COAL AGE

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

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Half Truths Are Misrepresentations

SECRETARY DAVIS at the National Safety Council meeting in Louisville called for facts about accidents and suggested that the Department of Labor was going to ascertain them, if Congress would support that development of the department's activities.

We have consistently contended that the facts about coal mining were misleading because they were not compared with facts regarding other industries. Now it appears that other industries are to come out into the light so that a comparison will be possible. It will no longer be so easy to condemn the coal industry simply because it has a record and the others no record at all. The coal industry feels glad that investigators are sharpening their pencils to keep track of other industries, confident that when the records are disclosed it will be realized that "when a man's a miner" he is not unduly prone to death.

There are other ways in which coal is being measured, and the measurement is unfair because it is not comparative. Perhaps after a while such measurements will be applied generally and it will then be found, we believe, that coal mining, though by no means clean of fault, does not compare unfavorably with other activities. Should the comparison, however, prove unfavorable the industry will be spurred even more than in the past to a house cleaning.

Screenings! Screenings!

THE ANNUAL futile struggle to sweep back the resistless tide of low price screenings is on. In some of the Midwest mining fields where the market price of screenings dropped enough to absorb all the seasonal increases on domestic sizes, operators are determinedly piling fine coal on the ground. And believe them, they are going to hold those screenings there if necessary until it's 32 above zero in Hades before they give that coal away to the patiently waiting big steam buyers. And so on and so forth. It is pitiful to hear them talk.

The truth of the matter is that storage at mines may raise the price of those screenings a shade—even enough, here and there, to cover storage losses and the cost of putting the coal down and picking it up again—but storage is no permanent cure for the screenings problem. The real cure lies in coking that fine coal. Some day the right process of low-temperature distillation will be evolved, economical types of ovens will be built. Then fine coal—if not even the whole mine output—will yield at least a part of its byproduct content and eventually be sold as good coke.

That day may not be far distant. Out of the extensive trail-blazing now going on somebody is going to chart the right course. One Illinois coal mining company is spending a quarter of a million dollars on experimentation in low-temperature distillation. With rare vision, and an even rarer willingness to spend money, these people realize that the mine operator stands to benefit first from the development of such a process and, therefore, should be first to know the art.

It is fitting that Illinois get seriously down to business because its proportion of screenings has increased from 19 to 48 per cent of the state's total output from 1900 to 1923, and the present annual loss to the state is from $10,000,000 to $12,000,000, if we accept the estimate of that skilled statistician Dr. F. C. Honnold. Considerable reduction in the proportion of screenings can be effected by improved blasting—possibly by the complete abolition of explosives—but low-temperature coking is the true solution of the screenings problem.

Working in the Dark

ELECTRICAL equipment plays such an important part in the successful operation of a mine nowadays that we wonder why so many mining officials are tardy in recognizing this fact.

Coal companies are of several kinds in this respect. There is the company that has an electrical engineering department which functions as such. Another company occasionally employs a consulting electrical engineer. A third type hires a chief electrician and lets it go at that, while a fourth is the company that just drifts along.

The ideal electrical organization is no doubt the one that plans and supervises the installation, use, and repair of all electrical apparatus belonging to the company. Such an organization is always on the job and continually sensitive of the changes and progress to be made by the company. Many appreciable savings can be effected by such a unit because nothing can occur within its scope of supervision without receiving proper attention.

Any company employing a consulting electrical engineer should not only use his services for particular jobs but have him continually in touch with all electrical details of the company. Only by a complete understanding of the various problems of a mine can a consulting engineer do his best. If an engineer is only temporarily employed the equipment he installs may never function as successfully or economically as was intended. He should remain on the job and direct its operation.

Too many companies are prone to fool themselves regarding their electrical organization. Self deception may be great sport for some people, but at home is a poor place to begin to fool. An electrical engineer traveling through some sections of the mining field would hate to be called an electrical engineer after he had seen some of the men who have been handed this title by their employers.

Those companies not having someone to look after their electrical apparatus are either small or some peculiar conditions are keeping them from bankruptcy. An adequate conception of the importance of electrically operated machinery by the managing officials will quickly make them realize that the day has passed when they can operate without knowing what is happening to their electrical energy or what is causing delays and high maintenance costs.

Possibilities of Stainless Steel

ONE OF THE useful metal alloys to make its appearance within recent years is that known as "stainless steel." At first to most people this metal appeared to possess possibilities only in the direction of domestic utensils, cutlery and the like. Its production and use, however, has now progressed to the point where it would seem to be adapted to a far wider field of industrial usefulness.

Steel of this kind is stainless because it resists both acid and corrosion. This characteristic renders the material suited for many uses to which ordinary steel is but poorly adapted. Of course, only the test of time and use can establish the adaptability of any metal to engineering purposes and the utility of any product is determined by balancing its cost against the service rendered.

At the present time, however, it would appear that stainless steel might find a place in the coal industry as shaker jackets, chute linings, jig linings, pump linings, as pipe for conveying acidulous water and in short wherever a forged or rolled acid-resisting metal is now desirable. It might be interesting to ascertain also how a steam power boiler built of this alloy or its close relative, rustless iron or chrome iron, would endure when fed with acidulous mine water. If its performance and life were satisfactory the water problem of many a mine now experiencing difficulties of this kind might be permanently solved.

The Humbug Harvest

AUTUMN is pre-eminently the season of harvest. But the harvests of grain and fruit are not the only ones that come to maturity in the Fall. Almost every autumn brings forth its crop of "fuel savers." No sooner do leaves begin to accumulate on the lawn than the good man of the house begins to receive "literature" setting forth in glowing terms the advantages, pecuniary and laborwise, of installing this or that device on the furnace door, the check damper, the smoke pipe leading to the chimney, or of treating the fuel or the ashes with some marvelous chemical that simultaneously aids combustion and conserves the purse, the back and the commandments.

Now it is not the intention here to utterly condemn all of these devices, *en masse*, as unmitigated fakes and humbugs. Some of them if properly installed and handled may give some degree of economy. As a rule, however, an equal economy could be secured by proper manipulation of the furnace itself.

Taking them by and large the "fuel savers" that make their appearance with the first frost and fade away about the first of March, are of three general types: Chemicals, devices placed between the furnace and the chimney or within the chimney and devices that admit air above the fuel bed.

Most chemicals sold in powder or crystal form, to be dissolved in water and sprinkled on the fuel to promote its combustion or "make it go farther," or to render possible the burning of ashes, have little or no real value. Common salt added to coal or coke in the proper amount will change the color of the flame, imparting a characteristic yellow tint. Copper or its salts gives an equally characteristic blue tinge. Such chemicals may deceive the observer but hardly aid combustion. Sodium or potassium nitrates and in general, chemicals that liberate oxygen on the application of heat may aid combustion but are expensive and consequently are sedulously avoided by the concoctors of "fuel savers."

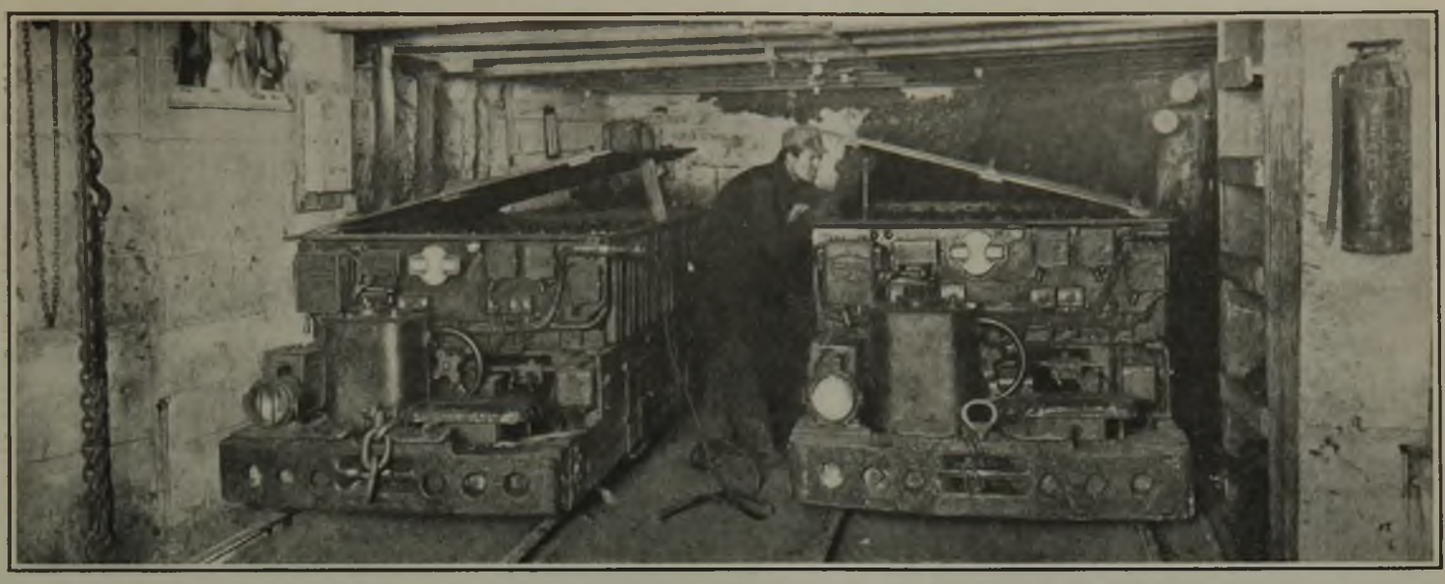
Devices placed between the furnace and the chimney or within the chimney itself usually operate on the idea that lowering the chimney temperature prevents heat loss or rather lessens the quantity of heat that "goes up the flue." While it is quite true that admitting cold air into the smoke pipe or chimney lowers the temperature of the chimney gases, it is not true that this process accomplishes any desirable result. In fact it may seriously reduce the draft and decrease the rapidity of combustion on the furnace grate.

Devices that admit air immediately above the fire come on the border line of usefulness. It is a fact that certain fuels require the admission of air above the fire during the coking process if perfect combustion is to be secured. In order to be effective, however, this air should be thoroughly mixed with the gases arising from the fuel bed before these gases come in contact with the comparatively cold metal surfaces of the furnace. Practically all furnaces are fitted with a draft in the fuel door for this express purpose. This draft is masked by a perforated baffle plate intended not only to prevent the fuel door from warping but also to heat the air admitted above the fire and to introduce it into the combustion chamber in a series of small jets or streams so that it will mix thoroughly with any combustible gases that may be present.

Ordinarily the householder forgets all about this little draft in his furnace door and the function it is supposed to perform. The device in question in effect substitutes some other form of air and gas mixing device and keeps the draft permanently open. It may or may not perform a desirable function depending upon the volatile content of the coal burned, the desired rapidity of combustion and other factors.

Nothing that has been here said is intended as casting any reflection upon various electrical stokers intended to render available to the householder the finer grades or steam sizes of anthracite. Nor is aspersion cast upon many other devices such as thermostatic furnace controls or various chimney caps or cowls that increase the draft. Many of these are designed on scientific principles and really accomplish economic results. But it has been rather the endeavor herein to point out that there are various and sundry fly-by-night, catch-penny schemes to which no honest coal producer or dealer can afford to lend his sanction.

IN RUSSIA loose-tongued enemies of the government in the streets are silenced forever in the coal mines by the dreaded Tcheka. In America we can't even check a few that are already in the mines.



Testing Battery Cells

How to Save Power and Thus Reduce Maintenance And Operating Costs of Mine Machinery

By Reducing Power Used Motors Are Saved from Overloading—Watch Operation Through Power Consumption—Machine Bits of Irregular or of Excessive Length Waste Power —Frequent Sharpening Less Desirable Than Correct Shaping and Tempering

By W. H. Russell
Farmington, Ill.

THOUGH the cost of electric power used in mining coal heretofore has not been a large item, in comparison with that for labor, changes in the system of mining seem likely to increase the power used. This will eventually mean that it will be necessary to have facilities for separating the power cost for each class of service just as the cost of labor is now separated. This is the only practical means of detecting and locating leaks so that they may be stopped. Such a system may be quite expensive in some cases and in others cheap. Where power for cutting and haulage operations is supplied from separate feeders, it is a simple matter to meter their requirements.

With direct-current systems supplied by alternating-current converting apparatus, it must be remembered that the total direct-current power supplied by a converter or motor-generator set will not equal the alternating-current power supplied to the converting equipment, yet it is for the alternating-current power that payment must be made. The losses, however, can be charged in proper proportion to the power used as recorded by the direct-current meters.

This method has often disclosed a serious loss caused by running a large motor-generator set to supply direct-current power for a small pump during the night shift. Sometimes it requires more power to operate the motor-generator set than it does to run the pump. Such a loss may amount to a considerable sum of money in the course of a year, besides the wear on the motor-generator set.

One of the principal reasons for keeping separate records of the cost of power for different purposes is that many things can happen to mining machines, locomotives and other machinery which will cause them to be wasteful of power even when they appear to be working satisfactorily and efficiently.

Wasted power may seem to be an insignificant subject to some who have never investigated it, but it is a fact that some of the simplest things may be causing leaks which amount directly or indirectly to thousands of dollars annually. For instance, it was decided a few years ago that the cutter chains on our mining machines were not properly arranged and were the cause of undue wear on all parts of the machines. After some experimenting we decided that a certain arrangement would give the best results and all of the chains were rearranged accordingly and that without the use of any new parts except rivets.

The immediate results were an increase of from 15 to 20 per cent in the work accomplished by the machines and a noticeable reduction in the heating of the motor and cable. From this example it can be seen that a reduction in the power required by the machines will make savings by decreasing the wear and strain on every part of the machine, but the saving of power is in itself well worth while.

After using this new arrangement of the chain for a month, we found that the power consumption for coal cutting had dropped from 1.33 kw.-hr. per ton to 1.09 kw.-hr. per ton. After several years use of the same chain arrangement it has been found that the power consumption for all of the machines, both shortwall and breast types, varies from 1.04 to 1.2 kw.-hr. per ton whereas for all of the time previous

Note—By keeping tabs on the current consumed by apparatus, as shown in the headpiece, correct conclusions can be made as to the condition of the equipment. Load charts will tell when a motor is overloaded and quickly show whether it is earning or saving the money expected.

to the adoption of this chain arrangement, beginning when the machines were new, the power consumption varied from 1.1 to 1.52 kw.-hr. per ton, the average saving being about 0.6c. per ton. The power consumption for two typical years before and after this change expressed in cents per ton is shown in Fig. 1. These results were all obtained from machines operated in a 4-ft. seam and include the power-conversion losses from alternating to direct current and transmission to the machines.

Keep Close Watch of Power Consumption

It is not a difficult matter to measure the power used for various purposes, but it probably is impossible to estimate accurately the indirect savings that can be effected by keeping watch of the power consumption and maintaining it as low as possible. Unfortunately the usual system of mining coal does not permit close supervision of either machinery or men, but a good check on the performance of machinery can be kept by a constant comparison of the cost of power with production.

Not all the defects which are revealed by a close watch of power consumption are mechanical or electrical —the human element is a big factor.. Machine runners

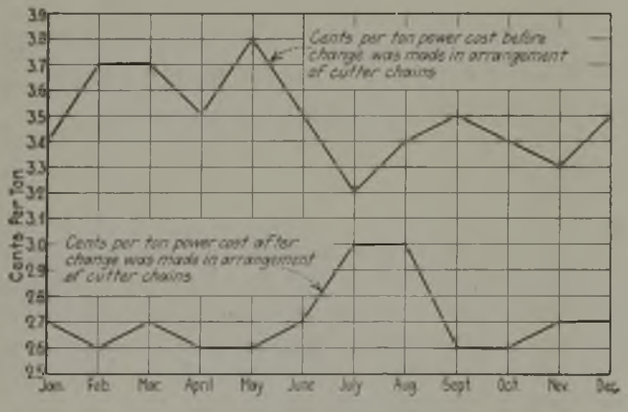


Fig. 1—Results Obtained by Rearranging Cutter Chains
Improper adjustments of chains on coal-cutting machines quickly increase the amount of power required. Delays and the careless repair of cutter bits also increase operating costs.

as a rule do not realize that if they do not set their bits properly they may increase the load on their machine as much as 25 or even over 50 per cent. If you have ever used a dull saw with teeth improperly set and then used it again after it had been sharpened and accurately set, you can realize what can be done to a mining machine by setting the bits at all lengths so that the long ones are immediately dulled. The first indication of poor results is in the power consumption and the last, perhaps, in the junk heap.

It must be remembered also that the bits may be set perfectly even and still cause unnecessary load by setting them a little too long; if they are set so as to cut a 6-in. kerf when a 5-in. kerf is enough, the power used in actually cutting the coal is increased and the quantity of cuttings is increased 20 per cent.

Properly Sharpened Bits Effect Savings

The sharpening of bits is an important matter but only too often is it neglected. It seems as though the sole object of some bit-sharpening departments is to turn out as large a number of bits as possible. A little intelligent inspection will often disclose the fact that half the same number of bits, if properly sharpened and tempered, would do more work with less power and effect many savings.

Here again the human element should be considered; the average machine runner is more likely to change the bits in his machine when necessary, if he has a good supply which he knows will fit the chain without much hammering. If he can do a fair quantity of work after he gets them and does not have to hunt all over for a box of bits which he knows he will have trouble in setting into his chain, he will take better care of his machine. If he breaks the points off half of them driving them in and afterwards sees some of the others break off the instant they strike the coal, he soon cares little about his work. If the latter condition prevails he will be sorely tempted to put off changing bits as long as possible.

The sharpening and tempering of bits is a matter which deserves no little attention and, if the cutting is extremely hard, the proper attention to sharpening, tempering, delivering, and setting of bits will pay big returns. Once the proper system is well established and understood, the satisfaction resulting to everybody concerned is usually enough to keep it going with but little attention.

It has been found that the practice of checking up the power consumption of apparatus has been the means of discovering numerous wastes of power, some of which are important because of power losses and others because of damage to equipment by bad operating practices, such as starting locomotives in parallel, operating motors on resistance points, or running on grades with the motors in parallel when better results could be obtained with the motors in series. Mining machines are often geared too high, and this makes it necessary to run on resistance points with much waste of power and damage to the rheostat. In the opinion of some engineers this is a rather common fault of gathering locomotives. It is quite possible that there are some cases where heavy grades predominate and a slow-speed locomotive would be better for main haulage service.

Voltage Drop Wastes Power and Causes Damage

Voltage drop is a common form of wasted power. It results in serious damage to every electrical part of the system, not to mention the slowing up of production. Excessive voltage drop is usually the result of ignorance. It is my opinion that the voltage drop should not be allowed to exceed 10 per cent, but many will argue that the interest and other expense of sufficient copper to keep it at that value or less is more than the saving that can be effected. This would be rather a hard thing to prove, but it is certain that money invested in copper is much more easily converted into dollars and cents than wasted heat energy and roasted field coils and armatures.

The damage, unnecessary expense, and a long train of other evils, which are the result of allowing power wastes to continue, cost more than the power which is wasted. Power consumption is such a good indicator of production that it seems as though every possible advantage should be taken to know how much coal every kilowatt-hour produces and what part of every kilowatt-hour purchased or generated is wasted in roasting some perfectly good motor because it is dragging around a worn-out cutter chain or because somebody installed an expensive compressed-terminal rail bond with a hammer instead of with a bond compressor..

Alabama Coal Washing and Cleaning Practice Helps Make Good Metallurgical Coke*

Beds Carry so Much Extraneous Matter That Cleaning Is Necessary—Dirt Mostly Confined to Medium Sized Mine Product—Small Coal May Be Shunted Past Jigs—Sludge Must Be Recovered

By H. S. Geismer
Birmingham, Ala.

BACK in 1896 H. H. Campbell stated that: "The Birmingham district in Alabama has certain great advantages for there are few places in the world where fuel and ore are so near together, although, unfortunately, both are of inferior quality; the ore being low in iron and high in phosphorus and the coal giving a weak and impure coke."

This statement could not have been questioned in 1894, but by 1896 several Robinson-Ramsay washers had been put into operation and weak and impure coke was a thing of the past.

The Warrior coal field of Alabama contains six beds that yield coking coal of excellent quality. In descending order, these are: The Brookwood, Milldale, Pratt, America, Mary Lee, and Black Creek. In each of these, however, occur bands of rock and bone; and while some of the impurity present can be separated and gobbed by the miner, much of it must be loaded out with the coal. Consequently, unless the coal is washed it will yield a coke of varying ash and sulphur content quite unsatisfactory for blast furnace use. At present, the Gulf States Steel Co. is producing run-of-mine coal at its Virginia mine, from the America seam, that is sufficiently uniform and low in ash to permit of coking without washing, but this is the only exception to the above statement.

At the present time two new systems of coal cleaning are attracting attention throughout the United States —the air or dry-cleaning process and the Chance sand-liquid method. Neither of these has been tested in Alabama but with these two exceptions all the methods used for cleaning bituminous coal have been largely brought to perfection in this state.

Two-Compartment Jigs Used on Coking Coal

In recent years, practically all of the plants designed to produce coking coal have used two- and three-compartment jigs, while the companies making washed coal for commercial purposes favor single-compartment machines. Experience with Alabama coals has demonstrated that there is little difference in the quality of the washed coal produced on the different jigs if they are intelligently operated; there is, however, a wide variation in the amount of water required and the percentage of coal lost in the refuse.

When the first washers were built in Alabama, coal costs were low and the land surrounding the mines was owned principally by the operating companies. Fine coal was considered a necessary part of the sludge, and was allowed to find its way to the nearest stream. Increasing coal costs made it advisable to recover the fines and damage suits, instituted by the farmers upon whose land the sludge was deposited, made it necessary to retain the sludge at the plant.

Three Methods of Recovering Fines

At present, three methods are used for recovering the fine coal from the sludge and for clarifying the sludge-carrying water. These include: (1) Long settling or clearing tanks with slowly moving conveyors that drag the fines that settle along the bottom to the discharge end. This is the most common method, but where large capacities are treated it often requires all-night operation of the conveyor to recover the fines that have accumulated during an 8-hr. shift. It also has certain other drawbacks.

2. All the overflow water from the washed-coal settling tank (this water contains all the sludge) may be pumped to an elevated conical tank. The water is recovered from the top of the tank and flows back to the sump. The fine material is drawn off at regular intervals from the bottom of the tank and carried, by a conveyor, to the top of the washed-coal bin. The conical tank is far superior to the long horizontal tank, and there is nothing connected with it to get out of order.

3. To date, two installations of Dorr thickeners are to be found in Alabama; one is at the Palos plant of the Republic Iron & Steel Co., where coking coal is produced, and the other at the No. 2 Overton plant of the Alabama Fuel & Iron Co., which produces steam coal. The fines recovered by the Dorr thickener at Overton have no commercial value, as they run high in rash and fireclay, but as the washing plant is located near a large river it was considered advisable to prevent the sludge being carried into this stream.

At all the Alabama operations where coking coal is produced, the sludge consists of water, pure fine coal, and fine impurities. The percentage of impurities, however, is not large and it is neither necessary nor profitable to separate it from the fine coal. At some of the operations in the non-coking fields, the sludge contains a large percentage of rash and fireclay. In such cases the material passing 20-mesh is worthless and no attempt is made to recover it.

Standard Sized Screens Have Been Adopted

Alabama plants producing steam or commercial fuel almost invariably screen all the coal as it comes from the mine and wash only that portion that passes through the screen perforations. Generally these are 2-in., but occasionally 3-in. perforations are found. Such plants do not require crushers. To meet the growing demand for stoker coal, some of the commercial mines may

*Abstract of paper entitled "Coal Washing Practice in Alabama," to be presented before a meeting of the American Institute of Mining and Metallurgical Engineers, Birmingham, Ala., Oct. 13 to 15, 1924.

decide in the near future to crush their entire output and sell it in this condition.

Plants producing coking coal almost invariably crush and wash their entire output. At two large modern plants, however, the coal as it comes from the crushers is screened and the fines bypassed, only the coarser product being washed.

Two-roll crushers generally have been used for crushing. Several hammer crushers were installed in the early days but they produced too large a percentage of fines and complicated the sludge problem. Of late years, Bradford breakers have been installed at most of the large operations replacing crushers. At one plant in particular, one of these machines has entirely replaced crushers and has increased appreciably the capacity of the washer, as the breaker serves as a preparatory cleaner and relieves the jigs of some of their work.

At the mines where the entire output is washed, the coal is generally crushed to pass through a ¾-in. circular opening; this size gives excellent results on plunger jigs of the Elmore or Faust type. With the Stewart and Montgomery jigs, the size of the coal treated has little bearing on the quality of the washed coal produced; in fact, a feed of mixed sizes, from 2½-in. down, gives excellent results. Sizing before jigging as an aid to washing is not attempted at any plant in Alabama; sizing the coal to permit of bypassing the fines has quite a different object.

Because of the large percentage of slate and bone found in most Alabama coals, officials in charge of properties producing washed coal for coking purposes early realized the necessity of placing chemists at the coal washers to keep accurate record on the results obtained. It was soon found that these men were not only able to improve the quality of the washed product and to keep it uniform but also to reduce the cost. Their tests showed whether an excessive amount of coal was being lost in the refuse (this always indicated something wrong with one or more of the jigs). Such a condition being quickly noticed, could be remedied before any large loss resulted. Operating a modern coal washer without a chemist is like running a modern power plant without recording gages.

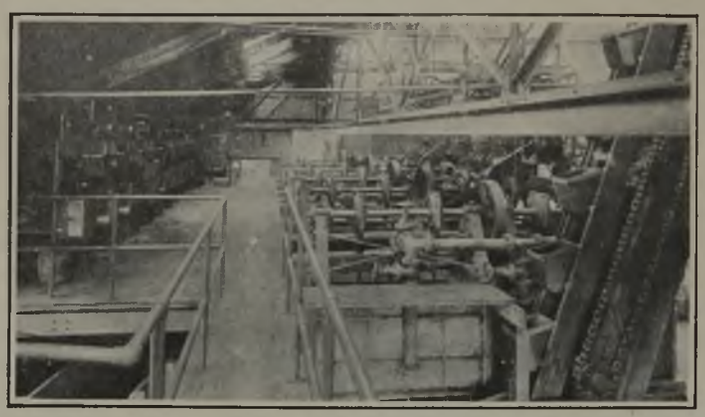
Washery Buildings are of Permanent Nature

All buildings around coal mines formerly were constructed of wood and the first coal washers were made of the same material. Gradually steel and concrete replaced wood for all mine buildings including coal washers. There is much difference of opinion as to whether concrete, cast iron, or structural steel is best suited for jig tanks and all three have their advocates. Steel plates are not satisfactory if the water being circulated in the jigs is corrosive; if it is not corrosive fairly heavy plates have been found satisfactory. In the modern plants fireproof construction is used throughout.

The four large iron-producing companies of the Birmingham district have done much experimenting with coal washers and data covering one washing plant of each company has been furnished.

The Woodward Iron Co. coal washer at the Woodward byproduct plant handles Pratt seam coal from the company's mines at Dolomite and Mulga. All the raw coal goes through Bradford breakers and the material rejected by them is carried to the refuse bin. The material passing the breaker perforations is delivered to a battery of Hummer screens. The material passing through the screens (⅜ x ½-in. slots) bypasses the jigs and is taken directly to the washed-coal conveyor. Approximately 30 per cent of the total run-of-mine coal is bypassed in this manner.

The jig plant consists of four three-cell Faust jigs. Although the primary jigs are of the three-compartment type, a secondary product is not produced, the refuse from the third cells and the third hutches is handled in a battery of rewash jigs and the resulting washed product goes to the primary washed-coal bin. Two cone settling tanks have been installed here. As this plant is located within a few hundred feet of the byproduct ovens, the coal is dewatered in three Elmore dryers.



Jig Floor, Risco Coal Washery

This plant, which is the property of the Republic Iron & Steel Co., treats coking coal. Much of the development work that has made modern coal washing equipment effective has been done in the Birmingham field of Alabama.

Figures showing the results from this plant have been furnished by the Operating Department of the Woodward Iron Co. and are set forth in Table I.

