COAL AGE

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

R. DAWSON HALL
Engineering Editor

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Doth Protest Too Much

AT THE RECENT safety meeting at Springfield, Ill., the statistician of the United Mine Workers, George L. Mercer, is reported to have said that since 1883, 1 man in 1.38 had been injured sufficiently to be off duty for thirty days. We don't know where he got the figures for these forty-one years—we did not believe that they were available—but we do know that he could have made them more startling had he gone back more years. Why stop at 1883? If he had gone back far enough he might have shown that more were injured than went into the mines, which is not, of course impossible because some men are injured many times.

Mr. Mercer is reported to have said that in the last thirty-six years one man has been killed in every 11.75 employed. The figures for fatalities if applied in Great Britain and carried back to the Plantagenets might show possibly that more were killed than entered the mines, thus calling for reincarnations. However, mortality tables extended back more than one year are not without value and taken back to a time within the period that a man might be expected to live bring out vividly the aggregate hazard of the industry in which he is engaged. Miners, who as a class live long, are quite frequently subject to a long-time accident hazard. The hazard of health, however, is much greater, than that of fatality and that is not figured at least popularly in any such manner. Of 11.75 twelve-year old boys how many will still be living thirty-six years later, certainly not 10.75 or even nearly that figure. The United States Life Tables of 1910 show that after thirty-six years in every 11.75 male persons who were healthy and insurable at twelve years of age 2.75 would have passed to the Great Beyond leaving nine behind.

Rock-Dumping Profligacies

IN MANY THIN seams rock transportation and disposal constitutes the greatest of difficulties in the surface work of mining. The cost of disposing of rock is often greater than that of dumping coal. Few managers have carefully estimated what that cost is. If they had, they could not have continued to face it with equanimity. If the rock had only to be dumped like coal, all would be well. Coal falls into a car and it is hauled away at the expense of the consumer, but rock when dumped falls into a pile and soon fills up the space so completely as to prevent further dumping. Thus, if the rock is favored with equipment like that provided for coal, a move is soon made necessary, and the grades leading to and from the point of dump need revision and reconstruction.

For this reason the provisions at the rock pile should be carefully elaborated and if necessary more should be spent in the construction of the rock dump than in the building of the actual coal tipple, for otherwise, where the rock tonnage is considerable, the daily cost of operating the former may be larger than the day by day expenditure on the latter.

For a while the rock may serve a useful purpose. It may be hauled by car or motor truck to places which need grading. It may aid in the construction of a tram or railroad, in the preparing of a townsite or in the revetting of a stream bank, but before long the rock becomes an unbearable nuisance and means must be taken to get rid of it. Piled on the hillside it may roll down on the houses or railroads beneath. Dumped into the valley it may burn and make the mine village unfit for habitation.

Many coal valleys are sufficiently restricted already and unless openings make it possible to spoil the rock in another valley, nothing remains but either inside stowage or some means of transporting the rock over the hills to some valley beyond, where perhaps it may serve some useful purpose such as aiding in the building of a dam for the impounding of water. Because rock is of little or no value is no reason why its handling may not make it an extremely expensive product.

The Vital Spot

MUCH gratification must be felt that the menace of oil is largely removed from the bituminous coal industry, for it has attacked the producer of coal in his most vital spot. The demand for slack was hardly at any time adequate as is attested by its low price, almost always below the cost of production. Many fields were opened that produced little but fine coal. In many regions the union triumphed and got the wages of the men fixed on a run-of-mine basis, reducing the anxiety of the miner to produce large coal, the rate being fixed on the percentage of sizes then existing and not on the percentage obtained when the anxiety of the miner to produce large coal was removed by the adoption of the new scale. Had the wage been fixed on the percentage of slack that the miner would make after the run-of-mine scale had been adopted, the miner would not have pressed so rigorously for its introduction.

Only the use of mining machines and the development of stokers and pulverized-coal furnaces, prevented slack from being given away for the cost of the freight. Now, perhaps, we may look ahead with some assurance. The National Coal Association's Research Committee is trying to find a way of burning small bituminous coal in domestic furnaces and others are discovering new briquetting processes that will make a market for fine coal. Let us hope a better time is ahead, when the operator will be able to get a price for his bituminous slack equal or at least nearly equal to the cost of production.

Oil and water power as competitors of the bituminous coal industry seemed to be new difficulties in the path, but in that respect, at least at the present, oil is on the descendent, and water power promises not to be as aggressive as in the past. There are still areas where

oil will, at least for a time, be a successful rival to slack. The far West is one of these. The coal industry can do no better than to try to introduce slack burning in industries where it is still little used. The railroads, apartment houses and small factories are examples of these opportunities. Cement manufacturing and reverberatories are already assisting the coal business admirably to rid itself of the incubus of slack.

The operators can help themselves also by increasing the practice of cutting in the bottom and in partings of bone or soft shale and by introducing, if it be found safe and made legal, the use of open-space charging of drillholes. An increase in the market for slack and a reduction in the production of that commodity are the two big needs of the coal industry. It proposes to instruct the public so as to accomplish the first end; does it really comprehend to the full the possibility of attaining the second? Are not all too many coal mines breaking some of the best of their coal into a low-priced article by cutting in the coal instead of cutting in the clay? Only recently some of the companies have concluded that they for years had been missing a big opportunity by overlooking the possibilities of making clay slack in place of bug dust. Our profits largely vanish because the slack market is so slack that it must be courted by an inordinately low price.

Anthracite Sales Problems Multiply

FOR YEARS it was the proud boast of the anthracite producers that the domestic consumers clamored at their doors. Difficulties there might be in the sale of the smaller sizes, and competition might even be admitted in the industrial field, but every producer true to the traditions of his business was sure that there was a yawning market for every ton of merchantable coal suited to the requirements of the private residence or the apartment house. So confident was the hard-coal industry in that belief that a few years ago it was decided to "elevate" the pea size out of the steam and into the domestic-fuel classification by the simple expedient of increasing the mine price. Mine-storage records bear eloquent witness to the success which has attended that effort in recent months.

The situation has changed. The anthracite distributors are learning anew the meaning of sales resistance. They are finding out that the position of a "luxury" fuel is not without its elements of danger. It is probably true that there are certain consumers who would burn anthracite no matter what the price was, just as there are gourmets so situated that they can satisfy their epicurean palates without regard to cost, but the demand from that class of consumers is not large enough to support an annual output of 90,000,000 tons. And even in that field of distribution fresh competition is gaining strength. Fuel oil has made its inroads and now it seems that gas will make a more active bid for the luxury business in the richest part of the anthracite-consuming territory. Within the past week, for example, the Consolidated Gas Co. openly solicited business of that character in an advertisement in the papers of New York City.

The change, however, will not be without its advantages. The multiplication of sales problems must inevitably bring the anthracite operators into closer contact with the ultimate consumers of their product and with the retail distributors. Out of that contact should grow a better appreciation of the problems of each, needed reforms to meet the situation and for the anthracite industry as a whole a public respect that does not now exist.

Must the Industry Pay for Safety?

FEW WINTERS have been so free of mine explosions as that we are now completing, and that fact seems to show that our new precautions are bearing fruit here as long ago they have borne fruit abroad wherever introduced. We trust that no arguments as to the cost of safety will let us delay the introduction of laws such as will assure a continuance of the present fortunate condition.

Let us make safety unanimous. Only by doing so can we pass the cost of these provisions over to the public, who, desiring the coal, should be willing to pay all that must be expended to assure the safety of those mining it. For a while, operators may be willing to write down, as a partial loss, on their books safety precautions that the law does not require, but gradually competition will be almost sure to make them slip back into the old hazardous ways. We want more uniform legislation.

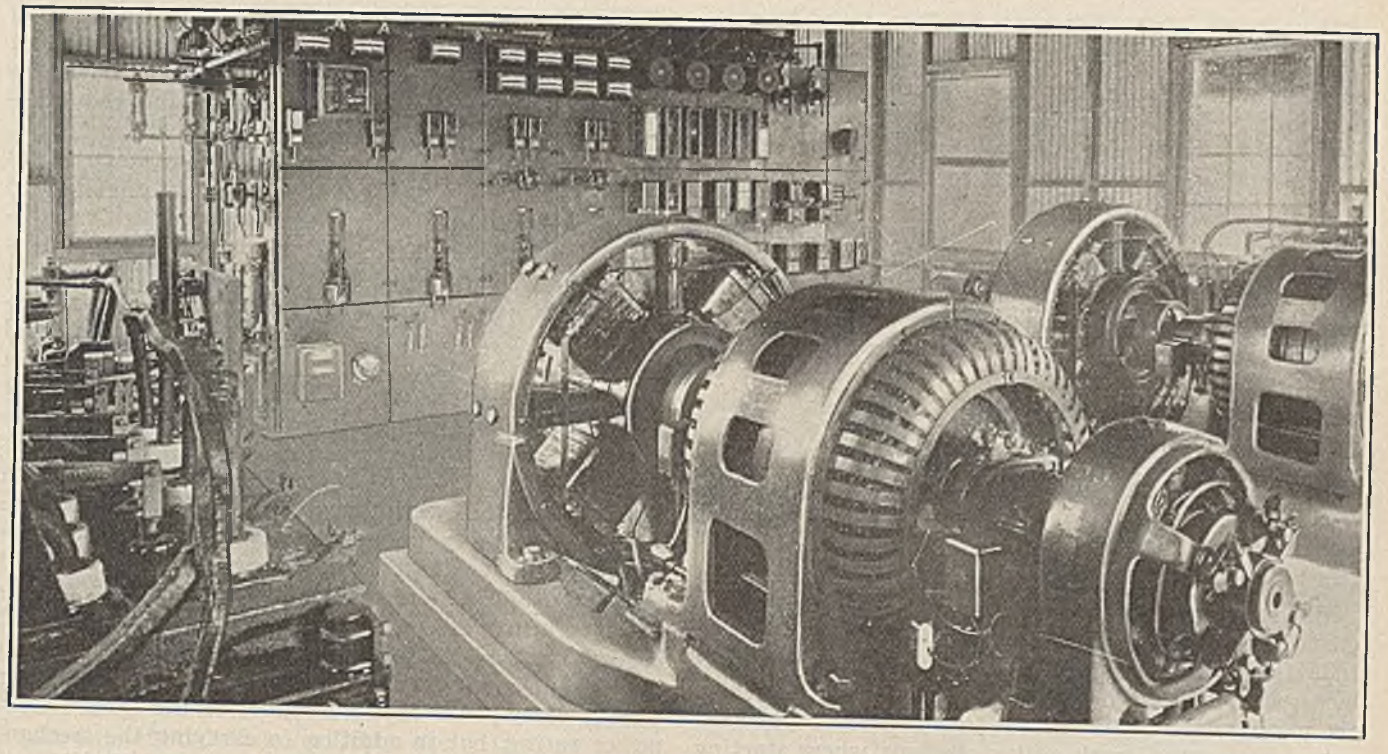
No one can but regret the effort to commit the governors without due consideration and discussion to a new safety program, but it is easy to see the arguments of those who have attempted to cause the stampede. Goverors are ill-disposed to sit through long sessions. It is difficult to get them to leave their capitals for long periods of time. Furthermore, safety is not a new subject. Its fundamentals are fairly well known, and the repeated explosions have made clear the need for more stringent legislation.

However, it is the right of the governed to be heard, and it is a bad practice to have legislation even promoted by the agreement of persons like governors without the barest formality of a consideration. They are told, "Here is the document, sign it. You have not considered it, but the clerk has read it to you. You are not equipped to understand it, but it is backed by persons who do." The governors thereby give up their prerogatives.

When the legislatures have investigated and passed laws, usually after an inquiry, the governors are given several days in which to consider them. But in this case they are to sign away in a single day their moral rights to listen to arguments against a certain bill if framed in accord with Bureau of Mines' suggestions.

We are afraid that questions of states' rights and governors' prerogatives and duties are going to destroy the governors' conference and are likely to appear more important matters in the governors' minds than questions of mine safety. The conference, if we have one, needs to be conducted with great diplomacy, and this introductory indiscretion seems likely to jeopardize the prospect of its being called and to make it a failure if it should assemble. It is a chance to make the mines safe and make the public pay the bill, every one conceding that the public should pay it. It is too bad that so many in the industry are meeting the opportunity to make the mines safe and to set the mining industry right with the public as if it were a persecution and an invasion of their rights.

Must the coal industry pay for safety as Illinois did after the Cherry disaster, or shall it be passed on to the public? That is the nub of the governors' conference.



Poor Power Factor Loads Cost More to Maintain Than to Correct

Synchronous Apparatus Will Correct Bad Conditions and Increase the Working Capacity of Distribution Lines and Generating Equipment — Unity Power Factor Not Always Desirable

By W. B. Snyder
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With the increasing use of alternating current in the mining industry, the evil effects of low power factor is becoming more and more important. It is the intent of this article to show some of the benefits which may accrue from the correction of a low power factor, and the means by which it may be attained.

The induction motor, due to its low first cost, great reliability, high efficiency and general suitability, is for many applications the best motor, from the user's point of view. However, it, like the transformer, draws its excitation from the line in the form of lagging magnetizing current, and thus does much to lower the power factor. Over-motoring, or the use of motors larger than necessary, also contributes to the lowering of the power factor, because the power factor of a lightly loaded induction motor is low. Distribution systems are designed to take care of peak loads, which are sometimes considerably greater than normal loads.

The necessary magnetizing current for all motors and transformers must be supplied at all loads. This current does not vary greatly with the load, hence, the power factor of a system is always less than the full-load power factor of the individual machines.

Because of the large induction-motor load caused by fans, hoists and tipple motors, the power factor of a mine power system is usually low. Low power factor is undesirable at any mine, no matter whether power is generated at the mine or purchased from a central station. In either case, it represents a waste of energy and money. It lowers the voltage and slows down the induction motors at times of peak load. It also increases the energy loss in the distribution system. As this loss increases as the square of the current, the loss in a system operating at 70 per cent power factor is approximately twice as great as if the system were operating at unity power factor under the same kilowatt load. The energy lost in power-distribution lines varies greatly, of course, in different systems, but probably 7½ per cent is a low figure. If this is doubled, due to low power factor, 7½ per cent of the total power generated or purchased is needlessly wasted. The capitalized savings on power cost alone would on many systems pay for the installation of the proper power-factor corrective equipment.

Saves Cost of New Equipment

Power factor correction is equally important whether power is generated at the mine or purchased from a power company. Frequently the use of electrical power increases to a point where it appears necessary to add additional generating equipment. However, if the present load is of low power factor, it is much more economical to correct this power factor and continue operation with the same generating units. If, in a given system, the power factor is raised from 60 per

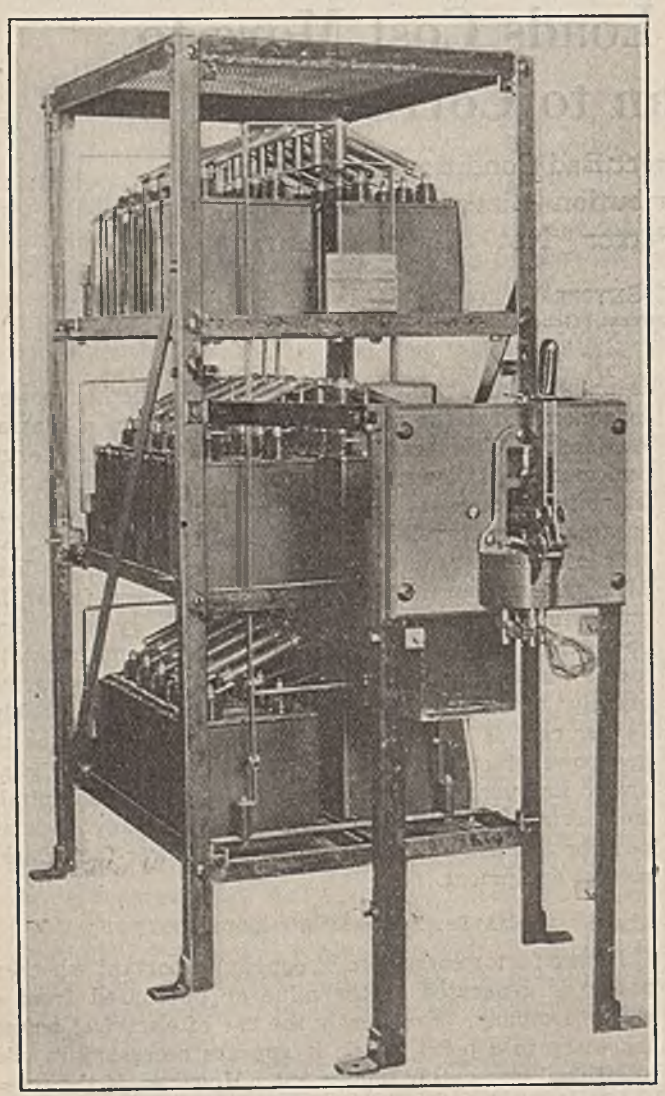
Note—The illustration in the headpiece shows one of the first two-unit automatic substations installed at a coal mine. The synchronous motors operate from a long distribution line and materially assist in maintaining a good power factor.

cent to 80 per cent, about 25 per cent of the total capacity of the system is made available without any increase of investment in prime movers or distribution equipment. In general, the cost for corrective equipment will be practically balanced by the saving in new equipment that otherwise would be required.

Some large mining operations have several generating stations feeding into a common distribution system. It may happen that in dull periods a low power factor load will require the operation of all the stations, whereas, if the power factor were high, one of the stations might be shut down, thus saving the operating costs of this station.

Power-factor correction is also of increasing importance to users of purchased power, as there is a growing tendency for public-utility companies to insert in their power contracts clauses penalizing the customer for poor power factor. Some power companies also give a bonus for power factors above a certain percentage, although this practice is not as yet common.

The first step toward obtaining a higher power factor on a given line is the investigation of the present induction motors to see if any machines are overmotored. There are some cases of over-motoring in the mining field which are due to conditions beyond the operator's control, such as installations where starting torque and not running torque is the the determining factor in selecting the motor. Here a betterment of power factor is rarely possible. There are other cases of over-motoring, however, which may and should be corrected by the substitution of smaller motors.



Unit-Type Condenser Outfits

The high efficiency of static condensers and the low maintenance or attendance needed has made them popular units for power-factor correction.

If the generating and distribution equipment is not overloaded, it may be possible to obtain the desired power factor by installing unity-power-factor apparatus, such as synchronous motors or synchronous converters. For example, if to a load of 100 kw. at 80 per cent power factor, or 125 kva., a unity-power-factor load of 100 kw. is added, the resultant load will be 214 kva. at 93 per cent power factor. Thus, if a large electrical load is to be added, unity power factor apparatus will probably correct the conditions to the desired degree.

Often, however, the load to be added to a system is small and the present power factor so low that the addition of a unity-power-factor load will not have sufficient corrective effect. In this case, additional load should be added in the form of 80 per cent power-factor synchronous motors. This is probably the most efficient method of obtaining corrective capacity. An 80-per cent power-factor motor is but 25 per cent larger than a unity-power-factor machine of the same horsepower rating, but in addition to carrying the mechanical load, it is capable of returning to the line 60 per cent of its rating as corrective capacity.

USE MOTORS OF STANDARD MAKE

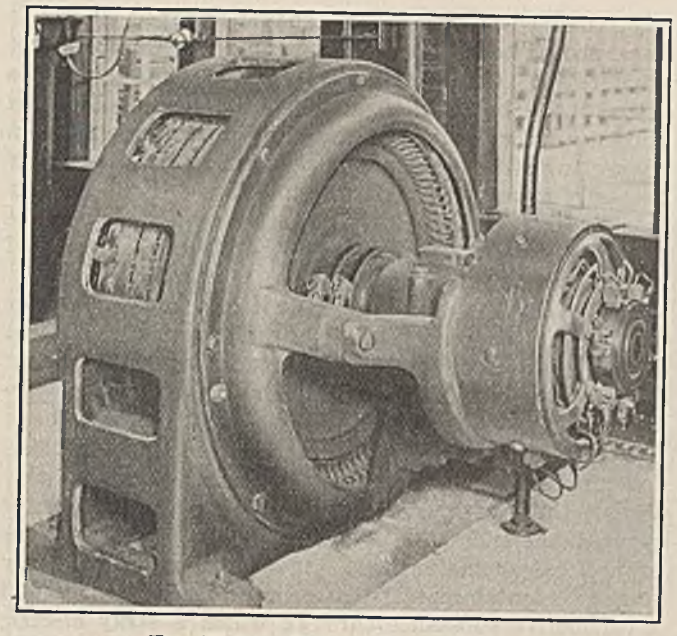
In some cases synchronous motors of such size have been used that they operate at leading power factors lower than 80 per cent, but this should be avoided, if possible, as such motors are not standard with the various manufacturers, and are therefore quite expensive. Their use is justified only when the additional cost of these machines is less than the cost plus the capitalized maintenance expense for separate corrective equipment.

When it is undesirable to add more load to the system in the form of synchronous motors, corrective capacity may be obtained by using static or synchronous condensers. In choosing between these two devices first cost, maintenance, losses and floor space should be considered. The question of reliability need not be raised, inasmuch as the design of static condensers has now reached a point where they are as reliable as synchronous condensers.

Static condensers are least expensive for 2,300-volt service. For lower voltages it is necessary either to go to a larger size of condenser or to use a transformer, to get the same kilovolt-ampere capacity. On 2,300-volt service a static condenser will cost approximately one-third more than a synchronous condenser of the same capacity. However, the losses in the static condenser will be approximately one-half of 1 per cent of its rating, whereas the losses in the synchronous condenser will be 6 per cent or 7 per cent and the floor space occupied by the static condenser will be only 75 per cent of that necessary for the synchronous condenser.

Furthermore, no operator is required for the static condenser, and the only maintenance necessary is an occasional inspection of the oil circuit breaker and the dusting of the bushings on the condenser units. The synchronous condenser though it has the advantage of lower first cost, is a rotating machine, and is not suitable for unattended operation unless automatic control equipment is provided.

On voltages other than 2,300 the static condenser



Fan Motors Correct Power Factor

At most mines the fans must be operated continually. Here is a wonderful opportunity to use a synchronous motor and better the line conditions.

loses some of its advantages over the synchronous condenser. Due to the necessity for a transformer, the losses will be increased to about 3 per cent. The floor space required will be slightly more than that for a synchronous condenser, and the cost will be about 55 per cent or 60 per cent greater than for a synchronous machine of equal capacity.

The electrical systems of mines differ so widely that power factor correction becomes a separate problem for each. In most mines, however, conditions are such that the addition of synchronous motors will give the desired power-factor correction. At the mines using trolley locomotives and direct-current mining machines it is probable that the alternating-current to direct-current conversion apparatus will yield the necessary corrective kilovolt-ampere capacity.

If the addition of unity-power-factor load is necessary, synchronous converters may be used with advantage. Care should be taken, however, in the application of synchronous converters for power-factor correction, as these machines are designed to operate at unity power factor over a range of from three-quarter to full load, and at light loads they draw a considerable reactive current. Cases have been found where power customers have been billed on the basis of a monthly power factor determined by the ratio of the readings of a watt-hour meter and a reactive volt-ampere-hour meter, in which the leading kilovolt-amperes drawn by the converters at light loads increased the power charge. If unity-power-factor loads will not furnish sufficient corrective capacity motor-generator sets with 80 per cent power-factor synchronous motors should be used.

In some mining operations, especially in the anthracite field, the pumping load, combined with the other induction motor load, is so great that the conversion apparatus cannot supply the necessary corrective capacity. In at least one such case, this condition has been met by using motor-generator sets with large synchronous motors operating at low leading power factor. In other cases the synchronous motor has invaded the field formerly held by the induction motor and has been applied to fan, pump, and compressor drives.

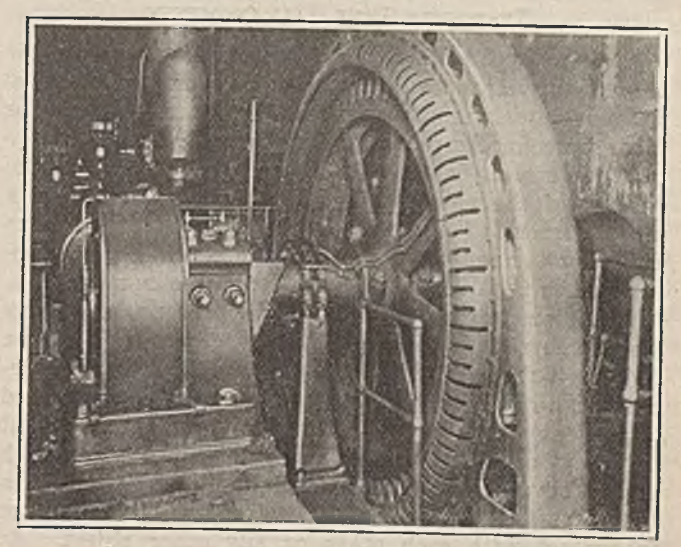
For driving constant-speed mine fans, the induction motor is preferable unless the user is penalized for low power factor, in which case it is better to use synchronous motors. The substitution of a synchronous for an induction motor, in addition to supplying corrective capacity, will eliminate the slow-speed induction motor with its inherent low power factor.

The application of synchronous motors to mine fans involves some difficulties, as the high pull-in torque required imposes too great a burden upon the ordinary type of motor. Synchronous motors have been connected to fans by means of magnetic clutches, which permit the motor to be pulled into step before the fan is started. These clutches have their disadvantages, however, as they require much space and, usually, heavier bearings. There is also a continuous demand for energy to supply the excitation of the clutch while the apparatus is operating.

The revolving stator-type synchronous motor overcomes these difficulties. This type of motor has the stator mounted on bearings, and arranged to turn freely during starting, thus allowing the motor to come up to speed and to be pulled into step before the load is started. Then, by tightening a mechanical brake placed around the stator, the load is gradually started and is brought up to speed as the stator comes to rest.

The application of synchronous motors to mine pumps involves no unusual difficulties, provided the pumps are started unloaded, or that some form of bypass is installed. For low-speed pumps which start under load, revolving-stator synchronous motors may be applied. For high-speed pumps starting under load, the induction motor is recommended. This motor will not affect adversely the power factor of the system appreciably, because the power factor of a high-speed induction motor operated at full speed is nearly 90 per cent.

When considering the installation of power-factor corrective equipment, an effort should be made to place the apparatus as near as possible to the motors which are causing the poor power factor. This will obviate the necessity for carrying the lagging current through the power lines and transformers. It will reduce the distribution loss and make available additional capacity in the distribution equipment.



Compressor with Synchronous-Motor Drive

A compressor load is peculiar, in that compressors require more power when loaded to capacity than when starting to build up pressure. The motor must therefore be designed for maximum loads but may rarely operate at full load, especially if the unloading devise is properly set. Much power-factor corrective capacity is available in synchronous-motor drives, when the motor is running light.

The question of the most economical power factor should also be considered. This is not always unity. It requires almost twice as much corrective capacity to raise a load from 90 per cent to unity power factor, as to raise it from 80 per cent to 90 per cent, whereas the reduction in line current is about the same in either case. The most economical power factor can be determined only by a consideration of the savings through power-factor correction and the investment charges on the corrective equipment.

Precautions in Blasting to Avoid Danger From Stray Electric Currents

BY CHARLES S. HURTER
Technical Representative, E. I. du Pont de Nemours & Co.

For some time it has been recognized that when currents of electricity stray through the ground from rails over which electric mine locomotives travel or from electric motors having a ground return, they may cause electric detonators and the charges of explosives primed with them to be exploded prematurely. Many articles have appeared recently outlining ways of preventing such stray currents. Efforts should be made, however, not only to eliminate this vagrant energy but also to lessen the chance of a premature explosion should such a stray current exist.

As a first precaution, it is wise to test for stray currents before making the connections for a blast. To do this one of the lead wires is connected to a terminal of the power circuit and an electric squib is connected to the other end of the wire and also the wire that later will be used as a return to the circuit, the latter connections being made at the point where a detonator is to be used.

The electric squib consists of a pasteboard capsule provided with wires similar to those of an electric blasting cap. This capsule, however, contains instead of a detonating charge, a pellet of flash powder. If the squib flashes when it is connected to the lead wires, with the other end of the circuit open, this indicates that there must have been a stray current of electricity which completed the circuit.

TEST WITH TRUE GALVANOMETER

Electric squibs are not waterproof and therefore for this test reliance can be placed only on fresh squibs without any signs of dampness. The same test may be made by connecting a galvanometer to the wires of the blasting circuit instead of an electric squib. The deflection of the needle will indicate the existence of a stray current of electricity. For this purpose a true galvanometer must be used, not the blasting galvanometer which is in reality a direct-reading ohmmeter.

If the preliminary test shows the presence of a stray electric current in the ground, great care must be taken to keep it from entering the blasting circuit. The precautions to be observed are practically the same as used to prevent current from leaking out of a blasting circuit in wet work. The bare ends of the leading wire which are to be connected to the switch should be placed in such a position that they will be absolutely free and not in contact with each other or any other object. At no point in their length should the wires make contact with pipes, rails or any other metal.

