COAL AGE

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Beware of the Soluble Ulmin

COAL APPARENTLY can be stepped back a few hundreds of thousands of years by a little oxidation. We can't be sure that we get the same compounds by that process as were in the coal when the Neanderthal near-man or his predecessors trod this earth, but as far as coking qualities are concerned they act in much the same way, and coal that will coke becomes coal that will not coke. The insoluble ulmins have been replaced by ulmins soluble in caustic alkalies. The whole nature of the vitrain has changed and it is the vitrain that cokes when in its prime condition.

Now the gist of the story appears to be that a lot of oxidation takes place early in the coking process at a relatively high temperature as compared with atmospheric and all the vitrain changes its character so that it can no longer make a coke. If the temperature rises quickly so that the vitrain is coked before it is oxidized, then coke will be formed. If the temperature is slow the vitrain is spoiled, ullmified, the professors say, and your batch is useless. Beware of the soluble ulmin, that makes long-exposed strip coal or stored coal uncokable and makes the coal of Illinois resistant to coking.

Always Some Not Satisfied

WHEN NEW REGULATIONS are proposed they always have opponents, some of them capable men and well-meaning. The strange fact is that many men from Pennsylvania and Illinois who today actually brag about the laws of those states, a few years ago used vitriolic language in discussing them. Your Englishman doubtless in times past cholericly condemned rock dusting regulations and now believes that rock dust is a great national institution.

So let us not take the criticisms of the Utah regulations at the Rocky Mountain Coal Mining Institute in too bad part. Perhaps a little revision of the rules might be well. Some of the provisions may be less invulnerable than those in the Decalogue. But on the whole the Utah rules point the way to safety.

We cannot feel that the remarks about the Rains explosion are to be taken seriously, though many will declare that they should be. The actual condition of the roadways in the Rains mines as to dust has not been made clear. Till we have a case in which we know how much gas was present and how much rock dust, we shall guess in vain and may do well to base our conclusions on experimental-mine data, rather than on guesses as to the actual condition of a mine when an explosion occurred. The Rains mine, we know, is in a district where the preventing of explosions is particularly difficult.

Nevertheless, while we talk, the explosions continue. Whatever may be the marvelous thing we have done in the past, it has not prevented explosions. We have sprinkled and moistened our roadways, but every little while the work has proved abortive. We might do it better, it is true, but at what prohibitive cost? The new method of rock dusting is cheaper and surer than effective moistening, if there is any such thing, so why not accept it?

Making Electric Lamps Universal

IN THE BENIGN hope of making mines more safe—no wish could be more devout—the universal introduction and use of electric lamps in all coal mines has been advocated. They give a good light and a safe one, so why not, say their advocates, use them everywhere?

Unfortunately they indicate nothing in their perfect airtightness, neither firedamp, nor blackdamp nor the absence of ventilation. As the first may be exploded—by some other agency than the electric lamp—as the second may snuff out life without warning and as ventilation is necessary for the removal of the other two it is well to have indications of approaching danger. The flame safety lamp affords a good indication of the first if diligently and expertly observed. In blackdamp it will go out, but as so many things will extinguish a safety lamp, the indication is uncertain. The flame safety lamp also does not indicate the passage of air.

The open lamp gives much better indications than the safety lamp as to blackdamp and ventilation. It ignites methane if in burnable quantities but even that may be a service as it may do this before a dangerous quantity of gas has accumulated and so warn the man in whose hand or cap the light is. With an electric lamp the firedamp would not be ignited, but the man would not be informed as to the presence of gas and when the working had filled with firedamp a spark or a lighted match might destroy the entire mine. With nothing to show whether air was traveling a door might have been left open without that fact being noticed. In consequence a large section of the mine might have reached a highly explosive condition.

It will be prudent in almost all mines worked by electric lamps to supplement them by flame safety lamps, so that at all times methane can be detected, if present. Some mines, it is true, have no methane, but in them the use of electric lamps is not necessary. In moderately gaseous mines it would be unsafe to introduce the electric lamp without frequent and vigorous inspections with flame safety lamps; otherwise a spark or a match might ignite gas. In fact inspection is hardly sufficient. It would be better to let every man have a means of detecting his own hazard. Consequently, it would seem that for safety two lamps, not one, would be required. This is an expensive provision, one also against which the miners would rebel as unnecessarily burdensome, especially in non-gaseous or slightly gaseous mines.

We would do well to go easily, for it has been found that in parts of mines where the air was likely to be

non-explosive and there was no way of ascertaining the presence of gas, or men did not know how to prove it whether from ignorance or defective eyesight they became careless and lighted cigarettes. With only the electric lamp available it is quite probable that smoking would be common in moderately gaseous mines. If a mine is going to accept the electric lamp it should not fail to accept also all those precautions as to inspection of places and persons which are common in flame safety lamp mines. Safety from gas explosions will not be afforded by the mere introduction of the electric cap lamp. It may in fact assist in increasing the hazard by delaying the gas explosion long enough for an extremely dangerous quantity of gas to accumulate, or by the absence of trifling ignitions it might create a sense of security that would result in the performance of many foolish acts.

All this does not mean that electric cap lamps in a well ventilated mine would not prevent many haulage accidents if supplied to couplers and switch throwers on intake airways where the percentage of gas should be low and where the advantage of a good and inextinguishable light is obvious.

Relying on Repair-Shop Mechanics

ABOUT THE COAL mines the mechanical engineer and in fact the entire mechanical department is frequently regarded more as a necessary evil than as an essential part of the organization. As a matter of fact, in most instances, although the mechanical men produce no tonnage yet without them those in the mining department would soon find themselves in a sorry plight. Without the mechanical department in some form or other no power would be generated, no cars built, no locomotives kept in repair, and no picks, cutter bits or drills would be sharpened.

With increasing mechanization of the mines the mechanical department—and this is here intended to include also the electrical department—becomes ever more important. In the day when all coal was produced by hand methods and when the motive power for its transportation consisted solely of a few mules the mechanical department comprised only a blacksmith and possibly his helper. Times have changed, however, and with our mines electrically operated throughout, as are many if not most of them today, the blacksmith, be he ever so brawny, intelligent, skillful and industrious, is utterly inlapable of caring for and keeping in repair the vast number of mechanical devices with which the mines are equipped.

To attempt to lower mining costs by a policy of stringent economy bordering on parsimony in the equipment and maintenance of mine shops and power plants is short-sighted and eventually will defeat the very end it is designed to foster. True, some men may for a time make up in ingenuity and skill what they lack in the shape of tools and appliances. As a general rule, however, men will do poor enough work with the best of tools and what may they be expected to do with those that are inferior, antiquated or obsolete? It is noticeable that the low-cost mines of today—the only ones that are operating with a fair degree of continuity—are almost without exception provided with modernly equipped shops, containing up-to-date forging and machine tools, as well as in many cases a foundry. And in the end it is the shop that provides the sinews of operation to the mining force by which the coal is actually produced.

In an old legend we are told that after King Solomon had completed his famous temple he gave a feast to those who had aided in its building, reserving a place beside his own for him who had aided most in the construction. When the curtains were pulled back from the throne behold a blacksmith was placidly ensconced in the seat of honor.

"By what right," demanded the king, "do you occupy that seat? What have *you* done toward building the temple?"

"Sovereign master," was the reply, "I have every right to this seat. It was I who forged the tools without which even your master builder would have been helpless."

And the wise old king, famed throughout the known world for his marvelous sagacity, promptly admitted the justice of the man's contention.

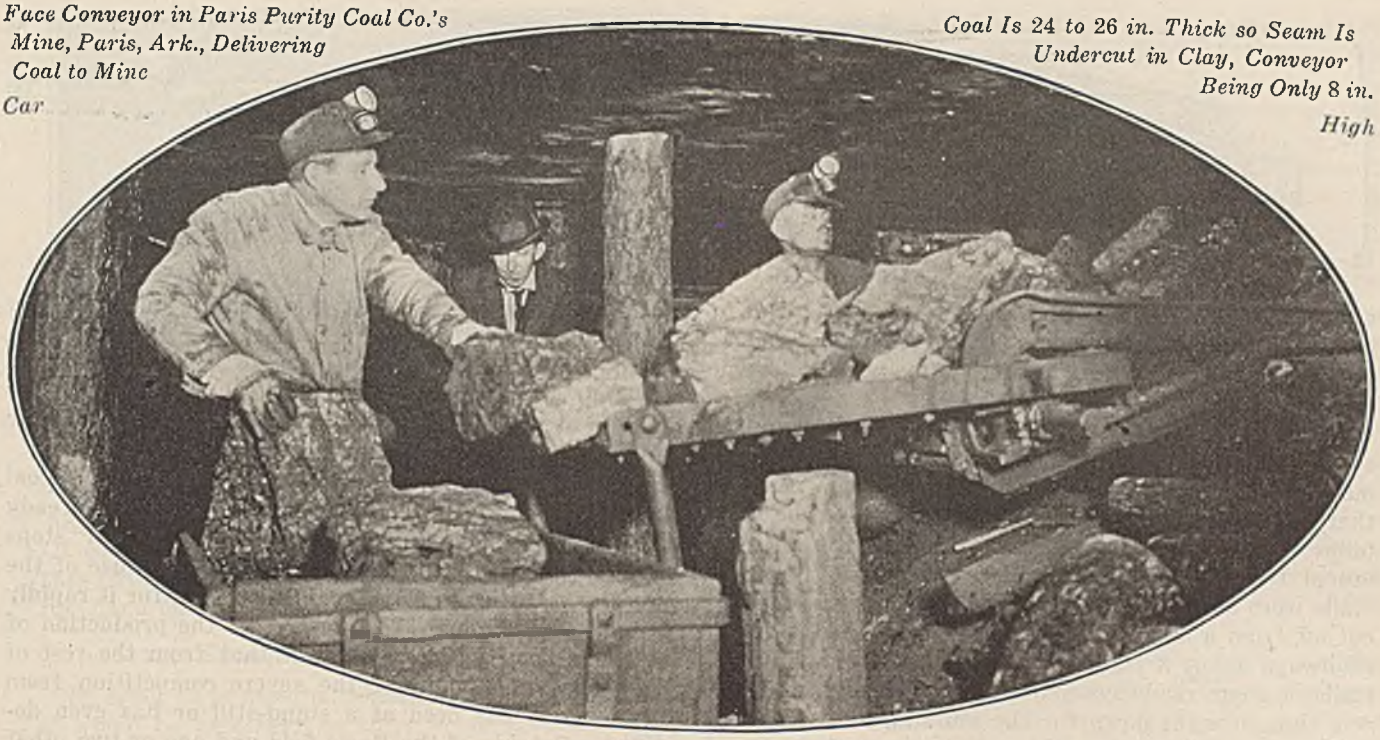
If the "mechanical department," in this legend represented solely by a blacksmith, was of such paramount importance to a constructive enterprise thirty or more centuries ago when hand tools and hand tools only were utilized, how much more important is it at our mines today where a vast array of more or less complicated power-generating and power-consuming equipment ranging all the way from mighty turbines to diminutive shothole drills must be kept in repair and ready for instant service if coal is to be produced regularly and profitably?

The Cleveland Meeting

NO MATTER WHO may attend the proposed conference of operators at Cleveland this week and no matter what the conductors of the conference may propose as a remedy for the present unhappy situation of union fields under the Jacksonville agreement, one development at the meeting can be counted on. The operators of the Central Competitive Field will hold widely divergent views. As always, the interests of Ohio and western Pennsylvania vary from those of Illinois and Indiana and if representatives from all four states are present—a thing which appears doubtful as this is written—it is not to be expected that agreement upon any course of action can be effected.

The desperation of union coal operators who have tried to live up to the Jacksonville agreement is so keen that a meeting such as has been arranged for at Cleveland by the Ohio coal operators is a perfectly natural development. The meeting held a month ago in Pittsburgh arose from the same cause. It got nowhere. Is it to be expected that this week's conference can do better? The chances are against it. If violation of contract is proposed as the only way out of the situation, the coal operators of the country will have weakened their position markedly, both now and for the future. It is to be hoped that such a proposal will not be made.

Unified adherence to the contract would be an admirable course for union operators to take. It would convince every union miner that he must accept less pay and changes in working conditions—or his union will collapse, and that, soon. But can the coal operators be unified? That is the test. The lake season will open soon. Ohio and Pennsylvania operators who supply this coal naturally are under the severest pressure just now. Can they withstand it? The Cleveland meeting may tell.



Face Conveyor in Paris Purity Coal Co.'s Mine, Paris, Ark., Delivering Coal to Mine Car

Coal Is 24 to 26 in. Thick so Seam Is Undercut in Clay, Conveyor Being Only 8 in. High

Longwall Conveyors in the Paris Coal Field

Room-and-Pillar Operation Unprofitable—Longwall Decreases Percentage of Slack—No Suitable Face Conveyor Available So One Was Designed—Difficulties of Roof Control Largely Surmounted

By H. Denman
Consulting Mining Engineer,
Clarksville, Ark.

AT THE MINE of the Paris Purity Coal Co. the seam is undercut in the clay along a longwall face; the coal falls *en masse*, is broken by sledges and wedges, picked up by hand, dropped on a conveyor and carried by that means to a roadway where it is dumped into mine cars.

In order to understand the need for face conveyors in the Paris coal field of Arkansas and the reason for installing them, a short description of the conditions existing there will be necessary as well as a brief history of the vicissitudes and development of the region.

The Paris coal field is located in Logan County, Arkansas, near the town of Paris, on a branch of the Missouri Pacific R.R. It consists of a small basin of elliptical shape about 2½ miles wide, and 7 miles long. In the center of the basin the coal lies about 200 to 250 ft. below the general surface. Near this point, however, two mountains rise to a height of about 1,000 ft. above the average level of the surrounding country. No mines have operated under these mountains nor is it likely that they will for many years to come.

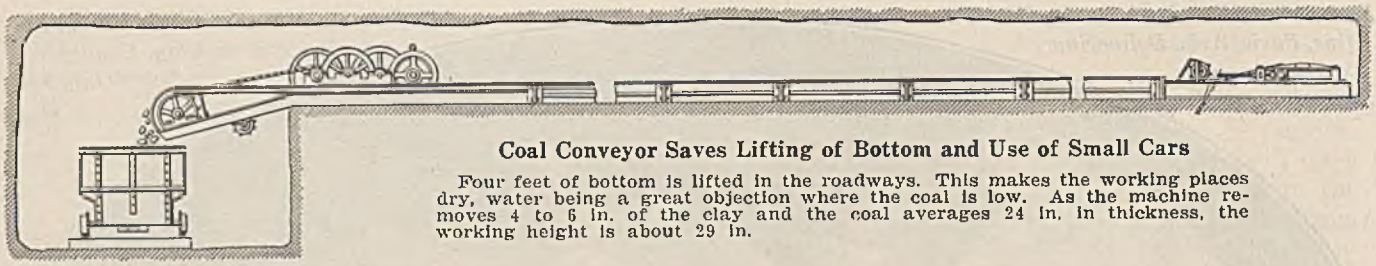
The coal in this basin is from 18 to 32 in. thick, the greater portion being about 24 in. thick. The coal itself is a rather hard semi-bituminous smokeless variety of excellent quality and especially adopted for domestic use. The bed proper is clean without partings. The bottom under the coal is fairly soft to a depth of from 4 to 6 in., but below this is a hard stratum difficult to cut. The roof is a firm sandy slate. In some parts of the field this roof is somewhat broken by slips.

This coal bed pitches from the outcrop toward the center of the basin on all sides. Along the outcrop the pitch is approximately 5 deg., but about 1,000 ft. from this point the inclination generally flattens out to from 2 to 3 deg. until the axis of the basin is reached.

AN OLD FIELD THAT SELDOM MADE A PROFIT

This coal field has been worked for at least forty years, it being one of the first in the state to be operated. Although there was always a good demand for the product for domestic purposes, because of the high cost of mining the field was a complete failure up to about the year 1915 or 1916. From the time this field was opened up until shortly before the war it was worked on the room-and-pillar system, practically all the coal being shot from the solid. This method of mining produced about 50 per cent of slack. At times the price of this fine coal was extremely low, which necessitated putting a high price on the lump. This coal is sold in competition with other smokeless grades from Arkansas, mined from much thicker beds and although its quality is superior, the price of the lump produced could not be maintained at a level sufficiently high to make any profit on the operation of the mines. Furthermore the output from the Paris field was small, and there was no incentive to develop new operations.

Prior to the world war several attempts were made



Coal Conveyor Saves Lifting of Bottom and Use of Small Cars

Four feet of bottom is lifted in the roadways. This makes the working places dry, water being a great objection where the coal is low. As the machine removes 4 to 6 in. of the clay and the coal averages 24 in. in thickness, the working height is about 29 in.

to undercut this coal with punchers, but the use of these machines was discontinued, presumably because coal could not be produced successfully with that type of equipment.

Later, Judge Hall, a resident of Paris, who operated a shaft near that town, introduced a longwall mining machine that cut in the clay below the coal. Shortly thereafter he changed his mine from the room-and-pillar to the longwall system of mining, using an individual roadway layout in which the branch roads or stalls were driven on about 50 ft. centers with the stalls cut off from a main road every 150 ft. Over the main roadways about 3 ft. of roof was brushed and in the stalls or room roadways about 20 in. Enough material was thus brought down for the building of pack walls. This system of mining did not decrease the cost of producing coal, figured on a mine-run basis, but it did increase the proportion of lump from 50 to above 90 per cent. The coal was not shot, being broken down by the roof pressure.

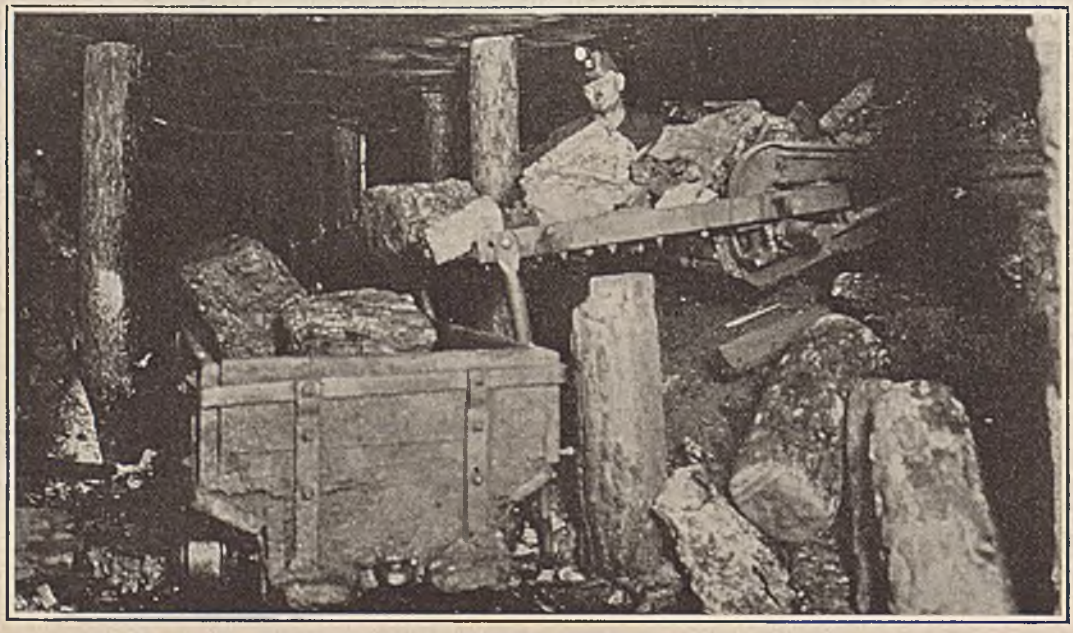
At the present time some of the mines make as much as 97 per cent and few make less than 90 per cent of lump. At some operations the coal is not screened at all but is dumped directly into the railroad cars and the entire output sold as lump. The miners are paid for the coal loaded on a "hand-picked" basis, but in practice the coal is largely loaded as mine run, little of it being left in the ground.

Dirt and Slack Is Left Underground

By the "hand-picked" basis I do not mean that the coal is undermined with picks, as this is not the case, but this term is used in this section of the country, and in the union contract to designate coal that is loaded by hand without the use of a shovel. The dirt, slack, and small coal is thus left in the mine and only the lumps loaded out. Although there was no reduction in the cost of mining, the increase in the percentage of lump above mentioned enabled the Paris mines to operate at a profit whenever a reasonable price and fair running time could be obtained.

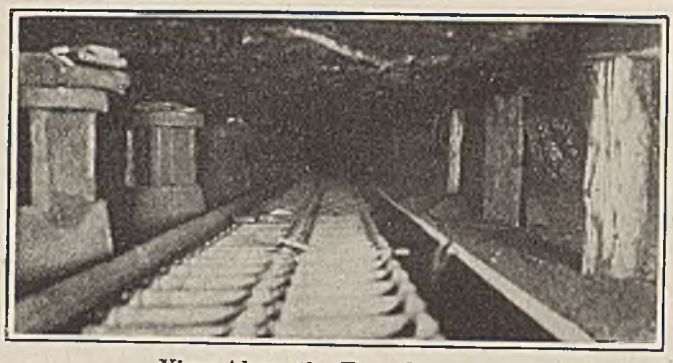
Thus began the real development of the Paris coal field. Many new mines were opened, and those already in operation added machinery and took other steps necessary to increase their production. Because of the superior qualities of Paris coal the market for it rapidly extended. Within the last few years the production of this field has been tripled, while that from the rest of Arkansas, on account of the severe competition from oil and gas, has been at a stand-still or has even declined. Outside of the Paris field and one or two other small areas, the majority of the mines in the state of Arkansas have been closed or have run only occasionally for about three years.

In the Fall of 1922 I and R. G. Johnson took a lease on two old mines close to the town of Paris. The property was underlaid with excellent coal, but, as the mines had been worked in a haphazard way for many years and were rather extensive, the cost of producing coal from them was high. After leasing these mines we organized the Paris Purity Coal Co. which undertook the operation of the mines. After one season's work we saw that some improvement must be made in production methods if these mines were to be worked in competition with newer ones along the outcrop where the coal was much easier to cut, where far less water had to be handled and where roadways were shorter and less expensive to maintain. Our coal in these mines is 24 to 26 in. thick and the bed in the part of the mine now being operated pitches about 2 to 3 deg.



Big Coal, Better Returns

Mine cars are higher than conveyors, and consequently in low coal it is necessary to break the lumps down to load them into cars even when top or bottom is taken, whereas with conveyors the coal need not be broken even when the roof and bottom are undisturbed. Furthermore, lumps can be handled with relative ease into a conveyor. With a car they can be lifted only with danger and strain.



View Along the Face Conveyor

The supports on the left aid in keeping the longwall face open. It is easy to load big lumps on such a conveyor.

Under the ordinary longwall system with individual roadways and the coal undercut by machine, the average output per loader per day was slightly over 3 tons. Of course, there were many loaders that far exceeded this figure but the average production of all men loading hand-picked coal was not much over this quantity.

LITTLE DEVELOPMENT WORK AN ESSENTIAL

In order to better the mining conditions we saw that it would be necessary to adopt some system of operation that did not require so much development work and in which the output per man could be increased. After studying the matter carefully for some time we concluded that only a system of mining employing face conveyors would prove adequate. At first we carefully considered all systems of conveyors adapted to our conditions. Our first idea was to lay out two walls, each about 275 ft. long with a conveyor along each, these to serve as wing conveyors discharging to a 300-ft. machine that would load into the mine cars on the entry. As the use of conveyors was somewhat of an experiment, we decided that this system entailed too large an investment, so we adopted the system that we are still using, as shown in the accompanying drawing.

In order to use this system it was necessary to lift 4 ft. of bottom in the roadways. Prior to this time no one had ever attempted lifting bottom in roadways to anything like this depth and we were uncertain whether it was practicable to lift so much material. However, after starting this system we found that it was not much more difficult to lift 4 ft. of bottom than to brush that much roof. Taking up bottom in the roadways had the additional advantage of making the wall perfectly dry. Prior to starting this system, the coal at the face along the wall was always wet, several places actually standing in water. In a bed only 2 ft. thick a little water lying at the face of the coal will give the loader a mighty disagreeable working place.

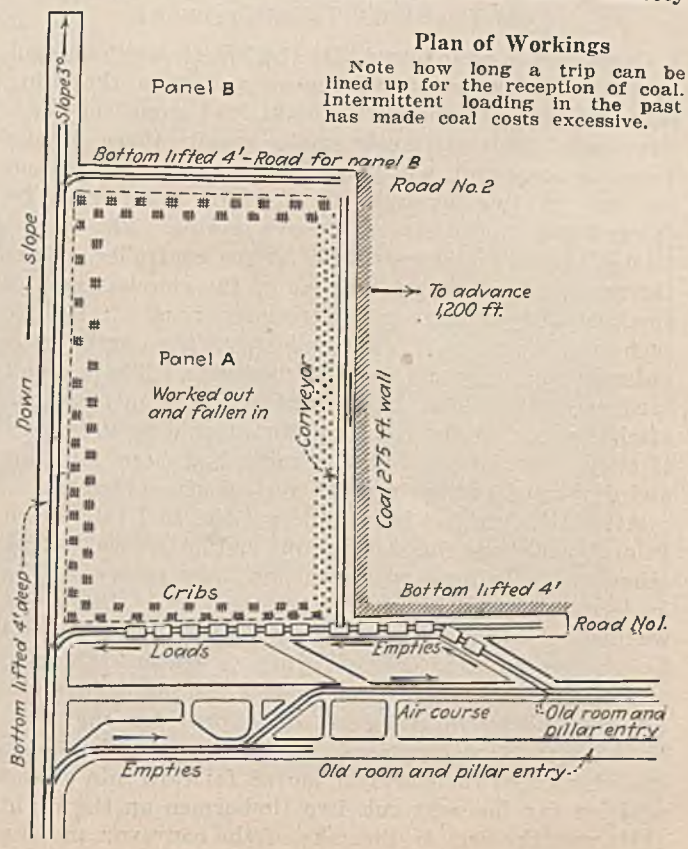
After determining on the system of mining to be adopted the next question was to decide on a conveyor. We had already come to the conclusion that we could not use one that was over 8 in. high. As already stated the thickness of the bed of coal averages 4 in. and the machine cuts from 4 to 6 in. in the bottom, making an average height of about 29 inches.

The most important consideration in this field is to get as great a percentage of large lumps as possible. In arriving at the maximum height of the conveyor we took into consideration the size of the lumps usually obtained in loading by hand direct to mine cars. We found that if the overall height of the conveyor exceeded about 8 in. it would be necessary to break many of the larger chunks, making a much smaller average product which would be a decided drawback as it would decrease the value of the output.

Several large companies making this type of equipment were asked to supply a longwall conveyor as low as we wanted but none of them had any such equipment to offer. In addition to this most such machines dragged the coal along the bottom of a trough which tended to cause deterioration of the product. After much correspondence we finally decided that it would be necessary to design a conveyor ot our own. We accordingly secured the services of Clarence Claghorn, consulting engineer of Baltimore, Md. Mr. Claghorn designed a longwall conveyor for us incorporating our ideas as well as some of his own. The result was a machine that carried the coal and did not drag it; one the over-all height of which was 7 in. It had a capacity of about 60 tons per hour, with a speed of 50 ft. per minute. The chain itself consists of two strands, each about 9¾ in. wide with a pitch of 5 in. The conveyor is driven by a 15-hp. alternating-current motor through triple-reduction gears.