Table I—Results Obtained at the Woodward Byproduct Plant

	Volatile Matter, Per Cent.	Fixed Carbon Per Cent.	Ash Per Cent.
Raw coal (coal sent to Bradford breakers)	26.77	63.52	9.91
Bypass coal (coal from breakers passing through ⅜ x ½ in. slot, going to coal bin without washing)	28.03	66.43	5.54
Coal to jigs (coal from breaker passing over ⅜ x ½ in. screen)	25.96	62.15	11.89
Coal from jigs (average from 4 Faust jigs for year ending May 1, 1924)			5.52
Coal from rewash jigs (average for year ending May 1, 1924)			9.46
Washed coal (a mixture from all jigs and bypass coal)	27.95	66.05	6.00

Refuse for the year, ending May 1, 1924, contained 3.21 per cent float; the ash in the float amounted to 6.58 per cent. The specific gravity of coal is taken as 1.37. The result of a screen test on coal from elevators (coal from all jigs) follows:

On 0.747-in. opening— 5.9 per cent.
On 0.525-in. opening— 8.3 per cent.
On 0.263-in. opening—24.5 per cent.
On 0.093-in. opening—71.9 per cent.
Through 0.093-in. opening—28.1 per cent.

The amount of water kept in circulation, per ton of coal washed, is approximately 950 gal.; the quantity of makeup water added, per ton of coal washed, is approximately 41 gal.

Two-Compartment Cast Iron Jigs Employed

The Risco plant of the Republic Iron & Steel Co., handles Mary Lee seam coal from the Risco mine. The plant consists of three two-compartment jigs of a modi-

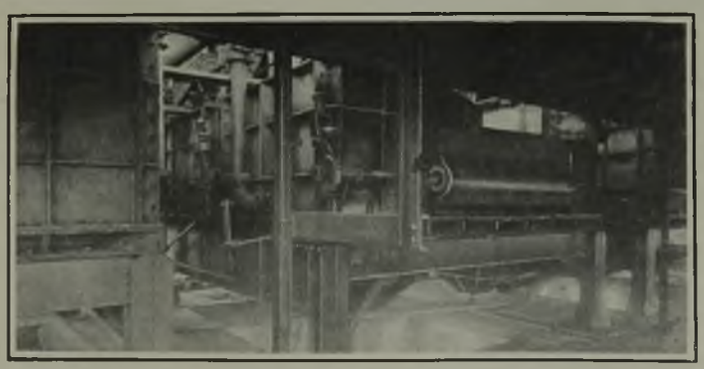
fied Elmore type, having revolving valves but specially designed plungers. These jigs are built of cast iron and steel castings throughout and each has a normal raw coal capacity of 70 tons per hour.

This plant has more elaborate equipment for the preparation of the coal before it reaches the jigs than any plant in the district. Two rotary dumps are employed. One is used only when it is desired to inspect the contents of a mine car, to see if the miners are loading dirty coal. Ordinarily the entire output goes through the other dump. From here the coal is fed to a Marcus screen by a reciprocating feeder. The fines from this screen, passing through 1-in. perforations, are carried directly to the main belt conveyor; the balance of the product goes through a large single-roll crusher, then through a double-roll crusher and onto a shaking screen having 1-in. perforations. All coal passing the 1-in. perforations is conveyed by a belt to a set of short-stroke quick-acting screens having $\frac{3}{16}$-in. perforations. Material passing through this screen can be made to bypass the jigs but the balance of the material is delivered to them.

Output Can Be Loaded Without Washing

Provision has been made for loading the entire output without washing. In that event, by manipulating the valves on the Marcus screen, any of the following grades can be produced: Lump, nut, lump and nut mixed, or run-of-mine.

The circulating water overflowing the settling tank, carrying in suspension a large quantity of fine coal, is pumped to a 70-ft. Dorr thickener, set at an elevation above the jigs. Two of these thickeners have been installed, the second one to be used as output increases. The clarified water from the Dorr machines returns to the jigs by gravity. This feed water to the jigs may be fed to the machines either above or below the plungers or to both places, as expediency may require. Fine coal from the Dorr machine consisting of 50 per cent solids and 50 per cent water, is sluiced to the main washed-coal conveyor and thence delivered to the washed-coal railroad bin. In transit it falls on the coarse washed coal, the water filtering to the bottom of the dragline conveyor, in the trough of which are three sections of thin copper plate perforated with fine slots which allow all water, free of coal, to return to the settling tank.



Cast-Iron Jig with Rotary Valve Mechanism

This is a view on the floor below that shown in the preceding illustration. There has been much controversy as to the relative merits of wood, concrete, cast iron and structural steel a materials of jig construction. It would appear that each has its place where it will serve to best advantage.

The operating officials of the Republic Iron & Steel Co. have furnished the following information:

Inasmuch as the output of the Risco mine has not been up to full capacity of the present jig equipment, rewash tables have not been installed and no thorough test of washer efficiency has been made. However, the following tests of operation show approximate results obtained at reduced capacity. Adopting 1.35 as the specific gravity of pure coal, the percentage of coal and impurities in the product going to the washer are as follows:

Flotation Test of Crushed Run-of-Mine Coal with Analysis

	Class Specific Gravity	Amount, Per Cent.	Ash Content, Per Cent.
Pure coal	1.35	78.7	7.28
Impure coal	1.35 to 1.40	4.7	14.19
Impure coal	1.40 to 1.45	4.3	18.24
Impure coal	1.45 to 1.50	2.1	22.13
Impure coal	1.50 to 1.55	1.2	28.51
Impure coal	1.55 to 1.75	1.5	35.85
Impure coal	1.75 and over	7.2	72.14

The average analysis of run-of-mine coal is: Volatile matter, 27.75 per cent; fixed carbon, 55.50 per cent; ash, 16.75 per cent; sulphur, 0.90 per cent.

Average quantities, by sizing test, are shown herewith.

Sizes and Percentages of Each of Varying Specific Gravities

Size	Per Cent	1.35 Specific Gravity	1.35 to 1.45 Specific Gravity	1.45 to 1.55 Specific Gravity	1.55 to 1.75 Specific Gravity	Per Cent sink at 1.75 Specific Gravity
1 in. to $\frac{1}{4}$ in.	18.8	60.7	12.6	3.9	3.3	18.9
$\frac{1}{4}$ in. to $\frac{3}{16}$ in.	45.1	79.0	9.9	3.9	2.6	4.6
$\frac{3}{16}$ in. to 20 mesh	27.0	89.5	3.5	1.9	1.6	3.5
Through 20 mesh	9.1	89.6	...	....	10.4	....
Whole sample	100.0	79.7	7.8	3.0	3.2	6.3

The average analysis of the washed product is: Volatile matter 28.50 per cent, fixed carbon 62.25 per cent, ash 9.25 per cent, sulphur 0.80 per cent.

Loss of coal of 1.40 specific gravity in refuse, averages about 1.4 per cent. This can be materially reduced by rewashing the crushed bone on tables, as contemplated in the original plans of the plant. Total washer loss is 8.5 per cent to 9.5 per cent refuse.

Since this plant has been in operation, the mine has been producing coal largely from narrow work. Machine cutting on the narrow work on the bottom increases the amount of impurities in the fines, therefore, there has been no opportunity to bypass the $\frac{3}{16}$-in. coal without washing and it is not possible to say if this plan will be feasible when a larger amount of coal is received from the mine. However, in the design of the plant it was arranged that should the $\frac{3}{16}$-in. coal be too high in ash, this product, together with the recrushed bone from the second-compartment of the jigs, will be washed over tables. This should insure almost a 100 per cent recovery of coal in this washery.

By using Dorr thickeners. all fines from 60 to 200 mesh are removed automatically from the circulating water. Tests made in another plant show that return water from these machines carried only 0.15 per cent solids. Water going to these thickeners contains 6 to 8 per cent solids. The ash in the final product, using the tables to be installed, should be reduced to 8 or 8.25 per cent, as against a theoretical 7.28 per cent ash at 1.35 sp. gr.

Water circulated per jig is approximately 1,300 gal. per minute, the capacity per jig is 70 tons per hour. Make up water is equivalent to the amount of moisture loaded in the coal, that is, about 10 per cent when the draining conveyor is not operating. This is equivalent to approximately 25 gal. per ton of coal washed. When the draining conveyor is operating, there is practically no water lost at the plant as coal is loaded out containing only approximately 8 per cent moisture.

Breakers Make Increased Output Possible

The Flat Top mine of the Sloss-Sheffield Steel & Iron Co. produces Mary Lee seam coal and the entire output is crushed and washed. The plant contained, originally, crushing rolls and six two-compartment double-plunger jigs made by the American Coal Washer Co. These are modified Faust type machines having the driving mechanism located below them.

For several years, prior to 1921, the average yearly

Washery at Bayview Mine, Tennessee Coal, Iron & Railroad Co.

At the left appears the mine headframe, at the right the washery and near the center the conical sludge separation tank. This means of clarifying the circulating water is extremely simple and effective. The clarified water leaves the cone at the top and the sludge is drawn off at the bottom.

run-of-mine output was 408,716 tons. The washed-coal produced averaged 9.88 per cent in ash and the refuse from the washer contained 8 per cent of good coal. In 1921, it became necessary to increase the capacity of the mine; but neither the crushing plant nor the jigs could handle an increased output satisfactorily.

A Bradford breaker was installed and the two-compartment jigs were converted into single-compartment machines of double length. For 1922 and 1923, the average output of the mine was increased to 604,346 tons. The ash content of the washed coal averaged 9.11 per cent, and the loss of coal in the washer refuse ran 9.1 per cent. Unfortunately, the changes were made simultaneously and it is not possible to determine just how much of this increased capacity resulted from the installation of the Bradford breaker and how much from the change in the jigs. The company's engineers are satisfied, however, that the change in design of the jigs has increased their capacity.

Of the six jigs as originally installed, five were used for primary washing and the sixth to rewash the slate and hutch from the last compartments of the five primary machines. Under the new arrangement all six jigs are used as primary washers and no rewashing is necessary.

Conical Tanks Recover Sludge Effectively

The Tennessee Coal, Iron & Railroad Co.'s washer, at Bayview mine handles only Pratt seam coal from the Bayview operation. The plant contains three, three-compartment Elmore jigs. The run-of-mine coal is first taken to a Bradford breaker. The portion passing through the breaker screen is reduced to ¾ in. and smaller. It is then delivered to the jigs. In normal operation all the sludge is carried to the top of a conical tank.

If any delays occur, such as might arise from the breaking of an elevator or a main supply water line, all the circulating water from the washing plant is immediately drained to a ground sump in front of the cone sludge tank. When the plant is ready to resume operations, this water is elevated into the sludge tank and work started. This sump is necessary because all the drainage from this washing plant finds its way to the main water supply of the company's furnace and steel plant at Ensley, so every precaution has been taken to prevent impurities reaching this supply. In a four-day test, it was found that the fine coal carried off by waste water from this washer amounted to only 8.7 lb. per 1,000 tons of washed coal produced.

Provision has been made for loading lump but under normal conditions all of the coal is treated in the washer. Considering the tonnage produced and the quality of the product one cannot fail to be impressed by the small size of this washing plant. This is partly because rewash jigs and tables are not used. The product coming from the last refuse valve on each jig is high in ash but as it makes a satisfactory boiler coal the company has found it cheaper to use it for steam raising (it is equivalent to only 6.53 per cent of the total raw coal) than to install the necessary rewash jigs or tables.

For the year 1923 the results shown in Table II were obtained at this plant; the data were furnished by the engineering department of the owning company.

Table II—Results Obtained at the Tennessee Company's Washery at Bayview Mine

	Per Cent	Tons	Tons
Raw coal delivered to washer			494,733
Washed coal to coking ovens, 1.37 sp.gr.	82.05	405,931	
Boiler coal to steam plants, 1.37 to 1.56 sp.gr.	6.53	32,295	
Refuse over 1.56 sp.gr., 11.42 to 5.4 per cent float	10.81	53,489	
Washer loss float at 1.36 sp.gr. in refuse	0.61	3,018	
	100.00		494,733

Number of 9-hr. shifts worked	566
Tons of raw coal per shift	874

Coal	Proximate Analysis Volatile Content, Per Cent	Fixed Carbon, Per Cent	Ash, Per Cent	Sulphur, Per Cent
Raw coal	26.42	61.14	12.44	1.76
Washed coal	28.18	67.06	4.76	1.30
Boiler coal	25.45	59.73	14.82	2.25
Refuse float (5.4 per cent)			5.19	1.49
Sink (94.6 per cent)			62.81	4.74

Sizing Tests

Raw coal	Over ¾ in.	9 per cent
Washed coal	Over ½ in.	19 per cent
Boiler coal	Over ¼ in.	20 per cent
Refuse float (5.4 per cent)	Over ⅛ in.	14 per cent

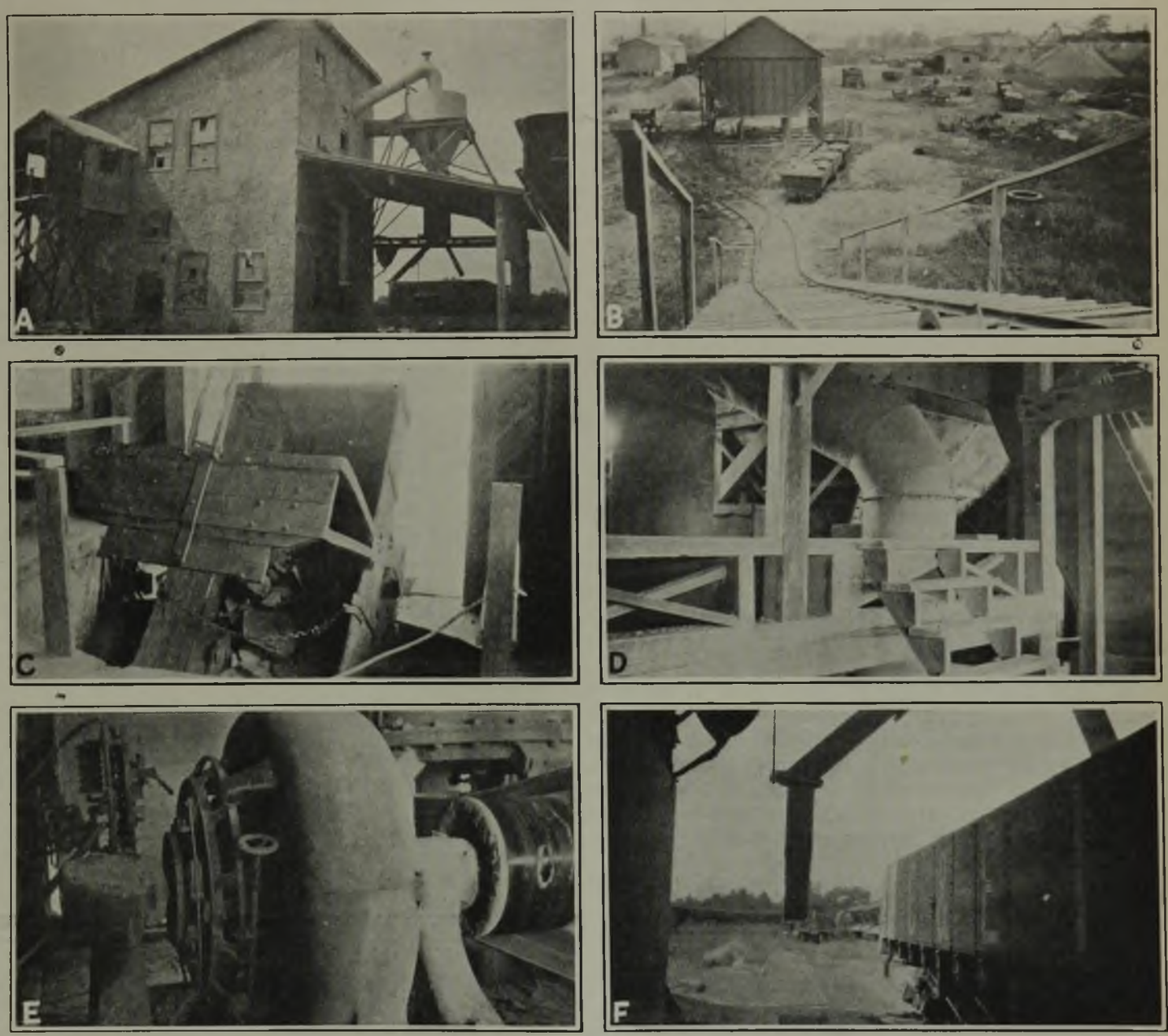
Note that per cent of sizes is highly variable.

Sink (94.6 per cent) Under ⅛ in. 42 per cent; ash 7.3 per cent.

Inherent ash in coal at 1.37 sp.gr.	4.2 per cent
Inherent moisture in coal	3.2 per cent
Washer efficiency: separation	88.23 per cent
recovery	99.39 per cent
Total efficiency	87.69 per cent

Water in circulation at this plant amounts to 600 gal. per ton of coal washed per shift or approximately 970 gal. per minute. Water lost amounts to 27 gal. per ton of coal washed. The average amount of power used equals 1.24 kw.-hr. per ton of washed coal produced.

Modern Methods Are Used in Making Rock Dust on a Large Scale at Old Ben No. 9 Mine



Rock-Dusting Plant Where Hard Rock Goes in One End and Fine Pulverized Dust Comes Out the Other

A. Electrically-operated plant where the stone is pulverized and delivered to the mine car tracks. *B.* The rock is gathered into ordinary mine cars which are assembled at the foot of a plane leadingto the top of the pulverizing plant. *C.* A car on the tipple discharging its load of rock. *D.* Pulverizer unit from which the rock is conveyed to the screens. *E.* In spite of the large quantities of dust in the air this motor gives little or no trouble. Incidentally the rock dust would prevent the spread of a fire in the wood-stucco building. *F.* Here's where the dust is delivered and may be packed in bags so that it may be transported about this mine or among the various other mines.

WHEN the officials of the Old Ben Coal Corp. operating in southern Illinois decided they were going to use rock dust to keep the mines safe they built a modern plant capable of turning it out in large quantities. Every modern means of conveying the material to and from the plant has been employed. Loaded cars into which the selected rock has been loaded are raised to the top of the building by means of a small cable hoist. When the car reaches its destination its contents is dumped into a bin and conveyed to the pulverizer. Motor-driven equipment reduces the rock and blows it through the sizing screens. On the outside of the building the rock dust drops through a canvas pipe into sacks and cars.

Unlike the methods employed at many other mines, the Old Ben Coal Corp. has a systematic way of handling its whole plant. When our British visitors last spring wanted to see how rock dust was made and used in this country they were taken to this mine and there they were shown the complete process. Those who witnessed the demonstrations—proving the efficacy of rock dust staged by the officials of this company—have something worth while to remember about ways to make the mines safer.

Alabama Has Made Great Progress in Coking Coal

Advanced Rapidly from Pre-War Smelting with Charcoal to Today's Oven Capacity of 7,836,000 Tons of Raw Coal—Leads the Country in Substituting Byproduct Units for Beehives*

By F. W. Miller
Manager, Byproduct Dept., Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

PRIOR to the Civil War, there were several small charcoal furnaces for smelting the brown limonite ore that is found, in comparatively small bodies, throughout the central and north-central portions of Alabama. During the Civil War, these furnaces furnished charcoal iron to the Confederate government. No attention was paid to the large bodies of lime-bearing hematite ore that now supply the bulk of the ore used in the various blast-furnace plants of the Alabama district until the latter part of the 19th century.

When it was found that these ores could be worked satisfactorily in the blast furnaces, there was a comparatively rapid growth in the blast-furnace industry in the Birmingham district. As these ores are far more refractory than the limonite ores, this blast-furnace development was accompanied by the construction of beehive ovens to carbonize the coal, in order to supply the necessary fuel. The state's production of beehive coke in 1880 was 60,781 tons; ten years later this had increased to 1,072,942 tons; and in 1897 the production had reached 1,443,017 tons.

In 1898, the first byproduct plant built in the state was put in operation. This plant consisted of 120 horizontal-flue Semet-Solvay ovens, three flues in height by thirty flues in length with an average width of 16 in. The plant was constructed by the Semet-Solvay Co. for the Tennessee Coal, Iron & R.R. Co. and was located adjacent to the blast-furnace plant of that company at Ensley. Coal was delivered from the Pratt mines by gravity tracks directly into bins of the ovens after having been properly crushed and washed at the mines. The coke was delivered by the Semet-Solvay Co. into coke bins of the blast furnaces directly from the quenching cars.

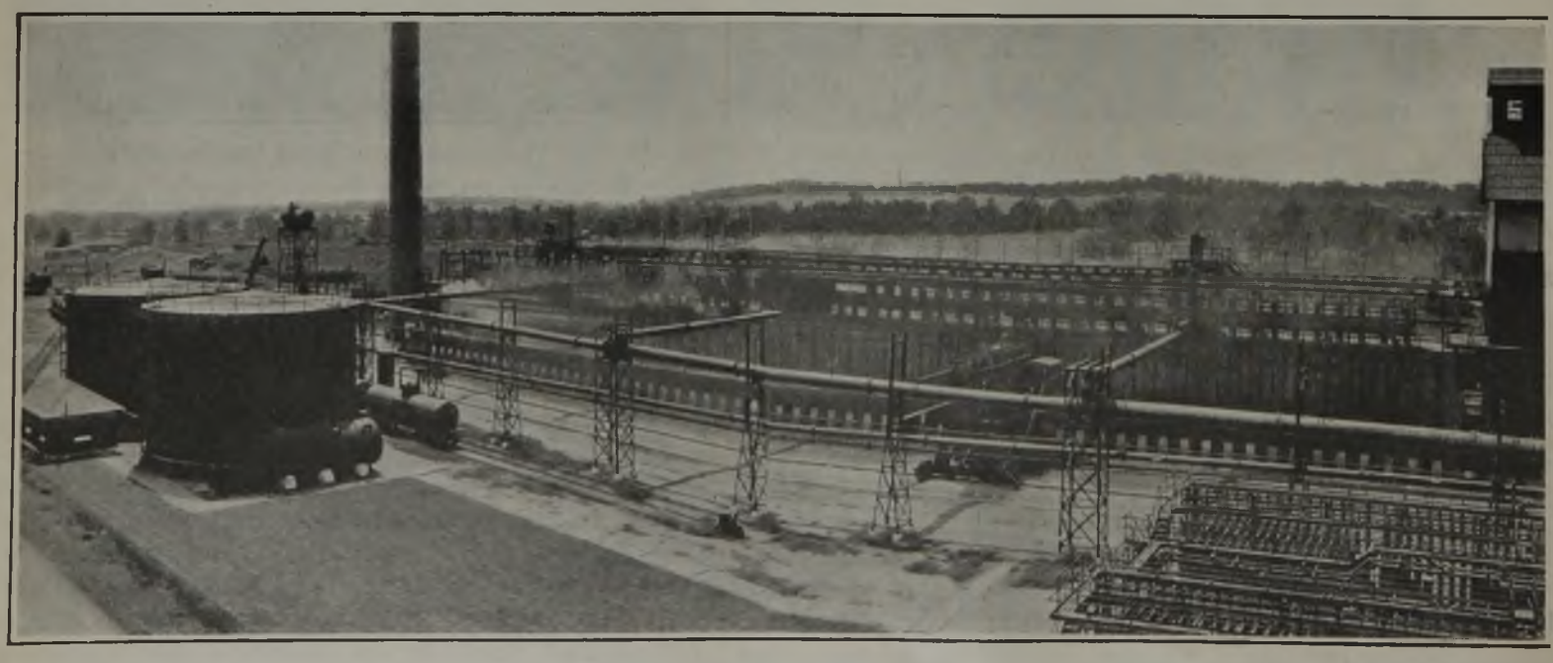
The coke production in 1898, for the entire state, was 1,663,000 tons; and in 1900, 2,110,837 tons. In 1902, four additional batteries of Semet-Solvay ovens were added to this plant. These later ovens were of the same dimensions but were four flues in height; that is, the heating wall was 80 in. high instead of 60 in., and the total coke production for the state increased to 2,552,246 tons.

In 1906, the Semet-Solvay Co. constructed, for the Central Iron & Fuel Co., at Holt, forty Semet-Solvay ovens of the cold-air type. These ovens are 100 in. to the coal line, 16 in. average width, and 30 ft. in length. No more byproduct ovens were added until 1911-1912, when the plants of the Woodward Iron Co. and the Tennessee Coal, Iron & R.R. Co. were constructed. The Woodward plant consisted of 170 Koppers ovens and 60 Wilputte ovens.

In 1911, the Tennessee Coal, Iron & R.R. Co. constructed four batteries of Koppers ovens 19¾ in. wide, 8 ft. 6 in. to the coal line and 37 ft. 3 in. long. The plant at that time had an annual capacity of 2,146,000 tons of coal. In 1920, this company added two batteries of 77 ovens each, bringing the total number of ovens in this plant up to 434 and increasing its annual coal capacity to 3,340,000 tons.

This plant now supplies all the coke required by

*Article entitled "Byproduct Coking in Alabama" to be read before the American Institute of Mining & Metallurgical Engineers, Birmingham, Ala., Oct. 13, 1924.



Two Batteries of Semet-Solvay Byproduct Ovens at the Plant of the Sloss-
Tar Tanks, Cooler Coils, Coal Bin, Pump House, Primary Coils,

eleven active blast-furnace stacks of the Tennessee Coal, Iron & R.R. Co. and, in addition, is capable of handling some coke for the commercial market. In 1913, the coke production of the state had risen to 3,323,664 tons, 2,022,959 tons of which was byproduct coke and 1,300,705 tons was beehive.

In 1917, the Gulf States Steel Co., located at Alabama City, placed in run its byproduct plant of 37 standard Koppers ovens with an annual capacity of 250,000 tons of dry coal.

As a result of the stimulus of the World War, the Alabama Byproduct Corporation constructed at Tarrant, a suburb of Birmingham, fifty Koppers ovens having an average width of 16 in., height to coal line, 9 ft. 10 in. and a length of 37 ft. The Sloss-Sheffield Steel & Iron Co. began the construction of 120 Semet-Solvay ovens with an average width of 18½ in., height to coal line 11 ft. and a length of 36 ft. These ovens, which have the largest coking chambers of any ovens in the state, have a capacity of approximately 15 tons of coal per oven charged and an annual coal capacity of 970,000 dry tons. In 1923, the Alabama Byproduct Corporation added twenty-five ovens of the same capacity to their original battery, bringing the annual coal capacity to 456,000 dry tons.

The total coke production of the state for 1923 was 4,200,000 tons of which 268,000 tons was produced in beehive ovens and 3,932,000 tons in byproduct ovens. This means that less than 7 per cent of the total coal carbonized for metallurgical purposes in the state was carbonized in beehive ovens.

It is hardly necessary to go into the fundamental causes of this rapid displacement of the beehive by the byproduct oven. The byproduct oven represents a much larger capital outlay per ton of coal carbonized, but the byproducts are fully capable of carrying this increase. The more uniform grade of coke, the direct saving of coal through yield of coke, the conservation of coal resources and the reduction of labor cost, together with more favorable working conditions for labor are the major factors.

It is, however, noteworthy that Alabama, which has always enjoyed a plentiful supply of common labor at comparatively low rates, has outstepped her sister states in her progress in coking. The annual capacity, in tons of dry coal, for this district is as in the accompanying table.

