

COAL AGE

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Paying for His Keep

AN ELECTRICAL-MECHANICAL engineer employed by a coal-mining company in Illinois said the other day that a few years ago he decided that each month he would try to do something special for his company which would more than pay for his salary.

The success that has attended his efforts shows that there is much to be done in improving conditions at nearly every coal mine. This man's greatest improvements were in realizing savings in operating costs. Needless to say he found himself often in a position where he had to change old methods for new, and consequently had to overcome the inertia of that kind of people who are satisfied to do things as grandfather always did them.

One might be surprised to know that this man was not working for a backward, inefficiently operated company. On the contrary he was employed by a relatively progressive firm, yet he is one of few in that company who want short cuts. He says that it is an easy matter to effect savings in these days when many new and more efficient methods are being introduced to the mining field.

Opportunities for improvements exist at all mines and the day is rapidly coming when mine officials will realize that more engineers of this type will be the profit makers of the future. "One new saving every month" would be a good motto for every mining engineer.

Square Company Shooting

COMPANY shooting can obviate many difficulties encountered in coal mining. It has been proved conclusively that where company men drill and shoot the factor of safety is raised and the proportion of screenings is lowered. More than one operator in a solidly unionized field has yearned to take over the shooting in his properties and has envied the non-union man who could readily do it without danger of drawing down upon his head the wrath of a powerful labor organization with a bludgeon in one hand and a contract in the other. However, operators who are free to assume complete control of the use of explosives in their mines, as some are doing in Utah lately, need to be temperate in the differentials they fix under contract rates.

It would seem that a differential as high as 30 per cent is excessive and the fixing of it on the theory that it is merely to compensate the company for its share of the expense of mining is deceptive. If it was admitted freely that the level of wages was being reduced in the process and both parties clearly understood this, then the differential should not be questioned. But reducing contract mining rates nearly if not entirely one-third on any other basis is likely to engender bitterness between employer and employee.

Such bitterness is not productive of good for anybody directly or indirectly concerned—except the United Mine Workers of America. That organization would be pleased indeed if most of the operators of Utah, for instance, were to stir up feelings of great discontent among their men. It would then be a most desirable state within which to conduct a vigorous organization campaign and everybody knows the United Mine Workers needs a few more fertile states in which to plant the seed of organization. The losses of territory already have been heavy enough for Mr. Lewis and his associates.

So we feel like cautioning Utah operators who tell their men that contract rates must be reduced one-third in order that the company be barely compensated for furnishing powder, setting shots and firing them. Few farseeing operators there or anywhere else would adopt such a course. Most of them are too honest with their men for that. There are a great many advantages to company shooting and we hope more Western mining companies adopt the practice—but they should play square with their men.

Coking by Steam

THE quest for a satisfactory method of low-temperature coal distillation has in the past proved somewhat unsatisfactory. High-temperature coking has been brought to a fair degree of perfection, but when an attempt has been made to coke the coal at a low temperature, obstacles have promptly been encountered. Chief of these difficulties has been the excellent insulating qualities of the material treated.

It is probable that the resistance to heat transfer possessed by many substances such as asbestos, magnesia, feathers, felt, fur, wool, wood and the like results from the large number of small air spaces that the material contains. These may be either cellular or interstitial—that is, air may be entrapped within the cells of the material itself or it may exist only between the fibers or granules of the insulating substance. In the first instance the air might be considered as forming an integral and inseparable part of the material; in the second it merely fills the voids between particles.

Air-filled voids in the oven charges have so delayed heat transference that various agitating devices have been employed. Few have proved themselves commercially important.

Within the past few years a medium has been undergoing development that in the future may play an important rôle in the low-temperature distillation of coal. This is highly superheated steam. Today steam is being superheated to temperatures which only a few years ago were considered both impossible and dangerous. No particular difficulty is encountered in imparting to water vapor a temperature of, say, 1,000 to 1,200 deg. F.

Forcing steam of this temperature through a mass of

finely crushed coal in a coke oven displaces the interstitial air and quickly brings the mass to a coking temperature. Experiments performed on coke ovens of this kind show that coke can be made by this means in approximately $2\frac{1}{2}$ hours whereas a much longer period is required for coking by the usual method of heating the side walls. Gas and other byproducts given off from coal coked by steam are readily separable from it by condensation and scrubbing.

As an industry the manufacture of high-quality smokeless fuels from low-quality smoky coals is yet in its infancy. There is little doubt, however, that it is destined to assume an increasing commercial importance as the years go by. Using a superheated vapor to carry the heat necessary for coking to practically all portions of the charge of coal in the oven would seem to open a wide range of possibilities in this direction.

Mining Engineer Architects

OUR AMERICAN mining villages bear eloquent testimony to the work of the mining-engineer architect, and it is not testimony of which we can be proud. Such a general utility man as the mining engineer can never hope to be an architect, and the company in the Campine, of Belgium, which decided to employ specialized designing talent is to be congratulated on its decision. The town, illustrations of which appeared in these pages recently, bears witness to the advantage of letting the work be done by those who have devoted their lives to that study.

Operators of coal mines should be as ready to seek architectural design and supervision as railroad companies are to employ chefs to prescribe the menus on their dining cars and to supervise the service. Even if a mining engineer shows a flair for architecture, his employers are so doubtful of his ability in that direction that he finds himself unsupported and is driven to follow old-fashioned and unsightly designs. The architect of experience would find his judgment less questioned and would be able accordingly to construct a presentable village. After all, mining towns are for human habitation, and men demand something besides mere utilitarian comforts. They are appreciative of beauty or can acquire that appreciation.

Indictments

OTHERS than coal men can be indicted—the household, for instance, with a furnace and coal cellar idle through the summer months. Radiators and piping also idle—another economic waste. The consumer's equipment is not 100 per cent efficient. It is working barely 50 per cent of the time. With such a condition of affairs in his home how can the consumer be critical of the coal industry with its 66 per cent efficiency?

We wonder whether the radiators might not during the extreme heat deliver a genial coolness to our habitations and make life bearable. Why should the radiator be restricted to delivering heat when it might be filled with cold air and thus continue to be a source of comfort? The janitor, who in summer months is relatively idle, could have work the year round instead of half the year. In suburban regions he spends his time gardening but in the city he is dismissed unless he has a group of apartments to keep swept and garnished.

Our forefathers shivered in the winter's cold. It

seemed perfectly natural to them. We swelter in the summer. It seems quite the regular order to us. But need it be so? Why not have comfort the year round? The ice industry it is true has aided in making life endurable, but, like the grate fire, it is a partial remedy. We should keep more than our comestibles at a proper temperature.

Domestic Storage Aids Industrial

SCREENING shortages quite frequently occur during the summer; the price increases accordingly and in consequence the industrial buyer is not encouraged to do his purchasing early. The operator producing a domestic coal cannot afford to crush it so as to satisfy the manufacturer or public utility or to sell it at screening price. Consequently he produces only as much coal of that size as the demand for domestic coal provides.

The only coal that usually can be obtained in unlimited quantity and at the lowest price during the summer is the run of mine produced at those low-volatile mines which do not supply the domestic market. This coal is of such high quality that the purchaser can afford to pay, and is willing to pay, even in years like this, approximately at least what it costs to produce, or in any event he is more ready to do so than when he is buying the screenings at a high-volatile plant.

Consequently unless the buying of the domestic consumer can be hastened so as to extend into the summer the industrial purchases of high-volatile screenings can hardly be greatly speeded, for the latter depend on the former.