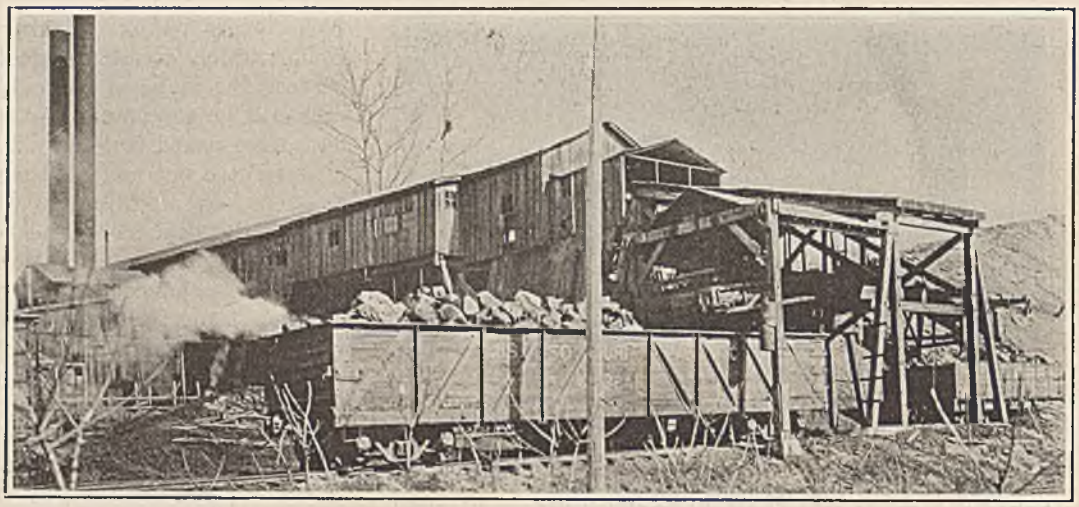
As the coal is all loaded onto this conveyor in chunks it is carried along with little of it touching the pan at all. It is thus transported along the face and loaded into mine cars on the entry. The accompanying drawing shows the general arrangement. Application has been made for patent rights covering this machine, and the sole manufacturer at the present time is the United Iron Works of Kansas City, Mo.

In starting a system of mining of this kind, the principal anxiety of most mining men is whether the roof can be controlled without building heavy pack walls. We did not worry much on this score, as a neighboring mine working under similar conditions had been using longwall advancing, employing face track, with the roadways about 300 ft. apart. This scheme had worked out successfully, and we consequently had little anxiety



Plan of Workings

Note how long a trip can be lined up for the reception of coal. Intermittent loading in the past has made coal costs excessive.



Tipple and Loading Boom

Observe the size of coal in the railroad cars. At present some of the mines in the Paris district are making as much as 97 per cent of lump coal and few make less than 90 per cent.

concerning roof control. However, since starting our conveyor we have found that control of the roof is a serious matter and that it requires constant watchfulness to keep ahead of roof breaks. We discovered also that with the face track system used in the near-by mine, 200 to 300 ft. of wall was not infrequently lost. With equipment as costly as face conveyors the loss of a wall with the face conveyor in it would be extremely expensive.

As may be seen from an inspection of the plan the wall is advanced into the solid coal with no attempt made to support the roof in the rear of the conveyor, except along the roadways where the roof is sustained with heavy wooden cribs. In the past the roof along the wall has been maintained by means of cribs and heavy timber posts. Concrete posts also have been used experimentally with much success. This system of mining has been in use for about a year and we feel we are beginning to overcome the difficulties encountered, so that the plan as a whole is successful.

Cars Too Small To Be Efficient

Operation is as follows: On the 275-ft. wall one man operates the conveyor, two move and trim the mine cars and seven or sometimes eight load along the face. Because of their extremely small capacity three chunks from the conveyor will sometimes entirely fill a mine car and on this account this machine often must be stopped and started several times a minute. This necessitates a man being constantly at the controller. Furthermore on account of the size of the chunks and the small capacity of the car the trimmers must often shift each chunk quickly after it falls from the conveyor in order to make ready for the next one. These small cars necessitate the employment of more men at the discharge end of the conveyor than would be necessary if they were larger, but the mine had been laid out and developed for the present system of operation.

After the face has been undercut the coal falls down in practically one chunk from one end of the wall to the other, there being few cracks and slips present. The loaders must first break into this coal with sledge and wedges. All the coal is broken out in this manner and loaded directly onto the conveyor. Seven or eight men can break out the coal, load out a cut and move the conveyor ahead in one 8-hr. shift, provided there are no abnormal interruptions. After the coal has been loaded out and the conveyor moved forward into proper position for the next cut, two timbermen on the night shift post the roof in the rear of the conveyor, moving props, building cribs, and doing other work. In the same shift three men cut the coal, two men operating the mining machine and one loading back the clay cuttings all of which must be thrown over the conveyor and into the gob.

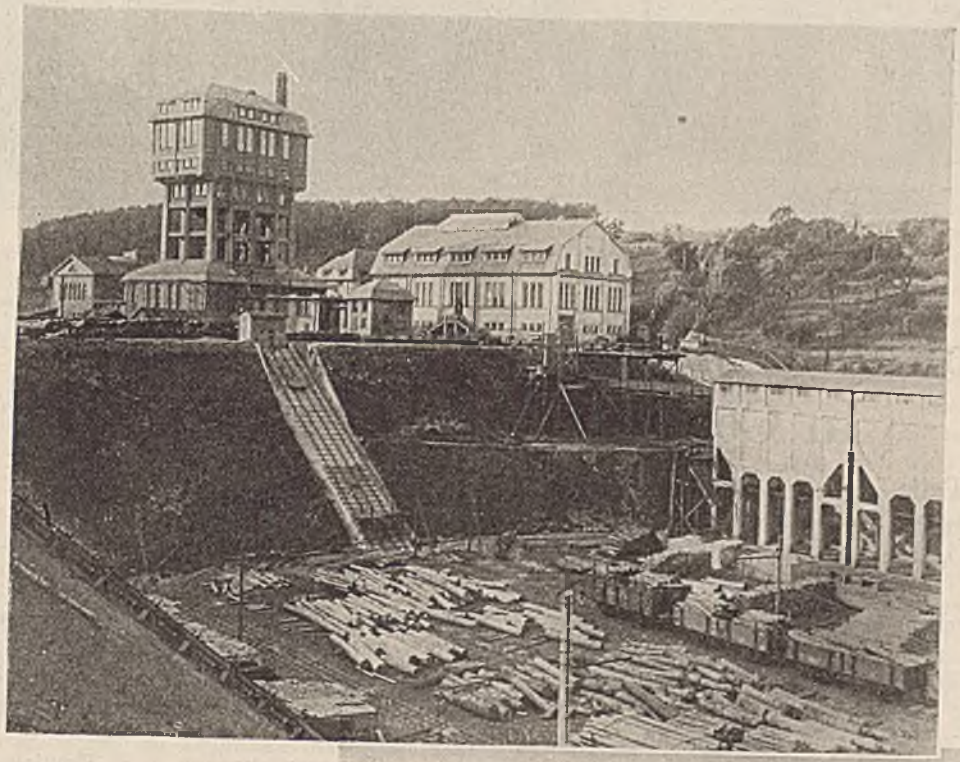
Cutting in the part of the mine now being worked is extremely hard. At times the machine bits must be changed every 10 to 12 ft. of advance but at others a machine will cut 75 ft. without any change. The machine used is a Sullivan CE-9 longwall undercutter. When nothing interferes with the normal cycle of operation a 5-ft. cut is loaded out each day. Such a cut on this wall yields about 90 tons of coal, the machine having a 5½-ft. cutterbar. At first one only 4 ft. long was used, but it was found that the output per day was too small considering the investment, and it was decided that the success of this plan of operation depended on getting a larger output per shift. After some experimenting it was determined that it was not much harder to cut the coal with a 5½-ft. cutterbar than with one 4½ ft. long, and that it made no difference in the roof control. It was also discovered that the coal broke off and came down much better when using the long cutterbar than when using the short one.

Roof Control Determines Success

The success of this mining system depends entirely on the control of the roof. From the experience thus far gained we feel sure that we can overcome the difficulties encountered. About 130 ft. of cover overlies the coal at the point where it is being mined. The overburden contains some extremely hard layers of sandstone and sandy slate, which break all the way to the surface.

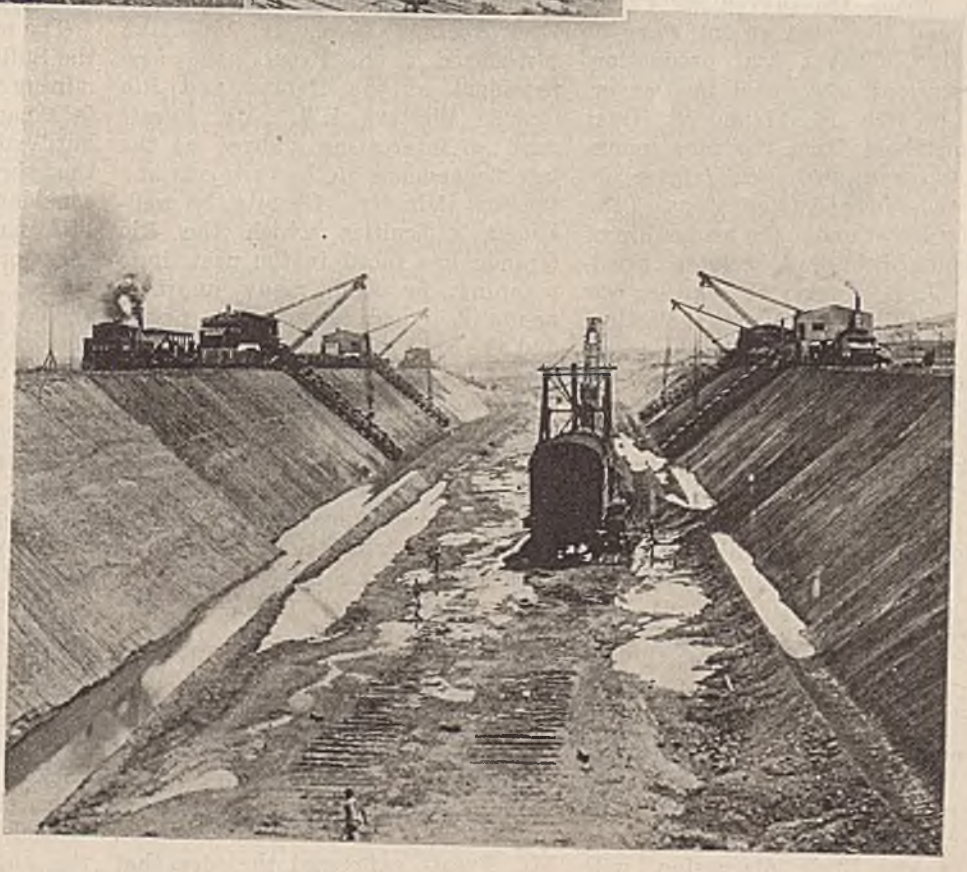
When operation was first started the main idea was to support the roof in the same way as in the ordinary system of longwall mining followed in the Paris coal field. After operating a short time, however, we have come to the conclusion that it will be highly desirable to devise some system of support along the wall that will break the roof. We have attained some success in doing this and are now experimenting with a form of roof support, which we believe will solve this difficulty and get away from some of the troubles we have had in the past. The great advantage of this system of mining lies in the concentration of the work, the small amount of development required to get a reasonable output and the fact that the entire operation is under the control of the management and therefore is easy to supervise.

Both Europe and Asia Have Mines with the Most Modern and Permanent Equipment That Their Ingenuity and Experience Can Devise



This plant with its interesting headframe and power house is located in an old coal field near Pécs in Hungary, known to the Germans as Steinamanger. It is on the border of Austria.

Photograph by Ewing Galloway



And this is a stripping at Fushun, Manchuria, operated by the South Manchuria Ry, a Japanese concern. The land dredges load the earth from the slopes into railroad cars and thus uncover the coal.

Rocky Mountain Coal Mining Institute, 20th Meeting Feb. 16, 17 and 18, 1925, Denver, Colo.

Rocky Mountain Men Develop New Ideas In Coal Mining

D. A. Stout Tells Institute How He Gets 15 Tons per Man by Novel V-Block System—Scraper Chute Loading in Wyoming Works Well—Rock Dust Is Criticised—Utah Men Protest Too Rigid Safety Code

WITH PAPERS and energetic discussions the twentieth regular meeting of the Rocky Mountain Coal Mining Institute canvassed the latest means for preventing explosions and the most recent ways of obtaining efficient coal production. The sessions were held in Denver, Colo., on Feb. 16, 17 and 18. Over 150 members from the four mountain states studied their joint problems and renewed friendships at the Albany Hotel under the leadership of William Littlejohn, retiring president. J. B. Marks, of Denver, was made president in the annual election.

Much of the interest at the meeting centered on rock dusting, and the complaints which Utah operators make against the drastic state safety provisions which were adopted after the Castlegate explosion of March, 1924. Some most constructive suggestions about new mining methods that increase output and reduce cost were developed by D. A. Stout, head of the coal operations of the Colorado Fuel & Iron Co. where production has been raised in one mine to 15 tons per man. Kemmerer Coal Co. men made a real contribution of this kind by describing their new scraper and chute system at Kemmerer, Wyo. A program of many papers and lively discussion, with good times sandwiched in between, made the three days' session both helpful and entertaining.

Following registration and the approval of the minutes of the previous summer session of the Institute at Rock Springs, Wyo., Mr. Littlejohn introduced J. S. Pyeatt, the new president of the Denver and Rio Grande Western R.R. Mr. Pyeatt gave an interesting address on the interdependence of the railroads and the coal industry. Despite the well-known difficulties which the Rio Grande has faced in the past, it is planning, he said, many improvements designed to give the public and the coal industry the maximum service possible. Ten of the largest narrow-gage locomotives in the United States have been ordered. Little could reasonably be expected in the way of coal freight-rate reduction as the advance in this rate as well as in certain other rates did not compare with the increase in labor and material costs since 1914.

Utah's Production Increases

Analysis by Mr. Pyeatt of coal-production figures in Colorado, Wyoming and New Mexico showed production about the same as ten years previous while the production of Utah had risen 25 to 30 per cent. Mr. Pyeatt expressed the idea that probably the depression in the metal-mining industry was a possible reason for the failure of these states to keep pace with the increased coal production in other parts of the country.

The next speaker, J. H. Emrick, of the Sullivan Machinery Co., brought mining efficiency to the foreground in a paper on the much abused but hard-working cutter bit. He said that three principal points are to be considered in the handling of cutter bits, namely, the kind of steel, the form or shape of bit, and the tempering of the metal. Cheap steel should not be used for, if it is, the cost of replacements and repairs will exceed the saving in original cost.

Generally alloy steel is not good as it is too brittle. A steel containing 0.70 per cent carbon and from 0.25 to 0.35 per cent manganese is the best for most purposes. Harder steels work well on coals with little impurity but not when sulphur balls or shale bands have to be cut.

The shape of the bits is also important and should be varied to some extent with the kind of coal. The pick- and the chisel-point bits are considered the most satisfactory. A back slope angle of about 30 deg. gives the best results except in extremely hard cutting, in which case the angle should be smaller. The side-slope angle for chisel-point bits

should be about 7 deg. and for pick-point bits about 16 deg.

The steel should be tempered to a hardness depending on the character of the seam. Formerly there were only a few machines used in any one mine, and the blacksmith gave bits careful attention but now there are so many that such attention is impossible. Bits should not be immersed in water and allowed to cool there but tempered gradually; a little practice will give the blacksmith an idea of the tempering required for the particular coal. Mr. Emrich said that bits are properly tempered if when they come out of the mine half of them are bent and half broken.

Correct Bits Save Power

Questions by George B. Pryde and Mr. Littlejohn elicited the information that bits properly shaped save 20 to 25 per cent of the power consumption, that properly tempered bits last more than twice as long as poorly tempered ones, and that one advantage of a bevel over a chisel point is that there is more material back of the cutting edge.

One of the most interesting papers presented at the meeting was that of D. A. Stout, of the Colorado Fuel and Iron Co.'s fuel department, on "Experiments in Mining Methods." This paper dealing with recent innovations in mining methods by the Colorado Fuel and Iron Co. will be printed in a forthcoming issue of *Coal Age*. These mining methods apparently have great possibilities in that they bring the workmen into groups, raise the tonnage per man, increase efficiency, improve supervision, and lower costs.

A "V" system in one section of the Berwind mine has resulted, despite some roof difficulties, in ten cars or 15 tons of coal being produced per man in an eight-hour shift, rapid and complete coal extraction, low powder consumption, high percentage of prop recovery, and favorable cost.

At the Kebler mine, working a seam having a pitch up to 40 per cent, a system of long- or slant-face rooms is being tried. Rooms are gradually widened as they approach their limit until they meet. They are driven in a series of four or five with the next room omitted to avoid squeezes. Increased lump and 11½ tons production per man with concentration of work and increased safety to workers have resulted.

At the Cameron mine a block system permitting seven men to work on a 125-ft. face has resulted similarly in an increased lump percentage and a larger output per man.

Discussion by Gomer, Reese and Glenn Knox, of the Kemmerer Coal Co., developed that the company is experimenting with a conveyor and a drag scraper in pillars of rooms driven up a pitch of 18 to 20 deg. A slant face is worked giving one side of a "V." The scraper pulls coal down to the conveyor, both being moved by a 6½-hp. hoist. With three conveyors twenty-four men can obtain 250 to 300 tons of coal per day from two pillars in a 9-ft. coal bed.

Cushioned Shooting Upheld

H. Petersen of the Hercules Powder Co., in a paper on the use of permissibles, upheld cushioned shooting despite recent articles by other explosive experts discounting its advantages. Properly cushioned shooting, he said, had in tests in Utah mines resulted in a better grade of coal with less powder. Permissible powder in cushioned shooting should not be tamped when rock dust stemming is used. Two feet of untamped rock dust cartridges should follow the powder and the remainder of hole should be tamped tightly.

Seventy-five per cent of all shots in mines are, in Mr. Petersen's opinion, overloaded. Some use three sticks of powder where two and one-half would be sufficient on the basis that the half stick is likely to be wasted, but the operator could better afford to lose the half stick than to charge it in the hole with resulting shattering of coal.

In 6 ft. of clean coal the center hole should not be lower than 12 in. from the roof, and the two rib shots 16 in. from the ribs and at same distance from the roof as the center holes; all holes should be as nearly horizontal as possible; a 6-ft. cutter-bar should be used and the holes should extend to within about 6 in. of the depth of cutting.

Remove All Bug Dust

Safety requires the removal of all bug dust from the kerf cut in the coal, its non-removal resulting essentially in solid shooting, particularly when water is used on the cutter-bar, for water packs the bug dust, making its removal more difficult. Delay detonators are now being used to advantage and in a given mine a standard system of holes can be worked out with increased lump production. He held that for maximum lump production no undercut should exceed 7 ft.

In discussion, Mr. Pryde, of the Union Pacific Coal Co., announced his 100-per cent advocacy of permissible powder because it increased safety. Formerly he was opposed to it. In the Union Pacific mines no decrease in lump production was ap-

parent where permissibles were used nor was there increased cost. In most instances when permissible powder is first introduced into a mine, the slack percentage increases due to the inexperience of miners in the use and charging of the explosive. This, he admitted, but declared the difficulty could be overcome.

P. M. Mosier, of the Victor-American Fuel Co., discussed some air-cushioning tests he had made with permissible powder in 3½ ft. coal and declared that for good lump production the diameter of the cartridge should be considerably less than the diameter of the drill hole.

Mining troubles were forgotten at the Monday evening banquet presided over by Pliny F. Sharp. President Pyeatt of the D. & R. G. R.R. in "A Word of Greeting" expressed the desire of his company to serve and co-operate with the industry and was optimistic as to the future of the coal business because of the necessarily increasing oil costs. Dr. Charles A. Lory, president of the Colorado Agricultural College, in "The Need of Technical Education" stressed the advantages to industry from technically trained men and visualized future possibilities in the utilization of coal. A state experiment station to include the study of coal problems was advocated.

A series of interpretative (?) Navajo dances preceded the "Mysterious Pillar Case" in which the white-robed and masked Komical Koal Kusses paid their respects in song and jest to the Institute. Helen Maria Dawes, Governor One-Hundred-per-Cent Morley, and Hot-Mamma Ferguson as principals managed to keep the peace with difficulty and won numerous encores from the 350 guests.

Safety Methods Discussed

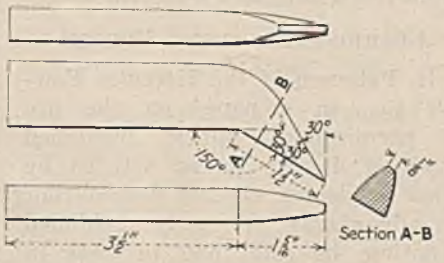
The night's entertainment and dance resulted in lagging feet on the morning of the 17th, but papers and discussion soon again wrapped the attention of the crowd.

Safety, discussed frequently but indirectly the day previous, was brought to the forefront in a paper by F. C. Miller on "Safety Methods with the Colorado Fuel and Iron Co." These included general safety committees, one from the management and one from the men, which inspect the mines three times each year and also investigate each fatal accident; a local safety committee at each mine meeting weekly with the mine superintendent as chairman; 200,000-cu.ft. capacity fan installations; extensive use of automatic doors and of ordinary doors in pairs; enlarged aircourses; analyses of mine air in the various mines from twice weekly to three times yearly, depending upon the mine, and the establishment of a limit of under 0.5 per cent methane content in air in places cut by mining machines and of 0.2 per cent surrounding pump and trolley installations.

Trolley wires are guarded at crossovers, "kickout" or automatic switches are employed, and props in rooms are set not over 4 ft. from the faces and on the same centers. Timber preservation with creosol is being practiced with good results. Steel timbers are being used to some extent in return aircourses. A check board at each inside parting enables missing men to be quickly discovered before the departure of each man trip. About 1,000,000 shots have been fired in his mines, Mr. Miller declares, without an explosive accident.

Supply Moisture to Air

The mines are thoroughly humidified by steam radiators consisting of 1-, 2- and 4-in. pipe, and exhaust steam from fans is carried into the intake aircourse by the radiators. Fine sprays placed along the entries at intervals of from 25 to 500 ft. supplement the radiators in supplying moisture to air. In the coking-coal mines water is being provided on the cutterbars of all mining machines. Safety lamps are tested in an explosive mixture of acetylene gas and air. Four permanent rescue stations are maintained in the various districts in which the mines of the company are located. Two railroad rescue cars are also kept in service, one equipped with mine-rescue apparatus and the other with fire-fighting and emergency-fan equipment. Coal-mining laws in the miner's particular language—if he is a foreigner—are supplied each man. A recent measure requires men at the face to wear goggles while using hand picks.



Standard Shapes for Cutters

Mr. Emrich explains that the side-slope angle for chisel-point bits should be about 7 deg. and for pickpoint bits about 16 deg.

O. C. Irwin of the same company demonstrated the method of "Automatic Mine-Fan Control" in use in Colorado Fuel & Iron Co.'s mines. If a fan slows down or stops, this device placed in the fan house cuts off the power to the mine and rings an alarm bell. The device consists essentially of a U tube with arms of different diameters, similar to a water gage, containing a mercury and oil bath in which a float is so arranged that a drop in pressure will open the circuit of a relay causing the mine power to be cut off and closing a circuit which rings an alarm.

Discussion by Messrs. Dalrymple, Stout, Mahn and others developed the fact that inasmuch as this device depended essentially on a water gage, changes in conditions underground such as falls blocking an entry, the short circuiting of the air through a door, etc., would not necessarily operate the device. Hence its principal use would be to warn the management in the event of fan trouble. It could be installed within a mine and would operate under any conditions affecting pressure in the split or section of the mine in which it was located. When so installed it could be adjusted so that the opening of a door monentarily for the passage of a trip would not operate the device, though if the door were kept open the mechanism would finally act.

Mr. Stout described a device in use at his Morley mine consisting of a door in a crosscut 150 ft. from the slope mouth so weighted that the stoppage of the fan would open this door and throw a knife-switch cutting the power off the mine.

Gas Causes Most Explosions

Concluding the morning session Samuel Tescher, general superintendent of the Royal Fuel Co., read a paper on "The Operation of a Gaseous Mine." He estimated that about 75 per cent of all explosions are originated by the ignition of gas. Most of the explosions start at the working faces because it is there that more of the gas is liberated, the ventilation is least adequate and the igniting agencies are most abundant. Efficient ventilation in a gaseous mine is paramout and is obtained by good ventilating equipment and large, straight aircourses with tight stoppings.

In driving aircourses an economical cross-section should be determined, and these should be increased at curves as air naturally tries to

follow a straight line. Aircourses should be kept clean. In the early development of a mine, ample provision should be made for additional aircourses. Entries should not be allowed to advance more than 60 ft. beyond the last crosscut.

Safety lamps should be well tested before taking them into a mine and should only be used for testing and when not so used should be extinguished. Mr. Tescher has developed an apparatus for testing safety lamps consisting of a large bottle with the bottom removed or of a bell jar, in which safety lamps may be inserted. In the jar is placed an explosive mixture of acetylene gas and air. Although this is a severe test, only three lamps have failed in over two years.

Mr. Tescher believes that fans should be equipped with safety devices to indicate changes in pressure. The Royal Mine is provided with two fans so arranged that one fan will automatically ventilate the entire mine if either should stop or they can each ventilate separate sections of the mine without any change in the normal course of the air except that in a so called by-pass entry. Both fans are run when the mine is working. Together they supply 206,000 cu.ft. of air. Mr. Tescher states that it is most important that gobs be kept free of gas. A mine to which he referred makes over 1,000,000 cu. ft. of methane in 24 hours, but tests show the gobs are free of gas accumulations. They should always be free because in case of interrupted ventilation, accumulations of gas in the gobs would be drawn through the mine. The fans and ventilating system in Royal Mine were described in *Coal Age*, Dec. 6, 1923.

Costs 20c. to Dust 1,000 Sq.Ft.

Mr. Tescher has designed a combination pulverizing and rock-dusting machine for use at the Royal Mine as described in *Coal Age*, Nov. 27, 1924. In rock dusting, this machine will apply about 50 lb. of dust over an area of 1,000 sq.ft. of mine surface at a cost of 20c. Only one man is required for operating this machine. It can grind and distribute about 2,500 lb. of rock dust in eight hours. It blows dust into the air current at low pressure and from any given set up, 300 to 500 ft. of room entry can be adequately dusted. The machine is handled by a mule or a rope in this mine, as no trolley or other types of locomotives are used. As strict discipline must be maintained in a gaseous mine, the men are searched every day for matches or smoking material. In conclusion, Mr. Tescher observed that "a little gas, like a little learning, is a dangerous thing."

J. B. Marks

New president of the Rocky Mountain Coal Mining Institute and assistant to the president, Colorado Fuel & Iron Co.

Suggest Reclaiming Dust

A. C. Watts of the Utah Fuel Co. suggested the possible reclamation of the rock dust obtained in cleaning up accumulations along roadways. He said that it might be separated from the coal dust on concentrating tables and used again, but the general opinion seemed to be that this was impracticable. However, the suggestion is worthy of consideration.

Mr. Brown, of the Spring Canyon Coal Co., discussed a dusting machine used at his mine in Utah. This machine requires four men for its operation and will dust 6,000 ft. of entry in six hours. The machine moves while dusting. Mr. Brown applied 3 lb. of dust per lineal ft. of entry on the first application and 2 lb. on the second. The first application was good for about six months on the main slope and entries. He stated that engineers who have seen the results of this machine have said that they did not see the need of using barriers when rock dusting was done so thoroughly. James Dalrymple, chief coal mine inspector of Colorado, said that he believed that rock-dust barriers should be put at the entrance of all abandoned entries. Mr. Brown agreed with him in this regard stating that he thought the engineers to whom he had referred meant that the live workings were so thoroughly dusted that they did not need barriers for their protection.

The first paper of the general session of Tuesday afternoon together with illustrated slides dealt with the Alamo mine and was presented by E. H. McCleary, general manager of operations of the Alamo Coal Co. This mine was described in *Coal Age*, March 27, 1924.