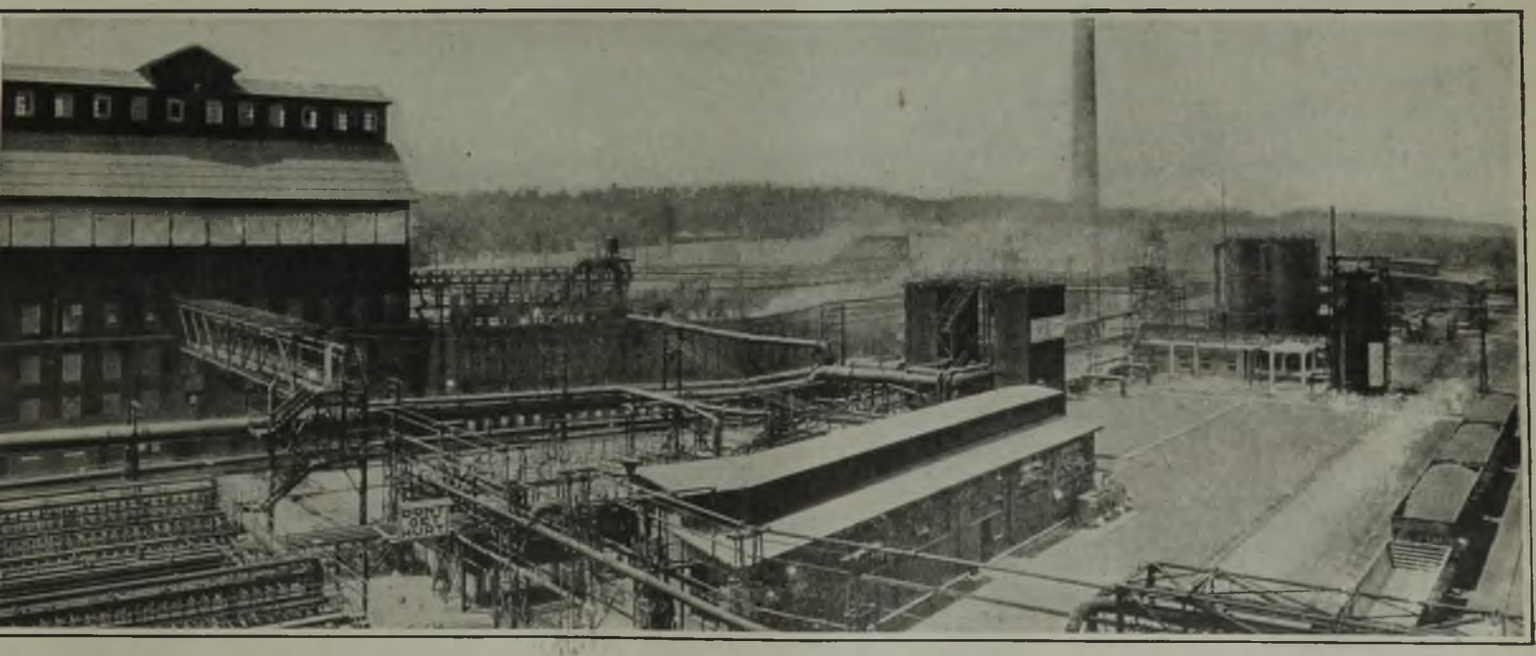
Byproduct Coking Plants in Alabama with Their Capacities

	Tons, Dry Coal
Semet-Solvay Co., Ensley	730,000
Semet-Solvay Co., Holt	330,000
Woodward Iron Co., Woodward	1,760,000
Tennessee Coal, Iron & R.R. Co., Fairfield	3,340,000
Gulf States Steel Co., Alabama City	250,000
Alabama By-Product Co., Tarrant	456,000
Sloss-Sheffield Steel & Iron Co	970,000
	7,836,000

It will be noted that the combined coking capacity of all of these plants, if operated at their maximum production rate, will be equivalent to the consumption of 7,836,000 tons. Assuming an average yield of 75 per cent of furnace fuel, these plants will produce annually 5,362,000 tons of coke. As the maximum quantity of coke so far produced in the state in any one year (1917) was 4,892,589 tons, even when allowance is made for improvements in furnace capacity, which have been steadily taking place, the byproduct ovens are capable of producing all the coke required by the state without any assistance from the beehive ovens whatsoever.

There is no district in the United States in which the substitution of the beehive oven has been so complete as in the State of Alabama. The districts of Chicago, Detroit, Buffalo, and a few other points, of course, have no beehive ovens. The development of these points represent a transference of the coking operation from the mine mouth in Pennsylvania, Kentucky, and West Virginia to the point of demand. This transfer has been justified by the production of coke-oven gas for domestic and industrial uses and by making available valuable byproducts nearer the point of consumption.

As the South is proportionately the largest consumer of ammonium sulphate, practically all the ammonium produced by the Alabama byproduct ovens is produced in the form of ammonium sulphate and marketed to the various manufacturers of commercial fertilizer.



Sheffield Steel & Iron Co. at North Birmingham, Ala. This View Shows Also Benzol Scrubbers, Fuel-Gas Equalizer and Exhauster Building

As the Birmingham district is the largest producer of cast-iron pipe in the world, it is also the largest consumer of coal tar for the dipping of pipe manufactured in this district.

The development of blended motor fuel has probably been carried further in the Birmingham district than anywhere else in the United States, and consequently almost the entire production of benzol is consumed within a short radius of Birmingham, by the automotive industry. During the late World War, practically all of this benzol was converted into pure products and consumed by the manufacturers of munitions.

The coke-oven gas from the various plants is largely consumed by industries and municipalities. The plant of the Sloss-Sheffield Steel & Iron Co. supplies domestic gas of approximately 550 B.t.u. to Birmingham through the Birmingham Electric Co. The Holt plant supplies gas to Tuscaloosa and to the ore-nodulizing plant of the Central Iron & Coal Co. The Tennessee Coal, Iron & R.R. Co. consumes its gas in its steel plant. In addition, it receives about 6,000,000 to 7,000,000 cu.ft. daily from the Semet-Solvay Co. at Ensley. The Alabama By-Product Co. has a 3,000,000-cu.ft. holder, in which it stores the surplus gas produced at night, thus making all its surplus gas available during the day. This has enabled the company, through a subsidiary pipe-line company, to supply gas to several large consumers.

The Gulf States Steel Co. consumes its surplus gas within its own steel plant, and the Woodward Iron Co. uses its gas under boilers, supplementing its blast-furnace gas to produce steam not only for its furnace plant but to supply power for its mines and other activities.

The boiler and power plant of the Sloss-Sheffield Steel & Iron Co., located at its byproduct plant, has a battery of eight Stirling boilers equipped to burn coke-oven gas, coke breeze in Coxe stokers, and pulverized coal. This power plant supplies the company's coal and ore mines, its quarry, two of its furnaces, in addition to its byproduct plant requirements. It also sells power. Extreme flexibility is required in order to be able to supply gas to the city in quantities varying over wide limits with the seasons and to take care of the rapid hourly fluctuations of its mine load.

Inasmuch as the conversion from beehive carbonization to byproduct coking has been so complete, the construction of byproduct ovens will be relatively slower, as it will be forced to follow the development of the blast furnace and steel industry. However, as the South is now consuming the greater part of the iron produced in this district and this southern demand is growing rapidly, additional blast furnaces, and probably steel plants, will be constructed and the building of byproduct ovens will keep pace with this development.

THE ROYAL COMMISSION ON MINING SUBSIDENCE, states *The Iron and Coal Trades Review*, proposes to visit Scotland on Oct. 16 and 17 for the purpose of of obtaining by personal inspection of typical cases direct evidence of damage caused by subsidence.

The Commission is in consultation with the various Scottish Local Authority Associations with a view to selecting a number of representative cases. Damage to private property will be inspected, as well as local authority and similar undertakings. It is probable that the Commission will visit the Lanarkshire coal field Oct. 16 and the East of Scotland on Oct. 17.

It is not proposed to hear any oral evidence during the visit to Scotland, since the view of the Commission is that evidence of this type can be heard more satisfactorily and with greater economy of time in London. Only a limited number of places can be personally inspected. In regard to evidence generally, the Commission is always glad to receive and consider photographs and statistics. In this connection the Commission desires it to be understood that what it wishes to obtain are brief descripeions of a few typical cases of severe damage, general statistics of costs incurred over a period of years, particulars of mineral reservation clauses in typical leases, reasoned and detailed proposals for the solution of the problem as a whole and similar evidence of a general and concise nature.

There's No Squalor in This Coal Camp

The town of Mohrland, Utah, at one of the United States Fuel Co.'s mines, is nestled in a place in the Wasatch range which gives it natural attractions and a wonderful outlook which are poorly shown by this photograph. There is plenty of room and fertile soil for grass plots and gardens and the houses are comfortable and kept in good repair. The company's community amusement hall is shown at the left.

Alabama Coal Mining Methods Vary Widely

Seams 24 in. to 13 ft. Thick Lying in All Positions from Flat to 90 Deg. Pitch Test Engineers' Ingenuity—Panel and Longwall Systems Common—Drag Loaders Are Saving 25 to 50 Cents a Ton

By Milton H. Fies
Vice-President, De Barbelben Coal Corporation,
Birmingham, Ala.

ALABAMA coal is won from thirty workable coal beds that range in thickness from 2 ft. to 13 ft., with an average thickness of 4 ft. The principal producing beds in the Warrior field are flat, or nearly so, whereas those of the Cahaba field range from slightly tilted to comparatively heavily pitching beds. It is to be expected that, on seams from 2 to 13 ft. thick, pitching from 0 to 90 deg., nearly all mining methods are used; hence a description of such methods must be more or less general.

Mines in Alabama are opened, generally, through drifts and slopes, although there are some vertical shafts in the state. The principal method of mining is the ordinary room-and-pillar. A modified longwall system is being used in several mines in the Cahaba field on pitches, and modified longwalls, or panels, are being used in several mines of the Warrior field.

To mine seams under 36 in. successfully the conditions must be favorable. Most of the thin seams mined lie flat. It has been found unprofitable, with very few exceptions, to mine thin seams that pitch. In most instances, thin seams are mined through drifts opened on the coal, although in a few cases such seams are reached by means of short slopes or shallow shafts.

Where this type seam is mined through drifts, the coal outcrops in hollows, and tram roads are graded along these hollows. Drifts or entries are turned into the hills, usually at room distances apart, either with double entries or an air course with each entry. Where the dip does not prevent, rooms are turned from both entries in a double-entry system or from the entry and the air course.

The depth of the rooms in thin flat coal varies from 125 ft. in 26 or 28-in. seams to 175 ft. in 36-in. seams. The thickness of pillars varies from 10 ft., where rooms are 20 or 30 ft. wide, to 40 ft. with 40-ft. rooms. The thickness of cover runs from 40 ft. to 300 or 400 ft.

A panel system in use in a drift mine in thin coal is shown in Fig. 7. The main entry, *A*, is opened from the surface and the main face entries, *B* and *C*, are parallel to and 1,600 ft. from it. Main butt headings, from which no rooms are turned, connect *A*, *B* and *C*. Double entries *D* and *E*, five to a panel, are turned from the main and main face entries. Each panel is surrounded by a barrier pillar that is ample to protect it. The headings *D* and *E* in each panel are developed by double gob entries, as shown in Fig. 8.

Rooms are turned on 80-ft. centers, each room having a double neck and with a double track. After the room is driven in from 50 to 65 ft., it is widened to connect with an adjoining room, until five rooms are connected. This affords a 400-ft. face, which in some instances has been carried forward for 70 ft., although this face usually advances in steps.

To afford the miner an opportunity to load, switches are laid from the room track or, in some instances where the top permits, the track is curved around the face. A solid pillar 40 by 145 ft. is left after five rooms are turned. When expedient, pillars such as this are left, so that on one entry the pillar comes beyond room No. 5 and in the next entry beyond room No. 7.

The purpose of this panel system, in thin coal lying flat, is to afford means for robbing each entry as it is worked to its limits by leaving pillars of sufficient size to obtain a maximum recovery. The recovery of pillars in thin coal is difficult at best, and it has been found satisfactory to leave short thick stumps rather than long thin pillars, as was the practice in Alabama until recently. Of course, this method can be applied only where the ownership is in fee. Where the ownership does not include the surface, rooms 30 to 40 ft. wide, depending on the top, are turned with pillars from 10 to 20 ft. in width, depending on the depth of the overlying strata.

In the gob entries, which are driven usually to a height of 5 ft. 2 in. above the rail, 36 to 44 in. of rock above the coal is shot down and gobbed. The entries

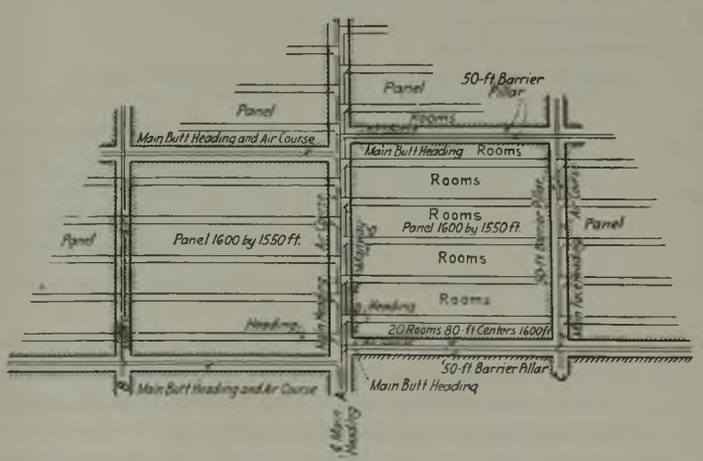


Fig. 7—Drift Mine Panel System

This layout is used in thin coal. The main entry is opened from the surface and the main face entries are parallel to and 1,600 ft. from it. Butt headings connect the face entries.

driven in the coal are of sufficient width to provide room for this rock. In coal 30 in. thick with entries clearing 5 ft. 2 in. above the rail, the entries must be driven 28 ft. wide in the coal to take care of the rock in an entry of standard width; i.e., 9 ft. wide at the bottom and 7½ ft. wide at the top. The cost of such yardage varies from $2.56 to $4.50 per running yard, depending on the thickness and hardness of the rock; the cost of yardage per ton varies from 25 to 40 cents.

When the hardness of the rock necessitates, drills with portable air compressors are used for drilling rock holes. Where such drills are used, it is common for

Note—The second part of a paper entitled "Alabama Coal Mining Practices" to be read at the Birmingham meeting of the American Institute of Mining and Metallurgical Engineers, Oct. 13.

the miner to drive his entry into the coal, say from 60 to 100 ft. ahead of his brushing. He then comes back and sets his breaking timbers, after which the drill runner spends the entire shift in the entry drilling the rock. A disadvantage of this method is that the miner cannot load coal each day, and utilizes his spare time for handling his rock, but it enables the drill runner to accomplish better results for he does not have to transfer his drill and compressor during the shift.

Coal lying as described is usually undercut with electric machines of the low-vein type. In some instances, one track of the room is brushed, that is, from 6 to 18 in. of rock is taken down over the roadway to admit the machine.

There are some modifications of the method described occurred and the fall rode the face to a slight extent. The wall was then cleared and, instead of using timbers along the face, cribs were built every 10 ft. and left in place. The result was the overburden crushed the cribs located back from the face and no falls occured at the face.

From an application of this system an apparent saving of 25 to 50 cents per ton has been effected, when the work progressed smoothly. In addition, the lump percentage was increased. The problem is one of control of roof subsidence, which must be worked out through experience, and the training of labor that has had no previous experience on walls.

Mining a flat seam of medium thickness is somewhat different. Much of the coal used in the manufacture

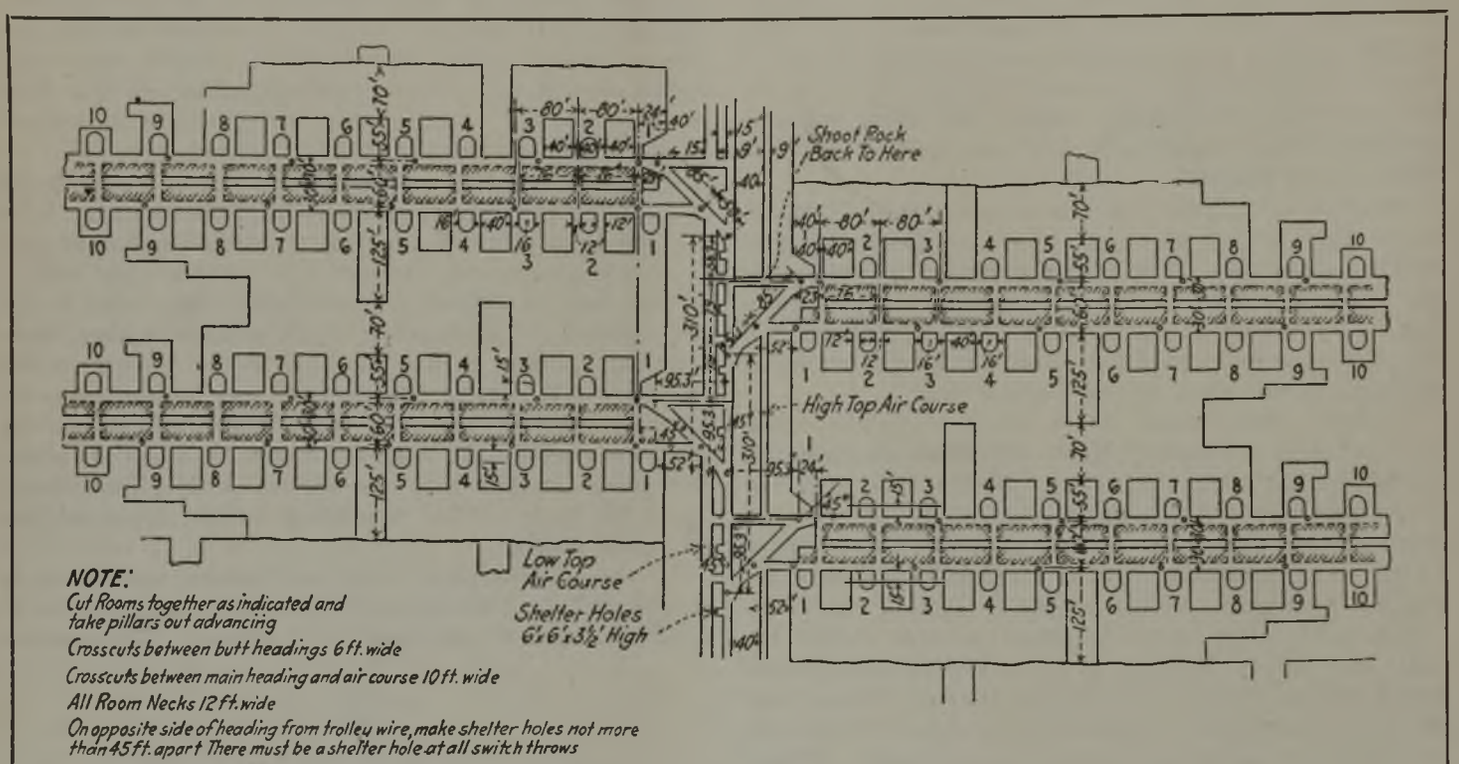


Fig. 8—How Panels Are Developed in an Alabama Drift Mine Containing Thin Coal

This figure shows how headings in panels D and E of Fig. 7 are developed by double gob entries. Rooms are turned on 80-ft. centers, each room having a double neck and two tracks. After rooms are driven up 50 or 60 ft., each is widened to connect with the adjoining rooms. In this way five rooms are eventually joined and a 400-ft. face is thus made available with all the advantages of such length. The face usually is advanced in steps and not in a straight line, however. Depth of these consolidated rooms sometimes runs up to 70 ft.

of mining thin coal lying flat. At one mine, in 30-in. coal, an experiment is being made with mechanical loading. While this method bids fair to prove successful, its consummation is not definitely assured.

Two cross entries, as indicated in Fig. 9, were turned 245 ft. apart in a drift mine. A pillar 75 ft. wide was left to protect the main entry and the cross entries were connected. In one cross entry, *A*, the bottom was taken up instead of brushing the top; in the other entry *B*, the top was brushed to entry height.

The face, or wall, 200 ft. in length is mined advancing. The coal is undercut with a chain machine, with 6-ft. cutter bar. Four rows of heavy timbers, set about 4 ft. apart were placed up to a point 5 ft. from the face, and, as the wall advances, the rear timbers are removed. A drag loader, 4 ft. wide, loads the coal directly into the cars placed in entry *A*, which is driven 250 ft. ahead of the wall.

Cribs placed "skin to skin" in two rows protect both entries. When the wall had advanced 100 ft., a break

of coke for the blast furnaces of the state is mined from such a seam—the Pratt. In the smaller mines, the prevailing method of mining is to drive a main opening through the center of the area to be worked. This opening is driven for single or double track, depending on the tonnage desired. It is necessary to blast down about 18 to 24 in. of roof to give height for a good haulageway. In some mines, a slab is driven with the haulageway wide enough to gob all the brushing rock; in other mines, the brushing rock is hauled to the surface, or gobbed in crosscuts, and rock eyes cut at intervals along the ribs.

An airway 12 ft. wide is driven on each side of the main haulageway, a pillar 30 ft. thick being maintained. Room entries are turned from the main haulageway measuring approximately 300 ft. center to center. After allowing 18 ft. for the width of the entry including the slab, 20 ft. for the airway pillar, and 12 ft. for the width of the airway—a total of 50 ft.—there remains 250 ft. for the length of the room. This is

the average depth of rooms worked in the Pratt seam of coal in Alabama.

In the larger mines, the area to be mined is blocked out with great care and worked on the panel system. Butt headings, or haulageways, are driven at right angles from the main haulageways at intervals of 1,600 to 2,000 ft. and room entries are driven from these haulageways every 300 ft. These panels, or sections, are surrounded by barrier pillars, ranging from 100 to 200 ft. thick, depending on the amount of cover over the area to be mined.

With one or two exceptions, all the mines on the Pratt seam are using the room-and-pillar system. The width of the rooms and pillars vary, depending on the character of the roof and the thickness of the overburden. The most popular system is a single-neck room driven 35 ft. wide and 250 ft. deep. The rooms are turned on 70-ft. centers, which provides for a 35-ft. pillar. A track is carried on each rib of the rooms so as to reduce the amount of turning of the coal. This makes the loading of the coal into the car convenient for the miner.

Pillars Are Robbed Only on the Retreat

Owing to the danger of encountering "squeezes," the room entries are driven to the boundary and all rooms worked out before any attempt is made to recover the pillars. The pillar robbing is started in the next to the last room—a track being carried up the rib on the inby side of the room—and is carried through the last cross-cut, which is at the face of the room.

After the first pillar has been pulled back about 50 ft., a second pillar is started; in the same order the third and fourth pillars are started. An attempt is made to keep the face of the pillars on a line running at 45 deg. with the room entry. The room pillars are pulled back to within 30 ft. of the entry and are left standing for a short time until they are extracted by miners known as "stump pullers."

Where the roof conditions will permit, double-deck

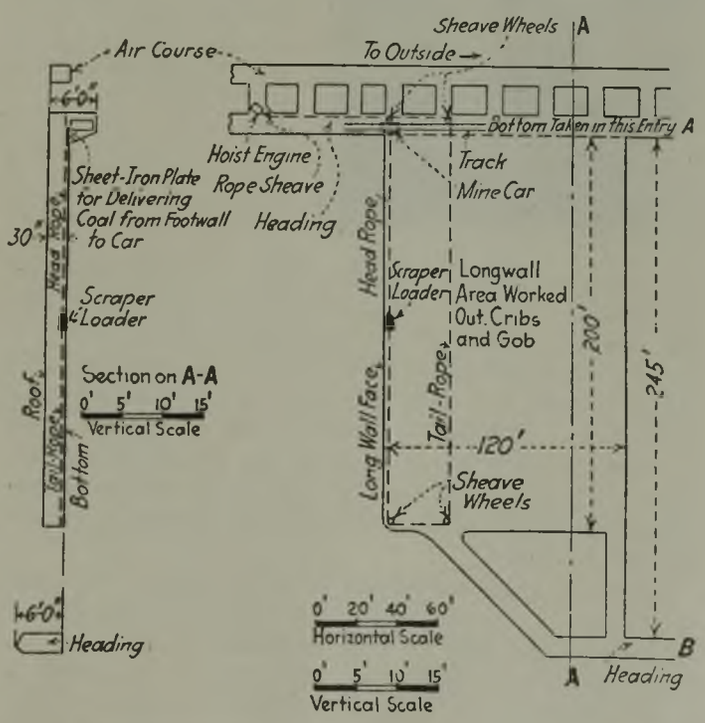


Fig. 9—This Mining System Saves Money

An apparent saving of 25 to 50 cents a ton resulted in one mine where a face 200 ft. long was mined, advancing by the longwall method. The coal was dragged by a tail rope scraper loader to cars on the entry. This style of loading is still experimental in Alabama but it promises well.

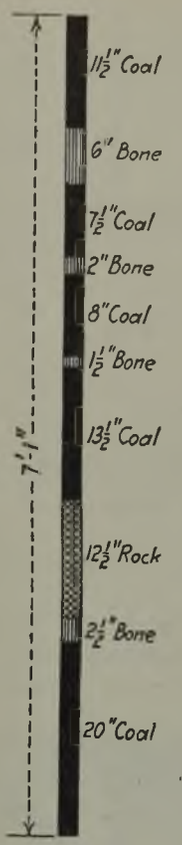


FIG. 10
A Dirty Seam

This section of a deposit shows why the miner sometimes gobs one ton of rock for each two tons of coal he loads.

rooms are turned and are driven 50 ft. wide with a 50-ft. pillar between rooms. This width of room is popular with the miners, and also provides a large tonnage per mining machine. The recovery of pillars in these 50-ft. rooms has been exceptionally high. The pillars are so thick that they are easily recoverable. And in cases where the rooms on each side of the pillar have fallen in, the pillar being 50 ft. thick, can be slabbed up or split, and practically all of the coal recovered. In the best regulated mines recovery of coal runs as high as 95 per cent.

Several mines in the district are now experimenting with semi-longwall mining, the work being done in conjunction with mechanical loaders. As a matter of fact, it is really two experiments being handled as one. All the work is still in an experimental stage and so far no definite conclusions have been reached.

At one mine, which so far has obtained the best results in the district, two entries 500 ft. apart are driven to the boundary, and then the face is opened up by driving a room 20 ft. wide from each side, these rooms meeting at the center of the block of coal. One cutting machine equipped to take a cut 4 ft. deep undercuts the place on the night shift. The coal is next blasted down, the length of the wall timbered, and left ready for the day shift, or the loading crews. Two loading crews are used, one working from each entry and being assigned to 250 ft. of the wall. The entries were driven 9 ft. wide and 4 ft. of the bottom is lifted so as to place the mine car below the level of the coal seam.

Cribs Built for Roof Protection Left in Place

When the work was begun, sectional conveyors were used for loading, but were abandoned and two drag loaders, one for each entry, were installed. Cribs, as previously described, are used to protect entries and walls. The cribs protecting the walls, placed 14 ft. lengthwise of the walls and 8 ft. apart, are not moved but are left in place as the wall retreats. The cover over these mines varies from 150 to 500 ft. and is composed of sandstone and shale. The bottom is a hard sandstone.

The actual loading is performed by a drag system. A double-drum electrically driven hoist is placed on the entry directly opposite the cut of coal to be loaded. A scoop, or drag, is placed on the face and a rope fastened to each end of it. The rope fastened to the rear end of the drag is carried to the rear end of the section and passed around a sheave, thence to what is known as the tail-rope drum. By operating the hoist, the drag is hauled along on the bottom, backward and forward, the length of the face and is in position to transfer the coal from the face to the mine car, which is located on the entry opposite the cut of coal.

Experience with mechanical loading, generally in Alabama, is more or less a matter of conjecture; its success has not been proved. On account of the partings in the

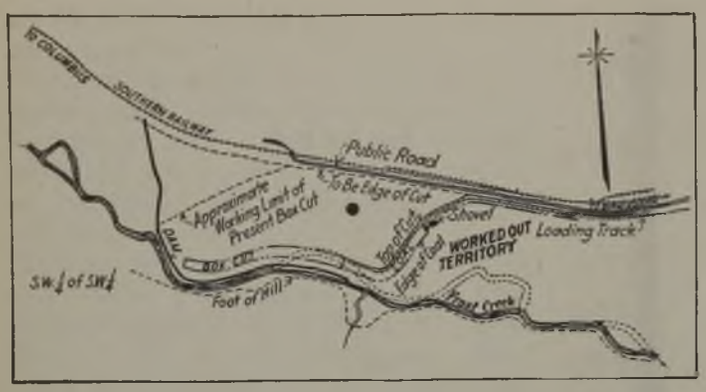


Fig 11—A Successful Strip Operation

Coal 42 in. thick but with a 4-in. parting is uncovered by a shovel equipped with a 2½-yd. bucket on a 60-ft. boom and loaded by a smaller shovel. A dam protects the workings against flooding. In most of Alabama's 10 strip pits the labor cost of coal loaded on railroad cars is from 50 to 70 per cent of the cost entailed in underground mining.

thicker seams, mechanical loaders of the Joy type have not been used.

Thick seams lying flat are mined in practically the same manner as thin seams and those of medium thickness. The rooms are deeper and the development necessary for a given tonnage is less; the production cost in some instances is only one-half the cost of producing coal in seams 30 in. and under. Under favorable conditions, seams 5 to 10 ft. thick, with partings from 24 to 30 in. are profitably mined. In some cases the miner actually removes and gobs ½ ton of rock for each ton of coal loaded. When mining is done with a chain machine, the bottom bench is shot and loaded, the "middleman" is forced down with a bar or wedge and gobbed and the top coal is then shot and loaded. A section of a seam with a 12½-in. "middleman" so mined is shown in Fig. 10. The washer loss at this mine is in excess of 20 per cent.

