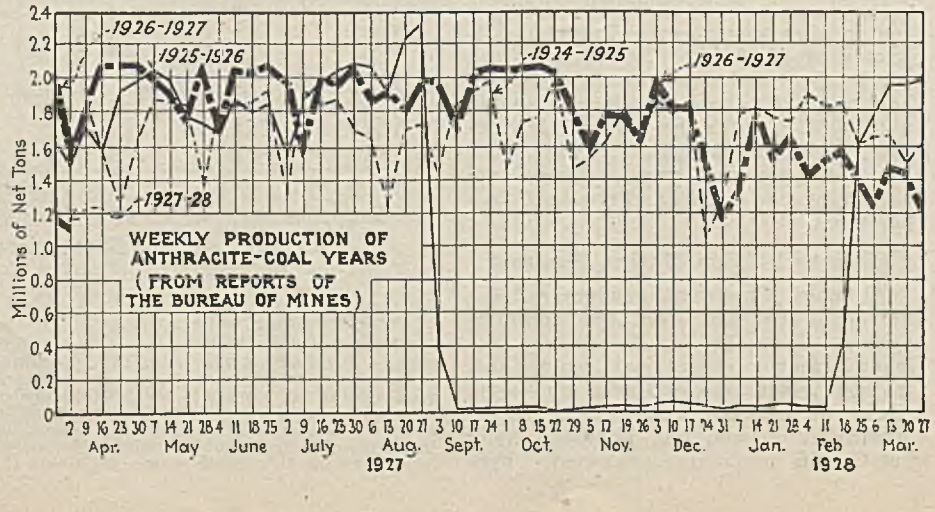
Size	U. S.	Scotch	Welsh
Egg	$15.25	$17.00	$17.25
Stove	16.00	17.00	17.25
Nut	15.50	17.00	17.25
Pea	13.00	.....	13.50
Buckwheat	9.50	10.00	10.50

With both British and United States mines unhampered by labor troubles a battle royal for Canadian trade is in sight.

Connellsville Quiet but Uneasy

No labor trouble has yet marred the serenity of the Connellsville coke region, but operators are frankly apprehensive that some disturbance may develop next month and reach a crisis in June. In the meantime the spot market is quiet. Furnace coke is quoted at $3.25@$3.50, but the tone is soft. Spot foundry has dropped to $4.25@$4.75—a decline of 25c. from levels established March 1.

Production of beehive coke in the Connellsville and Lower Connellsville region the week ended April 2 was



149,420 net tons, according to the Connellsville *Courier*. Furnace-oven production was 80,400 tons, an increase of 3,200 tons over the output for the preceding week. Merchant-oven production was 69,020 tons, an increase of 1,230 tons.

Inquiry for spot foundry coke in the Birmingham district is good and the production is readily placed. Domestic sizes, too, are bought somewhat more freely, following concessions in prices to encourage early stocking by retailers and consumers. Prices on domestic coke also have been cut at Buffalo, Toronto and Chicago and business has responded to the stimulus.

Traffic News

West Virginia Mines Win Fight On Cincinnati Rates

The high-volatile fields of southern West Virginia served by the Chesapeake & Ohio and Norfolk & Western have won their fight to be given the same rate to Cincinnati, Ohio, as enjoyed by producers in eastern Kentucky with mines on the Louisville & Nashville. The Interstate Commerce Commission has lifted the suspension of tariffs filed by the West Virginia lines reducing their rates 10c. per ton.

The tariffs under attack cut rates 10c. to Cincinnati and all Cincinnati district points on the north bank of the Ohio River. To south bank points the C. & O. made a reduction of 1c. and the N. & W. a cut of 10c. to put south bank points on a parity with rates to north bank stations. The L. & N. gives south bank points a 10c. differential under north bank rates. At the hearing of the case all parties requested that the question of the proper relationship between north and south bank points be left for future settlement.