Of course there are two slightly different interests in the coal regions. The high-volatile producer, though he objects to the domestic consumer being so opposed to fine coal that he will buy lump coal to break it down with a hammer to fit his stove, finds, however, that in that objection lies his sole opportunity to sell his coal at a profitable price. If the consumer were willing to burn slack, he also could get his coal from the smokeless-coal mines which cannot make lump coal, and the high-volatile producer would be deprived of the most profitable part of his market.

So the demand for the greater use of slack may become ultimately in a sense sectional. The high-volatile producer wants to sell all the slack he produces, and he does not like to be held in any way at fault for degradation of his coal on the way to the market, but at the same time the willingness of the consumer to pay a higher price for a lump coal is the only thing that keeps him out of the bankruptcy court. Consequently if the use of fine coal becomes at all general he will cease to be keen to educate the public away from the larger sizes, for in doing so he may lose his domestic as well as his industrial market.

The high-volatile man always is in a quandary. Either there are not enough buyers of large coal or not enough of small. He wants them both; the purchasers of lump because they are willing to pay him a profit and the purchasers of slack because they prevent him from showing a total loss on that commodity, but if the users of slack call on him heavily in the summer when the domestic consumer is indifferent, he is obliged to turn a deaf ear to them because slack is to him only a byproduct. He cannot afford to make this unprofitable size in order to help the buying-early movement so long as the lump consumer refrains from entering the market.



Street Scene, Kramer.

Kramer Mine Houses Its Stay-at-Home Employees

Only One Employee in Every Four Lives at Mine—Each Man Requires 4.4 Rooms—Two-Story Houses Accommodate Two Men Each at Cost 32.5 per Cent Less Than Bungalow Type

BY ALPHONSE F. BROSKY
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AUTOMOBILES, good roads and a general rise in the standard of living are creating new housing problems for the American mine owner. Workers who desire a certain degree of independence and the advantages inherent in living in a residential and business atmosphere are willing to pay bigger rents and travel to and from work by auto a distance sometimes as great as 10 miles. This releases the mine owner from the obligation of housing many of his employees. Pennsylvania bituminous miners in this respect are falling in line behind those of Illinois, the procession being led by the anthracite workers.

But with the rise in the standard of living the mine owner is obliged to assume the burden of providing more commodious quarters for those of his men who still choose to reside in the mining towns. He must also give them some of the conveniences found in the larger municipalities and cities. These factors influenced the plans adopted by the Northwestern Mining & Exchange Co. for building a mining town at its new Kramer operation, which was opened in 1920.

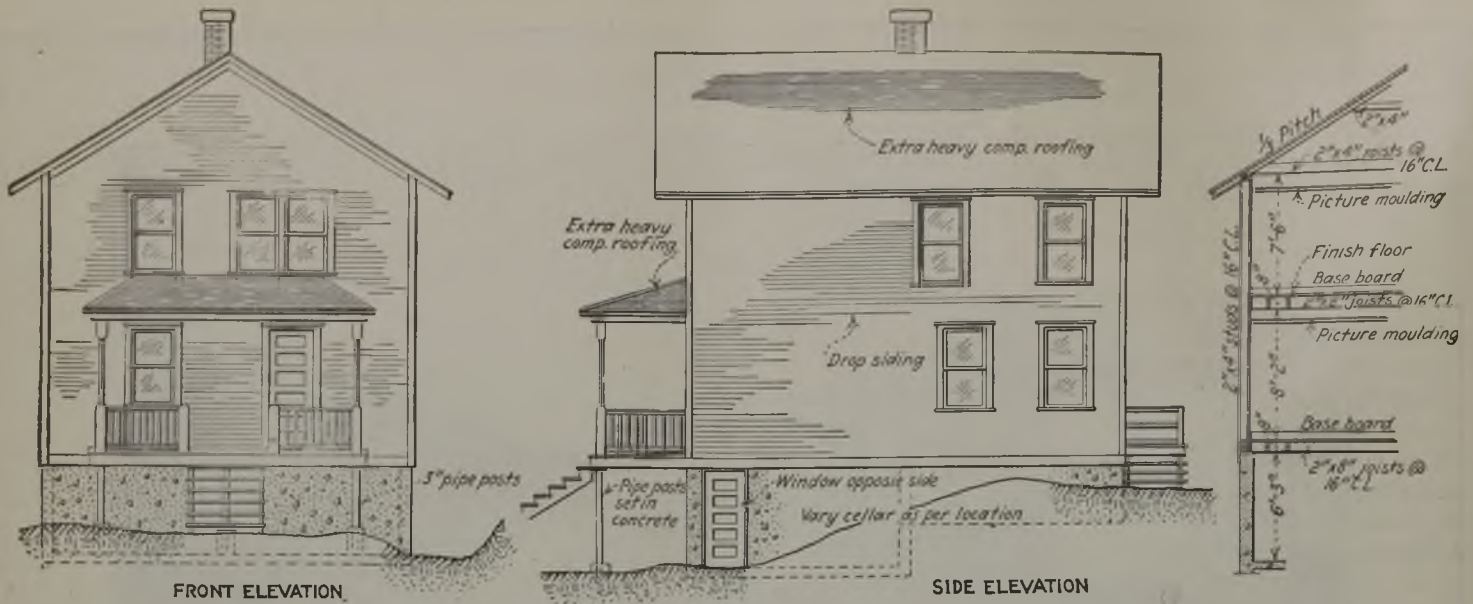
The new Kramer shaft mine lies in Jefferson County, Pennsylvania, 10 miles south of Dubois. It is designed for a maximum production of 4,000 tons of coal in 8 hours. About 800 men, including the necessary supernumeraries to fill the places of absentees, eventually will

be needed for the operation of this mine. At the present time approximately 300 men are employed in double-shift entry work and on the surface. Early this autumn room work will be started; when this is begun about 500 men will be employed. This number will be sufficient to produce 2,500 tons of coal each working day. As this rate of output, after it once has been attained, will not be exceeded for several years, the company has built a town sufficient to house only those of the employees required to produce this tonnage who do not choose to live in nearby communities.

ONLY A QUARTER OF EMPLOYEES REQUIRE HOUSING

Observation of the habits and proclivities of miners residing in the field surrounding Dubois, as well as past experience, enabled the Northwestern Mining & Exchange Co. to estimate the necessary initial capacity and the ultimate size of the town of Kramer. Two salient facts thus were established: First, only 25 per cent of the men employed need be housed in company-owned dwellings; second, only 4.4 rooms are required on the average to house each working man and his kin residing in the town. Accordingly, in order to house 125 of the 500 workmen that will be needed to produce 2,500 tons of coal daily 100 houses having a total of 550 rooms have been erected. Practically all these are occupied by company men. Information of this kind is of value only to those contemplating

NOTE—The owners of Kramer mine prefer to erect the two-story six-room houses shown in the headpiece because they are cheaper than dwellings of the bungalow variety. Note how the houses are set in pairs for protection in case of fire.



Front and Side Elevations and a Few Constructional Details

It will be noted that the houses are plain yet reasonably substantial. There are no ornate trimmings, the structure being designed for utility rather than beauty.