A room in a mine on one of the thick seams, lying comparatively flat, is shown in Fig. 12. This illustration shows that one-half of a room's width is driven ahead, the coal shot down and loaded while the other half of the room is being undercut by hand. This is a safe method, for the miner is required to leave a heel, or knee, on the loose end and in the center of the undermined half of the face. These knees are cut out before the shots are fired. After the miner has undercut the coal as shown, he must stand up while he cuts out the heel, so that the hazard from falling coal is minimized. A safety travelway for the miner is provided in all rooms. As shown in Fig. 12, it parallels the room track.

Power Stripping and Loading Practiced

There are eight or ten coal-stripping operations in Alabama, all are on seams that lie flat; coal from 28 in. to 6 or 7 ft. is being mined. From 4 to 40 ft. of cover is removed from coal with shovels of the larger type; the small or loading shovel follows the stripping shovel and loads the coal either into railroad or mine cars. Practically all the stripping coal is washed before it is shipped to the consumer.

A successful operation is shown in Fig. 11. At this operation levees are built and the creek changed when necessary to protect the open cut. The coal is 42 in. thick with a 4-in. parting.

At this mine, the total overburden is prepared for the stripping shovel by drilling holes, on 18-ft. centers, to within 1 ft. of the coal and shooting them with two and one-half sticks of 40 per cent gelatin, using a 5-in. by 16-in. cartridge. The box cut is approximately 1,100 ft. long, and develops approximately 14 acres or 90,395 tons. The box cut corresponds to narrow work in underground workings. After the box cut is driven, slabs are removed along the face until the workings advance to their limits, when another box cut is driven into the property.

There are some variations in this method. At some operations, the shovels work in a circle; in others, they work along the side of hills until the overburden becomes excessive. Where conditions are favorable to strip mining, it has been found that the cost of labor per ton for coal delivered on the railroad cars is from 50 to 70 per cent of the cost of underground mining for a seam of like thickness. This constitutes a decided advantage for this method of mining.

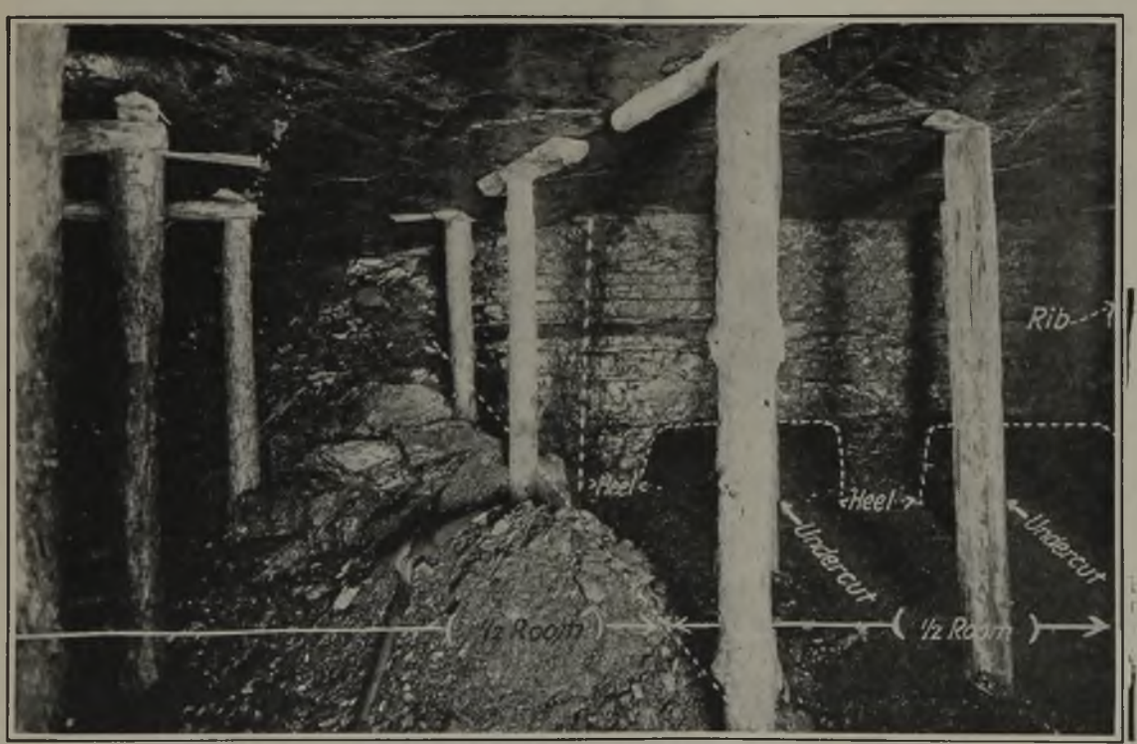


FIG. 12
Room in a Thick Flat Seam

One half of a room's width is driven ahead and the coal is shot down and loaded while the other half is being undercut by hand. The miner must leave a heel or knee on the loose end and in the center of the undermined half of the face. These are cut out before the shots are fired.

National Safety Congress at Louisville Gives Proof Of Progress During Past Year

Membership Has Gained 14 per Cent—Mining Section Attended by Engineers from All Over Country—Electric Hazards and Organization for Safety Discussed—Adams Throws New Light on Accident Accounting

A GAIN of 468 members during the past year raising the membership from 3,321 to 3,789 is a reassuring symptom of the health and vitality of The National Safety Council, now in its thirteenth year. Another healthy sign is that its gross revenue was $377,448.63 for the fiscal year ended July 31, the membership dues alone bringing in $187,929.51. Nearly 500,000 copies of the Safety Calendar were distributed.

The attendance at the Louisville Congress was large; just *how* large it was difficult to determine because many who attended failed to register. It seemed, however, to measure up in every way with the best of previous conferences, the mining section having an attendance of 60 to 70 at each of its three meetings.

Stray electric currents and their dangers formed the subject of E. E. Jones' paper at the Mining Section meeting on Tuesday. That paper had reference to electric fuses but J. L. Boardman, safety engineer of the Anaconda Copper Mining Co. declared that two serious accidents had occurred at the Anaconda mine from the premature discharge of shots not thus provided.

George Martinson, safety engineer for Pickands, Mather & Co., Hibbing, Minn., said that at one of the open ore pits of that company forty holes with an aggregate charge of 800 lb. of dynamite had been exploded during a storm. The holes were awaiting the action of the electric battery but the storm delayed the proper firing of the charge which was exploded, however, by the electric discharge of the storm.

He wondered if the wires were twisted the potential in the wires would become uniform so that no current would pass through the detonators. He said it must be remembered that the leads were but indifferently coated with insulating material and were in contact with iron ore which forms a ready conductor for any stray current the earth might contain. Mr. Jones believed that twisting the terminals as described would render the charge safe. Mr. Martinson stated that now the shooting gang when it saw a storm approaching hurried up its shooting to prevent a premature explosion but conditions did not always make such prompt action desirable.

J. T. Ryan said that in a mine at a point about 250 ft. beyond the trolley line a difference of potential of 6 volts between water pipe and rail was observed. One could put off a detonator at any time by connecting it with these points.

"Safety Kinks" was the title of C. L. Colburn's address, his kinks referring solely to meeting the human or moral hazard. He described the steps to be taken to get the men organized for safety and to keep them thinking in that direction.

That we need statistics to sell safety was the conclusion of W. W. Adams. He said that only by a careful statistical record can a sound and reliable basis be established for the information and guidance of those engaged in accident prevention work and added "Thus also will the work be removed from the realm of things subject to the vagaries of individual judgment and brought into the realm of things concrete and measurable, known alike to all who need the information and not subject to loss with the changing fortunes or the passing of any individual."

Mr. Adams called attention to the need for statistics that will show not only the number receiving injury by reason of any given hazard but also the number exposed to that hazard, thus making it possible to ascertain the accident-frequency and severity rate for each occupation. He gave the accident rates of various mineral industries as in Table I.

Table I—Accident-Frequency Rate for Several Industries

	Per Million Hours
Coal mines	96
Metal mines	91
Quarries producing crushed stone	70
Smelters (not including iron blast furnaces)	64
Mills	62
Beehive coke ovens	49
Quarries producing dimension stone	47
Byproduct coke ovens	47

Quoting the *National Safety News* figures for other industries than mining Mr. Adams gave the severity rates as in Table II.

Mr. Adams' papers showed some extremely interesting tables. From them has been constructed Table III.

J. T. Ryan said that in British and other European mines the percentage of accidents due to roof and sides was even higher than in America and that the British government was offering a prize for the best suggestion for the reduction of accidents of this class.

At Wednesday's session Francis Feehan, mine safety commissioner, U. S. Bureau of Mines, addressed the mining section on "Organizing the Mining Industry for Safety." Though his paper has not yet had the approval of the U. S. Bureau of Mines, it may be permissible to refer to it briefly. Mr. Feehan compared the figures of fatalities per 1,000 full-year workers in the United States, Great Britain, France, Belgium and Prussia since 1911 and showed that with the exception of Prussia the death rate in America's coal mines was approximately 3½ times that in the coal-mining industries quoted.

Mr. Feehan remarked that this was a serious indictment and added, "We lead the world in mining engineering, but we have grossly neglected the most important factor in production which is the conservation of the lives and health of those employed in the

Table II—Severity Rates for Several Industries

Coal mining	11.1
Metal mining	8.4
Chemical industries	4.8
General contractors engaged in construction work	4.8
Woodworking	3.4
Paper and pulp	2.7
Petroleum refineries	2.6

Table III—Causes of Temporary Injuries Underground

	Coal Mines		Metal Mines	
	Per Cent of Accidents	Per Cent of Days Lost	Per Cent of Accidents	Per Cent of Days Lost
All underground	100 00	100 00	100 00	100 00
Falls of roof and side	27 95	33 41	19 80	25 93
Mine cars and locomotives	27 55	30 48	17.46	16 46
Handling materials	13 00	11 06	17.34	15 68
Hand tools	13.66	9 34	10 72	8.76
Machinery	6 11	5 59	5.44	5.74
Falls of persons	3 64	3 44	7 94	8.48
Electricity	1 61	1.22	0 16	0.06
Falling objects	1 75	1 20	12 76	10 88
Explosives	0 57	0 96	0.47	0 58
Hoisting apparatus*	0 43	0 46	1.88	2 21
Explosions and fires	0 23	0.23		
Miscellaneous	3.50	2.61	6 03	5 22

* Mr. Adams makes this "Shafts and Cages" in his metal-mine casualty figures

mines." He called attention to the fact that rarely is a mine closed that is in a dangerous condition and said, "How seldom are the mine owner, his officials or the mine workers prosecuted for violating the mining laws?"

With equal energy Mr. Feehan assailed the mine owner and the mine worker, declaring that the latter constantly made the charge that the employer is not concerned about his safety but only about production. "Is not this," said Mr. Feehan, "true also of the mine worker?" Mr. Feehan said the miner frequently failed to make the inspections required by law and as a result was maimed or killed.

C. B. Auel

Newly elected President of the National Safety Council. He is safety engineer, Westinghouse Electric & Manufacturing Co.

Reference was made also to the Gay Coal & Coke Co., Logan, W. Va., that for seventeen years had not had a single fatal accident and yet had put out 2,500,000 tons of coal. Hardly anything in other industries could campare with this record. The general run of industries can be adequately protected by engineering. Almost every condition can be foretold and provided for. But the mine roof is not designed by engineers. It is an uncertain factor of varying quality. In places it is hardly a hazard, in others it is a perpetual menace. We cannot take it down and examine it and then, put it up again if we approve it or send it back to the manufacturer if we don't like it. It *is* what it is, but in any event we don't know just exactly what it will do.

The railroads have reduced accidents but in their case the blue sky above them is not in constant danger of falling and consequently only in tunnels are there dangers similar to those encountered in the coal mines and where these tunnels can be lined even these dangers are lessened. Moreover transportation underground is made hazardous by the small size of the units making elaborate breaking and coupling devices difficult of installation and by narrow, low roadways.

The problems encountered in mining, said one speaker, are less amenable to engineering treatment, and furthermore, the decrease in accidents in the last few years may be less in mining than in other industries partly because the mining industry had been planning accident prevention for years and had long been subject to legal supervision and so was already experiencing, before the general reform, the advantage of its own specific reformations thus making the opportunities for reform in the mining industry less promising than in other industries.

Theodore Marvin in the absence of N. S. Greensfelder delivered the latter's paper on "Safety in the Use of Explosives." Mr. Marvin declared that it was safer for a miner to use explosives than it was for a pedestrian to travel the city streets. About one life was lost for each 4,279 men employed, whereas in 1923 the fatalities from automobiles in the biggest cities have run from one for every 6,571 to one for every 2,633 of population. In some cities there is more risk by far that the ordinary citizen will be fatally injured by an automobile than that the miner will be killed by his handling of explosives.

Three Trophies for Accident Prevention

Mr. Marvin announced that in conjunction with the U. S. Bureau of Mines *The Explosives Engineer* would award three trophies, one to that coal mine, one to that metal mine and one to that quarry open-pit mine which has in any year the least loss of time from all classes of accidents in proportion to total hours of work performed, the accidents ordinarily classified by the Bureau of Mines carrying a double penalty.

To promote safety in the use of electricity J. B. Johnson, mechanical engineer of the United Verde Copper Co., Clarksdale, Ariz., said that for transmission nothing in excess of 6,600 volts should be used underground. It is seldom necessary to use anything over that voltage and unless the underground transmission line is unusually long, say over two miles, the standard pressure of 2,200 volts is sufficient.

Most engineers would say that in coal mines high voltages such as these should not be transmitted underground, but conditions similar to those of metal mines are found where the rising hills and dipping seams make depths prohibitive for shafting or for the lowering of cables in a borehole and in that case an underground transmission line of two miles length at high tension might be desirable.

The main feeder lines carrying 2,200 volts should, Mr. Johnson said, be insulated with a lead-sheath covering and flexible armor should be used. Such a cable is proof against moisture and being flexible can be anchored direct to timber sets or walls of tunnels and drifts. The metal sheaths are proof against stray induction currents. Mr. Johnson declared that the use of standard cable with metal sheaths was not desirable as moisture condenses within the conduits and wherever such construction is used provision must be made to trap the moisture and drain it off at suitable intervals. Mr. Johnson discussed feeder lines in hoisting shafts, electrical hoisting and its safe control.

J. W. Reed declared that he regarded these voltages as excessive but Mr. Johnson declared he was referring only to transmission currents. This did not satisfy Mr. Reed who takes a view somewhat common among coal engineers that high-voltage cables are undesirable in a mine. Metal miners are not so opposed to high potential because it is almost essential under their

conditions of operation. With them it is often a choice between high-tension transmission underground or no electrical current. Some coal engineers have gone to high tension even though conditions do not make it so absolutely imperative in coal mines.

In reference to transformer rooms Mr. Hall remarked that it might be well to recommend not only that they be "fireproof and have quick-closing air doors for isolation in case of accident" but that the floor be well sanded, that the doors be held in place by a cord that would burn readily and permit the doors to close in case of fire and that a sort of low dam or sill be built at the entrance that would prevent the issuance of oil should a transformer be destroyed and the oil be precipitated over the floor of the room.

Care in Details is Necessary to Safety

J. F. MacWilliams' paper on electric starting appliances showed in detail how every fuse or starter should be made a matter for careful study so as to avoid those hazards which even safety devices themselves are prone to introduce. Mr. MacWilliams declared that in the coal-mining regions, the undermining and the fracturing of the ground made the coal measures unnaturally dry and so introduced an electrical hazard, for it was difficult to get a good ground in material so lacking in the power of conducting currents. Quite generally in moist soils one could get, in grounding, a resistance of a half an ohm, but where the soil had been dried by the mine excavations the resistance might rise to 80 ohms.

J. B. Johnson remarked that pipes in the mines furnished a poor ground for they might be dismantled and the ground destroyed. The pipes are not under the electrician's supervision and so may be removed at any time, either entirely or in part, leaving the machinery without a proper ground. Furthermore, in a pipe there might be a gasket that would insulate one part of the pipe from another and thus prevent the transference of the current from the bedplate of the machine to the water in the sump. J. L. Boardman said that accidents from lack of grounding might occur by reason of the anxiety of electricians to get home at night. Some men who were working on a motor at the Butte mines were delayed by the exigencies of the occasion till after whistle-blow. They left without replacing the ground wire. They argued that tomorrow morning would do for the completion of the work, as the motor would not be used during that night. However, it was used, and, not more than five minutes after the electricians left the motor thus unprotected, an accident happened. In another case lights were connected in series, and the wire from these lights passed to a compressed air line which later was broken. A man stepping on the pipe and reaching over to a car was shocked and killed.

The nominating committee recommended the following members of the mining section for election: R. Dawson Hall, engineering editor, *Coal Age*, New York City for chairman; J. L. Boardman, safety engineer, Anaconda Copper Mining Co., Butte, Mont.; J. W. Reed, safety engineer, Consolidation Coal Co., Fairmont, W. Va.; R. B. Ageton, Tristate Zinc & Lead Ore Producers' Association and A. A. Bowden, safety engineer, Pickands, Mather Co., Ironwood, Mich., as vice-presdents; T. T. Reed, director of Safety Service of the U. S. Bureau of Mines, was nominated secretary. The men whose names were presented were duly elected. It was decided to form two committees, one on collegiate education in safety and the other on elementary education on the same subject. It was suggested that the Bureau of Mines might be induced to prepare and publish an elementary textbook on the subject of safety. J. L. Boardman said that at least 40 per cent of the questions in a foreman's examination should deal with safety exclusively.

In the round-table discussion that followed Francis Feehan answered some exceptions taken to his paper and particularly to his statement that employment in mining can be made safer than in any of our large industries. It is encouraging to learn from this that coal mining is an inherently safe industry.

L. A. DuBlois

Recently elected vice-president in charge of general activities of the National Safety Council. He is safety engineer, E. I. du Pont de Nemours & Co.

At the annual banquet Col. A. B. Barber, of the National Safety Conference, spoke on behalf of Secretary of Commerce, Herbert Hoover in relation to the big meeting in highway-traffic safety to be held in Washington in December. H. C. Spillman declared in his address that as man made machines, man power was superior to machine power and should be more carefully conserved. H. Walter Forster discussed the value of the safety engineer and suggested that his ends were best attained by encouraging the foreman to tell what he is doing for safety whether the work he has achieved has been unusual or merely ordinary, the safety engineer more or less casually and inoffensively slipping in an idea that might correct some ill-advised condition and practice. Strickland Gillilian, of Philadelphia, closed the post-prandial entertainment with a half-hour of merriment. The toastmaster was Dr. Charles E. Woodcock, Bishop of the Episcopal Diocese of Kentucky, well-known for his eloquence and wit.

New Staff of Officers Duly Elected

Announcements were made of the new officers of the National Safety Council: President, C. B. Auel, safety engineer, Westinghouse Electric & Manufacturing Co.; vice president in charge of public relations. L. R. Palmer, Equitable Life Assurance Society, New York City; vice president in charge of general activities, L. A. DuBlois, safety engineer, E. I. Dupont de Nemours & Co.; vice president in charge of public safety, David Van Schaack, Aetna Life Insurance Co., Hartford, Conn.; vice president of local safety councils, George T. Fonda, Fonda-Tolsted, Inc., New York City; vice president in charge of industrial safety, Henry A. Reninger, Lehigh-Portland Cement Co., Allentown, Pa.; vice president and treasurer, C. B. Scott, Bureau of Safety, Chicago, Ill.; Secretary and managing director, William H. Cameron, Chicago, Ill.

News Of the Industry

Co-operative Marketing Seen as Step in Cutting Coal Cost

Advantages Shown in Distribution of Farm Products—Legislation to Be Sought to Extend Benefits to Other Industries—Fear Conflict with Anti-Trust Laws

By Paul Wooton
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Co-operative marketing among farmers has been so successful that a determined effort will be made at the coming session of Congress to obtain legislation which will accelerate even more this striking development. In 1915 there were 5,400 farmers' co-operative associations with 650,000 members. In that year sales through these organizations aggregated $635,000,000. During 1923 the sales through farmers' co-operative marketing associations increased to $2,200,000,000. At the end of 1923 there were 10,160 organizations in the United States, with a total membership of 2,025,600.

The advantages of this form of marketing have been proved beyond all peradventure. The effort is to be made at the next session of Congress to remove some of the obstacles in existing law which are having a hampering effect, and to further encourage this trend. In all probability this legislation will be couched in such form as to extend its benefits to other industries. It will be recalled that Secretary Hoover nearly three years ago proposed co-operative marketing, within districts, for bituminous coal.

The advantages of co-operative marketing, along lines more nearly analogous to coal, are shown in the highly successful British Sulphate of Ammonia Federation. The workings of that organization were studied carefully by Americans who attended the World Power Conference at London.

Marketing Beset with Difficulties

Like most byproducts there are unusual difficulties in marketing sulphate of ammonia. Formerly the British coke makers, which in that kingdom means the coal companies, disposed of their sulphate of ammonia independently, at any price which might be available when their stocks reached a point at which they no longer could be carried. It was sold through brokers and exporters. It was found, however, that the exporters were putting their heads together and withholding purchases until they broke the market. These tactics drove the producers into an association in self-defense.

The organization thus formed sells the entire output of its membership, which comprises 95 per cent of the output of the British Isles.

When a producer delivers his output to the federation he is paid 60 per cent of the price which the association expects to realize from its sale. The remainder is paid to him at the end of the month in which the sale is made. From the total realization is deducted the small expense of marketing and 1s. a ton for extension work. This takes care of advertising expense and of the demonstrators maintained in the field to show farmers how to use fertilizer in that form. Large numbers of these demonstrators now are being sent abroad to explain the use of sulphate of ammonia to farmers in other countries. In fact, more is being spent in this way than all other costs of selling combined.

Treat Small Producer Fairly

The federation is an absolutely democratic organization. Every producer has voting representation in proportion to his tonnage. There is representation on a geographical basis and on an industrial basis, since ammonia production is not confined to the manufacture of coke. The oil-shale industry and gas-producing plants are important contributors to the pool. The organization has been extended to the British colonies. Producers in India already belong and those in Canada and Australia are expected soon to join. The federation is so organized that there can be no discriminations against small producers in favor of heavier shippers.

A striking fact in connection with the working out of this plan is that it has proved to be equally advantageous to the consumer. Formerly there were as many different prices for sulphate of ammonia as there were railroad stations in the United Kingdom. The federation immediately established uniform prices. Its product is laid down at any railroad station in the British Isles at the same price. It has extended a great protection to the purchaser of small lots. Sales are made at a circular price announced in advance and guaranteed against change for a period of three months. The farmer thus can tell what his season's sulphate will cost and he does not have to stop to figure freight rates or worry about changes in the price.

In the same way the federation announces its prices in advance for the export trade. In some countries, to develop its use, a price under the cost of production is made. Thus the costly business of education is carried by the entire industry—an important feature of the business which could not be undertaken by individual producers.

This sort of marketing may conflict with the anti-trust statutes in this country, although the opinion has been expressed that co-operative marketing of coal, so long as it is confined to a single district and so long as competition is maintained between districts, does not violate those laws. At any rate, it would be charged here that such an association would sell at low prices abroad and charge monopoly prices at home. The actual result in Great Britain is exactly the opposite. The average selling price in the British Isles during 1923 was substantially lower than the export price.

The whole scheme has demonstrated the value to all concerned of co-operative marketing. The volume of business handled compares quite favorably with that which would be involved in a similar marketing association among the coal producers of a single district.

There are other examples in Great Britain of successful co-operative marketing enterprises which should be considered by the coal trade in this country in connection with the legislation which will be discussed when Congress meets. The Yorkshire Gas Coal Association maintains standards of preparation which it guarantees. The members advertise jointly through the association.

Steam Coal Men Organized

Producers of steam coal in Yorkshire also have an organization known as the South Yorkshire Hard Steam Coal Association. Its production is almost entirely water borne, either in the export or coastwise trade. With the idea of maintaining standards of quality the association gives a certificate to the buyer to the effect that his shipment is the "best South Yorkshire hard steam coal." The organization has an arrangement with the railroads at ports to provide an independent inspection. The railroad examiner also issues a certificate as to quality and as to the mine from which the coal comes. He also certifies as to weight. By this means the producers protect themselves against the irresponsible company which would trade on the general reputation of the district.

Anthracite Mines Flooded When 8.6 Inches of Rain Falls in Two-Day Storm

Special to Coal Age

Scranton, Pa., Oct. 6. — Anthracite mines in the section bounded by Carbondale on the north and Hazleton on the south suffered heavily from the flood which followed the heavy rains throughout the anthracite region last week. The Hudson Coal Co. was the heaviest loser though several other companies also were hard hit. In Wilkes-Barre a flooded creek changed its course and emptied into the mines through a cave-hole in Hollenback Park. Mine cars, bales of hay, timber and steel rails were used in a fruitless effort to form a network over the cave and stop the water from entering the workings. In the meantime all mine workers were ordered from the operation. The situation was similar to the one confronted by the Glen Alden Coal Co. last spring, when the Lackawanna River flooded through a manway and filled several veins, crippling five mines and disabling the million-dollar pump-room located in the Sloan workings, as well as taking a toll of two lives.

After unavailing efforts to check the flow of the water, dikes were constructed and the course of the stream was finally diverted from the workings. The operation will be idle for several weeks until the workings are cleared of water. The underground pumps were submerged and ceased functioning soon after the deluge.

At Larksville the Loree No. 5 colliery of the Hudson company suspended operations on noon of the first day of the rainstorm, when it was found the pumps were not capable of handling the rush of water into the workings.

In the Hazleton region nineteen mines were idle on Monday and eighteen on Tuesday due to excessive water. The loading of cars at the collieries in the lower region was reduced from the normal output of 650 to 136 on Monday and 130 on Tuesday. It was not until the end of the week that the operations began to produce normally.

Water pouring into the mine workings through numerous cave holes caused the Red Ash vein of the Pennsylvania company's No. 7 colliery to become flooded on Tuesday night and threw 350 mine workers idle for three days.

A report from the Lehigh field stated that 8.6 in. of rain fell during the two days' storm. The eighth level of the No. 1 slope in the Hazleton colliery of the Lehigh Valley Coal Co. was flooded, the Crystal Ridge Creek having broken into the mine. The Hazleton Shaft and the Stockton openings likewise were flooded. Production was held up several days.

A substantial cement bridge just finished at the Crystal Ridge road of the Cranberry Creek Coal Co. over a small creek was dynamited by the coal company because it held back flood waters during the storm and caused them to pour into mine openings. The creek became a torrent at the height of the flood. Several sections of the mines were flooded.

Docks Are Ruthless, Says Federal Trade Commission

The report of the examiner for the Federal Trade Commission, in the charge against the Northwest Coal Dock Operators' Association, is to sustain some of the accusations of unfair methods against that body. He finds it to be guilty of unfair competition against the all-rail trade and that it aimed to drive the latter out of its field, but finds also that price cutting has gone on within its own body and that it has been so ruthless that one dock concern lost $1,000,000 in a price war.

Hoover Silent on Status Of Trade Associations

Efforts recently begun by the Chamber of Commerce of the United States to obtain an expression from the Commerce Department as to the legal status of trade associations have proved unavailing thus far, it was admitted by Secretary Hoover last week. He said that he had informed the special committee of the chamber that the interpretation of the Sherman Anti-Trust Act was not a matter for his department and referred it to the Attorney General. Mr. Stone has already indicated an unwillingness to outline a government policy toward trade associations.

Mr. Hoover, however, indicated the belief that there would be some governmental agency, such as the Federal Trade Commission, which would be in a position to help business interests through the clarification of the law. He felt that the establishment of such machinery would be very helpful and quite distinct from any idea of attempting to advise business as to the law and anticipating court decisions.

He described as "a fatal mistake" the failure of Congress to include the suggested functions in the scope of the Federal Trade Commission when that agency was created.

R. H. Lansburgh Named for Dr. Meeker's Place

Governor Pinchot has appointed Richard H. Lansburgh, of Swarthmore, professor of industry at the University of Pennsylvania, as state Secretary of Labor and Industry, succeeding Dr. Royal Meeker, who has presented his resignation, to take effect Oct. 15. Mr. Lansburgh has for several years been classifying the employment of state workers at the Capitol at Harrisburg and in state institutions. The Governor in announcing the appointment said he is of the opinion that Mr. Lansburgh is the best equipped man in Pennsylvania for the place.

