

COAL AGE

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What Does It Mean?

Governor Pinchot, living up to predictions made last summer, has at last come forward with an eleven-point program for a settlement of the anthracite strike. From the public standpoint, the outstanding features of this program are the proposal to prohibit any increase in the price of coal, a long-term agreement and an immediate resumption of operations. That last proposal already has been invalidated by the declaration of Mr. Lewis that resumption will follow agreement—not the reopening of negotiations.

Mr. Lewis and his associates, agreeing to nothing, promising nothing except a readiness to discuss the Pinchot program with the operators, nevertheless emerge from the situation with the blessings of Gifford and more public approbation than has been their lot at any time since the head of the United Mine Workers so brusquely ended negotiations with the anthracite producers last August. The operators, who have been gathering favorable opinion to themselves because of the justice of their cause, are again entering a cloud of public disfavor. For this they have nobody to blame but themselves. Their refusal to attend the governor's Harrisburg party last Saturday, their plea for advance knowledge of what he would propose reveal anew a pitiful incapacity for gaging public sentiment.

As for the Pinchot program, the more it is examined the less it appears in the public interest. The first proposal is that there shall be no increase in price "by reason of this agreement." That provision contemplates, in essence, a concerted maintenance of prices which is clearly illegal. Moreover, it is a denial of the demand that the cost of anthracite be lowered to a point enabling hard coal to compete with soft. In view of that denial, the later provision for a study "to recommend methods for increasing the efficiency and reducing the cost of operation of the mines" suggests no public participation in the benefits of such a procedure. As a matter of fact, the attitude of the miners has been that those benefits shall be wiped out by wage increases.

In the light of what has taken place in the bituminous regions, a long-term agreement with no machinery for modification is not in the interest of either the miner or the operator. Nor is the public served if the inflexible wage basis fixed prove uneconomic, since the cost of industrial losses must ultimately be absorbed by the public at large—indirectly, if not directly. That which the public most desires—an uninterrupted supply—is not guaranteed beyond the life of the new agreement. Another "study" is to be added to the wearisome bibliography on how to avoid strikes, but neither party is pledged to acceptance of the recommendations made.

The only possible public gain promised by the governor's activities was an immediate resumption of operations. Mr. Lewis has made it plain that that gain is not to be had. The other promises in the Pinchot program are too illusory to justify enthusiasm.

Father of Parliaments

ON DECEMBER NINE the Coal Mining Institute of America holds its annual meeting. Organized in 1887, it has had a long and laudable career—not only in what it has done itself, but in the institutions to which it has served as a model. None that have patterned after it have had, of course, so long a life nor indeed so vigorous a one. Located as it is, the Coal Mining Institute of America has been able to draw members as the city in which it meets has been able to attract citizens. Pittsburgh is a convenient center for a live and flourishing institute.

Many have friends and past acquaintances in Pittsburgh, and the annual meeting accordingly serves for them as an "old home week" where many coal men who have not come in contact for years greet each other once more and exchange confidences.

The Pittsburgh coal men have gone east, west, north and south and some have wandered into foreign climes, but the Coal Mining Institute of America is their first love, even though they may have others, and whenever they have an opportunity they slip back to greet familiar faces and talk over old times and modern developments. At its sessions they are sure to find those who will welcome them after their travels and inform them as to the health and progress of their cronies.

Thoroughly practical the institute has always been. Yet of late years it has kept a higher standard than in years past. In earlier days the budding politician occasionally found a chance at the summer banquet to try out his oratory on the patient members, never being quite clear whether he was addressing the United Mine Workers of America or a technical society. But those days when we used to hear about Tubal Cain and King Solomon are gone. We eat our meat today with better talent, and we digest it with greater comfort.

No institute, not even the American Institute of Mining and Metallurgical Engineers, has a better record for 100 per cent attendance at committee meetings. No programs are prepared with more care. So long as this condition obtains the life and vigor of the Institute will be assured.

The thirty-ninth annual meeting assembles next Wednesday. Let no consideration prevent the attendance of any coal man living within reasonable distance.

Setting the House in Order

HERBERT HOOVER in his annual report of the Department of Commerce for 1925 gives a glowing and yet truthful appraisal of the financial and economic condition of the United States, showing that the wealth and well-being of the average worker never stood any higher than today. The railroad improvement is mentioned as one of the main underlying stones of the present economic structure. And here, we cannot avoid alluding to bituminous coal; the low price

throughout the year, too low all will admit, has been kept from rising to undue levels by the excellent service of the railroads.

Many of the inflations of coal prices in years past have been due to the inability of the roads to handle traffic. It has been said that the transportation units of this country should not be planned to meet the unreasonable demands of the public. That is true, but when the railroads come nearer to supplying the public need, the public ceases to become panicky and no longer orders goods for long periods in advance of needs or annoys and hampers the railroads by complaints about delayed shipments and losses. Exits at theaters are made large for use in case of panic, but when there are plenty of exits the panics do not occur. So when there are many railroad cars there will be less anxiety, and no duplication, triplication and other multiplications of orders.

Standardization and simplification, as Mr. Hoover says, have done much to reduce waste. In the industries which cater to the coal mines standardization is difficult and makes slow progress, but it should be more rapid than it is. Greater standardization of the product of coal mines would be of great assistance. Nevertheless, the advantage of the movement is less in coal mining than in other lines, so that such immense savings as are reported in other industries seem amazing. Some day when every one burns small sizes of coal, savings like these will have been effected. But the process is slow as it involves large quantities of new consumer equipment and is not determinable on an act of will as is the size of a paving brick or the thickness of a plank.

The nation owes Mr. Hoover a debt of gratitude for his continued efforts toward greater efficiency. We are all of us laboring hard at jobs that simplifications would shorten and make lighter. The many items of Mr. Hoover's report will furnish many suggestions to the industrial operator, be he in coal or in any other business.

Bringing Tools to the Work

GREAT ECONOMY in operation is rarely possible where the tool has to be brought to the work rather than the work to the tool. This is why all forms of excavation or the turning over of the ground have not been as economical of effort as manufacturing. To move the heavy tool around cannot result in as much efficiency as is attained when a light material is brought to a heavy tool. This is why farming, excavation and mining have not duplicated the economies of manufacturing.

With machinery, production is cheaper despite increasing wages, but no such result has been possible where the tools have to be taken to the work. At the mines there are examples of great economies of operation. But here in every instance the material moves to the tool. If coal were carried on the backs of packers up a 300 ft. shaft a ton per man per day would be a good day's hoist, perhaps. But now one engineer can hoist with modern equipment 11,000 tons per day if the material hoisted is delivered to it. Similarly pumps receive their material and effect prodigious economies, but where machines have to run around to get a chance to do their work no economies like those attained by the manufacturer are possible, though such economies as are attained are certainly worth-while. Those who

declare that they did well in the old mule and hand-pick days exaggerate the results attained under such conditions and forget that the mines were small and near the tipple, that hours were longer and men worked harder and even then did not perform as much. To return to those days would double or triple the cost of our coal.

Safety the First Consideration

WHEN THE NATIONAL government was formed, few anticipated that it would undertake to instruct industry in technique. It found too much difficulty in raising money by taxes to do anything but maintain the courts, a small army, Congress and the administration. But as time wore on, the Federal government gradually became wealthy and found that it could interest itself in the technique of industry, first with regard to farming and then broadly through an extension of the Bureau of Standards. Later the Geological Survey formed a technological branch which dealt largely with technique of coal.

So far nothing had been done federally for safety. At length a number of distressing explosions caused Congress to urge that the technological branch of the Geological Survey undertake an inquiry into the technique of safety, a study more germane to the duties of government than the development of mining and manufacturing processes. Surely the safety of the worker is a primary public interest, a form of technique more consonant with the fundamental purposes of government than any other. The U. S. Bureau of Mines was formed out of the technological branch largely because the need for safety had become imperative.

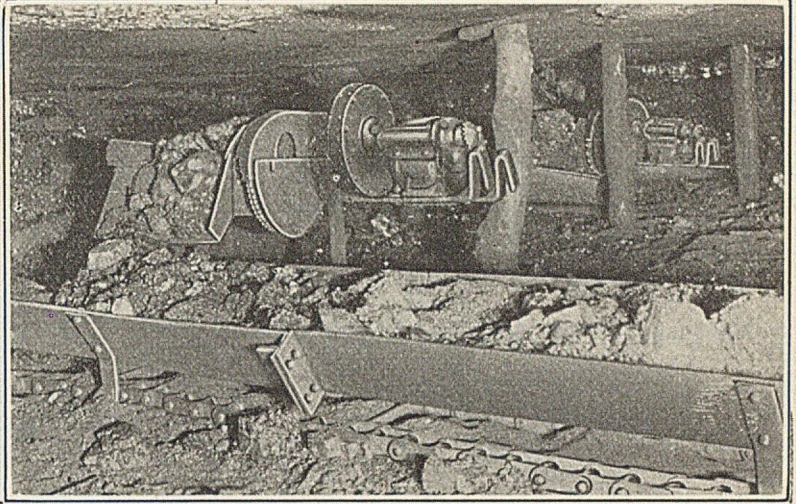
Had the Bureau taken up the matter in any half hearted, negligent or insufficient manner, its safety work might have been allowed to die without protest. But it succeeded so well that despite new hazards of increased depth, more gas, greater production, more machinery, more men in a single mine and larger and heavier transportation units, the growth in accidents not only did not increase but actually declined. For awhile safety drove out the greater part of the other activities of the Bureau. It became almost exclusively an institution for the study and promotion of safety. It branched out into mine rescue work. It trained men to perform the work of first aid and mine recovery.

The public has confidence in its work. It questions whether, if that work were left to each of the many states, it would be done as well. It notes with regret that state positions occasionally are held by men whose qualifications are political and not technical. It is confident that the Bureau of Mines is doing a more efficient work than the many mining states would do if left to themselves. So excellent has that work been that some states have sought co-operation of the Bureau in their inspectional activities and every coal operator who has tried to maintain good first-aid and mine-rescue teams has sought the Bureau's aid in keeping them in a high state of efficiency.

We hope that the Bureau's researches may some day be extended, but hold that not a dollar should be taken from safety work for the study of coal or metallurgical processes. It would be sad indeed if the Bureau should take as its motto the slogan, "Safety is not the first consideration." Such a decision would controvert the purposes for which that governmental activity was established.

Conveyors Double Output per Man In Room Workings

Raise Average to 16.23 Tons—
Five-Man Units Can Cut, Drill,
Shoot and Load Four Falls a
Day and Do Dead Work Too



By Alphonse F. Brosky

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IN TWO MINES under "Knickerbocker" management in Cambria County, central Pennsylvania, great concentration and speedy recovery are facilitated by conveyors in a room-and-pillar layout. These are the Telford mine of the Telford Coal Co. and the Jasahill mine of the Jasahill Coal Mining Co. By this means an appreciable saving in the production cost is effected. Once started, a room is driven to its limit and its complementary pillar brought back without delay.

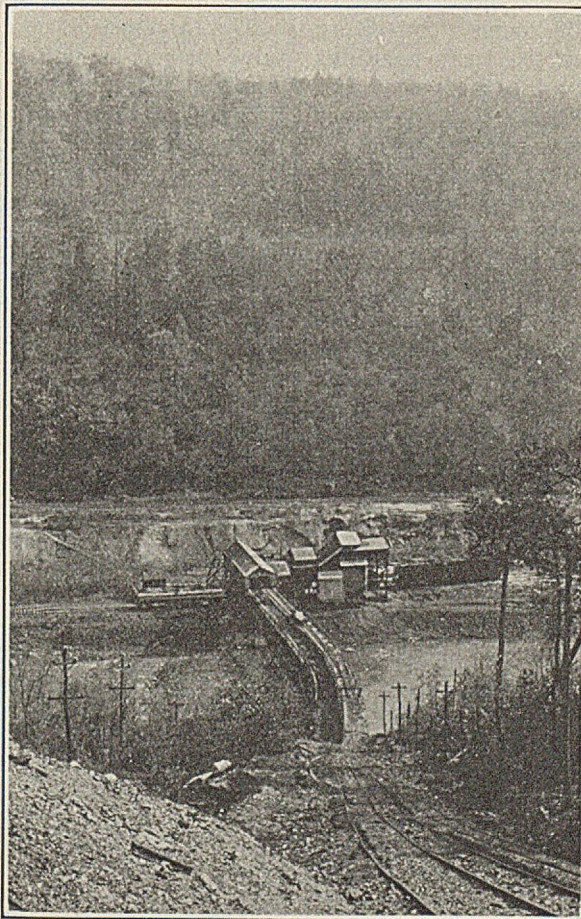
The cycle—in and out again—has been completed in a minimum of 16 and a maximum of 21 consecutive shifts of 8 hr. each by five men who cut, drill, shoot and load the coal, besides handling draw slate, setting timbers and moving the conveyors. An average of three cuts from a room and as many as four from a pillar are taken each shift. And despite the fact that conditions are not the best, each miner has produced an average of 16.23 net tons per shift as against 7.28 tons under the old system. It would appear, furthermore, that the limit of productiveness has not even yet been reached.

Under the plan followed, each unit is composed of certain definite pieces of equipment and the complement of men necessary to operate them. Each crew is composed of five men. The equipment consists of: A main con-

veyor, 250 ft. long made up of 6-ft. sections. This is extended in driving a room and shortened in drawing a pillar. Two face conveyors, each 12 ft. long, discharge into the main conveyor (a complete description of these conveyors, known as the "Suppes," appeared in last week's issue of this magazine). One undercutting machine; a distributing or booster fan and canvas tubing; a 5-hp. hoist and the necessary wiring and lighting materials complete the outfit.

A strong conviction that long-face mining involves disadvantages outweighing its benefits has fortified the "Knickerbocker Mines" management in the belief that mechanization yields best results in a room-and-pillar layout. The simplicity of roof control in this system of mining as compared with that in longwall operations, especially when a room and pillar never attain a month's age, is sufficient justification for the retention of this system. The management holds that transportation is the most important factor limiting the productivity of any mining method. Light, sectional conveyors solve this problem in one system as well as in another.

The management believes it is not wise to concentrate mining areas without likewise condensing the phases of the mining cycle. Thus it maintains that in non-gaseous mines, at least, not only should every phase of a mining cycle be completed in one shift but that two, three or even four, such cycles should be consummated on each face in this same time interval. A



Gravity Plane and Tipple at Jasahill Mine

In accordance with the common practice where the coal bed lies above the railroad track in central Pennsylvania, at this mine loaded cars are utilized to pull the empties back up hill. As a result no power is consumed.

The headpiece accompanying this article shows two independently-driven lateral conveyors arranged in tandem to discharge into a main conveyor which extends from a room face to the entry. By the aid of these conveyors four men mine three 6-ft. cuts, 35 ft. long, from a room in 8 hr. This is 30-in. coal in the B seam, Jasahill mine.

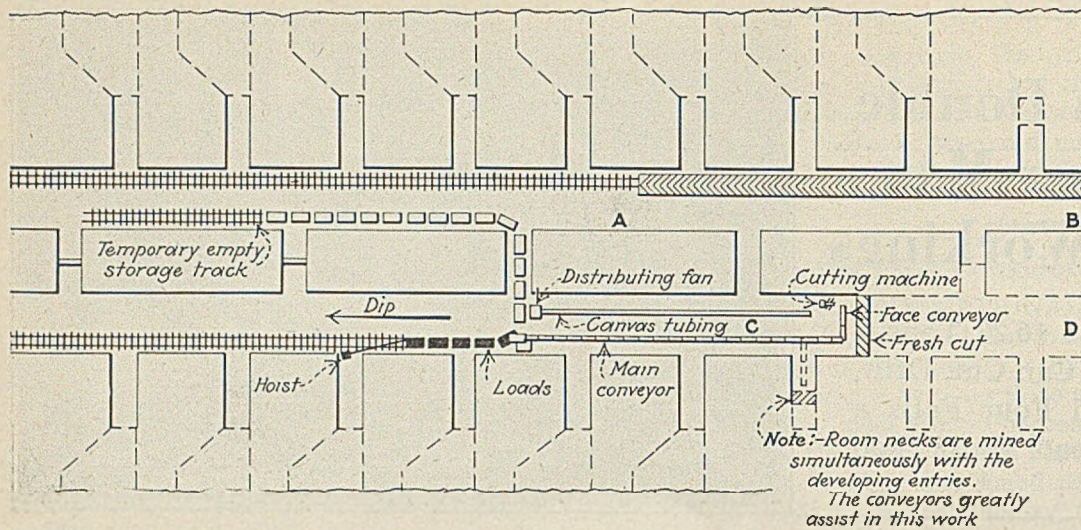


FIG. 1

Conveyors in Entry Work

After the upper entry is advanced from A to B the equipment is moved to the lower passage which is driven 220 ft. from C to D. Thus the driving process is alternated between the two entries. While the lower entry is being mined rock is being taken to provide haulage height in the stretch from A to B. Room necks are developed along with the entry.

mining cycle, of course, comprises those operations (phases) which are required to complete one cut—undercutting, drilling, shooting, timbering and loading out. These considerations dictated a choice of the mechanized room-and-pillar system.

The general layout is as follows: Room headings, consisting of two entries 25 ft. wide on 80-ft. centers, are driven at 90 deg. off the mains leaving a 500-ft. room-and-pillar territory or panel between them. Rooms on 53-ft. centers are turned right and left or off both entries of a room heading. These rooms are 35 ft. wide and 250 ft. long, with 18-ft. pillars between them. Room headings will be approximately 2,750 ft. in length or long enough to accommodate 50 rooms upon either side. It is the intention to drive the room headings to their limits advancing and to mine the rooms and pillars retreating. It is highly desirable that the rooms and pillars on one entry of the cross heading be mined advancing while those on the other shall be mined retreating. In closed-lamp mines a triple-entry cross heading would be required where rooms are driven off both sides of a room heading. Another modification, that could be worked successfully, would be that of driving rooms off only one side of a two-entry heading, using only one conveyor unit to advance the headings to their limits and to mine the rooms and pillars on the retreat.

Inasmuch as entry driving precedes room-and-pillar

work, it is well to consider development methods first, even though greater significance may attach to the mode of later recovery. In a sense, however, both plans are based on the same fundamental principles of quick recovery by the use of conveyors, wide places (where conditions will permit) and intensive mining accomplished by taking at least three cuts from one place in each shift.

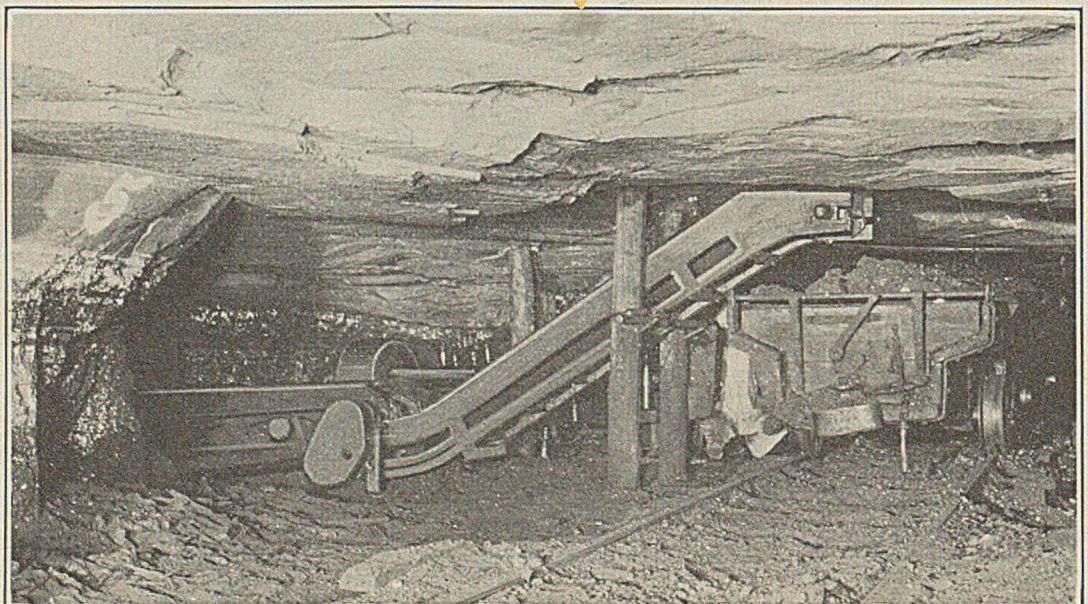
In Fig. 1 is indicated the plan by which an entry face is advanced at the rate of approximately 18 ft. per shift. The two entries of a room heading are extended by one mining unit, that also mines crosscuts through the chain pillar and develops the room necks.

The thickness of coal in both the Telford and Jasahill mines is not enough to provide sufficient height on the entries; consequently top or bottom, or both, must be taken. Brushing top and lifting bottom are operations performed entirely apart from that of mining coal from an entry. Having developed the upper entry from A to B (Fig. 1) the equipment is moved to the lower passage which is then advanced from C to D. The length of each step, that is, from A to B and from C to D, is about 220 ft. While the lower entry is being developed from C to D, rock is being taken down and the track extended in the upper entry from A to B as indicated by the herringbone hatching.

Sufficient rock is taken to provide from 5½ to 6 ft. of headroom over the haulway which is about 9 ft.

Loading Boom on an Entry

One man is stationed at the loading boom. He loads and spots mine cars in trips of 25. From 1½ ft. to 2 ft. of top or bottom must be taken on the entry for haulage purposes, indicating the thickness, or rather the thinness, of the seam. Roof is also brushed to give head room for the loading boom which must be elevated to clear the cars.



wide, leaving the remaining width or about 16 ft. of the entry for gob space. Furthermore, a pot hole is made at the mouth of each room neck to assure ample clearance above the loading boom of the conveyor during the room-and-pillar mining operation. Where the bed pitches, room headings as far as possible are for obvious reasons driven on the rise.

Entry driving, like room and pillar mining, is expedited by an adequate supply of mine cars. These are made up into trips of 25, into which the conveyor discharges a steady run of coal. In every second chain-pillar crosscut track is laid connecting the permanent track of the entry being advanced with a temporary track laid on the gob side of the parallel entry. A portable hoist, driven by a 5-hp. motor and remotely controlled from the loading station, is used to spot the cars composing a trip. The haulage arrangement is clearly shown in Fig. 1. As the direction of movement of the loaded cars during spotting is toward the dip, brakes must be set to hold them. The hoist moves the trip without these brakes being released.

The conveyor equipment can be used advantageously for handling rock. It has been thus applied in the driving of a stretch of the Fourth Main heading in the Telford mine, where bad roof was encountered under a stream. Here the entries, which customarily are driven 25 ft. wide have been narrowed down to 10 ft. At this point about 2 ft. of comparatively loose slate overlies the bed. This slate is temporarily propped up while the coal in each cut is being loaded out, after which it is taken down, loaded onto the conveyor and delivered to mine cars for outside disposal.

In panels A, B and C of Fig. 2 are indicated respectively the dimensions of rooms and pillars and the methods followed in driving the rooms and drawing the pillars. In panels B and C are shown also the arrangement of the conveyors and other equipment which provides quick recovery. As already explained room necks are turned and developed when the entries are driven. One mining unit advances a room heading to its limits; two such units, or one on either side, are utilized to mine the rooms and pillars in a full retreat.

ARRANGEMENT OF CONVEYORS IN ROOM

Imagine for the moment panel B in the earliest stage or room driving. The room neck has already been mined 10 ft. wide and 30 ft. deep. At the mouth of this neck and extending over the entry track is placed the loading boom. Onto the rear end of the loading boom are added as many 6-ft. sections of main conveyor (about four) as are required to reach the face of the room neck. Here the widening-out operation commences. In three consecutive cuts, made in one shift, the room is flared out to its full width of 35 ft. In each shift thereafter at full room width the face is advanced a distance equivalent to the depth of three 6-ft. cuts until its limit, which is 250 ft. from the entry, is reached. As each breakthrough projection (on about 105-ft. centers) is reached the room pillar is pierced in three consecutive buttoff cuts. Mining operations here alternate between the room and the crosscut faces until the pillar is mined through. When the limit of the room is reached, the pillar is, of course, broken through at its extremity, completing the mining of the room proper.

The main conveyor is so laid as to maintain a clearance of about 7 ft. from the pillar and extends almost to the face. The roof over the gob area is supported by

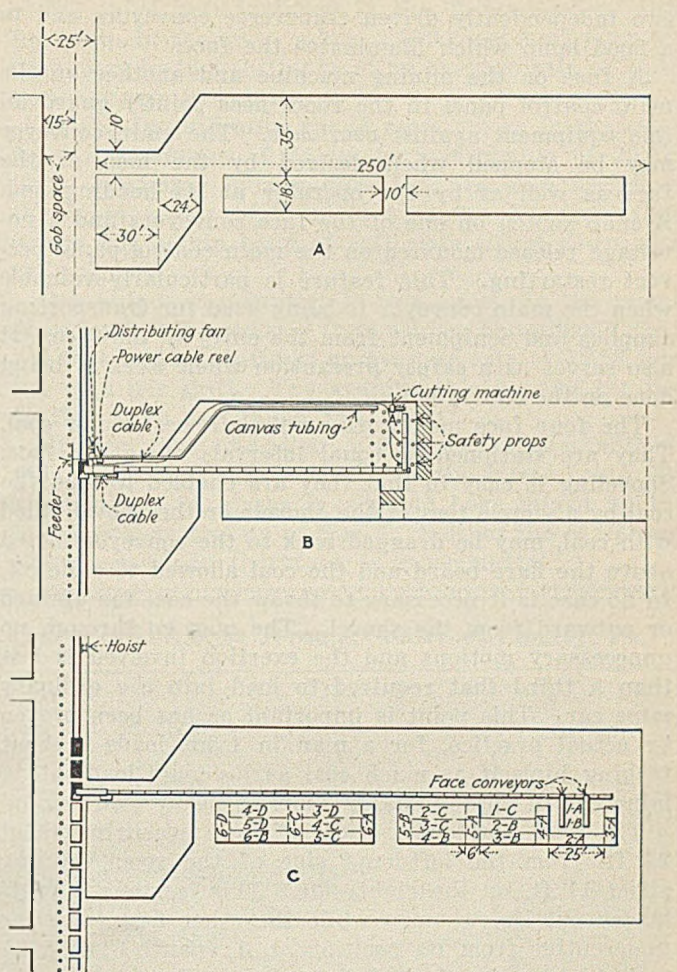


Fig. 2—Room and Pillar Layouts

Panel A simply gives the dimensions of rooms and pillars. Panel B shows the arrangement of equipment in an advancing room, and panel C indicates the method by which a pillar is drawn.

means of props on 5-ft. centers in lateral rows 6 ft. apart. The posts in the line flanking the main conveyor nearly touch it.

Within 2 or 3 ft. of the shot-down face are set in tandem the two 12-ft. face conveyors extending at 90 deg. to the main conveyor. The effective length of these two conveyors when in tandem is about 22 ft. so that they are within shoveling distance from the furthest corner of the room. Where the roof shows weakness three safety props are set between the lateral conveyor and the face, within 18 in. of the coal. These timbers are set in position in the wake of the undercutter before the cut is shot. They interfere with loading to only a slight degree.

Four men out of the 5-man crew work at the face, the fifth man being stationed on the entry to load, trim and spot cars. As in entry driving, the spotting of cars in conjunction with room-and-pillar mining is accomplished by means of a 5-hp. hoist remotely controlled from the main control panel in the room neck. All electrical taps are made on a duplex cable. This is carried overhead across the entry from the feeder to a cable reel of the mining-machine type set up in the room neck. Branch circuits lead from this connection to the main conveyor drive and to a small fan which by the aid of canvas tubing delivers air to the face.

As the room face is advanced the cable is unwound from the reel. The end of this cable terminates at a junction box at the face. From this point electrical connections are made to the cutting machine, to the

two independently driven transverse conveyors and to a flood lamp which illuminates the face.

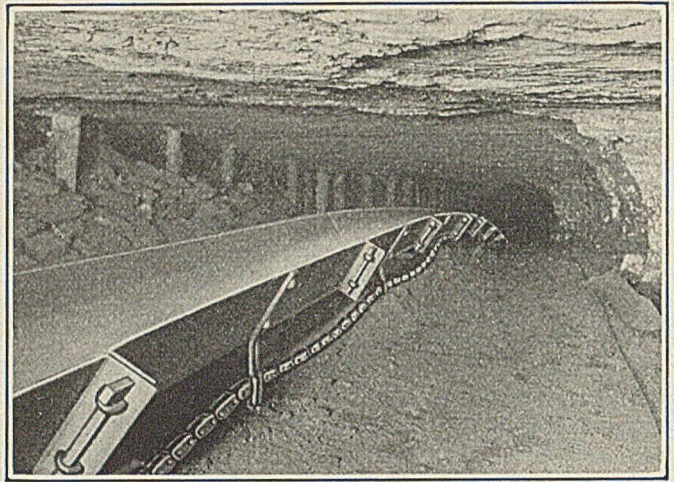
A fuse on the mining machine and another on the main control panel in the room neck jointly guard all this equipment against overloads. The main conveyor may be stopped when desired by the men at the face as well as by the operator at its heading end. A snap switch on one of the face conveyors and a no-voltage release mounted on the main control panel prevent restarting. This feature is particularly valuable when the main conveyor is being used for transporting supplies and equipment from the entry to the face. It also serves as a safety precaution when work is being done on the conveyor unit.

The four face men work on their knees in low coal. They are stationed at equal intervals along the face. Shoveling is easy in that they are enabled to load the coal by a simple toss of the shovel; or the shovel, filled with coal, may be dragged back to the conveyor, lifted above the flare board and the coal allowed to slide off. In no case is it necessary to throw the coal far upward or outward from the shovel. The men go through no unnecessary motions and the exertion involved is less than a third that required to load into the ordinary mine car. This point is important as has been proven by actual practice, for a man in 1 hr. loads without tasking himself as much coal as he could load into a mine car in approximately 3 hr. of heavy exertion.

The four men load a width of face measuring about 24 ft. from the left-hand side of the room, leaving about 11 ft. on the right side. This last one-third is loaded out by two men while the other two move the undercutter from its position at A (panel B, Fig. 2) and start cutting from left to right. By the time the cutting machine reaches the center of the face the two shovelers have about cleaned up the previous cut. Having completed the clean-up the two shovelers become drillers and start on the left side to drill and charge the shot holes, in the wake of the cutting machine.

While cutting and drilling are in progress the fifth man on the entry loads onto the main conveyor the supplies and equipment necessary to extend it, reverses the direction of its travel and thus transports to the face the wherewithal for its extension along with timber and supplies. He then goes to the face where he joins his buddies in lengthening the conveyor.

The two transverse conveyors are moved to an advanced position within 2 ft. of the new face. Then while three men add a 6-ft. section to the main con-



Looking Out of a Room

An average of three rolls are encountered in the driving of each room in the Jasahill mine, and the coal varies from 23 to 44 in. in thickness. The pronounced vertical bend in the conveyor in the background is noticeable. This room was started under the old system of mine car loading as indicated by the wall of rock taken from the bottom.

veyor, the two others set a row of props behind the face conveyors. When these jobs have been completed the shots are wired and the men retire to safety on the entry. From this vantage point the charges are detonated by means of a battery. While the face is being cleared of gases and smoke by the distributing fan the men usually eat lunch. Thus one of the three cycles of room driving ordinarily completed in an 8-hr. shift is finished.

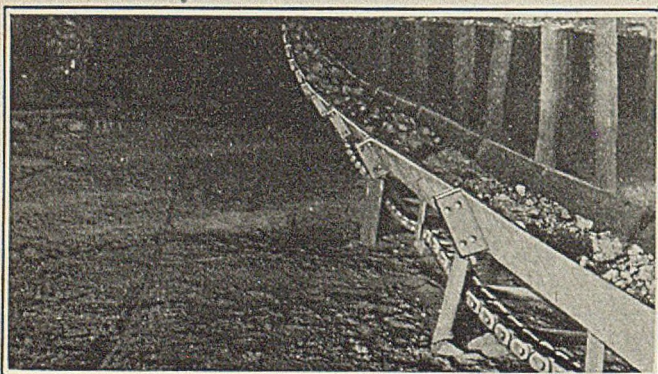
Turn now to panel C of Fig. 2, in which is illustrated the steps taken in drawing a pillar. Since the pillar is 18 ft. wide, three buttoff cuts, each 6 ft. in depth will pierce it. These buttoff cuts are made 25 ft. long, leaving a 6-ft. stump which is taken upon the completion of the adjoining buttoff place.

Three to four cuts are taken from a pillar in a shift. The sequence of working is indicated in Fig. 2 by a number-and-letter notation, the numbers indicating the places worked at one time and the letters the sequence of working. Thus during the first shift cuts 1-A, 1-B and 1-C are mined; during the second shift cuts 2-A, 2-B and 2-C; during the third shift cuts 3-A, 3-B, 3-C and 3-D, and so on. As shown, a room pillar can be completely drawn in six shifts. In many cases only four shifts have been required for robbing a pillar. The pillar is withdrawn only as far as the entry stump, which is left for later recovery with the chain pillar.

These abstract facts should be noted: The equipment composing a mining unit can be moved from a worked-out place to an adjacent room neck by five men in 12 hr. Toward the close of each shift it is customary to prepare at least one cut for loading at the beginning of the following shift. Each mining unit has its own cutting machine. All these arrangements lend themselves admirably to double-shifting.

Three units are installed in the Telford mine. Here the E seam being worked has an average thickness of 42 in. and is overlaid by 5 in. of draw slate which comes down or is pried loose and gobbed before the coal is loaded. Near the bottom of the bed is a 2-in. binder which is loaded with the coal. This breaks in big pieces which are easily detected and removed on the tippel. The coal is soft and friable.

One of the units here installed produced 17,371 net



Conveyor in a Room

The stepped bottom is an indication of a local rise to the crest of a roll. Note that this conveyor accommodates itself to the rise and dip.

tons of coal in the first 214 consecutive shifts (including the time required to move the equipment from place to place), making an average of 81.17 tons per shift or 16.23 net tons per man-shift. In mining one room in which the draw slate was only 1½ in. thick this unit maintained an average production of 95.76 net tons per shift or 19.15 tons per man per shift. It mined another room and its complementary pillar, yielding 1,377.6 tons in sixteen 8-hr. shifts at an average rate of 17.2 net tons per man per shift.

OTHER UNITS SHOW HIGH AVERAGES

The second unit installed in this mine in the first place worked, which was a 25-ft. entry, mined 1,072.96 tons in 18 shifts, an average of 11.92 net tons per man per shift. This same unit next mined a room at an average rate of 17.09 net tons per man per shift. In the third place mined by this unit, a room and a pillar, it produced an average of 16.01 net tons per man per shift.