In coal mines, care should be taken to see that the wires are not in contact with sulphur, with bands in the coal or with slate. Joints should be taped, or if left bare, should be kept away from contact with any object whatsoever. Connecting wire should be used only to connect the holes and should not be employed as a substitute for leading wire. The cotton covering on connecting wire is purposely thin in order that it may be easily removed in making connections. Consequently this kind of wire is not sufficiently insulated to make it safe for use as leading wire where stray currents of electricity are present.

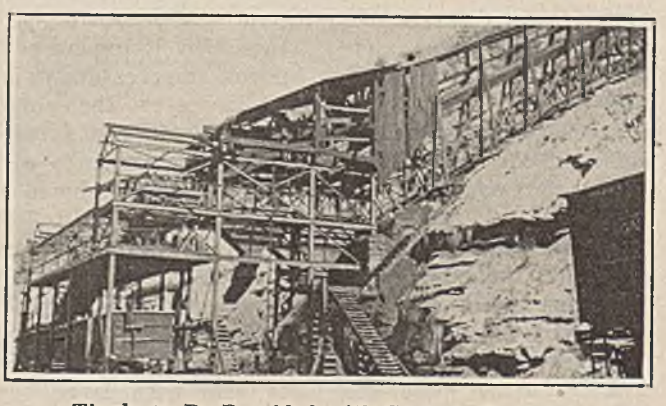
Ordinarily the insulation on either single or duplex leading wire adequately protects the copper wire against moisture, which is, of course, a conductor of electricity. Where there is much water, rubber-covered leading wire is desirable.

For final assurance, just before connecting the blasting circuit to the wires from the holes, it is advisable to test them with an electric squib or a galvanometer between the ends nearest the face. If the squib flashes or the galvanometer needle moves, there is evidently some accidental contact between the leading wires and a conductive substance through which a stray electric current is entering the circuit. This contact should be found and broken and a negative test should be obtained before the leading wires are connected to the detonator. Careful attention to these precautions should prevent premature firing of blasts by stray electric currents.

Raleigh Coal Co. Builds New Tipple

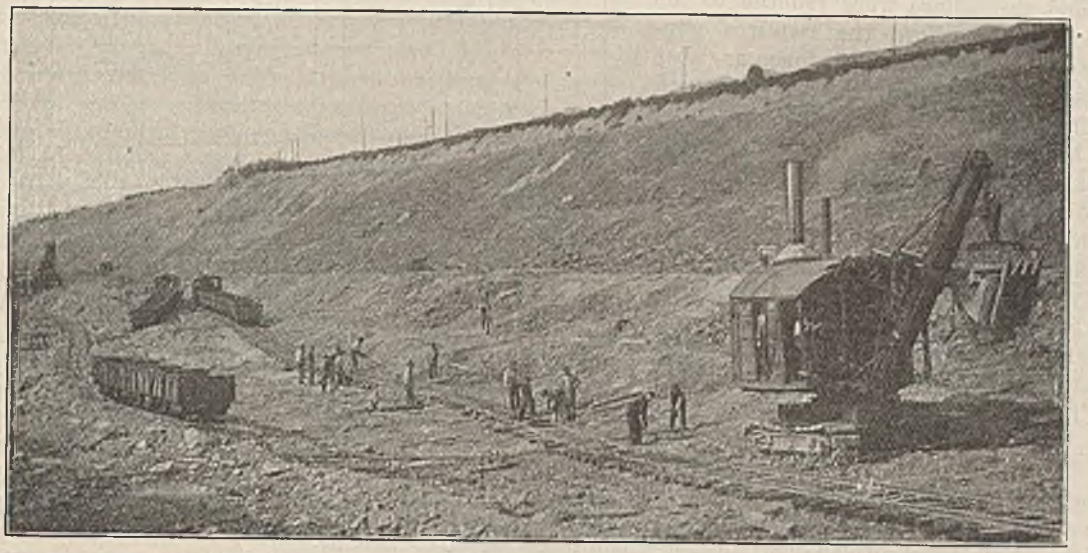
At No. 6 mine of the Raleigh Coal & Coke Co., at Raleigh, W. Va., a new steel tipple is being erected with a Miller scraper, or flight, conveyor to retard the coal from the headhouse to the tipple. This building was erected and put into use without interfering with the regular operation of the mine, the old structure being cut away as the new one was built. A section of the old tipple rests on top of the new building. This will be torn down as soon as the new steel conveyor is put into service. The structure is completed except for the roof covering. No siding will be put on, this being the practice of the company at its newer tipples.

The structure is arranged for the loading of lump, egg, nut and slack; though only two loading tracks have been provided. The bin near the stone foundation at the extreme right is for use in connection with a box-car loader which will handle smithing coal. The company's own men under the direction of their master mechanic, have erected the tipple from steel fabricated by the Webster Manufacturing Co.



Tipple to Be Provided with Scraper Conveyor

New steel tipple at Mine No. 6 of Raleigh Coal & Coke Co. The conveyor is not yet installed and the structure has not been roofed. No siding will be put on the tipple as the company believes that it may be advantageously omitted.



Stripping Anthracite Near Shenandoah

Much Anthracite Lost in Mining and Preparation

Only with Stripping Is Recovery Almost Complete—Squeezes Frequent Even Where Good Pillars Are Left—One Colliery Burned Over One-Third of Its Tonnage—Fires Frequent in Pitching Beds

BY H. H. OTTO
Mining Engineer
Lansford, Pa.

THE ANTHRACITE industry can be divided into two parts—the underground, or mining, and the outside preparation or manufacture. To understand the problems relating to coal recovery in the two branches of colliery operation, some of the history of the industry and the changes that have taken place in the past century should be considered.

It is a long step from 1807, when 55 tons were produced in the Wyoming field, to 1917, the peak year, when the aggregate shipment to market from all the fields was 80,841,223 tons. In 1820, the Lehigh Coal Co., the predecessor of the Lehigh Coal & Navigation Co., shipped 365 tons in arks down the canal of the Lehigh Navigation Co. The Schuylkill field was not opened until 1822, when 1,480 tons were shipped. The Wyoming field became a real producer only in 1829, when 7,000 tons were mined and sent to market.

It is well to note, at this time, the passing of the Coleraine colliery after a life of 88 years. In collieries of this age will be found the romance of the region, as well as the history of the changes to date.

In the Lehigh region, the first coal came from the old quarry mines at Summit Hill; a little later the open-cut workings, or quarries, east of Jeansville, and near Beaver Meadow were opened. In the Wyoming field, it was necessary to resort to underground mining almost from the first. Ashmead* has described the changes in outside preparation methods, all of which tended to increase the percentage of coal shipped to market. A description from the days when lump coal was raked and screened out in the quarries or mines, to the modern breaker of today, shipping as much as 6,000 tons of at least eight sizes of coal in an 8-hr. day makes an interesting story. The entry of each size into the market has been an important step toward increasing the yield from the property.

With the belief that the supply was inexhaustible, early mining was conducted with the thought of getting the maximum quantity of coal on first mining. The superintendent was his own foreman and engineer. As mining became deeper and production larger, however, it was necessary to give the superintendent assistance. Today, the mining engineer is almost entirely responsible for the proper laying out of the mines, the aim being to obtain the maximum economic recovery. In recent years, some companies have also employed men, known as robbing inspectors, to inspect the robbing area between general surveys or postings and to protect the operator and the land owner from waste by careless mining; frequently the inspector must show the miner how the latter can pull back his pillars without endangering his life.

The three classes of mining in the anthracite field are: stripping, which yields the maximum recovery; flat mining, where a partial separation of coal and refuse is made inside; and steep-pitch mining, where the coal and refuse are so mixed that both must be shipped together to the breaker for a proper separation. The last naturally yields the smallest maximum recovery.

In the early days, no pillars of any consequence

NOTE—Article entitled "Ultimate Recovery from Anthracite Coal Beds" presented at the winter session of the American Institute of Mining & Metallurgical Engineers, to be held Feb. 16-19, in New York City.

*D. C. Ashmead: "Advances in the Preparation of Anthracite." *Transactions, A.I.M.E.*, (1921) 66, 422.

were drawn in either flat or light-pitch mining; large areas were mined and the pillars were reduced to the minimum size which would afford the required support. This mining was most skillfully done, as later attempts to rob these areas revealed. As a result much of the coal remaining can now be recovered only at a high cost and can be mined profitably only in periods when the market is exceptionally good. The Hillman, Baltimore and Red Ash seams in the northern field and the Mammoth and Buck Mountain beds in the middle and southern fields were treated in this manner. Conditions of this type make the problems of the mining engineer and superintendent difficult.

Disregarding surface requirements, such as support for towns, rivers and streams, the geological conditions of the Wyoming, middle and southern fields are so different that it is impossible to co-ordinate them into one general group in determining the various losses.

The maximum recovery undoubtedly is obtained from strippings. In the early hand strippings, which helped to increase the yield from some properties, the only kind of overburden removed was clay, but with the increased size of stripping equipment it is possible today to strip entire basins and thereby obtain a maximum recovery. This, only 15 or 20 years ago, could not have been done.

In the flat territory, the room-and-pillar method is generally used in the thicker seams. In increasing numbers, the thin seams are being mined by modified longwall methods. In the lighter-pitch territory, a high percentage of the marketed coal is recovered by stripping. The underground mining is conducted by the breast-and-pillar method, the centers of breasts as a rule being 50 or 60 ft. apart. In the southern heavily pitching fields, some coal is recovered from strippings. Here, the inside conditions require a breast-and-pillar or chute-and-pillar method, and the mining on the upper levels must be well out of the way before work is started on a lower level.

In this territory, the thin-seam gangway and rock gangways have to be developed to replace the regular coal gangways in the seam to be mined. Where a thin seam is within 20 to 30 ft. of the Mammoth bed and has a good roof, the gangway is driven in the thin seam, chutes are driven up the pitch, and tappings are made into the seam to be mined. If the thin seam is too close to the Mammoth or if the condition of the rock above that seam does not permit, the gangways

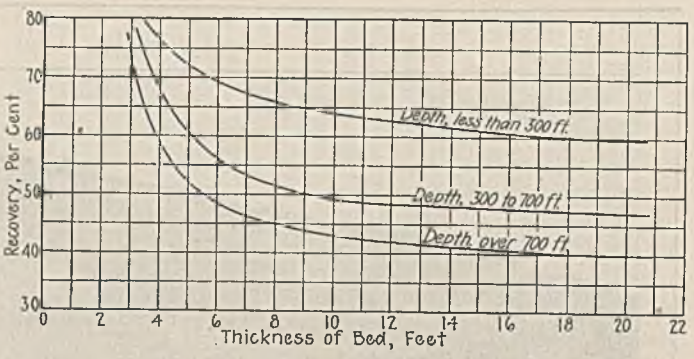


Fig. 1—Relation of Recovery to Depth of Seam

At depths over 700 ft. the recovery falls to 40 per cent wherever the coal is thick, rather a startling statement in view of the fact that mining is getting deeper and anthracite scarcer. However, with thin seams 75 per cent can be recovered.

are driven in solid rock. This method has already been described;* it permits a much higher extraction than is obtained when the gangways are driven in the Mammoth or Primrose seams.

The geologic factors affecting recovery are: Thickness of bed, character of bed, kind of coal, depth below surface, dip of bed, type of roof and bottom, nature of overlying strata, influence of mining of overlying and underlying beds, surface wash and streams. Where the seam is wet or gaseous, these physical conditions influence the percentage of recovery. The main factors determine, to a large extent, the losses in first mining and robbing, and will be discussed later.

The inside losses in mining and preparing anthracite are as follows: Coal in pillars left for support of shafts, slopes, tunnels, etc., coal in barrier pillars; coal left for support of streams, towns, cities, highways and railroads; coal lost in robbing because it cannot be recovered with safety; coal lost through breaking of roof; coal lost in gob; coal lost through fires, squeezes, and floods; coal lost through use of explosives; coal lost in transportation.

The outside losses are: Transportation loss, loss of coal in refuse, loss of coal in silt, loss of coal used as boiler fuel.

The loss of coal for support of shafts, tunnels, slopes, etc., will depend largely on the location of the shaft or tunnel to be supported and will vary in each colliery and with the depth.

*W. G. Whildin: "Steep Pitch Mining of Thick Coal Veins." *Transactions, A.I.M.E.*, (1914) 50, 698.

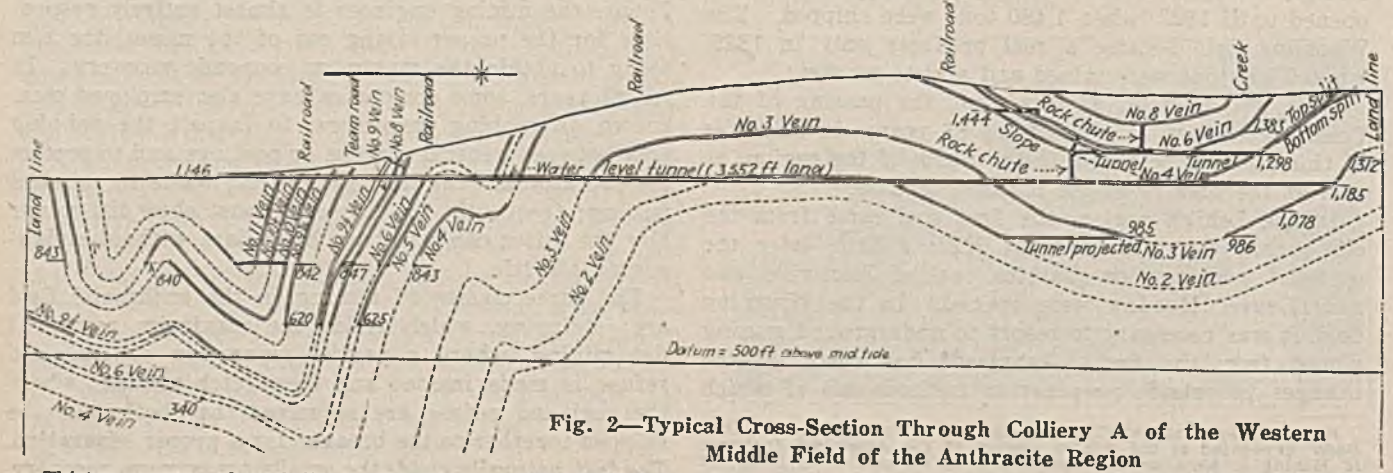


Fig. 2—Typical Cross-Section Through Colliery A of the Western Middle Field of the Anthracite Region

Thirteen seams of coal lie in the two main basins, the southern one, on the left, being deep with heavy dips and the northern one shallow and not seriously folded. This acreage shipped only 43.3 per cent of the coal contained in the area operated, 26 per cent being recoverable at first mining and 71.3 per cent on second mining. Boilers used 13 per cent of breaker output.

The loss in barrier pillars is necessary for safety and economic reasons; for when collieries are in the last stages of exhaustion, adjoining collieries need good barriers.

It is necessary to leave large quantities of coal in place to support highways, railroads, towns, cities, streams and rivers. Some leases specify the percentages of coal to be left for surface support, others leave the quantity to the operator's judgment. With culm and rock filling the percentage of coal that must be left for surface support is reduced. Where the surface must be supported a free-falling slate roof is a large factor in obtaining a high recovery. A number of shafts have been permanently lost because of inrushes of sand and water from the Susquehanna River or from the Buried Valley of the Susquehanna; these losses can be reduced, in part, if careful determinations of the rock-cover limits are made by diamond drills.

Table I—Section of Coal Seam

	Ft.		Ft.
Bone	0.4	Coal	2.5
Coal	1.1	Total coal	3.6
Bone	1.2	Bed thickness	5.2

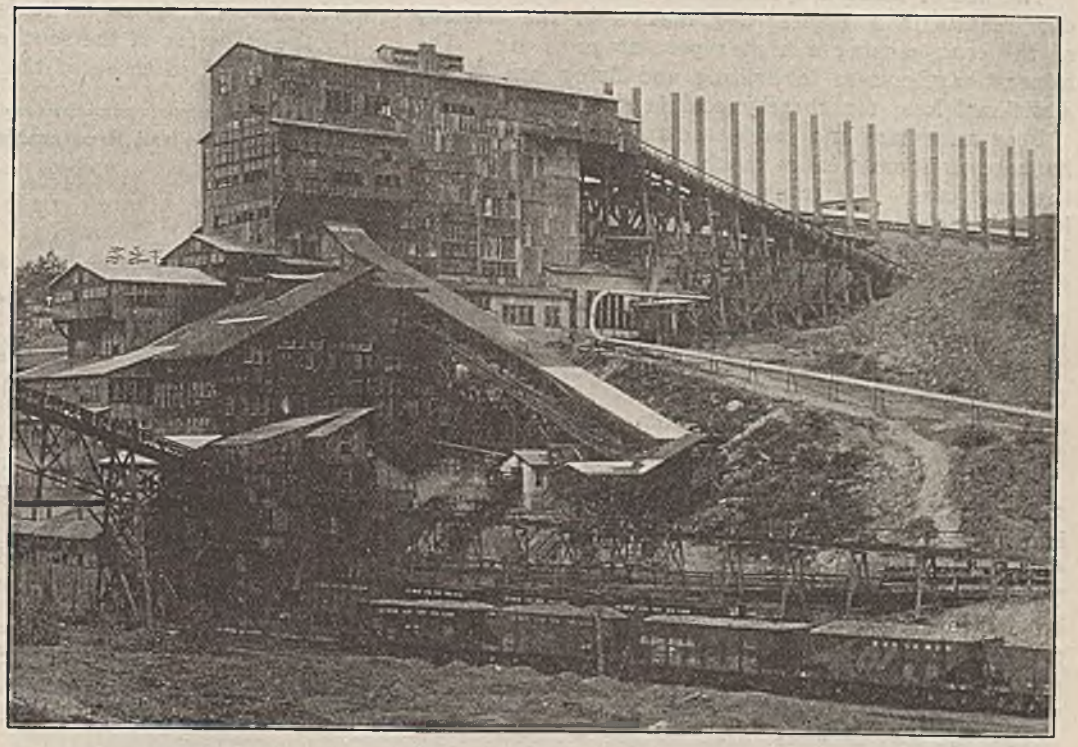
weighed. In the smaller dirty seams, the gob loss is high. Gob in the southern anthracite field means a mixture of coal and rock, caused by the caving of the roof over a breast.

The losses through squeezes, floods, and fires are important and, in a measure, are within the control of the operator. Squeezes have been numerous, particularly in the Wyoming region. Many were caused, not by careless engineering and mining, but by geological conditions, which became known only after mining had reached a certain stage. If large reserve pillars had been left and no mining done in them, except for the

FIG. 3

Greenwood Breaker

A Lehigh Coal & Navigation Co. plant near Lansford, Pa. Note the sixteen chimney stacks on the boiler house on the right and the long and well-covered and well-maintained steam line on the right. This is a side-hill breaker but the hill does not rise fast enough for the coal to be brought to the breaker without an incline or some other form of hoist.



Where this has not been done, collieries have been temporarily lost as a result of small streams breaking into the mines.

In robbing, many small portions of pillars are lost because they cannot be recovered with safety; at times, large areas are squeezed because the robbing is hurried and improperly conducted.

In first mining, in both flat and pitch breasts, a soft falling roof is likely to result in the loss of coal. The loss in pitch mining is considerably higher than that in the flat territory and is reduced by driving narrow breasts or chutes, which are usually more expensive to construct than full-width breasts.

The quantity of coal lost in the gob in the Wyoming field depends on the thickness and section of the seam, the care of the miner in the use of explosives and the separation of the coal from the refuse. A test made when cleaning up 60 ft. of breast in a bed with the section shown in Table I, revealed a loss of 8 per cent of the original coal content. All the gob was loaded into cars, the floor was swept and the material was sent outside, where it was carefully separated and the coal

excavation of gangways and airways, squeezes could have been localized, thereby reducing the total loss. The same is true of the more lightly pitching areas. In those pitching more heavily, one level must be practically exhausted before a lower one is operated, for by this means large squeezes in unexhausted areas are prevented.

The fire losses, however, are greater in pitching than in flat territory. The Carbondale fire is about the only large fire in the flat territory; the Red Ash fire is on the lighter pitches. The fires in the Panther Creek valley and at the Sioux colliery, near Mt. Carmel, are typical examples of the tremendous losses sustained from mine fires.

The causes of some of these are unknown; they were not the results of the careless use of lamps, etc., but they may have resulted from improper shotfiring by the miner. In the softer measures they may be caused by oxidation of the pyrite, although this has not been definitely proved. The losses by fires, floods and squeezes constitute some of the big mining risks. No percentage can be assigned to them, but the history

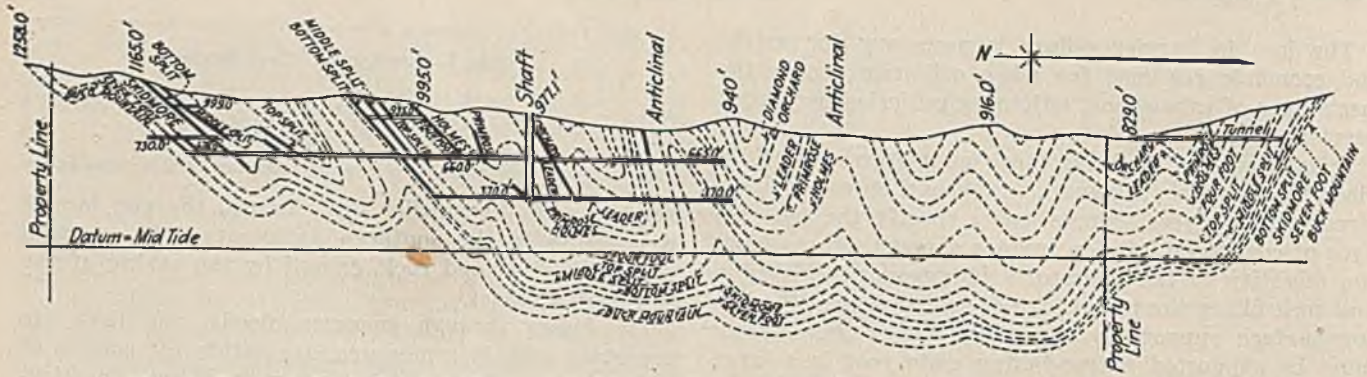


Fig. 4—Typical Cross-Section Through Colliery B, Also in Main Southern Basin of Anthracite Region

Here there are several small basins, the measures rippling like the waters of a pond and being broken in places by several reverse strike faults. The coal being friable, the yield of prepared sizes was only 46.6 per cent. The boilers of the colliery used 13.6 per cent of the coal produced by the breaker.

of the region shows that they are an exceedingly important factor in the mining loss.

The use of modern dynamites, instead of black powder, results in a greater degradation in the blasting of the coal, causing a higher percentage of silt. The miners' carelessness in drilling and firing has caused additional loss, for thereby coal is shot into the gob.

Poor mine cars and carelessness in handling modern haulage equipment cause much coal to be spilled along the roadways. The transportation loss, as a result of leaky mine cars, is high in collieries producing less than 55 per cent of prepared sizes; this loss is being reduced by the use of rotary dumps and closed-end cars.

Inside losses are being reduced by mining the beds in their proper sequence, by columnizing workings and by careful supervision and frequent inspections. Back filling of breasts in the flat territory, by silting or by other methods, has made much pillar coal available for the market.

Outside losses are much more easily controlled than those inside the mine. The outside transportation loss is smaller than that inside, because roads on the surface can be kept clean more easily than those inside. The refuse loss depends on the breaker equipment being of sufficient capacity to do the work properly, on its proper maintenance and on making necessary breaker changes to increase the recovery. Coal lost in refuse will run from less than 1 per cent upwards.

The silt loss depends, first, on the softness or friability of the coal and, second, on the breaker equipment. Low silt losses prevail in the Wyoming field, and high losses in the main southern field. Silt should not be treated as a waste product; wherever possible, it should be stored for future use in manufacturing briquets or for possible use as a pulverized fuel. In Table II is given Griffen's* summary of several determinations made as to the percentage of solids in silt.

The percentages given express a ratio of solids to shipments. Some actual tests show solids in slush at individual collieries as in Table III.

In the collieries of the southern field about one-third of the silt and in those of the middle field about one-half was coal, that could have been recovered on concentrating tables.

Table II—Solids and Recoverable Coal in Anthracite Silt

	Wyoming Field, per Cent	Lehigh Field, per Cent	Schuylkill Field per Cent
Total solids	7.2	22.4	22.3
Recoverable coal, with 15 per cent ash	3.5	9.5	8.8

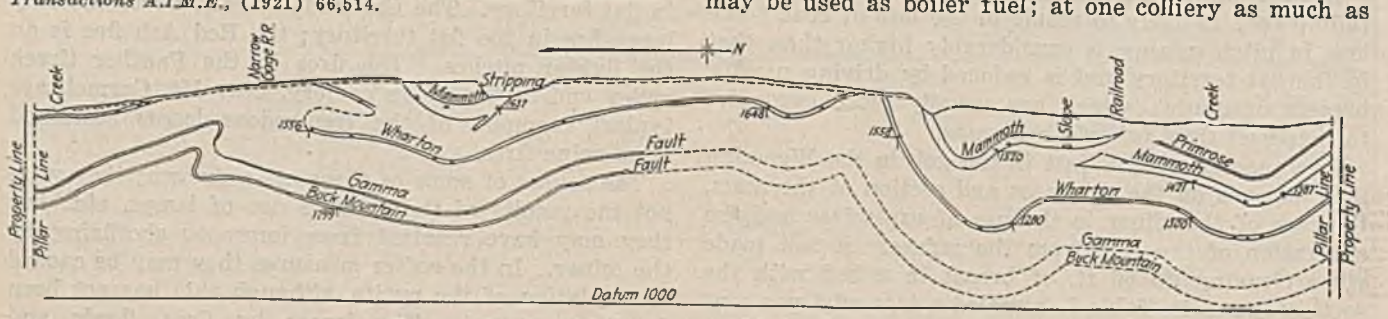
The coal used as boiler fuel at the collieries constitutes, roughly, 10 per cent of all the coal mined in the anthracite region; it is generally regarded as a loss, although the tendency is to charge it against the cost of steam at the prevailing price for the particular kind of fuel used. The highest grade of fuel is used by steam shovels, locomotives, and blacksmiths.

The fuel loss is being reduced by the use of purchased electric power or by a modernization of the steam-generating equipment, supplemented by the installation of the best hoists, compressors and pumps, which are the largest users of steam. At some collieries where a large quantity of water is pumped in comparison with the coal shipped as much as 22 per cent of the coal may be used as boiler fuel; at one colliery as much as

Table III—Ratio of Solids in Silt to Tonnage Shipped

	Percentage of Tonnage Shipped
A, northern field	8
B, southern field	23
C, southern field	22
D, southern field	28
E, middle field	19.9
F, middle field	17.0

*John Griffen: "Slush Problem in Anthracite Preparation." *Transactions A.I.M.E.*, (1921) 66,514.



Typical Cross-Section Colliery C, Near Hazleton, Pa.

Five seams including the Mammoth were mined. The main basin had a depth of 500 ft. below the surface. Though coal dipped from 25 to 45 deg. it was hard and the yield in prepared sizes was 64 per cent. Several strippings helped to increase the recovery from the property. The average boiler consumption for over twenty years was 17.3 per cent of the breaker product.

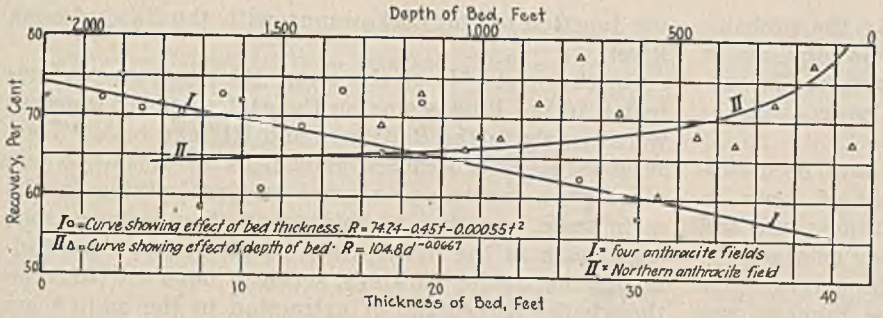


Fig. 6—Effect of Depth and Thickness on Recovery

Seams 40 ft. thick have an average recovery of about 55 per cent, whereas if the seam is about 4 ft. thick, about 72 per cent is the average recovery. For a bed 1,800 ft. deep the average recovery is about 64 per cent, but with a depth of 200 ft. it is about 74 per cent. This latter average is based on northern anthracite field conditions.

35 per cent was thus burned in the closing years of the operation.