The new head of the department will enter his work with a thorough knowledge of its functions, for he classified and fixed the salaries of its 600 employees. He has few illusions regarding the position.

West Virginia Miners Quit When Wages Are Cut

Two hundred and seventy miners employed at the Glendale mine of the Glendale Gas Coal Co., at Glendale, W. Va., refused to go to work Oct. 1 after they read a bulletin announcing a contemplated reduction in wages to the scale of 1917. Not an employee entered the mine and the suspension will be indefinite, so far as the officials of the mine can say.

Sheriff John Hazlett, of Marshall County, was warned of the strike and asked to be ready in case trouble starts. It was reported, however, that the strike began in an orderly manner and there was little indication that friction would develop.

The Glendale mine has not been unionized.

Many union miners employed by the Bethlehem Mines Corporation, a subsidiary of the Bethlehem Steel Corporation, at its Barrackville mine, in Marion County, West Virginia, also refused to work when notices were posted stating that on and after Oct. 1 the mine would be operated on an open-shop basis with the 1917 wage scale in effect. Hearing a rumor that a shift would go to work at midnight on Oct. 1, union mine workers patrolled the roads leading to the mine in order to dissuade anyone from going to work. No disturbances were reported, however. The Dakota and Barrackville plants are the only mines of the Bethlehem Mines Corporation in West Virginia which within the last two years have been operated in agreement with the union.

Jackson Resigns Presidency Of District 23

Lonnie Jackson, for four years president of the miners' union of District No. 23 (western Kentucky), resigned from that office Sept. 30, the resignation to become effective Oct. 1. Jackson gave no reason for his action, but indicated that he was considering entering the real estate business. He will continue to act as Mayor of Central City, he said.

Union miners in the district have been on strike since last April, when coal operators announced a wage cut, which miners declined to accept. Several mines have resumed operations in recent weeks, but they have furnished employment to only a minority of the union workers.

To Resume in Pomeroy Field

After several conferences between operators and officials of the United Mine Workers in the Pomeroy district of Ohio an agreement has been reached whereby the union has made certain concessions as to dead work and day work which will help in reducing mining costs. The agreement is quite similar to that recently concluded between miners and operators in the Hocking Valley field at Logan. It is expected that as a result of the agreement mines which have been idle for some time will be placed in operation soon, as the demand for domestic sizes is improving.

Equipment and Labor Useless Without Capable Management, Says Grant

A strong plea for the recognition of management as one of the constituent elements of modern business was the high light of an address by Richard F. Grant, president of the Chamber of Commerce of the United States, before the Philadelphia Chamber of Commerce, Sept. 24.

"In a very large measure," he said, "the great advancement of our country is due to those men who have had the vision and ability to organize and develop our vast resources and to convert them to the uses of our people. Any system which would give the reward of leadership to other than those who by demonstrated ability and work earn it and are entitled to it would be destructive of the principles upon which our development and our greatness are founded."

Mr. Grant, who is also president of the Susquehanna Coal Co., of Cleveland, Ohio, was in Philadelphia on what is termed as a "cross-sectional view of activities of the local Chamber of Commerce." After discoursing at length on the urgency of management, he added that, "public need, the equipment and material which capital provides and available employees will not constitute a business activity. They merely constitute a business opportunity. Unless somebody has the vision to see the opportunity and to organize it and finance it and make it a reality, nothing whatever will happen, even though the opportunity exists. Business opportunities only become business realities when the remaining constituent element of business is present. That remaining constituent element is management."

Here's Another Mule Story

There's a mine superintendent out west who believes some mules actually think. He enters one in the "bright mule contest" now raging in these columns. Says he: "I know a mule which absolutely refused to work underground and which figured out a system of its own to enforce its refusal. When they took him down and put him to work, he always ran away the first time the driver cut him loose from a load. Then he ran to the shaft, cleaned the bottom of men by backing up threateningly at anybody who got in his way, and then jumped into the sump. This always tied up the mine until the whole bottom crew spent an hour hoisting him out. Well, sir, he did that trick every blamed time they tried to work him below. He must have had it figured out that some day they would get tired of his stopping up the whole mine that way. And he won. I tell you that mule thinks."

Next!

Five Companies Merged in $2,000,000 Concern

A number of coal operators of Birmingham, Ala.; Memphis, Tenn., and Kentucky are principals in the formation of the Great Western Coal Co., a $2,000,000 company, incorporated under the laws of Delaware. The new corporation is a consolidation of the following concerns: Hawley-McIsaac Co., Inc., Western Coal Co., Gideon Coal Co., Morris Coal Co. (all of which are stripping operations in the western part of Kentucky) and the properties of the Kershaw Coal Co. in Kentucky.

An issue of $800,000 bonds has been sold to the Atlantic Exchange Bank & Trust Co., of Baltimore, the consolidation and sale of bonds being handled by Charles E. Rice, of the firm of Tillman, Bradley & Baldwin, of Birmingham, Ala.

Among those interested in the company are C. G. Kershaw, T. M. Porterfield, B. R. Smith and J. S. Stone, all of Birmingham; John R. Collins and R. J. Billings, of Memphis; C. R. Hawley and H. M. McIsaac, of Madisonville, Ky.

Operations of this company are located on the Illinois Central R.R. in Hopkins County, Kentucky, and on the Louisville & Nashville in Ohio County, Kentucky. The present output of these mines is on a basis of 900,000 tons annually. Steam shovels of the largest and most modern type are used in mining coal by this company.

Output and Value of Coal from Kentucky Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees — Underground — Miners, (a)	Underground — All others	Surface	Total	Average number of days worked
Eastern District												
Bell	2,575,670	44,986	38,630	.....	2,659,286	$6,820,000	$2.56	2,691	1,362	786	4,839	140
Boyd	143,024	5,840	608	.....	149,472	298,000	1.99	187	53	37	277	207
Breathitt	196,925	11,515	700	.....	209,140	470,000	2.25	298	129	81	508	131
Carter	122,153	25,430	277	.....	147,860	369,000	2.50	182	93	63	338	160
Clay	180,583	4,180	300	.....	185,063	330,000	1.79	197	112	65	374	165
Floyd	2,968,898	27,459	39,014	.....	3,035,371	7,984,000	2.63	2,475	1,424	860	4,759	137
Harlan	8,268,535	55,640	46,756	210,179	8,581,110	23,491,000	2.74	4,951	2,592	1,737	9,280	195
Johnson	630,938	10,682	17,691	.....	659,311	2,400,000	3.64	697	289	186	1,172	133
Knott	340,389	2,796	.....	.....	343,185	827,000	2.41	132	63	42	237	206
Knox	496,854	4,133	9,967	.....	510,954	1,474,000	2.88	631	256	209	1,096	133
Laurel	108,039	353	120	.....	108,512	257,000	2.37	225	74	53	352	126
Lawrence	11,835	.....	.....	.....	11,835	21,000	1.78	52	24	15	91	48
Lee	58,526	.....	486	.....	59,012	138,000	2.34	74	35	21	130	129
Letcher	4,263,937	50,931	55,100	.....	4,369,968	12,527,000	2.87	2,573	1,243	807	4,623	167
McCreary	862,772	14,587	2,400	.....	879,759	2,246,000	2.55	877	374	164	1,415	142
Martin	412,560	590	8,022	.....	421,172	944,000	2.24	200	115	85	400	161
Morgan	25,088	4,065	2,933	.....	32,086	148,000	4.61	105	27	63	195	231
Perry	4,990,754	27,346	3,933	.....	5,022,033	12,661,000	2.52	3,300	1,576	1,032	5,908	164
Pike	5,724,969	69,915	78,614	20,139	5,893,637	15,273,000	2.59	3,474	2,216	1,522	7,212	166
Whitley	471,538	10,452	15,687	.....	497,677	1,509,000	2.53	846	303	220	1,369	100
Other counties (b)	2,310	1,800	.....	.....	4,110	11,000	2.68	10	.....	.....	10	230
Total	32,856,297	372,700	321,238	230,318	33,780,553	90,198,000	2.66	24,177	12,360	8,048	44,585	161
Western District												
Christian, Crittenden, and Hancock	31,284	1,963	4,376	.....	37,613	$109,000	$2.90	181	99	54	334	100
Daviess	98,152	20,880	950	.....	119,982	244,000	2.03	99	43	28	170	170
Henderson	284,894	68,988	12,240	.....	366,122	866,000	2.37	399	178	77	654	130
Hopkins	2,529,690	140,455	46,632	.....	2,716,777	5,437,000	2.00	2,091	871	762	3,724	124
McLean	65,011	2,200	729	.....	67,940	134,000	1.97	165	70	66	301	61
Muhlenberg	3,728,624	180,051	68,050	.....	3,976,725	8,249,000	2.07	3,580	1,620	670	5,870	125
Ohio	943,993	17,216	33,478	.....	994,687	2,065,000	2.08	1,152	410	186	1,748	121
Union	1,188,215	30,496	45,302	.....	1,264,013	2,874,000	2.27	904	406	191	1,501	171
Webster	1,317,317	9,155	19,948	.....	1,346,420	3,045,000	2.26	1,163	489	272	1,924	120
Total	10,187,180	471,394	231,705	.....	10,890,279	23,023,000	2.11	9,734	4,186	2,306	16,226	127
Total all Kentucky	43,043,477	844,094	552,943	230,318	44,670,832	113,221,000	2.53	33,911	16,546	10,354	60,811	152
Wagon mines served by rail	106,485	.....	.....	.....	106,485	321,000	3.01	.....	.....	.....	.....	...
Grand Total	43,149,962	844,094	552,943	230,318	44,777,317	$113,542,000	$2.54	.....	.....	.....	.....	...

(a) Includes also loaders and shotfirers.
(b) Owsley and Wayne Counties.

166 Miners' Lives Lost in Mine Accidents in August; Eight Months' Total 1,628

Accidents at coal mines in the United States during August, 1924, killed 166 men, according to information received from state mine inspectors by the U. S. Bureau of Mines. The fatality rate for the month, based on an output of 41,851,000 tons of coal, was 3.97 per million tons, about 27 per cent lower than the rate of 5.46 per million tons for August, 1923. The rate for July, 1924, was 3.79. The average rate for August over a ten-year period (1914-23) was 4.17, so that the rate for August of the current year represents a reduction of about 5 per cent. The rate for bituminous mines alone for August, 1924, was 3.77 per million tons, as compared with 5.46 for August last year and 3.89 for the month during the ten years mentioned. For anthracite mines alone the August, 1924, rate was 4.94 per million tons, as against 5.41 for August last year and a ten-year average rate for August of 5.81 per million tons.

Reports for the first eight months of 1924 show that 1,628 men have been killed by accidents at the mines, as compared with 1,793 during the same months last year. The 8-months fatality rate for this year was 4.58 per million tons, as compared with 4.12 in 1923. The increased rate for 1924 was entirely in the bituminous industry and was caused by the explosions of gas and coal dust. The bituminous rate for the first eight months of 1924 was 4.40 per million tons; in 1923 it was 3.83. The anthracite rate for eight months in 1924 was 5.48; last year it was 5.63 for the same period.

An analysis of the causes of accidents in 1924 to the end of August, with those for the same period in 1923, shows an increased rate for gas and dust explosions in 1924, but no material change in the rates for other causes of accidents.

W. K. Field

President of the Pittsburgh Coal Co., which post he has occupied during the last fourteen years. He has been actively identified with the coal industry for more than thirty years.

Refer Mine Feud in Colorado To Governor Sweet

A row, having the earmarks of a feud, between miners and mine owners near Milner, in Routt County, Colorado, has been referred to Governor Sweet by Walker Glaister, general manager of the Yampa Fuel Co. Mr. Glaister wrote the Governor that his company cannot operate its newly leased Yampa mine, in Curtis Gulch, because a railroad bridge on the spur line running from Milner to the mine was burned some time ago, he thinks by incendiarists who sought to keep the mine from operating. He said threats have been made against the mine in case operations are resumed, but that Sheriff Charles Neiman and the county commissioners do nothing. Sheriff Neiman denied this by telephone to the Governor and said that $500 was offered for the arrest of those who destroyed the bridge.

Upon investigation Governor Sweet discovered that the mine had been leased previously to several small mining companies, all of which failed to operate it successfully, and all, on abandoning it, failed to make good their obligations to the miners to the extent of $20,000. The Governor wrote A. J. McGuire, president of District No. 15, United Mine Workers, to take personal charge of the miners for the time being, with the idea of preventing violence. He instructed Sheriff Neiman to maintain law and order. He wrote Mr. Glaister, and W. W. Curtis, of Colorado Springs, owner of the mine, that wages due the miners must be paid.

Coal-Mine Fatalities During August, 1924, by Causes and States

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

State	Underground												Shaft					Surface						Total by States	
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Explosions of gas or coal-dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923
Alabama	4		1		2		2					9													9	8
Alaska																									0	0
Arkansas	1			1			1					3													3	0
Colorado	2	1	1	1	1		2					8													8	5
Illinois	5		2				2		2			11													11	16
Indiana			1									1													1	9
Iowa			1									1													1	4
Kansas																									0	0
Kentucky	6		3		1		2					12													12	10
Maryland			1									1													1	0
Michigan																									0	0
Missouri																									0	4
Montana	1											1													1	0
New Mexico			1									1													1	2
North Dakota																									0	0
Ohio	5		1		1							7										1		1	8	10
Oklahoma										1		1													1	1
Pennsylvania (bituminous)	17		2						1		1	21							1				1	2	23	40
South Dakota																									0	0
Tennessee							1					1													1	2
Texas																									0	0
Utah		1										1													1	2
Virginia	4		2									6													6	7
Washington		1							1		1	3													3	3
West Virginia	17	2	9	2	1		1		2		1	35							1				1	2	37	43
Wyoming			2	1								3													3	101
Total (bituminous)	62	5	27	5	6		11		6		4	126							2			1	2	5	131	267
Pennsylvania (anthracite)	13	3	1	*4	5						4	30						2		1		2		5	35	48
Total, August, 1924	75	8	28	9	11		11		6		8	156						2	2	1		3	2	10	166	
Total, August, 1923	88	11	50	107	14	2	9	1	2		7	291	3	2	1		6	5		2		1	10	18		315

*Gas explosions only.

Moffat Tunnel Through Rockies Well Started, But Who Will Use It?

Real progress has been made in the driving of the Moffat tunnel in Colorado, which is counted on to give Routt County coal a better outlet. The tunnel, which is to be approximately six miles long under James Peak at the Continental Divide, is on the line of the Denver & Salt Lake R.R. (Moffat road), and may be used by that railroad but is being built by the state. Two bores are being driven simultaneously. An 8x8-ft. pioneer or water tunnel has been driven 4,450 ft. from the east portal and 4,150 ft. from the west portal and is thus 26 per cent finished. A total of 378 ft. of crosscuts is completed, or about one-third the total of crosscuts. Headings measuring 7½x9 ft. in advance of the main bore have been driven 4,260 ft. from the east and 2,800 ft. from the west. The railroad tunnel itself, which is to carry a single track, is finished for 1,120 ft. from the east and 480 ft. from the west portal. The loading out of rock from this work is all done by mechanical shovels.

Although the Moffat tunnel has been boomed for years as a possible great aid to the coal industry of Colorado because of the present difficulty of hauling coal out of the rich but little developed fields of Routt County, little enthusiasm over it is felt by Colorado coal men. Of course the bore, if used by the Moffat road, which is the only carrier for the region now, will eliminate more than 20 miles of heavy grades over the crest of the divide. Great difficulty has been experienced by the railroad in keeping this part of its line open in rough weather. Snow and rock slides tie up the road frequently. Also the whole route over the mountains is expensive to maintain. Curves have been so bad that derailments are common. The result has been that the Routt County shippers of coal do not always get enough cars when they need them and coal en route is often long delayed. Some of these troubles no doubt would be eliminated by the use of the tunnel by the Moffat road.

But as a matter of fact nobody knows positively that the Moffat road will lease the bore. No lease has yet been made nor any form of contract signed. There is much talk in Colorado of the possibility of the Denver & Rio Grande Western Ry. leasing or buying the Moffat road, extending it from its present western terminus at Craig, Colo., to a junction with the Salt Lake line of the Rio Grande somewhere in Utah. This would give the Rio Grande a much shorter route from Denver to Salt Lake City. The financial embarassments of the Rio Grande have previously made such a purchase unlikely, but the future of the road now looks brighter and a lease of the Moffat road together with the construction of a western link is a possibility.

The Union Pacific also is considered as a possible lessee or purchaser of the Moffat road. If that railroad built a link from its main line in western Wyoming south to connect with the present terminus of the Moffat road it could help develop the northwestern region of Colorado and shorten tremendously its route from Denver to Salt Lake City.

These railroad conjectures keep the nimble wits in the Colorado coal industry busy, but the actual digging of the tunnel and all the possibilities for the use of it have not started any rush of coal interests toward Routt County. In spite of the unquestioned high quality and great extent of the coal of that region and in spite of the probability that some day some good railroad will serve the region, there still remains the obstacle of high freight rates which Routt County coal is always expected to face, tunnel or no tunnel, because of the long mountainous haul. There are now 24 mines in Routt County, nearly half of which are shut down.

Woodward Colliery Reopens After Long Layoff

With the resumption of operations at the Woodward colliery of the Glen Alden Coal Co., at Edwardsville, Pa., Oct. 1, more than 1,800 miners returned to work after a layoff of three months made necessary by a series of repairs being made to the mine. The resumpis largely due to the efforts of Rinaldo Cappellini, district president of the miners' union, who called on S. D. Dimmick, vice-president of the company, a day after the return of the latter from a European tour and induced him to consider negotiations for the resumption of operations at the Edwardsville colliery.

Several days elapsed while Mr. Dimmick conferred with the Glen Alden officials, and it was finally decided to open up the colliery and conduct the remaining repairs during the night shifts and on Sundays.

Stanley Williams has been officially appointed check docking boss at the colliery by the local mine union officials, Mr. Williams was elected to that duty by the men last July.

Alberta Operators Not Likely To Reopen This Season

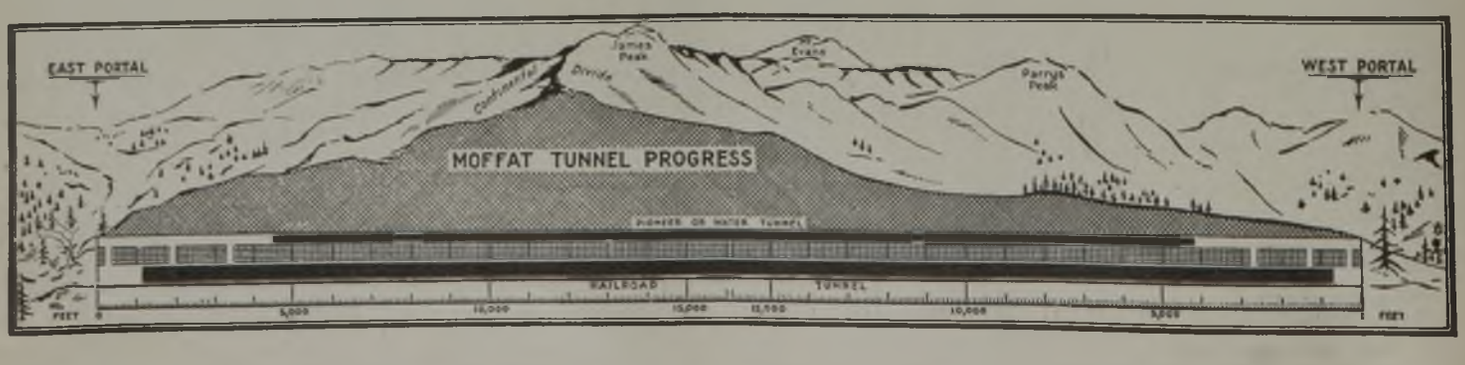
Owing to the Alberta miners' strike American coal is now in general use on the Canadian National Rys. as far as Biggar, Sask., and the prospects are that it will be supplying motive power for the trains even in Alberta before the winter. At present only two mines, at Coal Valley and Sterco, worked by non-union miners, are supplying coal to the Canadian National. The proposal to open some of the closed mines with non-union labor under police protection has been abandoned in favor of another attempt to bring the operators and miners together in a conference, but there is little hope of a settlement.

Operators of northern Alberta, it is stated, are not particularly anxious to reopen the mines, as they have lost the market for the season with little hope of regaining it at present. Alberta coal is at a disadvantage in competing in the Winnipeg and Manitoba markets with the more cheaply mined coal of Pennsylvania and the operators are disposed to continue the struggle to cut production cost. The introduction of natural gas into some of the cities and towns of northern Alberta has somewhat lessened the demand for coal, and the mines still in operation are pushing sales in other localities.

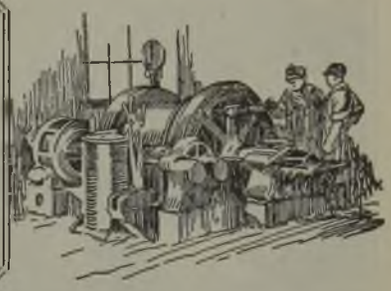
Backers Want to Build New Indiana-Kentucky Road

Opening of a new coal field in southern Indiana which now is not penetrated by any north-and-south railroad and which contains more than 7,000,000,000 tons of coal will result from the building of the proposed new Owensboro, Rockport & Chicago Ry., between Owensboro, Ky., and Elnora, Ind., by way of a proposed new toll bridge over the Ohio River at Rockport, according to testimony witnesses gave before the Indiana Public Service Commission late in September. The total cost of the road was estimated at $6,767,016.45. Bonds amounting to more than $6,000,000 and stocks of $2,500,000 are to be sold.

The railroad would be 71.9 miles long in Indiana and 12⅓ miles long in Kentucky, connecting with the L. & N., L. H. & St. L., and the Illinois Central railroads at Owensboro; the Southern Ry. at Rockport, Velpen and Tennyson; the B. & O. at Montgomery, and the C., M. & St. P. and E. I. & T. H. at Elnora.



Practical Pointers For Electrical And Mechanical Men



Tool Saves Time in Trimming Slot Insulation After Motor Is Wound

AFTER the coils are all in place in a newly wound armature or stator the protending slot insulation, usually consisting of a heavy paper, must be trimmed flush with the laminations. The common method of trimming using an ordinary knife is slow, tedious, and hard on the fingers and does not always produce uniform results. With the proper tool this work is almost a pleasure, being accomplished by making successive slices by moving the tool parallel to the slots and holding it so as to slide on the laminations.

The paper-cutting tool shown in Fig. 1 has a slightly turned up point so that it slides easily over any irregularities of the laminations. The offset handle keeps the operators hand clear of the work. It is important that the cutting edge be kept quite

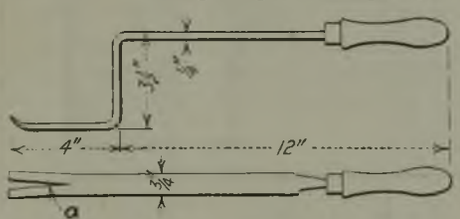


Fig. 1—Used in Hannastown Winding Shop of Keystone Coal & Coke Co.

This tool has an offset handle enabling the operator to cut the insulation for the full length of the slot without bumping his knuckles on the lamination.

sharp to eliminate any tendency to tear rather than cut the insulation. The material, if tool steel, and the cutting end is tempered to about the same hardness as a wood chisel.

Don't Bump Your Knuckles

A more simple form of slicing tool is illustrated in Fig. 2. It is constructed from a heavy-power hack saw blade and the handle is formed by a wrapping of ordinary friction tape. This type of tool should be at least six inches longer than the slot, so that the operators hand will not hit the end of the laminations.

In order to keep the cutting edge flush with the bottom side of the blade

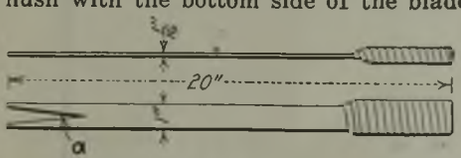


Fig. 2—Used in the Library Winding Shop of the Pittsburg Coal Co.

This tool, having no offset, is made long in order that the handle will not interfere on average length slots.

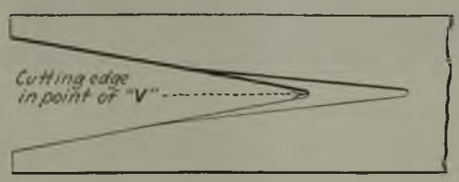


Fig. 3—View of Cutting Groove

The cutting is done in the very apex of the "V" opening which is flush with the bottom surface of the tool.

it must be formed by grinding on one side only, as indicated by Fig. 3. Both forms of the tool are the same in this respect, and in each the actual cutting edge is at the end of the opening between the two prongs shown at *a*.

Two-Motor Fan Drive Is Good in Emergencies

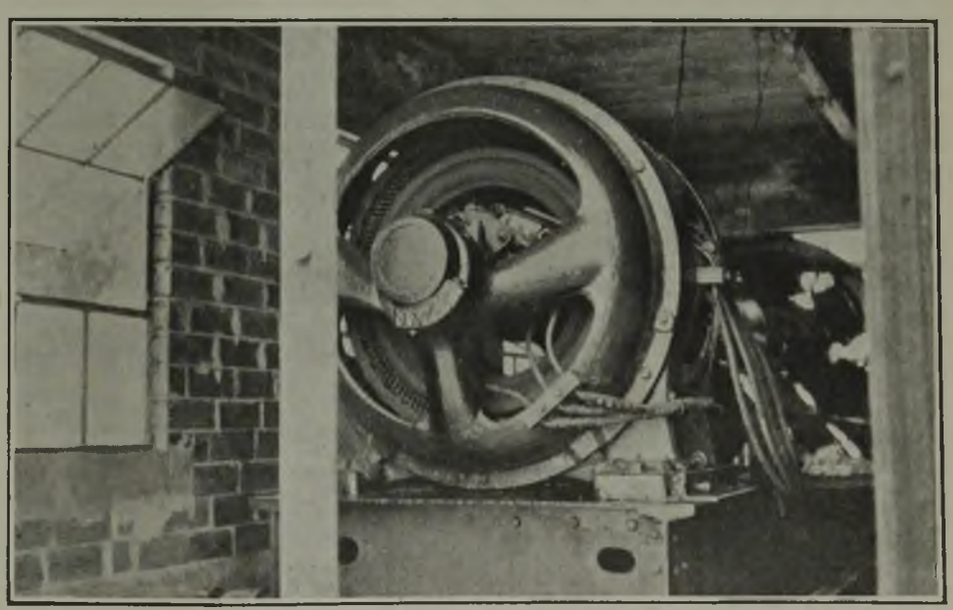
Continuity of service at coal mines is sometimes vital. This is especially true with mine fans. If the fan stops a relatively safe mine may quickly become a den of danger and death. Realizing this, the O'Gara Coal Co., at Harrisburg, Ill., has resorted to various schemes to make sure that mine fans will not stop when the usual supply of power fails to reach the driving motor.

At one fan installation, some distance from the mine shaft, the fan is connected to a two-motor drive. Under ordinary conditions the fan is driven by a large induction motor served from an overhead power line carrying 2,200-volt alternating current. Another motor mounted on a common base plate is a direct-current unit. This motor may be supplied from a direct-current circuit which comes from the main hoisting shaft and also supplies the direct-current energy for the inside workings.