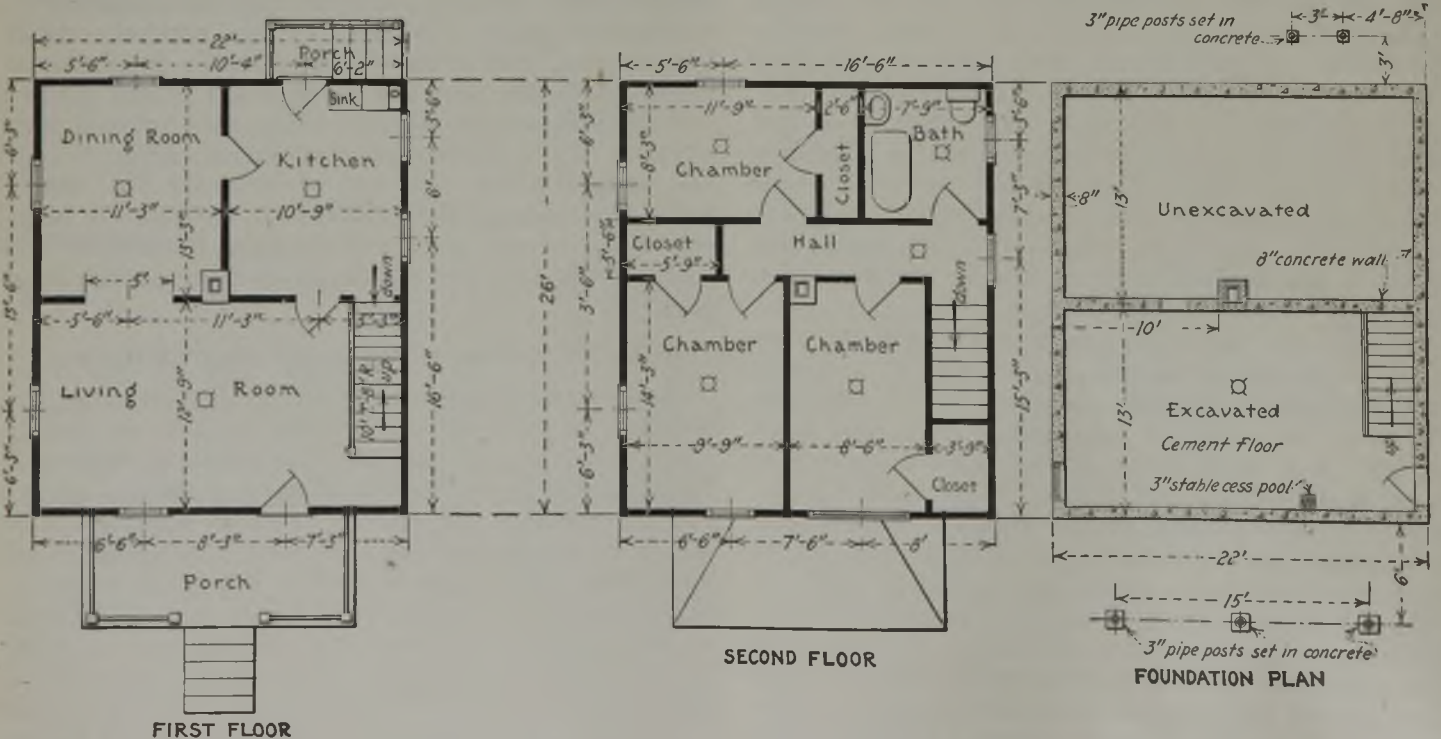
the erection of a town in a mining district connected by satisfactory traveling facilities with established communities.

Of the one hundred houses already built, ten are two-story structures containing seven rooms each. These are intended for occupancy by the bosses and the office force. Fifty two-story houses have six rooms each; this type has proved highly satisfactory, as will be explained later. The remaining forty houses are of the bungalow type, twenty having five rooms and the other twenty having four rooms each.

Before the daily output can reach 3,500 to 4,000 tons, at least 100 more houses will have to be constructed. The company has about decided to make these dwellings two stories high and of the six-room type, conforming in construction to the six-room houses already erected. This type of house probably will be adopted as a

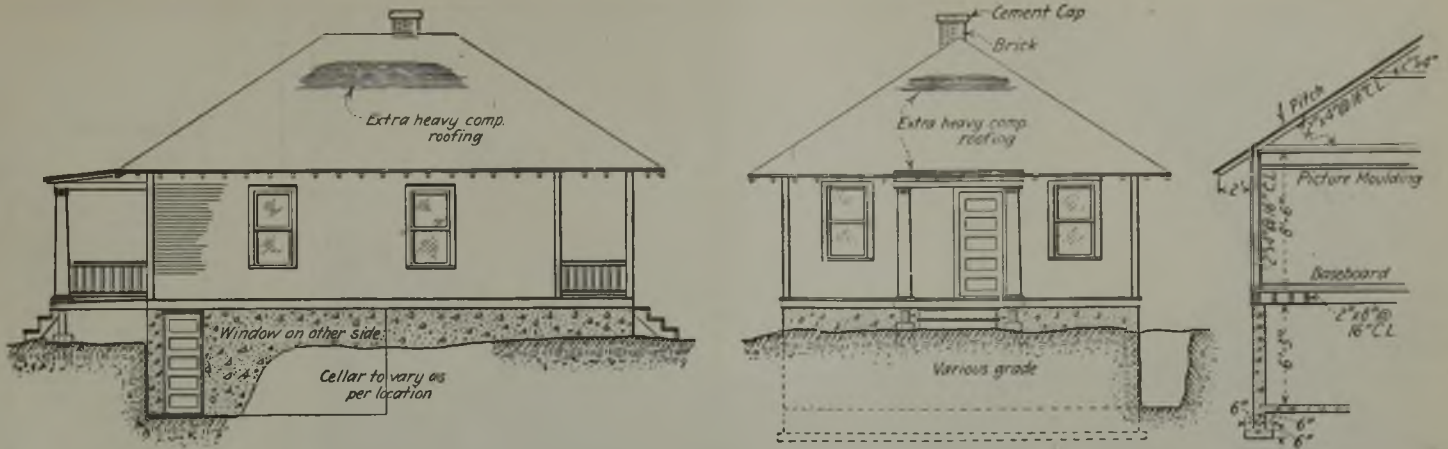
standard, chiefly because it will accommodate an average of two workmen as against one in the case of the smaller dwellings of the bungalow type. The reason for this is obvious when it is considered that the bigger house contains one more bedroom than the bungalow and that the rooms are larger. Married couples with no children may take in as many as four boarders, families containing two or three children may accommodate one or two boarders and large families may occupy an entire house. On the average, each six-room house should shelter two workmen.

The five-room bungalow is exactly like the four-room type, except for the addition of a small room adjoining the kitchen. In the four-room plan a single room serves as both kitchen and dining room. In the five-room type the additional room can be used either as a kitchen or as a storeroom. Thus, though the



Floor and Cellar Plans for Two-Story Houses

Here again utility is the keynote of design. A large living room together with a good sized dining-room and a kitchen of almost equal size make up the first floor. Three chambers and a bath, together with ample closets are found on the second floor. Half cellars requiring the least excavation are placed under these houses.



Front and Side Elevations, Also a Few Details of the Bungalows

The advantage of the bungalow lies not in its cost but rather in its convenience. So far as the coal company is concerned, however, it cannot allow this consideration to outweigh the housing utility of the two-story dwelling.

larger house is more convenient, it offers no more spacious accommodations than the four-room bungalow. People living in either type are cramped for space and dislike the idea of taking in boarders. The six-room house possesses a further marked advantage in that only three rooms per workman are required as against 4.4 rooms in the bungalow.

SIX-ROOM TWO-STORY HOUSES BEST INVESTMENT

As practically the same quantity of material and labor enters into the construction of the roof and foundation in the six-room house as in the four- or five-room bungalow, the cost differential between it and the six-room structure represents only the additional material and labor necessary to the construction between these two extremities. Excavation, foundation and roof construction are items that make up a goodly portion of the total cost. Inasmuch as the cost of the six-room house is only 35 per cent greater than that of the five-room bungalow, the expense of housing a workman in the former is 32.5 per cent less than in the latter. Of course, this calculation is based on the assumption that the occupants of the houses will take in boarders whenever circumstances permit them to do so.