Even after a careful examination of extensive data giving tests for the coal recovery over limited areas, it was found impossible to plot curves that would show the effect on extraction of pitch, thickness, depth, etc. The variations in the conditions in a single seam were too large and the records of the coal shipment by beds too incomplete to furnish suitable data. However, curves showing the general trend of the variation in recovery with changes of depth and bed thickness have been plotted. They show (Fig. 1) that the trend is toward a decrease in recovery with increase of depth and bed thickness. It is to be emphasized that these graphs are of no actual value, except to show the general tendency. If more data were available, empirical formulas could be derived that would show this tendency with a degree of accuracy which these curves cannot attain. The effect of dip might be considered in such formulas and perhaps other factors, such as the character of the coal. It is necessary to have data extensive and of a reliable character before curves can be drawn and formulas calculated.

The average extraction from different areas in all the anthracite fields for beds of given thickness, regardless of dip, depth or other factors was as in Table IV. The total production from the combined areas was over 30,000,000 tons.

If more data had been received for seams averaging from 15 to 19 ft. thick, the percentage for these seams would, in all probability, have been lower.

Many factors affect recovery. The information furnished represents so many conditions in the different fields, that the bed thickness can be plotted against the recovery to determine the curve most likely to represent the average effect of thickness on recovery (see I, Fig. 6).

Table IV—Recovery in Mining Anthracite Beds of Various Thickness

Bed Thickness, Ft.	Tonnage	Average Recovery, per Cent
3	745,159	72.3
4	2,382,827	75.1
5	4,550,819	71.0
6	4,093,994	71.5
7	3,190,762	70.6
8	1,859,420	58.6
9	2,567,181	72.8
10	2,203,678	72.1
11	2,515,154	60.8
13	2,332,548	68.9
15	291,800	73.4
17	695,870	65.6
19	287,495	72.0
22	498,600	67.7
27	255,579	62.5
30	2,307,455	57.5

The formula, $R = 74.24 - 0.45t - 0.00055t^2$, represents the most probable value of the recovery R, in per cent, for a bed thickness of t ft. If better than average conditions prevail, the percentage obtained by using the formula should be reduced. For seams 50 ft. thick, dropping the term $0.00055t^2$ will increase the

FIG. 7

Old Holywood Stripping

This exacavation, near Lattimer, Pa., is one of the first in the anthracite field. At places it is as much as 300 ft. deep, as may be imagined by the size of the pigmy representation of a man, hat in hand, by the water's edge. Note the rounded forms of the badly crumpled measures. The eastern middle coal field has many places where it has been possible to obtain much coal with what the anthracite region regards as not over-expensive stripping.

probable recovery only 1.4 per cent. As the probable error of the formula is ±3.4 per cent, this term can be dropped for general forecasting. The formula is subject to further reduction for outside losses, such as culm, breaker and fuel losses.

For the northern field, enough data have been submitted to show, in a measure, the effect of depth on recovery for all beds, regardless of thickness, dip and other factors. The graph, II, Fig. 6, was obtained for depths up to 1,300 ft. and represents the average of a number of limited areas. Most of the tonnage was won from beds not more than 500 ft. deep. This curve shows how depth affects recovery.

Table V shows that in the Wyoming, or northern field, the Baltimore and its various splits had more squeezes than any other seam, and that the Red Ash seam was next. Beginning at the Lackawanna-Luzerne County line, the Red Ash was subject to a squeeze in every colliery mining in the main basin to and beyond the junction of the Lackawanna with the Susquehanna River.

On the west side of the river, the squeezes predominated in the Ross seam; on the east side, the squeèzes were largely in the Baltimore and Hillman beds. They seem to have been caused principally by trying to win too high a percentage of coal on first mining in the main seam, and then by mining another seam or split contiguous to the first. As a result of imperfect columnization of the workings, squeezes were started, even though the percentage of extraction in the main seam did not appear to be excessive.

Some complete data giving the coal marketed from five collieries have been obtained, but unfortunately, the tonnage in the early years was not kept by seams. Estimates have been carefully made and the overall percentages of the original coal marketed from the minable area are submitted. Faulted and barren sections have been excluded in estimating the area mined.

Table V—Tabulation of Squeezes in Wyoming Region of Anthracite Field Showing Operating Conditions and Area Affected

Colliery Number	Bed	Thickness, Ft.	Pitch, Deg.	Area, Acres	Per Cent Mined	Date of Squeeze	Depth Below Surface, Ft.	Cause of Squeeze	Remarks
1	Red Ash	7.0	8	90	54		400		
2	Red Ash	12.0	8	129	62		250		
3	Red Ash	6.0	10	180	66		335		
4	Red Ash	5.7	5–10	9	51	1897	1,000–1,500		24-ft. breasts, 30-ft. pillars, shelly coal, gas appeared in great quantities.
5	Red Ash, top	10.0	5–10	29	52	1897	1,000–1,500		
6	Red Ash	11.2	5	86	58		520		
7	Red Ash	6.7		100	48		1,000–1,500		
8	Red Ash	6.5	5–8	210	62.5	1896	433	Irregular mining, squeeze precipitated by mining fifth vein.	Interval to fifth vein 10 to. 30 ft., fifth vein 3 to 4 ft. thick.
9	Red Ash	16.0	5–15	85	50		350		
10	Red Ash	21.0	10–15	40		1894		Irregular pillars, coal friable; pillars chipped off.	
11	Red Ash	16.0	5–15			1890			Broken to surface, admitted water from Susquehanna.
12	Red Ash	21.0	5–15			1897		Irregular mining.	
13	Ross	6.2		83	46		500–1,000		
14	Ross	18.0		94	43		500–1,000		
15	Ross	7.0	5–15	49	69		200		
16	Ross	4.5	8	42	70		280		
17	Ross	4.0	8	19	60		310		
18	Ross	6.8	5–15	162	61		160		
19	Ross, top	3.5	8	42	70		240		
20	Ross, top	3.3	8	19	58		290		
21	Baltimore, Cooper Bennet	6.5 6.0	8	50	50	1919	415–525	Irregular mining, no columnization.	24-ft. chambers.
22	Baltimore, Cooper Bennet	6–9 6.0	0–15		48.7 51.1	1916	730–790	Poor columnization, chamber too wide.	Reserve pillar every 11 or 12 breasts.
23	Baltimore, Bennet	10.0	5–10	26	54		500–1,000		
24	Baltimore, Pittston	11.0	8	120	61.5		400		
25	Baltimore, Pittston	11.75	8	131	62.6		260		
26	Baltimore	14.0		64	40.6		900		
27	Baltimore	16.0	15			1889	700		Pillars large, breasts narrow; gas appeared in great quantities before collapse; squeeze started in Bennet and affected Cooper, Five Foot, and Hillman.
28	Baltimore, Cooper Baltimore, Bennet		10–15	100		1899			
29	Baltimore, Top Baltimore, Bottom		5–10			1884		Small interval, lack of columnization; abandoned Hillman full of water.	
30	Baltimore		15–17	10		1874		Irregular mining, fire, no reserve pillars to break squeeze.	
31	Baltimore, Mammoth	30.0	25			1877		Irregular mining, extensive robbing; no reserve or gangway pillars.	Surface dropped 11 ft.
32	Top Baltimore	6.0	20–30			1890			Interval to bottom split 15 ft., bottom split unaffected
33	Top Baltimore, Cooper		10	4½		1890			Cogs and slush prevented squeeze from spreading.
34	Baltimore, Top Mammoth Bottom	6.4	15–35	16		1918	200–400	Too many pillars skipped.	24-ft. breasts, 55- to 60-ft. centers; interval 10-ft. of soft slate and fire clay.
35	Hillman	8.2 9.8	8	30	50	1919	415–525		
36	Hillman	10–12	10–15	20	50	1918	340–570	Pillars too narrow; extraction in first mining too high; columnization poor.	Too many roads through reserve pillars, 24-ft. chambers, 50-ft. centers. 24-ft. chambers, 50-ft. centers.
37	Hillman, Lance	6.0			48.6	1916	730–790	Poor columnization; chambers too wide.	Precipitated by Bennet-Cooper squeeze.
38	Hillman	7.5		88	53.8		550		
39	Hillman, Lance	6.1	10	18	82.9		500		
40	Hillman	7.0	5–15	85	50		350		
41	Hillman		15			1899	400	Due to squeeze in Baltimore below.	
42	Kidney	5.5	15–40	20		1879		Cover limit, too shallow.	
43	Diamond and rock (Contiguous)					1878		No columnization.	

Table VI—Data Relative to Interval, Thickness and Character of Beds and Method of Mining Employed at Colliery A

Bed No.	Interval, Ft.	Thickness Ft.	Thickness In.	Character of Bed	Character of Roof	Character of Bottom	Overlying Strata	Influence of Mining: Above	Influence of Mining: Below
2	140	2	6	C. 1 ft. 6 in. S. C. 1ft. 0 in.	Very hard	Slate	Conglomerate	None	None
3	220	2	6	C. 2 ft. 0 in. S. C. 0 ft. 6 in. C. 2 ft. 0 in.	Very hard	Slate	Conglomerate	None	None
4	80	3	6	S. 0 ft. 6 in. C. 1 ft. 0 in. C. 1 ft. 9 in.	Hard	Slate	Sandstone	None	None
5	30	3	9	S. 0 ft. 8 in. C. 1 ft. 4 in.	Hard	Slate	Sandy Slate	None	None
6	70	2	6	C. 2 ft. 6 in.	Hard	Slate	Sandy Slate	None	Falls into No. 5 vein
8	10–30	7	8	B. 0 ft. 8 in. C. 2 ft. 0 in. B. 1 ft. 0 in. C. 4 ft. 0 in.	Hard	Slate	Conglomerate	None	None
	30–40	7	7	C. 0 ft. 10 in. S. 0 ft. 3 in. C. 0 ft. 6 in.	Friable Slate	Slate	Slate	None	Strata breaks to No. 8 vein
9½	80	7	4	S. 1 ft. 0 in. C. 5 ft. 0 in. C. 0 ft. 6 in. S. 0 ft. 5 in.	Friable Slate	Slate	Slate	None	Strata breaks to No. 9 vein
9¼	40	4	11	C. 1 ft. 10 in. S. 0 ft. 3 in. C. 4 ft. 4 in. C. 3 ft. 6 in.	Clod	Slate	Clod Sandstone	None	None
10	50	5	3	S. 0 ft. 5 in. C. 1 ft. 0 in. C. 5 ft. 0 in.	Clod	Slate	Clod Sandstone	None	Strata breaks to No. 9¼ vein
10½	40	2	6	S. C. 0 ft. 3 in. C. 2 ft. 6 in.	Slaty	Slate	Slate and sandstone	None	None
11		5	8	C. 4 ft. 0 in. S. 0 ft. 8 in. C. 1 ft. 0 in.	Slaty	Slate	Slate and sandstone	None	None

No. 2 is bottom bed worked; No. 11 is top bed worked. *C* means coal; *SC*, shelly coal; *S*, slate; *B*, bone coal.

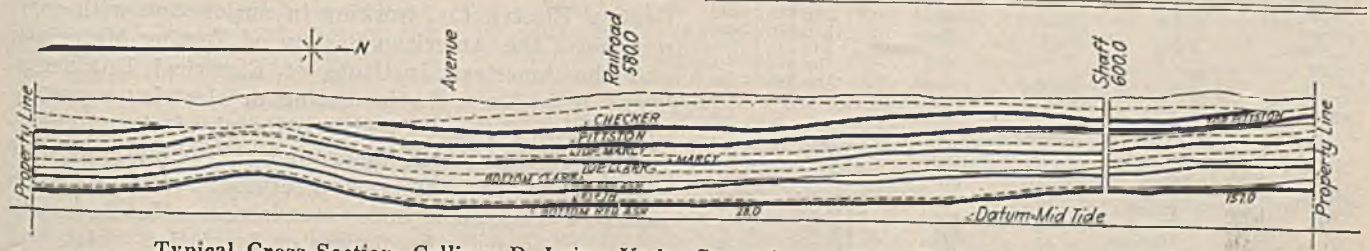
Colliery A is in the western middle field and can be considered typical. There are no towns over the area, merely roads, streams, and railroads. Thirteen seams of coal lie in two main basins; the southern basin is deep and the dips are heavy; the northern basin is shallow and not seriously folded, the intervals between the beds are not large. A few strike faults run east and west across the property. About 43.3 per cent of the coal in the ground from the areas considered was shipped to market, 26 per cent of the original coal was recovered on first mining and 17.3 per cent on second mining; 13 per cent of the breaker production was used for boiler fuel. The prepared yield for twenty-eight producing years averaged 57.7 per cent.

Colliery B is in the main southern syncline, and the coal lies in several local basins. No towns or streams requiring surface support lie over the coal. The measures are broken as a result of several reverse strike faults, and crop twice. The coal is more friable than that of the western middle field. It is carefully mined to obtain a maximum yield from the seven seams, all of which are being extracted. The general dip of the developed territory is 50 deg. The beds do not have big intervals between them; the thickest bed averages 10 ft., the smallest 3 ft. The boiler fuel used was 13.6 per cent of the coal produced by the breaker. In 1923, the yield of prepared sizes was 46.6 per cent. The colliery is not exhausted, the figures given being from certain areas, the work in which was carefully studied.

Colliery C is near Hazelton, and five seams, including the Mammoth, were mined; the others were much thinner. A small stream, a road and a railroad cross the property, but did not interfere seriously with the mining, as the stream was flumed and the railroad brought back to grade after subsidence took place. The coal, except where faulted or badly folded, dipped 25 to 45 deg. and lay in two basins, one being small and shallow. The main basin had a maximum depth below the surface of 500 ft. Generally speaking, the mining conditions were unusually good, the coal was hard and the yield, in prepared sizes, was 64 per cent. Several strippings helped to increase the recovery from the property. For the last thirty years most of the work done consisted

Table VII—Data Relative to Interval and Character of Beds at Colliery B

Bed	Minimum Dip, Deg.	Maximum Dip, Deg.	Minimum Interval, Ft.	Maximum Interval, Ft.	Thickness of Bed, Ft.	Thickness of Coal, Ft.	Remarks
Orchard	40	87	130	150	6.0	5.5	Fair vein, full of slips breaks easily.
Primrose	40	70	50	100	5.0	3.5	Poor quality, very, faulty; low per cent. of prepared sizes.
Holmes	40	65	100	130	8.0	8.0	Good vein, hard coal in spots, only worked where good.
Four foot	37	55	80	100	5.0	4.0	Good coal in limited areas where worked; bottom bench dirty.
Top split	35	55	60	80	5.5	4.0	Vein full of rolls and dirty.
Middle split	29	64	30	70	3.0	3.0	Good hard coal.
Bottom Split	34	62	100	110	10.0	9.6	North basin, good hard coal, balance soft but fair.
Skidmore	40	45	60	70	3.5	3.0	Poor vein, not exploited.
Seven foot	40	45			3.5	2.8	Fair coal where developed.



Typical Cross-Section, Colliery D, Lying Under Susquehanna River Wash and a Populated Area

A squeeze caused the mine to be abandoned. The upper broken line shows the lower edge of the river wash. It will be seen that at an anclinal the seams tend to lip upward toward the river wash making operation difficult.

Table VIII—Character of Beds, Intervals and Methods at Colliery C

Bed	Section	Interval, Ft.	Top Rock	Bottom Rock	Remarks
Primrose.....	Coal 3.7 ft. Slate 0.7 ft. Coal 3.3. ft.		Hard sandstone	Slate	Coal hard
		60			
Mammoth.....	Coal 15.0 ft. Poor Man 3.0 ft. Coal 9.5 ft. Slate 1.0 ft. Coal 5.5. ft.		Hard sandstone	Hard slate	Coal hard
		90			
Wharton.....	Coal 5.5 ft. Bone 1.2. ft. Coal 3.5 ft.		Hard sandstone	Hard slate	Coal hard.
		140			
Gamma.....	Coal 5.0 ft. Bone 1.3 ft.		Hard sandstone	Hard slate	Thin, faulted, and unworkable over large areas.
		50			
Buck Mountain.	Coal 2.4 ft. Slate 0.2 ft. Bone 0.3 ft. Coal 0.6 ft. Slate 0.2 ft. Coal 0.5 ft.		Hard sandstone	Hard slate	Thin, faulted, and unworkable over large areas.

First mining, room-and-pillar n descending order. Beds dry and non-gaseous, No slushing or rock filling. Pillars are skipped or split, the beds being robbed

in robbing pillars, and the management, by careful work, succeeded in removing the pillars without bringing on a squeeze. The average consumption of boiler fuel for over twenty years was 17.3 per cent of the breaker product. The colliery is considered exhausted and has been abandoned.

Collieries D and E are in built-up sections of the Wyoming territory and under the Susquehanna River wash. Colliery D was abandoned when the Susquehanna River broke into the mine following a squeeze

Table IX—Character of Beds, Intervals, etc. at Colliery D

Bed	Thickness, Ft.	Depth, Ft.	Per Cent Removed	Top Rock	Bottom Rock
Checker.....	5.8	136	60	Hard fireclay	Hard sandstone
Pittston.....	10.0	210	60	Slate	Hard sandstone
Top split....	4.3				
Bottom split	2.8	155	60		
Marcy.....					
Top split....	2.5	230	65	Hard slate	Hard slate
Bottom split	3.6	250	65	Soft sandstone	Soft fireclay
Red ash.....	6.7	467	60	Soft	Hard

that damaged the surface property. The seams are quite regular, with an occasional thinning, which had no serious effect on mining. The section through the colliery shows the limbs of an anticlinal cropping in the river wash, which reduced the workable area of the three upper seams.

Colliery E was abandoned because of damage to surface property and high pumping costs. The property was well silted in certain areas, nevertheless, subsidence occurred, which eventually forced the abandonment of the colliery. Eight beds were mined; the thinnest was 4.5 ft. thick and the thickest 20 ft. The maximum

Table X—Character of Beds of Colliery E

Bed	Thickness, Ft.	Top Rock	Bottom Rock	Remarks
Bowkley	5.0	....?	....	Small area
Hillman	11.0	....	....	Small area
Orchard	4.5	Good	Good	Dip 8 to 12 deg.
Five foot	5.0	Poor	Hard	Dip 8 to 12 deg.
Cooper	7	Soft	....	Dip 8 to 12 deg.
Bennet	12	....	Soft	Dip 8 to 12 deg.
Ross	7	Hard	Hard	Dip 8 to 12 deg.
Red ash	20	Soft	Hard	Dip 8 to 12 deg.

Colliery	Coal Area, Acres	Pitch	Number of Beds Mined	Maximum Depth, Ft.	Shipments, Long Tons	Per Cent.
A	1,143	Heavy	12	900	7,495,752	43.3
B	370	Heavy	7	700	2,320,200	42.7
C	346	Medium	5	500	11,418,843	61.8
D	307	Slight	6	467	5,047,994	51.0
E	155	Slight	8	810	5,068,118	45.5
					31,350,907	

pitch was about 12 deg. Accurate records of the quantity of boiler fuel used were not kept, but it was probably 8 per cent of the breaker production. Neither of these collieries can be regarded as having been exhausted as it is possible that additional coal may be recovered from both, but the risk is great and the cost will be very high. What has happened to these collieries may happen to others in the lowlands of the Wyoming valley.

Probably we all have seen areas of beds that were being robbed practically clean. Three of the collieries have been mentioned to emphasize the fact that, as an overall proposition, the percentage of recovery for the average colliery is not as high as is generally supposed.

Standardizing Tests for Electrical Insulating Materials

With the rapid increase in the size of practically all electrical apparatus and with the growing demand for high efficiency and power economy the problems of the insulating engineer have become more and more complex. For a time, according to L. E. Barringer, engineer of insulation, of the General Electric Co., the choice of insulation was based on experience gained by cut-and-try methods.

Recently these materials have been tested more systematically so as to establish their specific properties on a more uniform and generally accepted basis. In order to provide for ready identification of insulating properties which will permit of accurate duplication and also to make specifications more uniform it is essential that standard tests be established.

Mr. Barringer asserts that hitherto tests have been made in a haphazard manner without a due regard to their correlation with facts which other investigators have obtained. The usual practice of engineers or manufacturers of electrical equipment has been to conduct improvised tests which seem likely to determine the capabilities of insulation for certain specific purposes. Such tests are of slight value to those interested in other types of apparatus or in other fields of service.

Specifically, proper consideration has not been given to the effect of various concomitant physical and chemical conditions on the results of insulation tests. Mr. Barringer states that temperature, humidity, thickness of specimen, time period of voltage application, frequency, pressure of electrodes and other factors have a marked effect upon the values obtained. "Unless these conditions are reported with the results, the latter cannot be taken as strictly indicative of the true comparative value of the insulation.

Standardization of methods of testing insulating materials affords the ultimate answer to this complex question, Mr. Barringer believes. More than eighty standard tests have been outlined by engineers of the General Electric Co., working in conjunction with committees of the American Society of Testing Materials, and the American Institute of Electrical Engineers. These tests cover the insulating or electric properties of various substances, and also the physical and chemical properties which determine the performance of materials under assembly and service conditions. Such standard tests, made under standard specifications, will permit of comparative figures on insulation which will at last give reliable and accurate test results which may be readily utilized by electrical engineers.

News Of the Industry

Co-operative Marketing Seen as Escape From Ills Due to Jacksonville Pact

Launching of Plan Suggested Now to Meet Possibility of Strike in 1927 —Critics of Present Conditions Have Short Memories —Fuel Oil Competition Wanes

By Paul Wooton
Washington Correspondent of *Coal Age*

Co-operative marketing of coal is spoken of with such favor on all sides that wonder frequently is expressed that something is not done to get it out of the conversational stage. If the idea has merit, now is thought to be the time to take steps toward putting it into effect rather than waiting until the expiration of the Jacksonville agreement. A strike is a possibility at that time and it might put hundreds of additional mines into operation.

Had regional selling or co-operative marketing been undertaken in 1920 some 9,000 mines would have had to be invited into the pool. Profits would have been burdened by undeniable high costs at many mines.

While the point is made that the Jacksonville agreement has shut down efficient union mines and is maintaining many inefficient mines in non-union territory, it is admitted quite generally that it is bringing about an ideal situation for launching the co-operative marketing idea.

While a good deal can be said as to the untoward results which have come in the train of the Jacksonville agreement, it is obvious that it is a great improvement over its alternative—a desperate strike. Such an event simply would have tended to perpetuate the unstable conditions of the war period. The agreement has brought about a condition which offers a unique opportunity for a great advance in organizing the industry. This is being accomplished to a considerable extent by consolidations. It offers an opportunity to have better and stronger associations. Incidentally all agree that there never was a time when the services of associations were so much needed as is the case at present.

What is characterized as loose thinking is much in evidence just at this time as to the condition of the industry. One would think, for instance, from what John L. Lewis says, that before the war every miner had plenty of work and every operator had satisfactory profits. Only superficial analysis is necessary to demonstrate that the present situation differs from that prevailing before the war in degree only. In 1914 there was great potential overproduction. There was distress and bankruptcy. In 1914 25 per cent of capacity in Illinois was in a state of bankruptcy. Conditions in the Southwest Interstate district were not much better. In 1914 southern and eastern Ohio shut down because of a disastrous strike. Labor relations in Colorado had reached the point of bloodshed. Perusal of Representative Rainey's resolution of that year will reveal a list of all the troubles now the subject of complaint. The Illinois operators then were less familiar than now with the working of federal supervision. Paint the situation then in stronger colors and you have the picture of today.

Future Looks Brighter

While this picture of today is not a pleasing one, many experienced observers are convinced that prospects for 1925 are very encouraging. While it is now apparent that we are not heading into a boom, general business is in a much better condition than in 1924. There are no enormous stocks to liquidate. It is true that comfortable reserves are on hand but consumers are buying for current needs. Instead of having to give ground continually to fuel oil, as was the case in 1923 and 1924, it now is fuel oil that it being forced steadily to retire.

Winifrede Coal Co. Loses In Tax Appeal

A decision handed down Feb. 10 by the Board of Tax Appeals in the case of the Winifrede Coal Co., the Winifrede Railroad Co. and the Belmont Railroad Co., all West Virginia corporations, with principal offices in Cincinnati, Ohio, is to the effect that "amounts paid for the purchase and installation in a mine of electric motors, storage batteries and accessories, mining machines, and a track scale, having a useful life of a number of years are not ordinary and necessary expenses deductible from gross income in income tax returns. The evidence presented does not warrant the allowance of a greater amount for depreciation and depletion for the year 1920 than has been allowed by the commissioner. The evidence presented does not indicate any such abnormality of invested capital or of income for the year 1920 as would warrant assessment under section 328 of the Revenue Act of 1918."

This appeal came on for hearing Jan. 8, 1925, upon a determination by the commissioner of deficiency in income and profits taxes for the calendar year 1920 in the amount of $80,036.13, and the determination of the commissioner is approved by the board.

Perusal of the decision would indicate that this probably was not a fair case on which to make a test of the deductibility of the cost of locomotives, mining machinery, etc., in a developed mine, because in the present case it would appear that mule haulage had been replaced by electrical haulage motors and that real value may have been added to the property value. It was admitted by the taxpayer that items similar to the ones in question had never before been purchased. The decision evidently was made on the basis that these were unusual and that they added value to the property and probably also meant a reduction in costs.

Union Offer Asks Probe of British Empire Steel Co.

The Board of Conciliation in the dispute between the British Empire Steel Corporation and the Nova Scotia coal miners has completed its work and come to a unanimous decision respecting which information is refused. Previous to adjournment the board received a communication from District 26, United Mine Workers, offering temporarily to continue the present status and remain at work for a period of four months from Jan. 16 at present wages, provided that during that period a full and impartial investigation is made into the organization, direction, administration and financing of the corporation, including costs of production, transportation and distribution, and appropriate action taken upon the results of that investigation. The communication stipulates that all members of the union shall be employed not less that four days per week during the four months, or in lieu of employment shall receive wages.

So far there has been no intimation as to whether this offer has been accepted by the corporation.

Coal Output by States Shows Old Leaders Shipping

The total output of soft coal in the United States in 1924 was 483,280,000 net tons, according to estimates by the Geological Survey. The accompanying table apportions this tonnage by states and shows comparative figures for 1923, 1922 and 1921. Figures of production of anthracite, which in 1924 totaled approximately 90,000,000 net tons, also are included.

The state estimates, as well as that for the country as a whole, are based on weekly reports of cars loaded by the 137 principal coal-carrying roads, furnished by the American Railway Association. The carriers reporting load about 85 per cent of all the coal produced. Allowance is made for mine fuel, coal coked at the mines, local sales, shipments by water and shipments over certain small roads not reporting. Comparison of the Survey figures with those from other sources, such as state departments of mines, geological surveys, operators' associations, etc., have been made where possible, and in some cases the original figures have been adjusted to agree with the best information available.

Similar estimates have been made by the Geological Survey for each year since 1918. The experience of these six years has shown that such estimates usually are 2 to 3 per cent too low. The figures here shown for 1924 have been adjusted to overcome that error, and it is expected that they will approximate the final figures as reported by the mine operators more closely than have the estimates for other recent years.

The most striking fact revealed by the figures is the sharp decline in output in Pennsylvania, Illinois and Indiana. As against 171,879,913 tons in 1923, the mines of Pennsylvania produced approximately 123,530,000 tons in 1924, a decrease of approximately 28 per cent. In Illinois and Indiana the decreases were 14 and 15 per cent, respectively. Of equal interest and significance was the increase of more than two million tons in West Virginia, which carried the output of that state to a new high record. A new high mark, 45,000,000 tons, also was established by Kentucky, despite the fact that many mines in the western part of the state were shut down most of the year by strikes.

"Back to Coal" Movement Gains Headway

The movement back to coal from oil is gaining headway along the Atlantic seaboard, according to recent reports. This is particularly instructive as to the relative advantages of oil and coal as fuel because in no part of the country outside of the oil-producing territory is it as safe to rely upon a constant supply of fuel oil at a low price.

A partial list of recent changes contains the names of two large public utilities companies, namely, the Eastern Massachusetts Street Railway Co. and the Narragansett Electric Lighting Co.; of many large manufacturing establishments, including such diversified enterprises as Swift & Co.'s Jersey City plant, the Crane Co.'s Bridgeport plant, the Johns-Manville Co.'s Manville plant, the American Sugar Refining Co.'s Revere plant, the Androscoggin Pulp Co.'s South Windham plant and the Merrimac Chemical Co.'s Everett and Woburn plants, and Morris & Co.'s plant at Oklahoma City.

Not less noteworthy is the movement from oil to coal for heating purposes in large buildings. Among the striking instances of that change may be mentioned Mt. Sinai Hospital, Columbia University, Manhattan College, the Pershing Square Building, New York City; the Girard Trust Company Building, Philadelphia, and the Y. M. C. A. Building and the John Hancock Building in Boston.