Old Motor Earns Its Keep

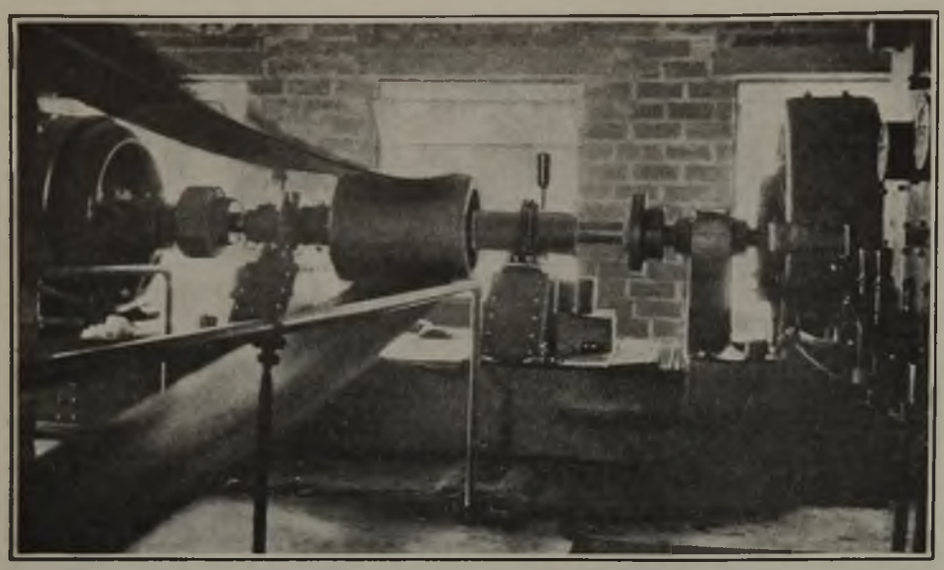
There are several advantages to this arrangement because practically no extra expense is involved in this duplication of equipment. The direct-current feeder does not stand idle because it supplies the coal-cutting and haulage machines. The direct-current motor is a very old type probably unsuitable for any other purpose around the mines. Consequently, if it were not placed in stand-by service it would have been sold at a loss or would be taking up space in the warehouse, rusted and out of service.

Two flexible couplings connect the two motors to a common belt drive which operates the fan. Normally the coupling on the induction motor is connected to the pulley shaft and the coupling on the direct-current motor is disconnected. It takes only a short time to make the coupling between the direct-current motor and the pulley shaft complete because all parts are on hand. Separate control apparatus is



Alternating-Current Motor of Double-Unit Drive

Ample ventilation for the motor winding is provided by setting the motors near windows and doors. This view shows the alternating-current motor which normally drives the fan.



How the Two Motors Are Coupled

A motor on each end of the pulley shaft makes the possibility of a shutdown reasonably remote. The power supply to the induction motor is furnished over an outside transmission line, the power for the direct-current motor is taken from a circuit inside the mines.

provided to start, stop and protect the direct-current motor when it is in operation.

Keep Pump Impellers in Balance—It Pays

Centrifugal pumps, like alternating-current machinery, are mysterious devices to some men. Whenever anything goes wrong with one of them such workmen just throw up their hands in despair.

Strange as it may seem, a centrifugal pump is one of the simplest pieces of apparatus used in the mines. It is compact and constructed of a few simple parts, only one of which rotates.

J. F. MacWilliams, power engineer of the Pennsylvania Coal & Coke Corp., Cresson, Pa., tells us an interesting experience he had with a pump and writes as follows: "Recently we had considerable trouble with a centrifugal pump. The wearing rings would wear out in about one month. There was no apparent reason why this should happen, so the impeller was brought to the shop for inspection, a spare unit being installed in its place. The dimensions of the impeller checked quite reasonably with the manufacturer's prints, but before the impeller was returned to the mines it was placed on balance ways. This test disclosed the fact that the impeller was ½ lb. out of balance.

"The impeller was balanced and reinstalled, seemingly improving the mining. From this experience it would seem that more attention should be given to the balance of pump impellers. If they are out of balance there is a tendency for them to swing and increase the wear on the wearing rings, and consequently the efficiency of an unbalanced impeller will be low.

"We have decided in the future to check all impellers as they come to the shop, and if found to be unbalanced they are corrected and a record of wear kept to see if the efficiency holds up better.

"It would seem that if it is important to balance other machines which operate at speeds as high as 1,750 r.p.m. it also should be important to balance pump impellers."

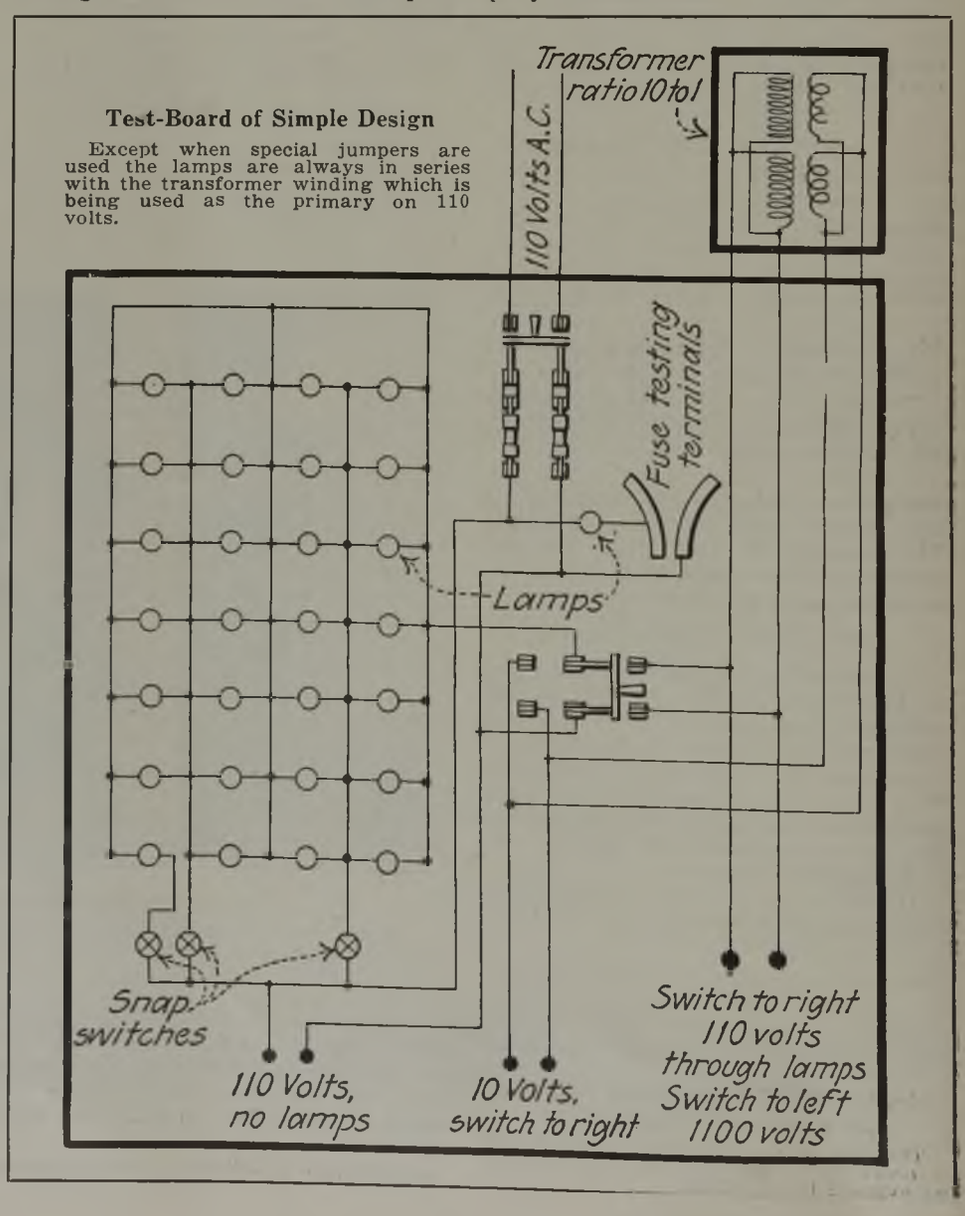
Simple Test-Board for Shop

We see many kinds of test-boards in mine repair shops, varying from the elaborate and expensive factory product to the simple home-made type which in its most abbreviated form consists of nothing more than one or two lamps in series with test leads connected to the low-voltage lighting or trolley circuit. The test-board pictured here is used by the Keystone Coal & Coke Co., of Greensburg, Pa.

The curved copper strips are proportioned so that any ordinary size fuse is conveniently tested by touching its terminals to the copper strips and noting if the adjacent lamp lights. For other testing purposes leads are connected to any one of the three pairs of terminals seen at the bottom of the board. By manipulating the double-throw switch either 10 volts or 1,100 volts are obtained; in either case, however, the side of the transformer then serving as the primary is in series with one of the desired number of lamps as controlled by the three snap switches. When testing 250-volt direct-current armatures for grounds, with 1,100 volts, it is very desirable to limit the current in case the insulation breaks.

The 10-volt terminals often are used when making a bar-to-bar test on armatures. Low-resistant armature windings required a large current to obtain the desired intensity of sound in the telephone receiver when used in the bar-to-bar test to detect faults.

Mr. Demi, chief electrician of the Keystone Coal & Coke Co., states that this company has found this type of board very satisfactory and that several have been installed at the company's various mines.



Test-Board of Simple Design

Except when special jumpers are used the lamps are always in series with the transformer winding which is being used as the primary on 110 volts.

Production And the Market

Bituminous-Coal Market Slowly Forges Ahead; Output and Prices Continue to Climb

The bituminous-coal market continued to forge ahead during the last week. The improvement, of course, is more marked in some fields than others, Baltimore, for instance, still being in the throes of the depression that descended upon the industry last spring. A most encouraging development, however, is the display of strength in the New England market, where pessimism reigned so long. Business is so brisk in western Kentucky that it is difficult to keep track of prices, they change so rapidly. In the other centers, however, the upturn is more gradual. Car supply has become a problem already in fields served by the Chesapeake & Ohio, Norfolk & Western and the Louisville & Nashville as well as in the Birmingham district.

General Conditions Gradually Improving

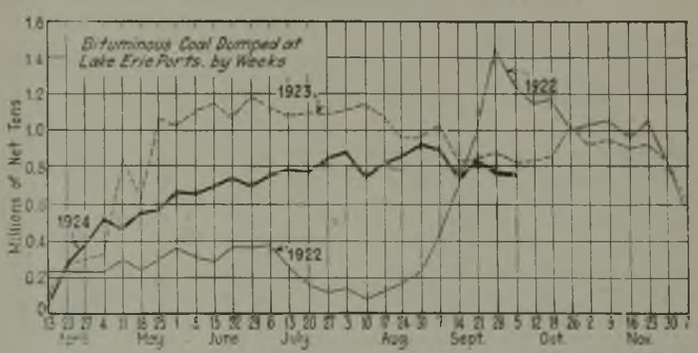
While the pace of general industry is irregular the trend is definitely upward and prospects are getting better, particularly in such basic industries as iron and steel as well as textiles. A notable feature of this expansion is seen in the huge orders for equipment being placed by the railroads, $60,000,000 having been spent for this purpose during the last month by carriers in this country.

Coal Age Index of spot prices of bituminous coal again advanced one point during the last week—its fifth successive rise—standing on Oct. 6 at 171, the corresponding price for which is $2.07. This compares with 170 and $2.06 respectively on Sept. 29.

Activity at Hampton Roads registered a further reaction last week, dumpings of coal for all accounts during the seven-day period ended Oct. 2 totaling 331,398 net tons, compared with 356,557 tons handled during the preceding week.

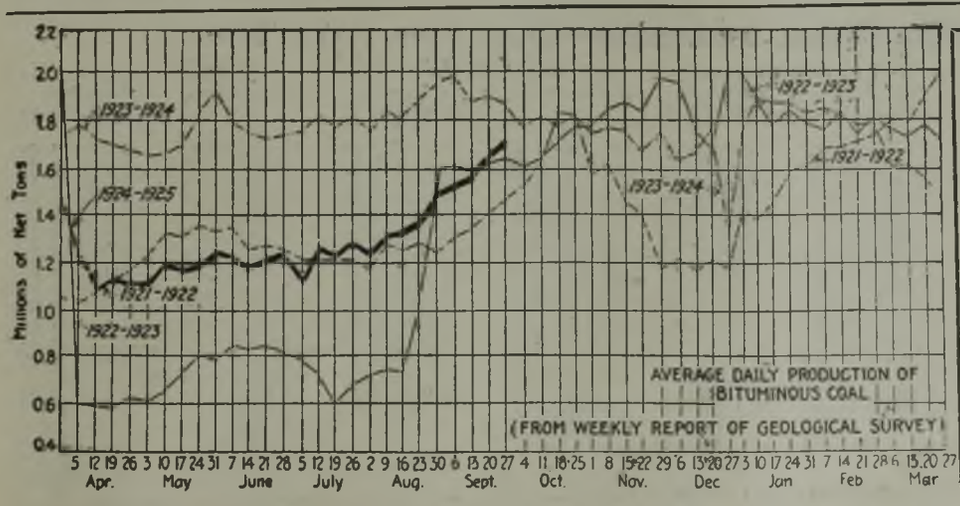
Coal movement up the lakes is holding up well despite the belief of some that it is a finished job as far as this year is concerned. Dumpings at Lake Erie ports during the week ended Oct. 5, according to the Ore & Coal Exchange, were as follows: For cargo, 731,604 net tons; for fuel, 45,145 tons, compared with 734,246 and 39,686 tons respectively during the previous week.

Output of bituminous coal is improving steadily, the total for the week ended Sept. 27, according to the Geological Survey, being estimated at 10,189,000 net tons, an increase of 359,000 tons over the week ended Sept. 20, when 9,830,000 tons was produced, according



to revised figures. The average daily output—nearly 1,700,000 tons—is 193,000 tons less than at this time a year ago, but is slightly higher than at the same time two years ago. Anthracite output also continues to mount, the total for the week ended Sept. 27 being 1,942,000 net tons, compared with 1,851,000 tons during the previous week.

Anthracite is moving easily in most markets, though a large proportion of the business is in small orders, and prices hold firmly. Stove continues to be most in demand, but there is a better call for the other sizes also, including steam coals, No. 1 buckwheat being in particularly good shape. Production has been hampered considerably by floods at a number of mines following the heavy rains of last week.



Estimates of Production

(Net Tons)

	1923	1924
BITUMINOUS		
Sept. 13	11,378,000	9,529,000
Sept. 20 (*a*)	11,454,000	9,830,000
Sept. 27 (*b*)	11,347,000	10,189,000
Daily average	1,891,000	1,698,000
Cal. yr. to date (*c*)	411,013,000	332,121,000
Daily av. to date	1,799,000	1,449,000
ANTHRACITE		
Sept. 13	2,000	1,820,000
Sept. 20	877,000	1,851,000
Sept. 27	2,025,000	1,942,000
Cal. yr. to date	71,264,000	67,851,000
COKE		
Sept. 20 (*a*)	335,000	122,000
Sept. 27 (*b*)	321,000	132,000
Cal. yr. to date (*c*)	14,451,000	7,459,000

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

Midwest More Than Holds Its Own

Though there has been a lull in orders for domestic coal at Chicago, prices have not weakened, as operators are far behind in deliveries of orders accepted some time ago. All lump prices have stiffened, and this applies also on cheaper grades in the various districts. Egg prices also have stiffened to a uniform level. Dealers who are unable to get shipments on their lump orders are willing to accept 6x3-in. egg. Smaller sizes of all grades, however, are somewhat hard to move. Screenings are plentiful. Nos. 3 and 4 nut are being held on track as "no bills." Some Indiana mines are still running part time, but these are mines that usually depend on steam business.

The western Kentucky situation remains unchanged—oversold on lump, egg in fairly good demand, but smaller sizes going begging. Smokeless coals of West Virginia are readily absorbed, and the prices firm. Anthracite is coming in fairly well and is being absorbed eagerly.

In southern Illinois most mines are oversold for five or six weeks on lump and egg. Nut is beginning to move some but not to any great extent. Screenings are slow and almost impossible to move. Many mines have been idle on account of unbilled steam sizes and there seems no relief for this. The mines are averaging four days a week. Strip mines are working practically every day. Somewhat similar conditions prevail in the Duquoin field, except that prices range 25c. lower on domestic sizes. Screenings here, as in the Carterville field, are now down to $1.25. The Mt. Olive field has picked up notably, save that smaller sizes are hard to move in spots, being applied mostly on contract. Prices, however, are unchanged. In the Standard district there is plenty of coal moving but at hardly above production cost. Screenings are as low as 50c. and 2-in. lump is ranging around $2.50 with 6-in. lump $2.50@$2.75 with a good demand for lump and no call for anything else. Railroad tonnage continues pretty good. Mines are getting three or four days a week.

At St. Louis the demand for domestic sizes continues good on the better grades of lump. Mt. Olive is coming into its own, while Standard is a little bit slow but it is picking up. The weather has been a little bit chilly and this has stimulated the household demand. Local wagon-load steam is showing up well but carload is slow. Mt. Olive and Carterville have advanced 25c. a ton retail. Standard has not moved up yet. Country steam is slow excepting in spots, but domestic is good for both high and low grades.

Business Heavy in Kentucky

Operating mines in western Kentucky, with a good car supply and good labor supply, are going ahead on a full-time basis and the field as a whole is more active than for

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

Low-Volatile, Eastern	Market Quoted	Oct. 8 1923	Sept. 22 1924	Sept. 29 1924	Oct. 6 1924†
Smokeless lump	Columbus	$6.10	$4.10	$4.10	$4.25@$4.50
Smokeless mine run	Columbus	3.05	2.10	2.10	2.10@2.35
Smokeless screenings	Columbus	2.25	1.20	1.20	1.15@1.30
Smokeless lump	Chicago	6.10	3.85	3.85	3.75@4.00
Smokeless mine run	Chicago	2.85	1.90	1.90	1.85@2.00
Smokeless lump	Cincinnati	6.10	3.85	4.00	4.00@4.25
Smokeless mine run	Cincinnati	2.75	1.85	2.00	2.00@2.50
Smokeless screenings	Cincinnati	1.60	1.10	1.20	*1.10@1.25*
*Smokeless mine run	Boston	4.80	4.20	4.25	4.20@4.35
Clearfield mine run	Boston	2.15	1.90	1.90	1.45@2.35
Cambria mine run	Boston	2.75	2.30	2.35	*2.00@2.50*
Somerset mine run	Boston	2.35	2.05	2.10	*1.75@2.40*
Pool 1 (Navy Standard)	New York	3.10	2.75	2.75	2.50@3.00
Pool 1 (Navy Standard)	Philadelphia	3.20	2.40	2.70	2.50@2.90
Pool 1 (Navy Standard)	Baltimore	....	2.60	2.55	2.35@2.85
Pool 9 (Super. Low Vol.)	New York	2.35	2.10	2.05	2.00@2.25
Pool 9 (Super. Low Vol.)	Philadelphia	2.55	2.15	2.15	1.95@2.35
Pool 9 (Super. Low Vol.)	Baltimore	2.40	1.85	1.85	1.80@1.90
Pool 10 (H.Gr. Low Vol.)	New York	2.05	1.85	1.85	1.80@2.00
Pool 10 (H.Gr. Low Vol.)	Philadelphia	2.10	1.75	1.75	1.65@1.90
Pool 10 (H.Gr.Low Vol.)	Baltimore	2.25	1.65	1.65	1.60@1.70
Pool 11 (Low Vol.)	New York	1.85	1.60	1.60	1.50@1.75
Pool 11 (Low Vol.)	Philadelphia	1.85	1.45	1.45	1.35@1.60
Pool 11 (Low Vol.)	Baltimore	2.00	1.55	1.55	1.50@1.60
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.65	1.50	1.50	1.50@1.65
Pool 54-64 (Gas and St.)	Philadelphia	1.70	1.50	1.50	1.40@1.60
Pool 54-64 (Gas and St.)	Baltimore	1.60	1.40	1.40	1.35@1.50
Pittsburgh so'd gas	Pittsburgh	2.55	2.40	2.40	2.30@2.50
Pittsburgh gas mine run	Pittsburgh	2.20	2.10	2.10	2.00@2.25
Pittsburgh mine run (St.)	Pittsburgh	1.85	1.85	1.85	1.75@2.00
Pittsburgh slack (Gas)	Pittsburgh	1.20	1.25	1.15	1.15@1.35
Kanawha lump	Columbus	3.15	2.10	2.10	2.00@2.25
Kanawha mine run	Columbus	1.85	1.40	1.40	1.30@1.55
Kanawha screenings	Columbus	.95	1.05	1.15	*.90@1.00*
W. Va. lump	Cincinnati	3.35	2.35	2.60	2.50@2.75
W. Va. gas mine run	Cincinnati	1.35	1.50	1.60	*1.40@1.65*
W. Va. steam mine run	Cincinnati	1.35	1.35	1.45	*1.35@1.50*
W. Va. screenings	Cincinnati	.85	.90	.95	.90@1.00
Hocking lump	Columbus	3.10	2.50	2.50	2.40@2.65
Hocking mine run	Columbus	1.85	1.55	1.60	1.50@1.75
Hocking screenings	Columbus	.95	1.15	1.05	*.90@1.00*
Pitts. No. 8 lump	Cleveland	2.60	2.35	2.35	*1.95@2.75*
Pitts. No. 8 mine run	Cleveland	1.95	1.80	1.85	1.85@1.90
Pitts. No. 8 screenings	Cleveland	1.10	1.15	1.15	1.10@1.25

Midwest	Market Quoted	Oct. 8 1923	Sept. 22 1924	Sept. 29 1924	Oct. 6 1924†
Franklin, Ill. lump	Chicago	$4.05	$3.35	$3.35	$3.25@$3.50
Franklin, Ill. mine run	Chicago	2.60	2.35	2.35	2.25@2.50
Franklin, Ill. screenings	Chicago	1.25	1.35	1.35	1.25@1.50
Central, Ill. lump	Chicago	3.10	2.85	2.85	2.75@3.00
Central, Ill. mine run	Chicago	2.10	2.20	2.20	2.15@2.25
Central, Ill. screenings	Chicago	.70	1.15	1.15	1.10@1.25
Ind. 4th Vein lump	Chicago	3.35	3.10	3.10	3.00@3.25
Ind. 4th Vein mine run	Chicago	2.60	2.35	2.35	2.25@2.50
Ind. 4th Vein screenings	Chicago	1.20	1.35	1.35	1.25@1.50
Ind. 5th Vein lump	Chicago	2.50	2.60	2.60	2.75@3.00
Ind. 5th Vein mine run	Chicago	2.10	2.10	2.10	2.00@2.25
Ind. 5th Vein screenings	Chicago	.80	1.25	1.25	1.20@1.35
Mt. Olive lump	St. Louis	3.10	3.00	2.85	2.75@3.00
Mt. Olive mine run	St. Louis	2.25	2.50	2.50	2.50
Mt. Olive screenings	St. Louis	1.25	1.25	1.25	1.25
Standard lump	St. Louis	3.00	2.75	2.85	2.75@3.00
Standard mine run	St. Louis	2.05	1.80	1.80	1.75@1.85
Standard screenings	St. Louis	.55	.95	.80	.75@.90
West Ky. lump	Louisville	2.55	2.85	2.85	3.25@3.50
West Ky. mine run	Louisville	1.75	1.65	1.65	1.50@1.90
West Ky. screenings	Louisville	.55	1.00	.90	.75@.90
West Ky. lump	Chicago	2.60	2.70	2.85	2.75@3.00
West Ky. mine run	Chicago	1.75	1.65	1.65	1.35@1.95
South and Southwest					
Big Seam lump	Birmingham	3.75	3.10	2.85	2.75@3.25
Big Seam mine run	Birmingham	1.95	1.60	1.60	1.50@1.75
Big Seam (washed)	Birmingham	2.35	1.85	2.00	*1.75@2.00*
S. E. Ky. lump	Chicago	3.35	2.85	2.85	3.00@3.25
S. E. Ky. mine run	Chicago	2.25	1.60	1.60	1.50@1.75
S. E. Ky. lump	Louisville	3.25	3.00	3.00	2.75@3.50
S. E. Ky. mine run	Louisville	2.00	1.55	1.55	1.35@1.90
S. E. Ky. screenings	Louisville	.85	.90	.90	.85@1.00
S. E. Ky. lump	Cincinnati	3.25	2.60	2.75	2.50@3.00
S. E. Ky. mine run	Cincinnati	1.35	1.50	1.55	1.35@1.75
S. E. Ky. screenings	Cincinnati	.85	1.00	1.00	.90@1.10
Kansas lump	Kansas City	5.00	4.50	4.50	5.00
Kansas mine run	Kansas City	3.50	3.25	3.25	3.25
Kansas screenings	Kansas City	2.25	2.35	2.35	2.35

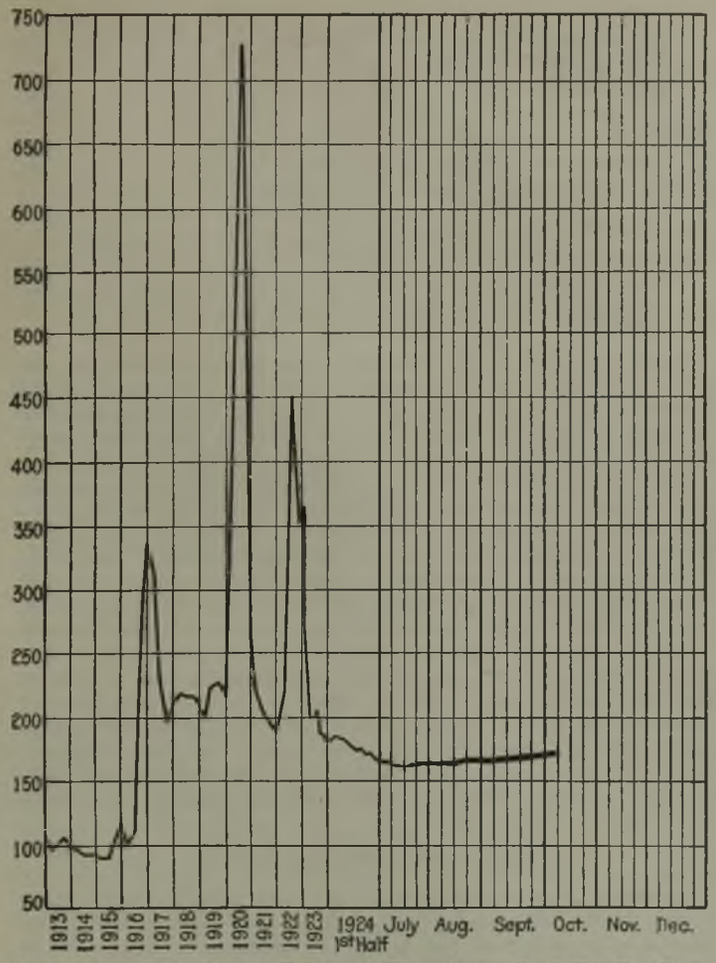
* Gross tons, f.o.b. vessel, Hampton Roads.

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

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

	Market Quoted	Freight Rates	Oct. 8, 1923 Independent	Oct. 8, 1923 Company	Sept. 29, 1924 Independent	Sept. 29, 1924 Company	Oct. 6, 1924† Independent	Oct. 6, 1924† Company
Broken	New York	$2.34	$9.60@$12.25	$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	9.85@12.25	8.75@9.25	$9.25@$9.75	8.75@9.25	$9.25@$9.75	8.75@9.25
Egg	Philadelphia	2.39	9.85@12.20	8.75@9.25	9.00@9.70	8.80@9.25	9.00@9.70	8.80@9.25
Egg	Chicago*	5.06	9.60@12.50	8.00@8.35	8.17@8.27	8.14@8.20	8.17@8.27	8.14@8.20
Stove	New York	2.34	9.85@12.25	8.75@9.25	9.50@10.25	8.75@9.50	9.50@10.25	8.75@9.50
Stove	Philadelphia	2.39	9.85@12.20	8.90@9.25	9.35@10.00	9.15@9.50	9.35@10.00	9.15@9.50
Stove	Chicago*	5.06	9.60@12.50	8.00@8.35	8.63@8.75	8.50@8.64	8.63@8.75	8.50@8.64
Chestnut	New York	2.34	9.85@12.25	8.75@9.25	9.25@9.75	8.75@9.25	9.25@9.75	8.75@9.25
Chestnut	Philadelphia	2.39	9.85@12.20	8.90@9.25	8.85@9.80	9.15@9.25	8.85@9.80	9.15@9.25
Chestnut	Chicago*	5.06	9.60@12.50	8.00@8.35	8.26@8.40	8.44@8.60	8.26@8.40	8.44@8.60
Pea	New York	2.22	6.75@8.00	6.15@6.65	5.25@5.75	5.50@6.00	*5.00@5.50*	5.50@6.00
Pea	Philadelphia	2.14	6.75@9.00	6.35@6.60	5.75@6.25	5.75@6.00	5.75@6.25	5.75@6.00
Pea	Chicago*	4.79	6.00@6.75	5.40@6.05	5.13@5.45	5.36@6.20	5.13@5.45	5.36@6.20
Buckwheat No. 1	New York	2.22	2.50@3.50	3.50	2.50@3.00	3.00@3.15	*2.25@3.00*	3.00@3.15
Buckwheat No. 1	Philadelphia	2.14	3.00@3.50	3.50	2.50@3.00	3.00	2.50@3.00	3.00
Rice	New York	2.22	2.00@2.50	2.50	1.75@2.25	2.00@2.25	**1.85@2.25**	2.00@2.25
Rice	Philadelphia	2.14	2.00@2.50	2.50	2.00@2.25	2.25	2.00@2.25	2.25
Barley	New York	2.22	1.15@1.50	1.50	1.25@1.50	1.50	1.25@1.50	1.50
Barley	Philadelphia	2.14	1.50	1.50	1.50	1.50	1.50	1.50
Birdseye	New York	2.22	.....	1.60	.....	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

	1924			1923
	Oct. 6	Sept. 29	Sept. 22	Oct. 8
Index	171	170	169	190
Weighted average price	$2.07	$2.06	$2.04	$2.30

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.

a long time past. Prices are changing rapidly, and mostly for the better, except for screenings, which are lower.