As the accompanying plans and elevations of the several types of houses in the town of Kramer give the layouts, proportions and many of the details of construction, little comment other than a few general remarks is necessary here. The walls are constructed

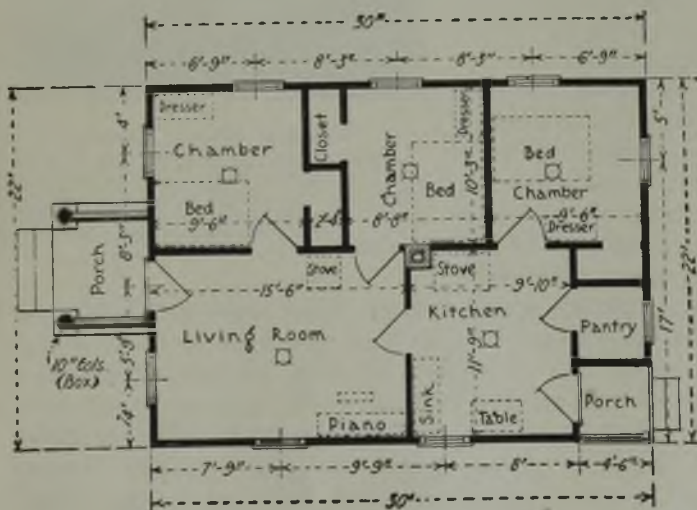
of 2x4-in. studding, lathed and plastered on the inside and drop-sided on the outside. Floors are built of tongued-and-grooved flooring resting on 2x8-in. joists spaced on 16-in. centers. Chimneys are constructed of a single course of bricks inside which is placed 1-in. flue lining tile, the clear opening being 8x12-in. The pier on which the chimney rests forms a part of the center wall of the foundation.

Each window sash contains one large pane of glass in place of four, this latter construction being frequently followed in building miners' dwellings. The large glass is a great convenience to the housewife in cleaning windows. The upper and lower sashes are provided with counterbalancing weights. This is a departure from general practice in this region. It eliminates the inconvenience and breakage caused by falling sashes. These two details might well be incorporated in all miners' houses. Roofs are covered with extra-heavy composition roofing paper.

Foundation and cellar walls are of concrete 8 in. thick. Each cellar is excavated under only half the house area, though the foundation wall extends completely around the building. The half-cellar requires the pouring of a center wall extending from side wall to side wall. When a house is built on sloping ground, the cellar is located under that portion of it where the ground is the lowest, so that the excavation is kept to a minimum. The cellar floors are concreted. Entrance into the basement is gained through an outside door in all except the seven-room houses, which are provided with an inside stairway for this purpose.

All foundation walls were poured with a concrete mixture, the proportions of which were 1:3:5. The coarse aggregate used was ¾-in. crushed limestone, sometimes termed ¾-in. screenings. This comparatively small and uniform material facilitates puddling in narrow forms and is disseminated uniformly throughout the wall mass, whereas a heavy aggregate—a 2-in. size was tried—sinks to the bottom.

The utility of the cellars was increased by providing each with a chimney flue so that a small stove might be set up for heating either the basement itself or water for washing. As each cellar is provided with a water faucet and a 3-in. stable cesspool with a bell trap, it can be made to serve either as a laundry or as a place where the miner may change his clothes. Though all houses are provided with running water, only the seven-room dwellings have bathrooms and 30-gallon range boilers or hot-water heaters. Every kitchen is provided with a sink.



Bungalow Floor Plan

The four-room bungalow is laid out similar to the five-room type here shown, the difference between the two being only slight.



A Bungalow Street

If he has no family or only a small one the miner frequently prefers the bungalow type of house. Many of them, however, prefer a larger dwelling so that they can keep boarders. Kramer is a new town; consequently streets have not yet been graded.

Water for drinking, washing and fire protection comes from a well 220 ft. deep, located near the auxiliary hoisting shaft. Thence it is forced against a head of 240 ft. by a pump having a capacity of 40 gallons per minute to a 20,000-gallon cypress storage tank. The intake pipe to the tank is 3 in. in diameter, and the discharge 4 in. The effective head at points in the town varies from 100 to 180 ft.

It has been observed by officials of the company that the average family living in houses without bathrooms will use about 50 gallons of water daily. On this basis 20,000 gallons of water is sufficient for one day's supply for 250 families (the number that some day must be accommodated in the town) as well as for a proposed bathhouse, the shops and other buildings. By pumping continuously, the tank can be completely filled in 8½ hours.

In case the water-storage tank, for any reason, must be emptied, the pump can be so bypassed as to discharge directly into the 3-in. cast-iron main. This water line is fitted with bell-and-spigot joints caulked with leadite. Twelve fire hydrants are installed throughout the town and so disposed as to afford fire protection to every house in it. These hydrants are of the anti-freezing type—that is, so designed that the water column automatically drains. Loose stone is buried at the base of each hydrant to receive the drain water.

As an added protection against the spread of fire,



A Bungalow Front

Round porch columns are more expensive than square ones but add greatly to the appearance of the structure. The weight of the porch is supported by 3-in. pipe columns footed on small concrete piers. This is a detail conducive to low maintenance.

houses located on adjoining lots are set in twos with an extensive open space between each pair. Lots have 50-ft. fronts and are 100 ft. deep. Streets are 40 ft. wide with a 20-ft. alley midway between each two that are parallel. Front building lines are 20 ft. back from the street lines. A plan that has worked out to advantage in this village is that of separating the town into two sections, one for people of American birth and the other for foreigners.

From the water mains a ¾-in. tap line is run to each pair of houses. On each of these tap lines close to the main is inserted a corporation cock for shutting off the water supply to the houses served, in the event of a leaky pipe or other accident. Adjoining the corporation cock an 18-in. lead gooseneck is inserted in the tap line. This gives flexibility to the connections and prevents a break, should either the tap line or the main settle below the levels at which they were first laid. Two house lines, of course, are connected to each tap line, one to each of a pair of houses. In each of these branch lines is placed a stop-and-waste cock for drainage purposes.

The town has been built on a flat-topped hill covered with loose surface material of a broken and sandy nature. This gives natural surface drainage.