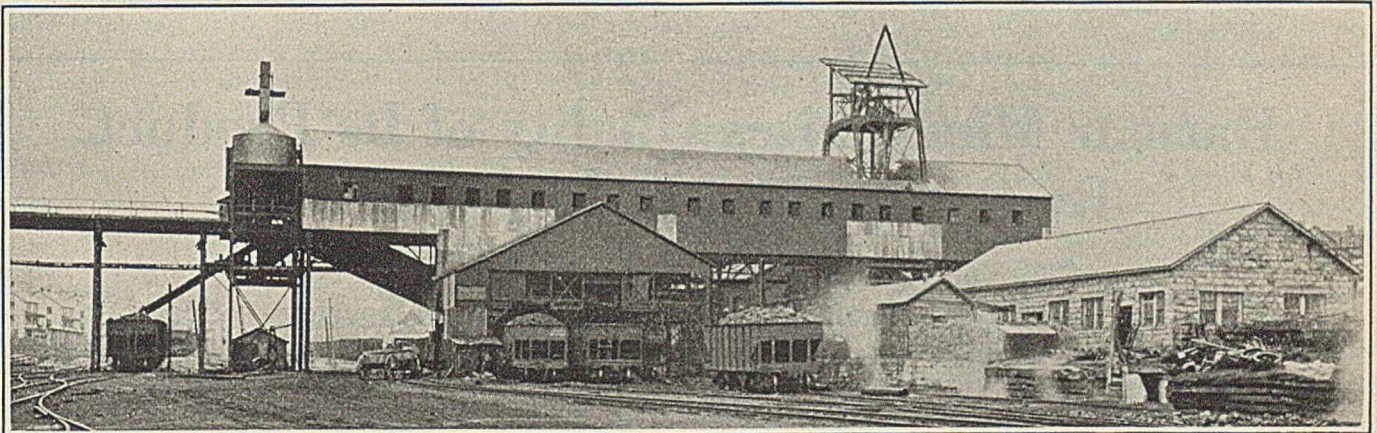
The third unit installed in the Telford mine, with four men in the crew, mined 1,019.2 net tons from its first room in 16.8 shifts, or at an average rate of 15.16 tons per man per shift.

At the Jasahill mine the B seam varies in thickness from a maximum of 44 in. to a minimum of 23 in. Rolls, extending in any direction, are encountered at the average rate of three to a room. No draw slate occurs but a thin band of soft slate comes down with the coal.

One unit is in operation in this mine. In the second place worked it produced from a room and pillar 1,258.9 net tons in 18.6 shifts at an average rate of 13.53 tons per man per shift. The average thickness of the bed in this room and pillar was 38 in.

Sixteen room-and-pillar places, five rooms without pillars and four entries (each of the latter being 220 ft. long) or 25 places in all, had been mined by the mechanical system up to Nov. 1. Neither the equipment nor the methods, therefore, is experimental.

Top Works at Jerome Nos. 1 and 2 Mines, Hillman Coal & Coke Co. at Jerome, Somerset County, Pa.

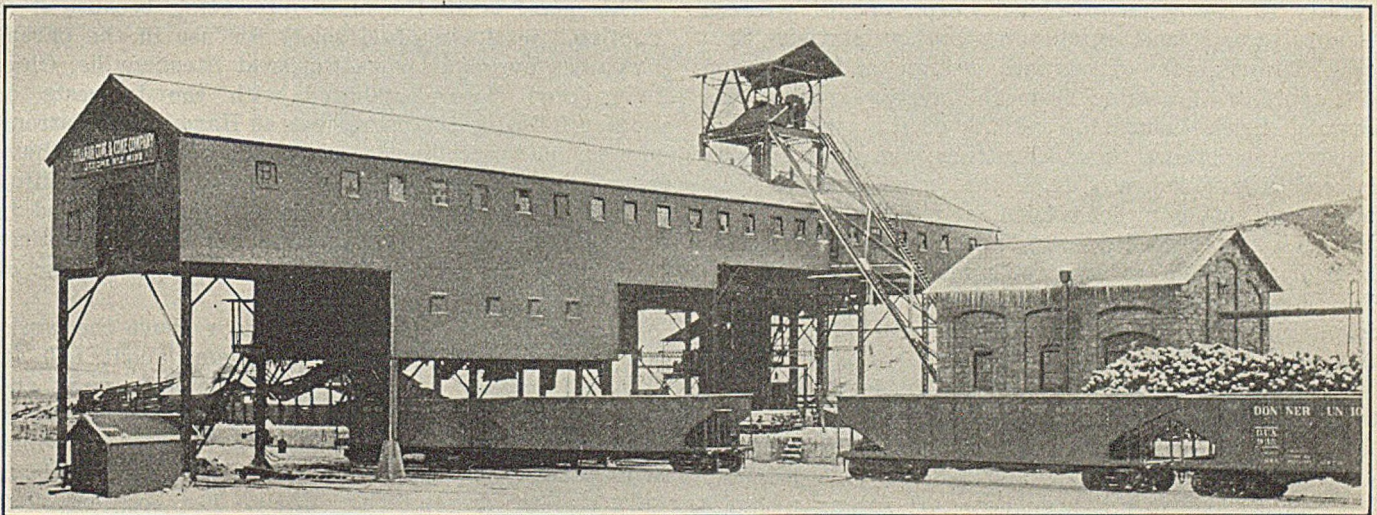


Jerome No. 1 Tipple Has Special Bin for Storing Crushed Refuse

Jerome No. 1 is one of two operations at Jerome, Pa., of the Hillman Coal & Coke Co. The capacity of this tipple is 2,000 tons per day, the coal coming from the C-Prime seam. In the bin supported by steel legs, to the left of the tipple struc-

ture and to the right of the bridge, is stored crushed picking-table refuse which is burned in a steam plant. After passing through a crusher in the tipple the refuse is raised and dumped into the bin by a bucket elevator. Mine cars carry this fuel

from the bin to the boiler plant which is located behind the tipple. The cross above the bin is not a part of the design of the structure. It is formed by a temporary horizontal working platform suspended from the bucket elevator housing.

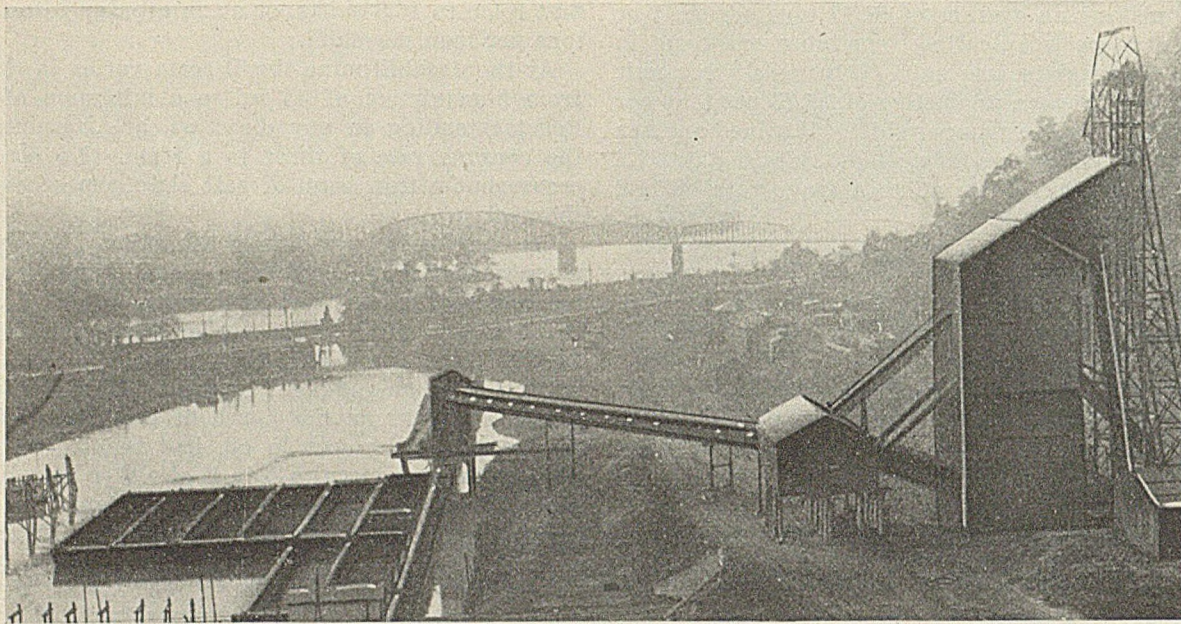


Tipple at Jerome No. 2, Where 2,000 Tons are Prepared Daily

This tipple prepares about 2,000 tons of coal per day. The shaft is 225 ft. deep. During the winter of 1924 much of the coal from this plant and that from the Jerome No. 1 plant of like capacity went to Eastern and New England markets in com-

petition with anthracite for domestic use. The coal comes from the low volatile, smokeless C-Prime seam of Central Pennsylvania. The slack coming from this plant ranges in sizes up to 2 in. and therefore makes excellent steam coal. Since this

picture was taken this plant has been remodeled. Shaker screens, picking tables and loading booms were installed in the fall of 1924. Also the platform cages indicated by the headframe construction in this picture were replaced by self-dumping cages.



Harmar Mine Raises Quality of Its Product By Overcutting in Impure Coal

“Captive” Mine Shows Influence of Steel Industry—
Ships by Either Land or Water—Problem of Housing
in Limited Space Is Solved by Building Terraces

By Alphonse F. Brosky

Assistant Editor of *Coal Age*,
Pittsburgh, Pa.

WHERE DEER CREEK EMPTIES into the Allegheny River, less than nine miles northeast from the city limits of Pittsburgh, lies the Harmar mine of the Consumers Mining Co., a subsidiary of the Wheeling Steel Corp., one of western Pennsylvania's most outstanding coal properties. Several details both of surface design and operation differentiate this mine from the average run of the common herd. Thus, top cutting of the coal is practiced in preference to undercutting; the design of its houses differs radically from that usually adopted by most coal companies; the mine product is crushed before it leaves the tippie and can be shipped by either land or water. It is one of the most thoroughly rock-dusted mines in the country. The extremely interesting subject of rock-dusting practice will be treated in the Dec. 10 issue.

The shaft of this operation is 134 ft. deep, extending to the bottom of the Thick Freeport bed and hoisting is performed by means of 10-ton skips. Present production is at the rate of about 3,000 tons per day but the equipment has been designed for an ultimate

The headpiece accompanying this article is a general view of the upper works at Harmarville. The output of this mine can be shipped by either rail or river. An artificial harbor has been dredged to accommodate barges of 1,000 tons capacity into which are loaded 600 tons of coal which is all that the ordinary stage of the Allegheny River will accommodate. These boats are then floated down the Allegheny and Ohio rivers to the byproduct coking plant at Steubenville, Ohio.

capacity of 6,000 tons and this output will doubtless be attained eventually. The property comprises no less than 3,300 acres of coal which is enough to fully justify such large capacity.

This plant is all the more interesting because it is “captive,” producing fuel solely for use in the parent company's byproduct coke works at Steubenville, Ohio. Being thus closely affiliated with the interests of another industry the operations at Harmar bear strong imprint of the influence which the steel works have exerted upon them. This is evidenced both in mining operations and in transportation. It is so marked in some respects as to render a number of the practices followed at Harmar distinctly different from those of neighboring operations.

The average thickness of the cover above the workings is about 450 ft.; the maximum about 650 ft. The roof directly over the coal is decidedly weak and has presented perhaps the most difficult problem encountered in mining the Thick Freeport bed, which in this mine, is about 86 in. thick and not all clean.

Entries are driven 12 ft. wide on 50-ft. centers. The main heading lies on a butt course and is composed of six entries protected by 200-ft. barriers upon either side. Cross headings, of four entries each, protected by 175-ft. barriers, are laid out at 2,490-ft. intervals. Double-entry room headings are turned every 400 ft., center to center, leaving 350-ft. strips of coal which

are mined by 21-ft. rooms 300 ft. long pitched on 80-ft. centers.

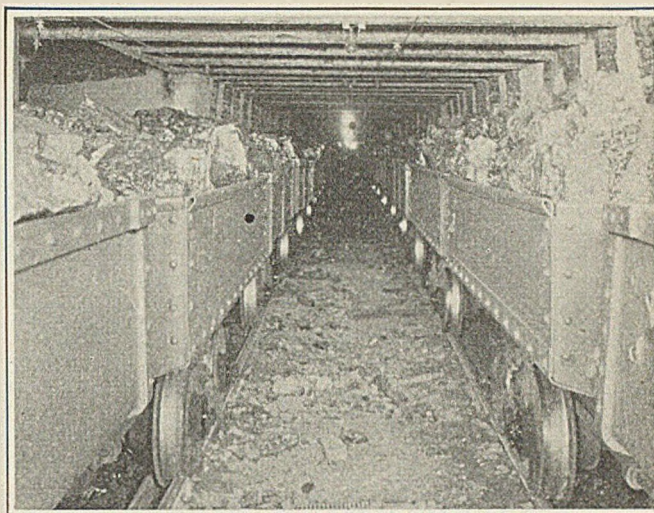
The demand for steel from the plants of the parent organization is reflected in the demand for coal on the Harmar mine. And as the coal company is not engaged in any commercial business, when times have been dull in steel, the mine has worked intermittently or not at all. This fact, coupled with a bad roof condition, accounts for the adoption of a layout of wide rooms in a region where pillars are seldom twice as wide as the openings between them.

These pillars are being machine-mined by an 18 ft. wide buttoff place protected by a 10-ft. wing which is recovered partly by machine and partly by pick. A 6x10-ft. stump is left at either end of the wing, to be drawn later by pick, and the coal between the two stumps is machine-mined. Under better-than-average conditions the entire wing may be machine-cut.

Where two men work on a pillar, which is the common arrangement in this mine, each miner has a place to himself. Consequently, two places in one pillar are worked simultaneously. When the buttoff place nearest the inby end of the pillar is just through, the miner there employer starts back with the wing pillar while the other miner starts a second buttoff place outby of the first. A concentration system of three such places on a single pillar is being experimented with and may prove successful if the roof is not disturbed to any great degree, thereby causing undue pressure on the isolated pillar coal.

SEVERAL LAYOUTS CONSIDERED

To avoid the danger just described a proposed layout of 22-ft. rooms on 60-ft. centers is now being considered. By this plan the pillar would be drawn by two men immediately following the completion of the room. Still another layout is being schemed, in an attempt to arrive at the best. This provides for 18-ft. rooms on 40-ft. centers. Concentration would be obtained by driving a set of six rooms simultaneously on an even front, working as many sets as are required to maintain a straight break line on an angle of 45 deg. to the headings. Pillars would be drawn, without interruption, following the completion of the rooms.



Loaded Mine Cars at the Shaft Bottom

Trip feeders have been eliminated from this mine by placing both loaded and empty storage tracks on a gravity grade. Thus the loaded tracks are on an inclination of $1\frac{1}{2}$ per cent. Heavy concrete piers protect the turnout points.

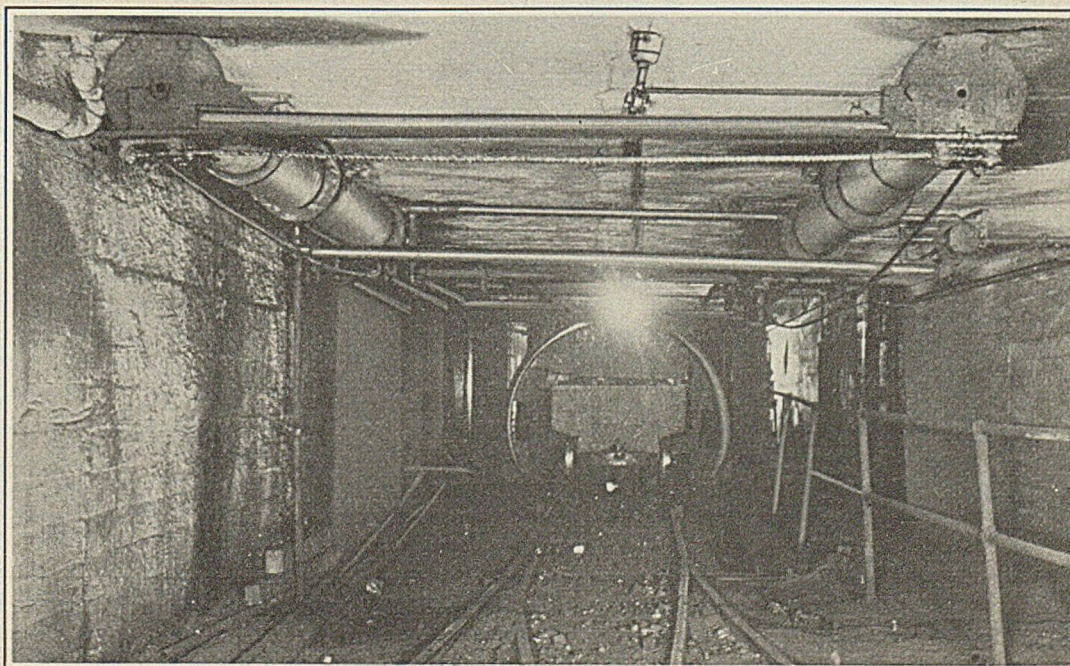
Within a section, mining would be pushed in a full retreat, which is the plan being applied to all the existing sections in order that splits of air may sweep the live workings first and then the goaf.

Twenty-five-pound rails are laid in rooms and butt entries. Coal is hauled in 3-ton steel cars to side tracks by storage-battery locomotives. Fifty-pound rails are laid in cross and main entries and from the gathering partings the coal is hauled in trips of 35 cars to the shaft bottom by two 13-ton locomotives. The maximum haul is about $1\frac{1}{2}$ miles. If present plans materialize the main haulway will soon be laid with 60- or 70-lb. rails. This improvement will be in accord with the modern tendency toward heavier track.

Coal is discharged from the mine cars by a 2-car, air-operated rotary dump which has a continuous-performance capacity of 6 cars per minute. Inasmuch as the dumping cycle is only 6 sec. in duration, 14 sec. are available between dumps for changing cars, which is ample time. The gate equipment under the dump is capable of handling the contents of eight cars per minute. It thus will be seen that with the skip hoist-

Rotary Dump

Solid cars, turn-over dumps and skip hoisting are all rather out of the ordinary in Pennsylvania mines. This dump is capable of discharging six three-ton cars of coal per minute with ease. It is actuated by compressed air, the operating cylinders being fastened to the roof instead of the floor as is generally the case. The dump is on a $1\frac{1}{2}$ per cent grade so that the cars proceed across it by gravity without loss of time.



ing at the capacity rate of 6,000 tons per day the dumping and loading equipment would operate in a comparatively leisurely manner.

All of the shaft-bottom equipment is operated by compressed air under 80-lb. pressure. From the dump the coal is discharged into 4-ton weigh-baskets and from thence into a 38-ton bin. Fly gates, controlled by the dump operative, allow rock to be bypassed into a 30-ton rock bin. One such fly gate is arranged under each car so that one car of rock and one car of coal can be dumped simultaneously, as well as two cars of either rock or coal. Air gates on both bins regulate the feed from them to either of two measuring pockets. Manually-controlled air gates govern the passage of the coal from the measuring pockets into either of the 10-ton skips.

UNCOMMON SHAFT BOTTOM

In several respects the shaft bottom in the Harmar mine is out of the ordinary. The loaded and empty storage tracks are not parallel, as is often the case with cage-hoisting where end dump cars are shunted by a kickback from the loaded track through a shoofly to the empty storage track. A kickback layout is always a source of trouble, which might well be avoided where possible. This difficulty is surmounted in this mine by establishing the empty storage, as shown in Fig. 1, as a continuation of the loaded track but, of course, beyond the rotary dump.

Both tracks are double. Cars are fed to the rotary dump by gravity and taken away in the same manner. The loaded side has a storage capacity of 225 cars and is on a grade of $1\frac{1}{2}$ per cent. The empty side can hold 250 cars. It is on a grade of $1\frac{1}{2}$ per cent within the limits of the runoff from the cage, and on a more gentle inclination from there on. In this way worries

arising from inopportune breakdowns of car hauls or feeders are eliminated.

Where the mine output is dumped within the mine the danger, and detrimental effect of the coal dust upon the health and efficiency of the crew, is ever present unless some means is provided to abate this nuisance. This is accomplished in the Harmar mine by a rather ingenious control of the ventilating current in the vicinity of the main bottom.

The main intake is a concrete, man-and-supply slope which is 580 ft. long on a pitch of 14 deg. In this passage a brick curtain separates the manway from the supply compartment. The exhaust shaft is about 800 ft. from the main shaft, which is, of course, neutral, being neither a downcast nor an upcast.

At *E* in Fig. 1 is located an old shaft which formed a part of an earlier operation within the property and which is now being utilized as an auxiliary intake. The air drawn in through this shaft travels as indicated by arrows, to join that of the main intake. However, part of this air is separated from the main course, passes through crosscuts at *A* and *B* and returns along the empty track in a direction toward the hoisting shaft to a point *F*. Here a hole in the concrete entry wall, practically adjoining the shaft, connects with a crosscut which is on a secondary return to the fan shaft. In passing through this hole and crosscut in its return to the fan, this air carries with it any coal dust that may be raised in the dumping operation. A large part of this dust settles in the return between *F* and *D*. At the latter point a regulator is located.

This arrangement does not rob the mine of needed air as the fan is now producing only about 118,000 cu.ft. at a 2-in. water gage as against its rated capacity of 300,000 cu.ft. at a 3-in. water gage. With the fan working at capacity it would be possible to attain

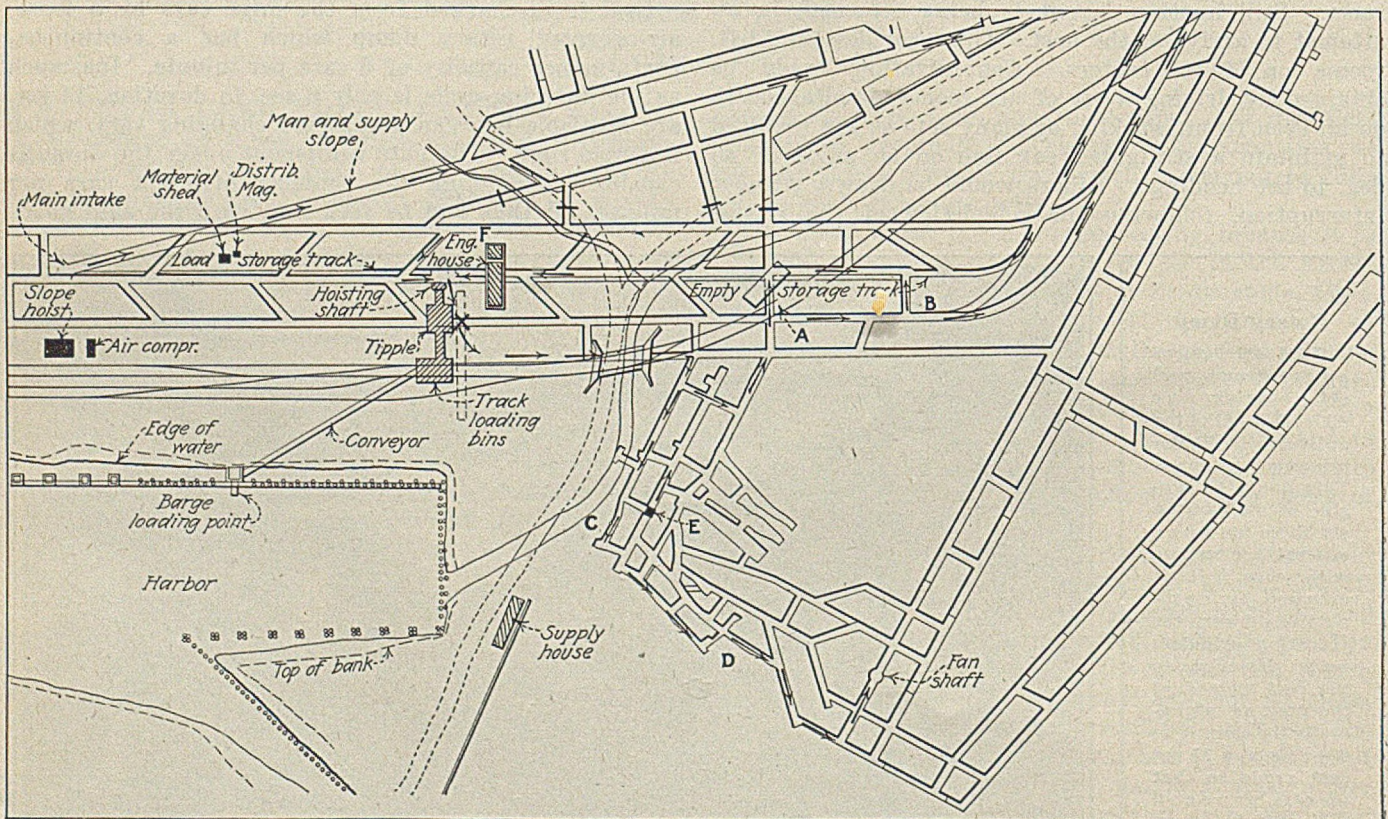
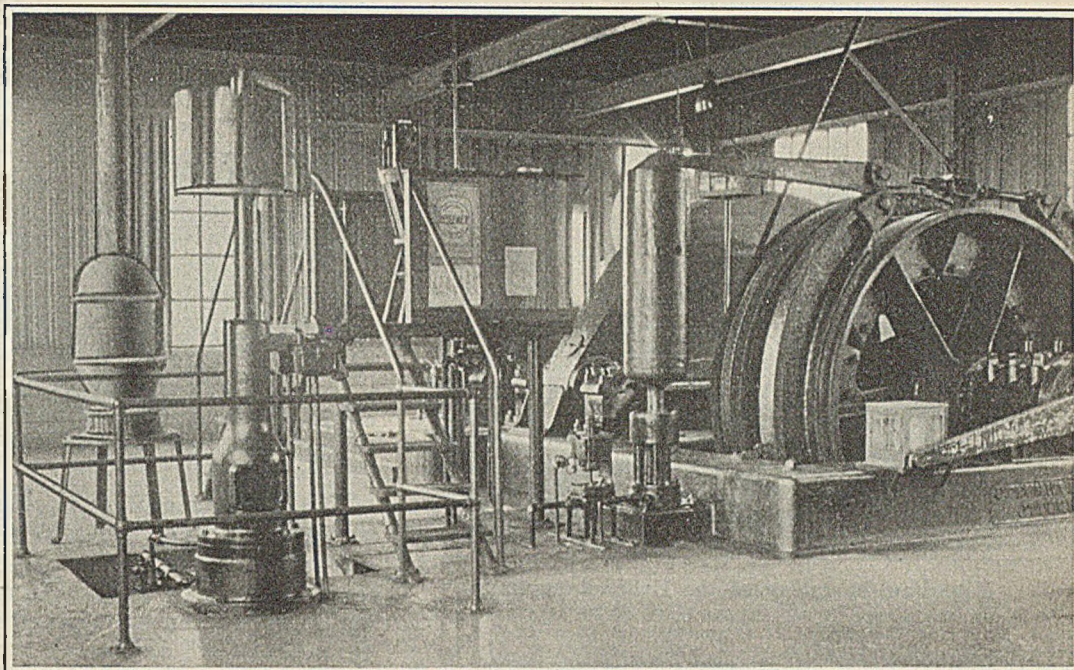


Fig. 1—Layout of the Shaft Bottom at the Harmar Mine, Harmarville, Pa.

This is a gravity bottom and the track arrangement, accordingly, is very simple. A small quantity of intake air travels past the shaft foot, thus carrying away the dust raised by the rotary dump.

Main Hoist

With the present small output the rope speed is low, being only 590 ft. per minute. The hoist is driven by a 200 hp. motor back-gearred to the drum at the ratio of 40 to 1. Thus equipped this machine is capable of handling the present load with ease. It is designed, however, for the application of a 600-hp. motor which eventually will be installed when the mine is brought up to its intended capacity of 6,000 tons per day. In the meantime the smaller motor draws far lighter loads from the line than would the heavier machine.



the same result by dividing the old shaft at *E* into two compartments, installing a small exhaust fan at the top of this shaft and erecting a stopping at *C*. The air taken in through the old shaft would then follow identically the same path as already described except that on its return to *C* it would be exhausted through the old shaft instead of through the main fan shaft, as is now the case.

Apparently the management believes in slow-speed hoisting for it expects a maximum capacity of only 6,000 tons a day from the two 10-ton skips which have a lift of only 313 ft. between the bottom and top landings. Moreover, it does not believe in motoring the hoist to the ultimate requirements until such time as the mine is producing at capacity rate. It has installed on the hoist a motor which is smaller than that necessary to handle the capacity output of the plant. Its speed of hoisting is lower than the conservative speed at which the hoist eventually will operate.

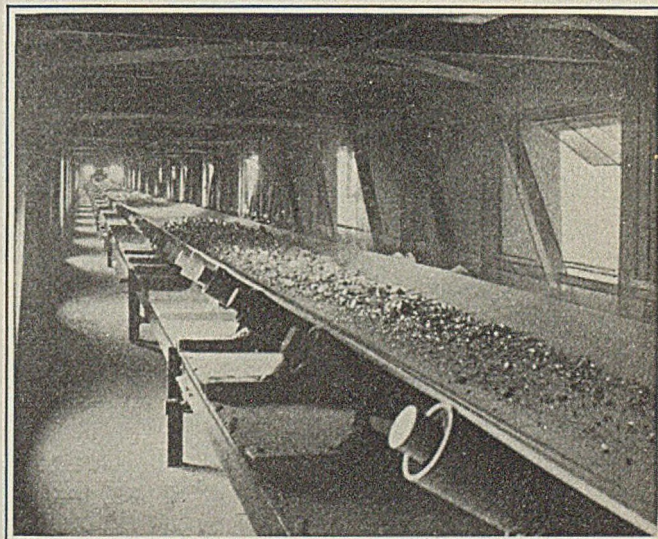
The design of this hoist calls for a 600-hp. motor at a duty of 6,000 tons in 8 hr. Knowing that for several years at least the daily output would not much exceed 3,000 tons, a motor of only 200 hp. was installed. This machine gives a rope speed of only 540 ft. per minute by a 4 to 1 reduction to a counter shaft and a 10 to 1 reduction thence to the drum. The peak load on this hoisting equipment is about 150 amp. and the average load approximately 46 amp. The peak load with this arrangement is considerably less than it would be if a 600-hp. motor were used and a substantial economy in power is thereby effected. Simultaneously the slower speed effects a saving by lessening the wear and tear on the rope and other hoisting gear.

Coal is discharged from the skips into a 12-ton receiving hopper, whence it passes over bar screens which separate the slack from the lump. The slack may be delivered either direct to railroad cars or onto picking tables, under the lump. As a second alternative it may be delivered direct to a 1,000-ton bin. Run-of-mine either picked or unpicked can also be delivered direct to railroad cars or to the bin. The usual practice, however, is to run the picked lump through one of two 42x48-in. toothed-roll crushers, each having a capacity of 300 tons per hour, thus reducing it to sizes

ranging from 2½ in. down. From the crushers this coal passes to the bin.

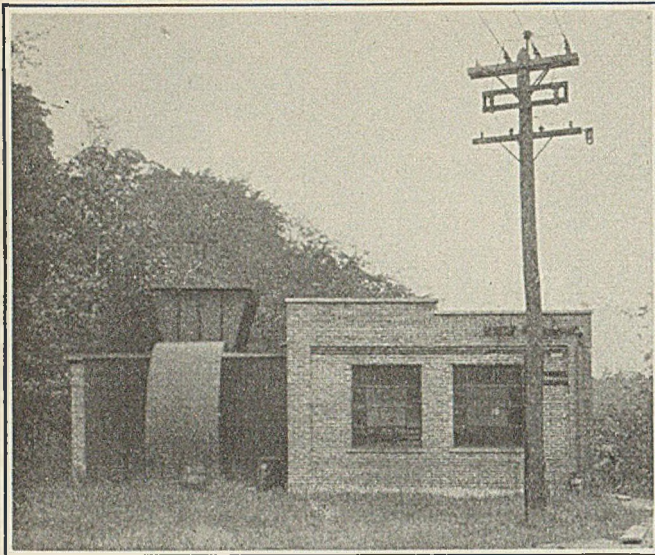
A steel apron feeder carries the coal from this bin to a 48-in. belt conveyor 64 ft. long which discharges either to chutes leading to railroad cars or onto a second apron feeder and thence to a second belt conveyor. The latter is 48 in. wide and 285 ft. long. It carries coal from the tipple to a barge loading station on an artificial harbor which connects with the Allegheny River at the mouth of Deer Creek. This harbor was formed by dredging out nearly 200,000 cu.yd. of material. It permits water transportation by 1,000-ton barges loaded with only 600 tons because of the low stage of the Allegheny above Pittsburgh. These boats are then towed from the mine to the byproduct coke plant at Steubenville on the Ohio River.

A vertical section from top to bottom of the Thick Freeport bed in the Harmar mine is roughly as follows: An 8-in. band of top coal, high in ash and sulphur; an upper bench of clean coal 2 ft. thick which



River Coal Conveyor

This conveyor which is 48 in. wide and 285 ft. long center to center, transports the coal from a 1,000-ton bin to a barge loading station on the artificial harbor. It has a capacity of 800 tons per hour at a comparatively slow speed.



Mine Fan Operating on the Exhaust System

This fan has a capacity of 300,000 cu.ft. of air at a 3-in. water gage. At present, however, it is so operated as to produce only 117,600 cu.ft. against a 2-in. water gage. The light on the line pole is a flicker signal indicating whether or not the fan is in operation.

is separated from the 3-ft. lower bench of clean coal by an 8- to 10-in. band of bone, and lastly there is an 8-in. band of bottom coal, likewise high in ash and sulphur. It should be remembered that this bed is under a weak roof.

The metallurgical use to which this coal is put naturally demands a comparatively low ash and sulphur content in the raw fuel as delivered to the byproduct ovens. The bottom band of impure coal adds nothing to the output because it is not removed. The bone is separated from the coal at the face and on the picking tables. The top coal and roof material contributes largely to a high ash and sulphur content unless they are eliminated. This cannot be done well by hand separation.