Under the adjustment approved by the Commission the Hazard, Jellico-Middlesboro, Kenova-Thacker, Kanawha, C. & O. Kentucky and Big Sandy districts will have a rate of $1.79; the Harlan, McRoberts, Tug River, Pocahontas, New River and Clinch Valley districts, $1.89. Rates from the L. & N. districts, viz., Hazard, Jellico-Middlesboro, Harlan and McRoberts are unchanged; the other districts had rates of $1.89 and $1.99. The low-volatile fields were included in the adjustment because of differential relationships and competitive conditions.

In opposing the reductions the L. & N. contended that the fact that it had been maintaining rates from the Jellico-Middlesboro district 10c. per ton less than from the West Virginia high-volatile fields since 1906 and from the Hazard field since 1912 was strongly presumptive of the reasonableness of the relationship. Advocates of the reduction from West Virginia retorted that when the differential was established the L. & N. tonnage into Cincinnati was comparatively unimportant. To this the Commission adds that the relationship has never had its approval although the L. & N. rates *per se* were upheld in *Cincinnati Association of Purchasing Agents vs. L. & N.*, 89 I. C. C. 285.

Byproduct Coke Adjustment Under Attack

The adjustment of coke rates from competing ovens in the Middle West, Minnesota and Canada to Middle Western, Northwestern and Southwestern consuming territories is under attack in complaints recently filed with the Interstate Commerce Commission. The complainants include the Milwaukee Coke & Gas Co., Byproducts Coke Corporation and the Chicago Byproducts Coke Co. The first two are part of the old Semet-Solvay group, the last-named is commonly identified with the Koppers interests of Pittsburgh. The Indiana Consumers Byproducts & Gas Co., the Citizens Gas Co. and the Zenith Furnace Co. also are parties to the proceedings.

The complaints put in issue the relationship and reasonableness of the rates from Chicago, Granite City and East St. Louis, Ill.; St. Louis, Mo.; Terre Haute and Indianapolis, Ind.; Milwaukee, Wis.; Duluth and St. Paul, Minn., and Sault Ste. Marie, Ont.-Mich., to points in Illinois, Iowa, Missouri, Nebraska, the Dakotas, Wisconsin, Minnesota, Kansas and the northern peninsula of Michigan. Each complainant charges that its adjustment hampers it in competing for business with ovens in the other cities.

A hearing has been set for May 2 at Washington, D. C.

Would Realign Rates

The coal, coke and iron ore committee of Central Freight Association Territory has called a hearing at Pittsburgh, Pa., on April 21 to consider a proposal of the New York Central R.R. to establish a rate of $2.39 per net ton from mines in the Kanawha district served by its Ohio Central Lines to stations on the Wheeling & Lake Erie, Gambrinus to Ellis, Ohio. The rate proposed is that applicable from corresponding districts on other lines. The hearing will be held in the Chamber of Commerce Building at 10 a.m.

Will Allow Increase

An increase from $1.40 to $1.71 in rates on bituminous coal from mines on the Cleveland, Cincinnati, Chicago & St. Louis Ry. to stations in Missouri, Gravois to St. Genevieve, inclusive, on the St. Louis-San Francisco R.R. is not unreasonable, according to a decision of the Interstate Commerce Commission in I. & S. Docket 2807. The Commission, however, ordered tariffs advancing the rates canceled because they involved a number of violations of the long-and-short haul provision of the interstate commerce law.

A new coal rate put into effect by the Baltimore & Ohio since taking over the Cheat Haven & Bruceton R.R. eliminates a 10c. differential on loads originating on the line, as the regular Connellsville region rate now obtains. Coal freight on the short haul—that is to the Uniontown (Pa.) coke yards and nearby points—originating on the Cheat Haven & Bruceton will now carry a rate 5c. higher than from points between the West Virginia state line and Uniontown. It is understood that extensive improvements will be made on the branch up Cheat River. Heretofore used as an outlet by the Kendall Lumber Co., the line has seven coal mines on it and it is expected that a revision of the rate will enable the producers to resume operations.