Following Mr. McCleary's paper, W. J. Reid, of the Lion Coal Co., gave a description of a machine being used by him for muditing his mines. A statement by John Crawford, coal mine inspector of Utah, to the Industrial Commission of that state was read by Mr. Reid to the effect that muditing used in connection with the present sprinkling system in coal mines is the missing link to systems we have had before.

This machine, which was described in *Coal Age* of Sept. 18, 1924, runs by its own power and delivers a mixture of shale and water from a spray. The spray is capable of covering a space 50 ft. wide and 30. ft. high. The coal dust is thrown into suspension by the force of the spray, and the falling mudite collects it and falls to the floor. The mudite sticks to the ribs and timbers and forms a heavy deposit on the floor, drying in about twenty-four hours. When applied to ribs and timbers all the edges are rounded, and coal dust does not remain on these rounded surfaces but falls to the floor.

Doubts Efficiency of Mudite

Much discussion followed as to the merits of muditing. Mr. Dalrymple, judging merely from the sample shown by Mr. Reid, thought that the mudite would fail to check an explosion. He said it had formed into a cake so hard that he doubted whether the advancing wave of the explosion would be able to pulverize it, at least to do it so completely that it would form a veil of rock dust and extinguish the explosion. Mr. Reid believes that the advancing wave of an explosion would break the cake up and throw it into suspension thus giving the same result as rock dust. Mr. Reid stated that other advantages of using mudite were that it can be used to seal leaky stoppings and to render brattice cloth fireproof.

W. D. Brennan, of the Phelps-Dodge Corporation, stated that he did not believe the material to which Mr. Dalrymple referred was a fair sample of the mudite in the mine.

Mr. Brennan has been guniting in his Dawson, N. M., mines and finds that the coating on the ribs and timbers has a feathery surface which can be blown into the air by one's breadth. Mr. Reid stated that this was true to a certain extent in his mines.

A paper by Eugene McAuliffe, president of the Union Pacific Coal Co., was read by Mr. Pryde. It was entitled "Reducing the Labor Turnover." Mr. McAuliffe compared the troubles of the coal-mining industry at present in regard to labor turnover to those of the railroads some years ago. He mentioned the merit and demerit system used by the railroads as possibly being a good system for the coal mines to adopt. The labor turnover constitutes a serious problem, and although the costs consequent on it have not been determined they would if calculated reach a considerable total. He believes that better conditions in the mining towns would attract a better element and hold the men at a mine.

W. D. Ryan, of the U. S. Bureau of Mines, when called upon by Mr. Littlejohn, gave an interesting talk on the necessity for preventing mine accidents. Figures were presented showing a loss to the industry in accident cost approximating $23,000,000 per year. He said there had been no appreciable reduction in mine accidents in the United States in the last eight or ten years. In December, 1924, 155 men were killed in coal mines, 114 in bituminous and 41 in anthracite mines. The accident rate per thousand men employed in the coal mines of the United States is about four times as large as in the coal mines of any European country. Mr. Ryan holds that accidents will be reduced only by the education of the miner.

Interchange of Certificates

Mr. Littlejohn advocated a change in legislation in the states of Utah and Wyoming which would permit of an interchange of mine foremanship certificates between Utah, Wyoming, Colorado and New Mexico, if the latter state at any time should require certificates (which it does not at present). Wyoming has just passed a law providing for the interchange of certificates with Colorado and Utah. Colorado for some time has had a law providing for interchange of foremen with Wyoming and Utah, but Utah has not as yet passed legislation of that character.

The morning session of Feb. 18 was opened by F. P. Wood of Wood and Weber, consulting engineers, who read a paper on "Oil Competition vs. Coal." Mr. Wood discussed the inroads which the oil industry has made on the coal industry. He asserts that the latter is too conservative and that coal men do not keep pace with the times.

Mr. Wood, however, takes an optimistic view of things and believes that if the coal industry will wake up, it can advantageously meet the competition of the oil industry. He cited a case of an oil company buying coal to burn in its refinery and said that if it is cheaper for an oil company to buy coal instead of using its own oil why shouldn't coal be cheaper for other plants that now burn oil?

Wood Advocates Publicity

Mr. Wood advocated an association of coal operators similar to the Portland Cement Co. for disseminating information to the public and making investigations as to new uses of coal, improved furnaces to increase efficiency, etc. One of the objections to using coal is that it produces smoke whereas oil should not. Mr. Wood thinks that with efficient boilers and furnaces coal smoke could largely be eliminated. Discussion brought out that the National Coal Association afforded a means of such publicity as Mr. Woods advocated.

A paper by B. W. Dyer, chief mine inspector of Utah, on "The New General Coal Mine Safety Orders of the State of Utah," read by E. H. Denny, of the Bureau of Mines, provided anticipated extended discussion and developed the fact that some Utah operators are not satisfied as to the necessity of Utah's safety provisions.

Mr. Dyer referred to the Castlegate disaster of March, 1924, which occurred in one of the best kept mines of the state as evincing two things wrong, namely, that too much was left to the discretion of the mine inspector as well as a laxity in inspection and enforcement of law.

As a result of the explosion ten orders were drafted by the state inspection department and Bureau of Mines engineers, submitted to and approved by a committee representing all Utah coal operators and issued by the Utah Industrial Commission.

These orders, briefly discussed by Mr. Dyer require: (1) Exclusive use of permissible explosives; (2) electrical blasting with all men except shotfirers out of mine; (3) approved electric cap lamps in all mines employing five or more men per shift and approved flame lamps used for testing purposes only; (4) rock dusting to points designated by state mine inspector; (5) rock-dust barriers; (6) water on mining machines and mechanical loaders; (7) sprinkling appliances in all working places; (8) daily signed reports from men sprinkling; (9) prohibition of the employment of such men on any other work with certain qualifications, and (10) prohibition of the moving of gas while a shift is in a mine and the closing down of entry and return workings therefrom until gas is removed.

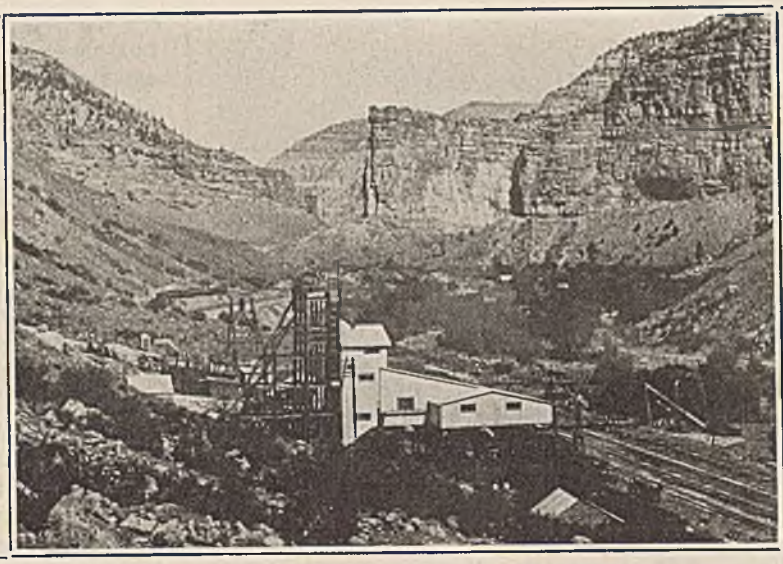
Mr. Littlejohn, with Mr. Miller in the chair, first discussed Mr. Ryan's comparison of European and American mine safety records and then the Utah law. From his own eighteen years experience in British mines he believed an international comparison between mine-accident records is unfair. Many British mines work in very thin seams—20 to 30 in.—which in numerous instances are underlaid and overlaid by fireclay. Cutting is done in clay and the coal is brought out in large blocks practically without the production of coal dust. Such mines are naturally rock dusted and have no coal-dust explosions.

The class of labor employed in the United States has much to do with our high accident record. In Great Britain coal miners are literally taught from the cradle, and usually their fathers are coal miners. They practically serve an apprenticeship under an experienced miner before working independently.

Should Educate Miner

Mr. Dalrymple, who has also had experience in British coal mines, agreed with Mr. Littlejohn and held that the solution of the problem of accident prevention lay in training the miner at the working face in the art of mining coal. L. E. Norman, state coal-mine inspector for the northern Wyoming district, also believes that miners should be educated in accident prevention and believes that in most mines there are an insufficient number of fire-bosses to examine the mine properly for gas, to say nothing of examinations of the roof and of other hazards. He believed that fire bosses in making examinations of mines should include in their inspections and reports not only the absence or presence of gas but other conditions also.

No. 3 Mine at Castlegate, Utah, Has the Most Unusual and Picturesque Setting of Any Mine



The Famous Castellated Gate Appears in Rear and the 1,500-Ton Tipple in the Foreground

In answer to Mr. Dalrymple's question as to what should be done relative to closing an entry together with all workings on the return side of a split in which gas is found until it is removed in event that this body proves so big that it cannot be moved, Mr. Littlejohn stated that this point had been overlooked by the operators' committee when the code was approved. He said that electric cap lamps do not give the wearer any warning against blackdamp.

Safety Orders Condemned

Mr. Monay, general superintendent of the Kinney Coal Co., also a member of the Utah operators' committee, in approving the safety orders, furnished some fireworks in a written discussion condemning the safety orders generally. He had acquiesced in these orders following the Castlegate explosion, because of a general demand for some action showing the operators' desire to avoid a repetition of such a disaster. He believes that greater safety will be found in letting the operators regulate their own mines in accordance with local conditions rather than through fixed rules laid down by inexperienced government bureaus.

E. H. Denny, of the Bureau of Mines, discussed certain points and raised certain questions regarding the discussions of Littlejohn and Monay. From a letter of Mr. Dyer it appeared that the rock dusting in the Rains mine had been quite limited, but he contended that the dust on the slope had reduced the damage along that roadway to a minimum as compared with that in other portions of the mine. As to the statement that the mine was no doubt adequately dusted, he ventured an opinion that it could not have been as was evidenced by the alleged violence and extent of the explosion. The only way to determine adequacy of dusting is through detailed sampling and probably the Rains mine as other Utah mines at that time beginning rock dusting had not had time or opportunity for such sampling and analysis.

With regard to the wetting of limestone dust in barriers, he agreed that limestone in the described pasty state was practically useless; but was the experience of all Utah operators the same and were all using the same limestone dust in barriers? Limestone when wet on ribs might have some of the virtues ascribed to mudite by its advocates.

Cakes on Surface

He understood that at the Old Ben mines in Illinois the shale dust in barriers became moistened on the surface resulting in a cake across the top about $\frac{1}{16}$-in. thick, the dust below this remaining dry. He thought such caking should be of assistance rather than a disadvantage in case of an explosion as the dust might continue to fall for a longer period.

Mr. Brown stated that although his company uses the same rock dust as that used by the Utah Fuel Co., the dust in barriers was still quite dry after six months in the mine. Jack Smith, safety engineer of the Union Pacific Coal Co., cited the Old Ben mines where some dust barriers have been installed for from three to four years. A cake about the thickness of a dollar covers the surface with dry dust beneath.

Mr. Littlejohn replied to questions regarding kind of dust he uses by stating that it came from one source, that he was trying adobe in the return airway and was going to try gypsum; so far the adobe had remained practically dry.

B. W. Snodgrass, of the Victor-American Fuel Co., said that he was surprised to hear of Mr. Littlejohn's difficulties with dust in barriers, as barriers containing adobe dust in the returns of one of his mines had showed no appreciable wetting although installed for a long period of time and in an atmosphere of 96 or 97 per cent humidity.

Use of Black Powder

Mr. Dalrymple stated that where maximum production of lump coal was desired he saw no reason why black powder should not be used if the mine operator wanted to risk his mine, provided that the shots were fired electrically from the surface with no one in the mine. No Colorado operator in such mines as are required to use permissible powder had as yet availed himself of this last proviso.

A resolution was adopted extending the Institute's sympathy to the relatives of the late George W. McNeil, a well-known mining engineer. Secretary Benedict Shubart announced the registration of 35 new members, 28 of them directly connected with the coal industry.

The full list of officers elected is: President, J. B. Marks, assistant to the president of the Colorado Fuel and Iron Co.; vice-president for Colorado, H. H. Bubb, of the American Smelting and Refining Co.; vice-president for Utah, W. J. Reid, of the Lion Coal Co.; vice-president for Wyoming, Gomer Reese, of the Kemmerer Coal Co.; vice-president for New Mexico, William Moorehead, Phelps-Dodge Corporation, and secretary-treasurer, Benedict Shubart.

What Makes Coal Coke?
What Spoils Coal for Coking?
Why Does Stored Coal Catch Fire?

British and American Investigators Throw New Light On These Old Problems But Much Remains to Be Learned—Woody Coal Makes Coke

What kind of coal produces coke? was the opening subject of the afternoon session, Feb. 16, of the Coal and Coke Symposium, held by the American Institute of Mining & Metallurgical Engineers at its winter meeting. Edward C. Jeffrey, professor of botany, Harvard University, Cambridge, Mass., declared that only the woody coal will coke. Reinhardt Thiessen, research chemist, U. S. Bureau of Mines, Pittsburgh, Pa., agreed that this was the experience with the coal of Illinois. The attritus would not coke.

In the Connellsville region, he added, the spores had disappeared, leaving the holes as evidence of their one-time presence. He did not say this was the reason for the excellent structure of Connellsville coke. S. W. Parr, professor of applied chemistriy, University of Illinois, Urbana, Ill., briefed the article prepared by W. Francis, junior assistant, Safety-in-Mines Research Board, England, and R. V. Wheeler, fuel technologist, University of Sheffield, Sheffield, England.

Milder Oxidents Used

"Of the methods," said these authors, "that have been used for studying the chemical composition of coal, attack by reagents has not, in general, yielded much information. Most of the reagents used have been strong oxidants such as nitric acid or Schultze's solution. The use of a milder oxidizing agent, such as air at low temperatures, enables progressive changes in the character of the coal substance to be studied and thus helps toward an understanding of its constitution."

The bright vitreous bands (vitrain), they explain, the dull hard bands (durain) and the "sooty partings" (fusain) were examined separately. Previous work had shown that clarain is intermediate in character, chemically, between vitrain and durain and so was not considered. "The method of experiment was, briefly, to draw a slow current of moist air through weighed samples (50g.) of the three ingredients (vitrain, durain and fusain) in the form of powder of such fineness that it would pass through a 60-mesh screen and be retained on one of 90-mesh. This powder was contained in glass tubes which could be maintained at a constant temperature during prolonged periods.

Examinations Once a Month

After passing through the coal the air bubbled into a measured volume of cold distilled water to condense or dissolve any gaseous products of the oxidation. Usually once a month for each temperature, this water was examined and changed, and a small fraction (5 g.) of each coal was removed from the tubes for analysis. The temperatures used in the oxidation were 100 deg., 150 deg. and 200 deg. C., and the total time allowed for oxidation at each temperature was 5 months, 6 months and 6 weeks respectively.

At 100 deg. C. the change in weight was a slight increase in all three types of coal, the vitrain gaining the most—1.74 per cent—the fusain gaining least, 0.66. This changed later to a decrease, all three eventually returning to their original weight. At 150 deg. all types of coal lost weight and regained most of it, the vitrain losing the most—8.79 per cent and the fusain the least, 3.26. But later the vitrain weight was only 0.22 per cent less than its original value. At 200 deg. C. the action was far more marked, the vitrain losing 27.0 per cent; durain, 23.5 and fusain, 19.7 per cent, but here again the loss in weight in all three materials later falling to about 7 per cent. Thus vitrain loses weight most markedly of any in the early stages of heating and oxidation both at 150 deg. and 200 deg. C.

Not only in weight did the progressive oxidation change fusain, durain and vitrain. It raised also the volatile matter in the ash-and-moisture free coal, the vitrain being little changed so long as the temperature was 100 deg. C., but when the temperature was 150 deg. C. the volatile matter rose from 30.74 per cent in the original coal to 40.5. When the temperature was 200 deg. C. the volatile matter was less, namely 39.0 per cent, decomposition having apparently set in. The fusain and durain also increased their volatile matter but more consistently, the volatile matter in fusain rising from 19.84 per cent, the original content to 31.2 per cent and that of durain from 28.91 to 37.1. There is with these two coal substances no intermediate peak.

The compounds soluble in caustic alkalies, "soluble ulmins" as they are termed, are nil in fusain, 0.01 in durain, 0.02 in vitrain and practically nothing in all three. Vitrain was powerfully affected under oxidation by air at 100 deg. C., its percentage increasing to 11.20; at 150 deg. C. the percentage jumped to 95.5 and at 200 deg. C. it had fallen back, due to decomposition, to 75.0. The ulmins increased consistently in fusain and durain reaching 22.0 per cent in fusain and 65.0 per cent in durain.

Loses Coking Quality

"Neither the durain nor the fusain," say the authors, "formed a coherent coke either before or after oxidation, and the coking properties of the vitrain were completely destroyed after two months of oxidation at 100 deg. C. The ultimate analyses show that in all three kinds of material, the quantity of total carbon steadily falls with increased temperature of oxidation, the quantity of hydrogen does the same and the quantity of oxygen steadily increases. The vitrain is an exception, it has the most oxygen when oxidized at 150 c. but the fall is quite slight thereafter. The analyses of fusain and durain gradually changed under the progressive oxidation till they approached those of vitrain, but they do not at any time reach the same figures.

"The analyses of the ulmins," say the authors, "produced from all portions of the coal in the seam from which the samples were taken were similar. This fact, together with the similarity of the analyses of the gas produced on their destructive distillation indicates that the soluble ulmins produced by oxidation of all parts of the same seam of coal have the same composition. The analyses of these ulmins averaged: Carbon 64.5 per cent; hydrogen, 2.8 per cent, and oxygen, etc., 32.7 per cent. They contained 41.5 per cent of volatile matter."

Francis and Wheeler in the close of their interesting paper recounted their experiments in the creation of soluble ulmins in coal by chemical oxidizing agents of which a solution of hydrogen peroxide is said to be simplest and quickest. Anthracites are not appreciably oxidized by hydrogen peroxide, but lower-rank coals soon become soluble in alkalies until a limiting composition is reached agreeing closely with that of the ulmins formed on atmospheric oxidation.

The upper limit of composition for ulmin compounds soluble in alkalies has been found to be about 70 per cent carbon and 4.2 per cent hydrogen, and the lower limit about 62 per cent carbon and 2.8 per cent hydrogen. Below this limit of composition the sodium salt of the ulmins could not be oxidized, but the free acid was readily decomposed, and during the decomposition the nitrogen contained in the compounds was evolved quantitatively as ammonia.

By treating coal sections with hydrogen peroxide the parts that do not become transformed to soluble ulmins can be examined.

Will Any Coal Coke?

E. C. Jeffrey in discussing the paper said that a president of the Chemical Society had stated that it was possible to make any coal coke. Dr. Parr was more cautious. All he would say was that it was possible to coke any coal on the borderland of non-coking coal.

A. C. Fieldner, in charge of the Pittsburgh station, presented an article on the "Constitution of Coal" by F. V. Tideswell and R. V. Wheeler. The authors say, "The natural ulmins, the brown amorphous products of plant decay, first attracted the attention of chemists on their extraction from the rotted wood of an elm tree (*ulmus*) by

A. C. Fieldner

Chemist of the U. S. Bureau of Mines, in charge of the Experiment Station at Pittsburgh, Pa., who presented the paper on "Constitution of Coal," by F. V. Tideswell and R. V. Wheeler.

alkaline solutions from which they were precipitated by acids as brown flocks. The solubility in alkalies and reprecipitation in an amorphous form on acidification were long used as the sole criterion of what constituted an "ulmin," but there is now considerable evidence that similar substances, insoluble in alkaline solutions, can with advantage be given the same general name. Ulmins are found in any substance derived from vegetable matter that has undergone moldering decay; for instance in soils, peats, and to a less extent lignites and coals. The ultimate composition of all such ulmins is similar, ranging from 50 to 60 per cent carbon, 4.5 to 6.0 per cent hydrogen, 0.5 to 2.0 per cent nitrogen and 30 to 40 per cent oxygen." The authors believe the dopplerite in peat and the vitrain in coal to be essentially similar. They then express themselves as believing that "vitrain is transparent and essentially free from plant structures," thus taking issue with Seyler, Thiessen and White. Mr. Fieldner said that durain, clarain and vitrain have been studied chemically at the U. S. Bureau of Mines and they have been found to have almost exactly the same composition.

Reinhardt Thiessen then presented his paper entitled "The Microscopic Constitution of Coals of Different Ranks and Ages." Mr. Thiessen said "That it requires no high pressure nor high temperature to transform mature peat into a hard coal-like substance can be demonstrated easily in a laboratory. When thoroughly matured peat is slowly dried while kept under a slight pressure, so as to bring the components in close contact and keep out the air as the water is evaporated, it will be converted into a hard coal-like substance. Any woody peat when treated with a weak alkaline solution and then left to dry slowly will also be converted into a hard coal-like substance."

In discussion Mr. Thiessen said that almost all the pyrite in coal is found in the anthraxylon or woody matter. He had found fossil wood in the Pittsburgh and in No. 6 seam of Illinois. Mr. Jeffrey said that most of the peat was laid down in open waters and not in restricted areas like those of the modern peat bog. The earlier plants, those of Paleozoic age, were not able to form resins within their cells. Those in the Mesozoic age had that ability. What were taken for resins in the earlier plants were uncollapsed tracheids and not resins.

G. S. Rice, chief mining engineer, U. S. Bureau of Mines, then presented a paper by F. S. Sinnatt, assistant director, Fuel Research Board, East Greenwich, England. This paper is entitled "Selective Combustion in Coal" and it details experiments that show that when coal is powdered and built into a small cone or a relatively long stack and combustion is started in it, the fire will extend through it turning the brownish coal black and spreading at a comparatively low temperature even as low as 130 deg. C. The oxidation, or combustion, is not complete, the most readily oxidized portions alone being affected. Later the pile or stack may be burned again. Combustion has been repeated as many as four times. This partial action on the more oxidizable portions of the pile has been designated by Mr. Sinnatt as "selective combustion."

Fineness of Fusain

Mr. Sinnatt's experiments on the combustion of fusain were made the subject of comment in *Coal Age* some time ago. The qualities of fusain seem now to be due solely to the fineness of its natural subdivision. Other coaly material, anthracite for instance, if reduced to powder will behave in a similar manner. Fusain is usually extremely fine. Mr. Sinnatt instances one coal that had only about 1.5 per cent of fusain, yet 54 per cent of the dust from a dust-collector at the mine that went through a 90-mesh screen was fusain and only 13 per cent that stayed on a 90-mesh screen, and went through

a 30-mesh screen was coal of that type.

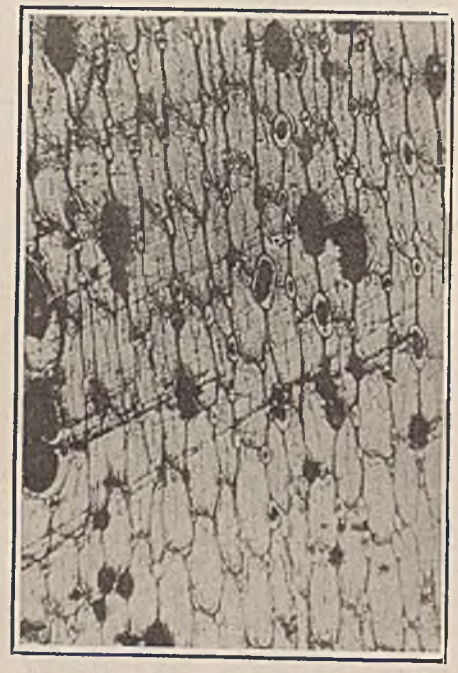
In order to make the test cones "the coal dust was allowed to fall into the funnel from an orifice placed at a constant level above it, and the excess of coal above the edge of the funnel was removed by means of a broad sharp blade. The apex of the cone was heated momentarily with a small flame. The combustion thus initiated "spread in regular zones through the mass provided the conditions mentioned later were satisfied. The color of coal when pulverized is brown not black. As combustion occurs the brown powder turns to black and this is then succeeded by rapid combustion. That the coal is burning is not always apparent as the temperature attained is only sufficient to produce a dull glow.

Zone Not Uniform

"The zone of oxidation may not spread uniformly through the heap, but may follow a well-defined path and leave the remainder of the coal nearly unaffected. The exact conditions that are favorable to the propagation of a zone of combustion in a particular region cannot be defined accurately at present, but absence of uniformity in the packing of the particles has a marked influence. It is not possible to assume that the combustion follows the path of most open packing, although experiments in which the powdered coal was placed under pressure have shown that the propagation of the combustion was then retarded or entirely prevented."

The fineness of the dust must reach a certain critical point with any given kind of coal if the combustion is to be propagated, and it has been shown by experiments with coal dust molded evenly and gently in a metal trough 5 in. long and ¼ in. wide that the speed of propagation of combustion increases with the fineness of the dust. Thus when Arley coal was ground for four hours so that its figure of fineness was 1.1684 the combustion advanced along the stack or "train" of coal a distance of 4 in. in 42½ min. When the same coal had been ground nine times as long so that its figure of fineness had reached 1.1320 the combustion spread the same distance in 24 min. However, with anthracite it was impossible to get this lateral propagation even when the finest powders were prepared for the experiment.

One would be disposed to believe that a little calcium carbonate dust or a little dust from pulverized shale would serve to prevent propagation if mixed with the coal dust, but strange to say, with pulverized shale that had passed through a 200-mesh sieve and Arley coal of a figure of fineness 1.1370, "it was found that the limiting quantity of rock dust in admixture with the coal dust that would just permit of combustion passing through the heap was 52 per cent. With a greater percentage the mixture failed to ignite, and with lower percentages oxidation proceeded regularly throughout the train of mixture." The coals Mr. Sinnatt was testing had small quantities of ankerites, containing manganese and ferrous salts. It was thought they might have a catalytic action and aid propagation, but with manganese carbonate, ferrous sulphate and with ankerites from the Arley coal no difference was observed that was not within the limits of experimental error. Calcium carbonate inhibited propagation only when 70 per cent of it was present. With platinum, platinum-rhodium thermocouples the temperatures ½ in. from the apex of a cone of ignited coal dust were observed, and it was found that with anthracite a temperature of 585 deg. C. was attained, that Arley coal rose to a temperature of 510 deg., Ravine coal to 540 deg. and Mountain Mine coal to 540 deg. There appear to be two stages of combustion as there are two maxima. Thus Arley coal recahed a temperature of 485 deg. C, then the temperature remained stationary for two minutes after which it rose to a maximum of 510 deg. C.



Cross-Section of Bright Coal

Cells are so well preserved and so little flattened that the coal suggests carbonized wood made dense by an infiltration of the products of a putrification solution. From the Forge split of the Mammoth bed, Nanticoke, Pa. This, of course, is anthracite and will not coke but it is woody matter, or anthraxylon, such as this, which in bituminous coal has the coking quality. Magnified 235 diameters. A Turner illustration.

In experiments in a combustion tube through which measured quantities of air were passed it was found that propagation took place at a very low temperature, though examination indicated that under such conditions the path of oxidation was irregular. "Taking into account," says Mr. Sinnatt, "only those experiments in which the oxidation occupied the width of the tube and passed regularly through it, 130 deg. C was indicated with both the Arley and Mountain Mine coals as the lowest temperature at which oxidation can proceed through the coal under the conditions under which these experiments were made.

Wheeler's View Upheld ...

"It is interesting that this figure lends support to the contention of Wheeler that in his series of determinations on the relative ignition temperatures of coals by observing the temperature rise of coal heated in a sand bath compared with the temperature rise in the same bath, the point of self heating should be taken as that at which the two curves cease to be parallel. A temperature of 125 deg. C. is quoted which compares closely with the temperature of 130 deg. C. noted already."