Estimated Coal Output in 1924 by States, Compared with 1921, 1922 and 1923

(In Net Tons)

State	1921	1922[a]	1923[a]	1924 Estimated
Alabama	12,568,899	18,324,740	20,457,649	19,490,000
Arkansas	1,227,777	1,110,046	1,296,892	1,300,000
Colorado	9,122,760	10,019,597	10,346,218	9,840,000
Illinois	69,602,763	58,467,736	79,310,075	67,880,000
Indiana	20,319,509	19,132,889	26,229,099	22,340,000
Iowa	4,531,392	4,335,161	5,710,735	5,100,000
Kansas	3,466,641	2,955,170	4,035,404	4,150,000
Kentucky	31,588,270	42,134,175	44,777,317	45,000,000
Maryland	1,827,740	1,222,707	2,285,926	1,720,000
Michigan	1,141,715	929,390	1,172,075	820,000
Missouri	3,551,621	2,924,750	3,403,151	3,140,000
Montana	2,733,958	2,572,221	3,147,678	2,700,000
New Mexico	2,453,482	3,147,173	2,915,173	2,550,000
North Dakota	864,903	1,327,564	1,385,400	1,090,000
Ohio	31,942,776	26,953,791	40,546,443	29,200,000
Oklahoma	3,362,623	2,802,511	2,885,038	2,800,000
Pennsylvania (bituminous)	116,013,942	113,148,308	171,879,913	123,530,000
Tennessee	4,460,326	4,876,774	6,040,268	4,800,000
Texas	972,839	1,106,007	1,187,329	1,075,000
Utah	4,078,784	4,992,008	4,720,217	4,460,000
Virginia	7,492,378	10,491,174	11,761,643	10,900,000
Washington	2,428,722	2,581,165	2,926,392	2,400,000
West Virginia	72,786,996	80,488,192	107,899,941	110,000,000
Wyoming	7,200,666	5,971,724	7,575,031	6,850,000
Other States [b]	180,468	253,126	261,910	145,000
Total bituminous	415,921,950	422,268,099	564,156,917	483,280,000
Pennsylvania (anthracite)	90,473,451	54,683,022	93,339,009	90,000,000
Grand total	506,395,401	476,951,121	657,495,926	573,280,000

(a) Includes "wagon mines," for which data are not available for 1921 and 1924.
(b) Alaska, California, Idaho, Georgia, North Carolina, Oregon and South Dakota.

Lewis Declines to Modify Jacksonville Pact

A conference early in February between John L. Lewis, president of the United Mine Workers, and a group of northern West Virginia operators, called for the purpose of effecting an adjustment of wages as fixed under the Jacksonville agreement was not productive of results. The conference was held at Fairmont, operators being represented by Brooks Fleming of the Consolidated Coal Co.; M. L. Hutchinson, president of the Hutchinson Coal Co., and A. Lisle White, of Clarksburg, president of the Fairmont & Baltimore Coal & Coke Co. The fact that Lewis was unwilling to agree to any change in the wage scale did not of course come as a surprise to the operators although they are finding it increasingly difficult to pay the union wage scale in competition with many nonunion companies operating in the northern part of the state.

After the conference, President Lewis made the following statement:

"I have made this visit to northern West Virginia to make a survey of existing conditions here in the coal industry and to confer with Van A. Bittner and other representatives in this field. I have checked up on every angle of the situation and am well satisfied with the manner in which the business of the United Mine Workers is being conducted.

"The aggressive campaign of resistance to wage reductions by operators who have broken their agreements with the United Mine Workers will be continued.

"The agreement made at Baltimore between the Northern West Virginia Coal Operators Association and our organization on the basis of no reduction in wages will be protected with the full influence of the International union. The same is true as regards the agreement made at New York by and between the Monongahela Coal Operators Association and the United Mine Workers.

"Regardless of any statements being made to the contrary there will be no change in the policy of the United Mine Workers upon the question of wage reductions.

"The future success of the coal industry and of our nation does not lie along the pathway of reducing the earning power of the mine worker and forcing him into economic degradation."

There is a crying need for more and better state inspectors for the coal industry, according to Safety Director Read, who says that only a few states do not suffer from a shortage of coal-mine inspectors. Even in the states where there is not a decided shortage the quality is not always par. Many inspectors, he said, are too old to go down into the mines and others are unqualified for the work. He cited a case which recently came to his attention of the graduation from barbershop to inspectorship in the Middle West. There is a sufficient number of federal inspectors, he added.

Media Coal Co. Will Spend $2,000,000 on Mine Plant

The Cambria & Indiana R.R. was authorized on Feb 13 by the Interstate Commerce Commission to extend its line from Revloc, Pa., a distance of five miles in Cambria County, Pa., for the purpose of providing rail facilities for a new bituminous coal mine to be developed by the Media Coal Co., which owns about 5,000 acres of high-grade bituminous coal land at the end of the proposed extension.

The plan for development for the coal properties by the company provides for an expenditure of about $2,000,000 for the construction of a modern mining plant and a new town to accommodate about 2,500 people.

The Pennsylvania R.R. protested against the granting of the application. It declared that further development of bituminous coal territory was not in the public interest and that the proposed line would reach territory tributary to the Pennsylvania system, and that the haul via the Pennsylvania would be shorter than via the Cambria & Indiana.

More Coal Bills Presented in Pennsylvania Legislature

A second bill repealing the anthracite tax law of Pennsylvania has been presented in the Legislature at Harrisburg. This bill is sponsored by Representative Huber, Luzerne County, and is identical with that introduced in the upper house by Senator Heaton, of Schuylkill County.

Representative W. J. Mangan, Allegheny County, has introduced a bill to regulate and determine the quantity of coal that shall make a ton in all transactions in this Commonwealth and to impose penalties for short weight. The bill provides that 2,000 lb. avoirdupois "shall make and constitute a legal ton of coal throughout this Commonwealth." The legal ton is now 2,240 lb. It is provided that any person, firm or corporation guilty of violating the provisions of the bill whereby it is attempted to sell less than 2,000 lb. to a ton or a proper proportion thereof to quantities less than a ton, upon conviction before a justice of the peace or alderman, shall be liable to a penalty not exceeding $50.

Representative Heffran, Washington, sponsor of a series of bills relating to the mining laws of the state, has presented a bill amending an act of 1891 providing for the health and safety of persons employed in the anthracite mines. Under the provisions of this bill certificates of qualification for mine foremen and assistant mine foremen can be granted only to citizens of the United States. The old act is amended to provide that the certificates be granted by the Secretary of Mines instead of the Secretary of Internal Affairs, in whose department a bureau of mines was at one time located.

A provision of the 1891 act relating to inspection of mine lamps and requiring the permission of the mine foreman before a lamp can be used unlocked is amended by the bill to provide that this permission come only from the mine inspector of the district. A new provision added is to the effect that the use of permissible storage-battery locomotives or other permissible electrical equipment approved by the Secretary of Mines shall be allowed.

An amendment is made to a section which provided that in charging holes for blasting in slate or rock in any mine no iron or steel-pointed needle shall be used. The change includes coal as well as slate or rock. A similar change to include coal is made in another section of the act which provides that a charge of powder which has missed fire shall not be withdrawn or the hole reopened.

Clarence A. Seyler

Now in this country to attend the annual meeting of the American Institute of Mining and Metallurgical Engineers, where he will present a paper on "The Constitution of Coal." He comes as the representative of Dr. R. V. Wheeler, the Director of Research for the British Mines Department. His research laboratory in South Wales is well known.

White to Confer on Statistics With N.C.A. Committee

C. P. White, chief of the Coal Division of the Department of Commerce, has expressed gratification that the Government Relations Committee of the National Coal Association has appointed a sub-committee to confer with him relating to statistics. Mr. White said that the proposed coal program would not be launched until he had conferred with this sub-committee. Mr. White, who recently returned from an eight-day trip to Pittsburgh, Toledo, Chicago, Indianapolis, Terre Haute, Cincinnati, Huntington and Charleston, during which he talked with operators, railroad officials, bankers and labor leaders, said that as far as he knew the government was making no effort to bring about a conference looking to a revision of the Jacksonville agreement.

135 Miners Lose Lives in Ruhr Mine Blast

Total of 121 Bodies Recovered from Minister Stein's Operation at Dortmund

At least 135 miners were killed in an explosion of firedamp Feb. 11 at a coal mine at Dortmund owned by Minister Stein, of the Luther Government. It was one of the worst disasters of its kind ever recorded in Germany.

On the following day 121 bodies had been brought to the surface, but the gas still was so heavy in the first level that it was impossible to reach the dead there, and two of the rescuers had succumbed to its effects. The work of rescue was hampered because the explosion was so terrific that the pit props in the levels near the shaft were destroyed and the roofs caved in. Fourteen men unaccounted for are assumed to be dead.

President Ebert has telegraphed condolences to the Mining Superintendent of Dortmund and informed him that 50,000 marks from the President's emergency fund had been placed at his disposal for the relief of the widows and orphans of the victims.

The explosion appears to have begun near the shaft so that its full force was felt in all three levels, the lowest of which is 1,650 ft. deep. Miners near the shaft were blown many feet and mangled beyond recognition, but the dead elsewhere died of suffocation.

The rescuers found in one place this chalked inscription on the wall:

"All well up to 11 o'clock. Nine men."

Underneath the inscription lay all nine hopeful workers, killed by the poisonous gases.

The Stein mine, which belongs to the Stinnes group, was equipped with the most modern devices. It had had no other accident since 1901. The rescued men believe a spark from the machinery ignited the firedamp, but only a formal investigation will be able to determine the truth.

The accident is the second greatest in the history of German mining. It was surpassed only by a disaster at the Radbon mine in 1909, where 341 men perished.

A bill just passed by the House of Representatives provides "that it shall be unlawful to mine and remove coal of any character, whether anthracite, bituminous or lignite, from beds or deposits in lands of the United States, or in deposits or beds reserved to the United States, with the intent to appropriate, sell or dispose of the same." Any person violating any of the provisions shall be fined not more than $1,000 or imprisoned not more than one year, or both. The provisions of this act, however, are not to interfere with any right or privilege conferred by existing laws. This bill is intended simply to protect the public lands against exploitation by those who have not qualified under the leasing act to operate on these lands.

Gandy Scores Bureaucracy And Efforts to Increase Governmental Activities

"Flagrant bureaucracy" was charged against the chief of the Safety Division of the U. S. Bureau of Mines by Harry L. Gandy, executive secretary of the National Coal Association, Washington, D. C., in an address at the annual meeting of the Pittsburgh Vein Operators' Association of Ohio at Cleveland Feb. 9. Mr. Gandy bitterly arraigned the efforts for expansion of governmental activities at Washington. "At the same time," he stated, "I am optimistic enough to believe the people generally are coming to a friendly regard for the bituminous coal industry and that both the federal and the state governments, with the exception of some bureaucratic chiefs, are showing a more sympathetic understanding of the efforts the operators are making to provide a continuous supply of fuel for the industries and the homes."

The speaker praised President Coolidge's program for economy and restriction of governmental activities, and urged operators to render active assistance to the President.

Mr. Gandy's attack on the Bureau of Mines was based on the proposal of the Bureau to hold a nation-wide conference on safety, "one of officials only, in which neither the operators, who own the properties and who pay the bills, nor the miners, who do the work and take the hazards, shall have any voice." In support of the statement that the Bureau of Mines proposed a conference of this nature, the speaker read a letter to the president prepared by T. T. Read, director of the Safety Division of the Bureau of Mines, for the signature of Secretary Work of the Interior Department, in which these sentences appear:

" 'I have not suggested that representatives of coal-producing companies be included as delegates to the conference because it is believed that their inclusion as such would lead to protracted discussion that probably would result in failure to take effective action.

" 'Representatives of the organized crafts of the coal-mining industry also have not been included for the reason that they cannot well be invited to participate unless a similar invitation is extended to the operators.'

Cites Extreme Example

"This proposal is one of the most extreme examples of bureaucratic effort," said Mr. Gandy, "that has come to my attention in more than twenty-five years as a close student of public affairs. The bituminous coal industry has more than seven hundred thousand employees, with eight or nine thousand operating concerns scattered through more than twenty states, on which for plant and equipment, developed and reserved tonnage, the engineers' valuation committee of the U. S. Coal Commission placed a valuation in excess of eleven billion dollars, and yet the Bureau of Mines proposes that no one from this industry shall have voice or vote in a conference which so vitally affects its interests and the lives of the men employed in it. A conference of office holders only, if you please, to pass on a question as far reaching as this.

"As an official of the National Coal Association and a representative of the bituminous coal industry, I do not concede to the Bureau of Mines or anyone else a more intense desire that the lives of employees be protected wherever possible. Varying conditions require different treatment. The operators have their all at stake, and certainly if for no other than a selfish motive they would be and are striving to make their mines safe. Here anew I pledge the industry in this effort for safety but not to the extent of undertaking to agree to what a hand-picked conference of office holders might say without the voice and counsel of those who live this problem in their everyday life."

In reference to proposed legislation by Senator Oddie for a bureau of coal economics, Mr. Gandy remarked, "if there are any lines of statistical activities overlooked in this measure, then my knowledge of the industry is at fault. Attempt to provide compulsion is found in the suggested withdrawal of railway transportation from those companies which decline or refuse to report. The fact that time and again the Supreme Court has held that the production of coal is not commerce and cannot be charged with a public interest by a mere legislative declaration and that the Court held unconstitutional the first child labor law and the child labor tax law, which also sought to use the interstate commerce power of the Congress as a punitive rather than a regulative measure, evidently falls on deaf ears."

Decries Wasted Effort

Commenting on the recent report of the agricultural conference regarding "many instances of unwise and unnecessary duplication in the accumulation of the same information for use before departments of the government that have come to the attention of the conference," the speaker cited a recent instance in reference to a series of domestic heater efficiency tests undertaken by the Public Roads Bureau of the Department of Agriculture, bituminous and anthracite coal and fuel oil being used in these tests. "The government has two bureaus," he said, "the Bureau of Mines and the Bureau of Standards, equipped for efficiency tests. Certainly the Bureau of Public Roads knew of the equipment in the two bureaus referred to whereby such tests might properly be made. Nevertheless, the tests are proceeding under the direction of the drainage engineer."

Another Big Strip Company Forming in Kentucky

It is reported from Owensboro, Ky., that a syndicate of coal men from Owensboro and Hartford, Ky., and Evansville, Ind., have exercised options held on several thousand acres of coal land in the Moseyville and Panther sections of Daviess County containing good coal that is close to the surface and easy to strip. It is reported that the project will involve a million dollars or more. Rowan Holbrook, George M. Johnson and W. H. Park, of Hartford; C. S. Field, Owensboro, and Dr. C. L. Lang, Evansville, are among those interested in the project, which it was reported some weeks ago would also include some of the men now active in strip operations about Centertown. A spur track to connect with the Louisville & Nashville R.R. at Owensboro or Browns Valley is planned, and also a tram line to Green River, to give water as well as rail transportation. All of the late development projects in western Kentucky have been on strip mines.

Growing Demand for Census Of Distribution

While a wide demand already exists for a census of distribution to supplement the biennial census of manufactures, it is apparent that a higher head of public pressure must be created before Congress would consider seriously the large appropriation necessary. The cost is estimated at $1,000,000 but it is believed confidently that the data could be gathered for less money. Such a census of distribution is expected to receive the vigorous support of producers, as well as middlemen and consumers, as accurate knowledge of the status of distribution would furnish additional light for the conduct of general business.

Rochester & Pittsburgh Leases Two of Its Mines; Subterfuge, Says Brophy

In following out a policy announced several weeks ago when the company closed down most of its mines in Jefferson and Indiana counties, Pennsylvania, the Rochester & Pittsburgh Coal & Iron Co. has leased its Adrian properties to the Jefferson & Indiana Coal Co., a corporation composed of Indiana residents. John Hare is president of the company; J. R. Richards, vice president and secretary, and Joseph P. Mack, treasurer. The lease includes the power plant, houses and other buildings on the company property at Adrian. On Feb. 9 the lessees put twenty men to work cleaning up the mine preparatory to starting operations. The Adrian mines, when working to capacity, employ 400 men. Men who worked in the mine prior to the shut-down will be given preference. The Rochester & Pittsburgh company's Stanley mine has been leased by the Northwestern Mining Co. and is now in operation.

John Brophy, president of District No. 2, United Mine Workers, characterizes the leasing of the Adrian mine as a subterfuge to circumvent the three year wage contract agreed upon by the miners and operators last year. In a statement issued at Clearfield on Feb. 10. Brophy charges that it is the purpose of the lessee of the Adrian mine to attempt to operate on the 1917 scale. President Brophy's statement was contained in a letter sent in reply to a communication from President B. M. Clark of the Association of Bituminous Coal Operators of Central Pennsylvania, in which Mr. Clark stated that the Rochester & Pittsburgh Coal & Iron Co. had cancelled its membership in the operators' organization.

Guns and Dynamite Appear in Western Kentucky Strike Zone

The first serious outbreak in nearly ten months of the western Kentucky strike—a strike which has turned the field non-union—occurred on Saturday night, Feb. 7, at the plant of the Rogers Brothers Coal Co., at Bevier, near Greenville, when a company building was burned and hundreds of shots were fired on the mining town from the hills and from a concrete wall back of a mine pond. The burning of the building, it was believed, was to draw off the mine guards and miners. More than a hundred shots were fired through the home of a mine boss. All telephone and telegraph wires were cut. There had been sporadic outbreaks previously in the strike region, however. A week earlier at Hillside the home of a miner working non-union was damaged by dynamite and a boarding house was fired on.

In the Bevier trouble on Feb. 7 about forty or fifty men were in the parties making the attacks. The Rogers company had been operating on an open-shop basis for six weeks or so, with about 100 men. On the opposite side of the tracks of the Louisville & Nashville R.R. is the mine of the Crescent Coal Co., which also was preparing to resume operations.

On Monday after the outbreak the Rogers company went ahead with operations as usual, there having been no casualties. Four of the rioters have since been arrested on charges of conspiring to destroy property and for shooting with intent to kill. Troops were sent to the mine immediately, and are now on duty. Things are quiet and orderly. The company was operating under a temporary federal restraining order, with the question of a permanent injunction against old employees, the union, etc., to have been taken up at Owensboro on March 9.

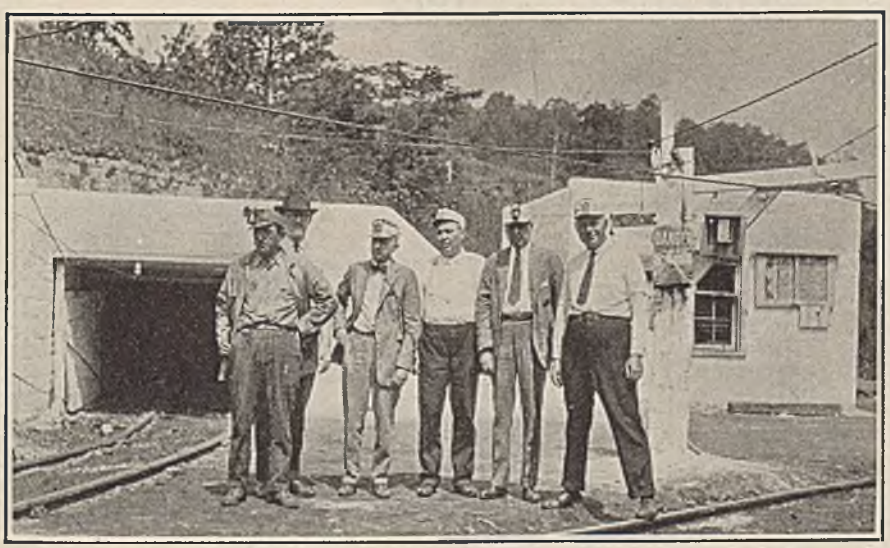
Three strikers recently were arrested and placed in the Greenville jail in connection with the recent dynamiting at the home of William Mosby, of Hillside, who had just recently entered the service of the Liberty Coal Co. Dynamite was exploded in the front yard of the Mosby home while the family was in the house. Many windows were broken and the building damaged. About Feb. 1, just before the attack on the Mosby home, trouble broke out at the Morgan mine, where a miners' boarding house was stoned in the dark, and then fired upon when the door was opened.

Harry Lauder Driven from Mines to Fame by Bad Eggs

Mike McLaughlin, Wichita (Kan.) plumber, recalls digging coal with Sir Harry Lauder, world famous comedian, in a Blanton (Scotland) colliery more than a quarter of a century ago. "We worked from daylight to dark for $2.40," McLaughlin says. "I can recall the first time he ever spoke a piece in public and the first time he got paid for singing a song," McLaughlin continues.

"One of the miners had been dangerously injured and we decided to give a benefit concert. We offered Lauder 2½s. to arrange the entertainment. When the time came to give the entertainment he demanded 5s. We finally let him have his way. While he was singing the second song he was greeted with bad eggs and rotten oranges. He did not seem to mind this, for he continued with his performance. I guess maybe he was worth the 5s., considering what he has received for performances since then."

The U. S. Engineer Office at Philadelphia, Pa., announces that sealed proposals will be received there until 12 o'clock noon, Feb. 27, 1925, and then opened, for approximately 12,000 tons of semi-bituminous coal for use on floating plant in the Philadelphia engineer district during the period April 1, 1925, to March 31, 1926. Further information can be had on application.



Courtesy Bertha-Consumers Co.

Official Inspection at Eureka Mine

Officials of the Bertha-Consumers Co. are shown preparatory to making a tour of inspection of the Eureka mine. This operation, located near Morgantown, W. Va., employs about 300 men and has a daily output of approximately 3,500 tons.

Chicago Court Orders Burton to Give Back Mine to J. W. McElvain

Fred A. Burton, of Chicago, found guilty of conspiracy in obtaining a controlling interest in the Freeman Coal Mining Co. from James W. McElvain, was ordered on Feb. 7 by Judge Denis E. Sullivan, in Superior Court in Chicago, to surrender the property, worth $350,000, and give an accounting of the profits. Burton's attorney, Maclay Hoyne, was ordered to turn back to Mrs. Clara A. Crozier, wife of McElvain's attorney, $100,000 said to have been obtained by intimidation.

This case is one of long standing. It dates back to an arbitration between Burton's and McElvain's coal companies in which McElvain won $52,000. The testimony in the present case showed that Burton considered the arbitration to have been unfair. The principals in the case recited in court that Burton and Hoyne told McElvain they had proof of the "fixing" of the arbitration. McElvain testified that they also threatened to make public some scandalous reports to ruin McElvain's private character. He and his partner, Carley Hoy, then turned over to Burton and Hoyne a majority of the Freeman Coal Mining Co. stock to hush the thing up. Burton became president of the company and McElvain withdrew. Further difficulties developed in which McElvain was threatened with prosecution because of inaccuracies in his income tax report to the government. Burton's attorney urged the prosecution, McElvain said.

Mrs. Crozier told the court she handed over stocks and bonds worth $100,000 to Burton's attorney because of threats of arrest, imprisonment and disgrace for her husband on account of the part he played in the arbitration. He was seriously sick in a hospital at the time. Judge Sullivan, in his decision, says Hoyne obtained this property from her after Burton had represented himself as her friend and adviser and that she relied upon Burton's statements that Hoyne had indisputable evidence against her husband.

Burton and Hoyne testified that when they took over the control of the Freeman Coal Mining Co., operating the Franklin mine at Herrin, Ill., the company was practically bankrupt and the property in bad condition. Judge Sullivan, however, decided the property taken from McElvain is worth $350,000.

W. H. Cunningham, chairman of the Government Relations Committee of the National Coal Association, has announced the addition of J. G. Puterbaugh, president of the McAlester Fuel Co., McAlester, Okla., to the special committee consisting of Michael Gallagher, W. D. Ord and Sidney J. Jennings, which was appointed to give consideration of the questions of co-operative marketing and statistics and the suggestions that have been made for some modification of the Sherman Anti-Trust Act. Mr. Cunningham directed that information be secured from other associations and industries and other available data be prepared for a meeting of this committee to be called within the next thirty days.

Federal Judge J. F. McGee Kills Himself With Pistol

Federal District Judge John F. McGee was found dead with a gunshot wound in his heart in his chambers at the Federal Building at Minneapolis, Sunday afternoon, Feb. 15, by his daughter. The wound was self-inflicted.

In a statement which he had signed and left on his desk, the Judge gave the cause for his act as failing health and fear that he was losing his mind.

Judge McGee was the war-time Federal Fuel Administrator for Minnesota. He was appointed to the Federal District bench by President Harding and was known throughout the Northwest as the "bootleggers' terror" because of the summary fashion in which he handled such cases and the heavy fines he inflicted.

During the war Judge McGee, then a member of the Minnesota Public Safety Commission, attacked the loyalty of the Non-Partisan League.

Mrs. McGee and their four daughters and two sons survive him. The Judge was 64 years old.

Pittsburgh Operators Refuse To Collect $1 Check-off

Operators in the Pittsburgh field are declining generally, it is understood, to collect the additional check-off requested by the United Mine Workers. The mine workers recently increased the February and March dues by $1. The scale committee of the Pittsburgh Coal Producers' Association points out that the amount of the dues to be checked off is definitely fixed in the existing agreement and that the additional check-off requested is not in accordance with the contract. In view of this attitude it is expected that the United Mine Workers will make this amount an assessment of the International and in that way technically avoid the provision of the agreement.

Union Re-elects Officers

John L. Lewis was re-elected International president of the United Mine Workers of America at the election held last December, as was shown by the report of the board of tellers made public Jan. 26. Philip Murray was re-elected vice-president and William Green, secretary-treasurer. As Mr. Green recently resigned that office to become president of the American Federation of Labor, Thomas Kennedy, who was appointed his successor, will serve the term for which Mr. Green was chosen.

The vote at the election was extremely light due to the fact that there was no serious opposition to any of the International officials. While the United Mine Workers has a membership of more than half-a-million, less than 200,000 votes were cast for the presidential candidates. Mr. Lewis received 136,209½, and George Voyzey, of Illinois, 62,843. The majority of Mr. Murray over Arley Staples, of Illinois, was 60,762½ while the majority for Mr. Green, which was the largest, was 87,290½.

John J. Mossop, of Bowdil, Ohio; Albert Neutzling, of Glen Carbon, Ill., and T. G. Morgan, of Linton, Ind., were re-elected international auditors. Thomas Paskell, of Shawnee, Ohio; Thomas Holliday, of Granville, Ill., and William Young, of South Ford, Pa., were re-elected members of the international board of tellers. Mr. Lewis, Mr. Murray, Mr. Green, Frank Farrington, Springfield, Ill.; Lee Hall, Columbus, Ohio; Thomas Kennedy, Hazelton, Pa.; Walter Nesbit, Springfield, Ill., and Fred Mooney, Charleston, W. Va., were elected delegates to the annual convention of the American Federation of Labor. The new term for which officials were elected is for two years beginning the first of next April.

Frederic W. Upham Dead

Frederic William Upham, president and chairman of the board of the Consumers Co. of Chicago and former treasurer of the Republican National Committee, died at Palm Beach, Fla., Feb. 15. Mr. Upham had been ill for more than a year. Last week he suffered a stroke of paralysis. He was 64 years old.

Mr. Upham resigned from the treasurership of the Republican Committee, partly because of ill health, after the Republican Convention last June. He remained National Committeeman from Illinois and at the time of his death was also president and chairman of the board of the Consumers' Company, dealers in coal, ice and building materials, which he had helped to found.

During the World War Governor Frank O. Lowden named Mr. Upham as a member of the Illinois State Council of Defense. He was president of the Illinois Manufacturers' Association in 1908 and 1909 and was a director at the time of his death.

Mr. Upham became vice-president of the Peabody Coal Co. in 1904, about ten years after going to Chicago to engage in the lumber business. He had close business and social relations with Geo. D. Getz and the late Francis P. Peabody and they later became Chicago's coal leaders. In 1906 the City Fuel Co. was formed by the union of the retail yards of the Peabody Coal Co., the Miami Coal Co. and Mr. Getz's Globe Coal Co. with Mr. Upham as president. This company expanded steadily and in 1911 absorbed the Knickerbocker Ice Co. and became the Consumers Co., which today is Chicago's greatest retail coal, ice and building material business.

Stuyvesant Peabody, head of the Peabody Coal Co., is chairman of the Consumers executive committee and it is reported as likely that he will be named president.