Re-establishes Zone Adjustment For Chicago District

Re-establishment of a zone system within the Chicago switching district is effected by the third and most recent decision of the Interstate Commerce Commission in *Chicago Coal Merchants' Association vs. Director General et al.* Since 1911 the flat Chicago rate has applied on most traffic to and from points in this district, which extends about 40 miles from Ivanhoe, Ind., on the southeast, to Des Plaines, Ill., on the northwest. Coal has been one of the outstanding exceptions to the general adjustment and complainant has been fighting for several years to have coal placed upon the same basis as other traffic.

Upon showings of costs, revenues and alleged lack of reciprocal movement, scored in a dissenting opinion filed by Commissioner McManamy, the Commission now reverses its previous extension of the flat Chicago rate to that part of the district lying north and west of the loop and divides that territory into two zones each extending from the lake to the western boundary of the switching district. Irving Park Boulevard is made the dividing line between the two zones and Weber and Greenwood Streets in the northern zone are again grouped with Evanston.

Carriers are permitted to charge 10c. per net ton more over the Chisago rate on anthracite moving to points in the southern zone and 20c. more to points in the northern zone. On bituminous coal, the flat Chicago rate applies to points in the southern zone; to points in the northern zone a differential of 10c. above those rates is allowed. The Commission suggests that rates on coke be correspondingly adjusted.

North Dakota to Probe Rates

The State Railroad Board of North Dakota has started a complete investigation of all freight rates on fuel products produced in the state, in accordance with House Bill No. 225, passed by the recent Legislature. The bill repealed the rates on lignite as fixed by the 1925 Legislature and directed the commission to investigate freight rates both interstate and intrastate, on lignite, bituminous and anthracite, wood, coke, oil and other fuels. The board states its purpose of fixing just, reasonable, non-preferential and non-discriminatory intrastate charges on fuels. All railroads in the state have been named as respondents. There is a fund of $10,000 for the investigation but it is feared it will not be enough in view of the wide scope of the investigation.

Foreign Market And Export News

Government Intervention Ends French Wage Crisis

The threatened crisis over wage reductions in the French mining fields has been ended without a suspension in operations as the result of the intervention of French government agencies. The workers have accepted cuts in their pay and the colliery owners, who recently lowered their pithead prices, are going forward confident that they will be able to retain some of the gains won during the British strike of last year.

Wages have been cut 8.4 per cent in the Sarre region, 6.1 in the Nord and Pas de Calais fields and 6.3 per cent in the Loire. It is estimated that these reductions mean an average cut of 2.1 fr. in the daily pay of the workers in the various districts. Pithead prices have declined from 11 to 14 per cent.

Negotiations Overshadow Market

Paris, France, March 31.—Questions of wages and selling prices are the all-absorbing topics of discussion in French coal trade circles at the present time. In a recent conference between representatives of the mine workers and the colliery proprietors of the Nord and Pas de Calais regions, the latter informed the workers that it was imperative that wages be lowered to take care of pending slashes in pithead prices of coal.

In the Sarre the owners declared it would be necessary to reduce wages 8 to 10 per cent, cutting the pay of the highest-rated men from 39 to 35.40 fr. per day. The owners further proposed to make the reduction by two successive cuts of 1.80 fr. per day, the first on April 1 and the second on May 1. The men rejected this proposal and appealed to the Minister of Public Works.

No agreement was reached at conferences in the Loire basin yesterday. The colliery owners, however, decided to ignore the strike threats made by the men and to post notices of a 10 per cent reduction. This will mean a cut of 3.25 fr. in the daily pay of skilled underground workers and 3.0 fr. in the rate for other underground and surface men. Women and minor workers are to have the wages lowered 2 fr.