In his conclusions Mr. Sinnatt says that "pyrite appears of secondary importance" as a source it may be supposed, of spontaneous combustion and of propagation. "Seams," he says, "may contain an extremely active form of pyrite and spontaneous combustion be quite unknown; other seams in which the type of pyrite is inactive are liable to fire in the gob."

L. D. Davis said that propagation of flame in pulverized coal was not unknown. The experiments with Trent amalgam had shown that fact. He had not found the combustion was selective. A. C. Fieldner questioned whether the oxidation chose certain kinds of coal. He believed rather that it selected the finest particles and those where the air conditions favored propagation. G. S. Rice said that fusain is that part of the coal that is most subject to combustion.

News Of the Industry

Operators from Four States to Meet In Cleveland in Effort to Readjust Wages in Central Competitive Field

Chicago, Ill., March 3.—What will happen at Cleveland March 6? The eyes of the coal industry are on a conference called by A. A. Augustus, president of the Cambridge Collieries Co., Cleveland, in the hope that operators of the whole Central Competitive Field will attend to discuss what should be done about the Jacksonville contract. Western Pennsylvania and Ohio will certainly be represented actively and the Indiana Operators Association voted March 2 to send a committee to observe, principally to prevent dangerous action. Illinois up to March 3 had officially taken no action. Its opinion was dead against the conference. Ohio men active in arranging the meeting said that they expected a good representation from all four states, even though Illinois takes no official notice. They proposed no definite plan of remedying the labor situation but hoped something would be developed at the session.

Phil Penna, of Indiana, said his state does not go to Cleveland favoring any invitation to the miners for a joint conference on wages and is definitely opposed to any steps by operators that look like abrogation of the present contract. The Jacksonville contract must be modified if operators are to stay in business, but Indiana believes the initiative should come from the miners. He said of the Cleveland meeting: "We have agreed to go but we do not indorse the undertaking. We believe it is safer to go than to stay away."

Gallagher May Be Retired

The fact that Mr. Augustus signed the call for the conference instead of Michael Gallagher, chairman of the Ohio scale committee, indicates to outsiders that if a change in the Ohio scale committee is made at the coming meeting Mr. Gallagher will be retired. He is faced with much opposition in his state. A previous conference on the Jacksonville agreement was held in Pittsburgh, Pa., several weeks ago without producing any constructive result. Only one man from Illinois attended and none from Indiana.

A distinctly antagonistic attitude toward the Cleveland conference was displayed by Illinois and Indiana operators late last week when the invitations arrived. Being signed by A. A. Augustus as chairman instead of by Michael Gallagher, who has been Ohio's chairman for more than a year, the feeling west of Ohio was that the upset of the politics of coal in Ohio had put a new régime in power there and that the conference proposal was the result.

"This is no time for such a meeting," was the consensus among the leaders of Illinois and Indiana thought. "The miners are feeling the pinch as much as we are, if not more. If we can manage to hold out, the first move for a change in the contract will come from them. To hold this conference now indicates a greater weakness among operators than really exists. Ohio was largely responsible for this three-year continuance of the old wage scale. Why should she be the first to weaken?"

It was commonly reported from man to man in Illinois that Ohio and western Pennsylvania are getting ready to abrogate the contract and try to run mines on an open-shop basis at reduced wages in the hope that hungry miners will be glad to work in them. Illinois and Indiana operators feel that such a course, besides being in violation of the contract, would settle nothing and would only postpone the date of a possible definite change in the wage situation.

One Miner Dies, 125 Escape In Second Indiana Blast

A gas explosion Feb. 24 in the Standard Coal mine at Wheatland, Ind., caused the death of Ed Cross, a miner, and William Ferguson was so severely burned that he is not expected to recover. One hundred and twenty-five other miners escaped.

The explosion occurred in a room far removed from the entry and was said to have been due to gas ignited by unknown cause. The two men were the only ones there at the time. The others were near the shaft and as the machinery was not damaged had no difficulty getting out.

The mine has been in operation for about twenty years.

Frank Oliphant, of Vincennes, is president of the company and his son, Earl Oliphant, is general manager.

An explosion in Shirkie mine No. 2 at New Goshen, Ind., Feb. 25, said to have been caused by an overcharge of powder, resulted in severe injuries to Clem Wolfe, of Clinton, and Raymond Fyfe, of Terre Haute, shotfirers.

Indiana Miners Get Fill Of John L. Lewis

As J. Rex Cooper, assistant secretary-treasurer of the Coal River Collieries Co., Huntington, W. Va., was opening his morning mail Feb. 21 he came across a letter from an Indiana miner containing the following:

"Would like to know whether you are hiring any coal miners at your plant and if you can use five or six experienced miners. We do not care about it being union, as we are all full of John L. Lewis in this part of the country."

Crucible Steel Co. Said to Be In $50,000,000 Coal Deal

The Crucible Steel Co. of America is negotiating for the acquisition of extensive coal lands in Logan County, West Virginia, according to reports in the New York financial district Feb. 27. Executives of the Crucible organization intimated that some statement may be forthcoming about the middle of March, when the next meeting of the Board of Directors will be held.

The transaction is said to involve $50,000,000 and 100,000 acres owned by thirty coal companies. Twenty-two men representing the New York interests spent two days at Logan inspecting operations of thirty leading mines. Most of the mines are in the section above Rum Creek.

Private-Car Owners File Suit Against I. C. C. Ruling

Two injunction suits, said to be the first of a series, were filed Feb. 27 by three steel companies and four coal companies in the U. S. District Court at Philadelphia in an effort to prevent enforcement of an Interstate Commerce Commission order restricting the use of privately owned coal cars to the general level of the field from a percentage standpoint during periods of car shortage. The order was scheduled to go into effect March 1.

The concerns bringing the suit were the Bethlehem Steel Corporation, the Berwind-White Coal Mining Co., the New River & Pocahontas Consolidated Coal Co., the Pennsylvania Coal & Coke Co. and the Westmoreland Coal Co.

Counsel for the complainants said that other suits were expected to be brought by railways and public utilities affected by the order.

Conciliation Board Orders Inquiry Into Affairs of British Empire Steel Co.

The Board of Conciliation appointed to investigate the dispute between the Nova Scotia coal miners and the British Empire Steel Corporation has made its report to the Dominion Government. The board is unanimously of the opinion that due to the unfortunate relations for many years between the operators and their employees, as set forth in the statement of the employees submitted to the minister, and further elaborated in the statement submitted to the board, no permanent improvement in industrial relations can be expected until complete confidence is established between the operators and the employees, which may possibly be brought about by a fair and impartial inquiry by a competent authority with a view to ascertaining the actual necessary cost of mining, transporting and selling coal, the ability of the company to pay a rate of wages satisfactory to the employees and to earn a fair return on capital invested, and the bearing which the attitude and action of the employees has in relation to the efficient and profitable carrying on of the operations.

The report points out that under prevailing conditions many of the employees are unable to obtain more than meager partial employment in the winter months, entailing serious hardships, and that this deplorable state of affairs probably can be remedied by the companies being able to obtain renumerative outlets for their product when access to the markets of central Canada is cut off, by the closing of navigation, prohibitive railway freight rates, and other causes.

The employees refused in any way to meet the Board as a board, but advised it in an unsigned communication that the miners would continue work at the rates paid Jan. 15 for a period not exceeding four months from Jan. 16 on certain conditions. The corporation offered to provide all employees with a minimum of four days employment per week during the four months period, at a reduction of 10 per cent in the rate of wages, which the miners refused to accept.

E. H. Armstrong, Premier of Nova Scotia, transmitted letters on Feb. 25 to J. E. McLurg, vice-president of the British Empire Steel Corporation, and J. W MacLeod, president of district 26 of the United Mine Workers, in which he announced the intention of the government to appoint a royal commission, "at the earliest possible date," under the Public Inquiries Act, to investigate conditions in the coal mining industry and to recommend a scale of wages, to obtain for a period yet to be determined, unless in the meantime an alternative method of settling the present dispute is mutually agreed upon. Pending the findings of the commission the company is asked to continue the 1924 wage scale and both company and men are invited to give an undertaking to abide by the decisions reached. The terms of reference, it is indicated, will follow closely those set out in the Winfield Conciliation Board's report, which are quoted in the Premier's letter, as follows:

"With a view to ascertaining the actual necessary cost of mining, transporting and selling coal, the ability of the companies to pay a rate of wages satisfactory to the employees, to earn a fair return on the capital invested, and the bearing which the attitude and action of the employees have in relation to the efficient and profitable carrying on of operations."

Both company and men are invited to forward comments on the plan at once.

J. T. Dunigan

Recently elected president of the Coal River Collieries Co., Huntington, W. Va., succeeding Harry A. Leaberry, who resigned to devote his time to other business. Mr. Dunigan will continue to discharge the duties of general manager in addition to acting as president. Prior to becoming identified with the Coal River Collieries Co., Mr. Dunigan was general manager of the Harlan-Kelloka Coal Co. with operations at Evarts, Ky. He was at one time vice-president and general manager of the Black Diamond Coal Co. at Linton, Ind.

Wholesalers to Redistribute Supply of Soft Coal

A plan to relocate the distribution of bituminous coal is about to be formulated by the executive committee of the American Wholesale Coal Association, according to an announcement at the conclusion of a meeting of the committee held in New York City on Feb. 26. The plan also will include provisions to reduce the cost of distribution by the elimination of waste.

The committee did not complete its labors but will have another meeting in April at which it is hoped the report will be ready for submission to the annual convention of the association to be held at French Lick Springs, Ind., June 1 and 2.

Those present at the meeting included Harry K. Cortright, of Philadelphia, president of the association; H. J. Heywood, Toledo, vice-president; George H. W. Merriweather, Chicago, secretary; G. N. Snider, New York City; G. H. Snowden, Pittsburgh; H. P. Smith, Cleveland; Fred Legg, Cincinnati; J. W. Dykstra, Detroit; S. W. Morton, Albany; L. F. Leighton, Boston, and G. M. Dexter, New York City.

Walters Victory in Kansas Is Setback for Lewis

Matt L. Walters, of Scammon, Kan., 60 years old and the first president of District 14, United Mine Workers (Kansas), is coming back to that office after a little vacation of 30 years. The official canvass of the vote of the run-off election, completed Feb. 19, showed Mr. Walters elected by a majority of 1,100 over Joseph Variot, who several years ago was secretary-treasurer of the district. He was once a member of the Kansas Legislature. He was first president of the district union in 1892 and was re-elected in 1894. Since then Mr. Walters has been continuously engaged in mining, either as superintendent, foreman, small operator or digger. He was employed as a digger in a Western Coal & Mining Co. mine near Scammon when elected to the union presidency this time.

As Walters was an Alexander Howat candidate his election with Howat's support means a defeat in the Kansas district for the Lewis forces. Thus more trouble for the U. M. W. A. organization may be expected. Lewis barred Howat from membership for calling an unauthorized strike long ago and since has prevented Howat's reinstatement, but now Howat has his man in control, even though he himself couldn't come back.

The other principal officers for district 14 as determined by the December election and February run-off are: Dan O'Donnell, Scammon, vice president; Harry Burr, Pittsburg, secretary-treasurer; James Harvey, Frontenac, international board member; J. V. Fitzgibbon, Pittsburg, joint board member.

Conflicting Demands Presage Trouble at British Mines

That trouble cannot now be averted between the operators and the miners in the British coal fields seems certain. While the operators are asking for a longer working day or lower wages so as to be able to reduce their prices, the men are demanding higher wages and better conditions all round.

The various sectional unions have prepared their demands, which are roughly as follows: South Wales demands a minimum wage of 9s. per day, reforms in the auditing of colliery accounts, the carrying forward of deficiencies on profits accounts to be discontinued, union membership to be a condition of employment, explosives to be supplied by the management. Lancashire wants joint control in each area of selling prices and costs of production, surplus profits to be divided between operators and men in an agreed ratio. Durham wants a minimum of 12s. per day, the proceeds of the industry so divided that the ratio of wages to profits shall be 88 to 12; complete information as to expenditure on capital account and renewals; "other costs of production" not to include owners' contributions to health and unemployment insurance or to political funds, and inquiry into clerical and managerial expenses, so that "unnecessary and unreasonable payments" may be avoided.

Federal Officials Apprehensive of Political and Economic Effects of Move to Reopen Jacksonville Pact

Administration Looks Upon Agreement as Private Contract—Operators Impatient, Contending That Plea to Avoid Strike Was Tantamount to Advising Continuance of 1920 Scale

By Paul Wooton

Washington Correspondent of *Coal Age*

Washington is watching with no little apprehension the growing momentum of the movement looking to the reopening of the Jacksonville agreement. The situation is recognized as one pregnant with dangerous possibilities, both political and economical.

The position of the administration is that the Jacksonville agreement was a private contract entered into by two parties schooled in such bargaining. If the contract is unsatisfactory, its makers have full power to reopen it.

As the union operators long since have made no secret of their belief that the agreement should be revised the situation is in the hands of the union. The union, and the operators too for that matter, are very anxious that the federal government open the matter. An effort is being made to establish a moral responsibility on the part of the federal government in connection with the Jacksonville agreement.

The administration sees a distinction between its admitted action in urging the operators and miners to settle their affairs without a strike and an effort to have them accept a particular contract. Had the administration seen fit to express an opinion as to the terms of the contract at that time it probably would have warned that a continuance of the 1920 scale would be suicidal, but the feeling was that the government should leave those concerned free to negotiate without federal interference.

Cite Hoover's Report

Among the operators there is much impatience with this view. To have urged them to settle their differences without a strike was tantamount to advising them to accept a continuance of the 1920 scale, as any insistence at that time on a lower level of pay would have meant a strike. The opinion is held in some quarters that the administration cannot deny its responsibility for this particular agreement. As one evidence of this the annual report of Secretary Hoover is cited. The language used therein in citing the achievements of the department is held by some to fix responsibility.

Since the administration apparently has no idea of being drawn into a discussion of the agreement, more interest attaches to the maneuvering of the two parties to the contract. The meetings of the operators' scale committees of the four states comprising the Central Competitive Field have special significance. John L. Lewis, president of the United Mine Workers, has turned down definitely a reduction application of the operators in northern West Virginia—the place of all places that it is needed. The *United Mine Workers' Journal* still breathes defiance to those who suggest a wage cut. This still is the official attitude of the International union.

All of the speculation on how the subject is to be reopened is of minor consequence; the real difficulty will come when the conference attempts to reach a conclusion as to the new agreement. If wages are reduced only slightly; for instance, by removing the increase given the daymen in the last half of 1920, the non-union field still will have a great advantage in labor cost. If the process is carried a step further and wages are reduced to the 1919 scale the non-union operators can make a corresponding reduction and maintain their present advantage.

No Labor Shortage

A month ago the action of the independent operators in the Connellsville coke region in raising wages suggested that a shortage of labor might be developing, but this action already has been rescinded. If there is a bottom to the labor market it is not yet in sight. The potential labor supply has been increased by the migration from the union fields.

If the conference should do the inconceivable thing and agree on a big reduction of wages—to the 1917 scale or lower—it would create nothing short of chaos. The non-union operators with swollen mine capacity would be forced to cut still lower. This would arouse dangerous dissatisfaction among their men.

If union mines have been forced to close solely because they have been paying the union scale and not because they are inherently high-cost mines, then it is in the public interest that they be reopened, but a wage cut carried so far that high-cost mines could be reopened admittedly would not be best for the country as a whole, nor to the union operators nor the union men. The good effects of the Jacksonville agreement in closing the high-cost mines would be lost.

The conference should recognize, it is declared, that some of the elimination of excess mines has been a good thing. Its effort should not be to get all the union mines into operation but to take action calculated to encourage the best to run full time. Those union mines with good coal, thick veins and efficient equipment if enabled to work full time still can pay good wages, but if they have to share the available business with a lot of inefficient mines they will not be able to run full time. Their costs will be correspondingly higher and their ability to pay good wages correspondingly reduced.

To accomplish this purpose requires a change in the policy of the union. The whole theory of competitive equality which has underlain the system of negotiating wages in the Central Competitive Field should be examined. If the United Mine Workers will scrap the idea of trying to permit every mine to live and will sacrifice the high-cost mines and build up the stronger and more efficient mines they can save something out of the Jacksonville agreement.

The union could well afford to concede lower rates to those mines that could guarantee steady employment. It should remove every restricton on output, every interference with the freedom of management in all technical matters and every trace of opposition to most modern machinery, including loading devices. It might also go further and place a premium on capacity operation and long-time contracts by offering a definite reduction in wages to all mines that would undertake to give in return a definite amount of work. Such a wage contract, secure against interruption for two years, would enable union operators to go out and contract for business.

This involves a sharp change in the wage policy of the United Mine Workers. It would mean that the union would attempt to obtain steady work and steady pay only for the number of men needed by the industry, rather than getting some work and some pay for every miner. A change of policy is in order because the old policy has broken down of its own weight.

Company Anthracite Prices at New York for March, 1925

(Per Gross Tons f.o.b. Mine)

	Broken	Egg	Stove	Chestnut	Pea
Hudson Coal Co..	$8.75	$8.75	$9.25	$9.00	$6.00
Phila. & Reading.	9.15	9.15	9.40	9.40	6.00
Lehigh Valley.....	8.50	8.80	9.15	9.15	6.00
Lehigh Coal & Navigation Co..	9.25	9.25	9.50	9.25	6.00
D., L. & W.....	8.00	8.75	9.00	8.75	5.85
L. & W.-Barre....	8.00	8.75	9.00	8.75	5.50
Pattison & Bowns (Erie).....	9.00	9.00	9.25	9.25	5.50
M.A. Hanna & Co.	8.80	9.15	9.85	9.40	6.75

Steam sizes—Buckwheat No. 1, $3 @ $3.15; rice, $2 @ $2.25; barley, $1.50, and birdseye, $1.60.

Mexican Coal-Mine Plant Nearly Completed

The new mine plant of the American Smelting & Refining Co. at Rosita, Mexico, will be completed by June and will have a capacity permitting the mining of 50,000 tons of coal per month, according to President Simon Guggenheim in his annual report made public on March 2. After taking care of the requirements for coke, Mr. Guggenheim says, there will be ample coal left for the commercial field, which it is expected can be placed on board cars at a cost considerably less than at present prevails. The Rosita coal property, the reports says, has proved reserves of coal exceeding 50,000,000 tons, or more than 80 years' production if the mining plant is worked to capacity. The company put into operation in December of last year a coke plant with a capacity of 19,000 tons per month.

Pinchot Superpower Report Outlines Plan and Cost

The Pinchot superpower plan contemplates the location within a reasonable radius of mines having a combined capacity of 25,000 tons of coal per day for not less than fifty years a coal-distillation plant capable of pretreating all the coal mined, using the high-grade product for domestic and industrial fuel and pulverizing the balance for the production of power; the use of cooling towers where water is insufficient for the economic operation of the plant; the installation of sturdy, large prime movers capable of continuous operation for years without interruption; the aggregate capacity in one plant to be not less than 500,000 kw., and transmission systems at high voltage with capacities of 250,000 kw. per tower line.

The manufacturing cost of power must be so low that existing sources of the largest and more efficient type will be attracted as purchasers of the output and will avail themselves of this source of energy for their fixed or base load power, using their own plants for standby or intermittent service.

The entire plant would occupy 150 acres and consist of: (a) Coal-treatment plant, 25,000 tons daily; (b) electric generating station, 500,000 kw. capacity, in 75,000-kw. units, 13,000 volts, operating at 60 per cent load factor and delivering 2,750,000,000 kw.-hr. annually; (c) transmission line, double tower construction, each tower carrying six wires or two circuits of 125,000 kw. capacity at 220,000 volts, with average energy loss of 6 per cent at 60 per cent load factor; length of lines, 300 miles.

An estimate of cost of such an undertaking is as follows: Coal treatment plant, $34,000,000; power plant ($70 per kw.), $34,909,000; trunk line transmission, $14,950,000, or a total cost of $83,859,000.

No detailed estimates of cost of operation, fixed charges, etc., for the coal-treatment plant are undertaken. The statement is made that the sale of byproducts is estimated to cover operating expenses and fixed charges of the fuel-treatment plant.

Coal costing $2.16 per ton at the tipple would be processed, on the basis of a continuous daily demand of 25,000 tons. Roughly, one-third of this tonnage would be supplied to the power plant at a nominal charge of 25c. per ton delivered in the bunkers at the power house. This is in the form of a semi-coke having a heat value of not less than 12,500 B.t.u. per pound delivered.

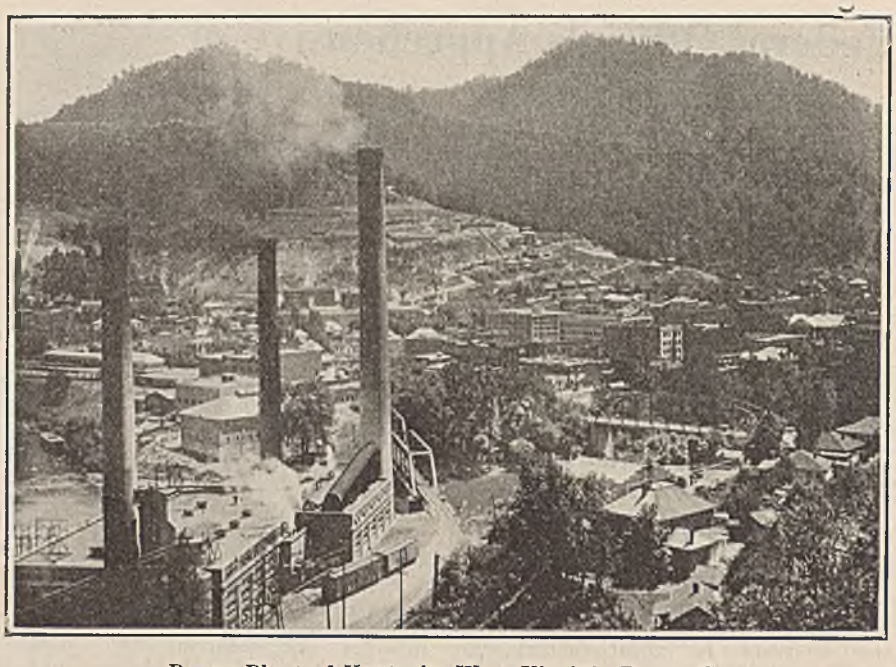
The financial operations of the power plant, and costs of power are estimated in considerable detail, as follows:

	Power Plant	Trans. Line
Fixed Capital Account:		
Distributed capital account	$34,909,000	$14,950,000
Organization, engineering insurance, interest during construction	2,400,000	950,000
Total capital account	$37,309,000	$15,900,000
Fixed Capital Charges:		
Interest at 5 per cent	1,865,450	759,000
Reserves—insurance, injuries, renewals and replacements, amortized capital	300,000	175,000
Total fixed charges	$2,265,450	$934,000
Recapitulation:		
Capacity, kw.-hr	500,000	500,000
Voltage	13,000	220,000
Generation, 1,000 kw.-hr.	2,750,000	2,500,000
Capital account	$37,309,000	$15,900,000
Operating expenses	1,048,000	95,000
Fixed charges	2,265,450	934,000
Maintenance expenses	1,240,000	150,000
Gross operating costs	$4,553,450	$1,179,000
Per kw.-hr.		
Fixed charges	.0009	.00038
Operating expense	.00042	.000038
Maintenance	.0005	.00006
Gross production costs	.00182	.000478

The manufacturing cost less profit being 1.82 mills per kilowatt hour, a rate of 3 mills per kilowatt-hour at the station bus for power at a 60 per cent load factor will leave for administration and profit $2,950,000, which is in excess of 10 per cent on capital invested in the generating plant.

Transmission costs will vary according to length of transmission distance. On the basis of the entire output being delivered at the terminal of the 300-mile line, the cost being .478 mill per kilowatt-hour a rate of 1.2 mills per kilowatt-hour at the incoming primary line of the substation will leave for administration and profit $1,805,000—in excess of 10 per cent profit on capital invested in the transmission system.

Some of the government's publicity issued in connection with the mine disaster at Sullivan has aroused objection from operators. They feel that the impression was conveyed that reasonable safety precautions had not been taken by the management when in fact there had been scrupulous regard for such provisions. John M. Lowry, general manager of the company, it is pointed out, evidently thought the mine safe as he was underground at the time of the disaster.



Power Plant of Kentucky-West Virginia Power Co.

This plant, which is owned by a subsidiary of the American Gas & Electric Co., is located at Logan, W. Va. It began operations in 1915 with two 4,000-kw. units, one of these being a spare. Now the plant has 40,000 kw. capacity, made up of two 15,000-kw. units and two 5,000-kw. units. Practically all of the energy supplied by this plant is transmitted to the coal mines, the growth of the business of this establishment during the last few years being shown by the following maximum loads: 1919, 8,000 kw.; 1920, 10,000 kw.; 1921, 15,000 kw.; 1922, 20,000 kw.; 1923, 25,000 kw.; 1924, 30,000 kw. The load factor (ratio of average load to maximum load) averages about 55 per cent on this plant.

Puts Kentucky Outlawry Up to Miners' Union

County Attorney W. O. Smith, of Greenville, Ky., on Feb. 17 issued a statement at Greenville, holding that stern measures must be adopted to stop outlawry in the striking western Kentucky coal region. Smith is bitter over actions of a band of 35 men who burned a building and shot up the Rogers Brothers coal-mine camp at Bevier, Ky., fired on a Louisville & Nashville train, shot into a house where there were women and children and even fired on state troops under cover of darkness after protection had been sent to the camp by the Governor. Smith once was a district union president. In his statement he said:

"If the men responsible for these atrocities are members of the United Mine Workers of America, that great organization should leave no stone unturned to ferret out the guilty parties. The destruction of property and the taking of human life will not give to the mine workers of this coal field the 'Jacksonville Agreement.' Such dastardly deeds do not remedy the evils of the coal-mining industry nor do they enable the coal operator to pay a higher wage rate; and if these truths had been brought home to the miners of western Kentucky ten months ago by Mr. Lewis, Muhlenberg County would not stand disgraced before the world today."

C. P. White, chief of the Coal Division, U. S. Department of Commerce, announced Feb. 28 that Harry W. Little had been appointed special agent of the division and would assume his new duties within a few days. Mr. Little was associated with the Bituminous Operators' Special Committee and later with the National Coal Association.

Some Kansas Mines Go Back To 1917 Scale

Notices posted Feb. 20 at two mines in Crawford County, Kan., the Eastern Coal Co. and the Capital Coal Co., both leased from the Sheridan Coal Co., that they will put the 1917 scale back into effect March 1 gave rise to a report that the Southwestern Interstate Coal Operators and independents generally will attempt such a move throughout District 14. This was promptly denied by John M. Young, Kansas vice president of the operators' association, and by superintendents of the Western Coal & Mining Co., Clemens Coal Co., Crowe Coal Co. and other large operators.

William Bogartz, president, and Harry Burr, secretary, of District 14 of the United Mine Workers, issued a statement which included the following: "We know of no general move on the part of the coal operators to abrogate the contract which they signed to expire April 1, 1927. It is supposed the parties who have continually charged the United Mine Workers with contract violations for the past ten years would hesitate to place themselves before the searchlight of public opinion by endeavoring to break the contract so recently signed. The Jacksonville contract will stand and be carried out until its due date of expiration."

The notices of reduction posted at the two mines put the tonnage rate at $1.01 instead of $1.25 and the wage for day work underground is reduced from $7.50 to $5 and surface work to $4.36.

Output and Consumption of Ruhr Coal Decline

Because of a falling off in consumption, the Ruhr Valley coal production figures for February show a decline. Whereas in November 365,000 tons was produced daily, in December 370,000 tons and in January 379.000 tons, the average daily output for February was only 344,000 tons. The decrease in consumption has necessitated the laying off of a considerable number of miners.