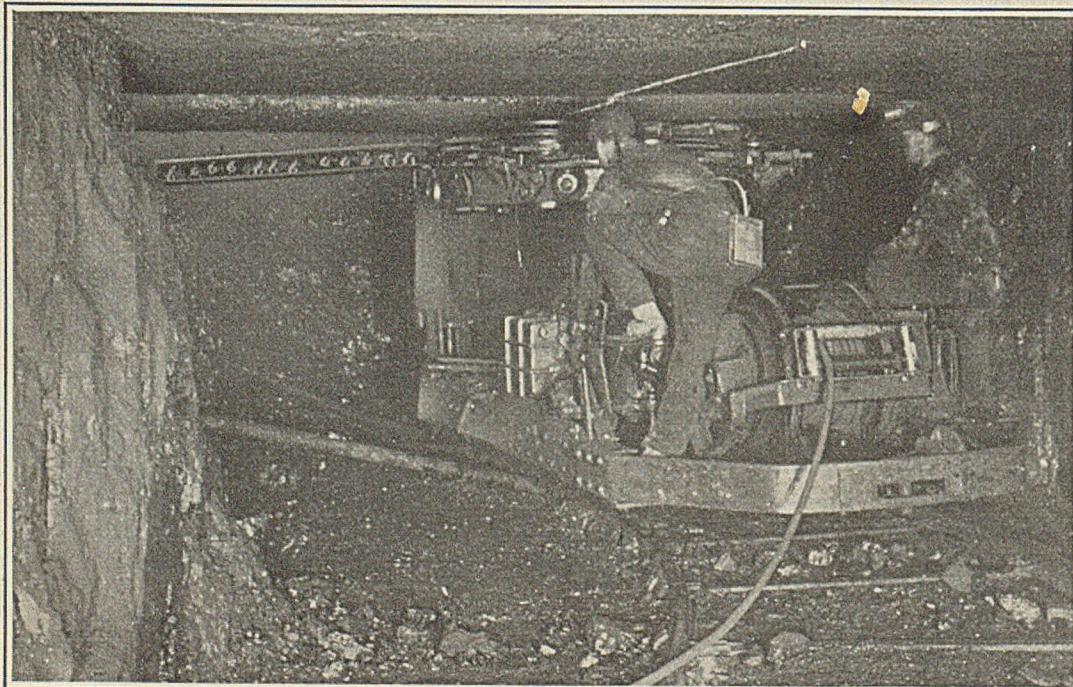
Until recently the general practice was to undercut the bed above the bottom coal. But this procedure was accompanied by the difficulties already reviewed and

also entailed a heavy timbering cost. Thus in the majority of entries and rooms where the coal is undercut the roof is not self-supporting and requires the use of 4- and 6-in. I-beams, 12 ft. long, on 6- to 8-ft. centers. In addition the roof must be further supported by lagging, and cribbing wherever it has arched.

In an attempt to eliminate these difficulties a turret cutter was installed and gave such satisfactory results that a second and then a third machine of the same type were purchased. In fact, so well pleased is the company with the results obtained from these cutters that it intends to replace all of its other machines with them. But this, of course, will take time because the change will necessitate training runners, widening clearances, altering track arrangements and educating the miners to shooting top cuts instead of those made in the bottom.

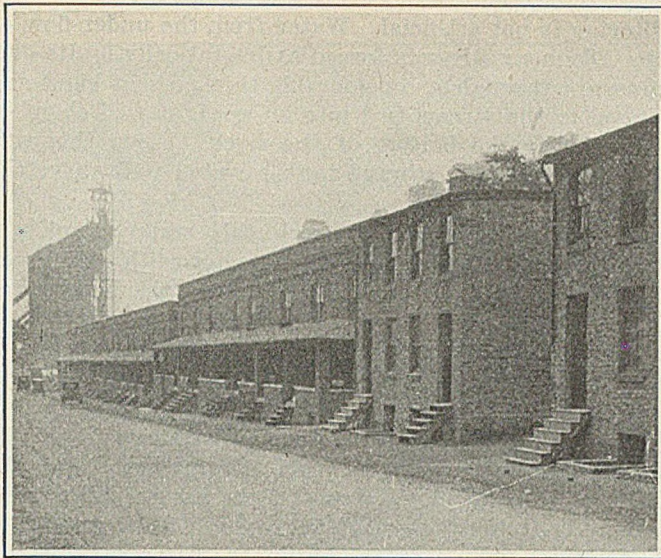
The turret machine cuts below the top coal, thus avoiding its high ash and sulphur, and assisting in holding the roof. The cutterbar is 9 ft. long and makes a cut 9 ft. deep. The machine will sump in, cut across a 12-ft. entry face and sump out again in about 10 min.; it will similarly cut a room in about 15 min. The cutting is hard, especially as the upper bits come into constant contact with the high-sulphur top coal. The upper bits are changed after cutting one room or two entries and sometimes bits of all positions are changed with equal frequency. On an average, all bits are changed after cutting about 30 lin.ft. of kerf. Each of the three machines now installed cuts, on an average, 18 mixed places in 8 hr., which is a fair performance, all things considered.

In areas of solid coal, places that are top cut require no steel beams except under unusually wide spans of roof or where clay veins are encountered. It is difficult to keep the analysis of coal coming from places which are undercut, below 1.3 per cent sulphur and 9 per cent ash. Top cutting produces a coal that runs about 1 per cent sulphur and 7 per cent ash. The top coal in undercut places is loaded and paid for—an operation and cost which are avoided in the case of top cutting. A saving is realized also in the handling of slate and in the picking of refuse in the tippel.



Top Cutting

In this bed the coal next the roof is high in ash and sulphur. Cutting in the top stratum somewhat below the actual roof and thus leaving some coal in place, has rendered it possible to appreciably reduce both the ash and sulphur content of the mine product. But this is not the only advantage gained by top cutting. Where the coal is undercut heavy roof supports must be employed as the roof weathers readily and arches to great heights. This type of machine thus far has practically eliminated this difficulty. As rapidly as possible more machines of this kind will be added until the mine will be entirely equipped with them.



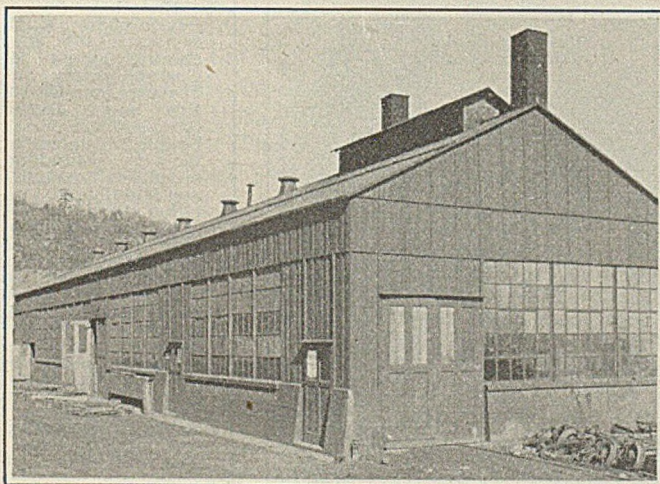
Front View of a Terrace

A few houses were on the property when the Consumers Mining Co., took it over. Construction of houses in rows such as here shown effected a substantial saving in end walls, which was reinvested in bath rooms and heating appliances. The wooden steps leading to the porches are soon to be replaced with concrete.

Altogether the topcutters are effecting appreciable economies.

Housing at the Harmar mine is of an order at least equal to that of any coal company in the country. Dwellings are all substantially built; some of wood, some of brick and still others of stone. They are tapped to sewer lines which discharge into a sewerage disposal plant; they are provided with running water which is filtered and chlorinated before being delivered into the mains. All but 10 of the 134 dwellings at Harmarville have a bath room equipped with suitable fixtures; all are fitted with hot water heaters and all but 17 are supplied with hot air house furnaces.

This plant manifests clearly the potent influence that the steel industry has exerted upon its industrial housing. There are here 17 five-room bungalows, 16 brick rows or terraces in each of which is a combination of 3-, 4- and 5-room apartments, as illustrated in Fig. 2, which shows floor plans and a front elevation of a typical row. These 16 terraces contain 117 apartments. Fifty-three of these have four rooms, 32 have three rooms and 32 have five rooms. In addition to the above buildings there are five double stone houses.



Portable Steel Shop Building

Blacksmith, machine and electrical shops are all joined together and under one roof. Such buildings as this have the advantages of being light, easily erected and when worn out have a salvage value.

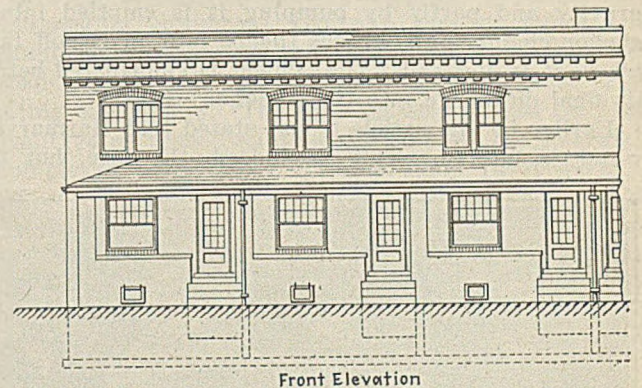
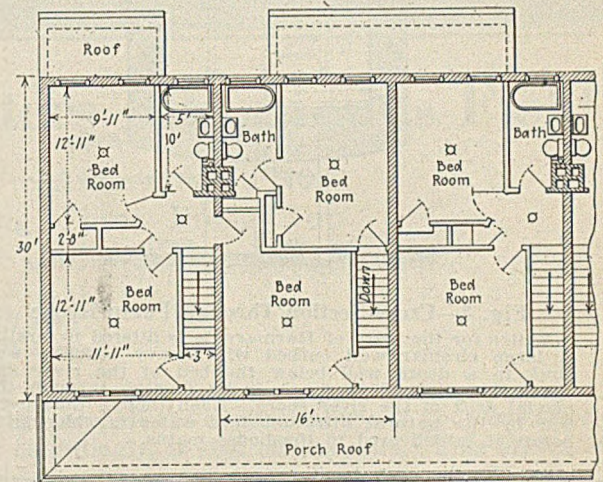
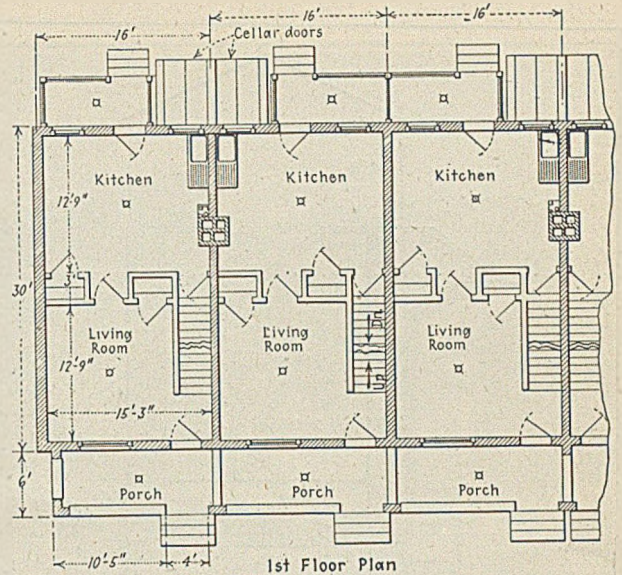


Fig. 2—Floor Plans and Elevation of a Terrace

Level ground is at a premium at Harmarville. Accordingly, rows of houses were built in place of the single dwellings ordinarily found at coal plants. Even with the housing facilities provided, many of the men prefer to live in nearby communities and travel to and from work by auto, trolley or train.

By no way other than that described could the men at this plant have been comfortably housed because level ground near the plant is limited in extent. Obviously, even the housing facilities provided are insufficient to the needs of all the workers of the Harmar mine. However, as the town is on a hard macadam road and is served by both a trolley and a railroad, a large number of the men prefer to make their homes in Parnassus and New Kensington, two neighboring fair-sized industrial and business communities.

Sewage is conveyed from the houses through 4-in. tap lines discharging into a 10-in. main. Partly by

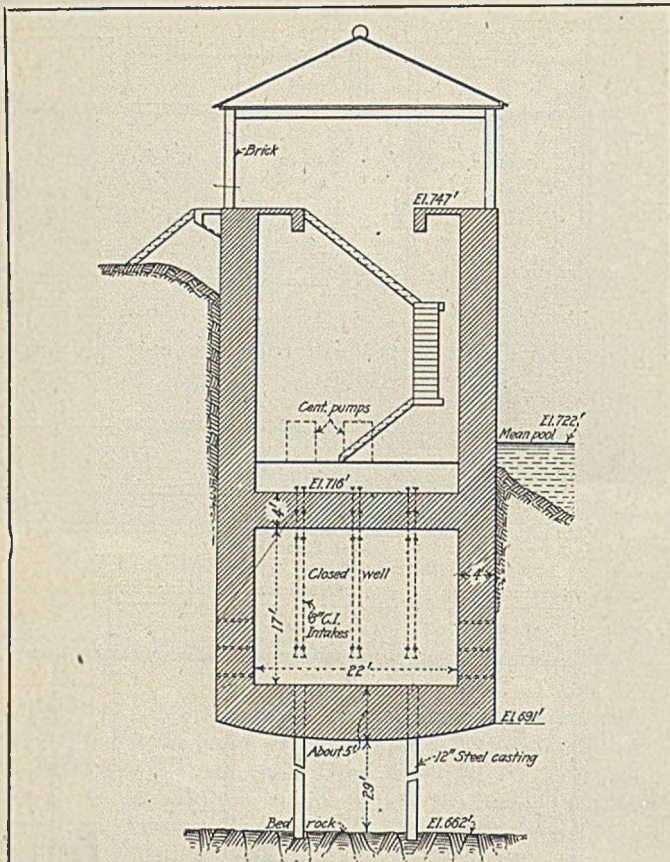


Fig. 3—Cross-Section Through Pump House

Water for the town of Harmarville is filtered naturally. A large circular well curbed with heavy concrete was sunk to a depth well below the bed of the river and the water allowed to reach it by flowing through the glacial drift of the river shore. Even though thus purified by the natural filtration this water is chlorinated before it is delivered to the house mains.

gravity and partly by pumping it is emptied into a syphon chamber and passes thence into an Imhoff tank where it is digested. The effluent is chlorinated before its final discharge into the Allegheny River.

Earlier in this article it was stated that Harmarville water is filtered. This is, indeed, the case, but the

filtering is not artificial. Water from the under flow of the Allegheny River is forced hydrostatically by its own pressure through a considerable thickness of sand and gravel in the stream bed into an airtight well chamber lying below the bottom of the river. From this well it is pumped to a storage tank elevated well above the town.

Fig. 3 is a section through this water plant. A circular well 22 ft. in inside diameter with reinforced concrete walls 4 ft. thick extends from the high water stage of the river to a point 31 ft. below its mean stage and 19 ft. below the river bottom at the point where the plant is built.

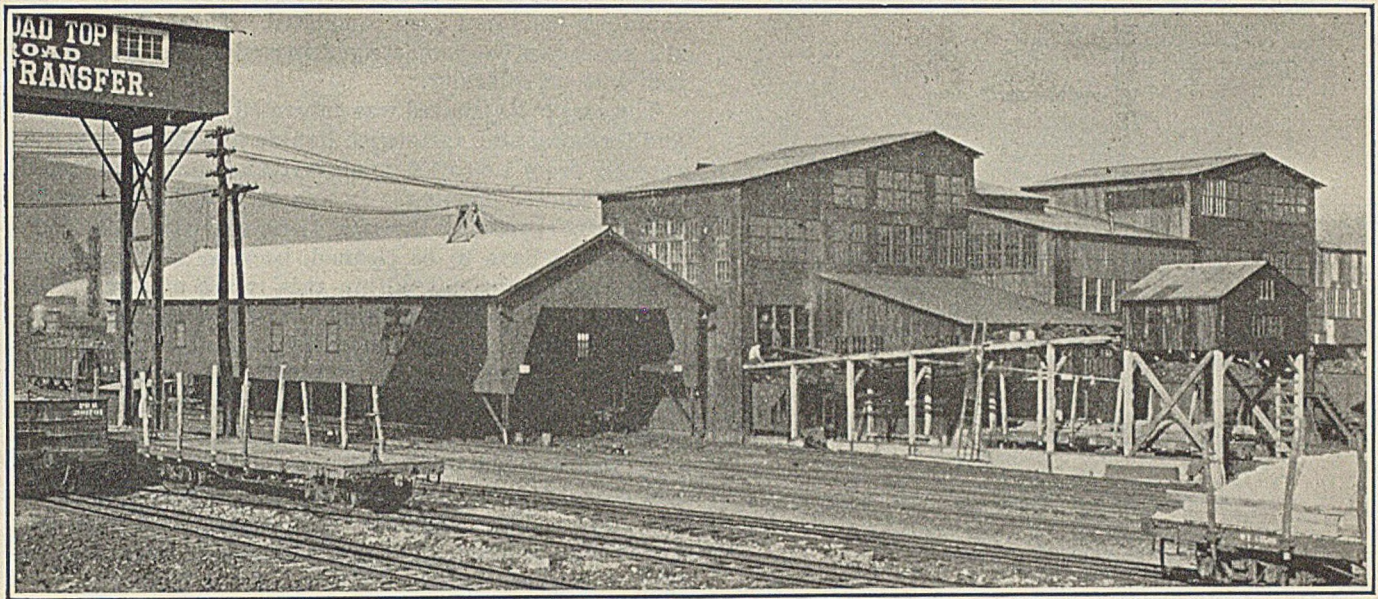
The circular concrete shell was sunk by the open-caisson method. The walls were built thick and heavily reinforced in order that they might withstand the heavy ice flows which occur on the river in the early spring. At the bottom of the shell is a concrete floor 5 ft. thick which was laid under water. In it are twelve 12x12-in. seepage holes. Also projecting through this bottom and extending downward to bed rock, are four 12-in. steel casings perforated by $\frac{1}{8}$ -in. holes on $\frac{1}{2}$ -in. centers and extending throughout a 10-ft. zone measured from the bed rock upward. The bottom of the well wall also is provided with 30 weep holes. These various openings are the means by which pure water from the underflow of the river finds its way into the well chamber which is air-sealed by a roof wall 4 ft. thick and placed 17 ft. above the bottom of the well. Projecting through this roof wall are three cast-iron intakes, two of which are each connected to a centrifugal pump, having a capacity of 500 gal. per minute against a 120-ft. head. The third intake is plugged at present as the water requirements of the plant and town are not sufficient to warrant the installation of a third pump.

As the water leaves the centrifugal pumps it is chlorinated and then passes through a 10-in. line to a 60,000-gal. reservoir tank. Whenever the pumps are in operation the water is delivered direct to the house lines, only the surplus going into the tank. In case of fire, water may be delivered under heavy pressure direct from the pumps to the fire plugs.



Harmar Officials

Kneeling, from left to right: R. E. Shaw, master mechanic; Frank M. Correl, safety inspector; Sam Yates, fire boss; James Sampson, fire boss; Frank Smith, motor boss. Standing, from left to right: Joe Middlemas, machine boss; J. F. Adamson, superintendent; A. A. Schneider, mine foreman; D. R. Snyder, fire boss; Cliff Barton, weigh master; D. Foster, assistant mine foreman; H. Couch, assistant mine foreman; Walter Giesy, mining engineer; John Beattie, assistant mine foreman; Earl Adamson, fire boss, and Charles Sneddon, coal inspector.



Sand Flotation Process Enters Bituminous Field

Cleaning Method Well Known in Anthracite Is Now Used in Central Plant Serving Three Broad Top Mines—Cuts Ash Content to Uniform Percentage

By Alphonse F. Brosky

Assistant Editor, *Coal Age*,
Pittsburgh, Pa.

A MECHANICAL bituminous coal-cleaning plant which in point of technique employed differs from all others in the bituminous coal industry is that located at Mt. Union, Pa., approximately midway between Pittsburgh and Philadelphia, on the main line of the Pennsylvania R.R. Here for the first time the Chance sand flotation process of preparation is applied to bituminous coal on a commercial scale.

This plant serves a double purpose. First, it transfers coal from the narrow-gage equipment of the East Broad Top Railroad & Coal Co., to standard-gage equipment of the Pennsylvania line; and second, it provides preparation facilities.

Coal here treated comes from the East Broad Top mines of the Rockhill Coal & Iron Co., at Robertsdale, Pa. These are in the Fulton bed, which averages 4 ft. of coal, divided into two benches by a parting of slate and fire clay. The thickness of this parting varies from about 2 in. to 5 ft. The bottom bench of coal is fairly uniform being about 1½ ft. thick, while the top bench varies from 2½ to 3 ft. in thickness.

The Broad Top deposit lies within the folded area of the Appalachian field, and consequently the Fulton bed is wavy. Its contour resembles that of a strip of corrugated sheeting. The rolls within the bed, which pitch

Of the three structures shown in the headpiece the largest is the coal-cleaning and transfer plant of the Rockhill Coal & Iron Co. This is operated by the East Broad Top Railroad & Coal Co. in connection with its coal transfer station. The long, narrow building adjacent to the washery houses the dump pits which, together with coal-handling equipment, facilitate the transfer of coal from cars on narrow-gage railroad track to cars on standard-gage tracks. The three-rail combination tracks are easily seen. Arrangements are such that of the coal coming from the mines of the Rockhill Coal & Iron Co. in the Broad Top field, that which is under 4½ in. is conveyed into the washery for treatment. The transfer plant has been remodeled from an old structure to which a cone house has been annexed. Of course much new equipment has been installed.

heavily, preclude the economical use of undercutters and coal, accordingly, is shot off the solid. This breaks the parting into more or less small pieces.

In 1914 a plant combining transfer facilities and hand-picking equipment (screens, picking tables and loading booms) was erected at Mt. Union by the East Broad Top Railroad & Coal Co. to handle coal originating on its lines. The Rockhill Coal & Iron Co. took advantage of these facilities and shipped the following hand-picked sizes: Run of mine, lump (over 4½ in.), furnace (through 4½ in. and over 2 in.), range (through 2 in. and over 1 in.), and stoker (through 1 in.). Such has been the past practice of the coal company. The capacity of the plant on this basis was 250 tons per hour.

Coal from the Fulton bed is one of the lowest volatile bituminous fuels in the country, possessing a high heat value. As such it is a coal enjoying a specialty market and wide distribution in its sized form as domestic fuel.

Because of the physical characteristics of the Fulton bed and the practice of shooting from the solid, a large quantity of the binder contained in the bed is broken into pieces too small for efficient cleaning underground. Twenty-six men on the picking tables in the old plant were unable to control the ash content sufficiently to meet the requirements of the market served. When uniformly free of impurities this coal is ideally suited to the ceramic industry where kilns must be drawn through a heat of predetermined maximum intensity in a given time. It is suited also to domestic use, as well as to power plants and railroads that operate within the limits of cities which have stringent ordinances directed against smoke.

The potentialities of these specialty markets made a uniform product essential. Wide fluctuations in the ash

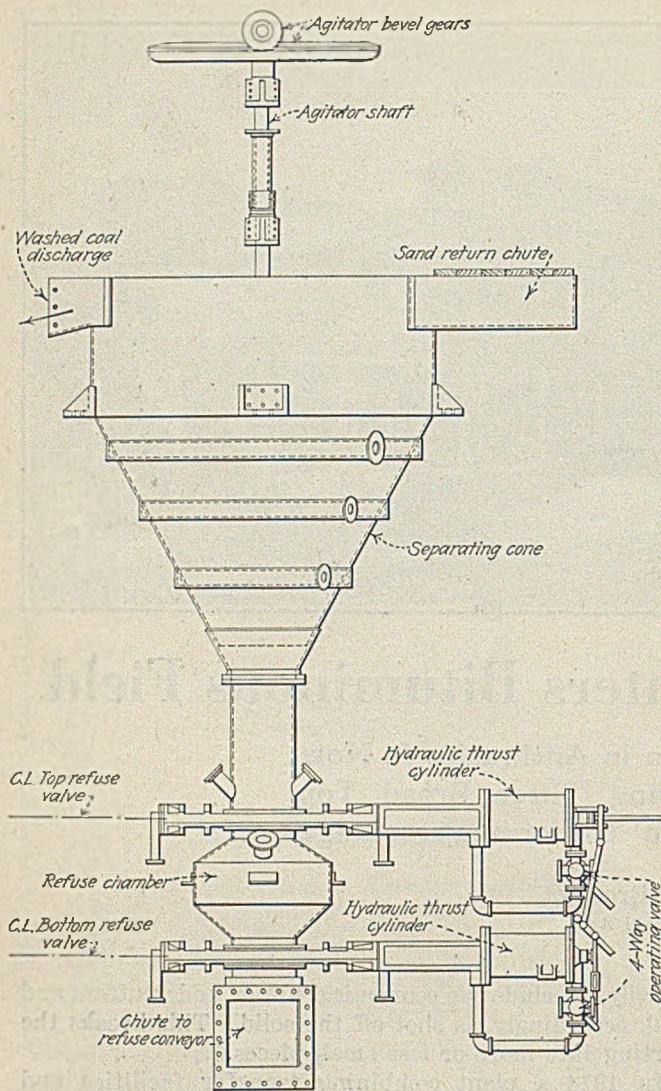


Fig. 1.—Chance Sand Flotation Coal Cleaner

and sulphur content of coal shipped from the mines resulted at the least provocation as, for instance, from an increase of output. Hand-picking methods were futile in any attempt to keep the ash content fixed.

Coupled with this fact, it was found necessary to increase the capacity of the Mount Union plant in order to accommodate increased tonnage produced at the mines. The results which were obtained by hand picking indicated that if a larger tonnage were to be handled and hand-picking methods continued not only would the force of pickers have to be augmented but additional picking facilities would have to be installed.

It was decided, as a result, to investigate various methods of cleaning coal with the idea of installing a suitable mechanical process which would eliminate the human element in preparation.

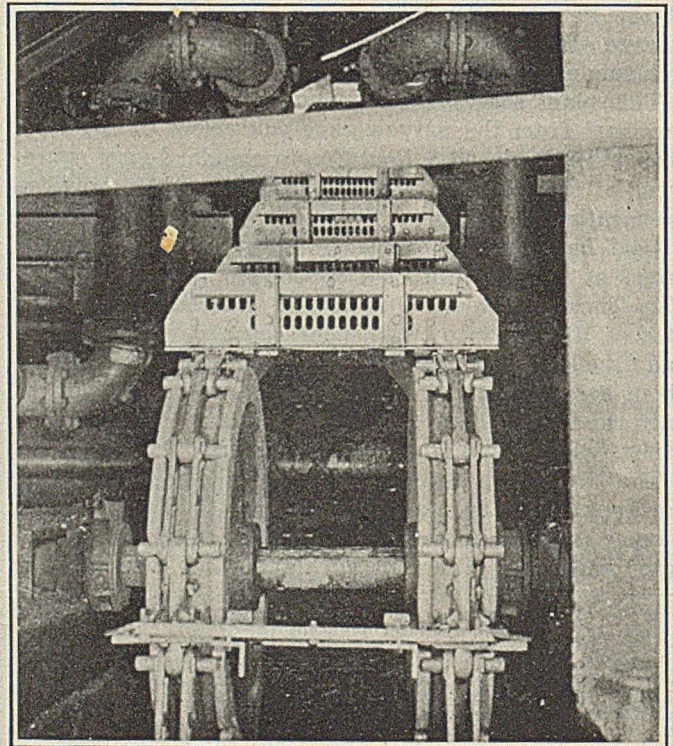
An investigation of various methods, including the sand flotation process, was carried on over a period of a year. At first the company hesitated to adopt any wet process because of the moisture which would thus be added to the coal. However, a study of shipments over a period of years disclosed the fact that an average of four days elapsed before the coal reached its destination, during which time it would likely encounter rain or snow. The mere fact that consumers had not complained of moisture derived from this source dispersed the fear of the relatively small quantity of moisture that would be added by the cleaning process.

The use of sand was not viewed with favor until after thorough tests had been completed. These showed that the sand can be completely removed from the washed coal without difficulty.

The coal to be treated was subjected to complete screen and float-and-sink tests with liquids of specific gravities ranging from 1.4 to 1.6 on all materials passing through a 1-in. square opening. It was a foregone conclusion that the coal passing through $4\frac{1}{2}$ -in. and over 1-in. openings would have to be cleaned, because of the concentration of impurities within this range of sizes. The results of these tests showed that the cleaning of coal smaller than $\frac{3}{8}$ in. was unnecessary, its ash content was not high and remarkably uniform. The proportion of this small size amounts to 15 per cent of the total product.

It was decided to continue preparation of the material passing over $4\frac{1}{2}$ -in. openings by hand-picking methods. Its quantity, however, represents only 18 per cent of the total product. The final outcome of the investigation, therefore, was the adoption of the Chance process for the cleaning of the sizes between the $4\frac{1}{2}$ -in. and $\frac{3}{8}$ -in. products.

Sand flotation as here applied is "the floating of coal on a fluid mass of sand and water" through which slate and other refuse readily sinks. This flotation of the coal and sinking of the refuse is accomplished in the cone separator shown in the illustrations. The top of the separator is a cylindrical collar, in which the coal is separated from the refuse. From its bottom a cone tapers downward and conducts the refuse to a central discharge point at its extremity. This leads to a large diameter pipe known as the classifier column where the sand is separated from the refuse. Below this pipe is a trap chamber for the refuse which may be closed or opened at the top or bottom, as required, by means of two valves. Below this trap is a chute which conducts the refuse to a scraper conveyor.

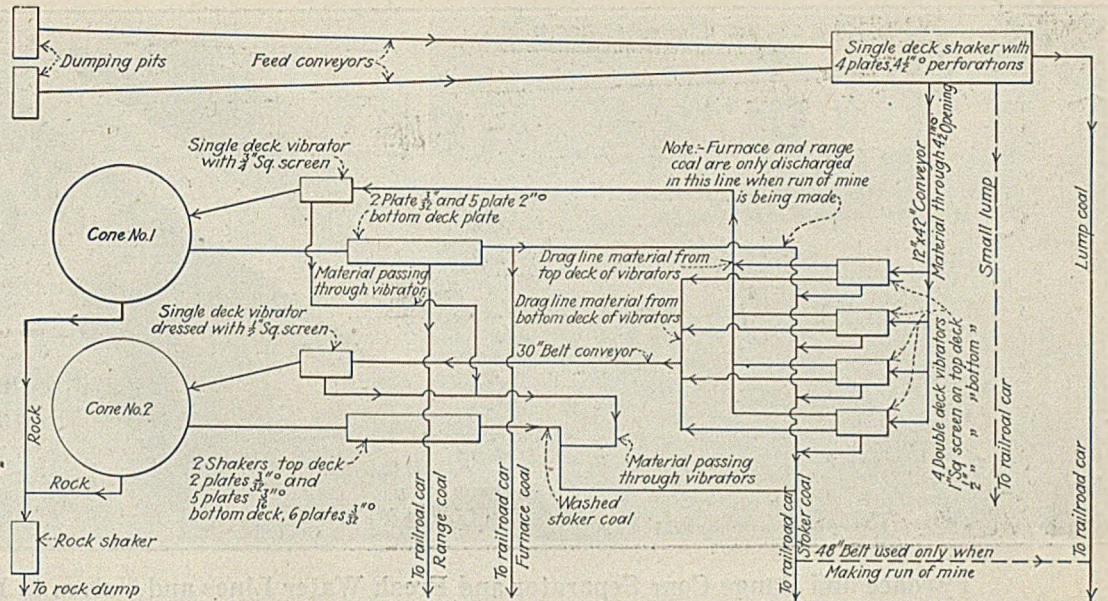


Refuse Conveyor

This conveyor drags the refuse drawn from the cones to the refuse desanding shakers. It is driven from the main counter-shaft in the cone house.

FIG. 2
Flow Sheet

This drawing is to indicate the course of the coal from the time the sizes to be washed are screened out, until they are fed through the two units of the sand flotation cleaner, and delivered at the discharge points. The refuse and coal are both desanded thoroughly before loading so that the actual leakage of sand out of the cleaning cycle is negligible.



Within the collar, extending from a level slightly below a discharge lip to practically the bottom of the cone, is a fluid mass composed of sand and water of a specific gravity greater than that of the coal but less than that of the slate, which are separated. This fluid mass is sustained by water entering the cone through the classifier column. The flow of this water through the classifier controls the specific gravity of the fluid mass—the less water the greater the specific gravity of the mixture. On entering the cone this water loses its velocity and is spread horizontally in “sheet-like layers” which percolate gently upward through the sand, displacing that water which is above it.

A spindle shaft extends into the separator coinciding with its main axis. To it are attached horizontally projecting paddles. These revolve within the fluid mass and, together with opposing injections of water from three peripheral manifolds, serve to agitate the cone's contents. These two agitating agencies serve to counteract each other and result in a tendency toward whirlpools, eddies and boiling. The fluid mass, however, literally revolves with the arms as a solid and in so doing serves to transport the floating coal through an angle of nearly 360 deg. from the point of feed to that of discharge. Overlying the fluid mass is a layer of clear water.

Over the top of this fluid mass is introduced and drawn off a gentle flow of sand and water, in a closed circuit from and to a sand sump. The separation of slate from coal takes place on the surface of the fluid mass as the coal floats in a circular path through nearly 360 deg. At the discharge lip the coal runs out of the separator in company with the overflow of sand and water. The sand and water are sieved from the washed coal on shaking screens adjoining the separator.

The Mt. Union plant as it stands today is a remodeled installation, with the addition of a building that houses the coal washing equipment. Incidentally no changes were made in the track layout under the tippie. As now arranged, this plant has a capacity of 500 tons of coal per hour, of which 335 tons per hour is washed. A flow sheet of the equipment appears in Fig. 2.