Following the recent reductions in pithead prices on French and Belgian coals, traders in the metropolitan area have announced new prices effective April 1. Compared with those in effect on March 1 the new schedules show reductions of 50 fr. on lignite briquets, 80 fr. on ovoids, 75@90 fr. on first-quality kitchen and grate coals, 20@50 fr. on large flaming coals, 78@98 fr. on Belgian anthracitics, 20@30 fr. on Welsh anthracite nuts and cobbles and 10 fr. on Russian anthracites. British style anthracitics (a mixture of Dutch and German coals) have been cut 50@65 fr.

The new prices are subject to advances during each month to September.

French output in February totaled 4,357,676 metric tons of coal, 93,314 tons of lignite, 312,525 tons of coke and 250,572 tons of patent fuel. In January the production was 4,530,859 tons of coal, 98,632 tons of lignite, 348,957 tons of coke and 257,718 tons of patent fuel.

Big Gain in French Output

French coal production last year totaled 51,407,600 metric tons, as compared with 47,047,630 tons in 1925. Lignite production was 1,056,200 tons, as against 1,007,270 tons in the preceding year. The output of coke amounted to 2,775,600 tons as compared with 3,069,610 tons in 1925 and briquet production totaled 4,074,500 tons as against the 1925 total of 3,656,010 tons.

In 1926, French mines employed a total of 330,469 miners, of which 238,637 were underground workers and 91,832 were surface workers. In 1925 a total of 313,925 was employed, of which 224,164 were engaged in underground work and 89,761 above ground.

The production of coal in the Sarre basin increased during 1926 to 13,680,800 metric tons as against 12,989,850 tons in 1925. Coke production in the Sarre in 1926 amounted to 255,200 tons as against 272,350 tons in 1925.

Arras led all the French mineralogical districts in coal production last year with a total of 24,048,000 metric tons in 1926 as compared with 21,095,190 tons in 1925. The Douai district was second with 8,476,000 tons as compared with 7,605,010 in 1925. The Strasbourg district followed with 5,323,600 tons as against 5,279,320 tons in the preceding year. St. Etienne was fourth with a total output of 4,251,200 tons as compared with the 1925 production of 4,096,230 tons and Lyons fifth with 3,107,000 tons against 3,011,050 in 1925.

Belgian Market Weakens Steadily

Brussels, Belgium, March 31.—Pronounced weakness characterizes the Belgian coal market in the face of unsettled conditions in the neighboring coal fields of France. Belgian colliery owners have called the attention of the government to foreign coal purchases by official organizations. Incidentally consideration has been given to a proposal to amalgamate small collieries and organize a national syndicate to market output.

Stocks are increasing steadily and prices declining, with the result that some producers contemplate reducing personnel and curtailing production.

In the Borinage there has been a further price decrease of 10 fr., but actual transactions are at much below official quotations.

Foreign competition is especially keen in semi-bituminous grades. Coals utilized by open-air industries are in only fair demand.

Coal production during February totaled 2,251,330 metric tons; coke, 393,870 tons, and patent fuels, 127,440 tons.

British Tonnage Erratic

British coal production during the week ended March 26 was 5,184,700 gross tons, as compared with 5,317,600 tons the preceding week and 5,371,400 tons the last week in February. The total for the last week in February was the highest reached by the British mines since the resumption of operations following the collapse of the general strike last winter.

British coal owners are watching the developments in the labor situation in the United States, France and Germany. While it now seems certain that government intervention has ended the coal labor crises in Continental Europe, and Great Britain can hope to benefit little from the present stoppages in the United States, the disturbances have had a stimulating effect upon the British market. Exports are increasing, with the bulk of the foreign business going to the Welsh coal fields.