Peak prices in both the eastern and western Kentucky fields are at around $3.50 for best block sizes. West Kentucky is quoting 75c. on screenings and east Kentucky 85c. as a minimum, but shading these prices 10c. at times to move surplus. Mine run is quoted at around $1.35@$1.90 in both sections, although west Kentucky isn't quoting much at under $1.50.

Louisville retailers are meeting with a big demand for coal, and are taking a lot of fuel not only to take care of immediate deliveries but for yard stocking. This condition is also true in the rural districts, and in states to the north.

Northwest Markets Ease Along

Trade in the Northwest moves along quietly with only a fair industrial demand here and in Duluth. The Steel Corporation is bringing up plenty of coal, however, and this points to a winter of mining, which will help the docks some. Trade in the Dakotas is brisk. Pocahontas lump took a 50c. jump at the Head of the Lakes this week, bringing the dock price to $7.50. Other bituminous prices are the same. Thirty-five cargoes, of which seven were hard coal, arrived at Duluth last week. Eleven are reported on the way, of which three are hard coal. Railroad congestion is feared, as incoming grain is already tied up.

Twin Cities consumers continue to buy coal only when they are forced to do so, but nevertheless strengthening prices have been the rule in the all-rail coals. Southern Illinois lump is firm at $3.25; central Illinois lump, $2.75; Indiana lump, $3@$3.25; western Kentucky lump, $2.75@$3. Dock coal prices continue to be at list, and increased prices are suggested as likely, though the competition of all-rail coal works to hold it back. There has been something of a shift in the demand for all-rail coal, due to the 28c. increase from southern Illinois and the deferring of the increase from northern and central Illinois and from Indiana. Some of the product from Indiana and from central and northern Illinois will get into this district as against the higher cost on southern Illinois. The dock trade is working hard to gain business under the new conditions.

Coal is moving better at Milwaukee, but even so it is not brisk. Consumers are holding back, seemingly because of a lack of funds with which to put in the usual winter supplies. This is noted throughout Wisconsin and the Northwest. Dealers expect a rush when real cold weather sets in, with consequent difficulty in filling orders. The higher grades are hard to get just now, as the mines are sold up to capacity for at least six weeks. This is especially true of the Kentucky mines. Coal is coming in freely by lake. During September the receipts at Milwaukee were 397,231 tons, of which 75,431 tons were anthracite and 321,800 tons were bituminous.

Western Centers Show Vim

Heavy demand for Kansas lump has caused an advance of 50c., to $5 a ton, on that grade. Other grades remain unchanged. Some operators are behind on deliveries of lump, but there is a slowly mounting surplus of screenings. There likewise is a strong demand for Arkansas lump. The demand for Arkansas screenings is so light that some shippers are quoting them as low as $1.25. The circular price remains at $2, with Arkansas semi-anthracite lump $5.50@$7, and mine run $3@$3.50. Henryetta (Okla.) lump is quoted at $5; nut at $4; mine run at $3.25 and screenings at $1.75.

Demand for domestic sizes has improved in Colorado but not to such an extent as expected, considering the small amount of coal having been taken into stock during the summer months. Working time at the mines last week averaged twenty-nine hours with only 27 per cent of the working time lost attributed to "no market." Prices remain unchanged and the present supply of labor is sufficient.

In Utah the industrial demand is light, about the only concerns buying coal being the mining and smelting companies. The domestic demand is normal for the season. Nut coal is moving slowly compared with the other sizes. Heating plants are taking slack. The car and labor situations are satisfactory, and wholesale prices remain firm. Retail prices are still unsettled with the tendency upward. Utah mines are operating around three days a week.

Ohio Markets Hold Gains

The Cincinnati market is holding up well, partly because of extra orders from northeastern Indiana, eastern and central Michigan. Lake buyers have been active, insisting on contract shipments being hurried, and some have entered the slack market, for which a drop was expected, but with these takers it has not been forced below 90c. and has ranged up to $1.10 for good gas offerings. The principal cause for note in the high-volatile fields is a diminution of equipment, allotment being necessary on some roads. In the smokeless market there has been a vast improvement, some firms reporting full bookings for the month. Slack is still going begging at $1.15@$1.25 a ton.

Domestic demand has expanded at Columbus to such an extent that prices have advanced from 25 to 75c. per ton in many cases. Splints and Kentucky grades have advanced and the strength has extended to smokeless varieties. Dealers in Indiana and Michigan are coming into the market, which complicates the situation. Steam business is still dull and featureless. Buying is restricted to immediate wants and the larger users are content to buy on the open market to a large extent. Contracting has not been stimulated by the better domestic demand and screenings are exceedingly weak, owing to the larger production.

Demand for prepared sizes for domestic use is stronger at Cleveland now than at any time this year, and particularly is this true of smokeless fuels from fields to the south, the f.o.b. mine prices on all of which have advanced somewhat during the past two weeks. Steam coal also is in more consistent demand. Output in the eastern Ohio No. 8 field is now larger than at any time since February. There have been some temporary car shortages in eastern Ohio.

Gradual Gain at Pittsburgh

Demand at Pittsburgh shows a slight further increase. The district is now working at about 50 per cent against scarcely 20 per cent in June. Industrial and railroad consumption has increased somewhat and the domestic trade has developed, though it is hardly up to normal for the time of year. Steam slack continues weak, but gas slack has stiffened, with heavier demand for the better grades, and is quotable at $1.15@$1.35 according to quality against $1.10@$1.20 a week ago. Otherwise prices are unchanged.

Further slight gains are being made in the central Pennsylvania field. Loadings for the week ending Sept. 27 were 13,998 cars, against 13,860 the week previous.

Trade is exceedingly dull at Buffalo. Resumption of operations in various mines which have been able to make lower wage agreements with their miners has added to the output and hurt an already overloaded market. In consequence slack has lost all its recent advance.

With the approach of winter the Toronto market is gradually improving. Householders are laying in supplies and a slight improvement in the industrial situation has resulted in an increased demand for soft coal. Both soft and hard coal are coming in in plentiful quantities, and there is no possibility of a shortage of either for a long while to come.

New England Market Gains in Strength

Further appreciation has occurred in prices in the tidewater bituminous situation at Boston. For standard grade New River and Pocahontas $5.35 gross ton on cars is as low as has been named the past week which compares with $5.25 a week ago and $5.15 a fortnight previous. Some shippers have not been open to orders at $5.35, demanding at least $5.40 and quite a fair tonnage has been booked. Some small lot business has been taken at $5.45 and at least one sale is noted at $5.50. The advance in spot f.o.b. prices at the Southern piers is principally responsible for this increase.

Rather too plentiful receipts at Providence the past week have prevented any advance in prices but the level has been well maintained at $5.35@$5.40 gross ton on cars for standard grade coal.

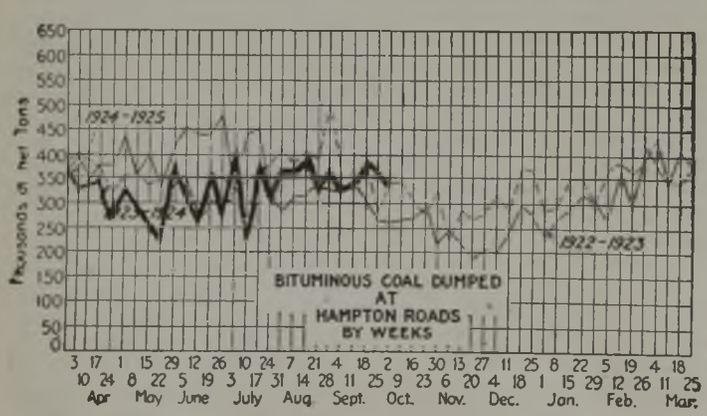
One or two shippers have managed to pick up some more orders on Pennsylvania steam coal the past week, but generally speaking, the all-rail phase of the market remains very quiet. Prices remain about the same, the range for business in New England being $2@$2.50 net ton, mines.

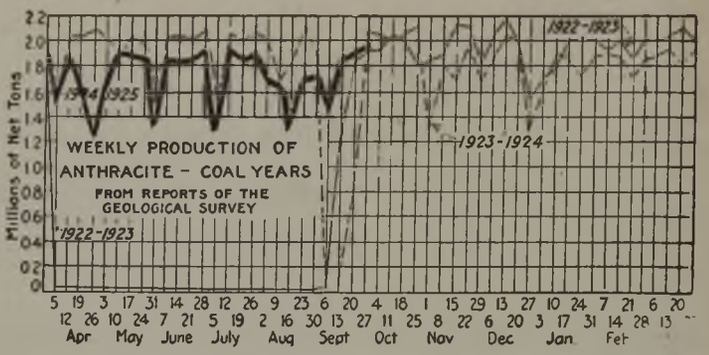
A noticeable feature in the market has been a further increase in the demand for coke, particularly heating coke, and fair sales of Connellsville crushed and sized are noted at $9.25@$9.75 net ton delivered.

Quality Coals Move Well in Atlantic Markets

For the first time since early summer some of the railroads are taking full coal requirements in the New York market. This together with a better demand from along the line has stiffened the market, prices, however, remaining steady. Many producers of high-class coals are sold up for some time to come. The cheaper coals are not moving as easily. The tidewater situation is in better shape. With demand stronger along the line shippers are not sending heavy shipments to tidewater, finding they can obtain better prices from inland dealers.

Slight improvement continues at Philadelphia. Inquiries are fairly numerous and the tonnage reaching this market is slowly increasing. Prices do not move upward, however, save in isolated instances. Most buying continues to be





centered on coal of Pool 9 grades, as the consumer for the most part wants a good article when he does buy. In the gas-coal market there is freer production of slack, which is in good demand by cement plants. The B. & O. car shortage seems to have passed. The tide market is unchanged.

The flat condition of the Baltimore market is a disappointment to coal men who had expected a boost in trading with the appearance of autumn. Industrial demand is light, as general business is at comparatively low ebb. While the export situation is behind other years, foreign shipments increased in September over the previous month.

Some cool weather at Birmingham boosted domestic trade decidedly, inquiry gaining strength and a substantial tonnage being booked for points throughout the territory. Medium grades are in better demand. The steam market also has improved. Quotations on steam coal are firm with some advance in domestic grades for October delivery. There has been some improvement in the working schedule of the larger commercial and domestic mines. Gondolas have been in short supply.

Anthracite Moving Easily

Anthracite is moving freely at New York. Stove continues to be the most wanted size with egg much easier. Chestnut is plentiful but is far from being a drug on the market. Prices hold firm. Dealers are dependent to a considerable extent upon small orders but are well supplied to take care of any rush that may come. Pea is moving slowly. No. 1 buckwheat is in good shape, the better grades bringing close to $3. Rice and barley are in fair demand.

The Philadelphia anthracite trade has been greatly unsettled by the heavy rains and floods throughout the entire region, which checked the industry almost in its entirety for several days. The retail trade continues fair but has not progressed as well as expected. The state of the retail trade is reflected in the varying prices offered. Buckwheat is improving, but rice and barley are quite slow.

Demand for anthracite at Baltimore is only moderate. There are fair stocks in yards, but as many homes have empty cellars the next few weeks probably will see much more active conditions. Several boats have just been chartered to bring British anthracite to this city.

In the Boston market the demand for straight stove is such that $10.50 gross ton mines is readily paid, but egg is not wanted and consequently is quoted at $8.75. The steam sizes also have slowed up and No. 1 buckwheat is offered at $2.25 without results.

Anthracite is moving better at Buffalo. The quantity in consumers' cellars is less than usual, but it is difficult to get them to buy. Some large consumers are trying smokeless coal and practically everybody is using natural gas.

The Connellsville coke market presents a slightly weaker tone, though there is no quotable decline in prices. It appears that while in August production and consumption were closely balanced, some operators obtaining additional business since then have blown in more ovens than needed merely to take care of the additional business, so that there may be some surpluses to work off.

Car Loadings, Surplusages and Shortages

	Cars Loaded—All Cars	Cars Loaded—Coal Cars
Week ended Sep. 20, 1924	1,076,553	188,985
Previous week	1,061,424	183,315
Week ended Sept. 22, 1923	1,061,424	182,591

	Surplus Cars		Car Shortage	
Sept. 22, 1924	143,345	72,279		
Sept. 14, 1924	167,157	84,197		
Sept. 22, 1923	59,008	16,840	13,515	5,482

Foreign Market And Export News

British Coal Market Weakens in Face of Keen European Competition

All sections of the Welsh coal market are in a very weak condition, business is diminishing and conditions generally seem to have gone from bad to worse. It has been decided to close down more pits, and a large proportion of the remaining collieries are working not more than three or four days per week. In some cases, notably at the Mardy Pit, Rhymney, the miners have agreed to revised operating conditions, and a threatened shutdown has been averted. In many instances the miners are cooperating with the owners in their endeavors to maintain the pits in operation, a case in point being the Big Pit, Blaenavon, where the miners have agreed to double shifts and other conditions. Competition is being felt keenly, and the operators everywhere are inclining to the view that revised conditions for the industry are necessary, either in the form of double shifts or the extension of the working day from seven to eight hours.

The general demand is somewhat restricted; business with France is slow and orders from Italy are only a fraction of normal. South American business is practically stagnant. There is a fair request for the best classes of dry steam coals owing to the scarcity of anthracite, but other descriptions are overstocked and irregular.

The Newcastle market seems steadier, particularly in steam coals. Prompt business is slow and export inquiry is so low as to be negligible. Twenty pits are idle in Durham and there are 10,000 miners out of work; in the majority of cases the pits are operating not more than three shifts per week.

Output by British collieries during the week ended Sept. 20, a cable to *Coal Age* states, was 5,135,000 tons, according to the official reports. This compares with 4,907,000 tons produced during the week ended Sept 13.

Lull in French Coal Market Extends to Domestic Fuel

The French coal market is stationary. Output is steadily mounting in the Nord and Pas-de-Calais, the average deficiency in daily production when compared with 1913 now being only 7,000 tons.

The demand for industrial coals is quiet, but stocks are not heavy. Competition of British prices is not keen as yet.

Deliveries of house coals are somewhat lower. The prices for October have been officially established at the same levels as for September, with the exception of ovoids, which have been reduced to 117.20 fr. net. Belgian prices for export to France also are unchanged, ovoids alone being reduced to 107 French francs net.

Imports from South Wales are normal again.

German tenders of coal on the free market continue large, but deliveries still fail to keep pace with the offers.

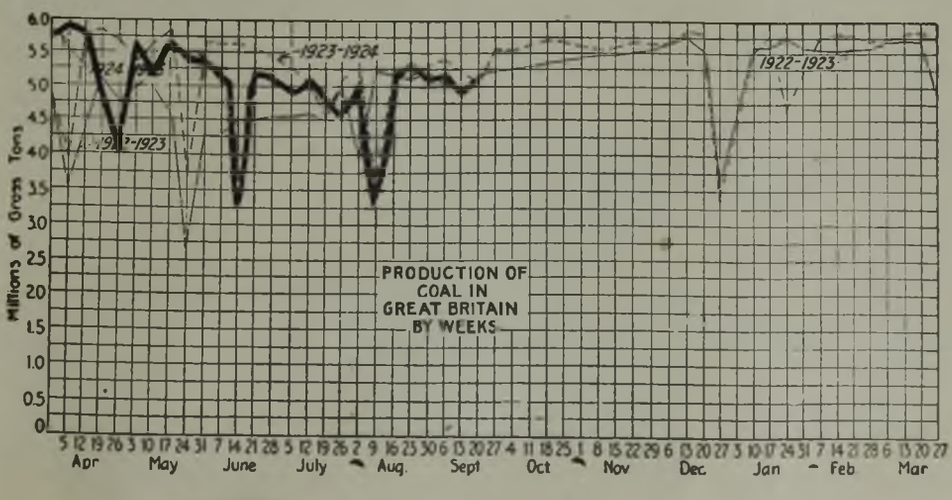
Rail traffic has improved on the northern lines, but on the State Railway system at Rouen the situation is still bad, as only 50 to 60 per cent of the requirements are covered, and very often the product cannot be used because of deterioration. Canal freight remains at 22 fr. Béthune-Paris.

Firm Tone at Hampton Roads; Outlook Brighter

Business at Hampton Roads shows little change from last week, being fair in all sections, with coastwise and bunker trade responsible for the bulk of the business. The market remains at about the same point and prospects continue to brighten.

Accumulations at the piers are not so heavy and movement from the mines has decreased to some extent. Foreign business is confined largely to Italy and Brazil, with scattered shipments elsewhere.

The tone of the market is strong. Domestic business is improving rapidly, with anthracite strengthening, quoted at $15 delivered, an increase of 50c. The best Pocahontas coal is quoted delivered at $10.



U. S. Fuel Imports During August

(In Gross Tons)

	1923	1924
Anthracite	588	437
Bituminous	58,344	27,216
Imported from:		
Canada	58,344	21,146
Australia		6,040
Other countries		30
Coke	3,162	5,852

Export Clearances, Week Ended Sept. 27, 1924.

FROM HAMPTON ROADS

	Tons
For Brazil:	
Br. Str. Eastmoor for Rio de Janeiro.	7,615
Du. Str. Ootmarsum for Santos	5,717
Dr. Str. Stephen for Para	2,792
For Canada:	
Br. Str. Dunslaw for Three Rivers	5,379
Nor. Str. Fragner for Three Rivers	7,930
For Canal Zone:	
Amer. Str. Ulysses for Christobal	11,674
For Cuba:	
Nor. Str. Besseggen for Havana	3,493
For France:	
Ital. Str. Emanuele Accame for Marseilles	11,436
For Italy:	
Amer. Str. Algic for Porto Ferrajo.	3,534
Ital. Str. Golden Gate for Genoa	3,524
For Malta:	
Ital. Str. Laura	2,025
For Porto Rico:	
Amer. Schr. Friendship for San Juan.	1,006
For West Indies:	
Dan. Str. Silkeberg for Port of Spain	2,596
Nor. Str. John Bakke for St. Pierre	2,612

FROM PHILADELPHIA

For Canada:	
Amer. Schr. Dorothy for St. John, N. B.	——

Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Sept. 25	Oct. 2
Cars on hand	1,249	1,505
Tons on hand	87,589	98,085
Tons dumped for week	100,419	99,331
Tonnage waiting	12,000	10,000
Virginian piers, Sewalls Pt.:		
Cars on hand	1,271	1,347
Tons on hand	87,150	93,650
Tons dumped for week	119,855	81,410
Tonnage waiting	2,900	7,315
C. & O. Piers, Newport News:		
Cars on hand	1,998	1,132
Tons on hand	104,210	57,265
Tons dumped for week	97,188	115,151
Tonnage waiting	4,640	350

Pier and Bunker Prices, Gross Tons

PIERS

	Sept. 27	Oct. 4†
Pool 9, New York	$4.75@$5.05	$4.75@$5.05
Pool 10, New York	4.60@4.75	4.60@4.75
Pool 11, New York	4.35@4.60	*4.35@4.50*
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	4.25	*4.15*
Pool 2, Hamp. Roads	4.00	**4.05**
Pools 5-6-7 Hamp. Rds.	3.90@4.00	*3.90*

BUNKERS

Pool 9, New York	$5.00@$5.30	$5.00@$5.30
Pool 10, New York	4.85@5.00	4.85@5.00
Pool 11, New York	4.60@4.85	*4.60@4.75*
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	4.00	**4.15**
Pools 5-6-7 Hamp. Rds.	4.00@4.15	*4.00*

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

Quotations by Cable to *Coal Age*

Cardiff:	Sept. 27	Oct. 4†
Admiralty, large	27s.6d.	*27s.*
Steam smalls	15s.3d.	*14s.6d.@15s.*
Newcastle:		
Best steams	19s.	**23s.@24s.**
Best gas	22s.	**21s.@22s.**
Best bunkers	18s.6d.	**18s.6d.@19s.**

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

News Items From Field and Trade

COLORADO

J. A. Halbert has purchased the coal mine of the Joerger Fuel Co., at Trinidad, and plans to make extensive improvements.

During the month of August a total of 701,359 tons of coal was mined in Colorado compared with 750,221 tons mined in August, 1923, bringing the total production for the first eight months of this year up to 6,285,781 tons compared with 6,479,351 tons mined during the same period last year. So far this year the number of days worked per mine in the state is 111.2. The total decrease in the production of coal during the first eight months of this year as compared with the corresponding period in 1923 has been 193,570 tons. During August 10,768 men were employed at the mines.

ILLINOIS

W. H. Riester has been appointed general sales agent for Donk Bros. Coal & Coke Co. at St. Louis, Mo., effective Sept. 23. Twenty-five years ago on July 1 he entered this company's employ as weigh master in one of its retail yards.

H. Clarence Bean, of the Sterling-Midland Coal Co., has been transferred from Duquoin, where he was connected with the operation of the Jewel Coal & Mining Co., of that place, to Evansville, Ind., where he will be connected with the company's affairs.

The Valley View mine near Rock Island, owned by Sackville & Wynn, opened the middle of September with about 35 employees after having been down since last February.

P. H. Greenlaw, formerly in charge of statistics for the Fifth and Ninth Districts Operators' Association in Illinois, is now with the Southern Coal, Coke & Mining Co., of St. Louis, handling problems of public and employee relations. He gets out an employees' magazine which will be named in October by the employees. August and September issues have already appeared.

Rock Island County recently awarded a contract to the Rock Island Fuel Co. to furnish between 600 and 700 tons of coal to the county buildings at $6.04 a ton until Sept. 25 and 25c. per ton higher after that date. This is a much lower price than last year. There were six bidders in the field. Saline County coal will be used.

Much railroad activity is centered around Orient mines Nos. 1 and 2, at Orient, near West Frankfort, and with the completion of two switches a total of four roads will serve these two large coal plants. The four roads are the Illinois Central, the Chicago, Burlington & Quincy, the Chicago & Eastern Illinois and the Missouri Pacific. Mine No. 1 holds the world's record for hoisting from a single shaft in eight hours time, but the new Mine No. 2, where a skip hoist went into service Sept. 12, is expected to exceed the former when fully developed.

INDIANA

F. J. Rawson and James G. McCarty, of the U. S. Bureau of Standards, are spending about a month in Vigo County, in research work on coal-mine tipple scales. They have nothing to do with the accuracy of the scales other than to recommend to the operators the best method to correct causes of error. They first made a trip through this vicinity in 1921 and another in 1923. They make reports to Washington from which bulletins are compiled giving information as to the best type of scale to install in a particular type of tipple.

Orders have been received at the Ingle No. 8 mine, at Petersburg, owned by the Ingle Coal Co., to clean up the mine preparatory to reopening at once. The mine, which is the largest of the Ingle system in Pike County and which gives employment to 350 miners, closed down nine months ago. It is connected with the Southern Ry. by an eight-mile switch, but arrangements are being made to connect the mine with the Big Four R.R. system by building a switch to the new railroad recently constructed by the Gray brothers of Evansville to their new stripping mines at Simtown, two miles south of Arthur. Less than two miles of track will have to be laid to connect the big Ingle No. 8 mine with the Big Four.

KANSAS

Mine No. 18 of the Sheridan Coal Co., near Pittsburg, has been reopened.

The Missouri Pacific has put in operation two new through coal trains from Pittsburg to Kansas City, Mo., giving one-day service from the Pittsburg field to the Kansas City market. The move was made necessary by increasing coal shipments, the road announced.

A steel tipple will be installed by the Pittsburg Block Coal Co. at its mine near Dunkirk.

William Bogartz, in announcing his candidacy for re-election as president of the United Mine Workers of District 14, states that he has been unable to carry out the policies he had mapped out upon entering office. "I encountered opposition from some of the rank and file and I did not have a working majority on the district executive board," he said in a published statement. Secretary H. W. Burr also has come out for re-election. Both have opposition. The number of candidates for district offices is unprecedented. Interest still centers on whether Alexander Howat will enter the race for president and whether the international Board will attempt to bar him as ineligible.

The Crowe Coal Co. has reopened its mines Nos. 15 and 21, in the Pittsburg field.

Leon Besson, state mine inspector, and W. D. Ryan, Kansas City, safety commissioner for the Bureau of Mines, called miners and operators for a meeting Oct. 1 to revive interest in mine-rescue work and begin arrangements for a Kansas safety meet in 1925. An intensive training campaign for the miners of the state will be launched immediately, training having become disorganized during a long period of mining inactivity. Practically all mines are again in operation and it is proposed to effect a safety organization at each one.

A new type steel conveyor tipple, the first such conveyor and the fourth steel tipple of any kind in the Kansas field, has been installed by the Dunkirk Coal Co. at its steam-shovel mine a mile west of Mulberry. Representatives of fifteen operating companies watched a test of the apparatus Sept. 29. A platform upon which may be driven wagons bringing coal from the pit, is installed a short distance from the railroad spur. A balance arrangement allows the rear end of the wagon to be lowered so that the load slips into a hopper beneath the platform Here the conveyor belt picks it up and carries it to the top of the gravity screening and loading chute which makes lump and a smaller size known in the field as "nut run." The only other steel tipples in the district are at two shaft mines of the Sheridan Coal Co. and one shaft mine of the Katy Coal Co.

KENTUCKY

The Peerless-Elkhorn Coal Co., Justell, Ky., has under development 1,000 acres of coal land, and will have daily capacity of 800 tons. F. G. Hatton, 150 E. Broad St., Columbus, O., is president.

James B. Torbert, formerly of the Phoenix Mine, near Drakesboro, who sold out in western Kentucky a

couple of years ago, is president of the new Harlan-Wallins Coal Co., which will own and operate the former plant of the Wallins Creek Collieries Co., in the Harlan field. Banks of Nashville, Tenn., are now offering a $600,000 issue of 7 per cent gold bonds of the new company, to be used in the financing of the proposition.

The Cumberland Straight Creek Coal Co., of Pineville, will rebuild its tipple which was recently destroyed by fire, with a loss estimated at $100,000. This tipple is located at Logan's Switch.

The Ulva Coal Co., Ulva, will let the contract at once for erection of a store building to replace the structure recently destroyed by fire, with a loss of $10,000.

Another tipple has been burned in western Kentucky. This one belonged to the Old Hickory Coal Co., four miles out from Providence, in Webster County. The loss was about $15,000, partly insured. The fire is believed to have been of incendiary origin.

It was reported from Whitesburg, on Sept. 21, that the Gorman-Pursiful Coal Co. would start operating a new mining plant at Sandlick within a few days, the plant starting off with a daily loading capacity of fifteen to twenty cars.

MISSOURI

The Kansas City Midland Coal Mining Co. has reponed its 800-ton mine at Novinger.

The Walton Coal Co., of Higby, has sold its mine and equipment to a group of fifty miners who will operate it co-operatively. The mine is rated at 500 tons. The company also leased its coal lands to the miners on a royalty basis for all coal mined.

NEW YORK

The Iroquois Gas Corporation, of Buffalo, will complete its byproduct coke plant at Winchester, near Buffalo in time to add daily 13,000,000 cu.ft. of gas to the city supply next winter. This ought to add 12,000 to 15,000 consumer families to the company's list, who would otherwise need to burn coal.

Robert H. Burrows and William R. McTurk have retired from the firm of W. A. Marshall & Co., New York City, after fourteen years' service as officers and directors. To fill the vacancies caused by their retirement John D. Kline and Raymond Havemeyer have been chosen as directors and vice-presidents. C. W. Sandford and G. B. Talbot, formerly in business together, have joined the sales organization of the company.