Coal is delivered to this plant from the mines 30 miles away in narrow-gage hopper cars, each of 35 net tons capacity. It is dumped into two 100-ton pits, from which it is drawn by automatic feeders discharging onto two

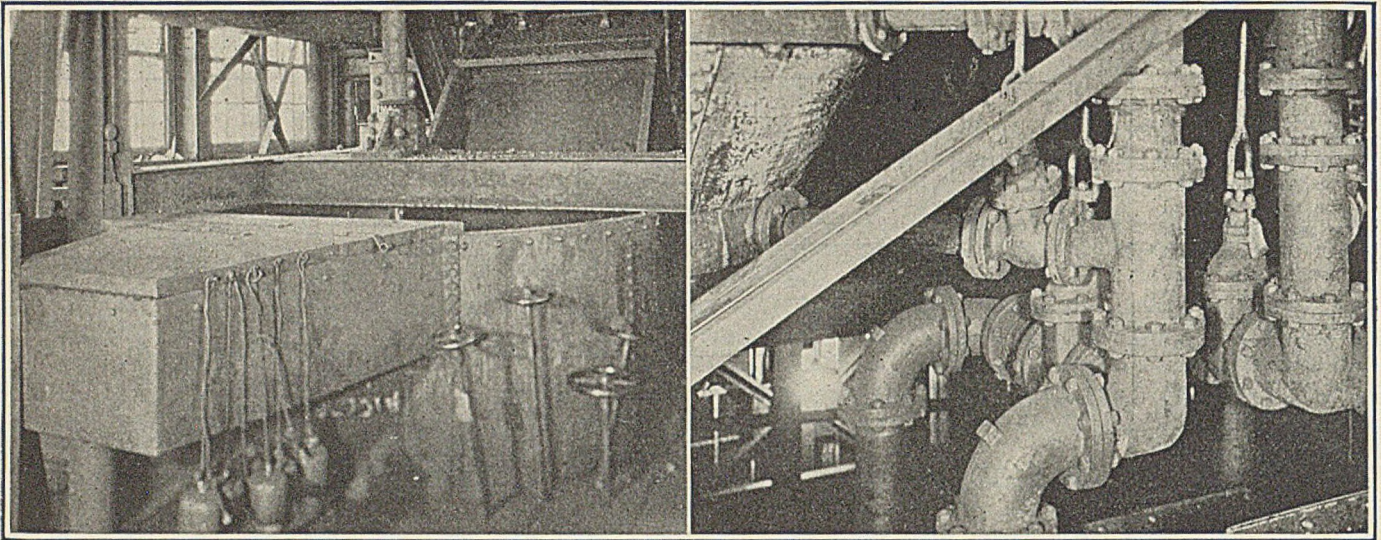
inclined apron conveyors. These deliver the coal at a common point onto a shaking screen 6 ft. wide. This shaker is dressed with four plates 3 ft. long having 4 1/2-in. round openings. The coal passing over these openings is discharged as large lump onto a combination picking-table and loading boom where it is picked by three men before being loaded into standard-gage railroad cars. By adding plates with 10-in. round openings to the lower end of the shaker, two sizes of lump (under and over 10 in.) can be prepared. A second or small lump picking-table and loading boom is provided for this purpose but has not been used as yet.

That coal which passes through the screen openings on the shaker is carried by a 42-in. scraper conveyor to a battery of four double-decked vibrating screens. The upper deck of each vibrator is dressed with wire screen having 1-in. openings over an effective area 4 ft. wide and 10 ft. long. The lower deck which has the same effective screen area as the upper one is dressed with wire screen with 1/2-in. openings. As these screens are installed on a 34-deg. slope, the effective size of their openings is about 7/8x1 in. in the upper and 3/4x1/2 in. in the lower deck. Each deck is composed of two 4x5-ft. screens in tandem.

Each vibrator is independently driven by a 3-hp., 1,200 r.p.m. motor through eccentrics of which there are two for each screen. These eccentrics are of small throw and are driven at high speed. Each vibrator has a capacity of 100 tons of feed per hour. Their capacity per square foot of screen area is believed to be greater than that of any other screen of the same general type yet developed.

These vibrators divide the coal into three distinct products: (1) coal over 1-in., (2) that under 1-in. but over 1/2-in. and (3) that under 1/2-in. The No. 1 product, as a combination of furnace (under 4 1/2-in. and over 2-in.) and range (under 2-in. and over 1-in.) is washed in No. 1 cone of the cleaner. The No. 2 product is known as sized stoker and is washed in No. 2 cone. The No. 3 product in dry form is reunited with the sized stoker coal after the latter leaves the dewatering and desanding screens.

This division into three sizes is not made to facilitate a better separation of refuse from coal in the cones. No. 1 and No. 2 products are of approximately the same quantities and are equivalent to the capacity of the



Furnace and Range Cone Separator and Fresh Water Lines and Valves to Both Cones

The coal is fed from the guard screen which is shown above and at the far side of the separator in the illustration on the left. Sand and water are pumped through the stand pipe in the foreground and flow gently into the separator. The refuse sinks

through the fluid mass on which floats the coal. The objects hanging from the sand-and-water intake are specific gravity measuring weights. The valve stems are carried to this floor to facilitate the work of the cone operator in controlling the flow

of water through the classifier column and the manifolds.

Taps from the water lines shown on the right lead to the manifolds and the classifier column. Practically all water circulated is reclaimed and reused.

separate cones. The No. 3 product, as stated above, does not require preparation. As a matter of fact, the No. 1 and No. 2 products could be cleaned in the same cone as well as separately if the capacity of the plant were less.

The No. 1 product (furnace and range), passing over the upper deck of the vibrators, is delivered onto a drag conveyor and carried to a 30-in. belt which transports in to a vibrator, of the same type as those already described but having only one deck. This is dressed with $\frac{3}{4}$ -in. square-opening screens. It serves only as a guard screen for the removal of fines which in dry form are joined with the washed stoker size. The coal pass-

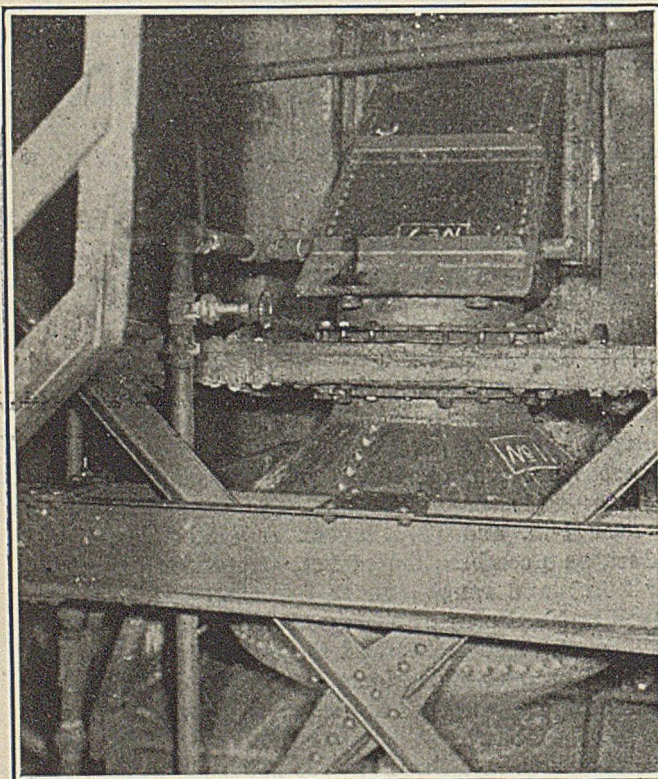
ing over this vibrator is fed to the No. 1 cone where the refuse is removed from it.

On leaving this cone, the coal together with a certain quantity of sand and water flows onto the upper deck of a double-decked, balanced shaker 5 ft. wide and 4 ft. long. By this machine the fluid mixture of sand and water is sieved from the coal. The upper deck is dressed with two plates about 3 ft. long each, provided with $\frac{3}{4}$ -in. perforations. These two plates in the upper deck hang over in the clear of the lower deck and through their openings is sieved, almost all of the sand and water which accompanies the coal onto the upper deck. What little sand clings to the coal is removed by sprays of fresh water, located at intervals along the remaining length of the shaker. Adjoining the two plates of small openings on the upper deck are five plates, each about 3 ft. long, provided with 2-in. openings which separate the range from the furnace coal. The latter is then delivered over a loading boom into a railroad car.

The range coal on the lower deck passes over six plates, each about 3 ft. long, provided with $\frac{3}{4}$ -in. openings and is washed by sprays of water, removing the few particles of sand which yet adhere to it. The range coal is then delivered to the railroad car by a 30-in. belt loading boom. So much for the No. 1 coal.

The No. 2 product upon leaving the lower deck of the main battery of vibrators is discharged onto a drag conveyor which delivers it to a 30-in. belt, which carries it to a single deck vibrating screen, 4 ft. wide and 10 ft. long provided with $\frac{1}{2}$ -in. square openings, which removes the fines from the sized stoker coal. The fines are reunited with the material from which it is separated after the latter is washed. From the vibrator the sized stoker coal is fed to the No. 2 cone where its refuse is separated from it.

On leaving the No. 2 cone this coal is desanded and dewatered in the same manner as is the product from the No. 1 machine. The shaker over which this size is passed is dressed on the upper deck with two plates having $\frac{3}{4}$ -in. openings. These overhang and clear the bottom deck, and through their openings the coal is almost completely desanded. Adjoining these two plates



Refuse Chamber and Chute

Refuse sinks to the bottom of the separator where it is discharged at intervals of about 4 min.

on the upper deck are five plates perforated with $\frac{1}{8}$ -in. openings under which on the lower deck are six plates with $\frac{3}{8}$ -in. openings. These together with jets of fresh water serve to remove what little sand is not sieved through the two small-opening plates on the upper deck.

The product on the upper deck of this screen is blended with that on the lower deck and both, together with the dry steam sizes are fed to one compartment of a 60-in., two-compartment apron conveyor. The other compartment is used only when run-of-mine coal is made and carries blended furnace and range coal. The stoker coal is discharged from this conveyor into a small hopper and thence into a railroad car.

Run of mine is made by closing the gates over the furnace and range loading booms on the No. 1 shakers, allowing these sizes to be discharged into the 60-in., two-compartment conveyor carrying the stoker coal. All three products are thus transported to a 48-in. belt conveyor. This leads to a chute where the smaller sizes join the lump in the formation of run of mine which is loaded into a railroad car on the lump track.

The refuse sinking through the fluid mass within the cone separator is trapped in the refuse chamber, from which it is drawn off at about 4-min. intervals. The discharge of refuse from this chamber is controlled by hydraulically operated interlocking valves. The refuse is discharged into a scraper conveyor which carries it to a refuse shaker. Here it is washed to recover the sand, and discharged to a refuse car by which it is transported to and dumped upon a rock bank.

The sand and water which is sieved through the shakers is sluiced to the sand sump, which acts as a large settling tank. The settled sand is returned to the cones by means of sand pumps of the centrifugal type. The relatively clear water overflowing around the rim of the sump is collected in a small reservoir which acts as a sump for the fresh water agitation pump. This pump is a 10-in., double suction, centrifugal of the volute type, with a capacity of 2,500 g.p.m. against an average head of 60 ft. The discharge from this pump supplies fresh water to the classifier columns and manifolds of both cones, and also for the sprays over the desanding and sizing shakers.

Make-up water is drawn from a reservoir located about a quarter of a mile from the plant by a 300-gal. centrifugal pump. This machine discharges approxi-

mately 200 g.p.m. through a 5-in. line into the top of the sand sump.

Sand and water are returned to the top of the cones from this sump by two sand pumps, each of 1,050 g.p.m. capacity at 33-ft. maximum head when handling 10 per cent sand by volume. The parts of these machines which are exposed to wear are made of manganese steel.

The plant was put into operation on Oct. 1 of this year and, because of the short length of time between the start of operations and the date of this article, analyses are neither complete nor sufficiently detailed to warrant publication. However, it has been proven beyond doubt that the process as applied to the cleaning of bituminous coal produces a product of uniform quality so far as ash and sulphur content is concerned. The average of analyses received to date shows a fluctuation in ash of approximately $\frac{1}{2}$ per cent and a variation in sulphur of 0.2 per cent.

Coupled with this result analyses so far made show marked reductions in ash and sulphur content of the product, as compared to that shipped when hand picking methods were employed,—the largest reductions being of course shown in the furnace and range sizes.

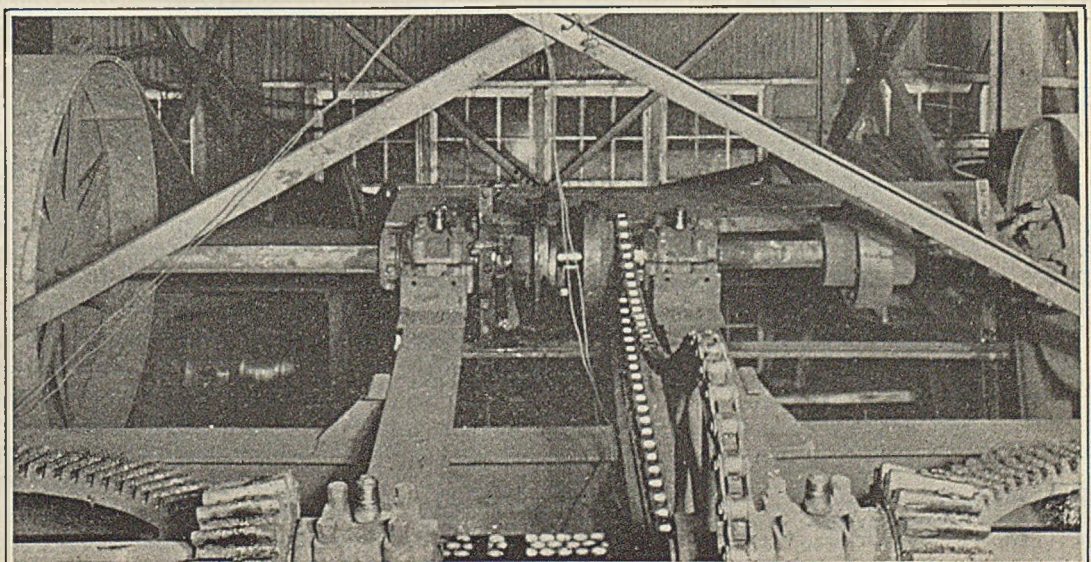
The aim underlying this installation, was naturally, the elimination of refuse from the shipped product, but this elimination is not desired at a sacrifice of good fuel. In other words, no attempt is being made to obtain a product having ash and sulphur contents equivalent to the inherent ash and sulphur of the pure coal. This would mean the elimination of fuel of relatively high value from the shipped product. The important thing which is being accomplished at this plant is the production of a coal of relatively low ash and low sulphur content, that is of uniform quality.

The best impression of the process is gained from watching the discharge of refuse from the plant. The rejected material is largely slate, mixed with bone to which adheres a little pure coal. A generous sprinkling of pyritic sulphur within the mass is readily distinguished. On the other hand, an inspection of the washed coal in the railroad cars discloses uniformly sized products which to the naked eye at least are free from mechanically included impurities. No sand was observed clinging to the washed coal.

The plant was designed and erected by the Coal Cleaning & Equipment Co. in collaboration with H. M. Chance & Co., both of Philadelphia, Pa.

Main Drive

It was the aim in the design of this plant to simplify the layout by locating motors at points which provided secure anchorage, and to drive combinations of units from common countershafts. This not only has simplified the drives but also has eliminated many nests of reduction gears in dangerous and inaccessible places. Also it has avoided the installing of motors and reducing gears on stilted moorings. A 75-hp. motor drives by a belt this counter-shaft.





Better and Cheaper Coal Mined with Greater Safety Discussed by West Virginia Institute

LESS EXPENSIVE and more complete coal extraction, preparation that will lower impurities, shooting that will increase the quantity of large coal, flame-proof motors that will aid in eliminating gas and dust explosions and projected concrete that will keep roofs from continued scaling, formed part of a symposium on means to improve West Virginia practice in mining at the winter meeting of the West Virginia Coal Mining Institute held at Morgantown, W. Va., Nov. 24. To complete the symposium a visit was made Nov. 25 to Nemaocolin, Pa., to see a mine where some of the important means suggested had been put in practice, or had been replaced by some other means tending to the same end.

R. M. Lambie, the president, occupied the chair and the meeting set down to work without the usual formalities of a welcome from the mayor and the Chamber of Commerce, the first paper being one on the "Smokeless Coals of West Virginia," by David B. Reger, of the West Virginia Geological Survey. Mr. Reger described first the semi-anthracite coals found in the Pocono series in the counties of Berkeley and Morgan, which lie in a sort of lip which projects from the northeastern portion of the state. The counties which are little known interpose themselves between Maryland and Virginia. Apparently the field which is only about 13 miles long and a mile or two wide has coal so folded and overturned and so impure as to be of little value, the impurity, however, not being part of the coal but mixed with it. The coal itself has only 6.47 per cent of ash.

Mr. Reger defined smokeless coal as that having a fuel ratio of from 5 to 2.5. Coal of this character can

be found in fairly continuous, but no wholly unbroken, line from the state of Maryland in the northeast down to McDowell and Mercer counties in the south of the state and following a line about southwest. In Randolph, Pocahontas and Greenbrier counties smokeless coals certainly exist but have not yet been studied. The explored fields, consequently, divide themselves into two, one occurring in Mineral, Grant and Tucker counties in the northwest and the other in Fayette, Raleigh, Wyoming, McDowell, Sumner and Mercer counties in the South. The first field has a little over two billion tons available and the lower field in excess of eleven billion tons. The fields have been barely scratched, despite the extensive operations that have been carried on for years.

Frank Haas, consulting engineer, Consolidation Coal Co., remarked that his investigations established the fact that not all the coal in Fayette County, despite the common belief, was smokeless or semi-bituminous. Mr. Reger agreed with that statement provided it was assumed that the true dividing line could be set empirically at a fuel ratio of $2\frac{1}{2}$. Still he asserted that the greater part of Fayette County could lay claim to having smokeless coals in accord with that definition. He agreed with Mr. Haas that smokelessness accorded not so much with the geological horizon as with the geographical location, though along the edge of the smokeless field certain seams were less smokeless than their geographical location would lead one to suppose.

Thomas Fraser, who is assistant professor of the mining engineering department of West Virginia University, then read a paper on the "Preparation of Commercial Coals" showing the sizes adopted for anthracite and for the southern Illinois coals, the operators in the latter district having been compelled to adopt a careful classification of coal into sizes in order to meet

The headpiece shows some of the participants in the West Virginia Coal Mining Institute's session grouped on the steps of the Post Office at Morgantown, W. Va.

the competition of hard coal. He said that some such sizing would have to be provided for West Virginia coals if the coal of that state was to be put into successful competition with the product of the anthracite-producing districts. He showed by tables how coal of different sizes in the same mine had different ash and sulphur percentages and exhibited different degrees of beneficiation as a result of cleaning by washing and pneumatic-table preparation.

Josiah Keeley, general manager, Cabin Creek Consolidated Coal & Coke Co., Kayford, W. Va., questioned why it was that the seam sample showed an analysis always better than the purchasers found when the coal was received. Mr. Haas said that the personal equation had something to do with it. The man who sampled the coal in the mine, was always disposed to believe that the miner would reject certain obvious layers of the bone and slate. When the coal was mined, however, much of this impurity was loaded; in fact, it could not be wholly eliminated no matter what care was taken.

J. J. Forbes, of the U. S. Bureau of Mines, declared that in taking a face sample a $\frac{3}{4}$ -in. binder would be rejected in the hope that the miner would throw it in the gob. That is not what happens. The miner almost invariably, when he gets it on his shovel, deposits it in the car. In France, a central bureau makes tests of the coal at the tippie, and the coal of the mine is accepted or rejected on the railroad tracks at the mine before the coal has been transported to the market.

Frank Haas then read a paper on the "Flameproof Motor as a Safety Measure." He said the first flameproof motor constructed in this country was manufactured in 1903, but such motors had been used in Europe at an earlier date. He urged on the members that it was impossible to keep a mine which generated gas in quantity entirely free from the hazard of an excess gas percentage. A stopping might be broken down by a fall of rock or a big area in a panel where the pillars were beginning to be drawn might cave a little, causing the gas to collect above the fall and to be precipitated violently into the working area when the first major fall occurred. Therein lay the need for flameproof motors.

R. L. Kingsland, chief of the power and mechanical division, Consolidation Coal Co., said that no more power was being used now per ton of coal mined with storage-battery power than when the current was conducted by wires from the power house to the face. Furthermore the demand was now far better distributed. True, there were power losses of 20 to 25 per cent in the operation of the battery, but there were losses greater still in the feed lines of a wire-equipped mine. It was not uncommon to have 175 volts at the generator and only 100 volts at the undercutter or locomotive. Furthermore, with a storage battery there was a constant voltage. Mr. Haas declared that it was not necessary to have twice as many locomotives with storage-battery operation as with other forms of mechanical haulage. The locomotives and also the cutting machines should have battery capacities to supply them the full day. The company's locomotives haul 1,000 tons in 8-hr., but the batteries are changed after a 4-hr. run.

B. C. Collier read a paper on the advantages of projected concrete, emphasizing the necessity for repairing breaks promptly and of using a sufficient thickness of the concrete to assure permanence. Less than that might do good for a while, but later it would be

found that the concrete had cracked and would begin to fall. He gave many instances where the gunite had served to prevent falls, and to act as a protection in case of mine fires.

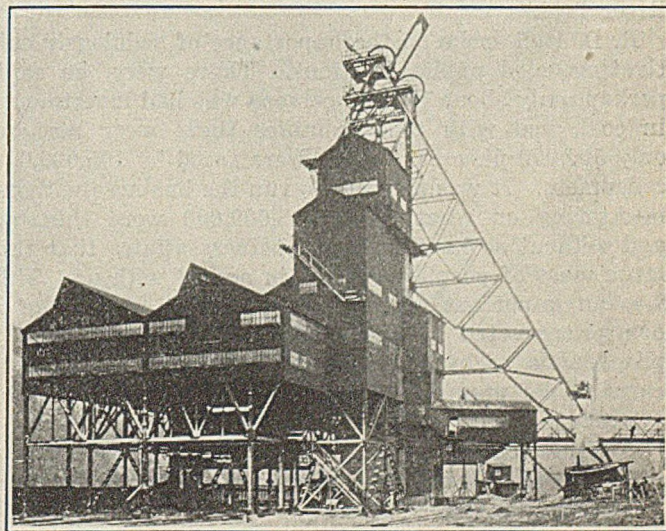
Mr. Stockdale, general manager, Bottom Creek Coal & Coke Co., said that a long sidetrack 35 ft. wide at the Bottom Creek mine had been covered with projected concrete eighteen months ago. Though the roof was bad and before being coated looked quite unsafe it has stayed up without a break despite the fact that it was so long that each of the tracks would hold 75 cars.

"Recent Developments in Shooting Coal" was then presented by J. E. Tiffany, explosives engineer of the U. S. Bureau of Mines, Pittsburgh, Pa. He said that improved results had been obtained by using $1\frac{1}{4}$ -in. instead of $1\frac{3}{4}$ -in. cartridges. However, when attempts are made to use cartridges of smaller diameter, deterioration sets in and there are delays in detonation. The U. S. Bureau of Mines, he said, was not prepared to say anything for or against the use of rock dust as stemming.

J. J. Rutledge, chief engineer, Bureau of Mines, State of Maryland, Baltimore, Md., said that he had obtained better coal by the use of rock-dust stemming. He had hoped to rock dust the face with the stemming but he had not obtained that result.

At the request of the chairman, Mr. Forbes described the work of the safety instruction department of the U. S. Bureau of Mines. Mr. Rutledge then gave a description of new methods of mining in the mines of northern Illinois, in Oklahoma, at Paris, Ark., and in the Helena-Straven mine, of Alabama. Mr. Rutledge expressed himself greatly interested in the uniformity with which the breaks in the roof occurred. They overhung the goaf at an angle of about 60 deg. to the horizontal. T. F. Downing, of the Edward V. D'Inwilliers Engineering Co., said that the difficulty with longwall at one place had been that the draw rock, which was 4 ft. thick and overlaid by sandstone, would break back of the coal face, leaving a most treacherous condition to be met when the mining work progressed.

In the election which followed, practically all the last year's officers were re-elected by acclamation. The offi-



Designed to Hoist 1,500 Tons an Hour

Today we figure in hourly capacity rather than in daily output and yet our figures are as large or larger than they used to be in earlier days. This Nemaolin headframe handles at present only 4,600 tons daily but 15-ton skips with cylindro-conical drums could easily raise 12,000 tons daily when orders come from headquarters and more men are employed.

cers for the ensuing years are: R. M. Lambie, president; Thomas J. Downing, Jr., Philadelphia, Pa.; George Wolfe, Beckley, W. Va.; C. C. Morfit, Welch, W. Va.; E. S. Wade, Power, W. Va., and R. L. Kingsland, Fairmont, W. Va., vice-presidents; Frank Haas, Fairmont, W. Va.; W. E. Fohl, Pittsburgh, Pa.; R. F. Carson, Huntington, W. Va., and W. E. E. Koepler, Bluefield, W. Va., members of the Executive Board; R. E. Sherwood, Charleston, W. Va., secretary-treasurer.

The resolutions included one urging a continuance without restriction of the safety work of U. S. Bureau of Mines.

OUTLINES PROGRESS OF ROCK DUSTING

At the banquet, which was attended by about 200, addresses were made by C. W. Riggs, I. C. White, E. Steidle, R. D. Hall, R. M. Lambie, D. C. Kennedy, C. R. Jones and J. T. Ryan. Mr. Steidle's address was on the "Present Status of Rock Dusting in the United States" and described the rapid progress in rock dusting in the various coal-producing states of the Union saying:

"Those who have followed the rapid progress in the art of rock-dusting will agree that opinion crystallized during 1924 and 1925 in support of this remedy for coal-dust explosions. Up to 1924 only one company in America practiced rock-dusting on a large scale. At present no less than 211 mines are rock-dusted, or approximately 4 per cent of the total number of bituminous coal mines in the United States, or in other words 11 per cent of the total annual production. Of these mines 63 are in Pennsylvania, 20 in West Virginia (about 2 per cent of the total number of mines), 8 in Alabama, 3 in Colorado, 21 in Illinois, 5 in Indiana, 2 in Kentucky, 13 in New Mexico, 3 in Ohio, 2 in Oklahoma, 21 in Utah and 49 in Wyoming.

"A total of about 1,000 miles of entry have been dusted. Pennsylvania leads with about 400 miles, and West Virginia has about 100 miles of dusted entries. In each case there is a sense of security, which not only the operator feels, but the miner also. The majority of the mines rock-dusted in West Virginia are in the Fairmont district. Several mines are rock-dusted in the Logan and Pocahontas fields, whereas none, according to recent reports, have been rock-dusted in the New River field."

R. D. Hall spoke on the importance of sedulously cultivating good public relations. There were, he said, perhaps only about 150,000 persons who had investments in coal, and with their families there were perhaps only 500,000 persons. These were faced by 105,000,000 consumers. It was not well to run the business without meditating on what those 105,000,000 were thinking and without so handling our business affairs that this large mass of people would be in accord with us. This was an important matter, he added, for citizens of a democracy voted as they thought. Not so much by propaganda as by a system of operation calculated to earn public approval could fair legislative action be attained.

From R. M. Lambie came a constructive talk relative to the progress of mine-accident prevention in West Virginia. He said in effect:

A train of 50-ton cars stretching from New York City to Omaha, Neb., represents West Virginia's coal production in October, and a train of 50-ton cars reaching from Charleston to Kenova the state's daily coal output last month. In 1914 the state produced 73,999,

999 net tons in the fiscal year compared to 110,000,000 net tons in 1925.

From 1914 to 1919, inclusive, the mine accidents in the state totaled 2,571. The tonnage mined in this span of years was 499,786,380 net tons, an average of 194,394 tons per fatality. From 1920 to 1925, according to the chief, there were 2,349 fatalities or 222 less than the preceding six years, and during that period 570,239,193 tons were produced, making an average production of 242,758 tons per fatality. A train 24 miles long carrying coal was produced for each fatality from 1914 to 1919, inclusive. A train 30 miles in length represented each fatality from 1920 to 1925, inclusive, which represented an increase of six miles in length compared to the previous five-year period.

The ratio of fatal accidents per 1,000 men employed inside of the mines for the period from 1914 to 1919, inclusive, was 5.83. From 1920 to 1925, inclusive, this ratio was reduced to 3.82 per 1,000, or two lives saved on every 1,000 employed.

In tracing the progress of the state's coal mining activities Mr. Lambie said that in 1863, West Virginia produced enough coal to fill a train of cars that would reach 55 miles, but during last year the train that would hold the coal produced would be 15,000 miles long.

In describing the new safety plan adopted in the state, Mr. Lambie said that by an appropriation passed at the last session of the legislature, five safety instructors are to be placed in various sections of the state, whose duty it will be to instruct the coal miners in the five different regions in safety work. Mr. Lambie said that West Virginia was the first state in the Union to inaugurate this first big forward step in safety work and added that the U. S. Bureau of Mines had assigned William Forbes, of Huntington, its division engineer, to assist in the work.

VISITS NEMACOLIN OPERATION

The institute on the second day of the meeting, Nov. 25, visited Nemaquin, taking the train to Huron and crossing by the rope ferry. The mine at Nemaquin is operated by the Buckeye Coal Co., a subsidiary of the Youngstown Sheet & Tube Co. It is planned for a tonnage as large as that attained in any mine in the country though just at present the output is only 4,600 tons daily. It can, however, hoist with its cylindrical drums, when the workings are brought to their ultimate production, 12,000 tons in an 8-hr. day or even more. The coal is loaded into 15-ton skips by rotary dumps. The man hoist is an electrically operated elevator controlled either from the elevator itself or the main hoist room. A rope haul operated by remote control from the tibble moves the railroad cars past the loading point.

The main shaft bottom is concrete-lined, 25 ft. wide, 17 ft. high and 1,400 ft. long. It contains three tracks for empties, one for loads and one for shunting. The car haul will handle a 100-car trip, the 100 cars passing through the rotary dumps without uncoupling.

The visitors in company with C. M. Lingle, general manager, saw the town, one of the well-appointed houses, the school, the motion-picture house, the tibble, the shaft, the big shaft bottom and the skip-filling arrangements. A bountiful lunch was served by the visitors in the passage which crosses the side track where are the dispatcher's room and the foreman's office and shower.

Why Do So Many Concrete Shaft Linings Fail?

Experts Before Engineers' Society of Western Pennsylvania Blame It on Water Percolating Through Porous Walls and Then Freezing There

THE DESIGN AND METHODS of constructing concrete linings of coal-mine shafts in this country must be changed—at least under certain conditions. The degree to which those alterations must be made depends upon the quantity of water outside the shaft and the range of temperatures below the freezing point within. This is the conclusion arrived at by the mining section of the Engineers Society of Western Pennsylvania at a bi-monthly meeting, in Pittsburgh, on Nov. 24, at which N. G. Alford, vice-president of Howard N. Eavenson & Associates, mining engineers, read a paper on "Failures of Concrete Shaft Linings at Pennsylvania Bituminous Coal Mines," covering the failure of 30 concrete shafts in a survey of 106 such openings which will appear in a later issue.

This meeting was well attended and the discussion lively, being participated in by men representing the coal, the railroad and the construction industries and also the Portland Cement Association.

In one of the typical shaft lining failures mentioned in Mr. Alford's paper, disintegration of the concrete was complete in a 4-in. curtain wall, leaving nothing but the reinforcing. H. M. Ernst, general superintendent of the Pittsburgh Terminal Coal Corporation, pointed to this fact as proof that hydrostatic pressure probably plays only a minor rôle, if any, in the failure of concrete linings. Mr. Alford thought the failure might have been due to the thinness of the curtain wall. C. H. Dorsey knows of a curtain wall erected in 1917 which

has since failed though it was 12 in. thick. He believes this failure was due to the wide variation of temperatures on the two surfaces of the curtain wall which separates a downcast from an upcast. He was backed up in this statement by Mr. Hopkins who pointed to the setting up of severe stresses in the concrete by such variations.

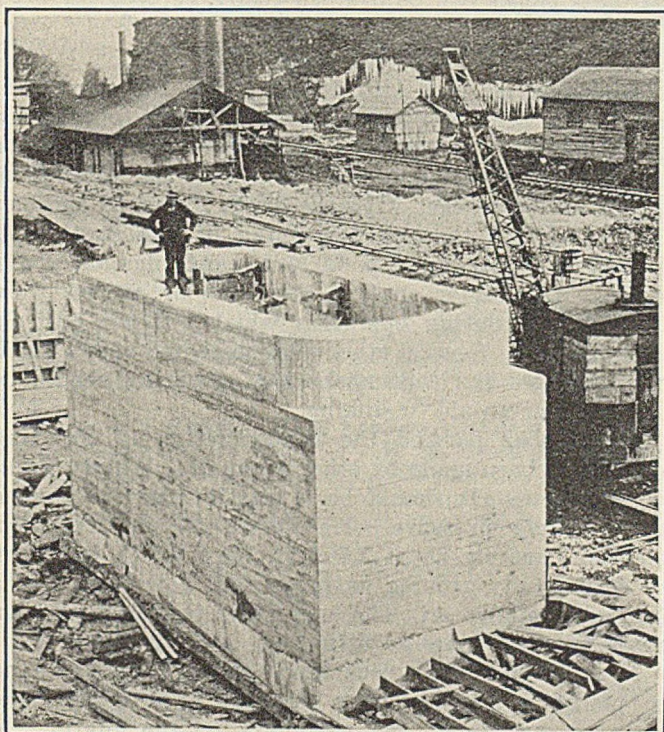
F. R. McMillan, of the Portland Cement Association, told the mining men not to be discouraged by the fact that 30 out of 106 shaft linings in Mr. Alford's survey have been reported as distinct failures. That record is little worse than that of other structures exposed to water, as reported by a committee of six which has been engaged during the past fifteen months in studying the causes of disintegration of concrete in various installations. He sees the possibility of some shaft linings being subjected to hydrostatic pressure of several hundred feet head.

He claims that practically 90 per cent of disintegration is due to the effect of frost on moisture in porous concrete, which is caused by improper proportioning of the mix and improper handling. Voids must be filled with an impermeable cement paste, which is possible only when a low water ratio is used and the paste is thoroughly manipulated. Coarse aggregate when used in large quantities, tends to segregate and produce a weak concrete.

Carl Weber, of the Weber Engineering Corporation, New York City, blames most failures upon cost-shaving, which he thinks is responsible for the construction of linings of less thickness and strength than are actually required. He has spent four years in the study of concrete linings in European countries. There, failures are almost unknown and there, also, he has seen one concrete shaft which, though forty years old, shows no signs of weakening. The shafts are of circular section and the linings are built thick. He would like to see this country follow this practice, and he doesn't see why we stick to the rectangular section which is the weakest of all the sections in use. Drawn out by a question by Mr. Hopkins, Mr. Alford stated that seven or eight of the thirty failures in his survey were in elliptical shafts.

Howard N. Eavenson believes that freezing of water within the shaft must cause most of the trouble because few failures of shafts at southern West Virginia mines have been noted whereas Somerset County, Pennsylvania, where the winters are severe, is believed to have had more failures than the western part of Pennsylvania. Protection against water is imperative. He doubts whether concrete, by and large, will last as long as wood in shaft linings judging by present indications. He feels that concrete will not do and looks to brick and wood as alternatives.

Mr. Watson believes in monolithic construction where possible, and in extending the present limits of sections where concrete structures must be built in stages. He has cast a 25-ft. high monolithic pier, embodying 175 cu.yd. of concrete, in 10 hr. He inquired as to the height of sections poured as monoliths in the construc-



This Shaft Sunk on Edge of Sunny South

Shaft sinking at No. 261 or Caretta mine of the Consolidation Coal Co. H. N. Eavenson declares that failures have been few in the southern West Virginia mines because the frost to which they are exposed is less severe than in more northern climes.

tion of shaft linings and was told that 5-ft. sections are poured in general practice. He thinks the section should be increased to as much as 25 ft. When told that the forms would not stand the pressure created by sections of that height, he countered with the suggestion that the forms be made strong enough.