Export Clearances of Coal, Week Ended April 7

FROM HAMPTON ROADS

	Tons
For Argentina:	
Br. Str. Domira, for La Plata	5,269
For Virgin Islands:	
Dan. Str. Arnold Maersk, for St. Thomas	2,764
For Hawaii:	
Amer. Str. Archer, for Honolulu	1,011
For British West Indies:	
Swed. Str. Fidra, for St. Lucien	2,658
For New Brunswick:	
Ital. Str. Valnegra, for St. John	6,269
For Canal Zone:	
Amer. Str. Lebore, for Cristobal	10,637
For Danish West Indies:	
Nor. Str. Dampen, for Curacao	3,729

Hampton Roads Coal Dumpings

(In Gross Tons)

	Mar. 31.	Apr. 7.
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week	127,138	122,927
Virginian Piers, Sewalls Pt.:		
Tons dumped for week	140,627	120,666
C. & O. Piers, Newport News:		
Tons dumped for week	141,626	126,437

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

Pier and Bunker Prices

(Per Gross Ton)

PIERS

	March 31	April 7†
Pool 1, New York	$5.35@$5.75	$5.35@$5.75
Pool 9, New York	5.00@ 5.25	*4.70@ 5.00*
Pool 10, New York	4.75@ 5.00	*4.50@ 4.75*
Pool 11, New York	4.25@ 4.50	4.25@ 4.50
Pool 9, Philadelphia	5.15@ 5.30	5.15@ 5.30
Pool 10, Philadelphia	4.85@ 5.05	4.85@ 5.05
Pool 11, Philadelphia	4.45@ 4.55	4.45@ 4.55
Pool 1, Hamp. Roads	4.50@ 4.65	**4.60@ 4.75**
Pool 2, Hamp. Roads	4.25@ 4.35	**4.50@ 4.60**
Pool 3, Hamp. Roads	3.90@ 4.00	**4.00@ 4.10**
Pools 5-6-7, Hamp. Rds.	4.00@ 4.15	**4.10@ 4.2**

BUNKERS

Pool 1, New York	$5.60@$6.00	$5.60@$6.00
Pool 9, New York	5.25@ 5.50	*4.95@ 5.25*
Pool 10, New York	5.00@ 5.25	*4.75@ 5.00*
Pool 11, New York	4.50@ 4.75	4.50@ 4.75
Pool 9, Philadelphia	5.40@ 5.55	5.40@ 5.55
Pool 10, Philadelphia	5.10@ 5.35	5.10@ 5.35
Pool 11, Philadelphia	4.70@ 4.80	4.70@ 4.80
Pool 1, Hamp. Roads	4.65	**4.75**
Pool 2, Hamp. Roads	4.35	**4.60**
Pools 5-6-7, Hamp. Rds.	4.15	**4.25**

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

Recent Patents

Carbonized Briquette and Its Manufacture; 1,618,248. Samuel F. Walton, Rose Valley, Pa. Feb. 22, 1927. Filed Dec. 3, 1925; serial No. 73,055.

Coke-Handling Mechanism; 1,618,701. David P. Finney, Clairton, Pa. Feb. 22, 1927. Filed Dec. 4, 1925; serial No. 73,166.

Coal Breaker; 1,618,721. Joseph T. Norman, Nanticoke, Pa. Feb. 22, 1927. Filed June 3, 1925; serial No. 34,707.

Support for Conveyor Belts; 1,618,957. Pierre R. Hunter, Lakewood, Ohio, assignor to the Brown Hoisting Machinery Co., Cleveland, Ohio. Feb. 22, 1927. Filed July 1, 1926; serial No. 119,933.

Loading Machine; 1,619,260. Joseph F. Joy, Franklin, Pa., assignor to Joy Mfg. Co., Franklin, Pa. March 1, 1927. Filed Aug. 2, 1924; serial No. 729,833.

Mining-Machine-Chain Lubricator; 1,620,135. Herman L. Seekamp, Gillespie, Ill. March 8, 1927. Filed April 20, 1925; serial No. 24,369.

Endless Belt Conveyor; 1,620,168. James W. Silver, Ogden, Utah. March 8, 1927. Filed Oct. 6, 1925; serial No. 60,823.