I. C. C. Examiners Recommend Rate Cut to Lakes

Rates on bituminous coal moving through Lake Erie ports for transportation to the Northwest should be extensively modified, according to recommendations made Feb. 27 by Charles F. Gerry and C. I. Kephart, Interstate Commerce Commission examiners.

The investigation made related exclusively to the rail charges between the ports and between the fifty-three coal mining districts in Virginia, West Virginia, Pennsylvania, Tennessee and Kentucky which ordinarily supply lake cargoes. The examiners recommended that a new scale be set up which would fix a rate of $1.15 per ton on coal from districts like Butler, Deerfield and Massillon in Ohio. From the Pittsburgh district the recommended rate was $1.45 instead of the present rate of $1.66 per ton. The charges suggested range up to $2.28 per ton, which was recommended for shipments to the lakes from the Clinch Valley No. 2, the most remote district.

Coal Wins Whole Fleet From Oil

The entire fleet of the Commercial Line of Moore & McCormack, operators of several deep-sea freighters out of Vancouver, B.C., have been converted from oil to coal consumers, it is announced by A. M. Moore, president of the line. It is asserted by Mr. Moore that with the increasing cost of oil and the availability of coal supplies, the company can effect a substantial saving by turning again to coal. Conversion of oil-burners to coal on the traffic lanes of the North Pacific has taken place recently in a number of individual cases, but this is the first time, it is stated, that a company has made the change in a whole fleet.

Pennsylvania Honor Cup Goes To W. L. Saunders

The University of Pennsylvania Honor Cup, which is awarded each year to the most distinguished alumnus of the institution, was given to William Lawrence Saunders, of the class of '76, Tuesday night at the University of Pennsylvania Club, 35 East Fiftieth Street, New York City.

The cup was the gift of William Guggenheim, class of '89, and among the names already engraved upon it are those of S. Weir Mitchell, Josiah H. Penniman, Judge Henry Galbraith Ward and William A. Redding.

Mr. Saunders has been actively engaged in many engineering enterprises in New York and is government director and deputy chairman of the board of the Federal Reserve Bank of New York. He also is a director of the Ingersoll-Rand Co., the A. S. Cameron Steam Pump Works, the American International Co., and the New York & Honduras Rosario Mining Co.

He has patented many inventions, among them the apparatus now in wide use for under-water drilling, using the tube and water jet system. He also is responsible for the system of pumping by compressed air and the radialaxe, a machine used in coal mining. He has been Mayor of Plainfield, N. J., for two terms and is a member of the New Jersey State and national Democratic committees.

The Terre Haute (Ind.) Chamber of Commerce has declared itself by referendum in favor of an "open shop" in Terre Haute's industries. At a meeting of the board of directors Feb. 24 it was reported 94 per cent of the ballots cast were in favor of the "open shop" and against the "closed shop" plan favored by labor unions. According to the report, 892 ballots were cast. Of this number 837 favored the "open shop" while 49 voted for the "closed shop" principle. Six ballots were returned mutilated and were not counted. The total number of ballots mailed out to the members was 1,360.

Indiana Authorities Want No Freak Safety Rules

Without mapping out any definite plan for legislation in the interest of safety to Indiana miners, a conference held Feb. 23 by members of the mines and mining committee of the Indiana House of Representatives with representatives of miners and coal operators revealed unanimous sentiment that Indiana should steer clear of "freak" safety legislation. The conference was held after the Sullivan explosion of the 20th that killed 51 men.

At the conference general approval was voted of the Sims senate bill, which provides for safety regulation for mines that employ three or more miners, including the requirement for an additional outlet. There was a general feeling of regret that the House committee had amended the bill to apply to mines of ten employees.

John G. Hessler, president of the Indiana district of miners, urged that steps be taken to compel companies drilling for oil and gas in the coal areas to seal the abandoned drillings both above and below the coal strata and keep a record of the drillings. He said that one of the worst mine disasters of Pennsylvania occurred where miners drilled into an abandoned and unrecorded gas well, causing the pent-up gas in this drilling to explode.

William A. Mitch, secretary-treasurer of the Indiana miners, said the Sullivan accident was "one of those accidents which are like'y to occur at any time." He spoke strongly in favor of an additional outlet in these mines.

Phil H. Penna, secretary of the Indiana Bituminous Coal Operators' Association, said that although he would not say that the barring of open lamps would have prevented the Sullivan accident, the use of closed lamps reduces hazards. He pleaded that operators have the right to require safety lamps in their mines if they desire. Miners have opposed such a rule.

New Kentucky Line O.K.'d by Indiana's Rail Board

The Indiana Public Service Commission on Feb. 16, after a hearing, recommended to the Interstate Commerce Commission that it issue a permit to the Owensboro, Rockport & Chicago R.R. for a new line from Owensboro, crossing the river on a new bridge at Rockport, and running to Elnora, Ind., there connecting with the Chicago, Milwaukee & St. Paul R.R., and giving a fine new outlet from the South and for western Kentucky coal moving North and Northwest. Another Ohio River gateway bridge has been needed for some time. Owensboro interests are behind the railroad, which will traverse rich coal-stripping properties in southern Indiana. The Interstate Commerce Commission has not been favorable to the project and turned down an application for a construction permit on the grounds that the line was not needed and that its estimates of revenue and construction costs were out of line.

Viewpoints of Our Readers

Sees Numerous Benefits in Rockefeller Plan

Former Employee of Colorado Fuel & Iron Co. Says Workers Speak Freely and Critically—Have Voice in Wage Disputes, Housing and Working Conditions

A word in defense of the Rockefeller plan of the Colorado Fuel & Iron Co. by a former employee of several years in various positions—underground, on top and in the offices—of that company.

I was an employee at the meetings in one district at the time when the Russell Sage Foundation was making its investigations, and *employees only* were present and therefore free to speak their minds. Ninety per cent of the information *volunteered* was criticism. In order to obtain the other side of the question it was necessary for the investigator to interrogate. Lack of knowledge of camp life as well as an understanding of the nationality complex present in those camps failed to draw out anything like the true facts of the good of the plan. For instance, the man of one nationality who scalded a hog in the porcelain bathtub had his ideas, as did other men.

The plan allows the employees to investigate and regulate, to a certain extent, the price of living commodities sold by the stores (company) in the camps, a voice in the wage scale, the hiring and discharging of employees (in case of dispute), the housing proposition with regard to upkeep, rental, etc.; in several cases the management, before erecting new houses, has taken it up with the employees under the plan, in order to ascertain the kind of houses and the rental to be charged that would meet with the approval of the employees. I believe that living and working conditions in that company's mines and camps are unexcelled in this region. This is largely due to the operation of the plan.

Formerly when an underground man received a serious injury there was considerable time lost in waiting for a train to take him to the Minnequa Hospital, at Pueblo, Colo. (one of the best in the West), and it was hours and sometimes days before he received hospital treatment. The employee representatives of the plan obtained from the management up-to-date twenty-four hour ambulance service with this hospital, so that if a man is properly treated by the underground first aid corps it is only necessary for the camp physician to inspect such treatment and send him direct to the hospital in the ambulance, which is a matter of only one to three hours from any mine. This service as well as medical and hospital attention for dependents is covered by the low charge of $1.50 per month per employee. This is quite a contrast to the imperfect service performed by other companies at a charge of from $2.50 to $8 per month.

According to the plan an unsafe workman should not be discharged, as he will obtain employment at other mines and continue his unsafe practices, to the detriment of himself as well as others, but he should be made a safe workman by discipline or education.

Employees' committees, at regular intervals and at the company's expense, inspect the mines, houses and camps with regard to health, safety, recreation, etc., and the majority of their recommendations are fulfilled.

There is no question that the plan has functioned for good during its short life. No doubt mistakes have been made, but the only plan that will supersede it is that of co-operative ownership.

Oscar Hurlbut,
Box 97, Superior, Wyo.
Feb. 23, 1925.

Why Not Salt Mine Roadways?

After reading several articles in *Coal Age* on different methods of combating the coal-dust hazard in mines, many of them adding considerably to the expense of operating, I lighted on an item in the daily paper which stated that a salt road is seldom dusty. It said:

> The peculiar property that salt has of attracting moisture makes the famous salt crystal road in Utah one that is seldom dusty. The salt crystals pack together and the road surface becomes almost like stone. Highway engineers are using salt crystals as a binder for other road construction because the success of salt roads has been so pronounced.

It seems to me that coal operators could sprinkle the roof, floor and sides of dusty mines with sea water or with the salt water shipped from the Michigan salt wells, or better, with a stronger solution made by dissolving the salt crystals at the mine.

Windber, Pa. David MacNicol.

This suggestion is not entirely new. Salt has been used without water and has laid the dust. For safety, however, the roads, ribs and roof must always be dust-free. Whether that is assured by salt has not been stated, and the clipping quoted says that the roads are only "seldom dusty." Salt tends to rob the air of water thus making portions not salted drier than ever with consequent danger. Unless salt can be obtained as a waste product and at a low cost its use becomes quite expensive, even when used at mines near the source of the salt. Its carriage as a liquid obviously would be excessively costly. The experience has been that the manufacturers of salt refuse raise the price as soon as a market develops.—Editor.

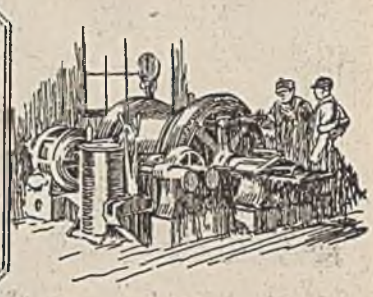
What Caused This Explosion?

A mysterious explosion occurred at the Indian Creek coal mine which belongs to the Knox Consolidated Coal Co., of Indiana. On Oct. 31 the mine was shut down until further notice, and the mine foreman took every safety precaution. No shots were fired that day and all electric current was cut off. This the mine foreman attended to himself. All inside switches were cut out. Permissible powder is used exclusively, but that fact it does not seem important to state, for no shots were fired and consequently the ignition of the gas could not have come from that source.

The fan was stopped at midnight Oct. 31 for repairs, and on Nov. 4 the mine fireman and his assistant noticed smoke coming out of the south section of the mine and at once went further inside to ascertain its origin. They found as they proceeded into the mine that there had been an explosion, doors being blown down, trolley wire being broken and other damage being done. In the section where the explosion occurred, the entries were making a little gas. What caused that gas to become ignited? Jacob Riley.

Bicknell, Ind.

Practical Pointers For Electrical And Mechanical Men



Electrical Repairwomen in Mine Shop More Dextrous Than Men

In practically every large factory making electrical equipment, as well as in big repair shops, girls today are employed on many of the winding, insulating and assembling operations. This is true practically the world over. The manufacture of electrical appliances has thus provided a means of independent livelihood for women in practically every continent on the globe, the only possible exception being Africa. In Europe, Asia, North and South America, as well as in Australasia, women and girls are employed by the hundreds and often thousands in the manufacture of various electrical machines and devices.

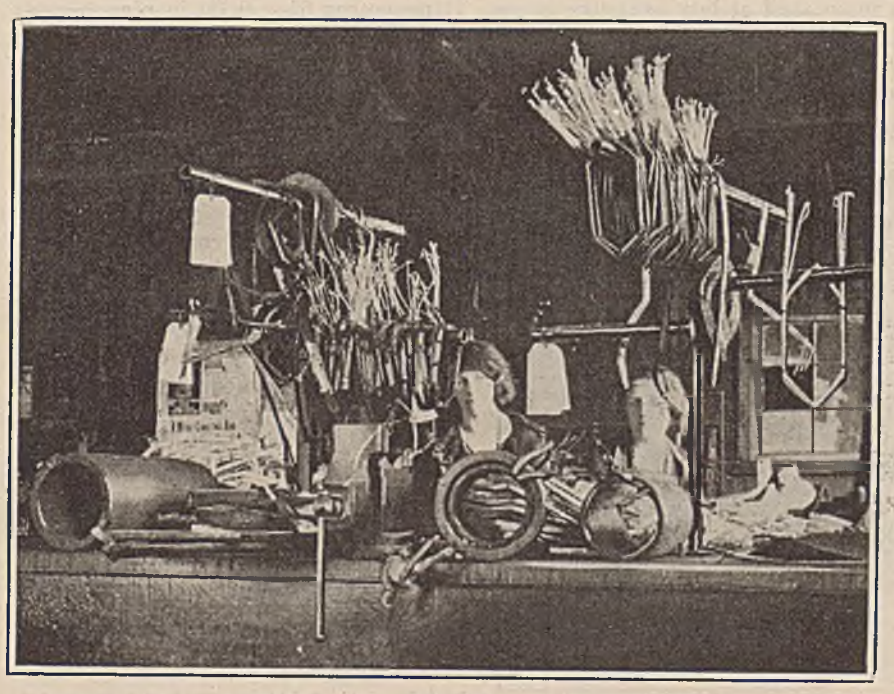
In many repair shops, also, women may be found in large numbers. At mine shops, however, for some reason, their employment heretofore has been practically nil. Just why this is so it would be difficult to say, unless it is because of the old idea or superstition that women should have nothing whatever to do with mining or anything that pertains to it.

The accompanying illustration shows two repair women employed in the electrical shops of the United States Coal & Coke Co., at Gary, W. Va. These shops, by the way, serve a fairly large group of mines all of which are completely electrified so that a large quantity and diversity of repair work is handled. Sometimes as many as three girls have been employed in this shop, although for the past several months only the two here shown have been retained.

It was once considered that the manufacture and repair of machinery of all kinds was strictly a man's job, work with which women had or should have nothing to do. This is still true of certain types of machines, particularly those of a heavy or ponderous nature. Electrical devices, on the other hand, both generators and motors, are made up of a vast number of coils and other parts of comparatively light weight any one of which a woman or girl can handle with ease.

It is noticeable that much of the work of the electrical repair shop can be done quicker and more efficiently by women than by men. The winding of field coils, the forming of armature coils and insulating operations of all kinds are among the jobs regularly performed in the mine repair shop in which girls far excel their male competitors.

The reason for this probably is not difficult to find. A woman ordinarily possesses a far more delicate sense of touch than a man. Coupled with this is the fact that she usually attains a greater degree of manual deftness and dexterity. In winding and insulating operations, therefore, she depends quite as much upon the "feel" of the work she is doing as she does upon her eyes. The result is that the completed job is finished in less time than if it had been performed by a "mere man."



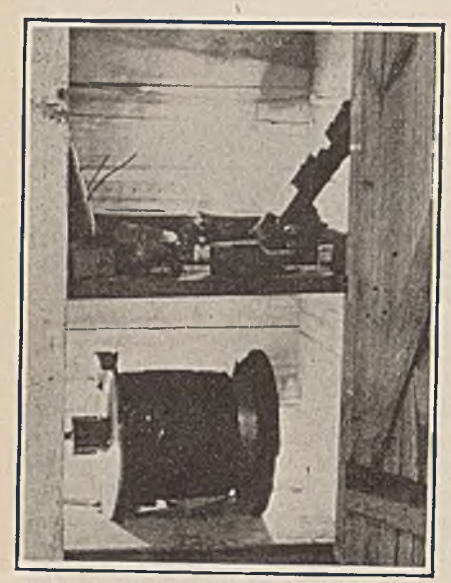
At Work in the Mine Repair Shop

Women usually possess a more delicate sense of touch than men. In making electrical repairs they seem to depend quite as much upon the "feel" of the work as on its appearance. The old superstition, incorporated in some state laws, that women should have nothing whatever to do with mining or anything that pertains to it, is so foolish as to be positively silly.

Warm Cupboards for Spare Armatures and Coils

Making provision for keeping spare armatures and field coils in good condition is just as important as the providing of these spares in the first place. When storing such material inside a mine, precautions should be taken against moisture and against possible damage from bumping.

In the new shaft mine, No. 20, of the Island Creek Coal Co., in Logan County, W. Va., spare armatures and field coils are stored in cupboards built in the small shop adjoining the repair pit. In each compartment of these cupboards a 50-watt lamp is kept lighted continuously. The object of these lamps is to supply enough heat to counteract the tendency of the stored material to accumulate moisture. The illumination



Stored in Underground Shop

The lighted lamps in the cupboards keep the material dry. The spare locomotive armature, shown here, is complete with bearings, housings and pinion.

supplied on the inside of the cupboards is also an advantage. It encourages keeping the cupboards clean and arranging the material in orderly fashion.

Home-Made Theater Seats for Miners' Comfort

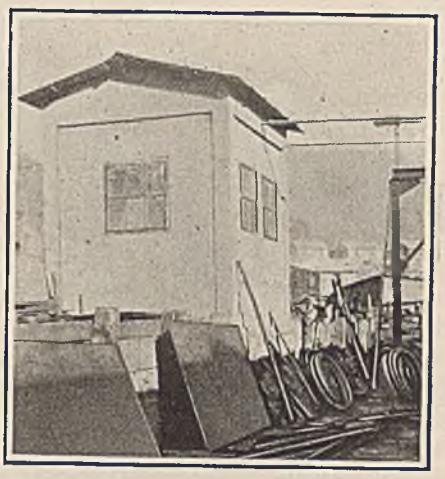
Many of us have had the experience when going into a moving picture theater in a mining town of trying several vacant seats before finding one which was not afflicted with "drop-seat" or some other ailment of dis-repair. The cheap, light-weight type of seat which many mining companies buy for their theaters are not designed in keeping with the ruggedness generally demanded of mining equipment.

In the Virginia theater of the Raleigh Coal & Coke Co., at Raleigh, W. Va., there are 1,000 seats which have been used over six years without any parts being broken. These theater seats were designed and built on the job. The frames were cast in the company's local foundry and the wooden parts were made up in the carpenter shop. A distinctive feature of the installation is that there are no floor-fastening screws to come loose. The bases of the seat frames are set in the concrete floor. The seats are made up individually and are hinged so they can be tilted back when not occupied. The angle of the seat and back is such as to be comfortable, and the seat spacing allows plenty of elbow room.

In addition to the seats, the theater shows evidence on every hand of the activity of the foundry. Cast-iron door hinges, lighting brackets, signs, and stoves are a few examples. It is estimated that an average of 150 tons of iron per year is cast in the foundry, all of which is used by the coal company for new construction and repair.

Separate Building Houses Acetylene Generator

Oxyacetylene welding is a process that has won its way into many repair shops as well as into factories of various kinds. For use in the welding or cutting torch two sources of fuel supply are available, namely, gas generated at low pressure as required and gas highly compressed into steel cylinders and passed to the torch through a reduction valve. The source to be chosen in any particular instance will depend upon whether the work to be done is in the shop or at some outlying point where a generator could not be set up profitably. In any case the necessary oxygen will be purchased compressed within steel cylinders.



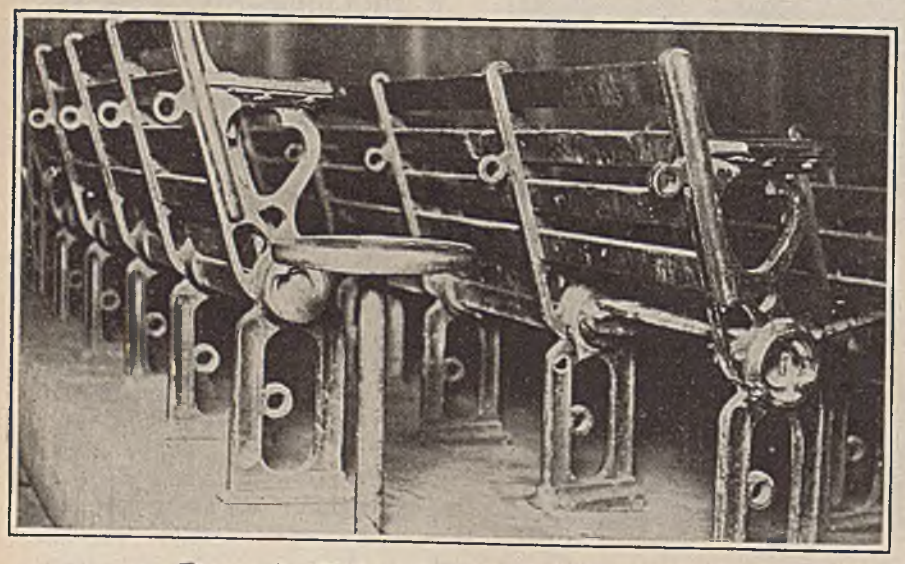
Housed by Itself, Minimizing Danger

This shows the hollow-tile and stucco building constructed to house the acetylene generator. Of the two pipes issuing from this building just below the eaves the nearer conveys the gas generated and the farther is an electric conduit.

The accompanying illustration shows the acetylene generator house installed and used as an auxiliary to the central shops of a large coal mining company located in West Virginia. The acetylene generator employed has a capacity of 50 lb. of carbide at one charge and the generating pressure is 8 oz.

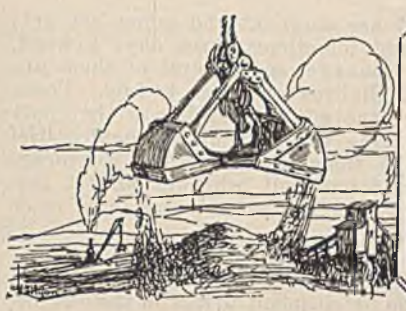
The building is of hollow-tile construction covered with cement stucco. It measures 6½ x 9 ft. in plan inside and is separated from the shop building where the gas is used by a space of several feet, thus minimizing the fire hazard. Although the walls and floor of this building are of substantial construction the roof is purposely made extremely light, being of corrugated iron carried on light steel angles. Thus should gas escape within the building and by any mischance be ignited the roof would blow off, relieving the pressure.

A small electric heater, under automatic control, warms this building during winter weather and precludes the possibility of the water in the generator freezing. All wiring is carried in metal conduit. Gas from this building is piped to all parts of the shop, with connections on the outside to provide for work being done in the yard if necessary. This acetylene generator as well as the building that houses it have been in use for the past six or seven years and both have given excellent satisfaction.

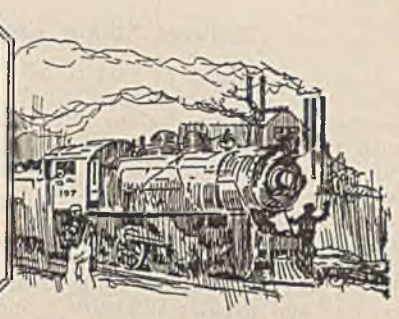


Frames Are Made of Cast Iron and Set in Concrete

There are 1,000 of these home-made individual seats in the Virginia theater of the Raleigh Coal & Coke Co., at Raleigh, W. Va. In the more than six years that they have been in use practically no parts have been damaged or broken. The frames were designed by the company's engineers and were cast in the coal company's foundry.



Production And the Market



Many Shutdowns and Cuts in Working Time In Dull Bituminous Coal Market

Continued demand for screenings in the face of a steady decline in production is all that gives a semblance of firmness to a soft-coal market that has been showing signs of progressive softening. All eyes are centered on the operators' conference at Cleveland on March 6, when an effort will be made to agree on a proposal to the joint scale committee to modify the present wage agreement. Invitations to attend have been extended to Illinois, Indiana, western Pennsylvania and Ohio producers.

Meanwhile, with spring just around the corner, the usual hesitant attitude is in evidence—only to a greater degree than ever, most consumers having decided not to contract in spite of the most favorable prices in a long while. Continued mild weather has eliminated even the occasional spurts that were helpful from time to time. "No bills" are common.

Slackening in demand and low prices throughout the Middle West have caused suspensions and reduced working time, one and two days a week being considered good in most Illinois fields. Even the Kentucky operations cannot get enough business to keep going and shutdowns are numerous. Output is being reduced in West Virginia, not only in the high-volatile region but in the smokeless fields as well.

Demand and shipments have fallen off at Duluth, due to the appearance of mild weather. Prices remain firm at recent levels, however, and screenings are pretty well cleaned up. The situation in the Twin Cities is unsettled because of mild weather and an influx of distress coal from the south. At Milwaukee the movement of coal to industrial consumers is steady but the flow to householders is somewhat slow. A substantial slump has hit the markets in Kansas, Colorado and Utah, demand and running time having fallen off.

The smokeless market, which hitherto had been unaffected by the whims of the market, flopped badly in Cincinnati last week. High-volatile coals are trying to stage a comeback without conspicuous success. Conditions in eastern Ohio are stagnant, Buffalo is much the same, and Pittsburgh is further in the depths.

New England lost some of its recent gains in the general slump, smokeless prices having softened despite curtailments in the Pocahontas and New River fields. Hand-to-mouth buying prevails in practically all the Eastern markets, though steam demand is still strong at Birmingham.

Hard-Coal Demand Sags Further

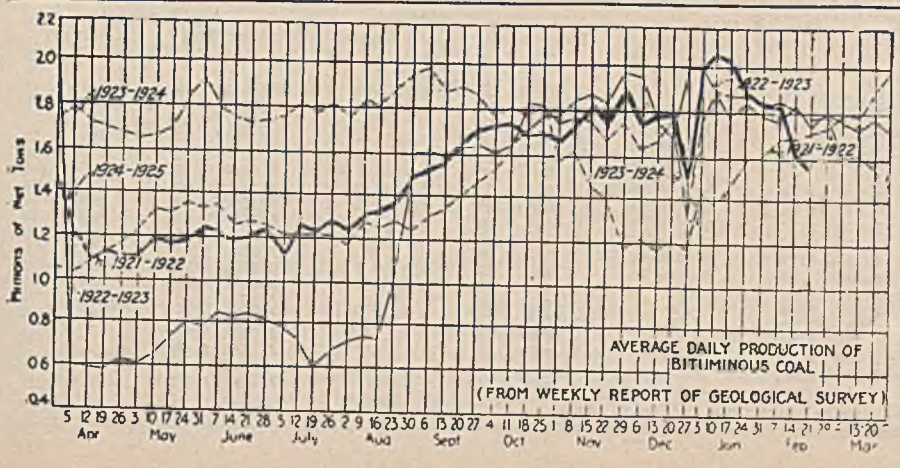
Anthracite demand has fallen off still further and independent prices have softened as a consequence. Orders are scarce and in small lots. The call for all sizes has tapered off, steam sizes being slow and weak.

Consumption of coal in industry is estimated by the National Association of Purchasing Agents at 42,145,000 tons in January, an increase of almost two million tons over theDecember figures. This does not include industrial heating. At the January rate of consumption there was estimated to be on hand in industries on Feb. 1 a supply sufficient for 34½ days, as compared with a 36½ days' supply on hand on Jan. 1.

Coal Age Index of spot prices of bituminous coal on March 2 was at 169, the corresponding price being $2.04, compared with 168 and $2.03 the week before.

Dumpings of coal for all accounts at Hampton Roads in the week ended Feb. 26 totaled 418,327 net tons, compared with 424,295 tons in the previous week.

Production of bituminous coal in the week ended Feb. 21, according to the Geological Survey, was estimated at 9,471,000 net tons, compared with 9,758,000 tons in the preceding week, as shown by revised figures. Anthracite output in the week ended Feb. 21 was 1,838,000 net tons, compared with 1,824,000 tons in the previous week.