W. A. Weldin, consulting engineer, Pittsburgh, Pa., noted that nearly all of the concrete failures reported by Mr. Alford were in downcasts. For every downcast there is likely to be an upcast the lining of which has not been reported as having failed. For this reason freezing must be looked upon as the all-important agent of destruction and hydrostatic pressure and bending movements should be regarded with less seriousness. The fact that the linings of shafts sunk in the earlier days, when the use of water rings and bleeder pipes was universal practice, have failed to a lesser extent than those of a later period is proof that shaft linings must be completely drained. Road paving in former years met with the same relative failure until rich mixtures were employed.

RELINING TIMBER SHAFT WITH CONCRETE

The H. C. Frick Coke Co. was represented by A. E. Duckwall. His company has thirty-seven concrete-lined shafts of which nineteen are downcasts and eighteen upcasts. The latter are more or less wet but none has failed. Of the nineteen downcasts, however, eight have failed. Six of these were constructed before 1921 and two after. He believes in relining timbered shafts with concrete though the cost of the latter is about 15 per cent more. Timber lasts about ten years in the coke region; one concrete shaft has been in since 1908. His company uses "fluxite," a compound which makes the mixture more plastic with the use of less water.

C. H. Dorsey, of the R. G. Johnson Co., shaft and slope contractors, would substitute brick for concrete in the lining of shafts at a 50 to 75 per cent greater cost. Water would tend to seep through the joints between the bricks, to be sure, but proper drainage would minimize the water trouble and the bricks (vitrified) would not spawl. Carl Weber does not favor the use of brick, partly because of the difficulty of getting a good setting but chiefly because frost might penetrate to a depth equivalent to the width of the face bricks.

F. A. McDonald, general superintendent of the National Mining Co., used brick in the relining of one of his failed shafts because only by this means could the job be completed with continued operation of the mine. In putting in the brick lining particular attention was paid to drainage although no great quantity of water was encountered. A comparatively small flow of water, however, is ultimately as serious as a large influx. He has made use of boreholes, located 4 or 5 ft. from the lining with rather satisfactory results, as a means of back-draining. He leans toward the use of concrete in preference to brick.

The Hillman Coal & Coke Co. has four concrete-lined shafts, sunk by contract, in which no failures have been noted. M. E. Haworth, chief engineer of this company, stated that a possibility exists that stresses may be developed in a shaft lining greater than those which concrete will stand.

Mr. Hopkins called attention to the possibility—which may be unlikely but which will bear investigation—of concrete in shaft linings failing by crushing due to the absence of expansion joints.

Some pointed remarks were made regarding the mixtures of concrete used in the linings which were reported in Mr. Alford's survey as having failed. These mixes varied from 1-3-5 to 1-2-4. A. C. Irwin, of the Portland Cement Association, claims that a 1-2-5 mix is not concrete. He cautioned against the use of a high water ratio and decided that the proportioning and handling of concrete in the lining of shafts must be changed since past practices have not produced an impervious concrete. E. T. Gott, Dravo Contracting Co., said that a 1-2-3 mix is coming in place of the 1-2-5 mix.

Mr. Gott mentioned the use of back-lining to stop the inflow of water into a shaft. His company sunk a shaft to a salt deposit near Detroit. The strata made several thousand gallons of water an hour during the sinking operations. By using a steel-plate jacket on the outside of the lining it was possible to cut down this inflow through the lining to 7 gal. per hour.

Mr. Weber says it is "all right to recommend" rich mixtures but the plan is of no avail without rigid inspection. This is difficult to obtain. Integral water-proofing compounds should be used. Percolation, in any case, is hard to stop.

Someone asked whether any way has been devised to mend a spawled lining without pouring a new face—an expensive procedure that often gets doubtful results. Mr. Weber answered that the cement projecting machine offers the only known solution of this problem.

Mr. McDonald wondered whether slope linings are subjected to the same action as shaft linings. Mr. Alford remarked that two concrete slopes included in his survey are giving satisfactory results. Mr. Weber suggested the use of clay for grouting in some cases. He told of having applied two years ago a mantle of clay over a concrete slope lining at the Langeloth mine of the Langeloth Coal Co., Burgettstown, Pa., which thus far has sealed off water from the concrete. Apparently slopes can be drained easily.

USE GROUTING TO AID SINKING

In his paper Mr. Alford stated that his survey includes no reports of successful grouting operations. Grouting in one or two cases under Mr. Eavenson's observation has done no more than to chase water from one point of contact with the shaft lining to another. Grout injected through the lining of one shaft near Welch, W. Va., traveled 3,000 ft. and plugged water wells. At another shaft 1,600 sacks of cement were used in a grouting operation which did not entirely stop the flow. Several other men presented views which substantiated the conclusions that grouting should be used only as an aid to sinking.

Mr. Weber parried the condemnation of grouting which had been made by other speakers. Watery grout is not grout. It should be a plastic material applied under heavy pressure. He knows of one European circular concrete shaft 2,700 ft. deep which has been so successfully grouted as to stop all flow from strata bearing much water. The long Swiss tunnels have been made waterproof by grouting.

Mr. Weber drills grout holes at such an angle as to pierce a water-bearing stratum at a point some distance outside of the periphery of the shaft. He extends the grout as much as 40 ft. radially outside of the shaft and uses pressures up to 400 lb. In grouting lined shafts he works from the bottom up. "Grouting should not be a gamble" is his conviction.

Coal Mining Institute of America Plans Important Meeting

UNDERGROUND COAL LOADING, mine timbering and new systems of coal mining are the principal subjects in the program arranged for the thirty-ninth annual meeting of the Coal Mining Institute of America at Pittsburgh, Pa., Dec. 9, 10 and 11. This meeting of mining engineers and others directly interested in the technical problems of coal production is expected to attract its usual large attendance of men from all over western and central Pennsylvania, parts of West Virginia and nearby coal regions. A great many questions that vex those engaged in actual operation of mines will be given full treatment at question box sessions. This program is topped off by a banquet at which Scott Turner, the new director of the Bureau of Mines, will speak.

The program in detail for the two-day meeting and the trip to the experimental mine follows:

WEDNESDAY, DEC. 9

Morning Session, 9 a.m.

Reports of the executive board.

Secretary-treasurer's annual report.

(Including list of deceased members for 1925)

Election of new members.

Election of six new tellers (for 1926).

Report by president on mail ballot.

Election for new officers for 1926.

Address by President Nicholas Evans.

Appointment of resolutions committee and auditing committee by the president.

GENERAL DISCUSSION ON COAL LOADING MACHINERY

Paper No. 1: "Coal Loading Machinery, Its Actual Accomplishments to Date," by Walter M. Dake, Franklin, Pa., consulting engineer of the Joy Machine Co. (Accompanied by lantern slides.)

Paper No. 2: Same subject as above by Charles C. Whaley, Myers-Whaley Co., Knoxville, Tenn.

Afternoon session, 1:30 p.m.

Motion Picture: "The Making of Wire Rope," showing the complete process, by John A. Roebling's Sons Co., Newark, N. J. (Through the courtesy of Frick & Lindsay Co.)

QUESTION BOX

Leader—Richard Maize, Uniontown, Pa.

Question No. 1: "What new work has been done in recent years to prevent or reduce mine accidents?" From Pittsburgh, Pa.

Question No. 2: "Do prize competitions in first aid work, as now conducted, defeat the purpose intended, by laying too much stress on the development of crack teams, rather than general training for the mass of employees?" From Grindstone, Pa.

Question No. 3: "With coal lands at the maximum price per acre (in the coke region) is it economical to leave a water barrier of 100 ft. of coal adjacent to a worked-out mine which lies at a higher elevation?" From Pittsburgh, Pa.

Papers No. 3 and 4: "Coal Loading Machinery, Its Actual Accomplishments to Date," by E. H. Johnson, Columbus, Ohio, consulting engineer for the Coloder Co., and John M. Christline, Ford City, Pa., consulting engineer for the McKinlay Mining & Loading Machine Co. of Point Pleasant, W. Va.

ANNUAL BANQUET

at 6.30 p.m.

At McCreery's store (ninth floor), Corner Sixth Ave. and Wood St. Toastmaster—President Nicholas Evans.

The speakers will be Jesse K. Johnston, Bolivar, Pa.; Director Scott Turner, U. S. Bureau of Mines, Washington, D. C.; Col. C. H. Birdseye, U. S. Geological Survey, Washington, D. C.

THURSDAY, DEC. 10

Morning Session, 9 a.m.

General Discussion on New Systems and Phases of Coal Mining Practice

Paper No. 5: "Recovery of the Big Vein Pillars in the

Georges Creek Region," by Dr. J. J. Rutledge, chief mining engineer, Maryland Bureau of Mines, Baltimore, Md.

Paper No. 6: "Modern Practice in Underground Substations," by C. H. Matthews, mining engineer of the Westinghouse Electric and Mfg. Co., East Pittsburgh, Pa.

QUESTION BOX

Leader, Wm. L. Affelder, Pittsburgh, Pa.

Question No. 4: "Is the arcing of electricity between steel rails and steel ties likely to cause a mine fire?" From Pittsburgh, Pa.

Question No. 5: "What items should be entered on a coal company's cost sheet? What constitutes what is known as strictly operating cost?" From Huntington, W. Va.

Question No. 6: "Discuss ventilation in single entry work. What is the best method especially where new methods of mining are being tried out?" From Baltimore, Md.

AFTERNOON SESSION, 1 p.m.

General Discussion on Mine Timbers

Paper No. 7: "Our Mine Timber Supply in Pennsylvania, Also in Other Coal Producing States," by Prof. H. S. Newins, department of wood utilization, State College, Pa.

Paper No. 8: "What Some Coal Companies Are Doing to Replenish the Mine Timber Supply," by Newell G. Alford, consulting engineer, Pittsburgh, Pa.

QUESTION BOX

Leader, Thomas G. Fear, Indianola, Pa.

Question No. 7: "What is the best practice for the blasting of coal for mechanical loaders? Do they have any decided effect on lump coal?" From Uniontown, Pa.

Question No. 8: "Is scientific management applicable to the coal mining industry and is there anything the coal mining industry should learn from manufacturers?" From Thomas, W. Va.

Question No. 9: "Is it safe practice to use open lights in so-called non-gaseous coal mines?" From Pittsburgh, Pa.

Treatise by J. E. Tiffany, U. S. Bureau of Mines.

FRIDAY, DEC. 11

Inspection trip to United States Bureau of Mines Experimental Mine, Bruceton, Pa., in charge of Managing Directors J. W. Paul and A. C. Fieldner.

The program for the visit at Bruceton will include the following:

Experimental mine

1. Inflammation of coal dust by open flame and by electric arc.

2. Explosion of coal dust ignited by natural gas, and stopped by rock dust.

3. Demonstration of rock dust barriers.

4. Demonstration of coal dust explosion in small portable field gallery.

5. Gas ignition in 12-in. steel tube showing slow propagation when lighted at open end.

Explosives section

1. Permissible explosive shot in large gallery in presence of coal dust.

2. Black powder shot in gallery with coal dust.

3. Ignition of keg of powder by electric current.

Safety service

1. Rescue crew with three types of breathing apparatus enter mine after explosion, followed by men with all-service gas mask and safety lamps.

2. Rescue crew obtains sample of air for analysis by gas chemist.

3. Gas mask man carries CO detector and tests air and reports. Give explanation of the CO detector.

4. Show workings of Burrell gas detector and test sample.

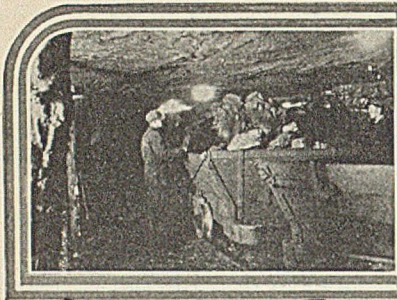
Exhibits

Breathing apparatus, CO detector, Burrell gas tester, Orsat apparatus.

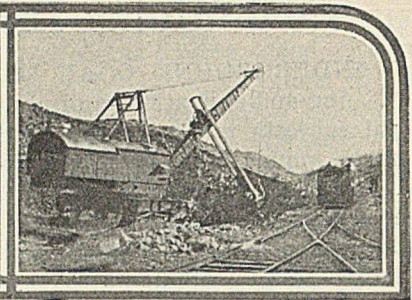
Flame Lamps—Wolf and Koehler.

Electric Lamps—Edison, Wheat, Concordia, Eveready Flash lamp.

Shot-firing Equipment—Davis, duPont, MSA, Eveready.



News Of the Industry



Operators Reject Pinchot Plan To Terminate Anthracite Strike; Lewis Is Willing to Negotiate

Insisting that the bases suggested offered no ground for a permanent settlement, the anthracite operators, at a meeting in Philadelphia on Monday of this week, flatly rejected a program for a renewal of negotiations to end the hard-coal suspension proposed by Governor Pinchot of Pennsylvania last Saturday. The United Mine Workers had already rejected one plank in the Governor's platform which called for an immediate resumption of mining, but had agreed to again meet with the operators and discuss the formulation of a new wage contract along the lines laid down by Mr. Pinchot.

The operators in their rejection denounced the Pinchot program as a policy of expediency to which they could not subscribe. They also outlined the terms upon which they were ready to resume negotiations. These terms, submitted to the miners a fortnight ago through an intermediary, rumored to have been W. A. Glasgow, counsel for the United Mine Workers, called for an immediate resumption of mining, the submission of any points upon which agreement could not be reached within 30 days after negotiations had been started to an arbitration board, and a five-year contract, subject to annual revision—if necessary—through direct negotiation and arbitration.

The Pinchot proposals came as the climax of a week of secret conferences and rumors. The operators started with a meeting at Philadelphia on Nov. 23, but no change from the position outlined in the preceding issue of *Coal Age* was announced. The following day a fillip of mystery was added to the proceedings when Mr. Lewis and Alvan Markle, chairman of the joint scale conference at Atlantic City last summer, conferred for several hours at the Union League Club in Philadelphia. Neither would discuss the subject of the conference, although Mr. Markle denied that it had any significance in so far as the present suspension was concerned. Late that same evening, however, Mr. Lewis wired District Presidents Golden, Cappellini and Matthey to meet with him and Vice-President Murray and Secretary Kennedy in Philadelphia the following day.

On Wednesday the Governor, who had twice summoned Mr. Lewis and Major Inglis to private conferences, again called in the leaders of the two sides. Once more the veil of silence

descended, but it was rent two days later when publicity was given to the fact that the Governor had asked the scale committees to meet with him at Harrisburg on Saturday afternoon. This invitation the operators declined on the ground that it was impossible to assemble their committee on such short notice. Their position was made known in a telegram from Major Inglis to Governor Pinchot, reading as follows:

In reply to your telegram, received late yesterday [Nov. 27], as I intimated to you over the telephone, I find it impossible to get the committee together for a conference at Harrisburg today. If you so desire, I will endeavor to arrange a meeting between you and our committee after Monday next to consider any proposition you may have to make. In my opinion, such a meeting is essential in order that we may know what you have in mind before entering into any joint conference with you and the miners' representatives. I think it advisable that any plan you have in mind be held confidential until both sides have had an opportunity separately to consider it.

Must Make Concessions

"Neither miners nor operators," said the Governor, "can expect, nor ought to expect, to see this strike settled on their own terms. Both must make concessions. If either side attempts to hold out against a reasonable settlement for mere pride of opinion, anxiety to save its face, or the determination to insist on some point too small to be weighed against the enormous losses of the public, it will justly be held responsible for those losses, and its condemnation will be as great as its offense."

The Governor declared that he was ready to propose a specific plan which he believed offered a basis for settlement with justice to all parties. The provisions of this plan follow:

- (1) The prices of anthracite coal shall not, by reason of the present suspension, or of this agreement or any part of it, be increased by the operators beyond those scheduled for the year 1925.
- (2) This agreement shall be for not less than five years.
- (3) A board of investigation and award shall be established under this agreement, and shall continue during the life thereof. It shall consist of two men chosen by the miners, two men chosen by the operators, and three others selected by the four thus chosen. All necessary expenses of the board shall be borne equally by the miners and operators.
- (4) The Board of Investigation and Award shall investigate and determine whether or not, all factors of cost being duly considered, the operators can reasonably pay an increase of wages without increasing the price of coal. If the board shall find an increase of wages without any increase of price is justified, such increase shall be paid in such amounts and to such

Commerce Commission Takes New Action on Coke Rates

The Interstate Commerce Commission, which several days ago canceled its permit to Southern lines to file tariffs establishing new rates on byproduct coke from Alabama to southern Michigan, has again reversed itself. A permit was issued Nov. 25 allowing the publication of such rates on five days' notice. The new permit, however, requires that the rates published under it shall expire Feb. 28 and makes the rate bases 75c. and \$1 per ton over Chattanooga, instead of 50 and 75c., as originally proposed.

Proponents of the new schedules declared they were actuated by a desire to relieve fuel shortages arising out of the anthracite strike. Opponents retorted that the Birmingham people wanted to get rid of an accumulation of coke thrown back upon them as the result of the loss of steel business.

The Commission also has refused to suspend tariffs reducing rates from Clairton and other western Pennsylvania byproduct ovens to stations in Pennsylvania, Ohio, Indiana, Michigan, New York and Ontario. Beehive interests had protested the publication of these rates.

classes of employees as the board in its award shall determine. If it shall not so find, no increase of wages shall be awarded.

(5) The Board of Investigation and Award shall meet and organize within thirty days and make and publish its award within six calendar months after it shall organize for business. Any increase of wages so awarded shall be in effect and date back to the day when the present suspension ends.

(6) The original records of both miners and operators shall be open to the Board of Investigation and Award for the purpose of enabling it to reach its decision, but the records shall not be made public in such manner as to enable the facts concerning any individual company or any local union to be separately known.

(7) When its award as to wages has been made, the Board of Investigation and Award shall forthwith proceed to investigate, determine and publicly recommend the most practicable and available method for avoiding suspensions of work in the anthracite mines and for assuring to the public an uninterrupted supply of anthracite coal. It shall also investigate, ascertain and recommend methods for increasing the efficiency and reducing the cost of operation of the mines.

(8) Full recognition of the union (the check-off) shall not be granted by the operators, but any operator shall honor the voluntary individual written request of any miner to assign the amount of his present union dues, not exceeding \$14 per year, and including neither fines nor assessments, as

assignment for house rent, coal, powder and other mining supplies, and delinquent taxes, as now practiced. (Such dues are already so assigned in certain anthracite mines.)

(9) The adjustment of working conditions, as specified in the demands of the miners, and any other matters not here specifically mentioned, shall be referred back to the representatives of the miners and operators for settlement.

(10) The Board of Conciliation, established under the Roosevelt settlement of 1903, shall proceed at once to equalize wages as agreed upon in the strike settlement of 1923. Wages shall not be reduced during the life of this agreement below those provided in the last agreement unless as the result of such equalization.

(11) The present suspension shall end and the mining of anthracite coal shall be resumed at once.

The miners, after a meeting Sunday, outlined their position in the following letter from Mr. Lewis to the Governor:

Conscious of the imperative public need which prompted your proposals to the anthracite operators and miners for adjustment of the present controversy, the mine workers' representatives have given to the subject the most profound consideration. It is obvious that the interests of peace in the anthracite industry require consideration by both sides in a spirit of compromise and mutual concession. The mine workers regard your proposals for a settlement as being representative of the public viewpoint, and have every sincere desire now, as before, to terminate a distressing situation which menaces public health and well being.

I am, therefore, authorized by the Tri-District Scale Committee of Districts 1, 7 and 9, United Mine Workers of America, to advise you that on behalf of our membership we accept the proposals made by you as a basis of settlement. We stand ready at any time to meet in joint conference with the representatives of the anthracite operators to negotiate an agreement which shall encompass the points set forth by you.

We further advise that promptly following such agreement upon the part of the anthracite operators we will arrange for a resumption of mining at the anthracite collieries at the earliest possible date.

Pinchot Praises Miners

Commenting on this letter, Governor Pinchot, who was in Pittsburgh at the time the miners' reply was handed to his secretary, praised the labor leaders warmly and declared that "the willingness of the miners to go without an increase of pay unless it can be granted without raising the price of coal to the anthracite using people of America sets a new high mark in wage disputes in the United States."

Formal notice of the rejection of his proposals was conveyed to the Governor in a letter signed by Major Inglis as chairman of the operators' negotiating committee. This letter read as follows:

Acknowledging your letter of Nov. 23, enclosing copy of the proposition which you laid before the meeting last Saturday afternoon and which you refer to the anthracite operators' committee for consideration:

As a first step, we have asked ourselves: Are the proposals you have submitted practicable? Will they end the present industrial strife in a way that will enable us for a long period of time to operate our mines, give employment to labor, hold prices at a reasonable level and give assurance of reasonable return on the investment? These questions are vital to the life of the industry, and the answer to them necessarily determines our answer to you.

You propose that prices shall not be increased and wages shall not be decreased for a period of five years, regardless of changed conditions. You suggest a board of investigation and award which, however, has power to do but one thing—increase wages. This is not arbitration and cannot be accepted as a substitute for real arbitration, in which proved facts would control.

You ask us to repeat the Jacksonville mistake of endeavoring to maintain high prices to pay high wages through the simple formula of writing these terms into a

Broadens Scope of Emergency Rates To Eastern States

About the time the anthracite operators were making known their rejection of Governor Pinchot's plan to end the strike the Interstate Commerce Commission at Washington announced further supplemental orders extending the scope of its decision opening up the New England and Middle Atlantic states to all-rail movement of coal from the Southern fields. The new rates, which are to become effective not later than Dec. 31, 1925, and expire April 30, 1926, are limited to prepared sizes (lump, egg and nut) and apply as follows:

(1) From all mines in the New River, Tug River, Pocahontas and Clinch Valley District No. 1 fields to all points in New Jersey and the New England states, other than destinations covered by original orders, rates \$1.10 above the Clearfield basis.

(2) Clinch Valley District No. 2 to Baltimore & Ohio, Pennsylvania and Long Island R.R. stations and to destinations covered under paragraph (1) the same basis as applic-

able from Pocahontas and Tug River.

(3) From all mines in the Kanawha, Coal River, Logan, Kenova and Thacker districts to all points on B. & O., P. R. R. and Long Island railroads covered by original order of July 22, 1925, and to all points in New Jersey and the New England states, rates not more than 25c. per ton above the New River-Pocahontas basis.

(4) From all mines on the Big Sandy division of the Chesapeake & Ohio Ry. in Kentucky to destinations described in preceding paragraph, rates not more than 40c. above the New River-Pocahontas basis.

(5) Semi-anthracite from McCoy and Merrimac, Va., on Virginian Ry., and Pulaski to Vicker, Va., inclusive, on Norfolk & Western Ry., rates not exceeding rates on Pocahontas coal to destinations embraced in paragraph (2).

The Commission, however, declined to extend the application of these rates to the movement of mine-run all-rail.

contract. An arrangement involving agreement on prices is clearly illegal. Furthermore, no producer of any commodity could in good faith bind himself to such a proposal. Prices are controlled by the law of supply and demand and cannot be maintained at artificial levels by arbitrary agreement.

You further propose that the board is to pass on the profits of the industry, and that irrespective of whether wages are just and fair, if profits permit, wages shall be increased. Without comment on the unsound theory that profits should fix wages (a theory that would operate against the employee as often as against the employer), it seems to us that it would have been more logical to suggest that if profits are excessive and labor well paid, prices should be reduced.

The check-off, condemned in principle by the Roosevelt commission in 1903 and refused by the Wilson commission in 1920, you now suggest that we accept by another name. By any name it is repugnant to reason and justice and a barrier rather than an aid to sound industrial relations. In theory only would assignments be "voluntary." In practice the system would result in coercion and intimidation. The check-off would not eliminate strikes, for the real effect would be to substitute the strike to force voluntary assignments for the "button strike" heretofore employed to force union membership. The confirmation of this lies in the finding of a federal court within the past few weeks that "the check-off system and its provisions are to prevent all non-union men from working in union mines and compel all workmen to become members of said organization, so that said organization shall have an absolute monopoly of all labor engaged in such industry."

Only on the ground of misunderstanding our seriousness of purpose and our desire to reach conclusions of lasting benefit can we account for proposals that so completely fail to meet the necessities of the situation. We note that your plan is satisfactory to Mr. Lewis and his associates. This is not surprising. Naturally, he agrees to the check-off and to continuation of high wages which can be further increased but not decreased by "arbitration."

Your telegram emphasizes the fact that you found it necessary to go ahead with a public meeting because of the extent to which the matters in controversy were charged with public interest. It is for that very reason, and because of the unwarranted increase imposed on the industry

through your mediation two years ago, that the operators are now proceeding with the caution that the seriousness of the situation demands. We are not unmindful of the public interest, for that interest and the future welfare of the industry are so closely allied that disassociation is impossible. In striving for a settlement that shall provide for extended peace and for effective machinery to adjust wages, should economic conditions require, we are fighting for the rights of the public as well as those of the industry.

Two weeks ago, through an intermediary who came to us, we offered Mr. Lewis the following proposal:

(1) An immediate return to work at wages paid prior to the suspension.

(2) A resumption of negotiations to consider any modifications of the expired contract that might be urged by either party.

(3) A new contract for not less than five years to be formulated and signed. Any matters in dispute and not disposed of within thirty days after the resumption of negotiations to be referred to a board for settlement.

(4) The board to be composed of two operators, two mine workers and three persons, in every sense impartial, to be appointed by the Chief Justice of the U. S. Supreme Court, the Chief Justice of the Pennsylvania Supreme Court, and the presiding Judge of the U. S. Circuit Court of Appeals for the Third Circuit.

(5) Either party to have the right, once in twelve months—but not oftener—to ask for a conference to reconsider any of the terms of the contract. Matters still in controversy thirty days after the convening of any conference, to be referred to the board for settlement.

Here was a proposition for immediate resumption of work, under the terms of the expired contract, while the parties made one more attempt to reconcile their differences, and with provision for settling any disputes that could not be settled by negotiations. It made no restrictions, but left open to determination, based on the facts, all matters in controversy. Mr. Lewis summarily rejected it.

It is only on some basis that recognizes facts as the controlling influence that this controversy can be satisfactorily settled. The substitution of expediency is a policy to which we cannot subscribe. It is impossible for us to find in your proposals the basis of a sound and lasting settlement, and for the same reason they cannot be considered as a basis for conference and negotiation.

Coal-Mine Accidents Kill 141 in October; Rate Still Declining

Accidents in the coal-mining industry of the United States in October, 1925, caused a loss of 141 lives among the employees, according to information furnished by state mine inspectors to the United States Bureau of Mines. One man was killed by fall of rock in an anthracite mine; all of the other fatalities occurred at mines producing bituminous coal. The October fatality rate for bituminous mines was 2.63 per million tons as compared with 3.03 for September and 2.89 for October last year. The output of bituminous coal in October was 53,203,000 tons.

During the first ten months of the current year, the production of bituminous coal was 419,371,000 tons while the anthracite output was 61,741,000 tons, including about 120,000 tons obtained from dredges. The 10-month fatality rate per million tons for bituminous mines was 3.26 as compared with 4.12 for the same period last year; the anthracite rate was 6.30 for the present year as against 5.46.

Current records covering "major" disasters, that is, disasters in which 5 or more lives were lost, show 10 separate accidents with an aggregate loss of 198 lives in 1925 as compared with last year's 10-month record of 9 separate accidents with a total loss of 452 lives. The per-million-ton death rate for both anthracite and bituminous mines based exclusively on these major

Serve Dinner to Twelve In Firebox

What is said to be the largest powdered coal burner in the world was completed recently at the Post Street heating plant of the Puget Sound Power & Light Co., Seattle. The firebox is 18 ft. long, 12 ft. wide and 16 to 20½ ft. high. Upon completion of the installation, Chas C. Moore & Co., contractors, gave a banquet in the spacious firebox to officials of the power company. Covers were set for twelve persons and there was room for as many more.

disasters was 0.41 this year as compared with 0.96 during the first ten months of 1924.

An examination of the causes of the fatalities reported thus far in 1925 and a comparison of the record with that for January to October, 1924, shows slight reductions in the per-million-ton fatality rates for falls of roof, haulage and electricity and a much more notable decline for explosions of gas or coal dust. The rate for accidents from explosives remained unchanged. The comparative rates were as follows:

	Jan.-Oct., 1924	Jan.-Oct., 1925
All causes	4.328	3.649
Falls of roof and coal	1.830	1.779
Haulage	.618	.590
Gas or dust explosions	1.097	.557
Explosives	.174	.170
Electricity	.147	.137

British Producers Study American Methods

In order to study at first-hand American mining methods and equipment, in the hope of being able to adapt some of them to the solution of their own problems, a group of British coal producers are now touring this country. The party includes C. C. Reid, general manager, Fife Coal Co., Scotland; William Telfer, general manager, Coltness Iron Co., Scotland; S. Walton Brown, general manager, Seghill Colliery Co., Northumberland, England; M. J. Foggo, manager, Cannock Chase Colliery Co., Staffordshire; C. Howson, agent, Dorman, Long & Co., Durham; A. Robinson, manager, Simon Carves Co., Manchester; Mr. Grant, of the Evans & Reed Coal Co., Ltd., London; John S. Morris, chairman, D. L. Flack & Son, Ltd., London; Hugh Wood, managing director, Hugh Wood & Co., Ltd., Newcastle-on-Tyne, and C. Rogerson, Blantyre Engineering Co., Blantyre, Scotland.

For the purpose of observing the latest developments in American coal-mining machinery the Britishers will visit the producing fields of Pennsylvania, West Virginia and Ohio. They will be guests of the Bureau of Mines at the Pittsburgh Experiment Station, where a chemist of the British Mines Department is now engaged in research work under a co-operative agreement between the British and American mines departments, and also will inspect the low-temperature carbonization plant of the Ford organization at Detroit.

Coal-Mine Fatalities During October, 1925, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground										Shaft				Surface					Total by States							
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Explosion of gas or coal dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falls down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1925	1924	
Alabama	4		1		1		2					8	1				1								9	9	
Alaska																									0	0	
Arkansas																									0	0	
Colorado	3	1										4													4	3	
Illinois	5		2	1								8													8	10	
Indiana	7		2									9													9	6	
Iowa																									0	1	
Kansas																									0	1	
Kentucky	4	1										5													5	21	
Maryland	1											1													1	2	
Michigan												1														1	1
Missouri																									0	0	
Montana	1		1									2													2	0	
New Mexico																									0	2	
North Dakota																									2	1	
Ohio	4		1	2								5							1	1					2	10	
Oklahoma																										2	3
Pennsylvania (bituminous)	13	2	5						2			23													23	31	
South Dakota																										0	0
Tennessee	2											2														2	0
Texas																										0	2
Utah	2											2														2	2
Virginia	5											5														5	2
Washington	3		1	2	2							4														4	2
West Virginia	27		9	2	2			8	1	1	2	52						1					2		54	31	
Wyoming				1								1														1	2
Total (bituminous)	81	4	22	6	3		13		1	1	3	134	1				1	1	1	1		1	1	5	140	140	
Pennsylvania (anthracite)	1											1														1	39
Total, October, 1925	82	4	22	6	3		13		1	1	3	135	1				1	1	1	1		1	1	5	141		
Total, October, 1924	84	12	28	8	3		10		1	1	4	159	2		3		5	4	1	1		3	6	15		179	

1 Only one fatality, owing to strike in anthracite mines.

Lewis Letter Mystifies Washington; Attempt to Force President's Hand Is Likely to Prove a Boomerang

By Paul Wooton

Washington Correspondent of *Coal Age*

John L. Lewis' letter to the President caused a decided stir in Washington. No one seems to be able to fathom just what the move means. Mr. Lewis evidently concluded that the time was ripe to play a card, but apparently no one is able to figure out just what trick he expects to take. The letter itself has done nothing to unravel the complicated plot of the coal drama; on the contrary, it has added new suspense to the story.

In this situation full of uncertainties the greatest uncertainty is Mr. Lewis' mind. Seldom has a labor leader kept his own counsel so completely during a strike. To predict the outcome of his threat requires a knowledge of his plans, but no inkling of his strategy has leaked out. If he really means to call a soft-coal strike it is obvious that the best time would be later in the winter when the demand for anthracite will have reached its maximum.

Thus far the real pinch of the anthracite strike has not been felt. The first month of idleness was no more than enough to take up the usual thirty days' slack time in the working year. The second month was no more than enough to liquidate the heavy stocks built up in anticipation of the strike. The third month of idleness was enough to force some use of substitutes, but the real deficit does not begin to accrue until the beginning of the fourth month. December hardly is the time to play the trump card. Just why Mr. Lewis is fingering that card and threatening to play it at this time is not understood. It hardly can be with the thought of forcing the administration to try to pull his chestnuts out of the fire before Congress meets. The actual effect on the administration seems to be just the reverse. The Lewis letter is calculated to make the President more determined than ever not to intervene.

Lewis May Cut Himself

The thought is advanced that the letter may have been intended to influence the President's reference to coal in his message to Congress. If that was the object it is more likely to sharpen rather than blunt the expected recommendation that added powers be given the executive to handle emergencies in coal—the very thing to which the United Mine Workers object most strenuously.

Most of those who are following developments closely express the opinion that it is idle to speculate on the mental processes of the mine workers' president. It is apparent that he has added one more name to the illustrious list of those he has flouted. It is curious how one after another of public men with whom he has had to deal have had to abandon friendly co-operation for out-and-out opposition. These men found

that the United Mine Workers cooperate only when it is to their advantage.

The feeling is that the administration went far enough on behalf of the miners when it counselled the union employers against undertaking another fight with the union at the time the Jacksonville agreement was under discussion.

As this is written no intimation has been given out as to the nature of the reply which the President will make to the Lewis letter. It seems certain, however, that the President will reiterate that the enforcement of labor agreements is not a responsibility that he properly can assume. None will be surprised if he calls attention to the fact that the courts are the public agency to which parties to private contracts may appeal in cases of dispute. He is expected to add that if different relationships between the coal industry and the executive branch of government are desired an act of Congress must be enacted.

St. Louis Coal & Iron Co. Is Reorganized

The Midland Coke & Iron Corporation, St. Louis, Mo., a reorganization of the St. Louis Coal & Iron Co., has taken charge of operations, James Duncan having officially relinquished his post as receiver of the old company's affairs.