Vibratory Screen; 1,620,575. Wm. F. Schadel, Charleston, W. Va., assignor to the Kanawha Mfg. Co., Charleston, W. Va. March 8, 1927. Filed May 25, 1926; serial No. 111,596.

Control System for Endless-Belt Conveyors; 1,620,532. Charles R. Fisher, Rogers City, Mich. March 8, 1927. Filed Feb. 27, 1922; serial No. 539,558.

Publications Received

Proceedings of the Twenty-Ninth Annual Meeting of the American Society for Testing Materials, held June 21-25, 1926, at Atlantic City, N. J. Vol. 26, in two parts. Part I has 1,204 pp. and contains committee reports, new and revised tentative standards and list of standards and tentative standards. Part II, containing technical papers, has 691 pp. Both books are illustrated. Price of each Part: $6 in paper, $6.50 in cloth and $8 in half leather binding.

Railway Fuel.—The Coal Problem in its Relation to the Transportation and Use of Coal and Coal Substitutes by Steam Railroads, by Eugene McAuliffe. Simmons-Boardman Publishing Co., 30 Church St., New York City. Price, $5. Pp. 480; 6x9 in.; illustrated.

Coking of Oil Shales, by W. L. Finley and A. D. Bauer. Bureau of Mines, Washington, D. C. Technical paper 398. Price, 5c. Pp. 11, 6x9 in.; illustrated. Discusses the tendency of oil shales to coke when heated and describes means for preventing the formation of dense hard coke.

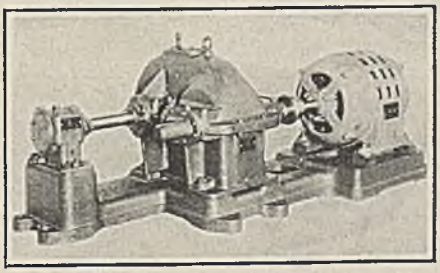
Water Power Engineering, by H. K. Barrows. McGraw-Hill Book Co., 370 Seventh Ave., New York City. Price, $6. Pp. 734; 6x9 in.; illustrated. An authoritative treatment of principles and practice underlying the design of modern hydro-electric developments.

New Equipment

High Efficiency Is Claimed For Falk Speed Reducers

The Falk Corporation, Milwaukee, Wis., has developed a new line of speed reducers in which continuous tooth, all-steel herringbone gears are used exclusively. It is claimed by the maker that, like the units previously built by this company, these gears are precision-made, silent and give high efficiency.

A special design of housing eliminates any internal ribs, projections or complicated cores. Lubrication has in this way been simplified and all possibility of dirt or core sand working into the gears definitely removed. Added features include airplane type, steel-backed, babbitt-lined bearings that are capable of carrying heavy loads and an improved automatic continuous lubrication system.



Standardized Reduction Unit

Certain motor sizes and certain gear ratios are needed with such frequency that they have been standardized. Most requirements of customers can thus be supplied immediately from stock.

Based on years of experience, this line covers certain standard reduction ratios as well as standard motor beds. Standardization of units and beds in accordance with general industrial demands makes possible stock delivery of this precision product.

These reducers are made in three types—single reduction for ratios up to 9:1, double reduction for ratios up to 70:1, and triple reduction for ratios up to 300:1. A double reduction unit is shown in the accompanying illustration.

Reconditioning Process Saves Waste Belting

It is claimed that a large amount of the greasy, oil-soaked, and apparently useless, ends and scraps of leather belting which accumulate in practically every plant, can be utilized by the "Nu-Ply" belt reconditioning service recently established by the Cleveland Oak Belting Co., Cleveland, Ohio. The service is soon to be extended, by means of agencies, to other large cities.