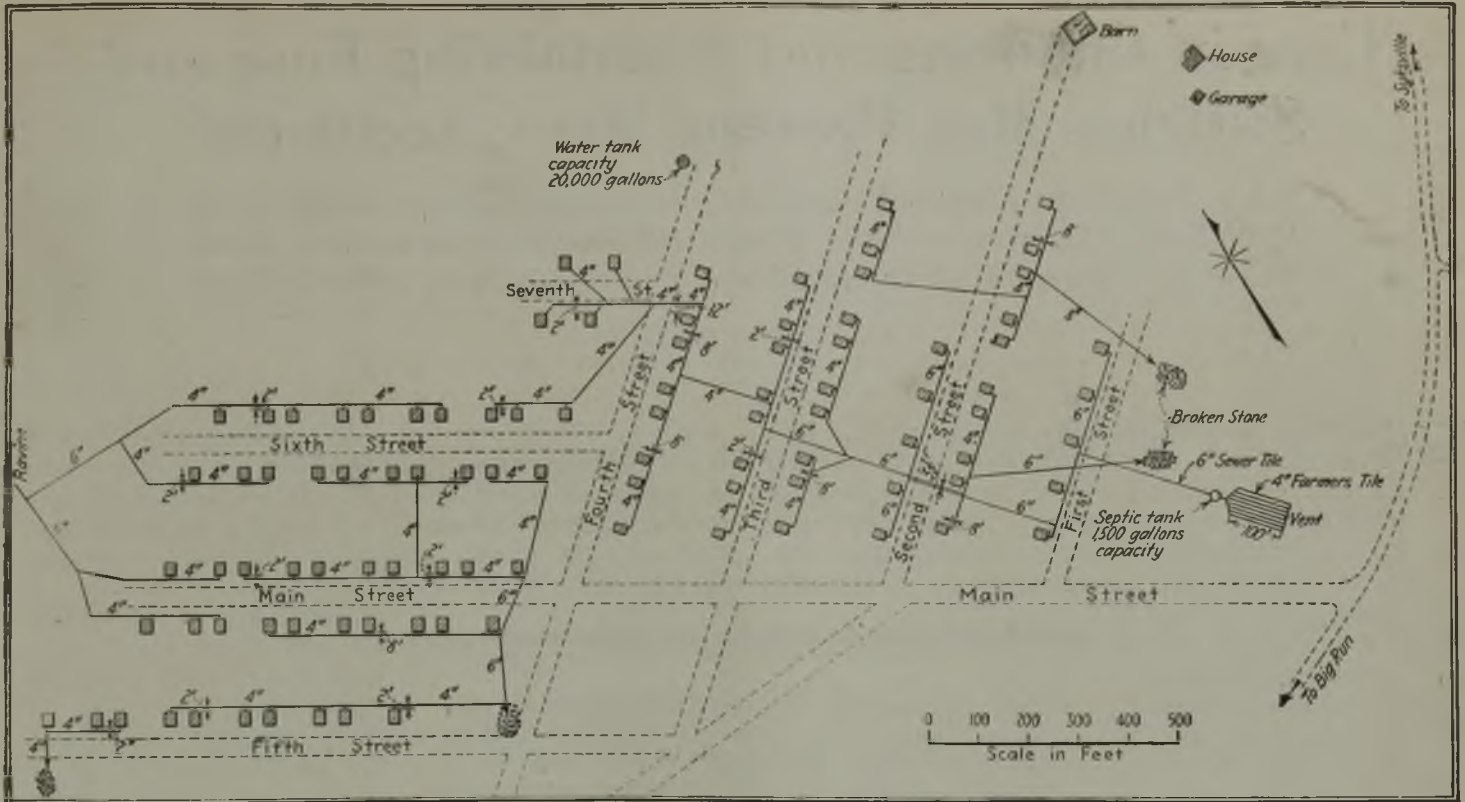
Two complete sewer systems have been installed. One is of the surface or open type and handles waste water from the four-, five- and six-room houses. It provides a quick run-off for surface water after a heavy rain. The other is of the sanitary or closed type, intended for handling waste water and fecal matter coming from the ten houses equipped with bathrooms. Each system, of course, is independent of the other.

The surface-sewer system, which cares for ninety of the one hundred houses, thus far constructed, is laid



Kramer Water Tower

Even a small mining town must have a dependable supply of potable water. Elevating a tank upon a tower as here shown provides not only water storage but also an ample head for fire fighting.



Map of the Town Showing the Two Sewage Systems

Two distinct systems of sewage disposal are here installed. One serves the houses provided with bathrooms and the other those not so provided. One system discharges to a septic tank and the other to surface disposal.

on the main streets with 4-in. terra-cotta pipe and connected to the houses through 3-in. pipe of the same material. These tile are set below the frost line. Waste water, not absorbed by the loose ground in which the open-joint sewers are buried, runs by gravity to the discharge point located in a ravine some distance from the town.

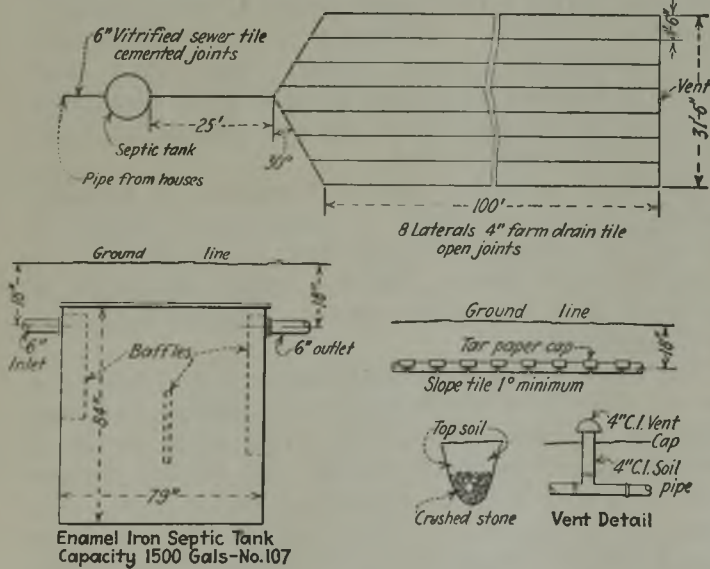
Sewage from the ten seven-room houses on the sanitary system is carried away in 6-in. sealed-joint terra-cotta pipes laid on a 3-per-cent gradient to a central septic tank. The capacity of this tank is 1,500 gal. All joints in this sewer line are sealed with a mixture of one part sand and one part cement.

Outside toilets are provided for the tenants occupy-

ing the houses not equipped with bathrooms. Two toilets and two coal bunkers are built under the roof of one outhouse serving each pair of houses. The two toilets surmount an open concrete vault.

It is now the belief of the company that it would have been to its advantage to install only one sewage system, and that of the sanitary type. Aside from all considerations of sanitation, the closed sewer system which discharges into a septic tank involves a lower maintenance cost.

All streets in the town are lighted with 75-watt lamps. A 2,300-volt circuit is carried from the mine plant to the center of the town, where it is stepped down to 110 volts by being passed through two 15-kva. transformers. This furnishes lighting current to both streets and houses.



Simple System of Sewage Disposal

After passing a septic tank the sewage flows to a system of drain tile, through which it percolates to the soil. The tile in this case acts as a filter for a liquid already purified by the septic tank.

In a recent lecture on the industrial uses of nickel, aluminum bronze and other non-ferrous alloys, delivered before the Institute of Metals in London, says the *Colliery Guardian*, W. M. Corse stated that the production of nickel was largely confined to the British Empire. The bulk of this metal is used in steel manufacture. The outstanding characteristic of aluminum bronze is its resistance to corrosion, although it possesses hardness and strength to a high degree. Curiously enough, it was stated, however, the largest single use for this alloy was for the manufacture of a worm wheel for Ford trucks, for which purpose 11,000,000 lb. had been bought during the past few years. The service records of these gears indicated a low percentage of breakage and a long life. Important work is being done both in Great Britain and the United States on stainless iron and stainless steel alloys, which contain nickel and chromium, and much is expected from experiments now in progress.

Care in Choosing and Maintaining Fuse and Switches May Prevent Many Accidents*

Keep Fuses in Fireproof Cabinets—Automatic Circuit Breakers of 2,000-Amp. Capacity or Over Should Be Remotely Controlled—Each Phase in a Three-Phase Circuit Should Be Provided with Separate Fuses

BY J. F. MAC WILLIAMS

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FUSES for electrical circuits may be divided into several classes. Link fuses of the open type should be used only when mounted on non-combustible and non-absorptive material. It is always preferable that they be installed in fireproof cabinets. This type of fuse is exposed, and consequently the probability of a short-circuit or injury to anyone working around the fuse or making a renewal is always imminent. The only advantage that this fuse has is that it is relatively cheap.

Inclosed fuses of the plug type are much safer than link fuses of the open type, but even these fuses may be misused and thus prove ineffective. It is a common practice for some men to insert a piece of metal about the size of a penny in the base of the socket and thus make the fuse inoperative. Whenever this type of fuse is used the line wire should be connected

to the center contact and the load wire to the threaded part. If this is done the circuit becomes dead the instant the fuse is turned loose from the bottom or line contact. In consequence it is much safer for the workman who has to handle it.