The new corporation, recently organized under a Delaware charter, has acquired the blast furnaces, coke ovens and byproduct plants at Granite City for \$3,000,000. The equipment originally cost the St. Louis Coal & Iron Co., \$40,000,000. The property was sold at auction Oct. 20 and was bid in by C. H. Hand, of New York, representing bondholders. To this equipment the corporation is planning to add \$3,000,000 in construction of a new blast furnace and power plant.

The officers of the new corporation are W. G. Maguire, of Chicago, president; M. D. Curran, St. Louis, vice-president; A. J. Mann, Chicago, treasurer; P. B. Nelson, Chicago, secretary, and L. A. Whitaker, St. Louis, assistant treasurer. Maguire and Mann held the same positions with the St. Louis Coal & Iron Co.

L. A. Busby, of Chicago, is chairman of the board, the other directors being John Henry Hammond, of Brown Brothers, New York; Alfred J. Kieckhefer, president of the National Enameling & Stamping Co.; C. D. Marshall, president of the Ritter Conley Co.; Breckinbridge Jones, chairman of the board of the Mississippi Valley Trust Co.; Clement Studebaker, president the Illinois Light & Power Co.; F. J. Lewis, James Duncan, George W. Buckingham and W. G. Maguire.

Output Mounts Steadily At Non-Union Operations In Upper West Virginia

There is a steady increase in the non-union coal loading in northern West Virginia and there is little doubt that the United Mine Workers have lost their fight in that field. The largest daily non-union coal production in the region since the strike began April 1 was reached Nov. 25, when 1,960 carloads was produced. This big total was partly due to heavy output on the Monongah Division, B. & O., which was 1,052 cars, and on the Monongahela Ry., which reached a total of 447 cars.

The union mines loaded 886 cars of coal in the first three days of last week compared to 833 cars in the corresponding period of the preceding week. The union tonnage is confined almost entirely to Scott's Run, where the mines have been loading from 250 to 260 cars a day. At present this is the only remaining union stronghold in the 12½ counties of northern West Virginia. Some of the mines that worked on a union basis in the heart of the Fairmont field, especially on the Monongah Division, B. & O., it is rumored, probably will start to work on a non-union basis at a later date.

While there is no great shortage of labor in the region there is a decided tightening up at some of the plants. In fact some of the mines report that many loaders have left the field.

Officials of the Consolidation Coal Co. report that steady progress is being made at the Monongah, O'Donnell and Wyatt mines, which were reopened recently.

Van Bittner, special representative of the United Mine Workers in northern West Virginia, took another fall out of the non-union operators at a mass meeting attended by 4,000 persons in Carmichael Auditorium, in Clarksburg, early last week.

"Not Really on Strike"

"The coal miners who were formerly employed by the Consolidation Coal Co., the Hutchinson Coal Co., the Clark Coal & Coke Co., the Bethlehem Mines Corporation and many other companies which abrogated their wage agreement are really not on strike," said Bittner, "but they are locked out, and with their wives and children are forced to undergo all the hardships of an industrial battle.

"If the United Mine Workers did nothing else but improve the conditions of safety in the mines of West Virginia, as they have in the mines of the Central Competitive Field, they have more than justified their existence. In the Central Competitive Field, the average number of men killed for the past 10 years per million tons of coal produced is 2.96, while in West Virginia, which has been principally non-union, the number of men killed per million tons of coal mined has been 4.87. In all the history of West Virginia mining, 1,546 coal miners have been killed by mine explosions in non-union mines (these include Monongah and Barrackville), while 41 men have been killed in mine explosions in union mines."

Court Annuls I. C. C. Decree Prorating Private Coal Cars When Rolling Stock Is Scarce

The U. S. District Court at Philadelphia held on Nov. 25 that the order of the Interstate Commerce Commission providing for a pro rata distribution of privately owned coal cars among bituminous mines in times of railroad car shortage was "unjust and unreasonable and an unlawfully arbitrary exercise of power." The decision annulling the Commerce Commission order came as the result of suits brought by railroads, steel, iron, coal, coke and public service companies numbering nearly one hundred, asking that the order of the commission be set aside. The suits were heard by Judges Victor B. M. Woolley, of Delaware; J. Whitaker Thompson, of Philadelphia, and W. H. S. Thomson, of Pittsburgh.

The order was issued in September, 1924, and though dates when it was to go into effect were announced from time to time and later deferred it never actually became operative, as it was to apply only when there were shortages of railroad coal cars.

The commission based its order on the legal conclusion that the "assigned car rule," as practiced by the railroads, was an unjust and unreasonable regulation and practice.

Attempts Regulation of Industry

The complainants contended that the order was beyond the scope of the commission's authority and the result of an erroneous conception of its powers. It was also contended that the order, in substance and intent, was an attempt to regulate the mining industry through distributing coal production ratably among all mines desiring to operate and that it deprived the plaintiffs of the value of their cars and of their right to have them used and operated in time of coal car shortage without compensation.

The opinion of the court, written by Judge Thompson, set forth that the right to the use of private cars was clearly recognized by the law, and that this "valuable legal right in the owner-

ship of private cars, in which sums of money amounting to millions of dollars have been invested, furnishes the only means by which car owners can procure an adequate fuel supply in periods of recurrent car shortage."

Decide Order is Unjust

"We conclude that the order of the commission is unjust and unreasonable and an unlawfully arbitrary exercise of power," says the decision; "that it undertakes by indirection to regulate the soft-coal industry in matters which do not constitute transportation service relating to commerce and are not within the regulatory power of the commission; that it assumes without authority of law to restrict the lawful right of the railroads to obtain by purchase or ownership of mines the supplies necessary to their operation in the service of the public; that the use of the railway fuel cars and private cars under the assigned car rule is not *per se* preferential; that there are not sufficient facts set out in the commission's report upon which to base findings of such discriminatory and preferential practices as to justify in this case; that it is confiscatory in violation of the Fifth Amendment of the Constitution in depriving the railroads of the use of their mines and the private car owners of the use of their mines and cars; that the order is, therefore, beyond the authority of the commission, without warrant of law, and null and void."

Under the prevailing system, which the court's order sustained, mines which own their coal cars are entitled to receive all of these and, in addition, an equal share of such railroad-owned cars as may be available on the system which serves them. If they are engaged in producing railroad fuel, they also are entitled to receive as many cars as the railroad requires.

The commission's legal representatives are expected to take an appeal from the decision and the question may finally be passed upon by the Supreme Court.

Industrial Coal Stocks Sufficient for 39 Days

Coal stocks in the hands of industrial consumers on Nov. 1 totaled 67,837,000 tons, or sufficient to last thirty-nine days at the October rate of daily consumption, according to an estimate by the National Association of Purchasing Agents. On Oct. 1 the estimated stocks were enough to last fifty days.

Coal consumption in October is estimated at 53,737,000 net tons, industrial activity having reached a new high level in registering an increase of 26 per cent over September. Bituminous-coal output in October was 53,528,000 tons, compared with 46,661,000 tons in September. Only 78,000 tons of anthracite was made available for consumption in October, however, as against 8,845,000 tons in August.

Navy Coal Bids Sought

Bids for supplying 80,000 gross tons of semi-bituminous coal from mines on the navy acceptable list for delivery at Hampton Roads will be opened Dec. 9 by the Bureau of Supplies and Accounts, Navy Department, Washington, D. C. The coal is for use of naval vessels, delivery to be made between Dec. 9, 1925, and June 30, 1926, in quantities as required. Proposals for less than the entire quantity required will be considered.

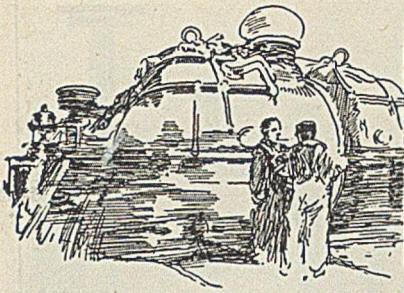
A practical reorganization of the executive departments of the federal government would make possible an annual reduction of \$250,000,000 in expenditures, Representative Wood, of Indiana, an influential member of the House of Representatives, believes. He thinks there is small prospect for Congress to agree on legislation specifying the exact form reorganization should take, but he feels there will be no great amount of objection to allowing the President more freedom of action in the grouping of executive agencies so as to obtain maximum efficiency.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of October

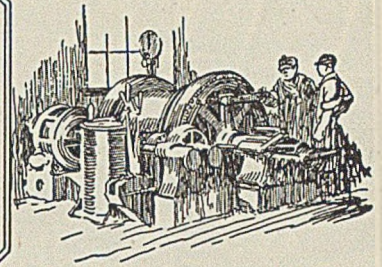
(In Net Tons)

Ports	Railroads	1925			1924			1923		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo.....	Hocking Valley.....	7,076,911	204,558	7,281,469	5,678,951	166,444	5,845,395	4,275,580	128,024	4,403,604
	Big Four.....	1,355,493	7,809	1,363,302	48,746	95	48,841			
	N. Y. C.-Ohio Central Lines.....	874,044	66,904	940,948	70,043	2,795	72,838	1,123,196	34,856	1,158,052
Sandusky.....	Baltimore & Ohio.....	2,825,528	84,769	2,910,297	1,790,827	54,773	1,845,600	2,491,822	73,702	2,565,524
	Pennsylvania.....	5,155,413	154,313	5,309,726	3,565,883	108,030	3,673,913	2,733,993	87,399	2,821,392
Lorain.....	Wheeling & Lake Erie.....	610,706	31,285	641,991	690,675	32,603	723,278	1,316,228	51,762	1,367,990
	Baltimore & Ohio.....	*1,212,417	134,060	1,346,477	1,830,823	140,255	1,971,078	3,113,444	170,299	3,283,743
Cleveland.....	Pennsylvania.....	336,838	154,324	491,162	1,333,028	166,168	1,499,196	1,625,999	179,898	1,805,897
	Erie.....	18,138	1,252	19,390	299,438	10,271	309,709	691,679	30,286	721,965
Fairport.....	Baltimore & Ohio.....	788,462	98,010	886,472	491,288	79,692	570,980	741,256	69,056	810,312
	New York Central.....	314,233	75,965	390,198	771,011	106,611	877,622	2,964,539	233,635	3,198,174
Ashtabula.....	Pennsylvania.....	664,144	79,630	743,774	1,023,545	71,712	1,095,257	1,859,006	81,373	1,940,379
	Beasemer & Lake Erie.....	1,064,204	198,465	1,262,669	1,430,385	188,575	1,618,961	2,446,562	214,030	2,660,592
Conneaut.....	Pennsylvania.....	265,933	52,274	318,207	584,639	75,862	660,501	596,461	78,816	675,277
Total.....		22,562,464	1,343,618	23,906,082	19,609,283	1,203,886	20,813,169	25,979,765	1,433,136	27,412,901
Storage Loading.....		133,017	1,048	134,065	182,060	4,940	187,000			

*Includes 42,005 tons cargo, 2,798 tons fuel dumped at Huron account fire at Lorain, June 12, 1925; also includes 3,631 tons fuel dumped over ore docks at Lorain. †Coal loaded into vessels in December, 1923, after close of navigation and forwarded from Lake Erie ports during 1924. ‡Coal loaded into vessels in December, 1924, after close of navigation and forwarded from Lake Erie ports during 1925. Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager.



Practical Pointers For Electrical And Mechanical Men



Old Mine Locomotives Are Fitted With Contactor Control

Lower peak loads and reduced maintenance are the principal advantages afforded by the application of magnetic contactor control to mine locomotives. These advantages apply in the greatest measure to heavy locomotives such as used on the main hauls. Many companies are now removing the old type controllers from the 10- to 20-ton locomotives and installing contactors.

The accompanying illustration shows a 15-ton locomotive at a Kentucky mine on which magnetic contactor control has been installed. On this equipment the reverse cylinder is manually operated and is combined in a common inclosure with the master controller.

On an old locomotive it may be a difficult matter to find suitable space for the contactors. In this instance, the contactors, or magnetic switches, are mounted just below the brake wheel and are protected by a box made of 1/2-in. fibre. The material was used because, due to lack of clearance, an insulating lining is necessary. The box can be opened for inspection of the contactors by removing the side next to the brake wheel. This section is unfastened

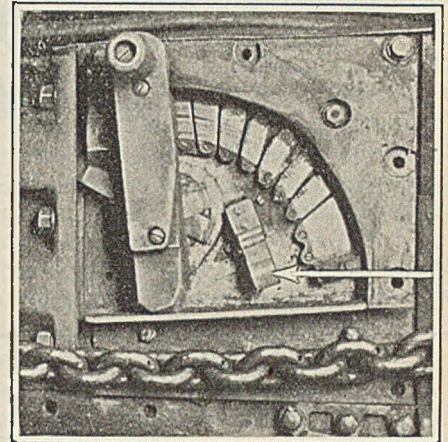
by pulling the pins out of the hinges.

The contactors of the control on this locomotive are not governed by the action of current-limiting relays, but directly by the hand-operated master controller. Fuses are eliminated on the locomotive. Protection against high demands and overloads is provided by an overload relay which is reset only by turning the controller handle back to the first point.

Adding a Finger Relieves Controller Trouble

Burning of the power stud has been a source of trouble with the open-type mining machine controllers used by the Island Creek Coal Co., of Holden, W. Va. L. D. Thompson, chief electrician of direct-current equipment, believes that he has "clamped the lid" on this particular "bug."

He has tried out and is now equipping all such controllers with an auxiliary contact which shunts the current around the power-stud contact when the controller handle is in the running position. A locomotive controller finger is mounted on the



Mining Machine Controller Is Greatly Improved

At the Island Creek mines trouble was caused by the burning of power-stud contacts on controllers. An extra finger, indicated on the illustration by an arrow, was added to the face plate, to provide a parallel path for the running current and all difficulty was removed.

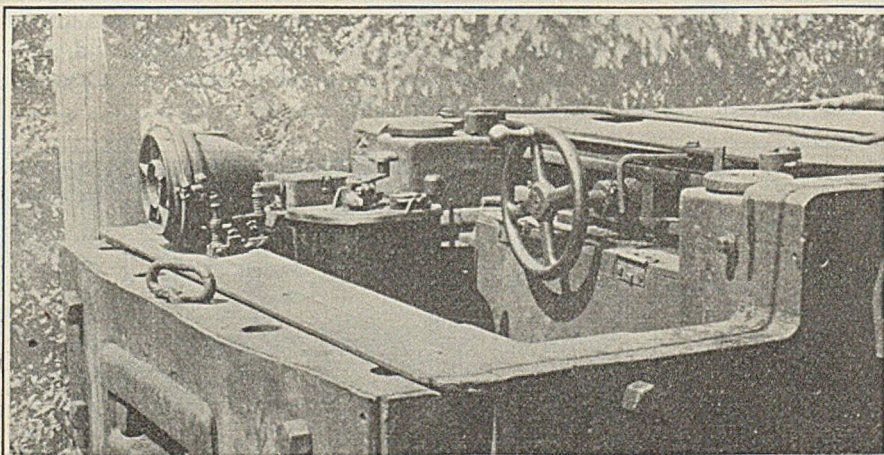
face plate near the last or running segment. This finger makes contact with the strap, on the under side of the handle, to which the controller brush is connected. On the back of the face plate a solid connection is made between the power stud and the contact finger.

This arrangement does not entirely relieve the power stud of carrying current. It must still handle the starting current, which, however, due to its short duration does not cause serious heating or burning. The operating current, which caused the trouble, is afforded a parallel path around the power-stud contact.

A Way to Make Bonds At the Mines

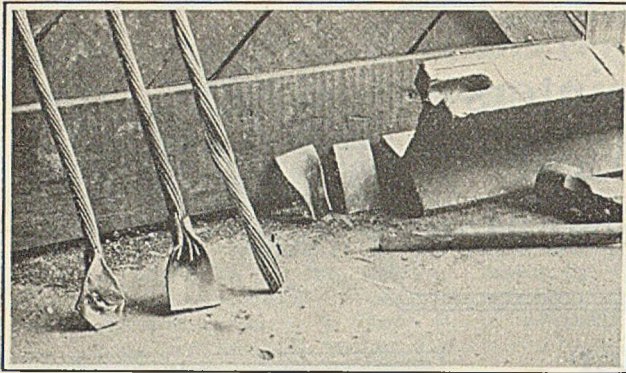
During the war we adopted the arc-weld type of rail bond for our mine tracks, but found that we were constantly being delayed in getting the bonds by slow shipment.

After some experimentation we developed our own bond, made from 19-strand 00 copper cable with a steel terminal oxyacetylene welded to the strand. The illustration shows the several steps in the process



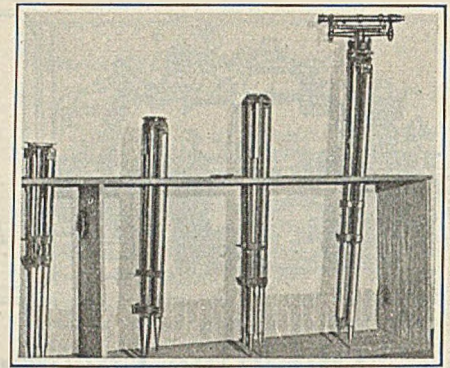
Contactors are Mounted in a Fibre Box Under the Brake Wheel

The original controller of this 15-ton locomotive has been replaced by a master controller and magnetic switches. The reverse cylinder is hand operated, and is in the same inclosing case as the master cylinder. Line fuses are replaced by an overload relay which is reset only by bringing the operating handle back to first point.



Home-Made Bonds

When shipments of material were slow and uncertain this method of making rail bonds was devised. Pieces of iron are bent into shape and then welded to the copper cable by means of an oxyacetylene torch.



Rack Safeguards Instruments

This instrument rack in the engineering department vault of the Fordson Coal Co., at Stone, Ky. is made up of ordinary 1-in. pine lumber 16 in. wide. In the top board, which is 30 in. above the floor, holes are provided for six tripods. These holes are 6 in. in diameter and are spaced on 18-in. centers. C. R. Bourland, chief engineer, believes there is sometimes less risk to an instrument left on its tripod in a suitable rack than to one removed from the tripod at the end of each shift and placed in its case or box, as is the common practice.

of making the bond, together with a somewhat primitive method of forming the terminal. This has since been abandoned for a hand-power press which shapes them more nearly to the finished size.

As we doubted the conductivity of these bonds at first, as compared with the factory product, we made

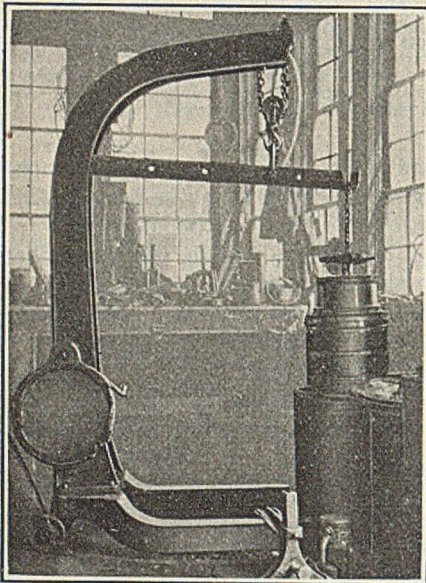
several hundred tests of them with a bond tester. We found that they had the same average conductivity as other bonds. Naturally, a saving in cost has resulted from this work.

R. R. SCHELLENGER,
Electrical Engineer.

Elkhorn Coal Corporation,
Wayland, Ky.

Special Jobs Are Handled By Boom on Crane

Use of a portable floor crane for certain jobs of shop work is im-



Holds Armature Out Over Tank

For special jobs where it is necessary to reach beyond the bed of a floor crane, a boom can be attached, but too much weight on the end of the boom will tip the crane. Use of such a device therefore, must be accompanied by the exercise of reasonable discretion.

practical because the bed of the machine extends several inches beyond the center line of the lift. The usefulness of such a crane for certain jobs, can be much increased by adding a boom such as that shown in the accompanying illustration. This photograph was taken in the central repair shop of the Fordson Coal Co. at Stone, Ky.

In this case a 2-ton portable floor

crane is being used to dip an armature. The boom is a 3x4-in. bar having a 14-in. extension beyond the hook of the crane. This extra distance brings the armature above the center of the tank when the front wheels of the crane bed are against its sides.

Like a floor crane itself, the boom is not a foolproof device. With it, only a certain fraction of the rated capacity of the crane can be lifted. The weight which can be handled without tipping the crane depends on the length of the extension beyond the hook.

Grouping of Supply Records Simplifies Work

It is only in unusual cases that a chief electrician in charge of maintenance of coal mining equipment has a clerk to take care of his files and records. Therefore, either because of lack of time or lack of experience in clerical work, he does not use "system" to any great ex-

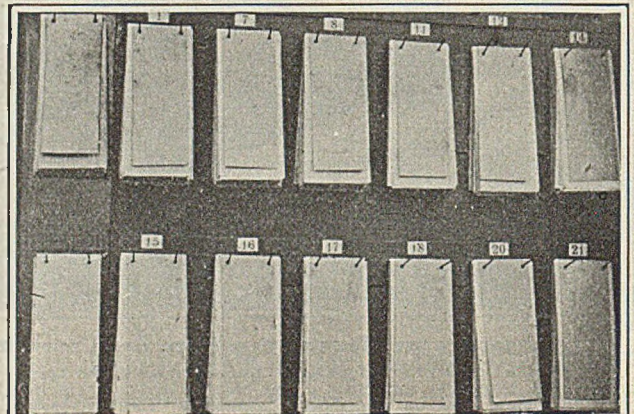
tent. There are, however, ways of systematizing the work without involving burdensome clerical work.

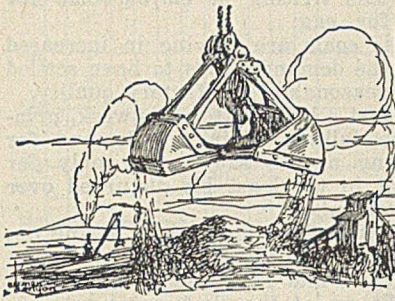
An example is the method which a chief electrician at a coal mining company's operation in West Virginia uses to keep record of repair material taken from the warehouse to the mines. Mounted on the wall near his desk in the electric shop he has a board on which copies of material orders are filed. A pair of finishing nails, a card bearing the mine number, and a heavy piece of cardboard, make up the file for each mine.

When orders are written repair parts for one mine only are listed on a single sheet. The carbon copies are then filed on the board in their proper places. The heavy pieces of cardboard placed on top of each file keep the sheets from blowing off. The orders, being filed consecutively as regards dates, it is quite easy for the chief electrician to "check up" on the quantity and character of material used at a certain mine during any period.

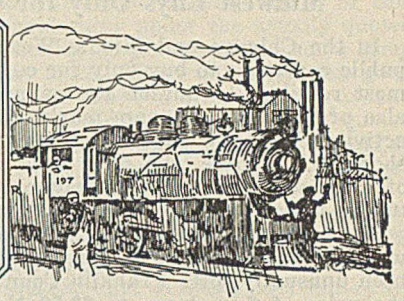
Easy Filing System

Carbon copies of all orders for repair-part material are properly grouped here so that it is a simple matter to learn how much and what kind of material each mine is using.





Production And the Market



General Softness Descends on Coal Market: Rumors Give Place to Action

Acceptance by John L. Lewis, United Mine Workers president, of Governor Pinchot's proposal to end the hard-coal strike and the operators' flat refusal to consider the Governor's plan were easily the outstanding events of the last week. President Coolidge has not as yet replied to the Lewis letter of Nov. 22 asking federal intervention in the soft-coal situation and reiterating his more or less thinly veiled threat of a general strike, but as Congress will convene next week Mr. Coolidge's message may embody the answer, to say nothing of the probable action of the legislative body itself.

Soft-coal production continues at almost record-breaking levels, and the market is absorbing the tonnage remarkably well, though prices, it is true, show a softening tendency under the influence of unseasonably mild weather and the virtual end of lake shipping, which always is an unsettling influence. Consumers in general are buying only for current needs and as a result some inducement sometimes is necessary to avoid demurrage charges, but even so "no bills" are in evidence.

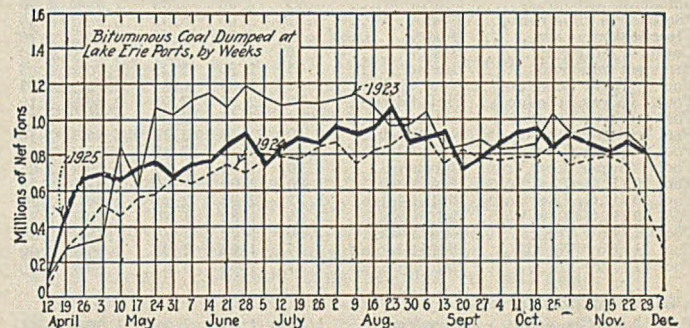
Scarcely a field or division of the trade escaped the continued reaction, West Virginia smokeless, Kentucky, Indiana, Illinois, southern and eastern Ohio, and central Pennsylvania coals of all sizes and qualities partaking in the decline. Business is fairly steady in the New York and Philadelphia markets, but in New England weak spots have appeared in the steam trade due to an absence of spot industrial demand. Liberal shipments off the Northwestern docks at Duluth and Superior are reported. The activity at Birmingham is keeping producers on the jump to keep up with requirements.

Transportation difficulties have been pretty well cleared up on the Louisville & Nashville R.R. Move-

ment of coal through the Cincinnati gateway last week totaled 14,318 carloads, which was 119 less than the previous week but 419 more than in the corresponding week of last year.

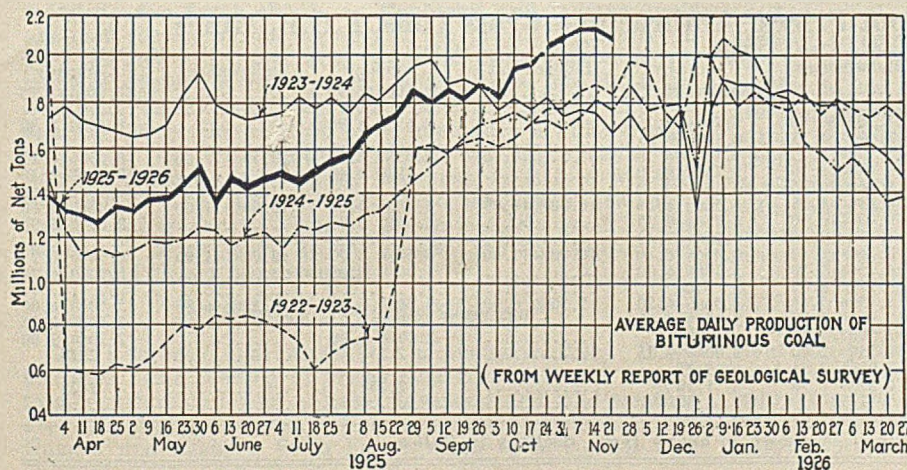
The inactive but expectant attitude of anthracite consumers has served to put a further crimp in the demand for coke, so that prices continued to show a declining tendency and output also has fallen off.

Output of bituminous coal in the week ended Nov. 21 is estimated by the Bureau of Mines at 12,624,000 net tons, compared with 12,167,000 tons in the previous week. Anthracite production in the week ended Nov. 21 was 46,000 tons, against 32,000 tons the week before.



Coal Age Index of spot prices of bituminous coal on Nov. 30 stood at 187, the corresponding price being \$2.26, compared with 192 and \$2.32 on Nov. 23.

Dumpings of coal at Lake Erie ports during the week ended Nov. 29, according to the Ore & Coal Exchange, were: Cargo, 769,446 net tons; steamship fuel, 35,978 tons—a total of 805,424 net tons, compared with 862,130 tons in the preceding week. Hampton Roads dumpings in the week ended Nov. 26 totaled 483,234 net tons, against 332,720 tons in the previous week.



Estimates of Production (Net Tons)			
BITUMINOUS			
	1924	1925	
Nov. 7.....	9,695,000	12,171,000	
Nov. 14.....	10,466,000	12,167,000	
Nov. 21 (b).....	10,910,000	12,624,000	
Daily average.....	1,818,000	2,104,000	
Cal. yr. to date..... (c)	423,265,000	456,339,000	
Daily av. to date.....	1,544,000	1,659,000	
ANTHRACITE			
Nov. 7.....	1,592,000	28,000	
Nov. 14.....	1,674,000	32,000	
Nov. 21.....	1,827,000	46,000	
Cal. yr. to date..... (c)	80,747,000	61,847,000	
COKE			
Nov. 14 (a).....	150,000	295,000	
Nov. 21 (b).....	158,000	283,000	
Cal. yr. to date..... (c)	8,531,000	9,064,000	

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

Midwest Buys Only for Current Needs

In the Chicago and Middle Western market the general public continues to buy only for current needs, thus forcing most retailers to pursue the same tactics. This situation also prevails in the steam market, where there is but little activity. Nobody pays much attention to the anthracite shortage, as those who have used up their current supply of hard coal and find they cannot procure any more have turned to coke and smokeless coals with satisfaction.

The domestic market is not so good this week; the weather has been fairly warm and the call for coal has been unusually soft. Franklin County operators, who raised the price of 6-in. lump to \$3.50 Nov. 18, have booked but little business on this new basis. It is only fair to say, however, that they gave their trade plenty of advance notice and consequently those retailers who were in the market bought at \$3.25 and so are taken care of for the time being.

Prices on smokeless domestic coals have fallen off sharply, as some good prepared smokeless lump has been offered as low as \$4.25 in the Chicago market. Egg continues to command a better price than lump, no doubt on account of the demand for egg from the East. West Virginia high-volatile coals also suffered a little decline, principally because the market in the East has not come up to expectations. The result is that plenty of good high volatile from West Vir-

ginia can be bought at this writing at \$2.75@3.25 for block and \$2.40@2.75 for egg.

West Kentucky domestic coals are moving in increased volume into Iowa, where the demand seems to have settled down for a cheap coal of reasonably satisfactory quality.

The steam market was just a little better this week, principally on account of the falling off in the demand for domestic sizes. Purchasing agents are buying only for current needs and are not in the least bit disturbed over rumors of strikes and walkouts.

In southern Illinois the demand for domestic is easing up, although lump is moving fairly well; egg and nut are somewhat hard to move, however, and some mines have even a few lump "no bills." Steam at the shaft mines also is slow and these mines are just about getting by with from three to five days a week. Movement of railroad tonnage from these mines in the last week has been fairly good, but there has been a slight car shortage at some points. Strip mines are getting full working time and an apparently ready market, although prices are uncertain. One thing that seems to be hurting shaft-mine steam sizes is the fact that the strip mines can crush better coal and undersell the shaft mines.

In the Duquoin and Jackson County field somewhat similar conditions exist both as to shaft mines and strip mines and working time is about four days a week. There has been no change in prices in southern Illinois with the excep-

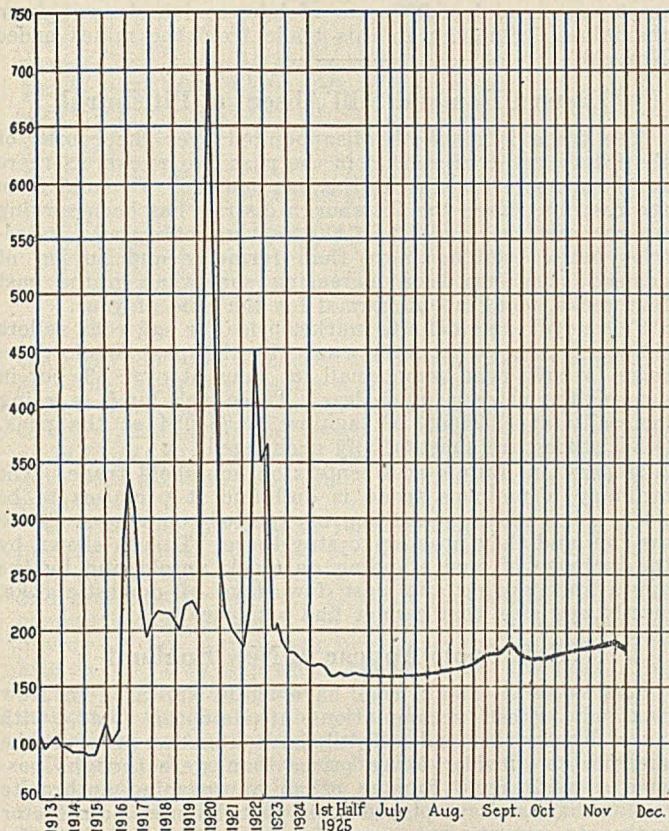
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Table with multiple columns for market types (Low-Volatile, High-Volatile, Midwest, South and Southwest), market names, and dates (Dec. 1, Nov. 16, Nov. 23, Nov. 30). Includes various coal grades and prices.

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

Table with columns for market names, freight rates, and dates (Dec. 1, 1924; Nov. 23, 1925; Nov. 30, 1925+). Lists various anthracite grades and their prices.

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



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

Index	1925			1924
	Nov. 30	Nov. 23	Nov. 16	Dec. 1
Index	187	192	190	171
Weighted average price	\$2.26	\$2.32	\$2.30	\$2.07

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

tion that egg went to \$3.50 and 2x3-in. nut to \$3.25 on the circular of some of the shippers, but someone must not be holding to the circular as much coal can be bought below the circular price. In the Mt. Olive field conditions apparently are good. The movement of domestic shows improvement, steam is doing better and railroad tonnage is moving well. Mines are working pretty nearly full time. In the Standard field it is the same old story of selling it at about cost and the mines are getting three to four days a week—sometimes five where they have contracts. Railroad tonnage is fairly good. All mines have "no bills" every night and only by strenuous work is the coal moved.

Domestic business at St. Louis is fairly good, especially for middle grade and Standard coals, but there is no unusual demand. Illinois high grade, which has been in good demand, is due for a slump, as Kentucky and Indiana coals are now coming in, on account of the price. Generally all over the field in the last week there has been a better movement of western Kentucky coal, which comes into St. Louis at about \$2.25 f.o.b. mine with a \$1.73 freight rate as against Carterville at \$3.50 f.o.b. mine with a \$1.38 freight rate, and western Kentucky gives unusual satisfaction. Country domestic is not good inasmuch as it is a weather proposition. Locally anthracite and smokeless are slow. Coke is fairly active. Country steam is fairly good. Local carload is about equal to the demand at this season and wagonload shows improvement.

Kentucky a Shade Weaker

The Kentucky coal market is a shade weaker. There has been some shading of prices over the week, due in part to a considerable let-up in Lake movement and mild weather over the Central states. A considerable tonnage in the Hazard and Elkhorn fields hasn't much of a market now

that the bulk of the lake movement is over. Some of this is reported as offered considerably under the usually quoted market, block being obtainable as low as \$2.75; some lump at \$2.50 and some egg at \$2.25. Most quotations on good grades of Harlan, Hazard and Elkhorn 4-in. coals are around \$3.25@\$3.75, with some of the specialty coals still quoted at \$4@\$4.50. Egg and 2-in. lump are weaker, however, at around \$2.50@\$2.80 in some instances, as these sizes are generally in good movement to the lakes.