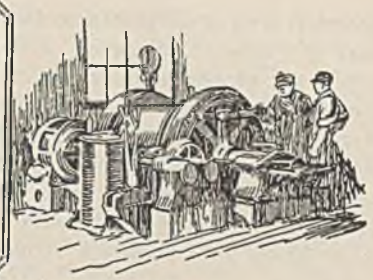
Bituminous Coal Mined by Different Methods In the United States in 1923

(Compiled by U. S. Geological Survey)

	Mined By Hand		Shot Off the Solid		Mined By Machines		From Strip Pits		Not Specified		Total Production
	Quantity (Net Tons)	Percentage	Quantity (Net Tons)	Percentage	Quantity (Net Tons)	Percentage	Quantity (Net Tons)	Percentage	Quantity (Net Tons)	Percentage	(Net Tons)
Alabama	3,740,428	18.3	7,241,565	35.4	8,716,291	42.6	545,102	2.7	214,263	1.0	20,457,649
Alaska	11,983	10.0	107,843	90.0							119,826
Arkansas	30,130	2.3	839,070	64.7	189,861	14.6	154,731	12.0	83,100	6.4	1,296,892
Colorado	4,430,770	42.8	894,033	8.7	4,896,915	47.3			124,500	1.2	10,346,218
Georgia	2,400	3.2	21,681	28.7			50,589	66.9	950	1.2	75,620
Illinois	4,618,236	5.8	18,936,803	23.9	54,170,999	68.3	1,283,044	1.6	300,993	0.4	79,310,075
Indiana	1,017,529	3.9	8,278,979	31.6	14,234,398	54.3	2,289,887	8.7	408,306	1.5	26,229,099
Iowa	1,011,345	17.7	3,447,076	60.4	1,181,342	20.7			70,972	1.2	5,710,735
Kansas	103,418	2.6	3,045,907	75.5	97,941	2.4	651,155	16.1	136,983	3.4	4,035,404
Kentucky	1,569,655	3.5	4,143,137	9.3	37,710,934	84.2	844,003	1.9	509,588	1.1	44,777,317
Maryland	1,410,336	61.7	255,939	11.2	582,734	25.5			36,917	1.6	2,285,926
Michigan			81,238	6.9	1,086,337	92.7			4,500	0.4	1,172,075
Missouri	481,472	14.1	955,100	28.1	1,005,756	29.6	845,143	24.8	115,680	3.4	3,403,151
Montana	785,925	25.0	842,054	26.7	1,495,902	47.5			23,797	0.8	3,147,678
New Mexico	1,364,383	46.8	670,840	23.0	851,705	29.2			28,245	1.0	2,915,173
North Dakota	20,797	1.5	373,175	26.9	426,008	30.8	376,384	27.2	189,036	13.6	1,385,400
Ohio	650,361	1.6	654,651	1.6	35,877,385	88.5	2,988,819	7.4	375,227	0.9	40,546,443
Oklahoma	58,176	2.0	816,556	28.3	1,636,668	56.7	313,471	10.9	60,167	2.1	2,885,038
Pennsylvania (a)	54,503,203	31.7	4,315,347	2.5	110,326,052	64.1	1,299,166	0.8	1,436,145	0.9	171,879,913
Tennessee	923,021	15.3	3,002,172	49.7	1,999,345	33.1	1,704	0.0	114,026	1.9	6,040,268
Texas	690,535	58.1	371,222	31.3	44,519	3.8			81,053	6.8	1,187,329
Utah	1,175,487	24.9	322,905	6.8	3,221,425	68.3			400		4,720,217
Virginia	511,564	4.4	2,520,870	21.4	8,645,351	73.5			83,858	0.7	11,761,643
Washington	1,605,634	54.9	1,025,617	35.1	252,880	8.6			42,261	1.4	2,926,392
West Virginia	17,895,509	16.6	4,179,989	3.9	84,986,380	78.7	296,936	0.3	541,127	0.5	107,899,941
Wyoming	1,001,323	13.2	2,764,456	36.5	3,793,415	50.1			15,837	0.2	7,575,031
Other States	23,769	35.7	27,306	41.1	5,000	7.6			10,389	15.6	66,464
	99,637,389	17.6	70,135,531	12.5	377,435,543	66.9	11,940,134	2.1	5,008,320	0.9	564,156,917

(a) Bituminous coal only.

Practical Pointers For Electrical And Mechanical Men

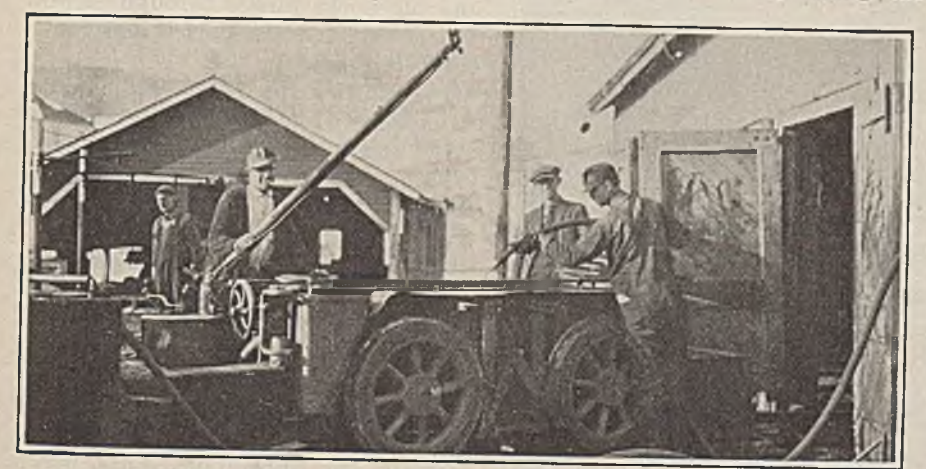


Locomotives Blown Clean at End of Each Shift Before Going to the Barn

The motor equipment of a mine locomotive can be made practically dustproof, but it is a difficult matter to design, for locomotive use, a resistance that will be proof against dust and yet able to dissipate the heat successfully that the passage of the current through it generates. Collection of dirt in an open-type resistance is often the cause of electrical troubles. Breakdowns and delays can be prevented by the practice of blowing all dust out of the resistance at frequent intervals.

At the Mabscot mine of the New River Co., near Beckley, W. Va., at about 4 p.m., when the locomotives have finished the shift, they are given a thorough blowing-out before being put into the barn. Inquiry was made of J. N. Kite, assistant superintendent, as to how often the locomotives were given this sort of cleaning. He stated that at the Mabscot and Beckley mines the locomotives are blown-out each day at the end of the shift; also that he understood that this same practice was followed at all other mines of the New River Co.

Air is supplied by a compact, direct-connected, motor-driven, two-cylinder air compressor such as is commonly used with mine hoists. The compressor is installed in a corner of the motor barn and about 30 ft. of hose provided so that the locomotives can be cleaned while on the track outside the building. All dust is blown from the electrical and mechanical parts of the locomotive. This thorough cleaning, in addition to forestalling resistance trouble, no doubt lessens the quantity of abrasive dust which works into the wearing parts of the armatures and axles, and encourages better care and inspection of the whole machine.



Regular Evening Performance at Mabscot Mine of New River Co.

All parts of the locomotive are cleaned thoroughly each day with a jet of compressed air. Special care is taken to blow all dirt from the resistance. Not only does this cleaning reduce electrical trouble and the wear of mechanical parts, but it also is a great help in obtaining better inspection and repair.

Electric Hoist Replaces Hand-Operated Winch

At the prevailing rates for day labor and for electric power a mechanical operation such as hoisting a weight can be accomplished by electric power for about one four-hundreth part of the cost of doing it by hand. This, of course, holds true only in cases where the operation can be made fully automatic, thus eliminating the operative. Even though an operative is required, still a big saving may be made by doing the work with electric power, because of the increased speed and the consequent shorter time required to perform the work.

Locomotive Crab on Swing Derrick

For 25 years a hand winch was used on this derrick for handling boxes of sand and other supplies. Now the work is done by electricity, saving both time and labor.

About three years ago, Reuben Lee, chief electrician of the Elkhorn Piney Coal Mining Co., at Stanaford, W. Va., decided that the application of an electric hoist to replace the hand-operated winch on the derrick at No. 1 mine would effect a large saving in unloading supplies. This derrick, which is of the swing type, is located alongside of the steep incline at No. 1 mine. One of the principal uses to which it is put is transferring boxes of sand from an incline supply car to mine cars in which they are carried to the sandhouse. For about 25 years this was done by a hand winch fastened to the derrick pole. Mr. Lee replaced this winch by a small electric hoist.

This hoist at one time served as a crab device on a gathering locomotive. It consists of a 7½-hp. series-wound motor, a controller and small rope drum. As can be seen in the illustration, the hoist has been

mounted on a small platform fastened near the base of the pole. Although small, the platform provides enough space to permit the operative to stand on it. A roof which is hung on the pole above the hoist provides protection to the operative and to the equipment. The application of this spare hoist to the derrick represents a small investment but its use slices off a large portion of the cost of handling each carload of sand or other heavy material. When watching it operate, one thinks of the man power that was consumed in turning the winch of the derrick for the 25 or more years that it was in use before electric power was substituted.

Large Forming or Swage Block Great Aid in Forge Work

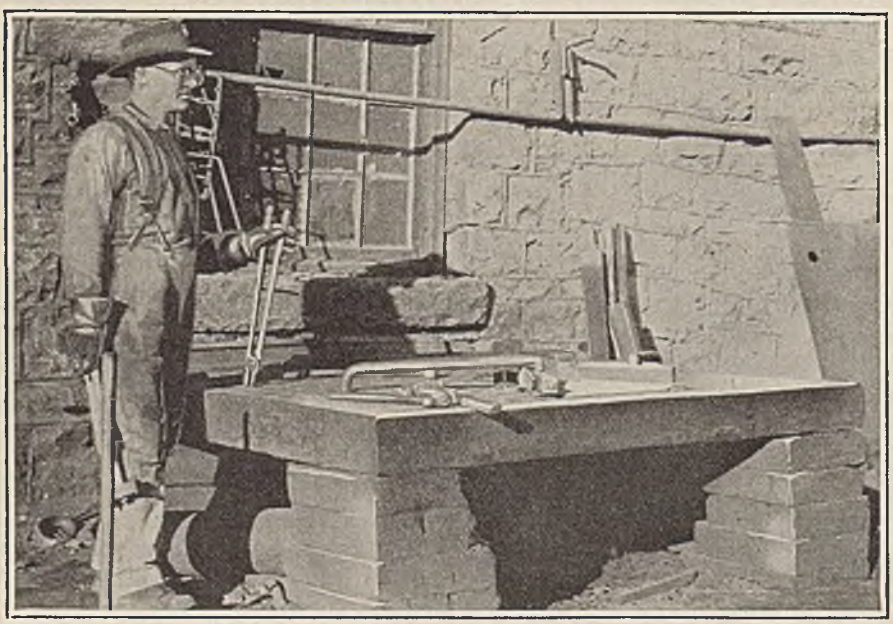
At many mining operations the blacksmith shop is what keeps the works going—that is, it is the place where all manner of forging and repair operations must be performed in order to keep the mechanical equipment in proper repair. A great variety of these operations may be much facilitated if a bending, or forming, block is available such as is shown in the accompanying illustration.

This block is in use at the shops of the United States Coal & Coke Co., at Gary, W. Va. It is a steel casting 6 ft. square and 6 in. thick with holes 2 in. square cored through it on 4-in. centers. It is surfaced on one side or face only. This block was purchased or rather made to special order about fourteen years ago and has paid for itself many times over in large bending, straightening and forging operations generally. At the present time it naturally shows appreciable wear but, nevertheless, looks as if it would be good for at least another fourteen years of use before it will require resurfacing.

In the accompanying illustration this block is shown being used in the forging of a ½-in. offset around the edge of a U-shaped plate intended to form the end of a conveyor bucket. In this process the plate, which has been previously cut to shape and heated, is centered or brought to place with its apex between two pegs set into two of the cored holes above mentioned. In this position its curved edge rests upon a ½-in. strap form of proper shape and width. The plate is clamped firmly in place by means of two L-shaped rods driven into two other holes in the forming plate.

Serves Many Operations

This makes it easy for the blacksmith and his helper to forge or swage the offset or bead around the edge and get all the plates to exact shape and practically duplicates of each other. This is only one of hundreds of operations wherein this device proves a great convenience and time saver. In fact, the men in this shop, without the aid of this forming block, would hardly know how to go about many of the operations they are daily called upon to perform.



Big Swage Block in Use at Mine Shop

By the aid of this block the smith and his helper have just forged a ½-in. offset all around the curved edge of a conveyor bucket end. The completed job may be seen clamped to the block near the front edge. Without this block this job would have been a formidable undertaking; with the block it was "a cinch."

Whippletree Made from Pipe May Bend but Not Break

About the coal mines the duty imposed upon certain pieces of equipment is unusually severe. Thus the whippletrees to which mine mules are hitched are often subjected to usage of a nature that would soon wear them out if they were made of ordinary wood even though hickory —the strongest and toughest of native American species—were used for this purpose. Furthermore, good straight-grained shagbark hickory is becoming extremely scarce and correspondingly expensive in many coal-mining regions.

The accompanying illustration shows how a contractor at a West Virginia mining plant circumvented the high cost of hickory, so far as its use in singletrees is concerned. In the manufacture of the whippletree shown in the illustration a piece of 1½-in. ordinary steel pipe was used. This was first cut to suitable length, its ends flattened down and the corners of the flattened portions trimmed or rounded off. A slight depression or groove also was swaged on opposite sides of the pipe in the center to receive the draft loop which entirely encircles the pipe and by which the completed singletree is attached to the load. A hole was next drilled or punched in each of the flattened ends and tug hooks forged through them. This completed the device and rendered it ready for use.

This Whippletree Is Non-Breakable

Old pipe has been utilized to make this light but strong piece of equipment. Neither under the stress of heavy load nor the impact of vicious heels will this whippletree break.

In addition to being light and cheap, this whippletree possesses another signal advantage, namely that it will not break. True, if overtaxed or worked beyond its strength, this tree may be bent double, but, unlike wood, which will withstand a certain stress and then snap, such a whippletree as that shown may be bent, and thus rendered useless but, as stated, it will not break. Anyone who has experienced the confusion that may follow a failure of this kind will appreciate this advantage. Another, albeit a lesser, superiority possessed by a singletree of this kind is the fact that there is no end or hook ferrule to be pulled off and possibly lost.

Viewpoints of Our Readers

Value of Rock Dust Underrated in Article

Contends That Less Rock Dust Was Present Before Explosion Than Was Stated and That Dust Was Not as Fine as Alleged

The interesting article entitled "Rock Dust No Cure-All, Says Western Engineer," by E. W. Davidson and A. F. Brosky, which appeared in your Dec. 4 issue has caused so many persons to ask me* my opinions on certain matters in the article, that this communication has been prepared discussing four of the subjects.

(1) "The West has had some coal-dust lessons that are still fresh in mind. It knows that dust on an intake airway which started a fearful explosion less than two years ago was 65 per cent inert."

This statement contradicts demonstrated facts and requires explanation. How was the sample gathered? Did it represent a true average sample over a sufficient zone or length of passage and was it taken before the explosion took place?

Quantity of Coal Dust Needed

A measurable quantity of coal dust per unit of space is required in the absence of firedamp (which is assumed if the airway was an intake) to start an explosion—0.3 lb. of the pure fine coal dust per linear foot of entry about 60 sq.ft. section placed on overhead timbers (plank) is the least quantity that in the experiments in the Bruceton mine has been found to propagate an explosion, but more than this is required at the initiatory point. Also when there is no firedamp a zone of coal dust is required at least 50 ft. long to build up sufficient pressure of gases by the initiatory inflammation, to produce the "pioneering air wave" which is an absolutely essential factor in the propagation of a dust explosion. I have no idea what "disastrous explosion" is referred to, or who the sampler and observer may have been or what constituted his test of explosibility.

In the past eighteen years there have been half a dozen or more explosion disasters (I personally investigated several) which have originated in intake haulageways where there were trolley wires or, in the case of slopes, other electric wires. The primary cause of these explosions was the wreckage of a trip of loaded cars which brought down or cut the electric wires so that arcing resulted and this undoubtedly occurred in a dense cloud of pure coal dust thrown up by the wreckage.

Evidences Hard to Obtain

If timbers have been thrown down by the explosion and falls have occurred over long stretches of entry, any evidences of coal dust are covered up, as I have frequently seen in making investigations. Any samples of dust gathered in such stretches would be misleading as evidences of the situation at the moment preceding the explosion.

If it is an accurate statement that an explosion originated in an intake airway in which the dust "was 65-per cent inert" then I would consider rock dusting to be an *impracticable measure,* but I do not so consider it and there is already ample evidence to justify this belief.

(2) The article states that the dust "was extremely dry—2 per cent moisture by analysis—and because of its fineness a large percentage of a sample passed through a 325-mesh screen."

Degree of Fineness Unusual

The dryness mentioned is not unusual, in fact, it is quite general in dust on the intake roads of bituminous mines during the cold months. On the other hand, the degree of fineness is most unusual.

The Bureau engineers in the past fifteen years have gathered many hundreds of dust samples in coal mines of the United States, including Far-West mines, and these samples were carefully rescreened in the Pittsburgh laboratory.

For the majority of such dust samples, less than 20 per cent of a sample passed through a 200-mesh sieve and practically no sample had more than 40 per cent through 200-mesh. If a 325-mesh sieve had been used the percentage passing through it would be much less than the foregoing figures. The finest screen made or listed for commercial purposes by the leading manufacturers of screens is 250-mesh. Screening coal by a screen with smaller mesh than 200 is usually considered impracticable.

Float Dust Displaced

I think there must be some typographical error as to the size mentioned, 325-mesh, but even if such a screen were used, and if the statement as it stands is correct, a fine float dust would not remain in place through an explosion, it would be transported hundreds or thousands of feet by the violent blast of the explosion, and other dust from remote points would be brought in by the strong returning air or gas currents, caused by the cooling of the afterdamp and the condensation of the steam produced by the combustion of hydrocarbons. I cannot but wonder whether the observer was not misled by the impalpable particles of soot and ash which settle as a film after an explosion wherever the air is quiet. In any case, samples of dust taken after an explosion at points within the explosion zone cannot be taken to represent the dust present at those points before the explosion. Rock-dust barriers, for example, when operated by an explosion, discharge their contents into the air and gas currents, and rock dust is distributed for hundreds of feet.

Inert and Coal Dust Ratio

Regarding the influence of fineness of a coal dust mixed with inert dust on the explosion limit, as measured by the percentage of non-combustible of the mixture, the finer the coal dust the higher must be the percentage of non-combustible to prevent explosion propagation. If the dust present in a length of passage is practically all 200-mesh or finer, then it might be possible under most unusual circumstances for an explosion to originate in a mixture with 65 per cent non-combustible content, as it requires 75 per cent non-combustible with such fineness. However, as stated, extensive systematic quantitative sampling has not found dust of this fine size in mines of this country.

(3) The statement that "the consensus is that (rock) dust coarser than 200-mesh is practically worth-

*Mr. Rice has been in charge of the coal-dust explosion testing work of the U. S. Bureau of Mines since 1908.

less and that a large proportion of it should be of 300-mesh" is manifestly based on opinions and does not rest on the foundation of explosion testing.

The Bureau of Mines has found by test that moderately fine rock dust (through 20-mesh and 50 per cent passing through 200-mesh) is, within the limits of testing, as effective as a finer rock dust and moreover has the merit of not packing down or crusting after distribution.

(4) The authors say, "These Midwest and Eastern dusting enterprises, no matter how efficiently performed, do not convince the Western mining engineer of their efficiency where the mines are dry." My reply to this is: When the mines are naturally driest then rock dusting is most needed, for rock dust is efficient only when it is as dry as the coal dust, rises with it in the air when the initiatory blast comes, and then by absorbing heat and by its particles interposing between particles of coal dust prevents propagation of flame.

Believes in Preventive Measures

As indicated in my writings on explosion prevention, beginning with Miners' Circular No. 3 (1911), I am in full agreement with any measures for preventing coal dust from being formed or getting into the air at the face of the mine or along the roadways; such as the admirable use of sprays playing on the cutter bars of machines; wetting bug dust before blasting and removing it from the working place; wetting coal after blasting; using as little explosive as possible and employing rock-dust stemming, in a proper manner; washing down the working place, also the cars, with a hose; providing cars tightly built and preferably with tight ends, not "building" the coal so high above the sides of the car that it is jarred off in haulage; using strong automatic sprays on cars at entrances to partings or sidings, including empty cars. All these measures will help rock dusting because with less coal dust produced daily, less rock dust in the ratio of 2 or 3 to 1 of coal dust produced will be needed.

Continue Dusting and Testing

Though I have great confidence that our mining men will develop the ways and means of rock dusting best suited to our American conditions, two things must be guarded against, first over confidence, in assuming that one rock-dusting treatment is sufficient (dusting must be done thoroughly and maintained) and second, enough inert dust must be present at all times, as determined by regular and systematic sampling and testing and redusting in accordance, to make the non-combustible content everywhere at least 55 per cent as a minimum. Such a minimum would in practice bring about an average of 70 to 75 per cent non-combustible in dust throughout the mine.

Trying Compromise Methods

At present some are trying compromise methods. One of these is not to water the coal dust thoroughly but to have the coating of inert material so damp it will not function as a dry dust. Another method is by means of a machine to use water as the medium for plastering a mud on the walls. This use of mud is well suited for the filling of crevices and for covering over the ribs and gob walls along a passageway; also it may have to a limited extent the virtue of a cement coating in preventing weathering of the ribs; but if dry coal dust is deposited on its surface and on the floor and timbers in a dangerous quantity the mud plastering underneath will be of no avail while it remains a mud.

The efficiency of rock dusting or any substitute must be tested by systematic and frequent sampling of the loose dry dust which a blast would raise into the air, weighing it to determine the unit quantity per cubic foot of space in the entry and determining by analyses or volumeter if it has the requisite non-combustible content.

British Explosion Checked

As I write, a letter has come from H. Eustace Mitton, a mine operator of Great Britain who visited some of the mines of this country a year ago, inclosing a statement of E. A. Hughes, the resident head of the Llay Main Colliery, North Wales, which experienced an explosion in the longwall face workings killing nine men and boys but not injuring 415 other men. The following is an extract from Mr. Hughes' statement:

"The range of the explosion was extraordinarily limited, but I attribute this to the fact that we have been in the habit of stone dusting profusely in this new mine, and you can take it as a fact that the stone dusting has saved the pit. The flame did not travel far—not more than 20 or 30 yards in any one direction from the seat of the explosion . . . only nine persons being within its range. . . . It is an undoubted fact that the fireman in charge of the district, now dead, was in the act of firing a shot, and if that is so that would be the means of igniting a pocket of gas—formed in one of the numerous breaks in the roof."

George S. Rice,
Washington, D. C.
Chief Mining Engineer,
U. S. Bureau of Mines.

Don't Blame the Safety Lamp

In your columns I noticed an article that was entitled "Flame Safety Lamp Proves Source of Danger" and I would like to express my opinion on that statement which is that it is not the safety lamp that is dangerous. The best of safety devices ever invented becomes unsafe in the hands of a careless or incompetent person, but when it does no blame attaches to the device. Mr. Harrington in *Coal Age*, Vol. 26, p. 610, says that in one case which resulted in loss of life, the flame safety lamp was taken apart and a burnt match was found in the lamp thus disassembled, but I assert that, if a burnt match was found in or near the lamp, it was the match that was the cause of the disaster and not the safety lamp.

Competency Gained by Experience

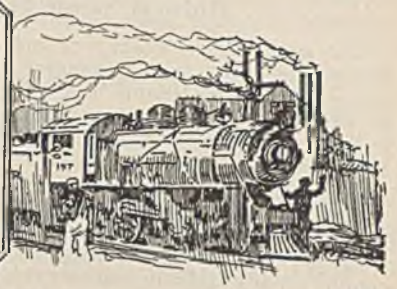
Not every man who holds a certificate of competency is a competent man. Not a certificate but practical experience qualifies a man to carry a safety lamp. Mr. Harrington says that two disasters occurred through imperfectly assembled safety lamps, but one that is thus improperly put together is *not* a safety lamp, and any man who will try to move a body of gas using such an improperly assembled lamp is not a man who is qualified to handle it, whether certificated for such employment or not.

I have worked with flame safety lamps for upwards of twenty-five years in very gaseous mines, and I think I am qualified to state that such lamps are safe when in the hands of a competent person.

We shall have less disasters when we have men qualified by experience and men who do not obtain their papers through a "political pull." With efficiency and lamps approved by the U. S. Bureau of Mines, we can look with confidence toward the elimination of such accidents.

Bicknell, Ind. Jacob Riley.

Production And the Market



Slipping Tendency Comes to Halt in Coal Markets As Output Falls to Near Normal Needs

Despite the comparatively general prevalence of mild temperatures, conditions in the soft-coal markets reflected a slight improvement on the whole during the last week. For one thing, output having fallen below eleven million tons per week, there is less overproduction to glut the various markets. Fine-coal prices in the Middle West show a general betterment, though there is said to be some undercutting of circulars. This pickup is counterbalanced to a considerable extent by the domestic situation, movement being so light that there is more talk of lessened running time and shutdowns in both Illinois and Indiana. The Kentucky trade professes to be unable to see any market at all, prices being weak and tracks cluttered with "no bills." In the Northwest, industrial consumers at Duluth are renewing coal stocks depleted by two months of stiff weather, and another spurt is not unlikely in the event of a change from the recent mild weather. At Milwaukee, on the other hand, business has slowed down considerably because of almost unprecedentedly high temperature for February. Trade in the West and Southwest also has quieted down, so that production has caught up with orders.

Ohio Trade Still Badly Jumbled

Not only is there no improvement in the glutted condition of the Cincinnati market but distress coal is beginning to affect prices and the railroads are having difficulty in averting a jam. Quiet prevails in Columbus and eastern Ohio, though the latter sees a grain of comfort in some early shipments to the lower lake docks for pre-season loading into vessels. Trade at Pittsburgh is far from satisfactory, for, though there has been no further slump in demand, most of the little business done is transacted under cover, so to speak, and there is much price uncertainty. A big thaw at Buffalo has caused a flood of cancellations.

Deliveries have slowed up somewhat at New England piers due to improved demand and slight delays at Hampton Roads, and while there has been no advance in prices a notable firmness in quotations is in evidence. Inactivity continues to prevail in the New York and Philadelphia markets, though some more contracting is reported at New York, while that class of business is marked by a tendency to hold off at Philadelphia. Industrial conditions at Birmingham continue to improve steadily accompanied by a gradual pickup in steam-coal buying and fairly good spot business.

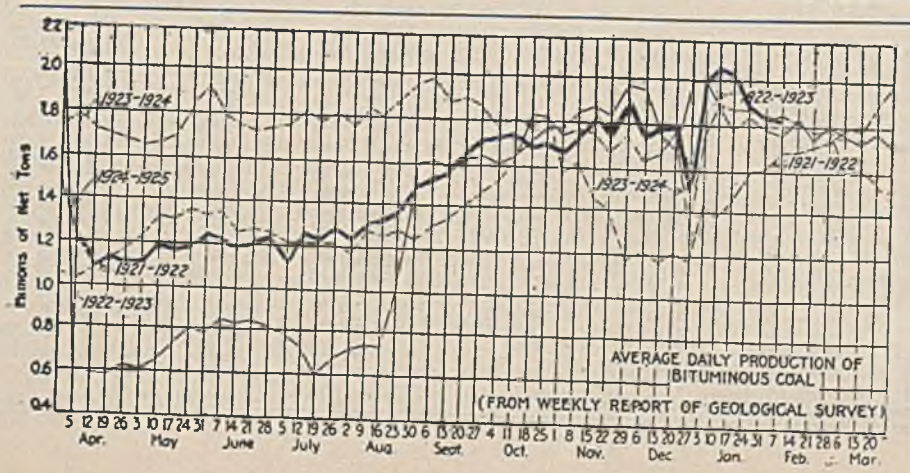
Quiet Reigns in Anthracite Trade

Interest is lacking in the anthracite market to an unusual extent at this time of year, demand, except for an occasional spurt, being comparatively quiet. Retailers are getting mostly hand-to-mouth orders and operators and sales agents are taxing their ingenuity to keep fuel moving. Chestnut and stove continue to lead in demand but egg has gained in strength. Pea, however, still moves slowly. Steam sizes are in fair demand.

Coal Age Index of spot prices of bituminous coal made only a fractional advance during the past week, standing on Feb 16 at slightly over 168, the corresponding price being $2.04.

Dumpings of coal for all accounts at Hampton Roads during the week ended Feb. 12 totaled 324,260 net tons, compared with 391,920 tons the week before.

Production of bituminous coal, according to the Geological Survey, again declined during the week ended Feb. 7, when the output was estimated at 10,900,000 net tons. This compares with a production of 11,073,000 tons in the preceding week, as shown by revised figures. Anthracite output in the week ended Feb. 7 was 1,909,000 net tons compared with 1,730,000 tons for the week ended Jan. 31.



Estimates of Production

(Net Tons)

	1924	1925
BITUMINOUS		
Jan. 24	11,951,000	11,588,000
Jan. 31 (a)	11,716,000	11,073,000
Feb. 7 (b)	11,891,000	10,900,000
Daily average	1,982,000	1,817,000
Coal yr. to date (c)	485,943,000	405,215,000
Daily av. to date	1,855,000	1,543,000
ANTHRACITE		
Jan. 24	1,782,000	1,740,000
Jan. 31	1,893,000	1,730,000
Feb. 7 (b)	1,906,000	1,909,000
Coal yr. to date (c)	78,308,000	75,883,000
COKE		
Jan. 21 (a)	264,000	250,000
Feb. 7 (b)	286,000	276,000
Cal. yr. to date (c)	1,449,000	1,447,000

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

Midwest Steam Is Stronger

The only change worthy of note in the Midwest market during the week was a general improvement in fine-coal prices. Southern Illinois best 2-in. is listed at $2 and 1¼-in. at $1.90, but there is some undercutting. Central Illinois has strengthened to $1.60@$1.90 but its volume is small. Standard District coal is 10 or 15c. stronger but not much of its gets into the Chicago market and its acceptance is none too ready anywhere.