The inclosed type of cartridge fuse also is safer than the open-link type, and when provided with ferrule contacts may be used on circuits carrying currents as high as 60 amp. When equipped with knife-blade contacts the fuses are suitable for use on circuits carrying much larger currents. Some of these fuses which have renewable links may be misused to carry a higher current than that for which they are designed. Even non-renewable cartridge fuses often are tampered with and made inoperative or fused to limits much higher than those for which they were designed by jumper wires being connected between the two terminals.

The inclosed externally operated fuse switch probably is the safest for general work. To renew the fuse the terminals are first of all entirely disconnected from all live parts. The Underwriters' classification of this complete unit is A.A.

Whatever type of fuse be used on a circuit it is always necessary that it be installed and maintained

properly. If this is done few accidents will occur. When renewing fuses in grounded cabinets care should be taken to avoid short-circuits or accidental connection with the ground. All contacts should be kept clean and in proper alignment; otherwise excessive heating may occur and cause serious damage.

Fuses and switches are provided to protect men and machinery, but, like other safety devices, they have their own dangers and need to be carefully chosen, correctly installed and kept in first-class condition. In consequence of accidents they have been carefully redesigned so as to eliminate hazards, and care now is taken to protect them and to keep their flashes within a fireproof cabinet. The boy set to open and close a door and thus keep a mine safe at Delagua, Colo., set fire to some chips and nearly destroyed the mine he was engaged to protect. Similarly the fuse or switch set to close or open a circuit, if not properly constructed and protected, may take a life or start a fire, thus negating in part the purpose of its installation.

Automatic circuit breakers will afford much better protection to apparatus than almost any type of fuse. Usually these breakers are designed so as to trip at any current value between certain limits for which the breaker has been made. Such breakers should be installed high enough from the floor and in such a position that neither the operative nor any inflammable material will be exposed to the arc which rises from the contact tips when the breaker opens.

They should be equipped also with a hand trip properly insulated and in such

a position that the breaker may be readily opened manually without injuring the operative's hand or arm or exposing him to the arc. Such a breaker should always be set to trip at a current value much less than that which would cause injury to any connected apparatus or cables. Automatic circuit breakers used for interrupting currents higher than 2,000 amp. should be remotely controlled so as to avoid possibility of danger to the operative if any part should fail when the circuit is being opened.

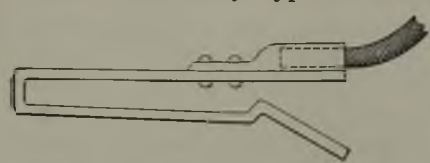
Automatic reclosing circuit breakers, if installed outside the power plant or substation, should be inclosed in a locked fireproof box to prevent anyone tampering with them. The key should be placed in the hands of a responsible person, familiar with electrical equipment.

This type of breaker is designed so that it will close just as soon as a short-circuit or overload has been taken off the line. Therefore, great care should be taken to avoid shock or burns. To obviate danger when repairing such a switch, or feeder wires connected to it, the control circuit should first of all be opened and the circuit grounded. Unless this be done the workman might begin to work on either the circuit breaker or one of the feeders when the power is off and later the circuit breaker might close, giving him a severe shock or burn.

*Article entitled, "Electrical Starting Devices," read Oct. 2 before the Mining Section meeting of the National Safety Council, Louisville, Ky.

If circuit breakers are properly installed and maintained the danger of burning out generators, motors or cables and injury to attendants will be reduced greatly. Automatic reclosing circuit breakers may be installed so as to sectionalize feeders and trolley circuits and thus localize any trouble. They also have another advantage in that they may be adjusted so as not to close on any load which would be injurious to the generating or converting equipment.

There are many types of so-called safety switches.



Busbar Grounding Terminal

A clip like this may be easily slipped over a busbar and connected to a good ground.

One manufactured by the V. V. Fittings Co. appears to give satisfaction. This switch is enclosed in an iron box and is provided with a curved operating handle locked in position when the switch is closed. This handle has a socket at the end which must be entered into a slot in an extension at the lower right-hand corner of the box. The shaft operating the switch is protected by this extension so that it cannot be operated with a wrench or plier. A lineman wishing to work on the circuit controlled by this switch opens the switch and unlocks the handle, which he takes with him. In this way he is assured that no one will close the switch without his knowledge.

Oil switches often are required to open circuits carrying currents much larger than those for which the switch is designed. The oil in these switches is provided in order to prevent arcing when the current is interrupted. These arcs carbonize the oil, thus reducing the insulating characteristics and possibly causing trouble. Dust and dirt also enter the tanks and in many cases form conducting material.

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KEEP OIL USED IN SWITCHES CLEAN

Whenever an arc is broken under oil the oil dissipates some of this heat and itself becomes heated. This causes an expansion of the oil, expelling a certain quantity of air from the tank. When the oil cools and contracts, new air enters the tank. If this air contains moisture, which it nearly always does, fine particles of water vapor form on the sides of the tank and drop into the oil.

If much moisture and dirt is permitted to collect in the oil and tank, a heavy arc may cause the switch to explode. Switches of this type with vertical contact boards permit dust and dirt to drop into the tank rather easily, whereas horizontal boards prevent a large part of the dust from getting into the oil. Dust and dirt collect on the outside of a switch owing to the presence of oil, which holds any particle of dirt which comes in contact with the switch. Common dust and dirt in this manner form a conductor between the switch terminals and often cause leakage of current to ground or from one line wire to another.

To avoid accidents it is therefore necessary to keep the switch as clean as possible and make periodic

inspections of all the current-carrying parts and also of the oil. Sludge in the bottom of an oil tank may become so deep as to cause current to leak from one of the line wires to the ground. If the switch is not grounded the tank and supports will become charged and dangerous.

How often the oil should be changed depends on the service which the oil switch is required to perform. It may be necessary to change it every month or only every few years. In dusty damp places it may need renewal every few months. In dry clean places it may be necessary to renew the oil not oftener than every four years. No general rule can be formulated, as the time will depend on the location and severity of the service. Every oil switch should be inspected at least once a year. If the contacts are damaged they will, of course, increase the probability of accidents.

FREQUENT INSPECTION SAVES TROUBLE

At the mines of the Pennsylvania Coal & Coke Corporation, unless a switch has been in abnormal service, it is inspected once a year. If moisture or sludge appears in the tank it is cleaned out, the contacts adjusted and the oil entirely renewed. Any oil which appears to be satisfactory is tested before it is used. Oil that appears to be good often is found, upon further inspection and test, to be unsuitable for use until filtered. For this purpose a pressure filter press is used.

New or filtered oil must not break down at any lower voltage than 35,000 when tested between sphere gaps 1/2 in. in diameter and set 0.15 in. apart. The flash point should not be lower than 171 deg. C. and the fire point not less than 178 deg. C.

Graded-resistance types of motor starters are used on both alternating and direct-current circuits. These starters have a number of contact points or small switches which must be periodically inspected. Perfect contact should be made at each point to obtain results.

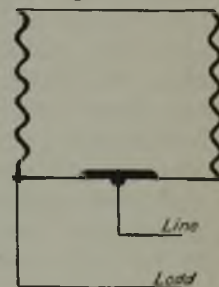
Most of these starters are provided with a blowout coil for preventing serious arcing. These coils must always be kept in good condition; otherwise they will not function properly, and serious damage may result. When shutting off the current with this type of controller each contact should be broken quickly; unless this is done, the controller cover may be blown out under severe conditions, and the operator injured or a fire result.

A compensator is a combination switch and transformer and is therefore subject to the same dangers as already mentioned and should be protected and cared for in the same manner as other switches.

The wedge-type contacts make a more perfect connection than other types and consequently greatly reduce arcing.