OHIO

Fire of undetermined origin destroyed the coal tipple and all equipment at mine No. 402 of the Sunday Creek Coal Co., at Santoy, recently at a loss of $200,000. The tipple, which was electrically operated, was known as the best equipped plant in Ohio. County officials are investigating the fire, which will throw more than 400 men out of employment. It was one of the few mines in this section that was operating full time.

"Buy Ohio coal—There is none better," is the legend ordered by Governor Donahey to be printed on a large block of coal weighing approximately 2,400 lb., which has been placed in front of the north-side approach to the State House at Columbus. The huge block of coal was sent from the Massillon district and was exhibited at the State Fair by a Massillon coal company. The company presented the block to the Governor. It was received at the State House recently, carefully crated.

First-aid training among miners in Ohio will depend entirely upon state inspectors of the mine division and use of Ohio's mine-rescue trucks and car, declared Jerome Watson, when he explained to Herman R. Witter, industrial relations director, that the U. S. Bureau of Mines rescue car stationed at Columbus had been withdrawn from service in Ohio for three months. Ohio is planning for a great first-aid and safety meet soon, such as was held Aug. 15 at Bellaire, Belmont County. The government has aided in this training, but such work is being carried on in Kentucky and the use of the Ohio car of the federal mine department is required there.

OKLAHOMA

The Pine Mountain Coal Co., of Heavener, Okla., has increased its capital from $65,000 to $250,000, and will build an entirely new plant, and install new machinery.

John Patterson, the 70-year old superintendent of the Kali-Inla Coal Co.'s mine at Cambria, Latimer County, claims to be the oldest active miner in the state. He began working in the mines in Scotland when he was 10 years old. He has worked in southeastern Oklahoma for 26 years. He it was who met the several hundred union miners from an adjoining county who marched to Cambria a few weeks ago, intent on stopping the non-union operations. Alone and unarmed, Patterson parleyed with the leaders of the union "army," and as a result, threatened bloodshed was averted.

Oklahoma's coal production was 1,991,733 tons in the fiscal year ending last June 30, as against 1,945,294 tons in 1922-23 and 2,578,005 tons in 1921-22. The figures are from the annual report of Chief State Mine Inspector Ed Boyle. Coal mined, by grades, included 392,390 tons of lump, 106,622 tons of nut, 299,-864 tons of pea and slack. There were 114 individual mines in operation in the state in 1923-24, the report shows.

As the result of recent renewed firing on state guardsmen patrolling the open-shop mine district of Latimer County, Adjutant General Baird H. Markham has reconsidered his intention to withdraw his troops. They will be left on the scene indefinitely. The guards stationed in the district have machine guns at the plant of each mine. Eight mines are now operating on a non-union basis, with 400 men employed at the 1917 wage scale of the United Mine Workers. A number of additional mines will reopen in the McAlester district early in October, all announcing that they will pay the 1917 bituminous scale. Two hundred men have been put to work in Creek mine No. 1 of the Crowe Coal Co., in the Henryetta field. This makes a total of 20 mines now operating in this field and at least 10 more are making plans to reopen during October.

PENNSYLVANIA

The Superior-Connellsville Coal & Coke Co., of which George Whyel of Uniontown, Pa., is president, recently sold 202 acres of coal land at Simpson Station, near Brownsville, to Columbus R. Porter, of Brownsville, for $370,000. The property sold was purchased from Mr. Porter in 1919 and adjoins the Superior mine operated by the above named company. The coal is in the Pittsburgh seam.

The balance sheet of the Glen Alden Coal Co., as of Dec. 31, recently issued, shows total assets of $29,654,283, including $9,887,669 in securities, $4,378,-302 in coal on hand, and $9,209,413 in accounts receivable. Accounts payable amounted to $6,355,481 and the surplus was $4,966,766.

Business in the Connellsville coke region is picking up. The Hillman Coal & Coke Co., of Pittsburgh, Pa., resumed operations Sept. 25 at the Tower Hill No. 2 mine near Republic, after having been idle there for nearly a year. The H. C. Frick Coke Co., subsidiary of the United States Steel Corporation, has increased operations at the Collier and York Run plants and fired 100 additional beehive ovens at scattered operating plants.

The Glen Alden Coal Co. has mapped out extensive plans for a tree-planting program which will get under way in the spring of 1925. The company has much idle land which can be used for the future production of mine timbers and the work now contemplated will produce

A New Kentucky Tipple

This steel structure has just been put into service by the Southern Mining Co. at Black Snake, Ky. It stands at the bottom of a steep tramway.

a forest growth in the years to come. Huge tracts of forest land on the West Mountain, just beyond the city limits are to be the scene of the initial tree-planting operations of the Glen Alden company. Years ago this land was the location of heavy stands of timber and the program now decided upon by the coal company gives promise of a reproduction of that growth within a quarter of a century. Forty thousand trees are to be set out by the company.

The Peabody Coal Co., of Chicago, is negotiating for the purchase of the No. 6 colliery of the Pennsylvania Coal Co., at Pittston, it is reported from authentic sources. Recently representatives of the Chicago interests visited the colliery and made a survey of conditions and equipment. At present the colliery is idle due to a strike, called without sanction of the district office of the United Mine Workers, because of alleged inequalities in wage rates in a section of the mine.

Fire, raging for several days in the Oakmont mine of the Hillman Coal & Coke Co., at Barking Station, near New Kensington, was brought under control Sept. 16 by members of the Pittsburgh station of the U. S. Bureau of Mines following the erection of brick walls. Operations in the mine were suspended when the blaze, about 200 ft. below the surface of the mine, threatened to assume serious proportions. Officials of the company said they would be unable to estimate the damage until an investigation had been made.

New officers named by the executive committee of the Hazleton Mining Institute are Commissioner James Harlor, president; D. E. Keller, superintendent of the Harwood Coal Co., vice-president; S. W. Smith, secretary-treasurer. It was decided to hold the annual banquet on Oct. 28, if suitable arrangements can be made.

The equity action in which the Philadelphia & Reading Coal & Iron Co., the New York Midd Fields Coal & Railroad Co. and the City of Philadelphia, trustee under the will of Stephen Girard, against the county commissioners of Columbia County, seeking a reduction in the valuation of property by the commissioners, has been continued until Dec. 1.

TENNESSEE

The Connellsville Coal & Coke Co., Connellsville, Pa., of which D. B. Northrup is president, is reported to have purchased 8.000 acres of coal land from the Waldensia Coal Co., Waldensia, and 1,200 acres from the Missouri Coal & Land Co.

UTAH

Application to increase the minimum weights for loading coal cars has been filed with the Public Utilities Commission by the Denver & Rio Grande Western, the Bingham & Garfield, the Utah Ry., the Utah Terminal Co. and the Carbon County Ry. The minimum weight is now 40,000 lb., but this is obsolete, for the reason that there is now no standard gage equipment used for the transportation of coal with a capacity so small as 40,000 lb., the petition sets out. The petitioners state that if they are granted permission to make the desired changes, uniformity will be obtained in coal tariffs and the minimum-weight rule will be the same in Utah as is applicable from Utah mines to interstate points in Nevada, California and other Western states. It is suggested that for cars of the marked capacity of 50,000 lb. the minimum weight be 48,000 lb.; for cars of 60,000 lb., 58,000 lb.; for cars of 80,000 lb., 60,000 lb.; and for cars of the marked capacity of 100,000 lb., 80,000 pounds.

WEST VIRGINIA

A new tipple is being built and other improvements made at the plant of the Chaplin Collieries Co., on Scott's Run, preparatory to resuming operations on an open-shop basis.

The White Rose Coal Co. has disposed of its stripping operation near Viropa, Clay District, Harrison County, for $112,500. The property includes about thirty acres of coal, steam shovels, locomotives and other equipment. The Walton Coal Co., which is the purchaser, is understood to be an organization of New York capitalists. Thirty thousand dollars was paid in cash, the balance being secured by a deed of trust.

Efforts to extinguish a fire in the new Lincoln mine of the Lorain Coal & Dock Co. have proved unsuccessful and state inspectors have given up the fight for the time being and that portion of the mine where the coal is on fire will be sealed up again. The fire broke out on Aug. 22 and at that time a section of the mine was sealed in an effort to smother the blaze. But at the end of two weeks it was found that the fire had spread. It was decided after resealing a section of the mine to permit operations on a 60 per cent basis and work was resumed on that basis on Sept. 22. The miners will work in such sections of the mine as have not been affected by the fire.

CANADA

At a special general meeting of preferred shareholders of the Dominion Coal Co. held in Montreal recently consent to the proposal to create a $15,000,000 mortgage, as required on the company's property, was given and the meeting authorized the mortgage.

The Princeton (B. C.) Colliery Co. is sinking a new shaft on the town site of Princeton, B. C., and is preparing for the construction of a new colliery.

Charles Graham has taken over the management of No. 5 Mine, Comox, Canadian Collieries (D), Ltd.

Dr. R. L. Rutherford, of the Canadian Geological Survey, has returned after a season in Northwestern Canada from the Brazeau to the Athabasca Rivers. This year's work will supplement that of the two past years, the survey now having been completed from the North Saskatchewan to the Athabasca. Dr. J. A. Allen, under whose supervision the survey has been made, says that a geological map will be prepared similar to that already made of Alberta coal fields. Another party under J. O. Sanderson has been continuing work in the Drumheller coal field. It is said that the seams of the Carbon, Three Hills, Trochu, Big Valley and Sheerness country are quite similar to those of the Drumheller district.

Industrial Notes

Zeb Stafford, formerly with the Higrade Oil & Gas Co., at Logan, W. Va., has severed his connection with that company and is now representing the **Hulburt Oil & Grease Co.**, of Philadelphia, in the Logan district.

The Continental Car Co. of America, Louisville, makers of mine cars, and the **Kentucky Wagon Mfg. Co.**, of the same place, are merging. The car company has moved offices to the wagon company plant.

C. L. Berger & Sons, Inc., of Boston, Mass., makers of engineering and surveying instruments, have appointed the **New York Blue Print Paper Co.**, 102 Reade Street, New York City, exclusive export agents for Latin America; this in addition to the exclusive agency for New York and New Jersey previously allotted.

The Ohio Brass Co. has moved its Philadelphia office from the Witherspoon Building to 1404 Packard Building, at 15th and Chestnut Streets.

Frank A. Wilch who has been associated with the Cleveland office of the Triumph Electric Co., has been placed in charge of that territory. He succeeds Edward S. Ford.

B. N. Broido who has been doing special consulting work for **The Superheater Co.**, of New York and Chicago, recently was appointed chief engineer of the industrial department of the company.

The Dings Magnetic Separator Co. announces that H. M. Gassman, who handles Dings magnetic separators in Birmingham, Ala., has moved to a new office at 513 N. 21st St.

At the annual stockholders' meeting of the **Allison Coupon Co.**, of Indianapolis, Ind., a reorganization of the management was effected with the election of M. J. Allison as president, James A. Allison as secretary, J. S. Berryhill as treasurer and John H. Allison as general manager.

Publications Received

First Annual Report, Department of Labor, Tennessee, 1923. Pp. 174; 6x9 in.; illustrated. Includes reports of Divisions of Fire Prevention, Mines, Workshop and Factory, Workmen's Compensation and Hotels.

Bituminous Coal Losses and Mining Methods in Pennsylvania, Including Thickness, Character and Reserves of Coal, by James D. Sisler. Topographic and Geologic Survey, Dept. of Forests and Waters, Harrisburg, Pa. Bulletin M 4. Pp. 216; 6x9 in.; illustrated.

The Property Owner's Handbook is the title of a 32-pp. booklet issued by the American Appraisal Co., Milwaukee, Wis. Constitutes a collection of suggestions which anyone responsible for the management of property will find of interest.

Annual Report of the Mineral Production of Canada During the Calendar Year 1922. Dominion Bureau of Statistics, Mining, Metallurgical and Chemical Branch, Ottawa, Canada. Pp. 228: 6x9 in.; charts and tables.

The Deep River Coal Field of North Carolina, by Marius R. Campbell and Kent W. Kimball, North Carolina Geological and Economic Survey, Chapel Hill, N. C. Bulletin No. 33. Pp. 95; 6x9 in.; illustrated. Covers results of examination by geologists of the U. S. Geological Survey co-operating with the North Carolina Geological and Economic Survey.

Annual Report of Coal-Mine Inspection and Mine-Rescue Departments, Kansas, 1923. Court of Industrial Relations, Topeka, Kan. Pp. 149; 6x9 in.; tables.

Traffic

Want Freight Rates Favorable To Kansas Coal

F. J. Bannister, president of the Kansas City Chamber of Commerce, and other officials of that organization, in a conference, Sept. 18, with the Pittsburg (Kan.) Chamber of Commerce, declared they will in the future do their utmost to bring about adjustment of coal freight rates into Kansas City which will be favorable to Kansas coal. Mr. Bannister said that the traffic department of the Kansas City Chamber in working for lower Illinois coal rates in the past had to a degree overlooked the effect upon the mining industry in the Pittsburg field, which is regarded as a part of Kansas City's immediate trade territory.

Pittsburg men had pointed out to the visitors that it is directly to the benefit of Kansas City's business to promote the industrial prosperity of a population of 150,000 persons within a radius of 150 miles of that city. Illinois coal has been Kansas' stiffest competitor for the Kansas City market. Through freight rates Illinois has been gaining in the race, Kansas operators say. A concerted effort is now being made to convince Kansas City business men that southeastern Kansas coal mining is a "home industry" so far as they are concerned. One coal company is conducting an extensive advertising campaign in the Kansas City newspapers to emphasize this appeal.

Allow 25c. Ton for Transfer Of Bunker Coal

An allowance of 25c. a ton for transferring bunker coal from cars to vessels at New Orleans was found reasonable Oct. 2 by the Interstate Commerce Commission.

The ruling was made in the case of the New Orleans Coal & Bisso Towboat Co. against the Louisville & Nashville. The rail carrier allowed only 11c. for the services but it said it was willing to make a retroactive allowance of 25c.

The commission said it would order the carrier to make good the difference of 14c. a ton for each ton handled.

Charges Unequal Share of Cars

The Francisco Mining Co., of Chicago, has attacked the equity of coal-car distribution at Francisco in September, 1922, and asked damages in the sum of $100,000, caused by the failure to deliver cars in the same proportion as to other mines in the vicinity.

New Companies

The Eureka Coal Co. has been incorporated in St. Louis, Mo., with a capital stock of $50,000, by W. J. Miller, J. M. Whelan, 4222 W. Pine Street, and L. M. Steed.

The Royalton Coal Co., capital $10,000, has been incorporated in St. Louis, Mo., with H. H. Taylor president and Jesse Irwin Taylor secretary.

The Lenox Coal Co. has been incorporated in Frankfort, Ky., by Clay Hunley, H. M. Collins and others.

The Walton Coal Mining Co. has been organized to operate in Harrison County, West Virginia. Capitalized at $100,000, the company is to have its general offices at Clarksburg, W. Va. Having an active part in the organization of the new company was Daniel Howard, one of the leading operators of the Harrison County field. Associated with him in the new company are C. F. Yates, C. C. Starkey, C. B. Johnson and Margaret Heitz, all of Clarksburg.

The Anchor Coal Co., Carbon Hills, Ohio, has been incorporated with a capital of $10,000 to operate coal mines and sell coal and coke. Incorporators are I. W. Achauer, W. R. Saunder, John Saunders, John Dicken and C. Cee.

The Hill-Crest Coal Co., Fourth & Market Sts., Steubenville, Ohio, has been chartered with an authorized capital of $50,000 to mine and sell coal. Rosa C. Anderson, Fred A. Stone, Robert J. Peterson, William E. Matleck and Carl E. Anderson are the incorporators.

The Blue Valley Coal Corporation, Madisonville, capital $20,000, has been incorporated by H. H. Coil, F. E. Coil and J. A. Jonson to handle mine operations. The Coil family has been well known in western Kentucky coal developments for years.

The Millville Coal Co., Salem, Ohio, has been incorporated with a capital of $25,000 to mine and sell coal. The incorporators are C. A. McKinley, W. L. Petlit, H. L. McCarty, Homer H. Hickling and Roscoe Nye.

The Beaver Coal Co., Swansea, Ill., has been incorporated with capital of $25,000 to do a general coal mining business. The incorporators are A. C. Danielson, Theodore Sirene and Albert G Ziesk. The company is served by the Louisville & Nashville R.R.

The Solar Coal Co., Belleville, Ill., has been incorporated with capital of $180,000 to conduct strip-mine operations near Lemenston. The incorporators are W. C. Wolf, Robert White, Samuel White, Frank Sergeant, Albert L. Klee, John Macke and John L. White.

The T. H. Cameron Fuel Co., Ltd., has been incorporated with $250,000 capital and head office in Montreal, Canada, to mine, import and deal in coal, by Chilton G. Heward, Henry M. Hague, H. W. Shearer and others.

The Highland Coal & Mining Co., with offices in the Safety Building, Rock Island, Ill., has been incorporated with capital of $25,000. The company will develop a mine on the farm of William M. Ferry, located approximately two miles from Moline, on what is known as the Highlands. Preparations are being made to sink the shaft, which will be completed within the next month. The shares in the company are owned largely by Rock Island and Moline people.

Coming Meetings

National Coal Association. Board of Directors' meeting, 9.30 a.m. Oct. 10, Washington Hotel, Washington, D. C. Open to association members and those interested. Executive Secretary, H. L. Gandy, Washington, D. C.

American Institute of Mining and Metallurgical Engineers. Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

American Institute of Electrical Engineers. Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Gas Association. Sixth annual convention and exhibition, Steel Pier, Atlantic City, N. J., Oct. 13-17. Secretary, Alexander Forward, 342 Madison Ave., New York City.

Canadian Institute of Mining and Metallurgy. Sixth annual Western Meeting, Oct. 16-18, Blairmore, Alta., Can. Secretary, Moses Johnson, Blairmore, Alta., Can.

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 909 Chamber of Commerce Bldg., Pittsburgh, Pa.

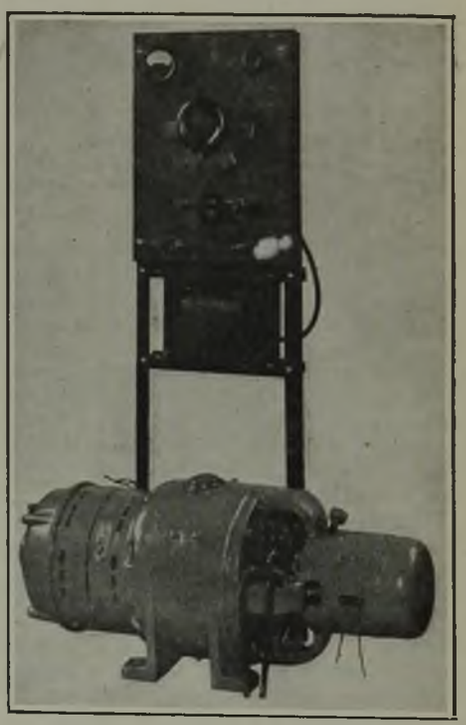
West Virginia—Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

New Equipment

Welding Generator

The Allan Manufacturing & Welding Co., 726 Washington St., Buffalo, recently developed and placed on the market a 120-cycle arc-welding generator suitable for any power installation. The armature is built up on a large-diameter shaft and is carried on two ball bearings. An extension of the shaft carries the exciter armature, the frame of which is cast integral with one end bell. The exciter is eliminated where direct current is available.

The 4-kw. size has a range of 50 amp. to 200 amp. continuous output, with an unlimited number of steps between these limits. With this new generator great ease of operation is obtained. The arc is easy to start and maintain and the apparatus is designed for smooth and rapid deposition of metal with the necessary penetration. This new welding generator also embodies a new feature for use in connection with the welding of light cast-iron sections.

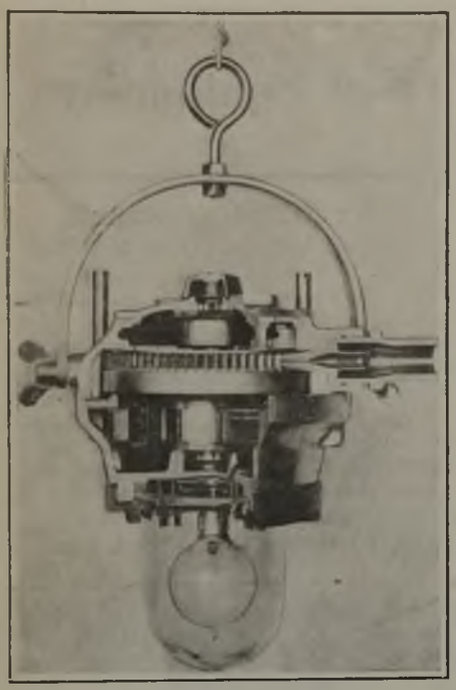


Welding Equipment and Control

Almost any current value up to the full capacity of this apparatus makes it suitable for all kinds of welding or repair work.

Air-Driven Generator for Safe Electric Lamp

Through the invention of a portable, pneumatic-electric lamp, another step forward has been made towards more effective illumination in collieries and in other places where electric sparking or an open flame might prove disastrous. A good light at the coal face or in the roadways simplifies the work of coal digging and, likewise, increases the safety of the miner by making more



Pneumatic-Electric Lamp

This vertical section view shows the turbine, generator and light bulb of this safety lamp.

clearly visible cracks and other signs indicative of a falling wall or roof. Efficient lighting also tends to reduce the much dreaded disease of miner's nystagmus; and, apart from added security, assures an increased output. In this connection it is interesting to note how compressed air, by improving conditions and by reducing hazards, has again come to the assistance of those who work underground.

Though this new lamp is especially fitted for service wherever explosive gases may be encountered, as in collieries, near gasoline tanks, etc., there are also many other places where it may be used to advantage. For example, where a slope or tunnel is being driven by means of compressed air it is much more convenient to employ a number of these lamps than to carry electric cables along as the work progresses. The lamp gives a bright light; and draws its operative air from the same source that supplies energy to drive the rock drills or other tools.

In designing this lamp, particular attention has been paid to the elimination of fire risks. The electric generator is an alternator with a revolving field magnet. Hence, there are no rubbing contacts or brushes of any sort which might cause sparking. The whole generator casing and the glass cover which protects the electric bulb are in communication with the exhaust side of the turbine; and a pressure of from 1 to 2 lb. per square inch is maintained by a spring-loaded exhaust valve. The outside atmosphere cannot, therefore, obtain access to the interior of the lamp when the latter is operating.

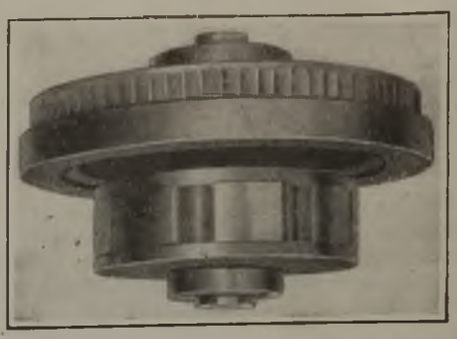
For service in coal mines, the lamp is provided with a further safe-guard—a device which cuts off the current from the bulb contacts should the excess pressure within the protecting glass cover fail through any cause. Any accumulation of gas in the protecting glass, or in the body of the lamp is prevented by a small hole communicating with the atmosphere so that a steady stream of scavenging air passes through the whole lamp whenever it is running.

The lamp body consists of two cylindrical castings. One of these carries the generator stator, cut-out, lamp holder, and protecting glass, while the other holds the bearing that supports the turbines, the turbine jet, governor, and exhaust valve.

This turbine is fitted with a single nozzle that can be easily detached for inspection or replacement. This nozzle is provided with a strainer to arrest any particles of dirt which might otherwise be drawn into the nozzle and clog it. The lamp is furnished with nozzles of six different sizes for pressures ranging from 35 to 120 lb. per square inch. With a 24-watt bulb and pressures of from 80 to 100 lb. per square inch, there are consumed approximately 4 cu.ft. of free air per minute, while 5 cu.ft. of free air per minute are needed when the lamp if operating at a pressure of 40 cu.ft. per square inch.

The complete lamp with swivel mounting weighs 14 to 15 lb. not including the air line or control valve. It has a normal rating of 24 to 36 watts—the equivalent of gas filled bulb of about 32 and 50 cp. respectively. Standard 12-volts, automobile head-lamp bulbs are employed; and the lamp is supplied with opal glass, to give a diffused light, or with a reflector, if a concentrated beam is desired.

These lamps are manufactured by the M-L Magneto Syndicate, Limited, Victoria Works, Coventry, England, and were recently described in *Compressed Air*.

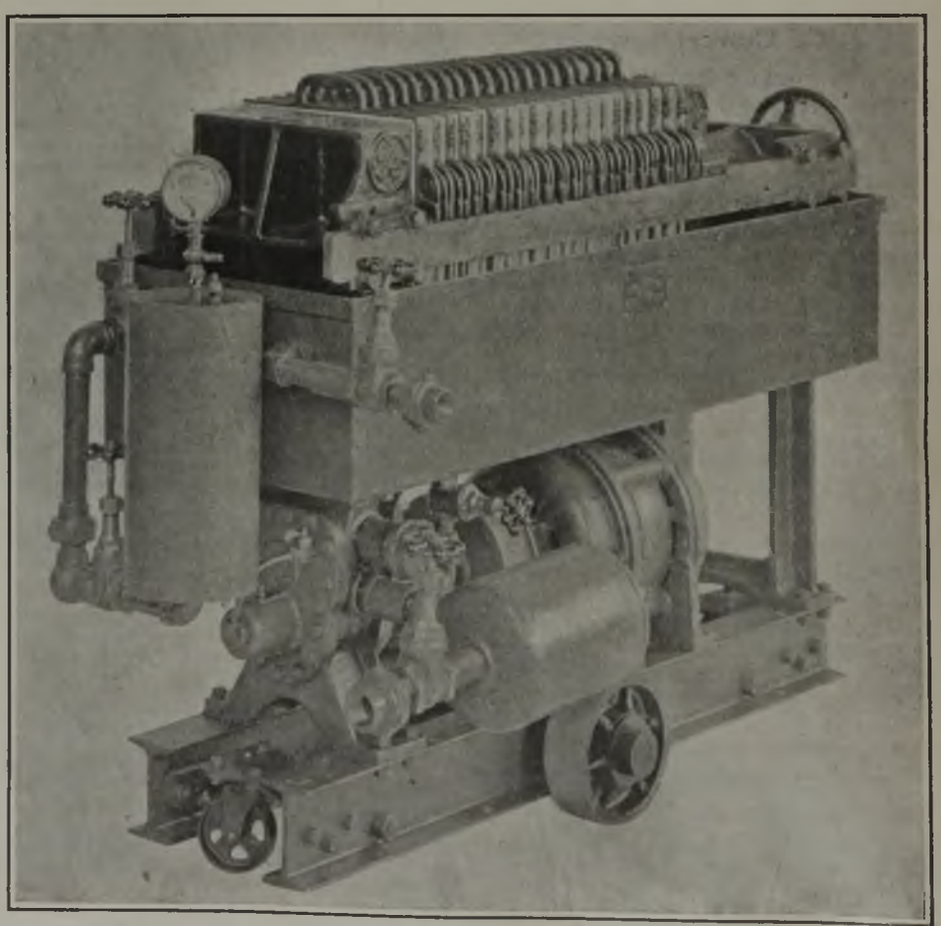


Turbine and Generator Rotor

A sparkless generator with neither slip rings or commutator supplies current to the lamp which is sealed from external air. The lamp may therefore, be used in dangerous gaseous mixtures.

Transformer-Oil Filter Has Bell to Test Connections

Another improvement has been added to an oil filter press made by the General Electric Co. An air bell for testing the suction piping, so as to avoid mixing any large quantity of air with the transformer oil as it is being purified, has been applied to the press. This air bell is arranged so it can be pumped up to the shut-off pressure of the filter-press pump. The pump is stopped after the suction-pipe valve is closed at the transformer drain, then the stored air is automatically released against the oil in the suction piping. Leaks are easily detected by oil coming through defective parts or connections. Air bells are available for existing filters.



Filter Affords Oil of High Dielectric Strength

This 30-gal. per minute oil-filter is equipped with an air bell to detect leaks in the suction-pipe connections. Air in these connections may be mixed with the oil, and its dielectric strength may be lowered.