Estimates of Production

(Net Tons)

	1923–1924	1924–1925
BITUMINOUS		
Feb. 7	11,891,000	10,910,000
Feb. 14 (a)	11,528,000	9,758,000
Feb. 21 (b)	10,697,000	9,471,000
Daily average	1,832,000	1,579,000
Coal yr. to date (c)	508,168,000	424,455,000
Daily av. to date	1,856,000	1,546,000
ANTHRACITE		
Feb. 7	1,906,000	1,909,000
Feb. 14	1,900,000	1,824,000
Feb. 21 (b)	1,655,000	1,838,000
Coal yr. to date	81,863,000	79,545,000
COKE		
Feb. 14 (a)	293,000	265,000
Feb. 21 (b)	277,000	258,000
Cal. yr. to date (c)	2,020,000	1,970,000

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

Midwest Steam Coal Strong

If any coal could be said to be in demand in the Middle West it is screenings from all fields. Steadily shrinking production in most regions is responsible for it. But even with the situation as it is, there are screenings enough for all who bid. Southern Illinois continues to get $1.90 for good stuff, failing in which, most big producers dump into ground storage. Central Illinois fines bring as good a price as southern. Almost all fine coal that reaches the Illinois and Iowa markets has stiffened up from 5c. to 25c. during the past week while domestic coals moved with greater and greater difficulty. Spring is only around the corner and coal is too cheap to build a market.

The main interest at the end of the week centered around the operators' conference which the Ohio mine owners are trying to hold at Cleveland. Little faith was put in it by most coal men in Chicago, but it commands attention anyway because every coal buyer is wondering whether the conference can have any effect on the cost of coal this summer. Some are wondering whether to contract at present prices or wait. Most have decided not to contract at all, in spite of favorable prices—the lowest in a long time.

There is little activity in the Franklin County field. Demand for screenings is good, but other than that, trade has almost stopped. Of course some domestic coal is still moving, but egg and nut are stagnant and mines are getting from one to two and sometimes three days a week, depending upon railroad tonnage, and several of them are arranging to shut down. Railroad tonnage is fair. There is much discontent among the miners working at the shaft mines and they are arranging to obtain employment at the strip mines and some of them are going to Kentucky. Strip mines seem to be doing well, working almost full time, but are selling coal at a low price in order to meet west Kentucky competition.

Conditions are unchanged in the Duquoin district. One and two days a week is good working time and prices here are about the same as the independent prices in the Franklin County field. In the Mt. Olive district conditions are bad and the only thing that is saving this district in a way is railroad tonnage. A few days of cold weather helps to move domestic and steam demand exceeds the supply.

In the Standard field conditions are unusually bad. All mines have "no bills." Railroad tonnage in this district is light and there are strip mines opening up around Freeburg that threaten to make competition unusually bad on Standard coal.

A few days' seasonable weather at St. Louis has moved a little domestic. The dealers are loaded up and find it unusually hard to move higher grade coals. The movement of anthracite, smokeless and coke is a trifle slow. Local

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

Low-Volatile, Eastern	Market Quoted	Mar.3, 1924	Feb.16, 1925	Feb.23, 1925	Mar. 2, 1925†
Smokeless lump	Columbus	$4.10	$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	1.15	1.10@ 1.25
Smokeless lump	Chicago	3.60	3.60	3.60	*3.00@ 3.25*
Smokeless mine run	Chicago	2.35	1.60	1.60	**1.50@ 2.00**
Smokeless lump	Cincinnati	3.50	3.85	3.75	*3.00@ 3.50*
Smokeless mine run	Cincinnati	2.50	1.85	1.85	**2.00**
Smokeless screenings	Cincinnati	1.75	1.35	1.35	1.25@ 1.50
*Smokeless mine run	Boston	4.70	4.45	4.45	*4.25@ 4.40*
Clearfield mine run	Boston	1.95	1.95	1.95	**1.75@ 2.35**
Cambria mine run	Boston	2.60	2.30	2.30	*2.00@ 2.50*
Somerset mine run	Boston	2.25	2.10	2.10	*1.85@ 2.25*
Pool 1 (Navy Standard)	New York	3.00	2.70	2.70	*2.50@ 2.85*
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	2.05	2.05	1.90@ 2.25
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	2.20	2.20	2.05@ 2.40
Pool 9 (Super. Low Vol.)	Baltimore	2.05	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	New York	2.00	1.75	1.75	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	1.80	1.70	1.70	1.65@ 1.75
Pool 11 (Low Vol.)	New York	1.60	1.55	1.55	1.40@ 1.70
Pool 11 (Low Vol.)	Philadelphia	1.65	1.65	1.65	1.60@ 1.70
Pool 11 (Low Vol.)	Baltimore	1.65	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	1.35@ 1.65
Pool 54-64 (Gas and St.)	Philadelphia	1.60	1.50	1.50	1.45@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.60	1.65	1.65	1.60@ 1.75
Pittsburgh so'd gas	Pittsburgh	2.55	2.50	2.50	2.40@ 2.60
Pittsburgh gas mine run	Pittsburgh	2.30	2.25	2.20	2.15@ 2.25
Pittsburgh mine run (St.)	Pittsburgh	2.10	1.95	1.95	1.90@ 2.00
Pittsburgh slack (Gas)	Pittsburgh	1.50	1.30	1.30	1.25@ 1.35
Kanawha lump	Columbus	2.60	2.50	2.35	2.15@ 2.60
Kanawha mine run	Columbus	1.60	1.60	1.50	1.40@ 1.60
Kanawha screenings	Columbus	1.10	.75	.75	.65@ .85
W. Va. lump	Cincinnati	2.85	2.05	2.15	*2.00@ 2.25*
W. Va. gas mine run	Cincinnati	1.55	1.40	1.35	1.25@ 1.50
W. Va. steam mine run	Cincinnati	1.55	1.30	1.30	*1.15@ 1.40*
W. Va. screenings	Cincinnati	1.05	.75	.75	**.90@ 1.10**
Hocking lump	Columbus	2.60	2.50	2.40	2.25@ 2.55
Hocking mine run	Columbus	1.85	1.60	1.50	1.35@ 1.65
Hocking screenings	Columbus	1.10	1.10	1.10	1.05@ 1.15
Pitts. No. 8 lump	Cleveland	2.35	2.30	2.30	1.90@ 2.75
Pitts. No. 8 mine run	Cleveland	1.80	1.85	1.85	*1.75@ 1.85*
Pitts. No. 8 screenings	Cleveland	1.35	1.30	1.30	**1.30@ 1.45**

Midwest	Market Quoted	Mar.3, 1924	Feb.16, 1925	Feb.23, 1925	Mar. 2, 1925†
Franklin, Ill. lump	Chicago	$3.35	$3.10	$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	1.85	1.85	**1.85@ 2.00**
Central, Ill. lump	Chicago	2.85	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	1.70	1.75	1.85	1.75@ 2.00
Ind. 4th Vein lump	Chicago	2.85	2.85	2.85	2.75@ 3.00
Ind. 4th Vein mine run	Chicago	2.35	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings	Chicago	1.85	1.70	1.80	**1.75@ 1.90**
Ind. 5th Vein lump	Chicago	2.60	2.50	2.50	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	1.60	1.45	1.55	**1.55@ 1.65**
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	1.50	1.50	**1.75**
Standard lump	St. Louis	2.75	2.35	2.50	2.50
Standard mine run	St. Louis	1.95	1.80	1.80	1.75@ 1.85
Standard screenings	St. Louis	1.15	1.25	1.25	**1.35@ 1.50**
West Ky. block‡	Louisville	2.85	2.25	2.25	2.00@ 2.50
West Ky. mine run	Louisville	1.70	1.35	1.50	*1.25@ 1.50*
West Ky. screenings	Louisville	1.30	.90	.95	**1.20@ 1.35**
West Ky. block‡	Chicago	2.60	2.35	2.35	2.25@ 2.5
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	*2.00@ 2.50*
Big Seam mine run	Birmingham	1.80	1.75	1.75	1.50@ 2.00
Big Seam (washed)	Birmingham	2.10	1.75	1.75	1.50@ 2.00
S. E. Ky. block‡	Chicago	3.10	2.75	2.75	*2.50@ 2.75*
S. E. Ky. mine run	Chicago	1.85	1.50	1.50	1.25@ 1.75
S. E. Ky. block‡	Louisville	3.25	2.35	2.35	2.00@ 2.75
S. E. Ky. mine run	Louisville	1.75	1.35	1.35	1.25@ 1.50
S. E. Ky. screenings	Louisville	1.30	.75	.80	**.75@ 1.10**
S. E. Ky. block‡	Cincinnati	3.00	2.50	2.25	**2.25@ 2.50**
S. E. Ky. mine run	Cincinnati	1.60	1.40	1.40	1.25@ 1.60
S. E. Ky. screenings	Cincinnati	1.00	.85	.80	**1.00@ 1.15**
Kansas lump	Kansas City	5.00	4.85	4.75	4.50@ 5.00
Kansas mine run	Kansas City	3.50	3.35	3.10	3.00@ 3.25
Kansas Screenings	Kansas City	2.25	2.50	2.50	2.50

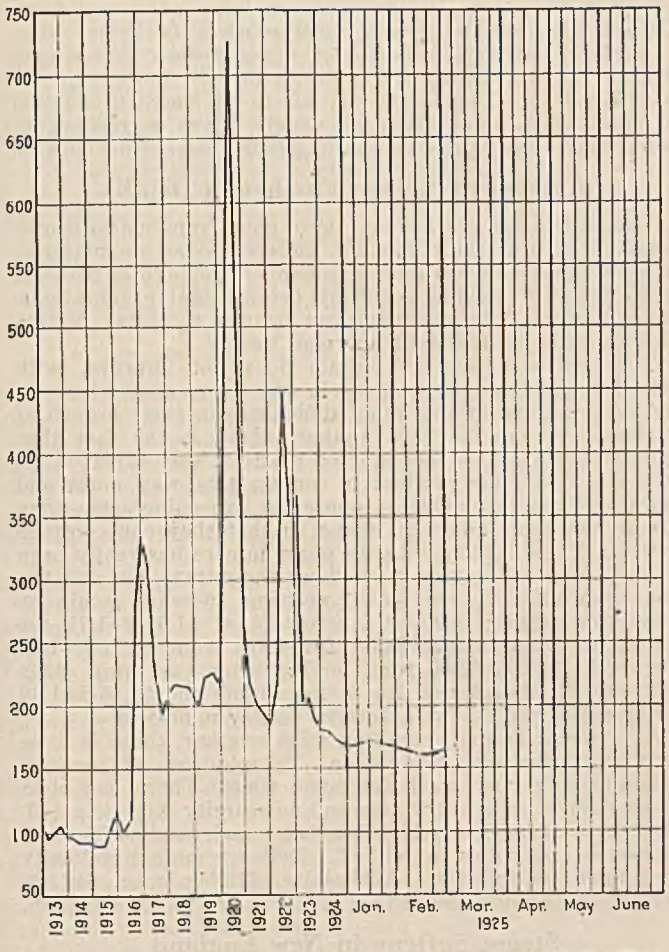
*Gross tons, f.o.b. vessel, Hampton Roads. † Advances over previous week shown in heavy type; declines in *italics*.

‡ 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	March 3, 1924 Independent	March 3, 1924 Company	Feb. 23, 1925 Independent	Feb. 23, 1925 Company	March 2, 1925† Independent	March 2, 1925† Company
Broken	New York	$2.34	.....	$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	$8.00@$8.50	8.75@ 9.25	$8.50@$9.00	8.75@ 9.25	$8.50@$9.00	8.75@ 9.25
Egg	Philadelphia	2.39	8.50@10.00	8.75@ 9.25	9.45@ 9.75	8.80@ 9.25	*9.25@ 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	9.25@10.00	8.75@ 9.25	9.25@10.00	9.00@ 9.50	*8.75@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	*9.40@10.40*	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	9.25@10.00	8.75@ 9.25	9.50@10.25	8.75@ 9.40	*8.75@10.00*	8.75@ 9.40
Chestnut	Philadelphia	2.39	9.85@11.00	8.90@ 9.25	10.00@10.75	9.25@ 9.40	*9.40@10.30*	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@ 5.50	6.15@ 6.65	4.50@ 5.50	5.50@ 6.00	4.50@ 5.50	5.50@ 6.00
Pea	Philadelphia	2.14	4.75@ 6.50	6.35@ 6.60	5.75@ 6.00	6.00	*5.25@ 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@ 2.85	3.00@ 3.15	*2.00@ 2.75*	3.00@ 3.15
Buckwheat No. 1	Philadelphia	2.14	2.25@ 3.50	3.50	2.50@ 3.00	3.00	*2.25@ 3.00*	3.00
Rice	New York	2.22	1.75@ 2.50	2.50	1.90@ 2.25	2.00@ 2.25	*1.80@ 2.25*	2.00@ 2.25
Rice	Philadelphia	2.14	1.75@ 2.50	2.50	2.00@ 2.25	2.25	*1.70@ 2.25*	2.25
Barley	New York	2.22	1.50@ 1.75	1.50	1.40@ 1.65	1.50	*1.35@ 1.50*	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	1.60	1.40@ 1.65	1.60	*1.35@ 1.60*	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
	March 2	Feb. 23	Feb. 16	March 3
Index	169	168	168	183
Weighted average price	$2.04	$2.03	$2.04	$2.21

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.

steam wagonload and local steam carload are good because production is below normal and screenings are somewhat scarce with a rising market. Country steam also is good for the same reason. Country domestic is quiet excepting in spots for cheaper coals. There seems to be a tendency with all shippers to cut prices regardless of their circular, and the result is much confusion.

In the central Illinois and eastern Missouri territory the trade reports almost total severance from Illinois coals, which has all come about within the last month or six weeks, and a survey of many dealers shows that they are going entirely to Eastern coals next season because they assert that there is greater dependability on the Eastern shipper as against the Illinois shipper.

Kentucky Does Little

As a result of mines closing down screenings are scarcer and higher. It is reported that western Kentucky producers are refusing $1.15 a ton for screenings, and the market is around $1.20@$1.35 on actual sales. In eastern Kentucky some cheap screenings are to be had at around 75@90c., with good grades principally at 90c.@$1.10 a ton. This is close to the mine-run price, which starts at about $1.25 in both fields.

Continued mild weather this late in February has about broken all hope for a period of severe weather to really move prepared sizes. Block, lump and egg are very dull, and while there is some demand for steam nut in western Kentucky, it is not keen, as shown by prices of $1.50@$1.80 a ton. Retailers are endeavoring to clear yards and go into the late spring with just as small stocks as possible, with the result that unless there is a long cold spring, there is not much prospect of any real business in prepared sizes until summer or fall stocking begins. A good many mines in all fields have closed down over the past few weeks.

Slackening demand and low prices have served to materially reduce output in West Virginia and there have been suspensions right and left, not only in high-volatile regions but in the low-volatile territory as well. Warm weather has forced the price of smokeless in the West from $4 a ton to $2.50@$3 a ton and in Eastern markets down to $2.25.

High-volatile lump of the larger size has reached a new low level at $1.50@$2 a ton. Egg brings $1.25@$1.50. Mine-run hardly brings more than $1 a ton and slack is selling as low as 50c.

Demand for Upper Potomac and western Maryland coal is a little softer and tonnage more difficult to sell even at the low prices which have recently been prevailing. Colder weather within the last few days may stimulate the domestic demand a little, but previous cold waves have failed to have such an effect.

In Virginia production is on a somewhat higher level, relatively speaking, than in other fields owing to the large volume of tonnage under contract, but at the same time it has been necessary to cut down the output to some extent owing to a smaller volume of spot orders.

Northwest Is Less Active

Prices at Duluth remain firm as reported last, and screenings are fairly well cleared up. Shipments have fallen off, as has buying, due to mild weather conditions. It looks as if the worst of the winter is over, and Duluth, which has had little snow comparatively so far, may be due for an era of snow, which always means milder weather.

Iron mines are still a disappointment. They are doing little but strip, as they do not wish to take ore from the mines because of the uncertainty of prices, as well as the heavy personal property tax on May 1. The docks are in the same fix, but they are trying to ship all the coal they can, so as to get rid of the heavy assessment. However, shipments off the dock probably will not exceed 19,000 cars for February.

On the whole things look good for the remainder of this season, and the estimate of 1,000,000 to 1,500,000 tons on commercial docks at opening of navigation, made some time ago, still holds.

Mild weather at Minneapolis has left the coal market in a scattered and unsettled state for some days past. A considerable amount of distress coal has moved into the Twin Cities market from the south. Whenever soft weather sets in at the Chicago and St. Louis markets, the custom seems to be to ship as much as possible to the Northwest. This upsets the market, so far as the going price is concerned, but it seldom has any effect upon the list or quoted price, and quotations are based upon the list right along. Southern Illinois lump is quoted at $3.25; central Illinois, $2.50@$2.75; Indiana lump, $2.75; western Kentucky, $2@$2.25. Dock prices are, as heretofore, $5.75 for Youghiogheny lump and $5.25 for Hocking lump. Smokeless in the Twin Cities is around $9 and at the dock is $9.50.

The flow of coal from Milwaukee docks to the industries is steady, but the flow to household bins is temporarily slow because of continued mildness. The domestic demand for coal does not as yet reflect the introduction of oil as a household fuel, and coal dealers are not distrubed as much as they were when the oil burner was first talked of. The only success thus far reported has been in experiments with water and steam systems. Use under hot-air furnaces has demonstrated that it will be necessary to have the furnace absolutely gas tight—a difficult matter with most furnaces—if the odor of burning oil is to be avoided.

West Goes Into a Slump

"No bills" of lump coal again are collecting at Southwestern mines, which, even with the 50c. slash in price noted last week, are working only about half time. The demand for industrial coal is firm, but domestic sizes are moving slowly while there are rumors, induced by the recent action of operators of two mines leased from the Sheridan Coal Co. in returning to the 1917 wage scale, that the high wages of the last few years soon must pass.

In Oklahoma, where price fluctuations have been espe-

cially pronounced this season, current quotations are $4@$4.50 for lump, $3.50@$4 for nut, $2.75@$3 for mine run and $2 for screenings.

The coal business is very quiet in Utah. Mines are working only about two days a week, and the immediate prospects for business are not good. Operators say few orders are being received from any section of their territory. Dealers are buying from hand to mouth. Prices continue steady. It is declared by operators that they will not change till the summer storage campaign starts, some months from now. There has not been a price change in Utah since early last fall.

There has been a substantial slump in the market for Colorado coal, due to the continuation of the warm weather, which has materially affected the demand for domestic, lump and pea coal, thereby resulting in reducing the running time which has dropped from 85 per cent to 70 per cent over the preceding week. The storage prices for the summer business will go into effect on April 1 and reductions are in line averaging from 50c. to 75c. per ton under the present lump price, which is $5.

The present quotations are: Walsen-Canon City lump, $5.25; Walsen-Canon City nut, $4.25; slack averaging $1.75 to $2.25; washed pea, $3.50; Trinidad Segundo coke, $7.50; Trinidad Segundo nut coke, $6; Crested Butte anthracite No. 3 and No. 5, $9; Crested Butte No. 6 chestnut, $5.75.

There is a surplus of labor even at the mines that are operating on the 1917 wage scale. The majority of the mines are still on the 1924 scale.

Smokeless Flops at Cincinnati

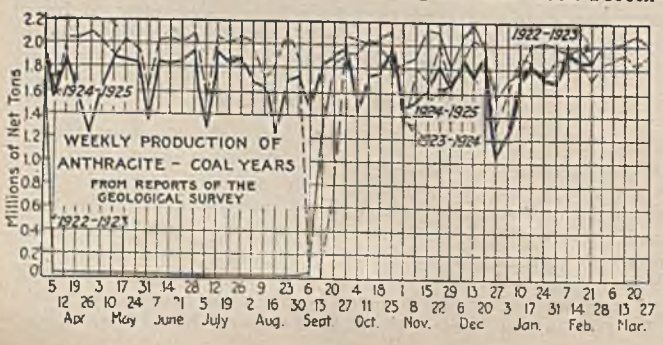
Cincinnati saw the bottom drop out of the smokeless market and the first effects of the mine shutdowns to the south of the river last week. The nose dive was induced largely by a break in Chicago and the inland sections where tonnage on track became topheavy, and considerable resource was needed to avoid a spectacular decline. Some smokeless lump and egg in distress that had to be moved was offered here at $2.75. The break did not include mine-run and the determination to sell screenings around $1.50 was still as strong as ever. The March circular shows a general quotation of lump and egg at $3.50; run of mine at $2; screenings at $1.50, and nut, where offered, is $2.50. Shutdowns in the New River fields, perhaps had the healthiest effect in steadying prices.

High-volatile lump and prepared sizes are trying desperately to regain lost ground. The Hazard and Elkhorn fields have so restricted output that little additional burden is being shifted to the gorge of coal awaiting buyers of domestic. The direct effect of this has been to strengthen the price of slack, which is now $1. West Virginians who levelled the price of 4-in. lump to $1.75 and lower a couple of weeks ago are now quoting $2. Kentuckians have not changed the spread of $2.25 to $2.50 for block, but it is hard to get it at the low figure. Run of mine held steady for offerings other than those in distress.

The retail market has taken a slide with quotations of Pocahontas lump at $7.50 and run of mine at $5.50; bituminous lump (Elkhorn) at $6 and slack at $4.50. River business has had everything in its favor.

Coal consumption in eastern Ohio apparently is lower than at any time in several years. Both steam and domestic consumers are buying only for current needs, which are below normal, and there is no stocking of coal in any appreciable quantity, as buyers feel that plenty of coal is available when needed.

While pessimism generally prevails throughout the industry in Ohio, one ray of hope is contained in the I. C. C. examiners' report released at Washington last week recommending reductions in the rates on lake cargo coal from Ohio mines, and a general readjustment in these rates.



A slight scarcity in slack and nut-and-slack caused spot prices on this grade to stiffen 5c. to 10c. per ton during the past ten days. This scarcity is due to the small production of lump, the preparation of which leaves a residue of screenings. Spot prices on other grades remain unchanged.

Pittsburgh Market Further in Depths

The Pittsburgh market has again gone from bad to worse. Demand is practically lacking, sellers having no inquiries of consequence to work on. Not much tonnage is believed to be actually moving decidedly below regular quotations, which are certainly low enough in relation to costs. Naturally, there is distress coal now and then.

The coal situation at Buffalo does not improve, with actual demand not as good as it was. Consumers look on the trade as one of the minor difficulties in their branch of business. What they are anxious about is the fact that general business has not started up as it was expected to. The West Virginia product is coming this way more and more and the Pennsylvania operators are doing what they can to put their mines in shape so that they can compete with it. The difficulty with the union miners has really been a good thing in the way it cut down the output, but now the mines so affected are slowly getting to work again at competing wages. Quotations remain at $1.60@$1.75 for Fairmont lump, $1.40@$1.50 for mine run, $1.25@$1.40 for slack; $2.25@$2.50 for Youghiogheny gas lump, $2@$2.25 for Pittsburgh and No. 8 steam lump and $1.45@$1.60 for slack; $1.75@$2 for Allegheny Valley mine run.

As a result of the prevailing mild weather, there is little activity in the coal business at Toronto just at present, orders having been slack for some time. There has been an abundant supply all winter and no scarcity is anticipated. The soft-coal market, which has been moderately active all winter, is beginning to fall off. Prices remain practically unchanged as follows: Anthracite, $15.50; coke, $12.50; Pennsylvania smokeless, $5.85; steam lump, $6.40; slack, $5.

Steam Softens in New England

The market for steam coal in New England has softened somewhat in the last week, the price of smokeless coals having dropped to $4.25@$4.40, though there has been more or less drastic curtailment in the Pocahontas and New River fields. Slightly more inquiry for central Pennsylvania coals is developing, but on the latter there has not yet appeared any sign of better prices.

At Hampton Roads there now seems a reasonably steady call for coals of No. 1 grade, with a fair market also for No. 2 coals at 15@20c. less. For the more desirable grade most reports agree that $4.40 per gross ton f.o.b. vessel is now the recognized price, and it is probable this level will carry through March unless there is an unlooked-for slump in inquiry.

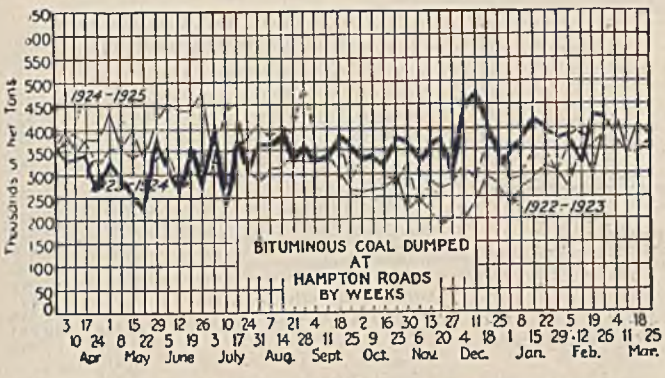
Buyers here are making purchases only for current demands, and there is nothing in the manufacturing situation to support anything approaching a buoyant market. The agencies will do well if they maintain the present market posture, for it is generally conceded that any material increase in output would restore the unsatisfactory conditions that prevailed during November and December.

For inland delivery the demand is in about the same proportion that exists at Hampton Roads. The asking price of several factors is $6 per gross ton on cars, but $5.60@$5.75 is about the actual selling figure for all but two or three. As the tidewater price advances there is a corresponding increase in the area available for Pennsylvania coals all-rail, and in certain directions there are indications of somewhat better movement in consequence. It is much too early, however, to expect any better prices on coals all-rail.

New York Market Steady but Lacks Snap

Tidewater coals showed more activity than all-real demand last week at New York. There was no snap to either, but coal sent to the piers was not allowed to rest. The bunker situation showed a little more activity than during the previous week, but prices were not affected. Buyers continued the hand-to-mouth attitude and there was no push in the snot coal market.

The drop in output recorded by the various reports aided considerably in keeping the market steady. Otherwise there



might have been a further drop in quotations, which now are in many instances down to or below the cost of mining. Contracting is going on slowly. Several contracts were reported as having been closed during the past week and others are under negotiation.

At Philadelphia the soft coal market is very quiet, there seeming to be less demand than at any time since the first of the year. As a result more mines are idle this week in central Pennsylvania than for several months.

Operators are doing their best to get a good share of tonnage in line by April 1. While $2.80 is generally accepted by the leaders as the contract figure, there is plenty of business being closed on desirable coals as low as $2.25, mostly non-union. There are plenty of reports of Pennsylvania producers casting off the union schedule, and others are doing their best to operate non-union.

With a sharp falling off in the call for sized coal from the West, the production of slack continues to shrink. The inquiries for this coal are increasing, but the demand cannot be met, and all users are taking considerable mine-run. All prices remain fairly firm.

The tide market remains quiet, with very little coal standing at the piers. The little flurry evident last week in tide shipments seems to have spent itself. In the matter of bunkers there has been at least a slight improvement, except in price.

Baltimore Deep in Dumps

The situation at Baltimore is far from encouraging to the trade, as demand is light and prices extremely low. A 40-per cent decline in the quantity of coal received at Baltimore piers during 1924, as compared with 1923, was due to a material decrease in production from mines which usually ship through Baltimore, according to local shipping offices.

Since Feb. 6 there have been but two shipments of coal on foreign consignment, the combined coal loadings of which was 8,048 tons cargo and 2,050 tons bunkers.

The domestic coal market at Birmingham is extremely weak and there is comparatively little spot or contract movement at present. Producers continue to divert as much lump and other domestic sizes on steam orders as practical, but at best this is a poor solution, and mines are having to turn down orders for prepared steam fuel and bunker business in some cases due to this practically dead condition of the domestic trade.

Inquiry is good for all steam grades, there being a satisfactory spot demand for mine-run and washed product, and shipments on contracts are reasonably heavy. Bunker trade is perhaps not quite as active as it has been, generally showing a slowing up about this season, but there is a good tonnage moving on orders now booked by the mines.

With the exception of low and medium grade domestic coals quotations are firm at figures which have prevailed for several weeks with little variation. Big Seam and similar fuels are off schedule, lump of this grade being obtainable at $2@$2.50 mines, but Black Creek and Cahaba product are maintaining a firm price basis where applied on domestic orders.