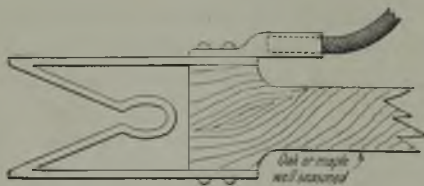
When properly designed and maintained, automatic motor starters are the safest equipment to use for starting motors. They can be located where there is little danger of fire or accident to the operator and can be made to perform their duty accurately each time they are used.

If six motor leads were brought out of delta-connected induction motors each phase could be protected independently by six fuses or relays. With this



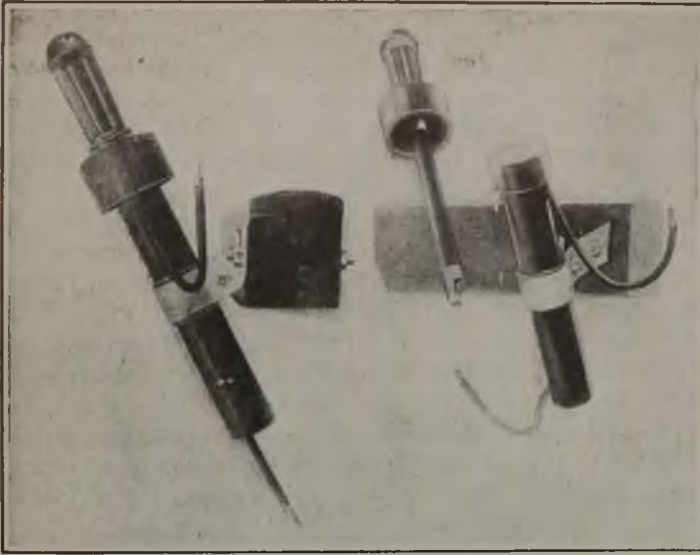
Fuse Socket

Just as soon as the fuse is partly unscrewed it becomes "dead" if the line and load are connected in this manner.



Pole-Mounted Clip

Because this grounding terminal is mounted on an insulated pole there is little danger to the workman even should he attempt to place it on a "live" conductor.



This Fuse Is Efficient, Safe and Readily Mounted

An efficient fuse suitable for outdoor service is important on any outside electrical circuit, but more especially is it important that it should be so constructed that it will not be ruined the first time it is called upon to function. Frequently one disturbance quickly follows another, and if the line is left unprotected after the first accident due to the breakdown of fuse apparatus the result may be disastrous.

arrangement better protection could be afforded the operative and equipment.

Line fuses always have been a great source of trouble and danger to power users and power companies. The Pennsylvania Coal & Coke Corporation has found, after several years' experimenting with many different types, that the Schweitzer & Conrad Type E ejector cutout, though perhaps more expensive than others, gives satisfactory results. This fuse is simple and compact; the fuse element proper consists of a strip of high-resistant high-tensile strength fusible wire which is held in tension by a coil spring. The fuse is provided with slots for quick insertion under terminal screws and enclosed in a cork which protects it from corrosion and also acts as an arc barrier. The cork itself is enclosed in a tube, so there is little possibility of the fuse being affected by external atmospheric conditions. The complete operating mechanism is enclosed in a bakelite tube which is screwed to the operating handle. Current passes from the base of the coil spring to the fuse element through a flexible copper cable. This cable shunts the spring, and therefore the current in the spring is negligible.

SPRING BREAKS HEAVY CURRENT ARC

When the fuse link is broken from any cause whatever, the spring contracts and introduces a long gap between the two fuse ends in the tube. This quick and positive rupturing feature is assisted by the barrier effect of the cork. The result is that if the fuse operates on an overload barely sufficient to melt the fuse link, a positive break is obtained. In case of a short-circuit, the cork is ejected by the explosive action of the arc, and besides acting as a barrier it helps to interrupt the arc by sweeping it out of the fuse tube.

The whole fuse outfit is mounted on a crossarm at such an angle that any flame or gases escaping from the open end at the bottom are directed away from the lineman. A new fuse is put into position by a quick motion. This is important if the operator is closing the circuit on an extremely heavy load.

If oil switches were designed so that it would be necessary to open the switch before a short-circuit or

ground could be applied, a great step toward protection of the operative would be accomplished.

In the short-circuiting and grounding-compartment type of switches, the ground connection should be made first. If the doors on the compartment are hinged at the top they should not be removed but swung forward sufficiently that the operative will be able to reach by them and apply the connection to the switch. By this procedure the door will act as a barrier in case the switch is charged.

When men are working on lines the conductors should be grounded and short-circuited. The ground connection should be made first and the short-circuiting devices applied afterward. This should be done whether the work is to be performed inside the plant or outside on the line. The apparatus for this work should consist of flexible cable of a size not less than No. 6, having for station work a clip, which hooks over the ground bus and locks in place.

On the other end of the cable a set of spring clips fitting the contacts of the line terminals and mounted on wood handles should be used. For grounding outside-line wires a piece of $\frac{3}{4}$ -in. pipe not less than 5 ft. long with a connection head on one end and a point on the other should be used. A clip similar to that mentioned above, made of copper and mounted on wood handles, should be used for attaching to the line wires.

DANGERS ARE LESSENERED BY GROUNDS

Ground connections should be made to provide safety to equipment, to discharge abnormal potentials and to afford a path for current leaks from equipment. Such means will reduce the hazards accompanying the operation of electrical apparatus. Sometimes it is not feasible to ground electrical apparatus, and often by doing so the hazards to the operator are increased rather than decreased. In any case, the grounding of equipment, supports, etc., must be understood to be done for the protection of the operative from shock should these parts become charged. Grounded-frame parts actually increase the danger of shock to the operative should he make contact between current-carrying parts and grounded-frame parts. All ground connections should be tested occasionally so as to be sure they are always effective.

A low-voltage release with short-time limit will be found preferable to the no-voltage release when equipment may be subjected to severe shock by a sudden restoration of normal voltage. The short-time limit prevents the complete interruption of service if the drop of voltage and its return is rapid.

Linemen always should use line protectors such as line hose, tie caps, rubber pigs, etc. These men also should use transformer-fuse pullers whenever they are required to remove or install fuse plugs on transformers which may be either heavily loaded or in damaged condition.

PROVIDE WORKMAN WITH TESTER

Some simple form of tester for determining whether the line wires are charged often has prevented serious injury to persons required to make repairs. A simple and cheap tester, called the Pocket Electroscope, that can easily be carried, is made by the Minerallac Co., of Chicago. It is the practice of the Pennsylvania Coal & Coke Corporation to furnish its men with this instrument.

Welders should be provided with lenses of suitable quality for protecting the eyes. Such glasses should give maximum protection against ultra-violet and infra-red rays. Combinations of red and blue, or red and green glasses give fair protection, but we are using at present a metallic glass which appears to give our welders less trouble than other glasses. Frames for helmets should be made of a material which will not conduct heat or light. To avoid danger of burns operatives should be required always to use asbestos gloves and aprons.

Rubber gloves should be subjected to a mechanical test. Any 2-in. section of the rubber should stretch to 6 in. without injury. All gloves not used in conjunction with an outer protecting cover should be at every point at least 60 mils thick. Gloves used with outer protecting covers should not be less than 50 mils thick. Variation from these thicknesses should not be more than 15 per cent. An air test for punctures in gloves is easily made by rolling the glove from the cuff toward the finger tips. By moistening the glove, leakage at any point can be easily observed. When immersed in, and filled with water, all gloves when tested with 10,000 volts for 2 minutes should show no leakage in excess of 10 milliamperes.