Leather usually fails because of the dust, grease, etc. that accumulates upon it. This causes the material to become stiff, to run unevenly over the pulleys, to crack, and finally to break. However, if the dirt on the surface and in the fibers is removed, it is often possible to re-use much of such leather.

The first step in the "Nu-Ply" process is to sort out, from the pieces of belting sent in, all leather that is not worth reconditioning. The plies and joints are then opened and the cement removed. A thorough cleansing next removes not only all traces of dirt and grease from every part of the leather, but opens up the pores of the material as well. It is now clean, but lacks the essential oil which creates the "leathery" qualities on which its future usefulness depends. These properties are restored by immersion and currying, and the various scraps are then assembled into lengths of practically new belting. It is claimed that the cost of this treatment is about one-third that of new belting.

To give strength and resist stretching, the outer plies of the reconditioned belts are made from new first-quality oak-tanned leather. The surface coming next the pulley, however, is made of the reconditioned material. As it is well known that the gripping power of an old belt is usually greater than that of a new one, the belts thus treated are equally strong, and often more efficient, than new ones. It is further claimed that they are practically indistinguishable, in general appearance, from new belts.

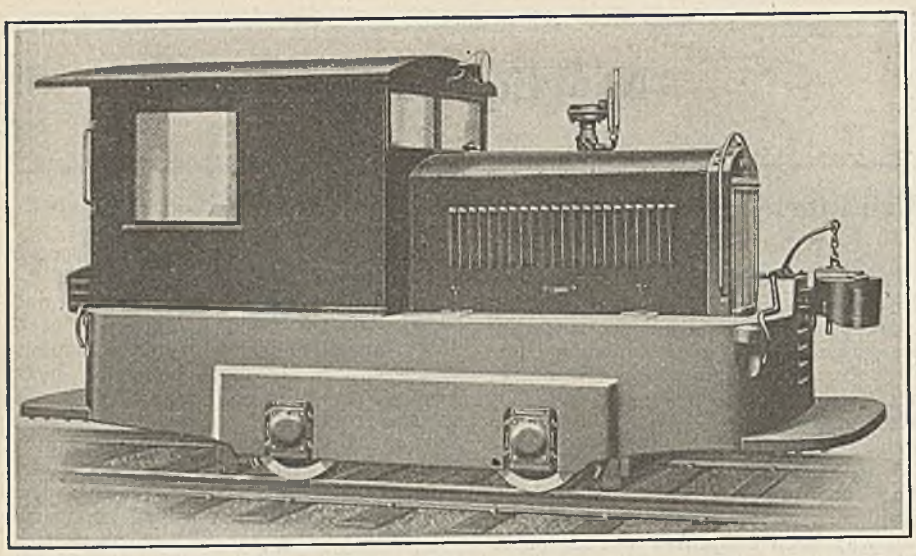
Railroad Cars Are Switched By Gasoline Locomotive

At many mines the upperworks are so extensive that more or less switching of railroad cars is imperative. To obviate the expense of a steam locomotive to perform this work the Mid-West Locomotive Works of Cincinnati, Ohio, has perfected the type of machine shown in the accompanying illustration. As now built this locomotive, known as the GD model and built in weights of 8, 10, 12 and 16 tons, embodies several improvements in design and construction over its predecessors.

The frame is a one-piece casting of semi-steel liberally alloyed with manganese and nickel. It is heavily ribbed and no bolts are employed to take the stress of either pulling or pushing the cars. Semi-elliptical leaf springs carry the weight of the machine giving eight points of support to the frame. This assures good riding qualities and entails small liability to derailment.

The drive on this machine is by chain and the main sprockets are mounted directly on the wheels. This relieves the axles of all torsional stress thus greatly prolonging their life. Danger of the sprockets loosening on the axle is also obviated. Take-up for chain wear is made by means of a threaded rod and adjusting nut. Wear may thus be taken up a little at a time as it develops.

Transmission in all models is claimed by the maker to be heavy and strong.