To balance this betterment in fine coal, the domestic situation has not moved anybody to cheers. Movement is comparatively light in spite of the price reduction of Feb. 2 and coal of most sizes has backed up on the mines in all Midwest fields, so that reduced running time and plans for shutting down mines are attracting much attention. Indiana is affected about as Illinois, with shutdowns even more numerous. The situation in most Indiana regions is not encouraging. One operator has shut down both his mines and offers to reopen them only at reduced wages. Most other producers feel this is pretty good business.

Quiet prevails over the Carterville field in Williamson and Franklin counties. The prospects get worse and unless something unforeseen develops, this coming summer will be the poorest that the southern Illinois field has had since the early days of this development, excepting in strike years. Steam tonnage seems gone entirely into the southern part of the territory and very little coal of any kind now goes from southern Illinois through the Thebes and Cairo gateways, so that all the south has been cut off. Railroad tonnage continues light. Strip mines show good working time and seem to find a ready market at various prices.

In St. Louis warmer weather has eased off the domestic demand and while a little stuff is moving, it is in small quantities and is for the middle and cheaper grades. Dealers feel that there will not be much demand for coal from now on and their bins are loaded with high-priced coals and very little smokeless, anthracite or coke is being delivered. Country domestic is unusually quiet as the weather has brought a feeling that the end of the season is here. Wagonload steam has eased off considerably and carload is about equal to the screenings available, while country steam is hard to find. Prices are unchanged.

Kentucky Weakens Some

At Louisville the word "market" appears to be a misnomer in the coal trade this week, as coal men assert that there isn't any such thing or that they don't know the meaning of it. Prime block coal is reported to have sold as low as $1.50 in western Kentucky in some instances, with egg and lump as weak, but the local trade is reporting the

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

Low-Volatile, Eastern	Market Quoted	Feb.18 1924	Feb.2 1925	Feb.9 1925	Feb.16 1925†
Smokeless lump	Columbus	$3.60	$3.85	$3.85	$3.75@$4.00
Smokeless mine run	Columbus	2.10	1.90	1.90	1.75@ 2.10
Smokeless screenings	Columbus	1.55	1.20	1.20	1.10@ 1.30
Smokeless lump	Chicago	3.60	3.60	3.50	**3.50@ 3.75**
Smokeless mine run	Chicago	2.50	1.60	1.50	**1.50@ 1.75**
Smokeless lump	Cincinnati	3.75	4.00	3.85	3.75@ 4.00
Smokeless mine run	Cincinnati	2.60	2.00	2.00	*1.75@ 2.00*
Smokeless screenings	Cincinnati	1.85	1.10	1.25	**1.25@ 1.50**
*Smokeless mine run	Boston	4.75	4.25	4.45	4.40@ 4.50
Clearfield mine run	Boston	1.95	1.95	1.95	1.75@ 2.20
Cambria mine run	Boston	2.50	2.30	2.30	2.10@ 2.50
Somerset mine run	Boston	2.25	2.10	2.10	1.90@ 2.35
Pool 1 (Navy Standard)	New York	3.00	2.75	2.75	*2.50@ 2.90*
Pool 1 (Navy Standard)	Philadelphia	3.00	2.80	2.80	2.65@ 3.00
Pool 1 (Navy Standard)	Baltimore		2.25	2.25	2.10@ 2.40
Pool 9 (Super. Low Vol.)	New York	2.25	2.10	2.10	*1.90@ 2.35*
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	2.20	2.20	2.05@ 2.40
Pool 9 (Super. Low Vol.)	Baltimore	1.85	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	New York	1.95	1.85	1.85	*1.65@ 1.90*
Pool 10 (H.Gr.Low Vol.)	Philadelphia	1.85	1.85	1.85	1.70@ 2.00
Pool 10 (H.Gr.Low Vol.)	Baltimore	1.70	1.70	1.70	1.65@ 1.75
Pool 11 (Low Vol.)	New York	1.60	1.60	1.60	*1.45@ 1.70*
Pool 11 (Low Vol.)	Philadelphia	1.65	1.65	1.65	1.60@ 1.70
Pool 11 (Low Vol.)	Baltimore	1.55	1.50	1.50	1.45@ 1.60
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.60	1.50	1.50	1.40@ 1.65
Pool 54-64 (Gas and St.)	Philadelphia	1.70	1.50	1.50	1.45@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.50	1.65	1.65	1.60@ 1.75
Pittsburgh sc'd gas	Pittsburgh	2.55	2.50	2.50	2.40@ 2.60
Pittsburgh gas mine run	Pittsburgh	2.35	2.25	2.25	2.15@ 2.35
Pittsburgh mine run (St.)	Pittsburgh	2.10	1.95	1.95	1.90@ 2.00
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.45	1.45	*1.25@ 1.35*
Kanawha lump	Columbus	2.70	2.50	2.50	2.25@ 2.75
Kanawha mine run	Columbus	1.60	1.60	1.60	1.50@ 1.70
Kanawha screenings	Columbus	1.15	.65	.65	**.65@ .85**
W. Va. lump	Cincinnati	3.10	2.15	2.00	**1.60@ 2.50**
W. Va. gas mine run	Cincinnati	1.75	1.40	1.35	**1.35@ 1.50**
W. Va. steam mine run	Cincinnati	1.75	1.30	1.25	**1.15@ 1.50**
W. Va. screenings	Cincinnati	1.25	.80	.75	.50@ 1.00
Hocking lump	Columbus	2.75	2.50	2.50	2.35@ 2.65
Hocking mine run	Columbus	1.85	1.60	1.60	1.50@ 1.75
Hocking screenings	Columbus	1.15	1.10	1.10	*1.05@ 1.15*
Pitts. No. 8 lump	Cleveland	2.40	2.30	2.30	1.90@ 2.75
Pitts. No. 8 mine run	Cleveland	1.80	1.85	1.85	1.80@ 1.90
Pitts. No. 8 screenings	Cleveland	1.45	1.30	1.30	1.25@ 1.40

Midwest	Market Quoted	Feb.18 1924	Feb.2 1925	Feb.9 1925	Feb.16 1925†
Franklin, Ill. lump	Chicago	$3.50	$3.35	$3.10	$3.00@$3.25
Franklin, Ill. mine run	Chicago	2.35	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings	Chicago	1.95	1.60	1.60	**1.75@ 2.00**
Central, Ill. lump	Chicago	3.10	2.85	2.85	2.75@ 3.00
Central, Ill. mine run	Chicago	2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings	Chicago	1.50	1.30	1.55	**1.60@ 1.90**
Ind. 4th Vein lump	Chicago	3.10	3.05	2.85	2.75@ 3.00
Ind. 4th Vein mine run	Chicago	2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings	Chicago	1.70	1.45	1.45	**1.60@ 1.80**
Ind. 5th Vein lump	Chicago	2.60	2.60	2.60	*2.40@ 2.65*
Ind. 5th Vein mine run	Chicago	2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	1.45	1.30	1.30	**1.40@ 1.50**
Mt. Olive lump	St. Louis	3.10	2.85	2.85	2.75@ 3.00
Mt. Olive mine run	St. Louis	2.50	2.35	2.35	2.25@ 2.50
Mt. Olive screenings	St. Louis	1.35	1.60	1.60	*1.50*
Standard lump	St. Louis	2.75	2.35	2.35	2.25@ 2.50
Standard mine run	St. Louis	1.95	1.95	1.95	*1.75@ 1.85*
Standard screenings	St. Louis	.80	1.05	1.10	**1.15@ 1.35**
West Ky. block‡	Louisville	2.85	2.55	2.55	*2.00@ 2.50*
West Ky. mine run	Louisville	1.70	1.35	1.35	1.25@ 1.50
West Ky. screenings	Louisville	1.20	1.00	1.05	*.80@ 1.00*
West Ky. block‡	Chicago	2.85	2.35	2.35	2.25@ 2.50
West Ky. mine run	Chicago	1.60	1.35	1.35	1.25@ 1.50
South and Southwest					
Big Seam lump	Birmingham	3.85	2.85	2.85	2.50@ 3.25
Big Seam mine run	Birmingham	1.75	1.75	1.75	1.50@ 2.00
Big Seam (washed)	Birmingham	2.10	1.75	1.85	*1.50@ 2.00*
S. E. Ky. block‡	Chicago	3.10	2.60	2.75	2.50@ 3.00
S. E. Ky. mine run	Chicago	1.85	1.50	1.50	1.25@ 1.75
S. E. Ky. block‡	Louisville	3.25	2.60	2.60	*2.00@ 2.75*
S. E. Ky. mine run	Louisville	1.80	1.35	1.35	1.25@ 1.50
S. E. Ky. screenings	Louisville	1.40	.85	.85	*.50@ 1.00*
S. E. Ky. block‡	Cincinnati	3.05	2.60	2.60	*2.25@ 2.75*
S. E. Ky. mine run	Cincinnati	1.75	1.40	1.30	**1.25@ 1.60**
S. E. Ky. screenings	Cincinnati	1.25	.90	.80	**.60@ 1.10**
Kansas lump	Kansas City	5.00	4.85	4.85	4.75@ 5.00
Kansas mine run	Kansas City	3.50	3.25	3.35	3.25@ 3.50
Kansas screenings	Kansas City	2.25	2.50	2.50	2.50

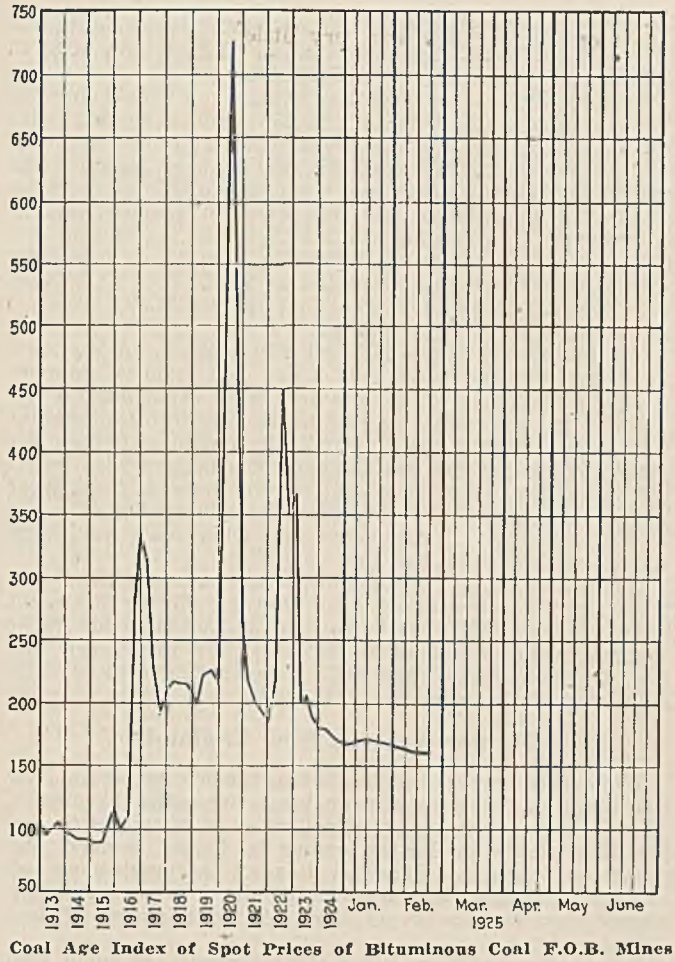
*Gross tons, f.o.b. vessel, Hampton Roads. † Advances over previous week shown in heavy type; declines in *italics*.

‡ The term block is used instead of lump in order to conform to local practice, but the same coal is being quoted as heretofore.

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

	Market Quoted	Freight Rates	Feb. 18, 1924 Independent	Feb. 18, 1924 Company	Feb. 9, 1925 Independent	Feb. 9, 1925 Company	Feb. 16, 1925† Independent	Feb. 16, 1925† Company
Broken	New York	$2.34	$8.00@$8.50	$8.00@$9.25	.....	$8.00@$9.25	.....	$8.00@$9.25
Broken	Philadelphia	2.39	.....	.....	.....	9.15	.....	9.15
Egg	New York	2.34	8.25@ 9.00	8.75@ 9.25	$8.50@$9.25	8.75@ 9.25	$8.50@$9.25	8.75@ 9.25
Egg	Philadelphia	2.39	8.50@10.00	8.75@ 9.25	9.45@ 9.75	8.80@ 9.25	9.45@ 9.75	8.80@ 9.25
Egg	Chicago*	5.06	7.50@ 8.80	8.00@ 8.35	8.17@ 8.40	8.08	8.17@ 8.40	8.08
Stove	New York	2.34	9.50@10.25	8.75@ 9.25	9.50@10.00	9.00@ 9.50	*9.25@10.00*	9.00@ 9.50
Stove	Philadelphia	2.39	9.85@11.00	8.90@ 9.25	10.10@10.75	9.15@ 9.50	10.10@10.75	9.15@ 9.50
Stove	Chicago*	5.06	7.95@ 9.25	8.00@ 8.35	8.80@ 9.00	8.53@ 8.65	8.80@ 9.00	8.53@ 8.65
Chestnut	New York	2.34	9.50@10.25	8.75@ 9.25	9.75@10.25	8.75@ 9.40	*9.50@10.25*	8.75@ 9.40
Chestnut	Philadelphia	2.39	9.85@11.50	8.90@ 9.25	10.00@10.75	9.25@ 9.40	10.00@10.75	9.25@ 9.40
Chestnut	Chicago*	5.06	7.95@ 9.25	8.00@ 8.35	8.61@ 9.00	8.40@ 8.41	8.61@ 9.00	8.40@ 8.41
Pea	New York	2.22	4.50@ 6.25	6.15@ 6.65	4.75@ 5.50	5.50@ 6.00	*4.50@ 5.50*	5.50@ 6.00
Pea	Philadelphia	2.14	5.25@ 6.50	6.35@ 6.60	5.75@ 6.00	6.00	5.75@ 6.00	6.00
Pea	Chicago*	4.79	4.50@ 5.60	5.40@ 6.05	5.36@ 5.75	5.36@ 5.95	5.36@ 5.75	5.36@ 5.95
Buckwheat No. 1	New York	2.22	2.25@ 3.50	3.50	2.25@ 3.00	3.00@ 3.15	*2.25@ 2.85*	3.00@ 3.15
Buckwheat No. 1	Philadelphia	2.14	2.25@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice	New York	2.22	2.00@ 2.50	2.50	2.00@ 2.25	2.00@ 2.25	*1.90@ 2.25*	2.00@ 2.25
Rice	Philadelphia	2.14	1.75@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley	New York	2.22	1.50@ 1.75	1.50	1.40@ 1.65	1.50	1.40@ 1.65	1.50
Barley	Philadelphia	2.14	1.25@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye	New York	2.22	.....	1.60	1.65@ 1.75	1.60	*1.40@ 1.65*	1.60

* 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

	1925			1924
	Feb. 16	Feb. 9	Feb. 2	Feb. 18
Index	168	168	169	186
Weighted average price	$2.04	$2.03	$2.05	$2.25

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.

market at $2 and up, it being reported that some coal is offered as high as $2.75, but trackage in western Kentucky is full of "no bills."

The market on block, lump and egg in western Kentucky is merely a question of what the owner can get for his coal. The nut market is reported at $1.50@$1.75, but some nut has been sold under that level. Some mine-run has been offered at $1.25@$1.50, but there is practically no mine-run moving, as prepared sizes can be had almost at mine-run figures. Screenings are reported at 80c.@$1.

The eastern Kentucky market also is quite weak, prime block coal having been offered at $2 and even under, although some fine gas block is still quoted at $2.50 and upward. Lump coal can be had at about block price or a little under, there not being much 2-in. lump offered. Egg is $1.75@$2. Screenings have been very weak and have been sold down to 50c.

Notwithstanding the softening of prices on smokeless coal there has not so far been any decline in activity in West Virginia, about 1,000,000 tons per week being produced. The market for high-volatile has been demoralized for the last few weeks, especially for prepared, which has a wide range owing to the anxiety of some operators to dispose of their product. There is as much of a spread in fact as $1.25 a ton. Some concerns are still adhering to $3 a ton and getting it but in other instances lump is sold even below $2 a ton. Mine run brings about $1.25 a ton and slack not more than 60@90c. a ton.

In the Upper Potomac and western Maryland fields it has been necessary to curtail production somewhat in order to meet existing market conditions although there has not been much reduction in the Upper Potomac region. Owing to limited industrial and domestic demand, however, prices remain on about the old level.

Northwest Is Busy

Industries are coming in for fresh supplies of coal now at Duluth, having used all that they had in stock in the past two months, which were severe. This alone keeps the market alive, as there has been a great dropping off in purchases since the warmer weather set in. It is expected, however, that cold weather will be here soon, and this will undoubtedly give the market a spurt. Prices are the same all along the line with the exception of Pocahontas screenings, which are selling at $4.25 instead of $4.

Much Pocahontas is coming in all-rail. Despite this the stocks of hard coal are moving well, and the North Dakota, western Minnesota and Winnipeg markets are making up for the deficit caused here by the lack of anthracite patronage. Altogether the morale at the Head-of-the-Lakes is better than it has been for some time past, and coal men feel that they will have an excellent season despite a bad start.

At Milwaukee a week of record-breaking high temperature for the month of February naturally has had a slowing effect on the demand for coal. This is the story of the dealers, who of course are doing more than marking time, as home and industrial fires must be kept burning. Aside from this there is nothing new to report as to market conditions. During January Milwaukee received 26,711 tons of anthracite and 71,613 tons of bituminous coal by car ferry, and 721 tons of anthracite and 64,108 tons of bituminous coal by the all-rail routes—totaling 27,432 tons of anthracite and 135,721 tons of bituminous coal.

Western Trade Quiets Down

Coal production in the Southwest, which since December has been from three days to two weeks behind orders, at last has caught up, as the result of a couple of weeks of warm weather. Only Arkansas failed to profit from the heavy midwinter demand, and even there a little flurry of activity occurred early in January. The only effect on prices has been a reduction of 50c. on Kansas shovel lump, which has been selling at $5 a ton.

There has been a slight setback in the Colorado coal market during the past week, which is solely attributed to springlike weather. The demand for domestic lump coal continues to be quite good, but the great difficulty is to dispose of the nut coal, and to this end the operators are endeavoring to see if something can be worked out with the operators of Wyoming and Utah to load nut coal in with lump coal during the winter months. If this were feasible it would eliminate the embarassing feature which now confronts the coal operators.

Production is just about the same as last week. Mines are operating approximately 80 per cent. The Colorado Fuel & Iron Co., the largest producer in the state, mined 166,000 tons of domestic coal during January, which was the highest in the history of the company.

Utah operators are finding the coal market dull in their territory. The weather is springlike and few orders are being received from any of the states served. Working time has dropped off nearly 50 per cent. Several of the large operators are storing their slack. The smelting industry is about the best industrial customer. Prices are still unchanged. Few coal contracts are being advertised yet.

Conditions More Complex at Cincinnati

No betterment in the gorged condition of the Cincinnati market is apparent. The two scales of prices are still in effect, with another condition added. Distress coal is now sufficient in volume to have an effect on prices in the market. So much coal is on the sidings between Russell, Ky., and the mines that the Chesapeake & Ohio Ry. has embargoed that reservoir. The Decoursey yards, on the Louisville & Nashville, are jammed and only the closest of attention by the Norfolk & Western in keeping Portsmouth in shape to move coal through.

Rejections and suspensions on orders have been hitting firms that have hitherto been secure in their trade connections. Five warm, balmy days followed by a short cold snap was the last straw in the coal man's cup of misery. The slack market broke and prepared is none too staple. A break in the smokeless market in Chicago and the West has not hit this market full force, but has softened it 25c. on

lump, egg and run of mine. Standard Pocahontas shippers are holding to the advance of $1.25@$1.50 on screenings.

Retail business has slowed down with the warmer weather, Pocahontas and smokeless lump selling at $8.50; run of mine, $5.50@$6; bituminous lump, $6.25@$6.50, and slack, $4.50. River business has increased in volume by reason of more favorable weather.

Warmer weather at Columbus has had a bad effect on the domestic trade and the market for prepared sizes is about as dull as the steam trade. Prices are irregular and there is little hope for improvement in the near future. As the domestic trade is a weather proposition pure and simple, it will require a considerable period of low temperature to inject much strength into the trade. Retailers are devoting their attention to cleaning up, as buying is from hand to mouth. Dealers' stocks are fairly good, much of which was purchased at higher prices than now prevail. Pocahontas and other smokeless varieties are selling fairly well while splints are showing some weakness. Ohio grades are extremely dull. Retail prices are weaker and some dealers are cutting to clean up stocks. Pocahontas and smokeless varieties are selling at $8@$8.50; splints and other West Virginia grades at $7.25@$7.75, and Hocking, Pomeroy and Jackson lump $6@$6.25.

Steam buying is restricted to immediate wants and there is no tendency to buy for the future. Reserves are pretty good and in some instances users are reducing surplus rather than buying, even at the extreme low prices. Utilities and railroads are fair purchasers and iron and steel plants are buying in moderate quantities, but there is no zip to the market and most of the producers and distributors believe there will be little activity until contracting starts about April 1. Already some inquiries have been made. It is believed that the prices will be slightly lower than those of a year ago. There is a considerable tonnage of distress coal available and this is tending to make steam prices irregular.

Production in the southern Ohio area is not much better than 15 per cent of capacity. Most of the output is from co-operative mines, which are able to compete with West Virginia prices.

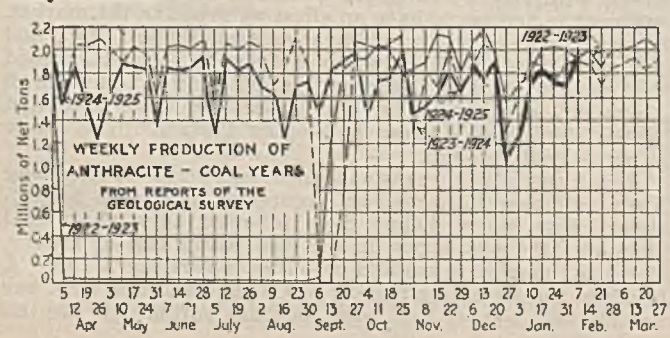
Eastern Ohio markets are in the doldrums, last week having been the dullest in demand for a long time. Retailers are stocked to the limit, and domestic buyers are purchasing in small quantities simply to fill out such requirements as they may have for the remainder of the season. Temperatures have been moderate, and there is a feeling anticipatory of an early spring, which has the natural effect of producing small-lot orders by domestic consumers.

In the steam trade, inquiries are so few that they are not noticeable, due to minimum consumption. The one bright spot in the entire situation is the beginning of shipments by some operators to the lower lake docks for pre-season loading into boats. Comparatively, this is only a small movement and will make little change in the rate of mining operations. During the week ended Feb. 7 the eastern Ohio No. 8 field produced 283,000 tons, or about 40 per cent of estimated potential capacity.

Pittsburgh Price Situation Uncertain

The Pittsburgh market has become still more unsatisfactory in the past week. Though there has not been any further decrease in demand there has been more pronounced price uncertainty, various lots going to forced sale practically at what they would bring.

Little coal is moving in open market transactions at regular prices, as heretofore quoted, but transactions are so irregular and so secret that market prices are practically nominal.



Slack, moving in an open trading market, shows a decline of 15c. in the week, steam slack being quotable now at $1.10 @$1.20 and gas slack at $1.25@$1.35.

Coal loadings in the central Pennsylvania field for the week ending Feb. 7 totaled 16,435 cars compared with 15,468 cars in the previous week. The apparent improvement is due to the fact that the last week of January was exceedingly low owing to heavy snows throughout the field, which tied up traffic on the railroads and hindered mining operations. The leading complaint in the district is low prices. Pool 18 ranges $1.60@$1.70; Pool 11, $1.70@$1.80, with sales reported in both as low as $1.50; Pool 10, $1.80@$2; Pool 9, $2@$2.15; Pool 71, $2.20@$2.30; Pool 1, $2.40@$2.75.

The Buffalo coal trade has had a hard week. A big thaw set in and the coal trade took a bad cold from it, shippers reporting that most of their orders were cancellations.

West Virginia output is pushing its way into this market with a persistence that means full control not very far away. Already there are shippers who declare that three-fourths of the bituminous coal coming here is from West Virginia mines. While this must be a very big estimate it is a fact that Pennsylvania and Ohio coals are being shoved aside fast by this new coal.

Meanwhile the West Virginia mines have cut their own prices, made a month ago, to $1.60@$1.75 for Fairmont lump, $1.40@$1.50 for mine run and $1.25@$1.40 for slack; Youghiogheny gas lump is $2.25@$2.50; Pittsburgh and No. 8 steam lump, $2@$2.25; slack, $1.40@$1.60, and Allegheny Valley mine run, $1.70@$2.

Firmer Tone at New England

While there are no reports of advancing prices in New England the quotations of a week ago are noticeably firmer. There is even a slowing up of deliveries at certain of the rehandling plants at Boston owing to better demand and moderate delays at Hampton Roads. Accumulations are less at the piers, and apparently there is a disposition among operators to avoid some of the mistakes of last season.

Pocahontas and New River of first grade are being held at $4.50 per gross ton f.o.b. vessel at Norfolk and Newport News, with almost no indication of prices less than $4.40. A few No. 2 coals can be bought down to $4.25, but these are hardly available in sufficient volume to affect the market on the more favorably regarded grades. Higher marine rates have a salutary influence on the spot market, and there are those in the trade who are now quite hopeful of fairly active spring trade at prices around $4.50@$4.75 at the Virginia terminals. An average return of better than $2 per net ton to the producer would be something of an improvement over the 1924 record.

Rehandling factors at Boston, Providence and Portland are actually accumulating orders agaist cargoes yet to be loaded. Some are adhering firmly to a $6 per gross ton level on cars, but there are sales being made at $5.75@$5.85 for delivery within a week or two. River freshets in Maine and New Hampshire will mean a mildly increased spot demand, and the low temperature averages of January have made themselves felt. A slight turn for the better among certain of the textile specialties also is a good sign.

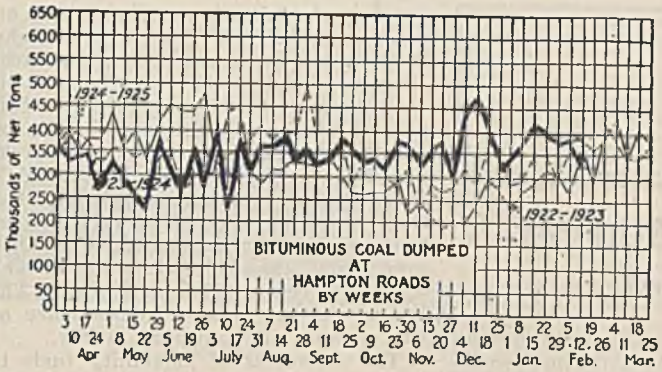
All-rail there is as yet no special improvement to be seen. And yet if $6 on cars at Boston is to be a prevailing price it will mean a less restricted outlet for the higher grades from central Pennsylvania. Tonnage over the New York and Philadelphia piers is still very small and prices continue to drag along on a minimum basis.

Inactivity Pervades New York Market

Weather conditions were not beneficial to the soft-coal trade at New York last week and the inactivity of the previous week continued. However, a good-sized tonnage of contract coal was moved, indicating that industrial consumption is steady. Competition is growing with the larger houses having the advantage when the question of price plays a prominent part.

More contracting is reported, prices being based on current market quotations, which while not satisfactory to the producers, are accepted rather than leave the mines dependent upon the spot market this spring and summer. Buyers seem to be insisting more and more upon individual coals unless they can be assured of classified pool coals.

At Philadelphia the demand for coal is practically un-



changed, the real activity, as it has been all season, being in the spot market. Consumers are buying freely as much of the stock on the ground was consumed in January.

There has not been much contracting of late, as there seems to be a tendency to hold off, by both buyer and seller, as April 1 approaches, in order to find the trend of prices for the many new agreements ending at that time.

Due to the falling off in prepared-coal orders, slack is even a bit tighter than it was, at a time too, when the cement mills, the big users, are endeavoring to get up their stocks in anticipation of the coming building season. Prices remain unchanged in these coals, in harmony with the mine-run, which must display an advance before slack will command an increased price.

Tide trade is very quiet, as usual, and bunkering is on the same scale. Spot market prices are unchanged, but are at least firm on the basis of present quotations.