Screenings in eastern Kentucky are just a shade weaker, at \$1.20@\$1.50. Eastern mine-run is firm at \$1.50@\$1.75. In western Kentucky the market is very steady with block at \$2@\$2.25; lump, \$1.75@\$2; egg, \$1.35@\$1.50; mine-run, \$1.25@\$1.50; screenings, pea and slack, 65c@80c.; 2-in. nut and slack, 80c.@95c., with some at \$1.

There are now some "no bills" in both fields, and not much complaint is being heard just now about car shortage. Jobbers report that instead of having to hustle to find coal they are having plenty of it offered to them.

Northwest Still Busy

Dock operators at Duluth and Superior are still making liberal shipments, though the tonnage is much less than in late October. Industrial plants have been the best buyers of steam coal in the last ten days, though some of the iron-mining companies and utilities have been making contracts.

Retailers' supplies are running low. Demand for Pocahontas and other smokeless substitutes for anthracite is the feature, but stocks of these coals on the docks are ample so that former anthracite consumers are not worrying over the probability that hard coal stocks will be practically cleaned up by the middle of January.

In the face of the heavy demand the docks are quoting Pocahontas nut and stove at \$8.50; lump and egg, \$9; mine-run, \$5.25@\$5.50; screenings, \$4.25. Three of the docks have received cargo shipments of prepared sizes of Pocahontas and have thus been able to fill orders promptly but plants that have been forced to screen mine-run have found their facilities for handling prepared-size orders inadequate. Other coals are being held exactly where they have stood since early last summer and no changes are looked for in the near future.

Bituminous coal is still moving this way in good volume from the East, twenty-three cargoes having been unloaded at the docks last week and nineteen cargoes were reported en route. Supplies on hand are about 5,500,000 tons, of which around 2,000,000 tons belongs to railroads.

Milwaukee coal-dock managers report a quiet trade, with demand fluctuating with the weather. Consumers are wrestling with the fuel situation without loud complaint. The domestic turn from anthracite because of its absence is largely to Pocahontas of nut size, but there also is a noticeable demand for West Virginia and Kentucky bituminous coal. The weather continues sharp for the season, and household furnaces are going almost at winter gait. In November up to the 27th Milwaukee received by cargo 379,130 tons of bituminous coal. Prices are steady.

Kansas Catching Up on Orders

After more than a week of mild weather, operators in the Southwest have cut down their unfilled orders for Kansas lump to three or four days, but so responsive is the market to weather changes this season that only a few days of freezing temperature would throw the mines back two or three weeks on deliveries. Nut and mine-run production is just about equal to the demand, while screenings are easy, though no surplus is reported in the field. Owing partly to railroads using more shovel coal this year than formerly the production of shaft screenings is lighter than in other years.

In Arkansas, also, there has been a slackening of demand because of the weather, with an increased production as new mines have opened. Arkansas semi-anthracite lump is quoted at \$6@\$6.50; mine-run, \$2.75@\$3.50; screenings \$2.25.

In Colorado the demand for domestic coal shows no abatement and prices that compare favorably with the war-time level continue to be maintained. As the labor situation is improving and there are no transportation difficulties the trade is optimistic over the situation.

Operators and dealers in Utah complain that business is

not as good as it ought to be at this season of the year. Demand for coal for heating purposes is better than it was, but with the exception of a few cold snaps which brought rush orders for a day or two, there has not been any weather to make a heavy and sustained demand. The call for steam coal is about normal. The car situation is good, prices remain steady, and there is no grade of coal on the market just now that is moving slower than the others.

Spot Tendency at Cincinnati Is Soft

Smokeless distributors in Cincinnati who issue a monthly circular name \$5@5.50 as the December price for lump and egg coal. This is in the face of the unsettling effect of the closing of the lakes. The spot market tendency is toward softness. Some New Rivers sold down to \$4.75. Mine-run is fairly firm with the general average at \$2.50. Some small sales have been made at \$2.25, but these mostly were for loads that had to be moved. Screenings hold up well, considering adverse market conditions, the range being \$1.85@2.

High-volatile domestic sizes have been struggling with a lull, mostly caused by too rapid stocking by retailers and mild weather. Some Kentucky coal has been offered at \$3 for block, the first time for weeks. West Virginia producers name a \$2.75 price. From this the quotations range up to \$3.25 for ordinary stuff and \$4.25 for specialized domestic coals. Egg sizings average around \$2.25, a drop of 50c. in the week. Mine-run is in better shape; gas, byproduct and steam holding their own. The surprise of the market is the way that slack holds to its price.

Car supplies on the Louisville & Nashville are better and the movement easier. There is practically a clear line between Cincinnati and the lower assembly yards. Total movement through the gateways of the Cincinnati district last week was 14,318 loads, a decrease of 119 cars as compared with the previous week but an increase of 419 cars over last year. River business continues at its usual seasonal gait.

Softness in domestic grades continues in Columbus, due largely to warm weather. Dealers are cancelling some orders placed for shipment late in November and early in December. Prices at the mines have softened to a certain extent, especially on smokeless and Ohio grades. Some splints are being offered at less than the usual prices also. Distress coal is having a bad effect on quotations. Retail prices have not declined as yet as dealers are still rather busy making deliveries on orders previously booked. Smokeless grades are not selling as briskly as formerly as the spread between Pocahontas and splints is too great for consumers and many former smokeless users are content to buy high-grade splints.

Dullness characterizes the steam trade in every way. Users are buying mostly for current needs, as reserves are generally good. Production in the southern Ohio field continues at about 30 per cent of capacity.

In eastern Ohio, coal demand, both domestic and steam, and also for screenings, which were strong a week ago, has subsided somewhat and seems to be pursuing a rather easy gait, with the result that spot prices during the week have softened all along the line 5 to 15c. per ton.

In the week ended Nov. 21 the eastern Ohio output was 356,000 tons, the largest for any week of this year.

Total coal from all districts cleared over the lower lake docks up to Nov. 23 was 25,018,776 tons, as compared with 22,001,161 tons for the same period last year and 28,995,709 tons in 1923. Today there still remain some 8,000 cars under load at the lower docks awaiting clearance, and there

are approximately 2,000 cars of lake coal in transit from the mines. Shipping in this trade from the mines ended Nov. 28.

Eastern Demand Still Absent at Pittsburgh

The trade is distinctly disappointed over the course of the Pittsburgh coal market in the past two weeks, as there has been no revival in the Eastern demand. Demand from the restricted area the Pittsburgh district has been serving for the past year and a half has kept up quite well. Industries are consuming more than formerly and buying of domestic coal has been increasing somewhat in the past few weeks, being about normal for the time of year.

There still is no definite market price for egg coal, sellers simply getting what they can. In the past week there seem to have been some small lot sales at over \$3, but in general the price is much less. Three-inch lump is going generally at \$3.25@3.50, against \$3.75@4 at the peak. Other prices are substantially unchanged.

Interest in Buffalo still centers on household trade. The ordinary bituminous trade is dull and it promises to be worse soon, unless something unexpected comes up. Prices are low and they promise to stay there. This is shown by the increase of coal standing on track unsold and by the appearance during the past few days of domestic coke, mostly egg size, that cannot find a buyer.

Soft Spots Appear in New England

Soft spots in steam coal have again appeared in New England. Fresh accumulations at Hampton Roads with much lighter demand all-rail have together forced the agencies to consider lower prices than were thought possible a week ago. Rumors of an approaching anthracite settlement also have played their part, but the main factor is the almost entire absence of any spot demand from industries. The latter have already taken on reserves sufficient for months ahead, and aside from the steady movement coastwise of tonnage on contract the volume of coal coming forward on contract is by no means heavy.

There is a decided lull in the market for screened sizes all-rail, especially from the smokeless fields. It is becoming quite evident that the New England public is not much inclined to change habits and put in quantities of bituminous in advance of actual necessity. In most communities, especially in or near the large cities, it is still possible to be accommodated with anthracite in small lots. Pea and No. 1 buckwheat are available in many places, and in Boston, Portland, Providence, New Bedford and other cities high grade Welsh anthracite is to be had in moderate amounts. For all these reasons the retail dealers are shy of buying more lump and egg from soft-coal operators until the public relieves them of what they have on hand at high prices. In consequence, what feeble demand there is for low-volatile screened is being more and more restricted to the quality grades in central Pennsylvania where the lowest through tariff applies.

As yet there has been no reduction from the \$6.50 level for Pocahontas and New River run of mine per gross ton on cars Boston and Providence for inland delivery. Practically all the distribution business is now in the hands of factors with ample storage facilities, and only when coal is forced on them by accumulations at the Virginia terminals are they at all pressed to move coal along to the consumer.

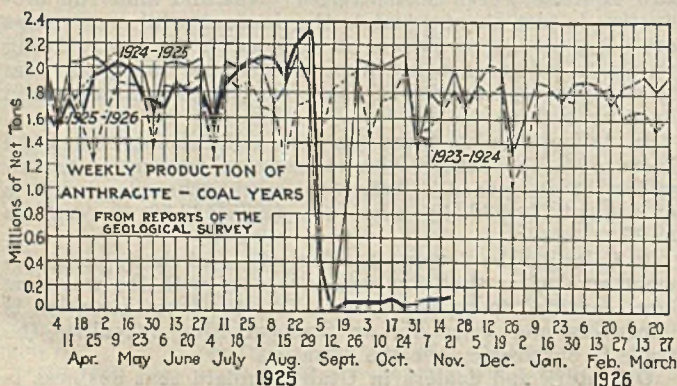
Run of mine from central Pennsylvania all-rail also is in the doldrums. Prices are off slightly on the part of those actively seeking business, and inquiry in this territory is confined to the narrow area that is not open to competition from smokeless coals via tidewater discharging ports.

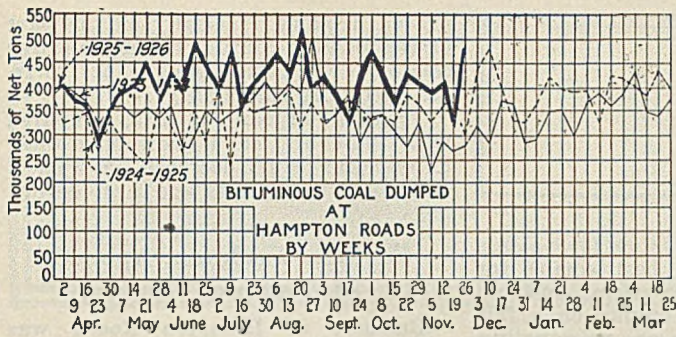
Steady Trade at New York

John L. Lewis' letter to President Coolidge made no impression on soft-coal consumers in the New York area. Most industrial users have good-sized reserves for emergency purposes and they are taking in a fair volume.

Movement of mine-run grades has been steady and up to normal requirements. No additional strength, certainly not in permanent prices, was noted during the week. Some of the maximum prices for the various pools are a trifle above last week's quotations but most of the coal went at the minimum figures.

Dealers in screened coals are looking for a sharp upward turn soon. At present the market is quiet. West Virginia





coals are quoted at \$3.25@\$4 and Pennsylvania coals at \$4@\$5. The latter are finding a ready market.

New River and Pocahontas lump is taking well in this territory, the quotations ranging around \$4.65, and for egg at \$4.75@\$4.80. Fair-sized all-rail shipments of these coals have been made to Long Island points and are giving entire satisfaction.

Demand for soft coal at Philadelphia goes along quietly, but the business situation of all producers is far stronger than at this time last year as attested by increased tonnage and much better prices. Most of the contract users are coming along for their full quotas and in addition those buying on the market are increasing their orders. There also is the always present railway fuel business. These factors are holding prices to their present level on the spot market in the face of the possibility of a loss of tonnage if the hard-coal situation is cleared up.

Demand for soft coal at Baltimore continues moderate for prepared sizes while the rest of the soft coal market remains rather flat. Prices, it is true, are a little stronger than a week or so ago, and more nearly approximate quotations that came shortly after the start of the anthracite strike. No further export movement is recorded from this point and immediate prospects along the line are negligible.

At Birmingham the coal market continues very active. All grades of steam are in good demand, and coking coals are especially strong and the supply hardly equal to requirements. Washed steam of the better grades also is being bought up heavily, some of the leading producers having turned down considerable business during the past week. All consuming interests are taking additional coal with a view of building up a reserve for the holidays, and current consumption by industrials, railroads and utilities is abnormally heavy. Producers are hardly able to meet the demand for bunker fuel to supply shipping interests at Gulf ports. Export shipments to Cuban points are reported slow, due to inability to obtain bottoms, many of the vessels plying in this trade now being engaged in relieving traffic conditions in Florida.

Mines are very well supplied with domestic orders and current production is being promptly moved. Intermittent cold spells are keeping retailers fairly busy. The better grades have the favored call, but on account of the limited supply the market for the medium and lower qualities is thereby improved.

Quotations on steam and domestic sizes are without material change from a week ago. Car shortage has eased up, but complaints of labor shortage are still being reported—especially common labor.

Coke buying for foreign shipment has eased up a little due to lack of cold weather in the North and West. Foundry coke is in good demand locally at \$6.50 per ton for spot. Egg and nut sizes range \$4.75@\$5.50, with about the same range for gas coke.

Peace Talk Depresses Hard-Coal Market

Reports of peace talk in the anthracite field last week had a depressing effect on the hard-coal situation at New York, and as on previous occasions resulted in cancellations of some orders for substitutes. Consumers continue to hesitate about putting in substitute fuel, and meanwhile users having anthracite in their cellars are using it.

A couple of cargoes of British anthracite arrived in the harbor during the week, one of which was without consignment. Its owners, however, did not expect any difficulty in disposing of it.

Movement of free independent pea and buckwheat coals has slowed up. Wholesale dealers report few sales and quotations for pea range \$16.25@\$17 alongside. Buckwheat

was quoted at \$8@\$8.50, also alongside. It was said there were a few small lots of egg, stove and chestnut coals offered, but no sales were reported. The larger companies continue to hold some buckwheat coal, which they are doling out on contracts.

Coke is moving steadily. Connellsville furnace coke was quoted at \$4.50@\$5, with foundry product at \$6@\$6.50. Egg was quoted at \$7@\$7.25 and nut at \$7.50@\$8.

The Philadelphia market is extremely quiet, as the temperature has been mild and rumors of the possibility of an early settlement of the strike have held back business. Coke is the fuel that leads, yet even sales of this have been meager of late. Plenty of beehive coke can be had at \$6@\$6.50, with byproduct selling at \$7@\$9. There seems to have been a grand rush to get in the beehive coke game and many ovens which have not operated for years are reported to be getting under way. This increased production has had much to do with the big drop in the price of this fuel. In addition to this coke has been badly marketed with retailers.

A stray car or two of anthracite pea and some shipments of buckwheat have arrived lately, but so far as the general market is concerned these sizes no longer figure, and with them anthracite is pretty much removed as a factor until mining is resumed.

There is no hard-coal situation at Baltimore, as dealers continue to sell prepared sizes of bituminous to former anthracite customers. There is some question in the minds of the local hard-coal dealers as to whether history will repeat itself, and the new users of bituminous return to hard coal when supplies of that commodity are resumed. The answer may be in the future price of anthracite as compared with that of the future price of prepared sizes of bituminous.

When it was thought by some that a settlement of the strike was near the demand at Buffalo for bituminous coal for domestic use fell off so that it had to be offered as low as \$3 at the mines for egg size, with no takers, though it had of late sold as high as \$4 or even more. Connellsville coke also fell rapidly, as consumers had found it so high that they preferred anthracite if it could be had. Local byproduct cokes have not fluctuated so much, the steadiness being increased by the holding of the product of one company at \$7.50 at the curb, while others were sometimes up to \$14. Prices are mostly dependent on the prospect of settling the strike.

Connellsville Coke Market Declines Again

Eastern buying of coke at Connellsville has not revived, which means a further decline in market prices, for production had greatly increased on account of current sales, most of which were spot or for shipment within a week. Coke has accumulated on track, but not a great deal, for, in view of heavy transportation requirements, railroads will not allow cars to be used for storage purposes.

Thus production had a momentum and purchases have not sustained the market. While the *Courier* report shows a slight increase for last week in merchant oven production, the fundamental trend has been the other way since the preceding week had been restricted by labor troubles, now practically ended.

While the report of eight days ago noted offerings of furnace coke going the rounds at \$5 in the last couple of days several operators have been offering coke at \$4, and meeting somewhat limited response. It might be expected that the blast furnacemen, whose contracts run out Dec. 31, might pick up some of this coke to use afterward, but they show little interest.

Foundry coke also has weakened from heavier production. Some operators switched from 48 to 72-hour burning to reduce tonnage, and it is now quotable at \$5@\$6 on actual offerings.

Car Loadings, Surpluses and Shortages

Week ended	Cars Loaded	
	All Cars	Coal Cars
Nov. 14, 1925	1,050,758	186,416
Previous week	1,063,332	189,212
Nov. 15, 1924	1,016,843	189,728

Week ended	Surplus Cars		Car Shortage
	All Cars	Coal Cars	
Nov. 14, 1925	112,572	37,041	
Nov. 7, 1925	103,969	37,726	
Nov. 14, 1924	145,589	79,111	

Foreign Market And Export News

Broader Inquiry in British Coal Market; French Orders Scarce

Inquiries in the British coal market are steadily expanding, but the progressive movement is partially checked by the scarcity of orders from France, the low level of exchange stimulating the sale of native coal to the exclusion of imported supplies. Despite this handicap, which is exceedingly serious to Wales, business is more evenly distributed among the different grades, and further compensation is provided in a consistent expansion in home demand and the development of forward inquiry.

There is a pause in buying from the United States and Canadian business lags on the closing of river navigation. To the former 130,000 tons has been booked, the bulk which has yet to be shipped. South American orders are much more numerous, and in addition

Bookings Satisfactory in French Coal Market

Although the present state of industry is not of a nature to provoke a very strong demand for fuels in the French coal market the French mines are filling their order books in a satisfactory manner, due to the depreciation of the franc. Calls are coming from consumers who under ordinary circumstances buy abroad, British coals suffering most. The State Railways have been authorized to ask for prices in Belgium on briquets to be delivered at ports of the West, those from across the Channel being too costly.

Demand for choice domestic coals has been light, which has enabled dealers to restock their yards in preparation for winter.

Receipt of indemnity fuels from the Ruhr during the first twenty-four days of October included 330,500 tons of coal, 185,200 tons of coke and 23,900 tons of lignite briquets. During the first nine days of November the O. R. C. A. received from the Ruhr 54,321 tons of indemnity coke.

French fuel output during September, 1925, consisted of 3,996,863 metric tons of coal; 83,804 tons of lignite; 262,564 tons of coke and 343,771 tons of patent

to a contract of 75,000 tons (two-thirds best large, one-third best small) for Lloyd Brasileiro other period business is offering. Italy is buying on a fair basis. Coaling depots are more active, and there is a brisk inquiry from Spain and Portugal.

The Newcastle-on-Tyne market improved again during the week, and in every section there was quite a brisk demand for fuel at current prices running practically till the end of the year. The coke market, too, maintained the improved tone of last week, and there has been quite a revival in that business following a better outlook in the iron trade. Contract business was not on a large scale and was mainly for gas coals, but the prices paid for over the year indicate a maintenance of current quotations.

Output by British collieries during the week ended Nov. 14, according to a special cable to *Coal Age*, totaled 4,880,000 gross tons, compared with 4,790,000 tons in the previous week.

fuel. Total production during the first nine months of 1925 was: coal, 35,591,622 metric tons; coke, 2,234,116 tons; patent fuel, 2,619,711 tons, compared with 33,325,931, 1,928,415 and 2,391,011 tons, respectively, in the corresponding period of 1924.

Belgian Trade Tendency Weaker

The price tendency in the Belgian coal market is again weaker. Demand is extremely modest and is inclined to decrease because of the keenness of French competition, aided by the depreciation of the French franc. British competition, on its side, has not decreased any more than the German and the Dutch. In the Borinage district in particular the crisis is felt and the reign of concessions, far from diminishing, is more in evidence than ever.

In industrial grades bituminous coals and coking smalls are most neglected; semi-bituminous coals are moving better, as are smalls for making cement and lime. Movement of lean duffs is still nil.

The tendency in domestic coals remains firm, and as cold weather has returned the outlook is favorable.

Briquets, in spite of the effect of the high cost of pitch, are in slightly im-

proved demand, especially on the part of the Belgian State. The demand for coke also is a little stronger, at 125 fr. for metallurgical quality.

Prices as of Nov. 1, 1925, compared with those of Oct. 1 show only these differences: 3 fr. decrease on washed semi-bituminous duffs and 2 fr. on dry peas.

Further Weakness Appears At Hampton Roads

Business at Hampton Roads was comparatively slow last week, with prices showing a tendency to weaken. Quotations for domestic coal were holding their own at \$6.50@7 at the mines, and the retail price showed no further incline above the scale of \$12.50@13 fixed several weeks ago.

Foreign business showed the biggest drop, though neither coastwise nor bunker trade was up to normal. Shippers held the new movement of coal to the North by rail as responsible for a comparative lack of interest in the coastwise trade.

Export Clearances, Week Ended Nov. 28, 1925

FROM HAMPTON ROADS		Tons
For Canal Zone:		
Amer. Str. Achilles, for Cristobal	12,026	
For Jamaica:		
Br. Str. Baron Sempill, for Kingston	2,211	
For New Brunswick:		
Br. Schr. A. T. Davidson, for St. John	876	
For Brazil:		
Br. Str. Bradclyde, for Rio de Janeiro	7,155	
For France:		
Ital. Str. Emanuele Accame, for Marseilles	12,245	

Hampton Roads Coal Dumpings*

	Nov. 19	Nov. 26*
N. & W. Piers, Lamberts Pt.: Tons dumped for week.	97,460	169,931
Virginian Piers, Sewalls Pt.: Tons dumped for week.	86,410	96,104
C. & O. Piers, Newport News: Tons dumped for week.	113,383	165,424

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

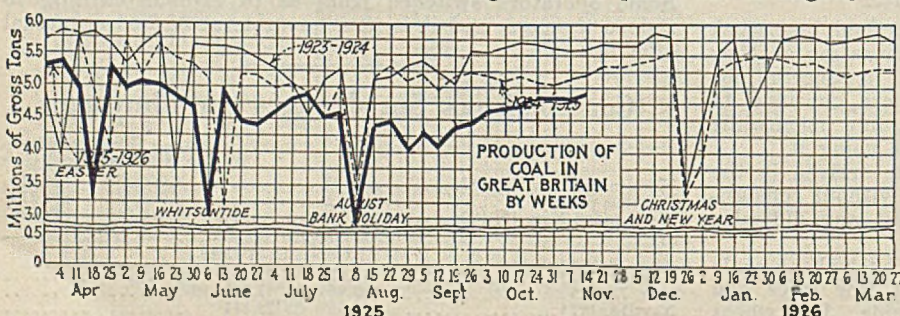
Pier and Bunker Prices, Gross Tons

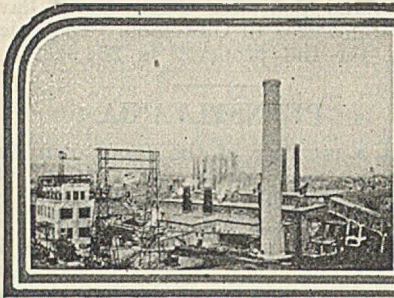
	PIERS	
	Nov. 21	Nov. 28†
Pool 1, New York	\$5.75@56.00	\$5.75@56.00
Pool 9, New York	5.00@ 5.25	5.00@ 5.25
Pool 10, New York	4.75@ 5.10	4.75@ 5.10
Pool 11, New York	4.55@ 4.70	4.55@ 4.70
Pool 9, Philadelphia	5.05@ 5.30	5.05@ 5.30
Pool 10, Philadelphia	4.80@ 5.10	4.80@ 5.10
Pool 11, Philadelphia	4.50@ 4.75	4.50@ 4.75
Pool 1, Hamp. Roads	4.85@ 5.00	5.00@ 5.25
Pool 2, Hamp. Roads	4.60@ 4.75	4.85
Pools 5-6-7, Hamp. Rds.	4.50	4.75
BUNKERS		
Pool 1, New York	\$6.00@56.20	\$6.00@56.25
Pool 9, New York	5.25@ 5.55	5.25@ 5.60
Pool 10, New York	5.00@ 5.35	5.00@ 5.35
Pool 11, New York	4.80@ 4.95	4.80@ 4.95
Pool 9, Philadelphia	5.30@ 5.55	5.30@ 5.55
Pool 10, Philadelphia	5.10@ 5.35	5.10@ 5.35
Pool 11, Philadelphia	4.75@ 5.00	4.75@ 5.00
Pool 1, Hamp. Roads	4.85@ 5.00	5.00@ 5.25
Pool 2, Hamp. Roads	4.60@ 4.75	5.00
Pools 5-6-7, Hamp. Rds.	4.50	4.85

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

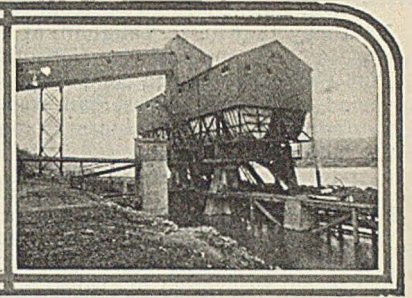
Quotations by Cable to <i>Coal Age</i>		
	Nov. 21	Nov. 28†
Cardiff:		
Admiralty, large...	23s.@ 23s.6d.	22s.6d.@ 23s.6d.
Steam smalls.....	10s.6d.	11s.6d.
Newcastle:		
Best steams.....	17s.6d.@ 18s.	15s.6d.@ 17s.6d.
Best gas.....	16s.6d.	16s.6d.
Best bunkers.....	15s.@ 16s.3d.	14s.6d.@ 15s.

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





News Items From Field and Trade



ARKANSAS

The Central City Coal Co., which has been operating between Branch and Charleston, has moved to Prairie View and has taken the contract for the Scranton Coal Co. to strip anthracite coal.

COLORADO

The state coal mine inspector's report, just released, shows October's production was 1,144,960 tons, contrasted with 1,050,805 tons in the same month a year ago. The number of men employed was 12,136 compared with 12,608 a year ago for the same month. The number of days worked per mine for October, 1925, was 142.1 compared with 148.1 in same period a year ago. The increases in production occurred in Routt and Las Animas counties, the other districts just about holding their own.

ILLINOIS

The itinerary of the Illinois Miners' Examining Board has been announced for this month as follows: Belleville, Courthouse, Dec. 7; Christopher, Miners' Hall, Dec. 8; Harrisburg, Rom Club, Dec. 9; Duquoin, Miners' Hall, Dec. 11; Centralia, Miners' Hall, Dec. 12; Staunton, Labor Temple, Dec. 14; Springfield, State House, Dec. 15; Taylorville, Courthouse, Dec. 16; Danville, Courthouse, Dec. 17; LaSalle, City Hall, Dec. 18, and Peoria, Court-house Dec. 19.

No. 1 mine of the Superior Coal Co., Gillespie, broke its record Oct. 29 for a day's hoist, when the mine produced 5,041 tons of coal in 1,626 dumps. Several years ago the rumor was current that No. 1 mine was fast being worked out, but since that time the mine has broken a number of records.

After being shut down for about a year and a half the St. Ellen mine, at O'Fallon, is again in operation. The mine gives work to 450 miners. It is reported that the Prairie mine, also at O'Fallon, which has been closed for many months, may also reopen.

INDIANA

The Pike County Collieries Co., owning strip mines in the southern part of Pike County, resumed operations Nov. 18 after a week spent in the hands of a receiver, Fred I. Conyers. Contested pay checks given miners at the time the receivership took place have all been redeemed and miners have been paid for their services. The company

operates three giant shovels, employs 250 men, and owns real estate and equipment in Pike County valued at \$1,000,000. The company has a production of from 60 to 80 cars of coal a day, requiring two trains to handle.

The tippie of the Somerville mine, wrecked by fire several weeks ago, is being replaced by a temporary wooden structure, which will ultimately give way to a steel structure. Operations at the mine are expected to be resumed within six weeks.

IOWA

An agreement has been reached between Budget Director Hogue and members of the board of mine examiners by which the board will hold only six meetings a year and with only three of the five members in attendance, in order to reduce expenses. This is the result of findings of F. H. Paul, accountant, which included an assertion that the board was likely to exceed its biennial appropriation before the two-year period expired. The recent Legislature was asked by Mr. Hogue to reduce the membership of the board from five to three and fix its appropriation at \$2,000. The appropriation, supplanting a system by which the board's allowance was unlimited and under which it spent about \$4,000 annually, was provided, but the law was otherwise unchanged.

KANSAS

James Price and Joe Lafayette, both of Pittsburg, have leased from J. S. Patton, of Frontenac, the old Hamilton Mine No. 7, known as Radley No. 7, near Radley, and expect to have it in operation early in December. The mine has been idle several months. It will employ seventy-five men.

The Crowe Coal Co. on Nov. 17 reopened its mine No. 21, near Croweburg, after several months of idleness. The mine employs from 200 to 250 men.

At the suggestion of Mayor C. Mart Montee, of Pittsburg, the Pittsburg Chamber of Commerce again this year is sending out small bags of southeastern Kansas coal to all mayors of the state. The bags carry the admonition imprinted on them, "Use Kansas Coal."

James Sherwood, Kansas state mine inspector, recently announced that one hundred more mines are operating now in Kansas than at this time last year. All but two of the district's larger mines are working. Central Coal & Coke Co.'s No. 50, closed since 1921,

and the Sheridan Coal Co.'s No. 20, alone of this class are idle. The Western Coal & Mining Co. has one new mine in operation, and another down to a depth of 250 ft.

The Lone Star Coal Co. has started the erection of a shovel on coal land it controls west of Pittsburg and expects to be mining coal within one or two months. The Joplin & Pittsburg Railway Co. will build an extension of its track to the mine. J. J. Nesch and R. G. Nesch, both of Pittsburg, two of the men interested in the new company, estimate their land contains sufficient coal for ten years' operation.

Hoisting at the Chapon & Westerlin Coal Co. mine near Chicopee, began Nov. 23. A new tippie recently was built to replace the one destroyed during the strike of 1921, since which time the mine had been idle. The mine employs 100 men. Its product is being handled by the Central Coal & Coke Co.

KENTUCKY

From Madisonville it is reported that the Federal Coal Co., of Indianapolis, has leased coal rights on 170 acres of coal land from T. M. Slaton, living near Madisonville. The acreage is on the Central City-Dawson Springs division of the Illinois Central R.R., four miles from Madisonville, where a shaft mine will be installed to mine the No. 9 and also the No. 11 beds.

The eastern Kentucky development along the Virginia border to follow announcement of routes to be used by the Louisville & Nashville R.R. in making connections from the Cumberland Valley and East Kentucky divisions of the road to the Carolina, Clinchfield & Ohio R.R. has been further delayed by application of the Louisville & Nashville R.R. for thirty days' additional time in which to file proposed construction lines for the two connections. This means that the papers will not be filed until about Feb. 1 and that there will be alternate routes included, which will mean some delay before definite routings will be established.

A recent report from southeastern Kentucky was to the effect that a number of the coal operators in the Harlan field were preparing for larger production, the Black Mountain Coal Corporation, at Kenvir, planning erection of fifty more homes and improvement of plant. The Harlan Collieries Co., at Ages, has just completed a string of houses, doubling its housing facilities, and other camps are reported to be enlarging.

It was recently reported from eastern Kentucky that T. C. Vaughan, of Elsie-coal, a manager for the Consolidated Fuel Co., a Pittsburgh company, over a period of several years, had resigned, planning to enter business in one of the mountain towns.

It was reported from Madisonville on Nov. 20 that the body of Tony Chortina, the last of five men killed in an explosion of gas in the Finley Coal Co. mine, had been recovered by workers from the U. S. Bureau of Mines, Evansville (Ind.) division, which sent a car to the scene after the explosion of Nov. 19. Trouble was experienced in reaching three of the bodies, due to fallen slate and fire. Two of the seven men in the mine escaped.

The Consolidation Coal Co., having large mines at Jenkins, McRoberts, Dunham and Burdine, is to start immediately a large improvement campaign including the opening of new mines, extending spur tracks, and building new miners' houses in and around its plants, which will necessitate the expenditure of several hundred thousand dollars.

MINNESOTA

The Duluth & Iron Range R.R. is rebuilding the pockets section of its coal dock at Two Harbors. The dock is 936 ft. long and has a storage capacity of 100,000 tons. The forty wooden pockets are being replaced by steel ones and the dock is being generally overhauled. The contract for the steel work has been let to the American Bridge Co. at a cost of \$110,500. The dock is Mead-Morrison equipped. In addition to handling coal required for mines on the Vermilion range and for its locomotive department the company supplies coal to its employees.

NEW YORK

The firm of Willard, Sutherland & Co., 8 Bridge St., New York City, will retire from business Dec. 31, next. Le Baron S. Willard will become affiliated with the Berwind, White Coal Mining Co., 1 Broadway, on Jan. 1.

NORTH DAKOTA

Appeal to the Supreme Court from the decision of the Burleigh County District Court was taken Nov. 21 by the Washburn Lignite Coal Co., in connection with its suit to enjoin the state board of administration from carrying out alleged illegal contracts with competing coal companies. The plaintiff's contention is that the board has illegally awarded contracts to the Republic, Knife River and Lucky Strike coal companies despite the alleged fact that the plaintiff submitted a lower bid. The lower court held that it could not interfere with the discretionary powers of the state board. The board contended that the awards were based on the value of the coal as shown by chemical tests and actual experience and that the coal from the plaintiff's mine tested by the board was less efficient than that from the mines of competing companies.

OHIO

The Fort Pitt mine of the Central Coal Co., of Pittsburgh, on the Ohio side of the Ohio River opposite Moundsville, W. Va., opened Nov. 30. Approximately 170 miners went to work on the Jacksonville scale. The mine had been closed for a year.

After a one day's trial at Pomeroy, the suit of the Martin Ebersbach Coal Co. against the New Pittsburgh Coal Co. for \$550,000, claimed as unpaid balance on the sale of six coal mines in the Pomeroy Bend district two years ago, was stopped by the judge, who asserted the matter was one for the two business firms to adjust outside of court.

The Akron Coal Co. has reopened the Murray Hill mine, at Cambridge after an idleness of several months. The plant employs 250 men.

Tom Bush, who for eighteen years was connected with the coal department of the Chesapeake & Ohio Ry. at Cincinnati, has been advanced to the position of coal agent, with headquarters in the Spitzer Building at Toledo.