The coke market is strong, foundry being in good position at $5@$5.50 ovens. Most producers are behind on deliveries of foundry coke, the quantity available being curtailed to some extent in the past two months by active operations of furnace companies, which are now consuming their entire coke output in iron-making. There is no demand for gas coke at present, quotations having declined to $4.50 ovens, with exceedingly light movement.

Independent Hard-Coal Prices Sag

There was a further drop in demand and quotations for independent domestic coals at New York last week. Anything but coal-consuming conditions faced the dealer and the industry suffered. Demand dropped off and wholesalers found themselves up against the problem that usually exists nearer April 1—that of hustling for orders. The larger companies are about caught up with standing orders and are now after new business.

Cancellations of orders after coal has left the mines resulted in some hurried sales at prices below the current market figures for independent coals.

Retailers' yards are filled with the various sizes and are delivering in one- or two-ton lots. Consumers are already talking about the usual April cut in prices, although nothing regarding it has been forthcoming from producers' offices. Meantime there are many reports that the mining companies are thinking about a reduction of sizes, but the definite announcement is still lacking.

Dullness likewise struck the steam coal situation. Movement was slow and prices dropped.

The Philadelphia anthracite market has had a thorough setback by the mild February weather. The first real indication of this was the cut in prices by a leading independent to $9.50 on stove and nut and $9.25 on egg, although pea stayed at $6. A good many other independents have followed this lead, but at least one of the larger individual firms is clinging to its schedule of about 65c. above company prices.

Steam coals are not very active, except possibly barley, and of this there is enough to go around. There has been quite a bit of buckwheat offering around $2.25 and with a little pressure the consumer can buy the best independent buckwheat at $2.75. Rice also is off in price, although company shippers hold firm.

The hard-coal situation in Baltimore has shown but little change in the past several weeks, although a sudden drop in temperature in the last few days has given a slight spurt of activity to the trade here. Householders, anticipating an early spring, however, are buying in small lots only, and there are ample supplies on hand to meet the demand.

February was very poor for the Buffalo anthracite trade, two long thaws causing demand to flatten out badly, and now that March is coming in the disposition to buy coal ahead is still less than it was. A good many of the consumers find that with warm days coming in at any time it is more satisfactory to use natural gas, for they do not need to use it all the time.

The demonstration of the use of small sizes in place of furnace sizes has been on for a week. Consumers have attended in good numbers but what the result is to be it will take some time to discover.

Coke Market Remains Quiet

The Connellsville coke market has been very dull in the past week and no developments have occurred. The price trade is running along much the same as formerly, with a heavy operation but no clear outlook, inquiry for pig iron being very light while deliveries are almost equal to production. It is between seasons as to quarterly contracting for furnace coke and furnaces are so well supplied by contract deliveries that they have no occasion to buy spot. Demand from other consumers is only fair and does not amount to much in tonnage.

Spot furnace coke is quotable roundly at $3.75, subject possibly to a little shading, but there is no basis for mentioning $3.50. Spot foundry remains at $4.25@$4.75, with buying light.

Talk has increased about wage reductions and it begins to look as if some important operators would reduce by April 1. Instead of flatly applying a percentage to the Frick scale they may reduce day labor more than tonnage rates.

Car Loadings, Surplusages and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Feb. 14, 1925	902,877	170,596
Previous week	928,244	192,655
Week ended Feb. 16, 1924	935,109	194,295

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Feb. 14, 1925	220,798	84,602	.....	.....
Feb. 7, 1925	199,210	63,561	.....	.....
Feb. 14, 1924	127,415	46,293	7,397	.....

Foreign Market And Export News

British Coal Market Unsettled; Contracts Scarce

The Welsh steam coal trade is very unsettled, demand being restricted and almost entirely confined to immediate requirements. Shipping conditions are still disorganized owing to heavy weather. Colliery stoppages are more numerous than at the beginning of the year owing to excessive stocks, slow loading conditions at the docks and the inability of operators to get their cars cleared.

Concessions from quotations are being reluctantly made by operators for immediate clearance, though in all cases quoted prices are being fought for in an endeavor to cut down already heavy losses. This attitude means that exporters are not placing future contracts but are going to the operators as and when they require coal, the result being that few collieries have orders in hand for more than a week's work.

Business at Newcastle is confined to immediate needs, the same factors operating here as in Wales. A few European inquiries are circulating for quantities not exceeding 5,000 tons of various descriptions.

Production by British collieries in the week ended Feb. 14, a cable to *Coal Age* states, was 5,341,000 tons, according to official reports. This compares with an output of 5,418,000 tons in the preceding week.

Hampton Roads Market Quiet on Eve of Contract Closing

Business at Hampton Roads in the last week has been at a low ebb, some shippers reporting movement slower than at any time since the war.

Accumulations continued at tidewater, but as the week ended were being cut down by a slow-down in shipments to port. Coastwise, bunker and foreign trade all were slumping, and the tone of the market was decidedly week. High-volatile coal dropped below $4 for the first time in a good many months, and shippers reported inquiries exceedingly rare.

The proximity of the contract period of April 1, some shippers said, was responsible for inactivity in the trade now, as many buyers apparently were holding off until the time for new contracts arrived.

French Coal Now Moving Freely; Wages Raised in Many Fields

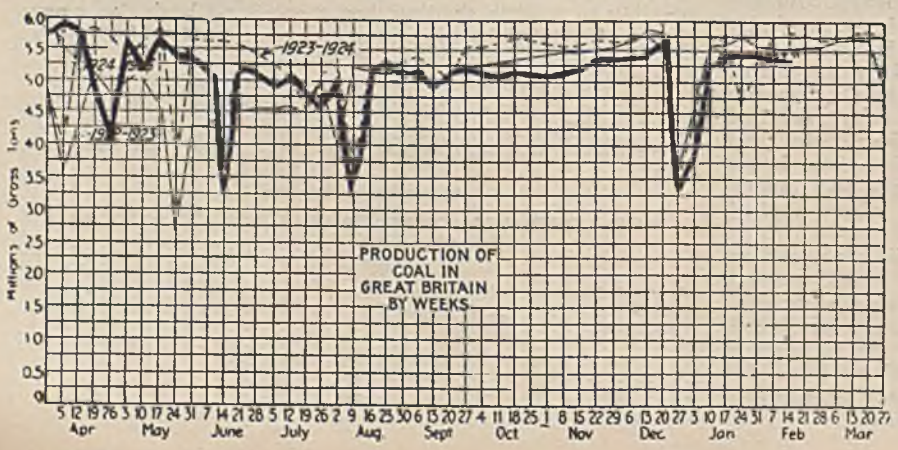
Output is selling freely in the French coal market. While there is no prospect of a change in prices, the Nord and Pas-de-Calais are considering the reestablishment of zone prices in certain sections where British and German competition is the keenest, which would mean a decline of about 4f. per ton in the regions furthest from the mines.

In the Loire coal field the men have been granted an increase in wages commensurate with that allowed in the Nord and Pas-de-Calais. The Moselle mines, in Lorraine, also have just conceded to the miners in their employ an advance in the indemnity for the high cost of living of 0.50 to 1f. per day, according to the age of the workmen.

The labor conflict in the Saar mines has been settled by wage increases conceded by the administration averaging 1f. 60c. per day.

Conditions in other branches of the industry are quiet. The Paris retail market is dull as the merchants are confronted with the readjustment of wages and a noticeable increase in transport charges. Prices, however, are unchanged apart from an advance of 5f. in maximum quotations.

When the O. R. C. A. tried to obtain increased supplies of free coke at a price more in keeping with that paid by German consumers the Ruhr cokeries refused to do business at less than the official price, fearing that any reduction they might consent to on these contracts might be applied to indemnity deliveries later on.



U. S. Fuel Exports in January And Their Destination

(In Gross Tons)

	Jan., 1924	Jan., 1925
Anthracite	272,005	296,075
Bituminous	1,057,639	979,600
Exported to:		
France	15,285	11,105
Italy	95,172	44,616
Other Europe	2,092	3,000
Canada	745,232	710,886
Panama	12,052	19,366
Mexico	5,828	9,470
Br. West Indies	4,026	13,832
Cuba	50,529	52,016
Other West Indies	28,912	9,651
Argentina	.....	12,656
Brazil	49,790	80,785
Chile	7,097	2,998
Egypt	7,418	.....
French Africa	7,950	.....
Other countries	26,256	9,219
Coke	53,117	62,845

Export Clearances, Week Ended Feb. 26, 1925

FROM HAMPTON ROADS

	Tons
For Porto Rico:	
Amer. Str. Irene, for San Juan	4,698
For Jamaica:	
Nor. Str. Facto, for Kingston	2,194
For France:	
Nor. Str. Hellen, for Marseilles	6,266
For Italy:	
Br. Str. Glenbank, for Savona	8,220
Ital. Str. Giovanni, for Porto Ferrajo	10,012
Ital. Str. Pollenzo, for Genoa	9,341
For Peru:	
Peru. Str. Tango, for Pimental	692
For Brazil:	
Br. Str. Dovenby Hall, for Santos	5,268
For Cuba:	
Nor. Str. Askeladdee, for Havana	3,674

FROM BALTIMORE

For Ecuador:	
Br. Str. Almagro, for Guayaquil	1,033
For France:	
Ital. Str. San Pietro, for Marseilles	7,015

FROM PHILADELPHIA

For Newfoundland:	
Nor. Str. Nyhavn, Port Aux Basque	——
For Cuba:	
Nor. Str. Dampen, for Havana	——

Hampton Roads Pier Situation

	Feb. 19	Feb. 26
N. & W. Piers, Lamberts Pt.:		
Cars on hand	2,071	1,934
Tons on hand	130,918	116,330
Tons dumped for week	160,764	143,457
Tonnage waiting	12,000	18,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	2,149	2,056
Tons on hand	146,000	136,500
Tons dumped for week	85,888	92,722
Tonnage waiting	21,231	2,000
C. & O. Piers, Newport News:		
Cars on hand	2,910	2,604
Tons on hand	147,180	132,600
Tons dumped for week	132,183	137,328
Tonnage waiting	6,125	1,175

Pier and Bunker Prices, Gross Tons

PIERS

	Feb. 21	Feb. 28†
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	4.30@ 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	4.15@ 4.20	*4.15*
Pool 2, Hamp. Roads	4.10	*4.00*
Pools 5-6-7 Hamp. Rds.	4.00	*3.90*

BUNKERS

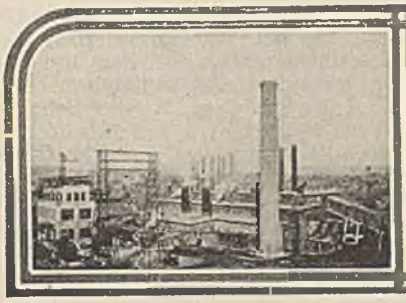
Pool 9, New York	$5.00@$5.25	$5.00@$5.25
Pool 10, New York	4.75@ 4.90	4.75@ 4.90
Pool 11, New York	4.55@ 4.80	4.55@ 4.80
Pool 9, Philadelphia	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.25	4.25
Pool 2, Hamp. Roads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

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

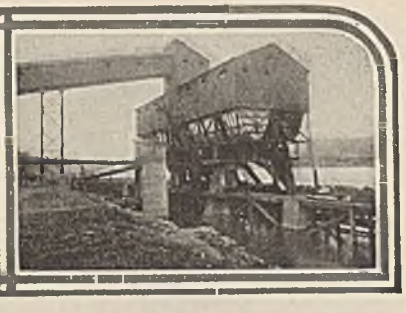
Quotations by Cable to *Coal Age*

Cardiff:	Feb. 21	Feb. 28†
Admiralty, large	26s.@26s.9d.	*26s.*
Steam smalls	15s.@16s.	**16s**
Newcastle:		
Best steams	18s.6d.	18s.6d.
Best gas	21s.	21s.
Best Bunkers	17s.6d.@18s.6d.	*17s.3d.@18s.6d.*

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



News Items From Field and Trade



ALABAMA

The U. S. Bureau of Mines, Birmingham station, has announced a list of meetings to be held throughout the mining district under the direction of the Joseph A. Holmes Safety Association on the subject "Necessity for Discipline." Speakers have been assigned appointments which will extend through March 13. The program is in furtherance of a special drive to stimulate interest in accident prevention and encourage first-aid work at mining operations.

The Sloss-Sheffield Steel & Iron Co. is reported to have closed a contract for the construction of a connecting link between its Flat Top coal mine and coke oven yards and the line of the Cane Creek branch of the Louisville & Nashville R.R., which passes within about four miles of the Flat Top colliery, and to have also perfected a lease with the railroad company for operating privileges over the railroad line for about sixteen miles. This will enable the Sloss company to transport coal and coke from Flat Top to Birmingham over its own rails and use its own equipment by means of effecting a physical connection between the Louisville & Nashville branch line with the Sloss company's railroad extending from its Mary Lee Mines, at Lewisburg, to North Birmingham. This will effect a great saving in freights to the Sloss company on raw material for its North Birmingham byproduct plant. The company is said to be in the market for several locomotives and 200 coal cars for the contemplated service.

A deal is reported to have been closed whereby the Gulf States Steel Co. has acquired valuable coal lands in Tuscaloosa and Fayette counties, known as the North River and Friedman holdings, from the Bessemer Coal, Iron & Land Co.. About 85,000 acres and some $2,000,000 is said to be involved in the trade, but officials of the corporation declined to confirm or deny the transaction. The properties in question are said to contain valuable coal seams, which, however, are of considerable depth, necessitating a rather heavy development cost. The lands are well situated in regard to transportation facilities, being in close proximity to the Mobile & Ohio, Louisville & Nashville and Southern railways.

GEORGIA

The Roach Creek Coal Co., with mines in east Tennessee and headquarters in Cincinnatti, has opened an office in Atlanta with B. B. Collier in charge.

ILLINOIS

All Montgomery County coal-hoisting records are believed to have been smashed at the No. 10 mine of the Indiana & Illinois Coal Corporation at Nokomis in a three days' continuous run ending Feb. 18, during which 18,288 tons was hoisted.

The O'Gara Coal Co. has announced the closing of its No. 12 mine at Muddy, employing 300 men. The company expects soon to reopen its No. 15 mine at Carrier Mills, employing 400 men.

A recent statement issued by the Coal Operators Association of the 5th and 9th districts, in St. Louis, shows an output for the month of January, 1925, of 1,304,531 tons. This covered 79 mines for which reports have been received regularly for the past three years. The output for the same mines for January, 1923, was 1,737,114 tons and for January, 1924, was 1,581,751 tons.

During the week of Feb. 16, the Indiana & Illinois Coal Corporation started construction on a large power plant at Witt, five miles west of Nokomis. The new plant will furnish power to the Taylor Springs, Kortkamp, Nokomis and Witt mines.

Much activity is being centered around the new strip operations at Ward, south of Duquoin. This is the location of the new strip mine which is being opened by a group of Carbondale and Marissa coal men. They have a huge shovel now under construction in the factory.

Many southern Illinois mines have shut down since the end of the semi-monthly pay, Feb. 15, throwing approximately 2,000 men idle. The list includes the following: Victory Coal & Mining Co., at Duquoin; O'Gara Coal Co., No. 12, at Harrisburg; Peabody Coal Co., No. 8, at Tovey; Taylor Coal Co., at Royalton, and the Peabody Coal Co. mine at Coalton, sixteen miles west of Pana.

C. M. Rau, engineer, who was released by Governor Pinchot of Pennsylvania to make surveys for the giant power project contemplated by Frank Farrington, president of the Illinois United Mine Workers, has assured the mine workers that recommendations concerning the project soon will be made. Mr. Rau plans to make preliminary survey of the coal industry first as a step toward determining the feasibility of the project. President Farrington conceived the huge power plant as a means of aiding the unemployment situation existing among the mine workers of Illinois. The last convention of the miners held in Peoria authorized Farrington to proceed with a survey of the possibilities of the power plant.

INDIANA

The Kern mine near Terre Haute, damaged more than $4,000 by a recent fire in the engine house, has resumed operations. It was reported immediately following the fire that the mine would be idle for about eight weeks. The work of rebuilding was pushed through earlier than had been expected.

A lease of 1,000 acres of coal land near Terre Haute to the Walter Bledsoe Co. by the Indiana Electric Corporation was recorded recently. The mining company is to pay 5c. a ton to the electric company and is to mine the No. 5 vein. The terms of the lease provide that the corporation can buy the shafts of the Bledsoe company for the original cost price less 10c. a ton for every ton removed or hoisted by the machinery at any time by giving a ninety-day notice. The lease will begin from the day the mine is capable of hoisting 200 tons a day and will run for a period of ten years. The lease, however, is not to be in effect after March 1, 1937. Coal is to be sold to the electric company at a price to be agreed on March 1, 1925.

IOWA

The Johnson Coal Co., of Boone, is about to begin work on its shaft, to be of timber construction, and to cost about $5,000.

KANSAS

Among a large number of applicants taking the examination before the Kansas state mining examining board on Feb. 21 were ten seeking to qualify for deputy state mine inspector. Anticipating that there are likely to be changes in the personnel for the inspection force following changes in the industrial court, which has jurisdiction over it, a number of miners are trying to qualify for the jobs.

A bill forbidding the removal of workmen's compensation cases from state to federal courts was introduced recently in the Kansas Legislature by H. W. Shideler, of Girard. The bill was prompted by a recent move by liability companies with which coal operators were insured to transfer compensation cases to federal court. The bill would extend the powers of state courts in compensation cases and would increase the amount of compensation obtainable in case of death. Another bill favored by insurance com-

panies, is, with the Shideler bill before the joint labor committee of the Legislature. It would place the administration of the compensation law in the hands of a state commission or commissioner. Neither bill is expected to be reported favorably by the committee, but there is a belief that an entirely new bill will be drafted to determine the manner of administering the compensation law.

KENTUCKY

The Kentucky Washed Coal Co., near Nonell, is completing a new washing plant, said to be the finest and newest type of washer in the fields of the state. The plant is being tested and probably will be in operation within a few days.

There has been a good deal of coal moving by water over the past few weeks as a result of good boating stages and no ice in the rivers. The West Kentucky Coal Co. is towing coal steadily from Casyville to Paducah, where it is making up fleets which move South. The Island Creek Coal Co. is towing steadily from Huntington, W. Va., to elevators at Cincinnati, Ohio, and some coal is coming into the Louisville market from West Virginia, as well as the Kentucky river points.

MINNESOTA

The receivers' sale of the property of the Reeves Coal Co. Yards, Inc., of Minneapolis, resulted in the property going to W. H. Dahn, vice president of the First National Bank of Minneapolis, West Broadway branch, for $14,000.

S. A. Stellwagen, of Minneapolis, manager of the Ford Motor Co.'s Twin City branch has just returned from a trip to the factory at Detroit. He states that the company expects to bring forward several hundred thousand tons of coal to the Head of the Lakes during the coming season for distribution over the Ford dock at Duluth.

MISSOURI

The Southern Coal, Coke & Mining Co. showed the U. S. Bureau of Mines motion picture films, "When a Man's a Miner," a safety-first educational film developed in co-operation with the Peabody Coal Co., and the "Story of Coal" and also the B. & O. R.R. film, "The Three Atoms" to more than 800 people, miners and their families at Belleville and New Baden Feb. 11 and 12.

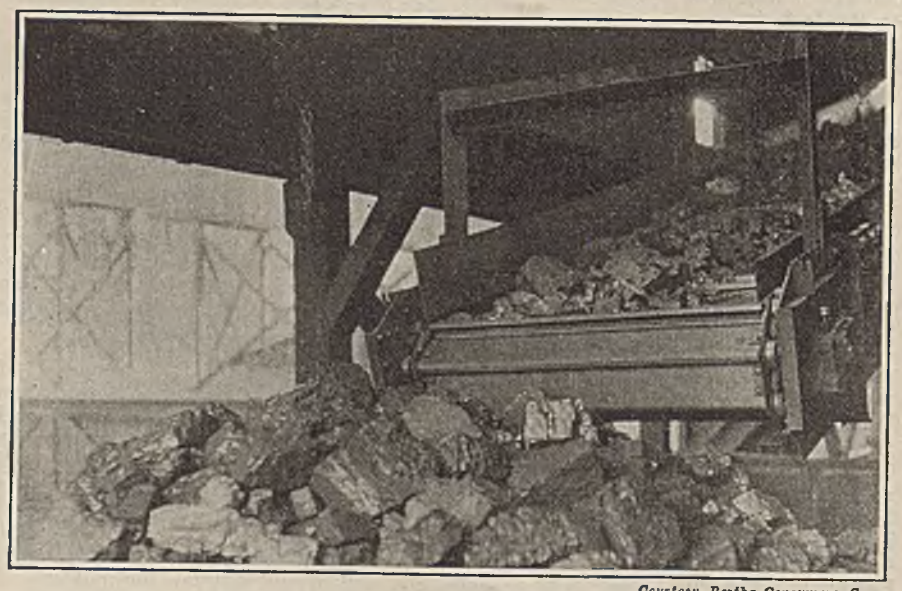
Operators from the Muhlenberg County field of west Kentucky had their representatives in St. Louis recently endeavoring to establish a sales connection that would give first consideration to moving their coal into St. Louis and the Northwest. They claim to be operating non-union and on a wage basis that is very attractive. The statement is made that they are in position to overrun Illinois and Indiana coal regardless of freight-rate differentials so long as the present wage scale stands in those states.

OHIO

Bids on 4,500 tons of Hocking nut, pea and slack for the garbage reduction plant and 11,500 tons of the same grade of coal for the municipal light plant, received Feb. 3 were rejected and the tonnage will be readvertised at a date to be fixed soon by the Columbus Board of Purchase. The only bidder on the two lots was the William S. Harman Coal Co. of Columbus, which bid $1.18 on the 4,500 tons and $1.23 on the 11,500 tons, f.o.b. mines.

OKLAHOMA

The Wise-Buchanan Coal Mining Co. announces that it is opening two additional entries to its mine which will permit an increase in the number of miners to 125. Other mining companies are planning improvements. All 57 of the mines in the Henryetta district have been in operation during the last few months. The Pittsburg-Midway Coal Co., which ordinarily employs 100 miners, has been working slightly less than this number, but has been in operation since last September. The mine of the Sun Coal Co. near Schulter has been cleared of a bad fall of rock and is again in operation. The Green Ridge, formerly the McDonald mine has fired up and is now in full operation.



Courtesy Bertha-Consumers Co.

Fairmont Low-Sulphur Gas-Coal Block

The Fairmont coal breaks into large well-formed blocks and the cleanliness of the coal makes picking these to pieces to remove impurity unnecessary. This scene is taken at the Rachel Mine of the Bertha-Consumers Co.

PENNSYLVANIA

H. A. Smith, vice president of the Delaware, Lackawanna & Western Coal Co., has been elected a director, increasing the directorate to nine members.

The Pennsylvania Coal & Coke Co., reports a January deficit of $65,000, against a surplus of $19,027 in January, 1924.

At the annual meeting of the Industrial Finance Corporation of New York, John Markle, president of the Jeddo-Highland Coal Co., was elected chairman of the board. The corporation is the organizer of Morris Plan banks and also controls the Industrial Acceptance Corporation.

The Adrian mine of the Rochester & Pittsburgh Coal & Iron Co., leased to other interests, is now producing from 1,200 to 1,500 tons daily.

A notice posted at the Cadogan mines of the Allegheny River Mining Co. reads: "Cadogan mine is closed down until such time as it can be operated at a profit." The notice is signed by Edgar W. Tait, president. Officials of the company stated that it was impossible to operate the mines at the present cost of production in view of the prevailing prices that are being offered for fuel. About 250 men are thrown out of employment.

Business in the Connellsville coke region is still slowing up. The Hillman Coal & Coke Co. is curtailing still more. The Century Coke Co. and Fayette Coke Co. have reduced to four days per week and the Snowdon Coke Co. has put out a few ovens. Many of the H. C. Frick Coke Co. plants are down to four days per week and the Footedale, Dearth and Juniata mines have closed down altogether. On the other hand the company has increased the output from the three Colonial mines over the new belt conveyor to the Manongahela River to 10,000 tons daily. W. J. Rainey, Inc., also is still curtailing.

Thomas Kennedy, who served as president of the United Mine Workers of District 7 for nearly fifteen years, having recently resigned to accept the position of international secretary-treasurer of the union, is succeeded by Andrew Matti, vice-president of the district. Mr. Matti has been vice-president of the district for the past twenty-seven years. Mr. Kennedy will continue as a member of the Anthracite Conciliation Board until all the grievances he has pending are cleared up.

Mechanics are engaged in installing an overwind safety device at No. 1 Richards slope of the Susquehanna Collieries Co., at Mt. Carmel. This mechanism is being placed to prevent accidents caused by overlifting of the

cars over the top of the slope. When the trip has reached a certain point this device will automatically cut off the power and apply brakes.

Coal operators who are looking forward to an early opening of the lake trade as the lifesaver for their business were cheered recently when they learned that ice breakers are at work to get two boats up to the Toledo loading docks. The plan is to load these two boats at once and start them up the lakes, watching their chances to get ahead as the ice goes out. The official date for the opening of navigation in the upper channel is May 1, but it is seen that the need for coal on the Northwest docks will cause some boats to go through before that date if the channel is free of ice.

TEXAS

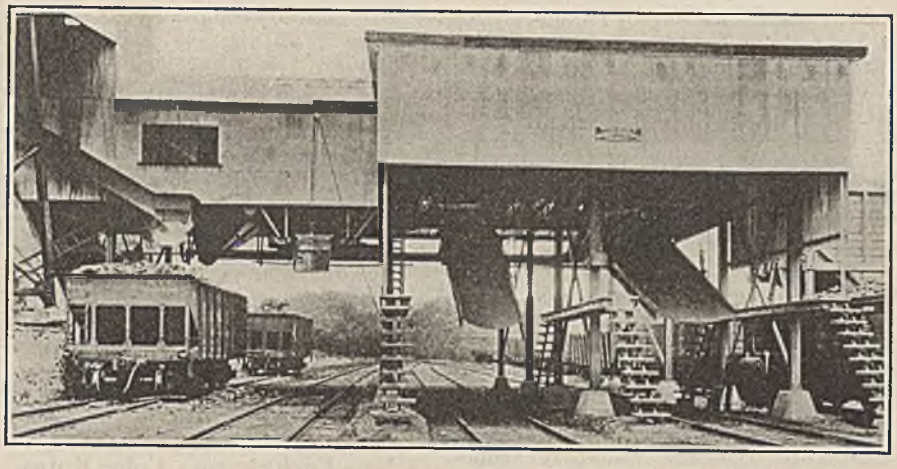
The Texas Power & Light Co. having made extensive tests to prove the availability of lignite to be used as fuel, announces that it will erect a mammoth power plant in Henderson County near Malakoff. The company has purchased several thousand acres of land, all underlaid with good quality of Texas lignite and will develop this land and mine fuel for the Malakoff plant as well as other Texas plants operated by this company.

UTAH

Representative William C. Stark, manager of the Citizens Coal Co., a prominent retail agency of Salt Lake City, has induced the House to start investigating the alleged action of Secretary Hicks of the Securities Commission who wrote a letter eulogizing the Great Western Coal Mines Co., promoters of which have been indicted by a federal grand jury. It is stated that the company after failing to make satisfactory progress on a regular stock basis, attempted to make headway by changing to the mutual plan. George A. Storrs, Jos. S. Welch, Earl J. Welch and Chas. N. Croft are the men who have been indicted. They are accused of using the mails to defraud. The trial is scheduled for March 16.

The Securities Commission has approved the application of the National Coal R.R. for a certificate to sell $450,000 worth of stock to complete construction of a road into the Gordon Creek region for the purpose of serving the National Coal Co., Great Western Coal Mines Co. and others. The issue will include $200,000 of first mortgage bonds and $250,000 of common stock, with no allowance for sale commission. The National Coal Co. has been given permission by the commission to offer for sale $400,000 of first mortgage bonds and $775,000 of paid-up capital stock to continue development of its coal lands in Carbon County.