In the Baltimore market the only encouraging feature of immediate effect is in relation to a reconversion of many ships from oil burning to coal burning, the U. S. Shipping Board Emergency Fleet Corporation having ordered that nine oil burning steamships operated by managing agencies located at Baltimore be replaced by coal burning ships. Bunker inquiries already have increased and from now on the general tone of that business, for a time at least, should be much improved. The export situation is not at all satisfactory. Only one ship has loaded so far on export account during the month of February. The home situation on soft coal remains little changed. Industries are buying lightly.

Buying of steam coal is reasonably active in the Birmingham market and the outlook is hopeful for still better business. Gradual improvement in the industrial field is increasing requirements and spot sales are fairly good both as to number and volume. Some good-sized twelve-month contracts are being signed, such agreements carrying a wage clause and prices on about the same basis as spot quotations. Cotton mills in Southern territory are becoming very large fuel consumers, many such plants now operating double shifts, and cement plants also are using much coal, several such concerns having recently been greatly enlarged or having provided for increased capacity. An unusually active season of several months duration has been experienced in the bunker trade and producers in this district supplying this grade of coal have moved a large tonnage, though these improved conditions are spoken of in a comparative sense only, demand not having reached the desired proportions by any means.

Domestic trade is rather dull at present, but the cold spell which has just come on may occasion a short spurt if it lasts long enough. Some of the local yards are sparsely stocked but dealers are buying sparingly and little improvement is expected in domestic trade during the balance of the season. Quotations on steam and domestic coal are unchanged.

There is a strong demand for foundry coke, which is quoted $5@$5.50 ovens. Domestic egg ranges $4@$4.25. Gas coke is very quiet; quoted $4.75@$5, ovens. Production and consumption locally of furnace coke is very heavy.

Anthracite Market Lacks Interest

At New York the condition of the anthracite market is extremely unusual for this time of the year. Save for occasional spurts demand remains quiet and uninteresting. Operators and sales agents are not having an easy time to keep their output moving and the outlook is not particularly bright unless the weather turns violent.

There are reports that cancellations have begun. Retail dealers are already making one-ton deliveries instead of putting in sufficient coal to last until April 1 and this has caused many dealers to recast their standing orders with wholesalers.

Chestnut continues to move fairly well, egg has gained in strength and is not now far behind stove size in movement, but pea continues to drag. Steam sizes are in good shape as regards demand but prices for independent coals, with the exception of barley, are not up to company circular prices.

Trade at Philadelphia has been considerably affected by very mild weather. Though this helped deliveries there was an immediate lessening in demand and coal accumulated so rapidly in dealers' yards that they were compelled to stop shipments from the operators.

Nut and stove sizes continue to be the ones in demand by the retailers, and as most of the large shippers are still behind orders on the former size the independents are still able to get premiums above company coal. For a day or two, however, a few of the smaller independents were actually shading prices on both these sizes, but with the change to more seasonable weather these offerings disappeared. Egg and pea continue to be slow movers. The steam trade is only ordinary, outside of barley, which continues well taken.

When February brought spring temperatures instead of real wintry gusts, Baltimore householders who had begun to lay in supplies on renewal curtailed their orders in the hope of witnessing an early flight of the swallow and the robin. Taken as a whole, however, the dealers say that business is fair, with sufficient supplies in the yards to meet all demands promptly.

Buffalo hard-coal trade has been held up lately by warm weather and the consumer is all the time trying to find some other fuel and he will pay considerable more for gas or oil than he is willing to pay for hard coal. The coke trade is coming in pretty fast at last. For a time the consumer seemed to associate coke with fuel administrations and enforced use of something he did not want, but finally the reduction of $4 to $4.50 a ton attracts him and he learns that coke is good fuel, used just as anthracite is.

And now the consumer is to be given a chance of using small sizes of anthracite at reductions of about $7 a ton, with the anthracite companies standing behind it and showing how it is to be done. It is pretty late to do much this winter, but if the change of apparatus recommended is not too great there will be enough use of the small sizes to call for a big showing next winter.

Coke Market Has Setback

At Connellsville the recovery in spot furnace coke from the slump of early in January, in progress for several weeks, was interrupted by a fresh setback in the past week. Either operators did not curtail production as much as they should have done, or quickly enough, or the situation was affected by lesser shipping requirements on contracts. There are reports of a number of furnaces slowing down the wind, to restrict their output of pig iron, and correspondingly instructing coke operators to reduce slightly the contract shipments.

Some spot furnace coke in the past week has been sold at $3.75 and none seems to have gone at above that figure. Off-grade, not suitable for metallurgical purposes, goes at big discounts.

Spot foundry coke has been weakening in tone for a couple of weeks, and in the past week became definitely quotable 25c. lower, at $4.50@$5, depending on brand, etc.

Serious negotiations on second-quarter furnace coke were dropped several weeks ago, but there was talk about what was likely to be done; now even that is absent. Operators have no idea what they would ask if inquiry should develop, and furnacemen see such a poor pig-iron market that consideration of second-quarter coke is far from their thoughts.

Car Loadings, Surplusages and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Jan. 31, 1925	896,055	192,339
Previous week	924,254	201,229
Week ended Feb. 2, 1924	929,936	198,955

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Jan. 31, 1925	213,921	69,736	.....	.....
Jan. 22, 1925	228,836	77,964	.....	.....
Jan. 31, 1924	169,036	67,578	4,598	.....

Foreign Market And Export News

Business Lags in British Coal Market; Output Still at High Level

Signs of substantial revival in the Welsh steam coal trade are still lacking, but orders continue to come slowly in. For prompt loading positions most loading collieries are sufficiently well placed to maintain prices. A general indisposition is apparent toward operating. Sections of the market, notably second Admiralties and best Monmouthshires, are well booked, but material advance is retarded by Northern United Kingdom and Continental competition. Increased inquiry is coming from France and Belgium, although orders are slow in maturing. There is a much better business with Italy and the coaling stations, and inquiries are a little more numerous from South America.

Best steam coals in Newcastle have held a fairly firm position throughout the week, but all other sorts have weakened. The gas-coal section is not so badly hit by the depression, and what little contract work there has been this week is on gas coals account. The coke section is still the worst of all, the patent sorts being a glut on the market at a very weak price, whilst gas coke a little, if any, better. In the coalfields the position is unaltered, many collieries are still idle, and the number of unemployed shows no signs of diminishing.

Production by British collieries in the week ended Jan. 31, a cable to *Coal Age* states, was 5,434,000 tons, according to official reports. This compares with an output of 5,427,000 tons in the preceding week.

Business in All Lines Sags At Hampton Roads

The market at Hampton Roads last week was extremely weak and business was dull, with inquiries dropping off and coal piling up at the piers. The accumulations at tidewater reached one of the high marks for the last twelve months.

New foreign business was practically eliminated, bunker trade was comparatively weak and coastwise business was slow. Domestic retail trade was reacting to mild weather, and a general atmosphere of inactivity pervaded the trade. Shippers were of the opinion that the slump in business was only temporary and that the indications of stronger business at the beginning of the year would be borne out in fact.

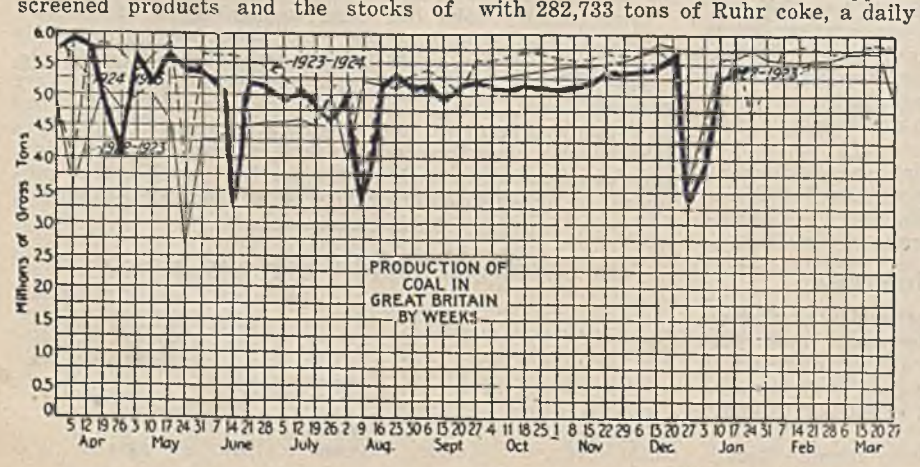
Long-Awaited Improvement Seen In French Coal Market

An improving tendency has developed in the French industrial coal market. There have been some sales of screened products and the stocks of smalls are practically sold out. On the other hand, trade in patent fuel remains quite dull and prices have been reduced 5f. to 125f. per ton for briquets. The effect of the advance in transport charges upon the prices of coal delivered at consuming plants is increasingly felt. For instance, the calculation of transport charges on distance actually covered increases the rate from Béthune to Paris 0.45 centime per ton. Contrary to general expectations, the freight rate has been lowered 1f. to 23f., Béthune-Paris.

Under pressure from the government, in order to safeguard industrial peace, the coal mines of the Nord and Pas-de-Calais agreed on Jan. 26 to an increase of 40 per cent as from Jan. 15 up to April 15, 1925, in the temporary supplements to wages (premium for the cost of living) provided for by the agreement of November, 1923, and confirmed several times since then. It has been reckoned that this decision will result in an actual increase of wages of from 0.70 to 1f. per day.

During the first twenty eight days of January, the O.R.C.A. was supplied with 282,733 tons of Ruhr coke, a daily average of 10,100 tons. Rumors of an advance of 15f. in the price of coke have neither been confirmed nor denied. It was expected that on Feb. 1, indemnity coke would be raised by 1.15f. per ton from the price at that date of 139.40f. on truck frontier station Sierck, plus 5f. 50c. per ton for the O.R.C.A.'s charges, the understanding being that there must be a constant relation between the price of indemnity coke delivered from the Thionville region and that of French coke, delivered. The latter was raised as a consequence of the advance in transport tariffs

The deliveries of indemnity fuels to France and Luxemburg in the first seventeen days of January totaled 348,500 tons, of which 127,000 tons was coal, 204,600 tons coke, 16,900 tons lignite briquets.



Export Clearances, Week Ended Feb. 12, 1925

FROM HAMPTON ROADS

	Tons
For Virginian Islands:	
Nor. Str. Angot, for St. Thomas	5,433
Nor. Str. Thomas Haaland, for St. Thomas	4,163
For Egypt:	
Br. Str. City of Bombay, for Port Said	2,360
For Italy:	
Ital. Str. Posilippo, for Genoa	8,211
For British West Indies:	
Nor. Str. Nils, for Port of Spain	2,436
For West Africa:	
Ital. Str. Enrichetta, for Dakar	7,029
For French West Indies:	
Br. Str. Sheaf Spear, for Fort de France	4,302
For Nova Scotia:	
Br. Str. Dienze, for Halifax	777
For Brazil:	
Br. Str. Francis, for Para	645
For Argentina:	
Swed. Str. Sveajarl, for Buenos Aires	6,548
For Cuba:	
Belg. Str. Rogier, for Havana	3,800

FROM BALTIMORE

For Porto Rico:	
Am. Str. Delisle, for Guanico	536

Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Feb. 5	Feb. 12
Cars on hand	2,302	3,042
Tons on hand	152,559	198,186
Tons dumped for week	133,060	101,639
Tonnage waiting	5,000	10,000
Virginian Piers, Sewalls Pt.		
Cars on hand	1,576	2,103
Tons on hand	111,500	143,700
Tons dumped for week	103,871	85,915
Tonnage waiting	18,485	1,203
C. & O. Piers, Newport News:		
Cars on hand	1,918	4,673
Tons on hand	93,894	133,810
Tons dumped for week	112,998	101,964
Tonage waiting	5,875	515

Pier and Bunker Prices, Gross Tons

PIERS

	Feb. 7	Feb. 14†
Pool 9, New York	$4.75@$5.00	$4.75@$5.00
Pool 10, New York	4.50@ 4.65	4.50@ 4.65
Pool 11, New York	4.35@ 4.55	*4.30@ 4.55*
Pool 9, Philadelphia	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.35@ 4.50	*4.25*
Pool 2, Hamp. Roads	4.15	*4.10*
Pools 5-6-7 Hamp. Rds.	4.00	4.00

BUNKERS

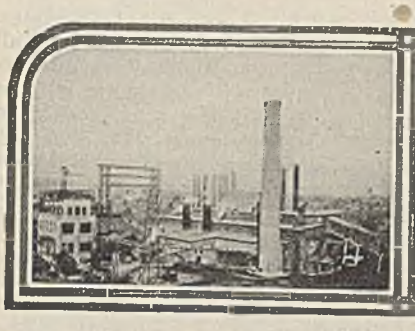
	Feb. 7	Feb. 14†
Pool 9, New York	$5.00@$5.25	$5.00@$5.25
Pool 10, New York	4.75@ 4.90	4.75@ 4.90
Pool 11, New York	4.60@ 4.80	*4.55@ 4.80*
Pool 9, Philadelphia	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.35@ 4.50	*4.30*
Pool 2, Hamp. Roads	4.25	*4.15*
Pools 5-6-7 Hamp. Rds.	4.10	*4.00*

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

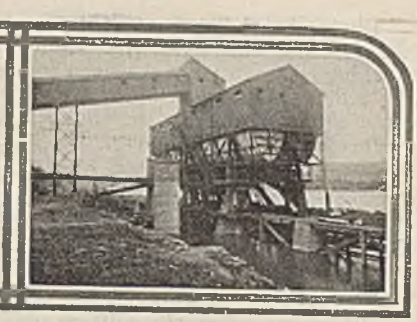
Quotations by Cable to *Coal Age*

Cardiff:	Feb. 7	Feb. 14†
Admiralty, large	26s.9d.@27s.	27s.
Steam smalls	16s.3d.@16s.6d.	*16s.3d.*
Newcastle:		
Best steams	18s.6d.	18s.6d.
Best gas	21s.6d.@22s.	*20s.@22s.*
Best Bunkers	18s.@19s.	18s.@19s.

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



News Items From Field and Trade



ALABAMA

The two largest coal mines of the Tennessee Coal, Iron & Railroad Co. broke all previous records in the way of production in January, when Edgewater turned out 116,318 tons as against its previous record of 107,625 tons, and Docena, located near the champion producer, sent to the top 72,815 tons against its previous high mark of 71,879 tons. Records also were broken at ore mines and the steel plant of the corporation, the rail mill turning out 54,219 tons of rail, the previous record for a month being 51,652 tons.

A chapter of the National Safety Council has been formed at Birmingham, Leon C. Bradley being elected first president. C. A. Moffett, president of the Gulf States Steel Co., and J. L. Davidson, secretary of the Alabama Mining Institute, were among the vice-presidents named. Mining men named on the executive committee were A. B. Aldridge, Stith Coal Co.; E. J. Rowe, of Adams, Rowe & Norman, Inc., coal sales agents and F. B. Winslow, Tennessee Coal, Iron & Railroad Co.

W. Carson Adams, of Adams, Rowe & Norman, Inc., general coke and coal sales agents, has been awarded the Birmingham *News* loving cup for 1924 The award was recently made by a committee selected from the Civitan and Rotary Clubs, Chamber of Commerce and other civic and religious organizations of the city. This honor is bestowed each year upon a citizen who is adjudged to have rendered his city the most outstanding patriotic and unselfish service during the current year. Mr. Adams is widely known in industrial circles and is considered one of the best informed men in the coal and coke trade.

COLORADO

Routt County coal mines have their difficulties with transportation but 1924 was far and away the biggest producing year since 1920. The 1924 total was 904,158 tons, which is 105,000 tons ahead of 1923 and 487,000 tons more than was shipped in 1922. The county's biggest year was 1919, when the output reached 1,165,681 tons.

J. Edgar Smith, examiner for the Interstate Commerce Commision, will be in Birmingham, March 3, to hear complaint of Alabama coal producers aganist prevailing rates on coal from West Virginia and Pennsylvania mining districts to points in the Mississippi Valley. Existing rates, both rail-water and all rail, are alleged to be discriminatory and unfair, enabling these far-distant fields to obtain business at the very door of the Alabama district and practically eliminate Alabama coal from its logical and rightful territory. S. Lovell Yerkes is chairman of a committee of the Alabama Mining Institute which is preparing data to place before the examiner, and it is believed that the commission will remove this discrimination when the true facts are presented to the body.

ILLINOIS

Old Ben No. 18 mine, at Johnson City, has closed down indefinitely. On Feb. 7 the men were ordered to take out their tools. This added about 400 men to the growing army of unemployed miners in the Johnson City region.

The Illinois Coal & Coke Corporation posted notices Feb. 2 at West Mine No. 9 stating that the mine would be closed indefinitely after three days' clean up.

Mine No. 10 of the Indiana & Illinois Coal Corporation, Nokomis, operated by Theo. C. Keller, of Chicago, broke all previous records for the mine on Feb. 4 by hoisting 1,886 mine cars, or a tonnage of 6,253. This was done in 7 hours and 31 minutes hoisting time from a depth of 720 ft. H. C. Perry is general superintendent of the properties; W. T. Haywood, assistant general superintendent; J. J. Fries, mine manager, and Chester Cunningham, top foreman.

A new strip mine is soon to be opened one and one-half miles west of Ward on the Illinois Central R.R. Ward is ten miles south of Duquoin. A $200,000 corporation is forming with $150,000 paid in cash. The company is made up of R. E. Renfro, John and William Montgomery, C. E., F. O. and W. W. Hamilton, all of Carbondale. According to the plans of the company, an excavating shovel costing $117,000 and a smaller loading shovel costing approximately $30,000 will be installed. The tract to be stripped contains 360 acres and the coal is about 7 ft. thick with from 18 to 40 ft. of overburden. A switch connecting the mine with the main line of the Illinois Central will be constructed. Contracts with a Benton contractor have been drawn up and it is expected construction will begin on the switch this week. With favorable conditions stripping should commence at this new mine by April 1.

Counsel for the majority creditors of the Southern Gem Coal Co. appeared before U. S. District Court Judge at East St. Louis, Ill., Jan. 27 and suggested to the court that N. C. McLean, of East St. Louis, be appointed to act as co-receiver with W. S. Wilson, of Pinckneyville, Ill. The appointment of a new co-receiver was made necessary by the recent resignation of C. B. Thomas, former referee in bankruptcy for the district. Creditors favoring McLean hold claims totaling $1,759,000. Creditors with $525,000 in claims against the coal company suggested Ray R. Karraker, St. Louis, Mo., be appointed. The court took the matter under advisement.

INDIANA

So long as those union miners from District No. 11 who have gone to Gary and other northern Indiana towns to work in the factories and mills do not perform labor for which there is a union, there will not be any objection on the part of the union officials, William Mitch, district secretary, said in a statement issued Feb. 7.

The Ohio Valley Coal Co., of Indianapolis, has filed a certificate of preliminary dissolution.

Three mines, besides the Martin cooperative venture near Bicknell, opened in the Terre Haute field in the week of Feb. 1. The Wilford pit near Sherburn, employing 200 men; the Binkley Mine No. 3 near Skirkieville, in the Clinton field, and the Wabash, near Terre Haute, which uses 500 men, again are working. The Wilford mine, closed for several months, was leased by the receiver, J. F. Bolinger, to several citizens of Shelburn. The Binkley was closed two weeks following an explosion which killed two shotfirers. The Binkley reopened with 110 men. It will use more later. The Wabash is owned by the Coal Bluff Mining Co. It had been closed several weeks.

Senator George W. Sims, Terre Haute, has withdrawn his bill in the Indiana General Assembly regulating safety devices and measures in Indiana mines. The bill was handed to him by John Hessler, of Terre Haute, president of District No. 11 of the United Mine Workers, and Harold Henderson, attorney for the mine workers, Senator Sims said. He submitted the measure at their request without studying it, he explained. The bill would make safety regulations which now apply only to larger mines in Indiana applicable to smaller ones, including wagon mines. It also would increase the maximum speed for hoisting from 600 to 800 ft. a minute. "These provisions," declared Senator Sims, "would drive the owners of small mines and wagon mines out of business. As chairman of the Mines and Mining Committee, I could not recommend such a measure." It is possible that the bill will be filed anew with certain changes.

During the latter part of the week of Feb. 1 union officials of District 11 were seeking a solution of the complaint lodged with them against the opening of a 400-man mine in the Bicknell field by a co-operative company. The Martin mine was reopened Feb. 3 by the East Side Mining Co., composed of the miners themselves. The mine employs about 400 men but all of the workers are not stockholders in the corporation. The complaint made to the union by union men was that all of the men formerly employed in the colliery when it closed about a year ago have not been given employment as the special permission agreement from union headquarters required.

KANSAS

Net sales of $8,791,184 were reported by the Central Coal & Coke Co. for 1924, against $10,472,857 in 1923. After all expenses and reserves there was a net profit of $364,035, against $565,615 in 1923. The net profit for 1924 was equal to $19.42 a share earned on the 5 per cent cumulative preferred stock, on which back dividends amounting to one year's dividends are overdue. The company's balance sheet at the end of 1924 showed net current assets valued at $2,986,715 and current liabilities, aggregating $1,861,472, leaving net working capital of $1,125,243. The profit and loss surplus as of Dec. 31, 1924, amounted to $13,040,863, against $12,676,828 on Dec. 31, 1923.

KENTUCKY

The Elkhorn Collieries Co., Thornton, will soon let the contract for construction of a $10,000 store building.

Western Kentucky coal men are behind a movement to obtain a U. S. Bureau of Mines rescue car station at Madisonville to take care of the western Kentucky coal fields section. The nearest mine car is at Evansville, Ind., and frequently it is in service in the Indiana territory and not available when needed in western Kentucky, as was recently the case in a mine explosion near Madisonville. The western Kentucky field has grown until it is felt that it deserves a car. A bill will be submitted to Congress, if possible, through Congressmen Robsion and Kincheloe, of Kentucky. The Kiwanis Club at Madisonville named J. D. Overall, Robert Pride and Robert Moran as a committee to look after the matter, and it was reported that the West Kentucky Coal Bureau was using its influence. Mr. Overall is president of the coal bureau.

Holbrook, Hawley & Collins, composed of Robert H. Holbrook of Hartford; H. J. Hawley, of Madisonville, and John Collins, president of the Southern Coal Co., who arranged a consolidation some months ago of strip and shaft mines, including two strippers at Centertown, in Ohio County; one at Carbondale, in Hopkins County, and shaft mines in Hopkins County, are reported to have a deal on for another large strip operation in Daviess County, near Panther and Moseleyville, where options have been obtained on over 3,000 acres of land, in which there is a 4-ft. seam of coal available. A six-mile branch railroad connecting at Pettit or Owensboro with the Louisville & Nashville R.R. is planned.

Some of the leading jobbers' and producers' representatives in Louisville have gotten together and formed a private credit information bureau, with a card index system carrying information concerning steam buyers as well as domestic buyers who do not pay their accounts promptly, those who kick on shipments and demand unfair adjustments, etc. It is believed that in this way it will not be easy for a small buyer to crash, and leave fifteen or twenty coal companies holding the bag with accounts calling for payment of from one car upward, as has been the case in some of the failures that have been recorded over the past year or two, where by shopping about the shaky buyer was able to hook a number of concerns. There are some concerns with past due paper out in payment for coal that have been eagerly sought by other houses which had no knowledge of the credit condition.

NEW YORK

W. E. Schmidt has taken the Buffalo agency of the Byrne Fuel Co. of Pittsburgh and opened an office in the Bramson Building. Formerly he was local manager of the Link-On Coal Co.

It is announced that the Buffalo office of the Pittsburgh & Shawmut Coal Co. will be closed on April 1 on account of poor business. This is the sales company of the Allegheny River Mining Co., which has extensive mines in the Allegheny Valley and a railroad to handle the coal. The mines of the company also will close, as it is found impossible to mine coal at a profit at union wages. This appears to be a further move in the effort to break the power of the miners' union and drive it out of the district.

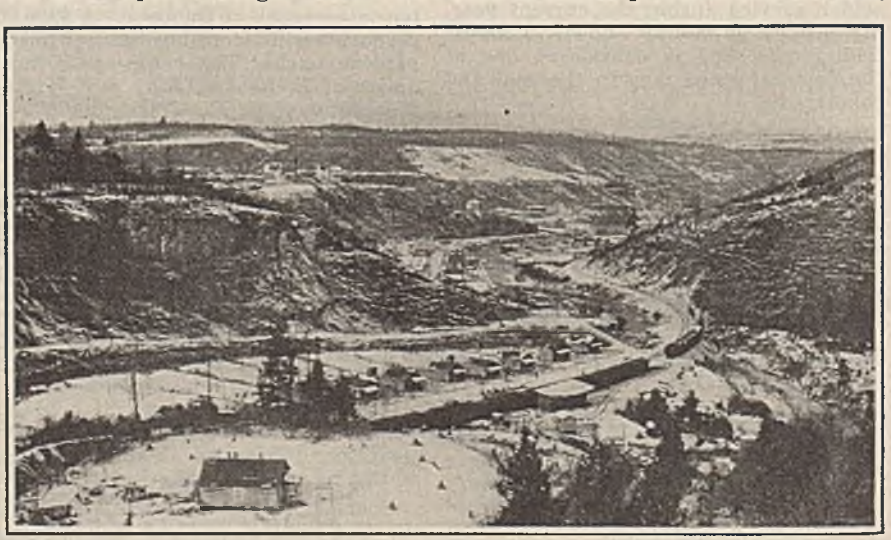
The furnace use of small sizes of hard coal will be demonstrated in Buffalo this week under the auspices of the Anthracite Economy Service, with E. J. Byrne manager and backed by the leading anthracite companies. This work has been in operation all winter in Eastern cities. When the furnaces are fired up the public will be invited to inspect the work and learn how coal costing about $7 a ton and with the same amount of carbon content can be substituted for $14 furnace coal.

OHIO

Engineers of the Consolidated Fuel Co., of Pittsburgh, an associate of the Bertha-Consumers Co., have completed a survey for the purpose of erecting a modern tipple at Powhatan, where the former company owns approximately one hundred acres of surface land directly across the Ohio River from its Frances Mine, at Franko, W. Va. The plans include a tunnel under the Ohio River from Powhatan to Franko, which will link the properties. The Consolidated Fuel Co. is now shipping coal from Franko over the B. & O. R.R., both east and west from the West Virginia side of the river, where the holdings consist of 1,700 acres. The new project will permit shipment of the coal from the Ohio side over the Pennsylvania R.R. into Michigan and other western points, under more favorable freight rates, and will give employment to 500 additional men.

In the breach of contract suit of the Interstate Coal & Dock Co. of Wisconsin against the Harlan Coal Co., the plaintiff filed its reply in the U. S. District Court at Cincinnati, Jan. 24 to the answer of the defendant and to its counter-claim for recovery of $46,870 said to be due. The court is asked to dismiss the cross-petition and to award the plaintiff damages. The ligitation involves a coal contract entered into by the two companies in 1920. Trial of the original suit of the Interstate company was started before Judge Smith Hickenlooper on Jan. 26, but delays again occurred before the second day of the hearing was concluded. The Interstate is suing for $32,000.

F. Lee Hall and G. W. Savage have been re-elected president and secretary



Winter in Piney Creek Valley Near Raleigh, W. Va.

A bird's-eye view from No. 6 Mine of Raleigh Coal & Coke Co. looking down Piney Creek valley toward the town of Raleigh. On a low hill, near the center of the illustration, can be seen the home of Ernest Chilsen, general manager of the Raleigh Coal & Coke Co.

Panoramic View of Bertha Mine Tipple

Looking west along the main line of the Panhandle R.R. Located at Dinsmore, Washington County, Pa., the Bertha Coal Co. properties have a frontage of two miles along the main line of the P. C. C. & St. L. R.R. The company's holdings consist of approximately 1,200 acres of Pittsburgh coal and 300 acres of surface land.

of District No. 6 (Ohio), United Mine Workers of America, according to an announcement made at the annual convention of the district held in Columbus recently. Their terms start April 1 and will continue for two years. William Roy, of Bellaire, was elected vice-president; Fred Helle and Robert Burns, auditors, and A. J. Thompson, Belle Valley, international board member. The report shows that there are approximately 50,000 members in the Ohio district. The financial condition of the organization is fair.

PENNSYLVANIA

That the Jefferson & Indiana Coal Co. will be able successfully to operate the Adrian mine, leased from the Rochester & Pittsburgh Coal & Iron Co., on the basis of the 1917 scale is indicated from reports that have been received at headquarters in Altoona. Operations were resumed on Monday, Feb. 9, and the output has increased each day. Feb. 9, there were mined 515 tons; Feb. 10, 567 tons; Feb. 11, 735; Feb. 12, 840 tons. The mines are being operated by men residing in Adrian and not imported men.

From headquarters of the Central Pennsylvania Coal Producers' Association in Altoona, it was stated Feb. 13 that "the agreement made a year ago at Jacksonville has proved a ghastly failure, a fact that is becoming generally recognized by the miners in the central Pennsylvania field.