Gasoline Switch Engine

Shifting or shunting of railroad cars is work which at many mines requires the services of a steam locomotive, while at others the locomotive crane is pressed into service. The machine here shown is particularly adapted to this work. Both larger and smaller models are made and any of them can be fitted for the handling of mine or industrial equipment. The machine is said to be both durable and efficient.

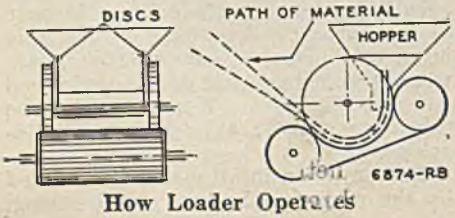
Four speeds either forward or backward are provided. The power ratio (horsepower per ton) is said to be ample and the fuel consumption to be low. Other sizes built include 3-, 4,-5-, 6-, and 7-ton models as well as 20-, and 25-ton machines. As illustrated the machine is of standard gage equipped with MCB couplers and adapted to handling railroad cars. Units fitted for pulling mine cars may also be had.

New Box Car Loader Throws Material Loaded

To load box cars to capacity with spouts or by hand is a difficult task. A new device for this purpose has been developed by the Stephens-Adamson Manufacturing Co., of Aurora, Ill. An entirely new principle is involved in its operation. A belt is used which operates at a high speed through a curved path, permitting sufficient contact with the material to give great velocity to the load as it passes from the machine. The ingenious combination of high speed with the resulting exerted centrifugal force provides the desired trajectory within a remarkably short space, facilitating maximum loading of cars.

Bulk material may be fed to the loader either by conveyor or spout. The machine placed in the center of the car will throw the load into the far ends of the car speedily and with ease. How the loader works is shown in the accompanying cut. The position of the loader is easily changed. It is mounted on two light steel wheels. The supporting standards are furnished with spurs. A driving motor is directly connected to the belt pulley through a reduction drive. The motor and mechanism are completely protected with a steel housing.

This machine is furnished with an extension cable 50 ft. long to bring the current from the power supply to the loader. The short belt has no clips or flights to come loose, and is easy to replace. The total weight is about 875 lb.



How Loader Operates

Coming Meetings

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

American Institute of Electrical Engineers. Regional meeting of Middle Eastern District, at Bethlehem, Pa., April 21-23. Chairman of General Committee, Wm. E. Lloyd, Jr., Pennsylvania Power & Light Co., Hazleton, Pa.

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.

Chamber of Commerce of the United States. Annual meeting, May 3-5, at Washington, D. C.

Mine Inspectors' Institute of America. Annual meeting May 3-4-5, Charleston, W. Va. Secretary, C. A. McDowell, P. O. Box 64, Pittsburgh, Pa.

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.

Oregon Coal Dealers' Association. Seventh annual convention, Portland, Ore., May 13 and 14. Secretary, O. F. Tate, Board of Trade Building, Portland, Ore.

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.

National Foreign Trade Convention, Detroit, Mich., May 25-27. Secretary, O. K. Davis, India House, Hanover Square, 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.

Pennsylvania Retail Coal Merchants' Association. Annual convention, Wilkes-Barre, Pa., June 1-3. Secretary, W. M. Bertolet, Reading, Pa.

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 Society for Testing Materials. Thirtieth annual meeting, French Lick Springs Hotel, French Lick, Ind., June 20-24. Secretary, C. L. Warwick, 1315 Spruce St., Phila., Pa.

American Society for Testing Materials. Annual meeting at French Lick Springs, Ind., June 20-24. Asst. secretary, C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

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.

Illinois and Wisconsin Retail Coal Dealers' Association. Annual convention, the Hotel Pfister, Milwaukee, Wis., June 28-30. Managing Director, N. H. Kendall, 706 Great Northern Bldg., Chicago, Ill.

International Chamber of Commerce. Fourth congress at Stockholm, Sweden, June 27 to July 2.