The Standard Fuel Co., of Salt Lake City, one of the important coal mining companies operating a retail agency of its own, has filed a protest against the awarding of a contract recently for furnishing coal to the county infirmary, county jail and poor department, claiming that bids were not advertised.



A Modern Kentucky Tipple in Western Kentucky Coal Fields

The western end of Kentucky is full of old wooden top works at coal mines but this all-steel tipple at the North Diamond mine of the St. Bernard Coal Co., three miles from Earlington, is an exception. It was built in 1922 to handle 3,500 tons a day at the newest mine of the company—now absorbed by the West Kentucky Coal Co. There are 170,000 lb. of steel in the structure. This mine is using two Joy loading machines. It has had much trouble with a heavy flow of water underground. Part of the shaft is concreted through the water-bearing sand. The bottom and main entries are timbered with steel on which is supported concrete slabs.

VIRGINIA

All records for Mine No. 2 of the Virginia Iron, Coal & Coke Co., at Sexton, were broken on Feb. 19, when 1,112 bank cars, or 2,615 tons, were dumped over the tipple in eight hours. The mine is supervised by G. W. Rose, superintendent; W. V. Gibson, general mine foreman; V. C. Gibson, mine foreman, and Aula Kiser, assistant.

WEST VIRGINIA

A grand jury in the Circuit Court of Marion County returned six indictments naming forty-five miners and their families at Grant Town, charged with intimidating workmen at the open shop mines of the New England Fuel & Transportation Co.

It has been announced by J. T. Dunigan, president of the Coal River Collieries Co., that miners employed by the company will have a voice in the election of directors at the annual meeting to be held on April 6. The company, which is owned principally by members of the Brotherhood of Locomotive Engineers, operates on a non-union basis, and because of that fact has been engaged in a controversy with the United Mine Workers. The miners will elect one of their own number as a director of the company. Approximately 92 per cent of the miners employed by the company have subscribed for stock, for which they are paying on the installment plan under the co-operative plan of organization.

The Black Betsey Consolidated Coal Co. has changed its principal office from Putnam to Charleston.

The Beech Fork Coal Land Corporation, the Gilbert Fuel Co. and the Shelby Creek Coal Co. have filed certificates of dissolution with the Secretary of State of West Virginia.

Coal operators regard the action of the board of directors of the Hocking Valley R.R. in authorizing the double-tracking of that road from Columbus to Fostoria as a part of a plan to make the Hocking Valley an important link in a new trunk line system which is destined to provide an all-rail route from the coal fields of West Virginia, Ohio and Kentucky to the Northwest. The work of double-tracking the stretch between the two points mentioned will be completed this year and next year it is expected that the gap between Toledo and Fostoria will be completed. The fact that many long sidings were constructed during the war will greatly simplify the work of constructing an additional track.

As Mine No. 22 of the Consolidation Coal Co., at Monongah, has been closed down, forty union coal miners who had been employed at that mine were transferred late in February to the company's New England mine.

The published statement of earnings of the Hardy Coal Company for the year 1924 shows a profit of $136,623, after interest charges, but before depletion and depreciation, equal to $2.43 a share on the 56,063 shares outstanding. After deducting interest charges the profit per ton was 33c. It is stated that the company produced 410,754 net tons of coal in 1924, as compared with 174,709 tons in the last six months of 1923.

Information is to the effect that by the middle of the current year the Virginian R.R. will have its electrification project completed from Elmore to Princeton, and that three months later electrification will have been extended to Roanoke, Va. Double tracking of the road will be completed early in March.

The Jere mine of the Soper-Mitchell Coal Co. and the No. 2 mine of the Gilbert-Davis Coal Co. in the Scotts Run field of northern West Virginia have been closed down. It is understood that the Jere mine has only been closed down temporarily. The Gilbert-Davis mine has been closed down for some time.

It has been announced by J. T. Dunigan, president of the Coal River Collieries Co., that Warren S. Stone Mine No. 2, about 11 miles from Seth in Boone County, has been reopened after

having been closed down for more than a year. The closing of contracts for large volumes of coal for export made it possible to resume operations. About 20,000 tons a month will be produced at the mine and production will be increased at other mines of the company in Boone County and in Kentucky.

CANADA

The mines of the Crows Nest Pass Co., at Fernie, B. C., have been working fairly steadily since the new agreement between the company and the striking workers went into effect at the end of last year. This has been rendered possible through the company being able to reduce selling prices commensurate with the voluntary reduction in wages accepted by the men. The company states it is confident that it will be able to retrieve a large proportion of the coke trade it lost six years ago through labor strife and high selling prices. In the new agreement between the company and its men it has been provided that Nov. 11, Armistice Day, should be substituted for the hitherto observed Thanksgiving Day holiday in the Fernie and Coal Creek mines.

Statistics of the importation of coal during 1924 to the end of October show a large increase in shipments from the United States due to the protraded strike in Alberta, indicating that the operators of that province sustained a severe loss in the Manitoba market. Imports of bituminous coal at the head of the Lakes for the first ten months of 1924 totaled 1,656,447 net tons, compared with a five-year average of 1,434,064 tons. Imports at provincial customs ports for the period were 108,-181 tons, against 54,319 tons for the 5-year average. All told there was an increase of imports into western Canada of 276,245 tons, indicating that American operators have to a great extent regained the ground they lost in recent years in the Manitoba market.

Traffic

B. & O. Reduces Rates from Northern West Virginia

The Baltimore & Ohio R.R. will put into effect on March 15 new tariffs reducing the freight rate on the coal from Fairmont and nearby points to Buffalo, Black Rock and other points in that vicinity. The old rate was $2.58 a ton and the new rate soon to become effective is $2.47 a ton. The new rate applies as far east as Thornton but apparently does not affect points between Fairmont and Clarksburg. Points affected are Thornton, Ironton, Grafton, Fairmont, Kingmont, Grant Town, Baxter, Downs, Rivesville, Rock Forge, Cascade and all points on the B. & O. between Fairmont and the Pennsylvania state line.

In order to equalize coal traffic on the Cumberland Division and the Pittsburgh division, eastward, the B. & O. is now routing all coal mined along the Morgantown & Kingwood east via Morgantown and Connellsville instead of by way of Rowlesburg Junction and the Cumberland division. By the change practically all the coal mined on the Morgantown & Kingwood branch will be moved to Morgantown, thence to Connellsville, where it will be rerouted over the Pittsburgh division to Cumberland The company took this action in order to relieve the Cumberland division of some of the heavy coal freight traffic it was handling. Practically 80 per cent of the coal mined on the Morgantown & Kingwood branch originates at the mines of the Bethlehem Mines Corporation and is shipped to the byproduct plant of the Bethlehem Steel Co. at Sparrows Point, where it is mixed with southern West Virginia coal for byproduct coking purposes.

New Lackawanna Coke Rates Are Approved

The New York Public Service Commission has approved rates of the Delaware, Lackawanna & Western R.R. on coke, coke breeze, coke dust and coke screenings, carload minimum weight in open cars 50,000 lb., except that when car is loaded to full visible or cubical capacity, actual weight will apply, but not less than 35,000 lb., and in box or stock cars, 35,000 lb., from Harriet to Buffalo, Rochester & Pittsburgh stations: Barnard, Bocks Siding, Brooks, Brooks Avenue, B. L. & R. Ry. connection, Canal Dock Siding, Charlotte, Charlotte (Latta Road), Charlotte Docks, Dock Junction, Garbutt, Genesee Dock, Le Roy, Lincoln Park, Lime Rock, Maplewood, Mumford, Pittsburgh & Lehigh Junction, Rochester, R.R. & L. Junction, Scottsville, Stone Road Siding, Uptonville and Wheatville of $1.39 per net ton; no joint rates heretofore in effect; effective March 23, 1925.

The commission also has approved switching rates of the Boston & Maine R.R. on coal, carloads, in connection with line haul in either direction between Lansingburgh and Troy of 38c., a reduction of 2c. per gross ton; on coal, carloads, in connection with line haul, received from or delivered to the Delaware & Hudson or the New York Central at Troy 38c. per gross ton; a new rate; effective March 23, 1925.

Association Activities

The annual banquet of the **Buffalo (N. Y.) Bituminous Coal Association** was held on Feb. 20 with more than sixty in attendance, a good representation coming from out of town. The meeting is said to have been the most successful of any held so far.

A large attendance which took an active part in the business session marked the annual meeting of the **Southern Appalachian Coal Operators' Association**, which was held at Knoxville, Tenn., Feb. 20. Election of officers resulted as follows: President, C. W. Henderson, Knoxville, Tenn.; First Vice-President, J. E. Butler, Stearns, Ky.; Second Vice-President, H. C. Williams, Middlesboro, Ky.; Board of Directors, V. N. Hacker, L. C. Gunter, Alexander Bonnyman, G. M. Camp, John L. Boyd, C. M. Moore, E. C. Mahan, all of Knoxville, Tenn.; J. D. Templin, E. S. Helburn, of Middlesboro, Ky.; R. B. Robertson, Canton, N. C.; S. S. Pratt, LaFollette, Tenn.; E. L. Hampton, Tracy City, Tenn. V. N. Hacker, Knoxville, Tenn., was endorsed to fill the vacancy on the directorate of the National Coal Association, caused by the resignation of L. C. Crewe, who has retired from the coal business, for the time being, at least, to accept the management of the Robesonia Iron Co., Robesonia, Pa. R. E. Howe continues as secretary and treasurer.

New Companies

The Turkey Foot Coal Co., Louisville, $10,000 capital, has been incorporated by Robert Jameson, Joe Harris and Millard G. Cox, Jr. Liability limit is $25,000.

The Airdale Coal Co., of Wilder, Tenn., has been organized to operate a coal mine and engage in the wholesale and retail coal business. The incorporators are: Miss Vina Mullinix, Miss Abbie Pogue, Chas. Anderson, Walter R. L. Hamby and Oscar H. Jones. Miss Mullinix is president and treasurer, Miss Pogue is vice-president and Mr. Jones is general manager.

The Renfro Supply Co., of Williamsburg, capital $100,000 has been chartered by C. W. Renfro, S. L. Renfro and James Murphy, to handle mine supplies.

Guaranteed Fuel Saving Co., Inc., New York City has been chartered at Albany with $100,000 capital, of which 2,000 shares are preferred stock, $25 par value, and 500 shares common stock, $100 par value, to deal in coal-saving appliances. C. P. Shinn, 862 E. 34th St., C. P. Shinn, Jr., 2159 Redford Ave. and O. I. Lamberger, 2456 Woodbine St., Brooklyn, are the directors and subscribers. J. L. Hochman, 1540 Broadway is attorney for the corporation.

Banff Collieries, Ltd., has been incorporated with a capital of $1,000,000 and head office at Winnipeg, Man., by Elise Olafson, Daniel King, A. McFee and others.

The Coal & Mining Co. of Eagle Pass, Texas, has been organized and charter filed with the Secretary of State at Austin. The company is capitalized at $50,000 and will operate coal mines in the vicinity of Eagle Pass from which a good grade of coal is mined. Organizers of the company are: C. W. Settle, R. E. Doty and T. J. Evers.

The Hunter Mining Co., Providence, Ky., capital $60,000, has been chartered by W. L. Funkhouser, R. B. Cox and R. W. Hunter.

The Stearns Coal Co., capital $40,000, Louisville, has been chartered by J. S. Stearns, R. L. Stearns, W. T. Culver, E. E. Barthell, J. E. Butler, C. D. Saylers holding three shares each, and the Stearns Coal & Lumber Co., Stearns, Ky., with 335 shares. The debt limit is $100,000.

Obituary

Col. Frank Coles, of Ashland, Ky., for many years connected with the Ashland Coal & Iron Co., in which he was a large stockholder, was found dead in his bed on the morning of Feb. 11. Colonel Coles started at fourteen years of age as a drum boy in the Union army during the Civil War.

Coming Meetings

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. Calibreath, Munsey Building, Washington, D. C.

Chemical Equipment Exposition. June 22-27, Providence, R. I. Association of Chemical Equipment Manufacturers, 1328 Broadway, New York City.

New Equipment

Air Engine Silently Drives Shaking Chute Conveyor

Coal conveyors assist materially in reducing the cost of production of coal, and many mines have taken advantage of this means of reducing their production costs. For these reasons a description of one of the latest coal conveyors on the market, namely the Finlay, is presented.

This conveyor is of the shaker type, and the engine is driven by compressed air. Sections through the cylinder and valve-chest of the engine show at a glance the extreme simplicity and few-ness of the working parts. It will be observed that there are no tappets, cams or levers, and that the valve gear is entirely operated by compressed air. Fig. 2 shows the position of the valve and the piston at the beginning of the outward stroke. The piston travels forward until it uncovers one of the ports in the tube valve (shown in the top half of the cylinder wall), air then passes to the back of the piston valve and shoots it into the position shown in Fig. 3. The air then exhausts from the cylinder and allows the piston to return under the action of gravity. Before the piston has completed its return stroke it closes the exhaust port at the bottom of the cylinder, thereby trapping a quantity of air, and the high compression thus obtained serves, not only to reverse the piston valve, but also to give the kick to the troughing which is so effective in moving the coal. A remarkable economy is obtained in the use of compressed air, and what air which would otherwise have been lost to the exhaust, is utilized in doing useful work.

A photographic print shows the engine. It has been developed to meet the demand of the miners for a silent machine, for they realize that silence means safety to them. The quiet action has been obtained by passing the exhaust from the cylinder into two pressure-reducing chambers which are cast on the cylinder. From these chambers the exhaust is admitted to that end of the cylinder which is open to the atmosphere through one of the ports. In this manner not only is the exhaust silenced effectively, but the entry of grit by way of the atmospheric opening, which is a source of considerable trouble in some machines, is entirely prevented, and the engine therefore does not have to be brought out of the pit for cleaning.

It will be noticed that a special heavy-section steel angle-bar foundation frame is fitted to the engine, and screw jacks are fitted to the foundation frame. The two front jacks are inclined at an angle, and pit props are placed between the tops of the jacks and the roof. These sloping jacks effectively take the strain of the engine and prevent it from slipping. The two vertical jacks at the other end keep the back end of the engine from tilting. The engines are made in three sizes with cylinders 9, 11, and 13 in. in diameter. This complete outfit is marketed by the Finlay Conveyor Co., Newport, Monmouthshire, England.

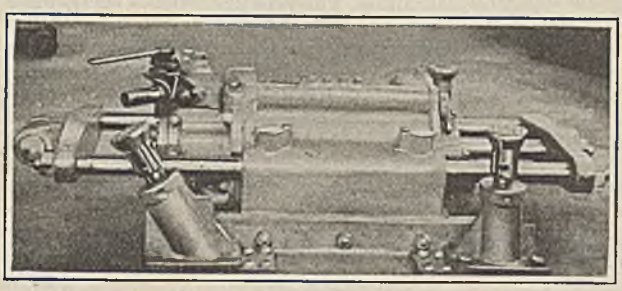
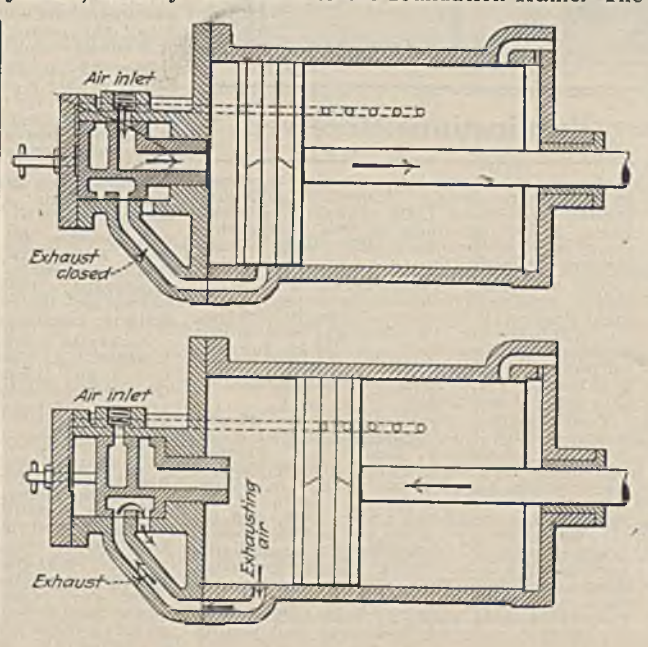


FIG. 1
Complete Engine
The screw jacks are fitted to the foundation frame of the engine to facilitate the work of installing the device and fastening it in position.



FIGS. 2 AND 3
Cylinder Sections of
The first figure shows the position of the piston and ports at the beginning of a stroke. The second figure illustrates how the return stroke is made. The piston returns under the force of gravity when the air exhausts from the cylinder.

Seamless Brass Tube Protects Electric Steam Radiator

An electric steam radiator known as the "Niagara" has been placed on the market by the Buffalo Gas Radiator Corporation, North Tonawanda, N. Y. This electric heating system consists of a cast-iron radiator fitted with extra-size nipples at the bottom into which the heating element is fitted. This element extends through the entire radiator, is of the heavy-duty type and is completely protected by a seamless brass tube which serves to provide large radiating surface for heating the water surrounding it. A three-heat switch is made a part of and affixed to the radiator. The radiator may be used on 25-cycle or 60-cycle current, 110 volts, direct or alternating current. Elements of the single-heat type can be supplied on special order to operate at 220 volts. A thermostat can also be furnished with the radiator, if desired.

Meter Service Switch

A new line of "class A" meter-entrance switches has been placed on the market by the Wadsworth Electric Manufacturing Co., Covington, Ky. These switches are intended for service where the central-station company encourages the customer to renew his own main service fuses. The service fuses are "dead" and accessible through a shuttered opening only when the switch is in the "off" position. The sliding shutter which covers the fuses and protects against theft of energy must be entirely closed before the switch can be thrown into service. These switches are known as the "1200" line, and are manufactured in the two-wire and three-wire types with and without test facilities.

Grinds and Classifies Rock Dust or Coal

Interesting work is being done with the new air classifiers, which have been developed by the Hardinge Co., York, Pa., for use with its conical mill.

These classifiers operate on an entirely new principle—that of reversed air currents. The same volume of air is used throughout the entire process of grinding and separating, the classification of fine from coarse material being accomplished by regulation of the velocity in different sections of the classifier. The current first enters the mill, stirs up the material, thus hastening its discharge, and at the same time reducing any moisture content. As the material discharges, this air cur-

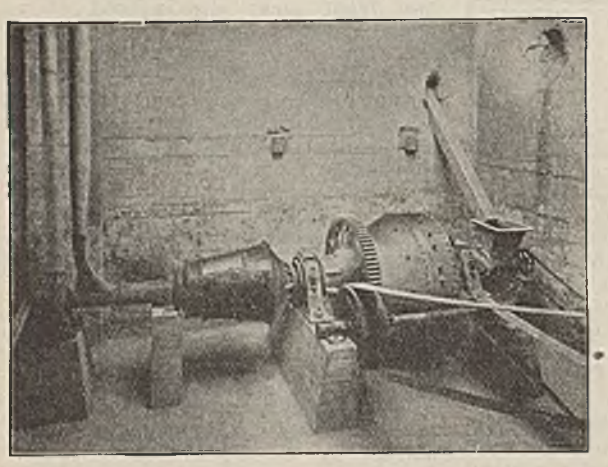


FIG. 1

Classifier and Mill

The fine particles remain in the device until they are sucked out by the fan. The coarse parts drop into the hopper and are blown back into the mill.

rent carries the fines directly to the finished product bin. Returning to the mill, at a higher velocity, the coarse oversize material is blown back into the grinding zone. The prompt removal of fines results in a marked increase in efficiency of the grinding unit. The cost of power per ton of material ground is reduced and the capacity of the mill increased.

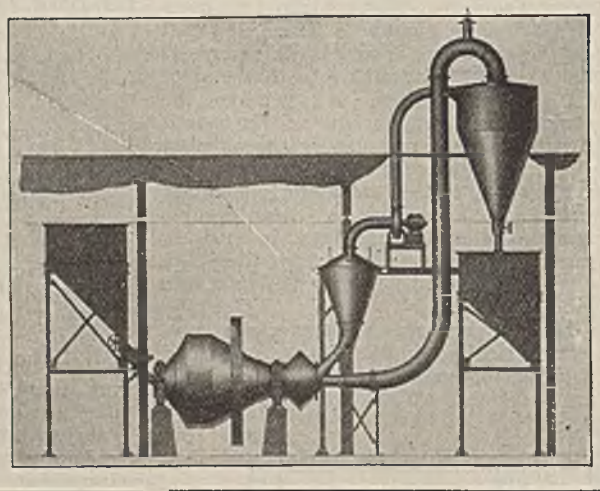
From Fig. 1 the simplicity of the layout may be judged. All auxiliary equipment is eliminated. This layout shows the rotary and superfine classifier, which will produce a product of any degree of fineness. Where a fineness up to 98 per cent passing through a 48-mesh, or 80 per cent passing through a 200-mesh is required, the rotary air classifier is recommended.

Fig. 2 shows the arrangement of the mill and classifier when grinding coal for pulverized-coal units. Satisfactory work has been done in grinding limestone and shale for rock dusting and here a simple arrangement of the mill and classifier on a standard mine car makes it possible to grind and distribute rock dust in the mine without the necessity for maintaining a surface plant, or a separate distributing unit. Capacities range from 400 lb. to 35 tons an hour for the rotary classifier and 300 lb. to 23 tons an hour for the rotary and superfine outfit.

FIG. 2

With Superfine Classifier

By the use of this system it is possible to obtain two products; one fine and the other granular. The coarse product is obtained by bypassing the oversize return of the secondary or superfine classifier.



Industrial Notes

The Denver Rock Drill Manufacturing Co. has moved its Pottsville (Pa.) office from 622 West Market Street to 500 West Market Street.

Lynn W. Nones has been appointed Eastern sales manager for the **Diamond Power Specialty Corporation**, in charge of the Atlantic Coast offices from Boston to Charlotte inclusive. His office is at 90 West Street, New York.

A. S. Taylor, formerly sales engineer for the United Alloy Steel Corporation, Canton, Ohio, is now with the **Central Steel Co.**, Massillon, Ohio, in the same capacity.

In order to best serve the interests of their customers in the Middle West, the **Okonite Co.**, Passaic, N. J., manufacturers of insulated wires and cables, have opened a sales office in St. Louis at 444 Frisco Building, with L. R. Mann in charge.

The Pennsylvania Crusher Co., of Philadelphia, recently appointed the Stratton-Cahoon Co., 809 McIntyre Building, Salt Lake City, Utah, district agents for the sale of its coal preparation machinery and heavy duty primary, secondary and fine crushers for limestone, gypsum, cement rock and ores.

Publications Received

Sharing Management with the Workers, by Ben M. Selekman. Russell Sage Foundation, New York. Pp. 133; 5½ x 8 in. Price, $1.50. A study of the partnership plan of the Dutchess Bleachery, Wappingers Falls, N. Y.

The Analysis of Fuel Gas, by S. W. Parr and F. E. Vandaveer. Engineering Experiment Station, University of Illinois, Urbana, Ill. Circular No. 12. Pp. 41; 6 x 9 in.; illustrated. Describes apparatus for the purpose of analyzing fuel gas and contains a synopsis of the methods best adapted to this type of apparatus.

Coal-Washing Problems of the Pacific Northwest, by Earl R. McMillan and B. M. Bird. Engineering Experiment Station, University of Washington, Seattle, Wash. Bulletin No. 28. Pp. 234; 6 x 9 in.; illustrated. Covers important results of investigations conducted up to 1923, and reviews various typical seams and their composition and characteristics, float-and-sink methods for determining specific gravities, float-and-sink studies of raw and washed coal, descriptions of washery practice and results of tests made at various plants in an effort to improve technique and results.

Recent Patents

Process for the Distillation of Bituminous Coal; 1,512,577. F. C. Blythe, Southsea, England. Oct. 21, 1924. Filed March 28, 1921; serial No. 456,197.

Process for Treating Coal or Other Mineral and Apparatus Therefor; 1,512,701. A. R. Lockwood, London, England. Oct. 21, 1924. Filed Nov. 8, 1923; serial No. 673,552.

Coal Drill; 1,512,841. J. R. Gamble, Belleville, Ill., assignor of one-half to W. F. Greiner, Belleville, Ill. Oct. 21, 1924. Filed Nov. 29, 1921; serial No. 518,623.

Acetylene Miner's Lamp; 1,513,068. A. C. Recker, Oakville, Conn., assignor to Chase Co., Inc., Waterbury, Conn. Oct. 28, 1924. Filed June 26, 1923; serial No. 647,809.

Coal Pulverizer; 1,513,279. Frank Sawford, Vancouver, B. C., Can. Oct. 28, 1924. Filed June 12, 1923; serial No. 644,942.

Glass Guard for Miners' Incandescent Lamps; 1,513,625. Anton Peters, Dortmund, Germany. Oct. 28, 1924. Filed Feb. 26, 1924; serial No. 695,232.

Car-Operated Mine Door; 1,510,600. John H. Miller, Pineville, Ky. Oct. 7, 1924. Filed Jan. 19, 1924; serial No. 687,292.

Trade Literature

Mounted Rock Drills. Gilman Mfg. Co., East Boston, Mass. Bulletin 101. Pp. 31; 6 x 9 in.; illustrated. Describes different types of rock drills for mine, quarry and contractor.

Gear Teeth that Are Accurate to Two Ten-Thousandths of An Inch is the title of a little folder on IXL ground-tooth spur gears put out by the Foote Bros. Gear & Machine Co., Chicago, Ill.

Attaining and Maintaining Quality in Instrument Manufacture. The Esterline-Angus Co., Indianapolis, Ind. Bulletin 1124. Four-page folder of standard letter file size describing the operating advantages of the instruments manufactured by this company.

American Flat Ash Gates. Conveyors Corporation of America, Chicago, Ill. Four-page folder describing these gates, which are of the rack and pinion type, for use in connection with storage tanks, ashpits, coal bunkers, etc.

Hand Held Rock Drills. Gilman Mfg. Co., East Boston, Mass., Bulletin 100. Pp. 27; 6 x 9 in.; illustrated. Among the different types described are: Plug-hole hammer rock drill for drilling dry holes, foot-hole hammer rock drill, light sinker for drilling with water under pressure, light sinker for drilling dry holes. Details of construction and various other information are included.

The Geo. D. Whitcomb Co. of Rochelle, Ill., has issued bulletin No. 2512, covering the subject of seven-ton positive gear drive gasoline locomotives and discussing in detail the power unit, clutch, transmission and construction of these locomotives.

The "2 in 1" Megohmer. Herman H. Sticht & Co., New York City. Bulletin No. 135. Pp. 8; 6 x 9 in.; illustrated. Designed to meet all requirements for quickly and accurately measuring insulation resistance; has a differential galvanometer movement with "megohm" and "ohm" scales and a hand-operated direct-current generator and voltmeter for A.-C. and D.-C. measurements.

Automatic Heat-Treating Machines for Rock Drill Bits. Gilman Mfg. Co., East Boston, Mass. Bulletin 102; 6 x 9 in.; illustrated. This bulletin should prove of particular interest to all users of rock drilling machines.

Safety in the Use of Explosives. Hercules Powder Co., Wilmington, Del. Pp. 86; 6 x 9 in.; illustrated. A paper by N. S. Greensfelder delivered before the thirteenth annual safety congress of the National Safety Council. The book is well illustrated and copies may be had upon request.

The American Blower Co., Detroit, Mich. has issued a four-page folder entitled **"A Complete Heating System Installed in a Day for Buildings Like These."** The advantages and capacity of the heater are recorded.

The Self-Contained Traveling Grate Stoker. Combustion Engineering Corp., New York City. Leaflet describing the novel features of this stoker for boilers ranging up to 600 hp.