"It has been rejected in the union fields of Kentucky and in northern West Virginia, as well as in Oklahoma and Arkansas, where they are working under the scale adopted in November, 1917.

"It is being rapidly accepted in the central Pennsylvania field. Over one-half of the coal being mined in this district is being taken out on a non-union basis and under the 1917 wage scale rates. The real wage scale here, therefore, is that of November, 1917."

All told, it is stated, over 200 mines in the central Pennsylvania field are now working on the 1917 wage scale or its equivalent.

Directors of the Pittsburgh Terminal Coal Co. declared an initial quarterly dividend of $1.50 a share on the preferred stock on Feb. 7 payable March 1 to stockholders of record Feb. 18. This is the first dividend paid by the company since the segregation of the coal and railroad properties of the Pittsburgh & West Virginia Ry., which formerly owned the Pittsburgh Terminal Coal Co.

The Westmoreland Coal Co., Philadelphia, announces the appointment of the General Coal Co. as its exclusive Western sales agent with offices in the Henry W. Oliver Building, Pittsburgh.

The Pittsburgh & Erie Coal Co. announces the removal of its office from 815 House Building to 2205-6 Henry W. Oliver Bldg., Pittsburgh.

Protesting against methods alleged to have been adopted by the Lincoln Coal Co. at Nant-y-Glo, Cambria County, a mass meeting was held near the mines on Feb. 8. Two thousand miners and members of their families gathered and heard addresses by district organizers. It was asserted that when about 300 men left the mines several weeks ago, alleging that the company refused to pay the regular wage scale, non-union miners were put to work and that the company employed a policeman to guard the men so employed. More than 300 miners are out at Nant-y-Glo and there is no prospect that an early understanding between the operators and miners will be reached.

Announcement was made on Feb. 9 that the operations of the Hill-Worth Coal Co. at Acosta, Somerset County, have been purchased by the Cosgrove-Meehan Corporation, of Johnstown. The deal includes two mines, tipples, tracks and 100 homes for miners. The Acosta operations had been owned by the A. W. Hillebrand company, of Tyrone.

The Pittsburgh Coal Co. shut down Montour No. 4, on the Montour R.R., and Ocean No. 5, on the P. & L. E. R.R., two of its large mines the end of last week. These mines were kept in operation on short time during 1924 and it is reported that the company has closed them indefinitely because the prospects for business are poor.

R. B. Mellon, president of the Mellon National Bank, Pittsburgh, has tendered his resignation as chairman of the board of directors of the Pittsburgh Coal Co. William G. Warden of Philadelphia was chosen to succeed him. Mr. Mellon will continue as a member of the board, however.

The Phildelphia & Reading Coal & Iron Co. has sent a check to Auditor General Samuel S. Lewis for $2,053,404, representing the company's anthracite tax for 1921, 1922 and 1923. The 1924 tax is not yet due. Payment was not made for these years because of litigation.

The Shamokin Coal Co., after several months of intensive preparation and installation of modern equipment, anticipates making shipments of anthracite before spring weather arrives. The property is located on the site of the old Neilson colliery and comprises 190 acres, part of which lies in the borough and part in Coal township. Sixteen veins of coal are located within the property and are reached by slopes and by a shaft 42 x 14 ft., comprising four hoisting compartments to a depth of 700 ft. The breaker is electrically operated and capable of preparing 1,500 tons of coal per day, with all the other usual auxiliaries.

Coal operators of central Pennsylvania, represented by B. J. Clark, president of the two operators' associations, and district officers of the United Mine Workers, headed by President John Brophy, named W. Hazard Murray, of Clearfield, as umpire of the arbitration board in District No. 2 on Feb. 2. Mr. Murray succeeds W. Clark Miller, who died several months ago.

UTAH

About three years ago the U. S. Bureau of Mines acceded to an appeal of the Utah authorities to permit three federal employees to inspect the coal mines of Utah. The state authorities had only one inspector on the coal-mine assignment and he was advanced in years. They explained this situation as due to lack of funds. The result has been that the federal bureau has been the target for complaints, it is said, and state officials, utilizing the federal inspection as a convenient abibi, are prone to blame their "wicked partner" when criticisms of inspections are made. Consequently, notice has been served on Utah that it's up to the present state Legislature to appropriate funds sufficient to employ her own inspectors. The federal men are retiring from the rôle of state inspectors.

Coal produced in Utah in December, 1924, amounted to 508,312 tons, compared with 435,139 tons the previous month. In December, 1923, the production was 405,635 tons. The production in December was the greatest since 1920, when 526,155 tons were mined.

D. D. Muir, Jr., vice-president and general manager of the United States Fuel Co., has been elected a director of the Utah Associated Industries and will serve a three-year term.

WEST VIRGINIA

The Williamson Fuel Co., owned by New York interests and operating within the corporate limits of the city of Williamson, has filed a voluntary petition in bankruptcy in the U. S. District Court at Bluefield. The company in its petition gives its assets at $204,751 and its liabilities at $239,058.

In connection with the case of Charles W. H. Crane against A. J. Dalton and John A. Kelly for the recovery of $250,000 alleged to be due the plaintiff, tried in the Circuit Court of Cabell County, the jury was unable to reach a verdict. The case involves approximately 50,000 acres of coal land in Wyoming County, on which the plaintiff alleged he had held an option which the defendants exercised in purchasing the land. It was the contention of the plaintiff that under an agreement he was supposed to receive $5 an acre for his option.

The Bolen Coal Co. has just been organized and development commenced in the Winding Gulf district of Raleigh County. The new company will operate on the waters of Piney Creek, having its post office at Fireco and its shipping station at Willabet. The mine of the company is to be located on the line of the Virginian Ry. E. C. Minter, of Beckley, is president of the company and John N. Smith is superintendent.

The successful bidder at the sale of 45,000 acres of Mingo county coal, timber, oil and gas land at public auction at Williamson was C. W. Krebs, of Charleston, vice-president of the Cotiaga Development Co. Under the terms of sale one-fourth of the purchase price was to be paid in cash and the remainder in payments extending over two years. The sale covers 103 tracts, formerly the property of Stuart Woods, who died about five years ago, and his brother, Walter Woods, Philadelphia capitalists. Much of the land has been involved in litigation since the death of Stuart Woods. Prior to Stuart Woods' death Logan county holdings of the Woods brothers were sold to the Main Island Creek Coal Co.

The coal tipple at Simpson owned by the Simpson Creek Collieries Coal Co. has been abandoned and a crew of men is busy tearing it down, after being in operation for over 30 years. The machinery is being moved to Galloway, where another opening has been made in the same vein. The coal formerly was hauled three miles under ground to the Simpson opening. The Simpson mine was first opened by Thomas Davis, one of the pioneer coal operators in the district.

WYOMING

The Union Pacific Coal Co. is using diamond drills to prospect for new coal beds in the vicinity of Cumberland, according to reports received at Rock Springs from this region. It is said that the present mines of the Union Pacific company at Cumberland are about worked out. Mine No. 3, which caught fire about fifteen years ago, is still burning.

Directing Engineer Plainsted of a crusher and pulverizer company in St. Louis, is in Rock Springs for the purpose of enlarging the rock-crushing plant recently installed by the Union Pacific Coal Co., to provide rock dust with which to dust its mines to prevent explosions. When the work has been completed the rock-dust plant will have a capacity of 3,000 tons annually, which is the required amount for all the Union Pacific mines. The plant will run 24 hours a day as soon as it is completed until 1,500 tons has been prepared for the mines, which is the immediate need. The dust is made from White Mountain shale, the rock being hauled to the plant by truck.

CANADA

In his speech at the opening of the Ontario Legislature on Feb. 10, Lieutenant-Governor Cockshutt stated that the government had caused an expert inquiry to be made into the actual cost of the transportation of coal. The information thus obtained will be the basis of an application to the Dominion Railway Board for a special rate for the shipment of coal to Ontario, in the hope that it may be found possible to arrange for a supply of Canadian coal to consumers.

Alberta coal for Ontario is again a live issue. The expert inquiry into transportation costs, which was announced in the speech from the throne, at the opening of the Ontario Legislature last week, has a vital bearing upon the subject, Premier Ferguson stated. The inquiry has been conducted by Messrs. Lockhart, Gordon, George Kilmer, Earl Lawson, and Mr. Oliver, a Chicago transportation expert. Applications based upon their findings will be made to the Dominion Railway Board for a special rate for coal shipments from Alberta to Ontario.

Traffic

Disque Probes Indiana Rates

William Disque, of Washington, an examiner for the Interstate Commerce Commission, has just conducted a hearing in the Federal Building in Indianapolis to determine whether certain coal freight rates ordered by the Indiana Public Service Commission on bituminous coal are just, and what maximum or minimum rates should be charged by railroads. The hearing follows revision downward of coal rates made by the Public Service Commission against approximately thirty railroads operating in Indiana. The railroads are attacking the order of the commission on the ground that it violates the federal constitution by confiscation of property without due process of law. They also alleged that the lowered rates interfere with interstate commerce. A mass of documentary evidence was introduced by both sides.

C. I. & W. Schedules Suspended

The Interstate Commerce Commission, in an order in I. C. C. Docket 2340, has suspended to June 10, 1925, the operation of certain schedules published by the Cincinnati, Indianapolis & Western R.R., proposing to cancel their rates on bituminous coal from Brazil, Burnett, Coal Bluff, Coxville, Ecker, Mecca and Rosedale, Ind., from mines on the C. I. & W. to points reached via the Chicago, Attica & Southern line.

Association Activities

At the annual meeting of the **Pittsburgh Vein Operators' Association of Ohio**, which was held in Cleveland Feb. 9 and was largely attended, these officers were re-elected: President, Ezra Van Horn, general manager of the Clarkson Coal Mining Co.; Vice-President, W. L. Robison, vice-president of the Youghiogheny & Ohio Coal Co.; Treasurer, H. R. Sullivan, of the Central Coal Mining Co.; Secretary, D. F. Hurd.

Measures looking toward stabilization of the coal business were taken by the **Logan Coal Operators' Association** at the annual meeting at Logan, Feb. 5. A decision was made to discontinue forthwith the practice of loading and shipping coal to markets before the orders are received. E. J. McVann, secretary of the Smokeless Coal Operators' Association, made a constructive talk on transportation problems. Harry L. Gandy, executive secretary of the National Coal Association, also spoke. Officers were re-elected as follows: President, M. E. Kent; Vice-Presidents, C. W. Jones and H. A. McAllister; Secretary, J. W. Colley; Executive Committee, A. R. Beisel, R. R. Smith, C. H. Jenkins, H. E. Jones, Walter Thurmond, John A. Kelley, T. F. Downey, Sr., James Ford and A. J. King.

New Companies

Papers have been filed chartering the **Ava Brick Co.**, of Ava, Ohio, with an authorized capital of $100,000 to operate coal properties as well as other lines of business. Incorporations are: John J. Marsn, V. R. Marsh, H. E. Marsh, J. H. Marsh and F. J. Huff.

Articles of incorporation were filed Jan. 27 by the **Two-Ton Smokeless Fuel Co.**, of Salt Lake City. The company, capitalized at $150,000 divided into 15,000 shares, has purchased the patents to a low temperature carbonizing oven granted to James T. Fenton, local inventor, who has been experimenting at a small plant in the Sugar House district of Salt Lake City. The patent covers the treating of coal so as to make it smokeless by the extraction of natural coal oils. The president of the company is Alvin S. Nelson; Royden E. Weight is secretary-treasurer, and Samuel G. Clawson an additional director.

Obituary

John McLennan, president of the Colorado state Federation of Labor for nine consecutive terms, died of pneumonia early in February. He was president of district No. 15, United Mine Workers, during the strike against the Colorado Fuel & Iron Co. in 1913-14 that culminated in the burning of the Ludlow tent colony.

D. F. Wright, vice-president of the Leckie Coal Co., died at Columbus, Ohio, Feb. 6, and was buried in Norfolk, Va., Feb. 9. He had lived in Norfolk for about five years and was a native of Clarksville, Va. T. S. Crockett, of Columbus, president of the company, and W. V. Beal, superintendent of operations at Fireco, W. Va., attended the funeral and burial.

Coming Meetings

Canadian Institute of Mining and Metallurgy. Annual meeting March 4-6, Ottawa, Can. Sec. Geo. C. Mackenzie, Montreal, Que., Can.

Indiana Bituminous Coal Operators' Association. Annual meeting March 11, Terre Haute, Ind. Secretary, P. H. Penna, Terre Haute, Ind.

New England Coal Dealers' Association. Annual meeting, March 25-26, Springfield Auditorium, Springfield, Mass. Secretary, C. R. Elder, 141 Milk St., Boston, Mass.

Upper Potomac Coal Association. Annual meeting April 6, Cumberland, Md. Secretary, J. F. Palmer, Cumberland, Md.

National Retail Coal Merchants Association. Annual convention Traymore Hotel, Atlantic City, N. J., May 11-14. Resident vice president, Joseph E. O'Toole, Transportation Bldg., Washington, D. C.

Mine Inspectors' Institute of America. Annual Convention May 19, 1925, at the Jefferson Hotel, Peoria, Ill. Secretary, G. B. Butterfield, Hartford, Conn.

Chamber of Commerce of U. S. A. Thirteenth annual meeting, May 20-22, Washington, D. C.

Manufacturers' Division of the American Mining Congress. National exposition of coal-mining equipment, Cincinnati, Ohio, week of May 25. Secretary of American Mining Congress, J. F. Callbreath, Munsey Building, Washington, D. C.

New Equipment

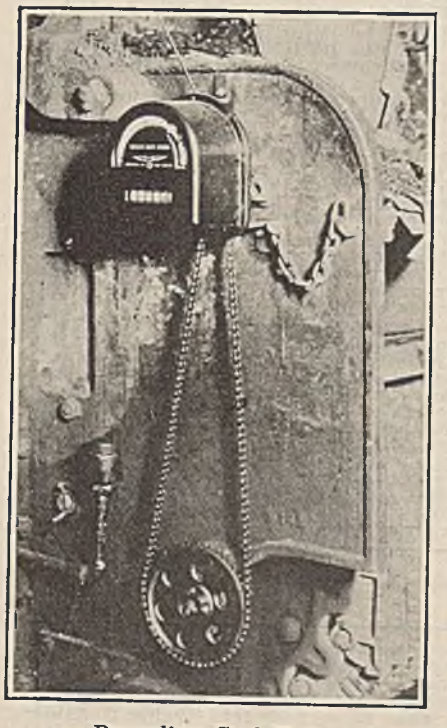
Volumetric Measurement of Boiler Fuel

Where accurate methods of ascertaining coal consumption over any given period are not available, the use of coal meters will result in important savings. With this in view the Republic Flow Meters Co., of Chicago, Ill., has developed a new coal meter. The measuremnet is made by the automatic recording of the product of the cross-sectional area and the velocity of the layer of coal passing into the furnace, the meter therefore registering the volume of the coal burned.

The method by which this measurement is effected is as follows: The meter is attached to the driving mechanism of the grate in such a way that the speed of a ratchet wheel is varied in proportion to the grate travel.

At the maximum gate height, the counter makes a complete revolution with the ratchet wheel, turning off ten units. As the gate is lowered the motion is communicated to a cam which throws the two pawls out of contact with the ratchet wheel during a portion of a revolution so that the number of units turned off by the counter is decreased in proportion to the amount by which the gate is lowered.

Thus for an 8-in. maximum gate the counter turns off 10 units per revolution, at 4-in. gate height, 5 units per revolution and at 0 gate height the pawls are held from engaging the ratchet throughout a complete revolution so that the meter reading is zero.



Recording Coal Meter

The boiler and furnace efficiency of any plant may be easily checked by the use of this automatic instrument which measures the quantity of coal fed to the fire.

If a number of equal volumes of any coal are weighed the variation in weight of the samples is extremely small, and therefore by multiplying the revolutions of the counting wheel by a suitable constant, a highly accurate indication of the weight of coal burnt will be obtained.

If coal is bought and accepted on weight at a given moisture content, the volumetric coal meter gives a relatively accurate record of coal consumed, as, the record being based on measurement of volume, all errors due to change of moisture in the coal are eliminated.

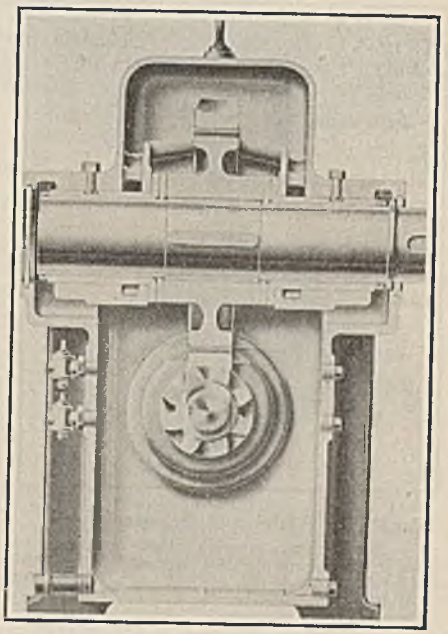
It is desirable, however, to stress the point that it is the comparative records obtained that are of greatest value to the engineer.

Reduction Gears Give Any Speed Reduction

A line of completely inclosed speed reducers of the worm reduction-gear type has been placed on the market by the De Laval Steam Turbine Co., Trenton, N. J. Speed ratios from approximately 4 to 1 up to 100 to 1 are obtainable in one step, double reductions being used for higher ratios. Power is delivered from a worm reduction gear at right angles to the motor shaft, and frames can also be supplied for vertical-shaft drive. The wheel shaft may be extended to the right or left in both directions. Flexible couplings of the pin and rubber bushing type are provided.

The tooth shape used is said to be such as to combine a minimum of sliding and a maximum of rolling action between the worm and gear. In the gearing three or more teeth are always in contact, thus giving high lead capacity. The wheel shaft is carried on bronze bearings, and the worm, which may be placed either above or below the wheel, is mounted on ball bearings. The worm is made from a low-carbon, alloy-steel forging which is carbonized and heat-treated after the threads are cut. The wheels are made from a special composition of phosphor bronze.

The reduction is completely inclosed in a casing, which keeps out dust and moisture. The casing is split horizontally in the plane of the center line of the wheel shaft, the lower half is supported by four substantial feet designed to permit air circulation underneath, this giving additional radiating surface. A large oil reservoir with baffles on the bottom serves to settle out foreign matter from the oil. The wheel shaft is carried on plain bronze bearings, so split as to be easily removable without disturbing the wheel shaft or the couplings. The side thrust of the wheel is carried by a hardened, ground and polished steel plate, which bears against the bronze face of the wheel shaft bearing. The worm may be located either above or below the wheel and is mounted on ball bearings,



Speed Reducer for Right Angle Drives

A minimum of sliding and maximum of rolling is accomplished by the teeth on the gears used in this speed reducer. Three or more teeth are always in contact.

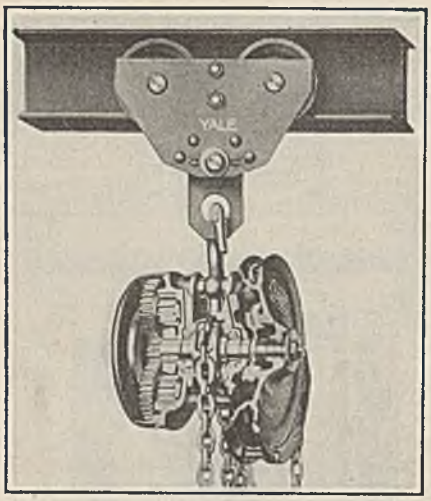
the one at the rear of the worm being of the double type and designed to carry the combined radial and thrust load, regardless of the direction of rotation of the worm. The inner races are pressed on the shaft and the outer races are clamped both radially and axially, adjusting and locating the worm in the case. The bearing at the forward end of the worm is of the radial type, the inner race of which is pressed on the worm shaft, while the outer race has clearance axially, permitting the bearing to adjust itself to the linear expansion of the shaft. This outer race creeps slowly, which distributes the wear over the race way. The bearings are carried in separate housings so that the case itself is not subject to wear. The worm and wheel and the bearings are lubricated by a splash system, the oil thrown from the gearing being caught in troughs cast on the casing wall and thereby led to the bearings.

Ball Bearings Add Strength To Chain Block

Hoisting is dangerous work. Hand hoists are frequently used by inexperienced or careless workmen, and serious accidents are likely to happen unless the best materials and workmanship are used in the construction of these hoists, and a liberal factor of safety employed in their capacity rating.

The latest development in chain blocks consists of the introduction of ball bearings of large size to support the load sheave as shown in the illustration. This block is just being put on the market and interesting claims are made for its high mechanical efficiency which results principally from the use of chrome vanadium-steel ball bearings of large size. It is made by the Yale & Towne Manufacturing Co., Stamford, Conn.

A sectional view of the block shows



Built To Withstand Severe Shocks

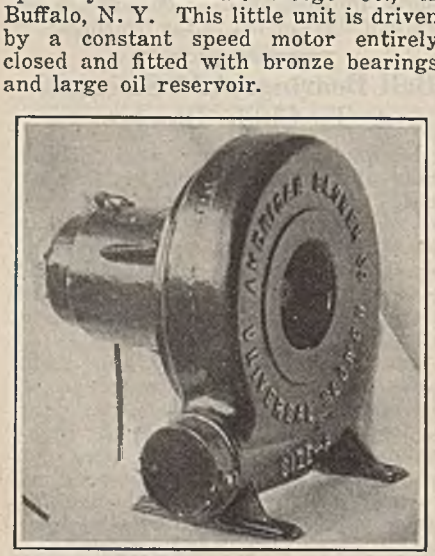
By introducing special steel bearings to support the load sheave, the entire weight of the load and all surges are taken on these ball bearings.

the location of the massive steel load sheave carried on two ball bearings, each containing vanadium steel balls. The top hook, crosshead, suspension plates, load sheave, electric-welded load chain, detachable shackle, bottom crosshead and hook are all steel, so that the load hangs on a line of steel from hook to hook. The mechanical efficiency of this block has been increased over 6 per cent by the introduction of these ball bearings where they carry the full load.

The ball or roller bearings in a chain block must be able to stand up under the chock or pile-driver blow which occurs when the load "drops" or takes up the slack in the load chain. These bearings must be sufficiently liberal in size, and superior in material to take this hammer blow without showing any ill effects.

Electrically Driven Blower For Forges and Furnaces

A little blower suitable for forge or furnace blast service has been developed by the Buffalo Forge Co., of Buffalo, N. Y. This little unit is driven by a constant speed motor entirely closed and fitted with bronze bearings and large oil reservoir.



Blower Driven by Electric Motor

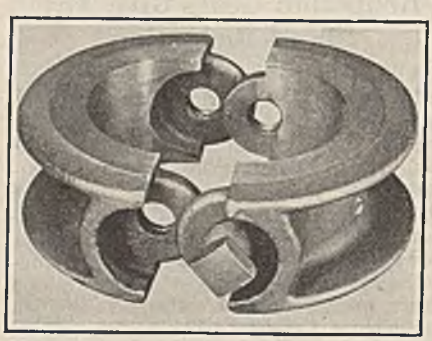
A compact little fan like this can be adapted to any forge or coal-burning furnace. The blower has a 5-in. outlet.

Malleable-Iron Safety Collar Maintains True Alignment

Ten per cent of the power generated in the average industrial plant is said to be wasted between the generator and the consuming machine. Attention to this loss of power has given rise to changes in power transmission equipment and the development of more efficient mechanical means.

One of the most recent developments along this line comes from the Link-Belt Co. of Indianapolis, Ind. The device is illustrated by the accompanying photographic reproduction. This new safety collar is intended to maintain the proper alignment of such equipment as pulleys, shaft bearings, hangers, etc.

Great strength, toughness, durability, and light weight have all been incorporated in this new malleable-iron safety collar, in addition to which, a new design which permits the collar to be split in two pieces, thus affording ready and economical installation or adjustment. This type of collar, however, is made also in the solid-ring type, both types being accurately machine finished,



Checks Power Loss

Constructed for heavy-duty service, this safety collar prevents power loss by maintaining proper alignment of pulleys, shaft bearings, hangers and similar equipment. The two-piece design aids quick installation or adjustment.

assuring a tight fit and a pleasing appearance.

Exhaustive tests made with the collar have proven it to be impervious to shocks and strains encountered in heavy-duty service. The material of which it is made possesses unusual wear and rust-resisting qualities. This extends its sphere of usefulness to installations where the atmospheric conditions contribute to rust or excessive abrasiveness. The set screw, by which the collar is firmly affixed to the shaft, is flange protected.

Industrial Notes

B. J. Roberts became sales manager of the Deister Machine Co., Fort Wayne, Ind., on Feb. 1. Until recently Mr. Roberts was in charge of the reconstruction and operation of the coal-preparation and coking plant of the St. Bernard Mining Co., at Earlington, Ky.

The Chicago Pneumatic Tool Co. has entered into an agreement whereby it will become exclusive distributors in the United States of the Pedwyn balancer. This device provides means for suspending, lifting and balancing of electric and pneumatic portable tools, increasing labor efficiency and decreasing overhead hazards.

Barton R. Shover, Oliver Building, Pittsburgh, Pa., has taken over the business of the late Harry F. Randolph, consulting engineer, who died in August last.

Publications Received

Power Studies in Illinois Coal Mining, by Arthur J. Hoskin and Thomas Fraser. Prepared under a co-operative agreement between the Engineering Experiment Station of th University of Illinois, the Illinois State Geological Survey and the U. S. Bureau of Mines. Bulletin No. 144. Pp. 82; 6x9 in.; tables. The data for the investigation covered in this book were collected at the request of Illinois coal operators, but it is hoped that the suggestions will prove helpful to coal operators generally.

Sanitation in Mines, by R. R. Sayers. Bureau of Mines, Washington, D. C. Miners' Circular 28. Pp. 16; 6x9 in. Covers drinking water, sewage disposal and ventilation.

History of the Portland Cement Industry in the United States, by R. W. Lesley. International Trade Press, Inc., New York. Pp. 330; 6x9 in.; illustrated. Price, $3. The history is divided into convenient chapters covering phases of development in the industry, advances in mechanical methods, etc.

Trade Literature

American High Duty Conveyor; Conveyors Corporation of America, Chicago, Ill.; pp. 8; 8½x11 in.; illustrated. Designed to handle ashes from large power plants and built with a 9-in. conduit through which the ashes pass.

Fifty-Two Years' Experience; a brief history of the Osgood Co., Marion, Ohio; pp. 16; 4x6 in.; illustrated.

Wing Type E M Blower; L. J. Wing Mfg. Co., 352 West 13th St., New York City; bulletin No. 26 A. A four-page folder illustrating and describing the use of these variable speed blowers for forced draft, especially developed for low-pressure heating boilers. Their use in schools, apartment houses, etc., it is stated, has effected large economies by burning low-priced coal instead of the domestic sizes.

Detrick Arches; M. H. Detrick Co., Chicago, Ill.; pp. 50; 8½x11 in.; illustrated. Describes the adaptability of these arches for all types of boilers and stokers, industrial furnaces and oil stills.

The Columbian Rope Co., Auburn, N. Y., has issued a beautiful marine calendar for 1925 featuring a fine square rigged ship of the clipper design. The calendar measures 16½x33 in. and has a large date pad showing three months at a glance.

You Can Do It Quicker with Air. Sullivan Machinery Co., Chicago, Ill. Pp. 15; 8 x 11 in.; illustrated. Devoted to showing graphically some uses to which compressed air may be put.

Portable Electric Hoist. Sullivan Machinery Co., Chicago, Ill. Bulletin No. 76-E. Pp. 7; 6 x 9 in.; illustrated. Describes the single and double-drum portable electric hoists of 6½ hp., 2,000-lb. vertical lifting capacity with single line.

47-A Sectional Conveyor. The Jeffrey Mfg. Co., Columbus, Ohio. Bulletin No. 407. Pp. 8; 6 x 9 in.; illustrated. An important unit for use in facilitating concentrated mining.

G-4 Instantaneous Heater. The Griscom-Russell Co., New York City. Form 202. Leaflet describing and illustrating the special advantages and construction specifications of the heater; also includes a complete table of sizes, capacities and dimensions.

American Mono-Rail Cable Conveyor. Conveyors Corporation of America, Chicago, Ill. This 6-page spread describes and illustrates each feature of the conveyor, which can be used in the power plant as well as the coal yard.

Recent Patents

Automatically Disinfected Mine Closet; 1,510,111. Albert Schwesig, Buer, Germany. Sept. 30, 1924. Filed Dec. 7, 1920; serial No. 429,039.

Mine Door; 1,510,208. Walter C. Canterbury, Beckley, West Va. Sept. 30, 1924. Filed Jan. 12, 1924; serial No. 685,865.

Mine Door; 1,510,374. Ernest L. Bailey, Charles H. Scott and Wallace Wiley, Lookout, Ky. Sept. 30, 1924. Filed July 3, 1924; serial No. 724,096.