Operations in the Pomeroy Bend field have been rather brisk during the past two weeks. As the mines in this field are operating either under the 1917 wage scale or under the co-operative plan, they have a decided advantage over other parts of the southern Ohio field, where the Jacksonville scale prevails. The New Pittsburgh Coal Co. is producing from 1,600 to 1,700 tons daily at three large mines employing 550 men. The mines operated are the Dark Hollow Mine, No. 72; the Syracuse Mine, No. 75, and the Thomas Mine, No. 76. The Forest Run mine, which had been in operation for several months, has been closed temporarily. The Stalter-Essex Coal Co. has two mines in full operation, employing about 350 men. The Blue Stone mine, at Rutland, the tippie of which was destroyed last August, is now running full blast.

Announcement is made that the litigation between the New Pittsburgh Coal Co., of Columbus, and the Peacock Coal Co., of Pomeroy, controlled by the Ebersbach interests, involving about \$3,000,000 and a large tract of good coal land, has been dismissed and the case settled out of court.

Nolan Mahan, of the General Coal Co.; John Stirnkorb, of the Hatfield Reliance Coal Co.; Armour A. Sizer, of the Flat Top Fuel Co.; C. R. Moriarty, of the Cabin Creek Consolidated Coal Co.; John Callahan, of the Southern Coal & Coke Co., and J. C. Layne, Jr., of the Man O' War Fuel Co., have been nominated for directors of the Cincinnati Coal Exchange.

The property of the Buckthorn Collieries Co., located in Tuscarawas and Guernsey counties and consisting of 1,400 acres, has been sold by Attorney O. O. Vrooman, of Cleveland, who has been acting as trustee for the property, to a syndicate of Cleveland capitalists. The new company will be known as the

Cleveland Collieries Co. and will have general offices in Cleveland. The price paid for the property is \$54,900.

PENNSYLVANIA

At a meeting of the Johnstown Association of Credit Men, Nov. 24, Charles O'Neill, of Altoona, secretary of the Central Pennsylvania Coal Producers' Association, explained that it was freight rates, not labor, that have reduced production of coal in central Pennsylvania. He said that times and things have changed since the war, but the most inflexible thing is the rate sheet of the Northern roads. The cost of carrying coal out of Pennsylvania is still at the war-time peak. Hauling coal 200 miles for 25c. a ton has put Pennsylvania second and West Virginia first. Production in Pennsylvania has fallen from 180,000,000 tons to 100,000,000 tons and West Virginia has grown from less than 100,000,000 tons to 146,000,000 tons.

The month of November is establishing a new high record in the eastbound loaded freight movement over the Pennsylvania R.R. through the Altoona and Hollidaysburg yards. A daily average has been maintained of 3,755 cars. The tonnage will be higher than in October, 1915, when the daily average was 3,560 cars, which was the previous high mark.

Coal production in the Philipsburg region is steadily increasing and nearly all the mines in the region are opening up under the 1917 scale, while a few are operating at a slightly higher rate. A new difficulty now is a scarcity of mine labor. During the early stages of the slump large numbers of miners went into other industries and advertisements for miners failed to bring them back to their former employment.

It has been definitely announced that the Adrian furnace at DuBois will resume operations at an early date, or as soon as necessary repairs, now under way, are completed. One hundred and twenty-five men will be employed. This is a direct result of the resumption of the coal industry.

After experiencing considerable trouble due to sniping and picketing on the part of labor sympathizers, the Bethlehem Mines Corporation finally got production started at the Marianna mines of the company near Bentleyville, on the 1917 scale. Shipments were made last week in small quantity, three cars going out the first day.

Recovery of the coal industry in the Russellton-Curtisville district is seen in the reopening of the Superior Coal Co. mines at Superior after a shut-down of more than 18 months. Mines of the Republic Iron & Steel Co. at Rural Ridge are operating on part time. Installation of a new cage at the Ford Colliery mine No. 3, at Curtisville, is believed to indicate the early opening of that mine. Miners are returning to the Russellton field, and mining villages are exhibiting signs of life after an enforced idleness of nearly two years.

Two hundred and fifty representatives of anthracite companies, public water companies, railroads and industrial corporations and municipal officials have been invited to attend a meeting of the Delaware River Treaty Commission of Pennsylvania to be held in Harrisburgh Dec. 10. The meeting has been called by Dr. Charles H. Miner, Secretary of Health and chairman of the commission, for the purpose of enabling the public to express its views on the proposed treaty, which seeks to apportion the waters of the Delaware River among the municipalities and communities in New York, New Jersey and Pennsylvania which lie in the Delaware River watershed.

Announcement was made last week of the appointment of former Judge John P. Kelly, of Scranton, as general counsel of the Hudson Coal Co. Judge Kelly succeeds James H. Torrey, deceased, who has acted as legal adviser to the company for many years.

The Braznell mine of the Pittsburgh & Lake Erie Coal Co., about two miles from Brownville, which heretofore has been a union mine, is preparing to resume operations on the 1917 scale. All of the former employees of the plant refused to work and those occupying company houses have been notified to vacate, so that others can be brought in.

UTAH

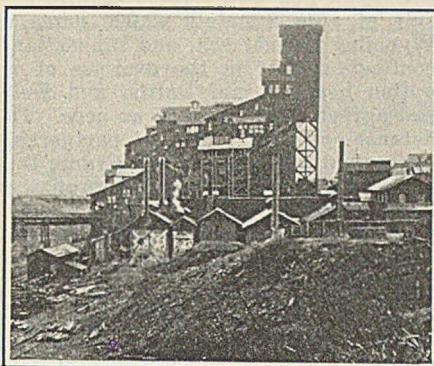
An echo of the coal strike in Utah in the spring of 1923 was heard last week when prosecuting attorneys having jurisdiction in Carbon County, where the strike occurred, moved for the dismissal of the charge of murder against several strikers whose cases had been postponed. The men were said to have been implicated in the killing of a deputy sheriff who was helping to guard the mines. A few convictions were obtained following the death of the deputy, but for various reasons all of the men had not been brought to trial. The scattering of witnesses and the difficulty of obtaining convictions were given as reasons for the request for dismissal.

The Sevier Valley Coal Co. has received permission to offer for sale \$60,000 worth of stock, the commission not to exceed 20 per cent.

WASHINGTON

Oil stored for fuel purposes is blamed for a conflagration which wiped out one of the principal blocks in Seattle's Auto Row recently and was brought under control only after it had done damage aggregating \$1,000,000. Many garages and service stations save old crankcase oil and use it for heating purposes. Several barrels of this reclaimed oil had been stored in the basement of one of the automobile service houses. The blaze is said to have started by spontaneous combustion. Three hundred motor cars and 75,000 tires were lost in the fire.

The Bellingham Coal Mines' new 18 per cent slope, one of the longest mine slopes in the United States, began op-



Mount Pleasant Colliery

Mrs. Kate Pettibone Dickson, of Scranton, Pa., widow of Alan Dickson, has sold this property to the Elk Hill Coal & Iron Co., a subsidiary of the Scranton Coal Co., as announced in *Coal Age* Nov. 19. The sale involves the transfer of 227 acres of coal land and 96 acres of surface property, including the site of the Mount Pleasant breaker. The consideration was \$650,000, part of which was covered by a mortgage payable within one year.

erating Nov. 16. The slope, which is nearly 2,000 ft. long, will serve the fourth and lower levels. It will be able to handle 50 per cent more coal than the old slope, which has a 30 per cent grade. The latter will continue to operate. The construction of the slope was under the direction of James Pascoe, superintendent, and E. C. Lyle, local engineer. W. P. Williams had charge of the machinery. The slope was started about a year ago.

WEST VIRGINIA

The Island Creek Coal Co. on Nov. 24 declared a dividend of \$5 on the common stock and also the regular quarterly of \$1.50 on the preferred, both payable Jan. 1 to stock of record Dec. 15. In the preceding quarter the company paid an extra \$1 besides the regular \$2 on the junior issue.

A warning to mine operators to use rock dusting instead of sprinkling as a means of preventing explosions was issued Nov. 21 by R. M. Lambie, chief of the state Department of Mines, in connection with his monthly accident report.

The Wheeling Steel Corporation will erect an additional battery of 57 by-product coke ovens, to cost \$1,000,000, at the present plant at East Steubenville. Production will be increased from 1,000 to 1,700 tons daily. Coal will be obtained from Harmarville, in the Pittsburgh district.

Announcement was made Nov. 28 by the Brady-Warner Coal Corporation, Fairmont, that R. M. Magraw, a mining engineer, who has been located in Colorado, Montana and Utah during the last 20 years, will become general superintendent of the company Dec. 1 to succeed John Whelan, formerly of Ohio, who resigned.

The New England Fuel & Transportation Coal Co. and the Jamison Coal & Coke Co., will soon start to rock dust their mines in the Fairmont region. The Bethlehem Mines Cor-

poration is continuing the work started some months ago.

J. Edgar Long, of J. E. Long & Co., coal wholesalers of Clarksburgh, announced Nov. 28, after a return to the East, that the Acme Coal Co., composed of Eastern capitalists, had leased his various mining properties and were now operating them. Although newspaper reports previously carried similar information, it was not definitely announced until recently that the deal was definitely closed.

The Clarksburgh District Mining Institute at its 68th monthly meeting in Clarksburgh, Nov. 28, decided to invite Robert M. Lambie, of Charleston, chief of the West Virginia State Department of Mines, to address one of the meetings in the near future. The annual meeting of the Institute will be held on Jan. 23 in Clarksburgh.

Earl B. Beerbauer, of Fairmont, general superintendent of the Fairmont Gas Coal Co., on Nov. 27 assumed the duties of general superintendent of the Lincoln Hill Coal Co., near Washington, Pa. The mine is operated by a steel car company, which utilizes its own tonnage, according to reports. Mr. Beerbauer is making arrangements to dispose of his interests in the Fairmont Gas Coal Co.

The American Coal Co. of Allegany County has declared a dividend of \$1 payable Dec. 21 to stock of record Nov. 30. This makes \$4 paid this year.

The Baltimore & Ohio R.R. in October reports that mines on its system produced 3,756,570 net tons of coal, compared to 3,250,000 tons in September. On the Monogah Division there were 26,898.4 cars of the equivalent of 50 tons, and 18,733.9 cars on the Wheeling Division.

The Beechwood Mining Co. recently started its coke ovens at Beechwood, Monongalia County. They have been closed since the World War ended.

The Kingston-Pocahontas Coal Co. is installing a new tippel at its Springton operation, in Mercer County, and the Turkey Gap Coal & Coke Co. is installing a new washer at Hiawatha, Mercer County. The Miller Pocahontas Coal Co., operating on the Virginian, is making plans for the erection of two small tipples at its operation, it is reported unofficially.

The H. T. W. Coal Co., which recently took over the Alma Thacker property on Blackberry Creek near McCarr, in the Williamson field, has elected the following officers: J. W. P. St. Clair, president; John S. Hall, vice-president, and E. A. Hansbarger, secretary. Other stockholders are John L. Chafin and L. S. Spaulding.

The mining men in the Clarksburgh section have organized their own mining extension class with an enrollment of 19, after the mining extension department of West Virginia University decided to concentrate on southern West Virginia and eliminate northern West Virginia this year, because of the existing labor troubles in the field.

Some of the work pursued in the mining extension department of Pennsylvania State College probably will be followed.

The Island Creek Coal Co.'s newest tow boat, the "Sam P. Suit" started on its maiden voyage from Huntington to Cincinnati, Nov. 21. The boat, which cost \$175,000, is named after the general superintendent of river transportation for the Island Creek company.

A contract for twenty-five new miners' houses to be erected at Mine No. 4, on Laurel Creek, of the Coal River Collieries Co., is to be let, according to an announcement made by J. T. Dunigan, president and general manager of the company. The coal company has completed work on twenty-five new houses at the same operation and a new moving picture house and bath house are in the course of construction. A new recreation center also is projected.

The sale of the property of the Greenbrier Smokeless Coal Co. at Bellburn to interests headed by A. B. Crichton, of Johnstown, Pa. has been announced by Robert M. Bell, president of the concern. This purchase gives the Crichton interests control of 1,000 acres of coal lands on Meadow Creek adjoining lands already under lease. The Greenbrier Smokeless Coal Co. was organized by Mr. Bell, W. E. Nelson, W. B. Hines, H. H. Blackburn, Mason Bell and Edward Graff and began operations in the Greenbrier field in 1920, being the pioneer company in point of development in that field. The sale concluded involves property worth approximately half a million dollars.

Announcement is made of the appointment of C. A. Warden, formerly assistant to the general manager of the Kingston Pocahontas Coal Co., with general headquarters at Hemphill, as general superintendent of the company, which operates on an extensive scale in McDowell, Mercer and Fayette counties as well as in Pike County, Ky. Mr. Warden is to have supervision over operation, construction and store management. He has been connected with the company since 1910, having served in the capacity of mine superintendent, general superintendent of mining operations in Kentucky and assistant to the general manager.

One hundred and sixty-five frame houses will be built by the Island Creek Coal Co. at Holden, five miles above Logan, within a short time, company officials said last week after receiving initial bids from contractors. The cost of the new homes will be \$200,000. The buildings will be four- and eight-room structures, and will house a substantial addition to the population of Holden, already one of the largest and best equipped mining camps in the state.

Circuit Judge Thomas R. Shepherd of the Circuit Court of Cabell County has overruled a motion to set aside the verdict of the jury for \$122,500 in the suit of Charles W. H. Crane, of Cincinnati, against A. J. Dalton and J. A. Kelly, of Huntington. Crane based his suit upon a contract for the

sale of approximately 49,000 acres of Wyoming County coal and timber land, contending that in the exercise of an option held by him Dalton and Kelly had agreed to pay him \$5 an acre. The defense claimed that a partnership agreement existed between Crane, Dalton and Kelly and that the profits, if there were any, were to be divided. Sale of the land later, it was contended, did not show any profits.

J. W. Bischoff, who for a number of years was connected with the West Virginia Coal Co., has become identified in an important capacity, with the Kanawha & Hocking Coal Co., in the Kanawha field and will have his headquarters at Longacre.

With the dismantling of a wooden tippie at the river plant of the Island Creek Coal Co. at Huntington, that company is starting work on a new steel tippie which is to cost in the neighborhood of \$250,000. The new coal loading apparatus is in partial use now and is handling 4,500 tons daily, an increase of 1,000 tons over the full capacity of the wooden tippie.

WYOMING

M. W. Medill, assistant superintendent of the Union Pacific Coal Co. mines in the Rock Springs area of this district, has been elected Wyoming state president of the Izaak Walton League of America.

The Rock Springs Labor Temple Association has declared a 10 per cent dividend upon its capital stock of \$27,500. The stock of the association is owned by United Mine Workers locals of the district.

Ten Chinese coal miners employed by the Union Pacific Coal Co. for an average of more than 36 years will be returned to Canton, China, due to old age and failing health. The company will pay expenses of the voyage and supply sufficient money to keep the men during the remainder of their lives. All are married, their wives living in the old country, and they will for the first time return to their native land since coming to America.

CANADA

Officials of the Hamilton (Ont.) Chamber of Commerce and representatives of several large industries have entered a protest with the Dominion Board of Railway Commissioners against the action of the Canadian National and Canadian Pacific railways in raising the rates on coal from Port Stanley and Erieau from 90c. to approximately \$1.50 per ton. The new rate will go into effect Jan. 1 and will seriously affect industrial conditions in Hamilton.

Alberta claims the distinction of being the first province in Canada to establish a research council, with laboratories and a staff under its own control. The present membership of the council is: Chairman, H. Greenfield, premier of the province; Dr. H. M. Tory, Prof. J. A. Allan, J. T. Stirling, Prof. N. C. Pitcher, Dean R. W. Boyle,

and Prof. Edgar Stansfield, honorary secretary. The two main problems under study have been coal and road materials. Much work has already been accomplished in the determination and correlation of coal seams. Some 700 samples have been received since the formation of the council, but only the last 500 of these have been analyzed in the council's laboratories.

The production of coal at the collieries of the British Empire Steel Corporation during October amounted to 467,725 tons as compared with 427,122 tons for the month of September.

Traffic

Protest Maryland Rates

Rates on coal from the Cumberland-Piedmont region of Maryland are discriminatory to the extent that they exceed those from mines on the western slope of the Alleghenies or from the mines of the New River and Pocahontas districts, it is alleged in a complaint filed with the Interstate Commerce Commission by producers in the first mentioned field.

Freight rates on coke from Appalachia, Stonega and other producing points to California destinations are not unreasonable, in the opinion of Examiner Knowlton, who recommends that the Interstate Commerce Commission dismiss the complaint filed by the Ro-mann & Bush Pig Iron & Coke Co.

The Gulf Coal Co., of Tams, W. Va., in a complaint filed with the Interstate Commerce Commission, protests against a rate of \$1.13 per ton on coal from its Hot mine to Pemberton, plus New River district rates from Pemberton to destinations on the Chesapeake & Ohio R.R.

The Utah Traffic Shippers' Association has been organized to carry on a vigorous fight for fair transportation rates for this state. Among the important industries of Utah which it hopes to protect are coal, it is stated. The new association has strong backing.

Obituary

J. O. Reed, 64, one of the leading spirits in the coal industry in the Clearfield region, died at his home in Philipsburg, Pa., on Nov. 23. Early in life he worked in the steel mills at Braddock, later became a bridge and car builder for the Huntingdon & Broad Top R.R. For a time he worked in the silver mines of Colorado and in 1897 assumed charge of construction of railroad cars for the Pittsburgh & Susquehanna R.R., the coal line which traverses the field between Ramey and Philipsburg. He became general manager of the railroad and later its superintendent and at the same time was general superintendent of the operations of the American Union Coal Co., which shipped over the road. He was a resident of Philipsburg for 22 years and served as a member of the Borough Council. He is survived by his wife and two daughters.

J. R. Smith, president of the Little Cahaba Coal Co. and of the Blocton Cahaba Co., of Alabama, was found dead in bed at his home in Fayetteville, Tenn., Nov. 20. He was buried in Birmingham, Ala.

Coming Meetings

Smokeless Coal Operators' Association. Annual meeting, Dec. 10, at Washington, D. C. Secretary, E. J. McVann, Washington, D. C.

Coal Mining Institute of America. Annual meeting, Dec. 9-11, Pittsburgh, Pa. Secretary, H. D. Mason, Jr., P. O. Box 604, Ebensburg, Pa.

American Mining Congress. Twenty-eighth annual convention, Dec. 9-11, Washington, D. C. Secretary, J. F. Callbreath, Munsey Bldg., Washington, D. C.

American Wood Preservers' Association. Annual meeting, Jan. 26-28, 1926, at Cleveland, Ohio. Secretary, E. J. Stocking, Chicago, Ill.

Coal Club of Philadelphia. Annual meeting, Jan. 23, 1926, at the Bellevue-Stratford Hotel, Philadelphia, Pa. Secretary, C. K. Scull, Philadelphia, Pa.

New Companies

The Glen Jean Smokeless Coal Co., with a capital of \$25,000, has been incorporated by J. M. Turner and C. M. Faulkner, both of Huntington, W. Va.

The Paramount Coal Co., of Middlesboro, Ky., a consolidation of the Bellman Coal Co., Winna Coal & Coke Co. and the East Point Coal Co., with a capital of \$63,000, has been incorporated by J. L. Manning, W. E. Cabell and R. E. Howe.

The Coal Creek Co. has been incorporated in Henryetta, Okla., with a capital of \$10,000, by Frank Barrow, J. R. Hopkins and others, and will open a coal mine.

The North State Coal Company with a capital of \$20,000 has been incorporated by Junius H. Harden and E. L. Henderson.

The Rock Forge Coal & Coke Co., capital \$10,000, has been incorporated at Morgantown, W. Va. The incorporators are James Moreland, Preston Road and Robert E. Guy.

The Sutton Coal & Coke Co., capital \$25,000, has been incorporated at Sutton, W. Va. The incorporators are J. W. Johnson and Van B. Hall.

The Payne-Baber Coal Co. has just been organized and will have its offices in the Union Bank Building at Huntington, W. Va. It is headed by E. J. Payne, formerly of the Lake & Export Coal Corporation. Associated with him is B. C. Baber, well known in the coal trade.

Association Activities

C. W. Henderson, president, Cambria Coal Mining Co., of Knoxville, Tenn., was re-elected president of the Southern Appalachian Coal Operators' Association at the annual meeting in Knoxville Nov. 20. Broadening of the statistical work of the association was authorized. The report of Secretary Howe showed increasing membership and a strengthened position of the local association. Mr. Gandy discussed the work of the National Coal Association on behalf of the industry. J. E. Johnson, secretary, Kentucky Mine Owners' Association, briefly told of the efforts of that association in combating a tonnage tax proposal in Kentucky, inasmuch as quite a portion of the operations of the Southern Appalachian Association is in that state. A meeting of the Southern Appalachian Efficiency Association, an auxiliary of the local operators' association, also was held, at which E. V. Albert, superintendent, and A. G. Hahn, mine inspector, United States Coal & Coke Co., Lynch, Ky., discussed safety efforts. Judge H. B. Lindsay presided as toastmaster at a largely attended banquet at the Cherokee Country Club in the evening, at which there were various entertainment features and addresses.

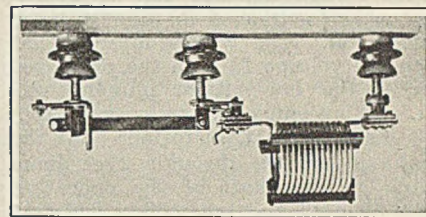
The Cincinnati Coal Exchange, at a meeting Nov. 17, voted to change the constitution so that associate members might be admitted. This matter has been hanging fire since Feb. 5, when Ernie Howe, Fred Legg and George Kearen were appointed a committee to study the move. The Exchange, being a subsidiary, had to have power granted to make the move from the Chamber of Commerce. Then the point arose whether the associate members

New Equipment

Protective Units Are Now Simplified

A combination disconnecting switch, fuse, and choke coil, designed to reduce the size and weight of the combined unit as well as the number of insulators required is a new product of the Westinghouse Electric and Manufacturing Co. The possibility of trouble through insulator failures is thus reduced, and a saving in initial and upkeep costs is effected.

Insulator assemblies similar to those used with other fixtures are employed with these combinations. These standardized insulator assemblies employ



Choke Coil and Switch Are Mounted Together

This combined unit, mounted on three insulators, is available for service requiring underhung or slanted insulators.

only three-bolt circles for the complete line. Two types of outfits are available, one with underhung and the other with inclined insulators, both of which use the same assemblies for a given voltage rating. The insulators have sanded heads and pin holes which adhere firmly to the cement. All hardware is galvanized and is provided with cupped and ribbed holding surfaces from which the cement cannot slip. The cement, used at both cap and pin, is steam set so that injurious stresses due to temperature changes will be avoided. The combinations are available for all voltages up to and including 110,000 volts.

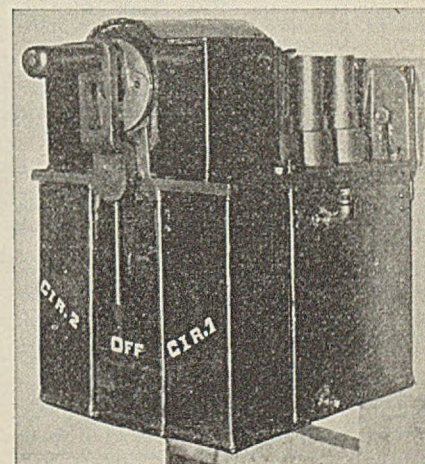
Change Over Switch Provides Continuous Service

An automatic change-over switch, that has for its chief application installations where continuity of service is the primary feature, and where interconnected secondaries are not available, has been designed by the Westinghouse Electric and Manufacturing Co. It has a full automatic feature which functions to keep the main contacts on a selected circuit, so long as that circuit is energized, and which assures the operator that his feeder loads are properly distributed under

Industrial Notes

The Superheater Co., of New York and Chicago, announces the appointment of R. L. Ehmann as district manager of its industrial department, with an office at 923 Union Trust Building, Pittsburgh, Pa. The former manager, of the Pittsburgh office, John R. LeVally, has been assigned to special duties with the company and may be reached through the New York office.

The McGraw-Hill Co. has purchased the E M F Electrical Year Book, published by Electrical Trade Publishing Co., Monadnock Block, Chicago. The 1926 edition, which will be out April 1, 1926, will be edited by the staff of the Electrical Trade Publishing Co. and sold by the staffs of both organizations. Headquarters for the Year Book until completion of the 1926 edition will be at the offices of the Electrical Trade Publishing Co., in Chicago, but information and data may be obtained from men of both organizations. This standard reference book will supplement the service of McGraw-Hill electrical publications by supplying the reference information needed by buyers and specifiers throughout the industry.



Makes Quick Circuit Change

A transfer switch such as this automatically connects itself to one energized circuit or another.

normal conditions. Another feature of this switch is that by opening a single-throw knife-switch the main contacts can be thrown from the main to the auxiliary circuit, and by closing the knife-switch the contacts will be returned to the preferred circuit.

This switch depends for its operation on the action of an undervoltage release coil. The wiring is such that when the voltage falls in the preferred circuit, the low-voltage plunger will fall. This completes the circuit from the instrument transformer on the auxiliary circuit through the drum switch on the shaft of the operating mechanism to the trip coil. The trip coil raises its plunger and allows the main drum to revolve through an arc of 180 deg. This throws the main contacts of the breaker from the preferred circuit to the auxiliary circuit.

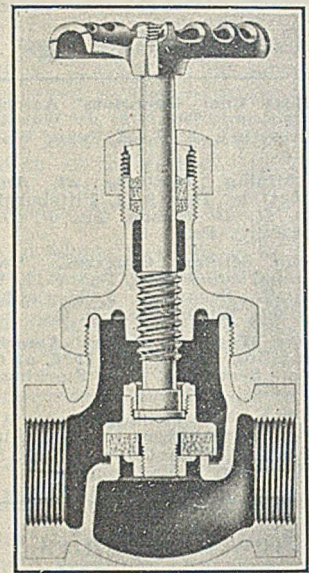
In construction this switch, which is essentially a three-pole, double-throw, full automatic oil circuit breaker, with a low-voltage release attachment, is sturdy and compact. The oil tank is lined with mica, while tubes of the same material protect all incoming and outgoing terminals. The main contacts are of the familiar wedge and flexible finger type and the operating drum, mounted directly above the oil tank, is protected by a dust-proof cover through which a shaft extends. No attention is required by this automatic switch other than the usual monthly inspection.

Improved Type of Globe And Angle Valves

For working steam pressures at 225 lb. a new line of medium pressure bronze globe and angle valves has recently been placed on the market by Jenkins Bros., of New York. They are designed to meet the need for a valve with a renewable disk that will satisfactorily handle higher pressures than those recommended for the standard pattern.

An important detail of the new valve is the bonnet and union, made in one piece to screw on to the outside of the body thread. This construction affords strength to the body and as the bonnet hexagons are large they allow the bonnet to be easily removed without distortion. Of special interest also is the "ball joint" formed when the bonnet and body are screwed together. This is a new feature and makes a strong, though easily removable joint.

These valves are regularly fitted with a composition disk for high-pressure work. This will appeal to those who recognize the superiority of this construction over the metal-to-metal seat. No regrinding is necessary in order to insure a tight valve. The spindle is made of manganese bronze, with large threads which are all in contact when the valve is closed. The stuffing box is deep, affording plenty of room for packing, which is compressed by means of a



Cross-Section of New Valve

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Miner's Lamp; 1,552,218. Joseph Menapace, Latuda, Utah. Sept. 1, 1925. Filed Jan. 3, 1924; serial No. 684,211.

Mine-Car Truck; 1,552,542. Robert J. Colson, St. Louis, Mo. Sept. 2, 1925. Filed July 3, 1924; serial No. 723,920.

Mine Car; 1,552,571. Hugh W. Sanford, Knoxville, Tenn. Sept. 3, 1925. Filed March 10, 1924; serial No. 698,221.

Coking Process and Product; 1,553,641. Frederick W. Sperr, Jr., Pittsburgh, Pa., assignor to the Koppers Co., Pittsburgh, Pa. Sept. 15, 1925. Filed July 18, 1919; serial No. 311,811.

Multiple Chute Coal and Slate Separator; 1,552,166. Charles H. Hutchison, Knoxville, Tenn. Sept. 8, 1925. Filed Aug. 19, 1924; serial No. 732,997.

Publications Received

Proceedings of the eighth regular meeting of the Atlantic States Shippers Advisory Board. Pp. 99; 7 $\frac{1}{2}$ x10 $\frac{1}{2}$ in.

Coils and Magnet Wire, by Charles R. Underhill. McGraw-Hill Book Co., Inc., New York City. Price, \$4. Pp. 494; 6x9 in.; illustrated. A practical book on the principal classes of coils and the magnet wires from which they are constructed.

Report of the United States Coal Commission, in five parts. Part I, Principal Findings and Recommendations; pp. 314, with index covering the five volumes. Part II, Anthracite—Detailed Studies; pp. 715; illustrated. Part III, Bituminous Coal—Detailed Labor and Engineering Studies; pp. 959; illustrated. Part IV, Bituminous Coal—Detailed Studies of Cost of Production, Investment and Profits; pp. 725; tables. Part V, Atlas of Statistical Tables; pp. 516. These books are all 6x9 in., except Part V, which is 9x13 $\frac{1}{2}$ in.

The Mineral Industry — Vol. XXXIII, 1924, edited by G. A. Roush and Allison Butts. McGraw-Hill Book Co., Inc., New York City. Price, \$12. Pp. 887, 6x9 in. Contains the latest technology in all fields and statistics of production of all commercially important minerals.

Annual Report of the Smithsonian Institution for year ending June 30, 1924. Pp. 535; 6x9 in.; illustrated.

Mainsprings of Men, by Whiting Williams. Charles Scribner's Sons, New York City. Price, \$1.50. Pp. 313; 5 $\frac{1}{2}$ x8 in.; illustrated. A statement of what the author has learned from his experience as a worker in four countries.

The Ruhr-Lorraine Industrial Problem, by Guy Greer, with the aid of the Council and staff of the Institute of Economics. The Macmillan Co., New York City. Price \$2.50. Pp. 328; 5x7 $\frac{1}{2}$ in.; tables.

Annual Report of the Director of the Bureau of Mines to the Secretary of the Interior for Fiscal Year Ended June 30, 1925. Pp. 70; 6x9 in.

Further Contributions to the Geology of the Allendale Oil Field, with a Revised Structure Map, by Gail F. Mounton. State Geological Survey, Urbana, Ill. Report of Investigations No. 7. Pp. 27; 6x69 in.; illustrated.

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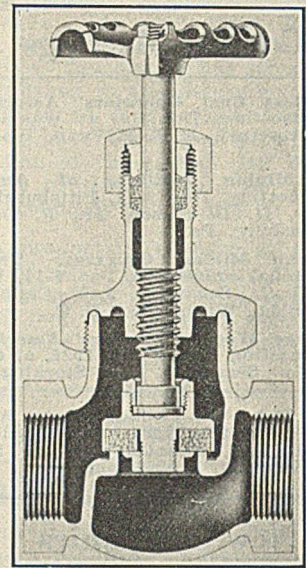
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Method of Separating Ash from Coal by Flotation; 1,552,197. Lindell T. Bates, Mount Lebanon, N. Y. Sept. 1, 1925. Filed March 21, 1921; serial No. 454,195.

Mine's Lamp; 1,552,218. Joseph Menapace, Latuda, Utah. Sept. 1, 1925. Filed Jan. 3, 1924; serial No. 684,211.

Mine-Car Truck; 1,552,542. Robert J. Colson, St. Louis, Mo. Sept. 8, 1925. Filed July 3, 1924; serial No. 723,920.

Mine Car; 1,552,571. Hugh W. Sanford, Knoxville, Tenn. Sept. 8, 1925. Filed March 10, 1924; serial No. 698,221.

Coking Process and Product; 1,553,641. Frederick W. Sperr, Jr., Pittsburgh, Pa., assignor to the Koppers Co., Pittsburgh, Pa. Sept. 15, 1925. Filed July 18, 1919; serial No. 311,811.

Multiple Chute Coal and Slate Separator; 1,552,166. Charles H. Hutchison, Knoxville, Tenn. Sept. 8, 1925. Filed Aug. 19, 1924; serial No. 732,997.

Publications Received

Proceedings of the eighth regular meeting of the Atlantic States Shippers Advisory Board. Pp. 99; 7 $\frac{1}{2}$ x 10 $\frac{1}{2}$ in.

Coils and Magnet Wire, by Charles R. Underhill. McGraw-Hill Book Co., Inc., New York City. Price, \$4. Pp. 494; 6x9 in.; illustrated. A practical book on the principal classes of coils and the magnet wires from which they are constructed.

Report of the United States Coal Commission, in five parts. Part I, Principal Findings and Recommendations; pp. 314, with index covering the five volumes. Part II, Anthracite—Detailed Studies; pp. 715; illustrated. Part III, Bituminous Coal—Detailed Labor and Engineering Studies; pp. 959; illustrated. Part IV, Bituminous Coal—Detailed Studies of Cost of Production, Investment and Profits; pp. 725; tables. Part V, Atlas of Statistical Tables; pp. 516. These books are all 6x9 in., except Part V, which is 9x13 $\frac{1}{2}$ in.

The Mineral Industry — Vol. XXXIII, 1924, edited by G. A. Roush and Allison Butts. McGraw-Hill Book Co., Inc., New York City. Price, \$12. Pp. 887, 6x9 in. Contains the latest technology in all fields and statistics of production of all commercially important minerals.

Annual Report of the Smithsonian Institution for year ending June 30, 1924. Pp. 535; 6x9 in.; illustrated.

Mainsprings of Men, by Whiting Williams. Charles Scribner's Sons, New York City. Price, \$1.50. Pp. 313; 5 $\frac{1}{2}$ x 8 in.; illustrated. A statement of what the author has learned from his experience as a worker in four countries.

The Ruhr-Lorraine Industrial Problem, by Guy Greer, with the aid of the Council and staff of the Institute of Economics. The Macmillan Co., New York City. Price \$2.50. Pp. 328; 5x7 $\frac{1}{2}$ in.; tables.

Annual Report of the Director of the Bureau of Mines to the Secretary of the Interior for Fiscal Year Ended June 30, 1925. Pp. 70; 6x9 in.

Further Contributions to the Geology of the Allendale Oil Field, with a Revised Structure Map, by Gall F. Mounton. State Geological Survey, Urbana, Ill. Report of Investigations No. 7. Pp. 27; 6x6 $\frac{1}{2}$ in.; illustrated.