ELIMINATE FALSE IMPRESSIONS OF SAFETY

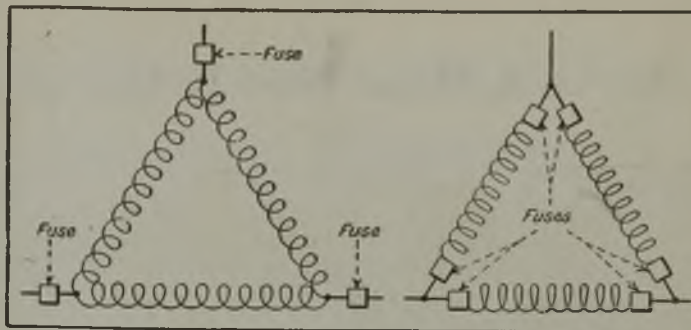
In laying out a new wiring installation all conductors should be arranged so as to indicate to the workmen the pressures of the different wires. Colored cables and conductors, also insulators and supports, may be used to indicate the pressure of the conductors. Where many different circuits are laid out together it is sometimes possible to arrange those conductors carrying the highest voltages in places where they will be safest. In some installations it may be possible to locate conductors carrying high voltages on the uppermost arm or rack.

When using insulated wires it is well to use only conductors having an insulation which under nearly all conditions could never become dangerous. If this cannot be done, bare wires should be installed, as they can in no way convey to the workmen a false idea of security. Many people have been injured by mistaking weatherproof for insulated wire. These accidents probably would be much less frequent had the wire been bare.

All cable sheaths and conduits carrying conductors should be grounded. Metal tags may be placed on cable sheaths indicating the voltage carried by the conductors, and end bells or potheads should be plainly marked. All cables or wires should receive a test of two and one-half times their working pressure soon after being installed.

PUT DANGEROUS APPARATUS OUT OF REACH

It is hardly necessary in these days to install a switchboard having any parts at the front of the board carrying high-voltage circuits. It is wise to use rubber matting if proper care is taken of it—that is, if it is kept clean and dry; otherwise it may become a menace. Wooden platforms, in my opinion, are dangerous. It is easy to stumble over them; they absorb oil, and if not carefully made the nails or screws in them may easily defeat their purpose. Any device installed as a safeguard is more dangerous than nothing at all if it is defective, as the attendant is misled into thinking he is safe when actually he is in great danger.



Do We Fuse Three-Phase Circuits to the Best Advantage?

The figure on the left shows the usual method of fusing three-phase systems. Fuses of smaller size which will respond to conditions in each phase may be used if inserted as shown in the figure on the right.

All switches should be opened and closed as quickly as possible, and the blades and contacts should be perfectly aligned so that this may be done. Otherwise there may be serious arcing.

Switch handles should be strong and well insulated. Fiber guards should be provided to prevent switches being closed on circuits which should be left open. Any switch connected to a circuit where there is a possibility of any flashing should be provided with barriers of non-absorptive and non-combustible material. In general, disconnecting switches on 2,200-volt circuits or higher should be provided with such barriers.

Arcing horns for taking up surges, flashovers and overloads should be installed so that neither the operative nor equipment will be in danger when the horns come into action. They should be installed only in places where the arc will not cause damage to overhead equipment. If located in a low position or near other apparatus, side barriers should be installed. The horns themselves should have sufficient spread so that any arc passing along them will be quickly interrupted.

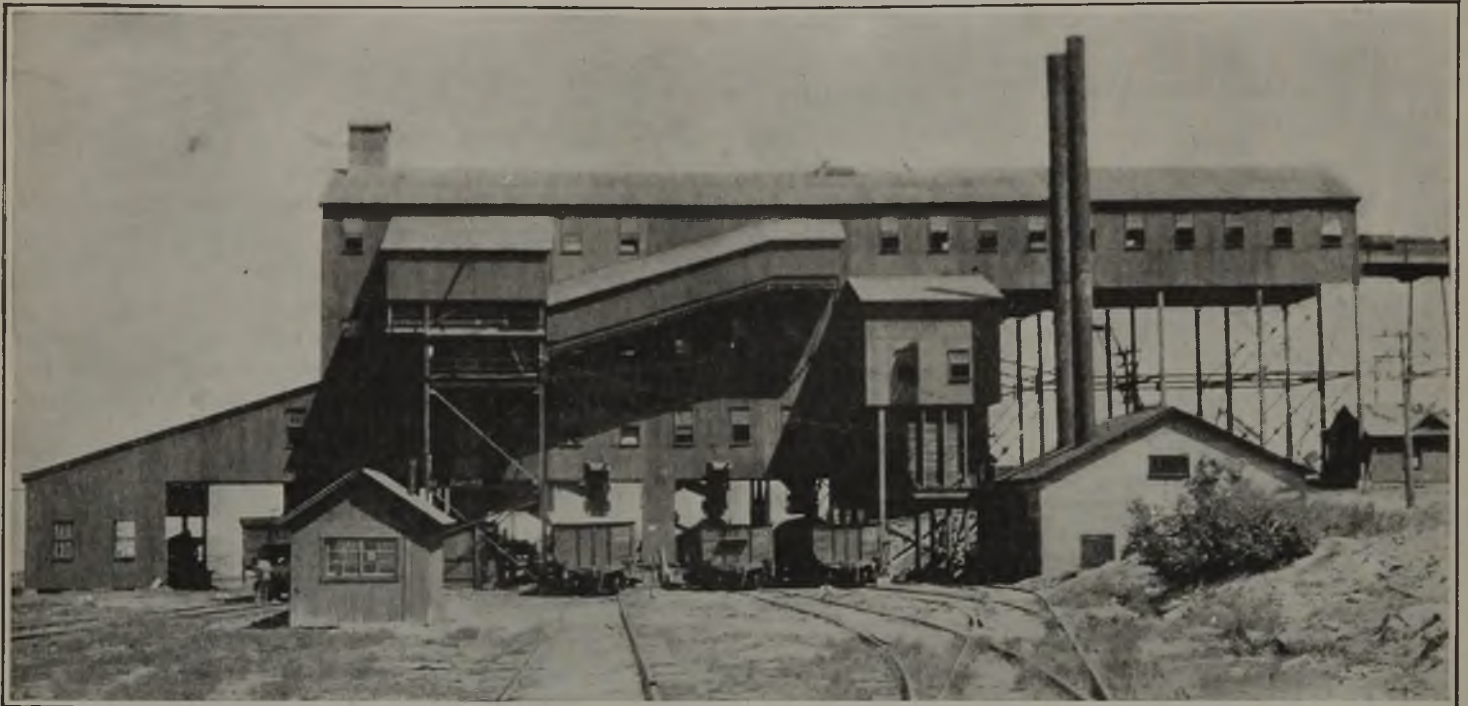
Almost any expense incurred in making electrical equipment safe is a good investment. Where operators feel secure from shock or other accidents, better care usually is given to it, and it is better operated. By eliminating dangers to the equipment and also to the operatives, much expense occasioned by delays and damage is obviated.

TAKE PRECAUTIONS BEFORE ACCIDENTS OCCUR

Any reasonable expense incurred when endeavoring to select good electrical equipment for almost any job may easily be justified over a period of years. However, it is also important that the apparatus be installed in the best approved manner. Too often do we see expensive high-grade equipment purchased for a mine and either left unused until it is badly rusted or else it is installed in a careless way. It is not sufficient for the mine officials to merely appropriate large sums of money for the purchase of electrical equipment. The expenditure of such money is justified only when the apparatus has been properly installed and is truly effecting the savings originally claimed for it.

Workmen should be taught the essential details of the equipment they are called upon to operate or maintain. With a perfect knowledge of the function of each coil, relay or contactor the operative will not attempt to use electrical devices which when in disrepair increase the hazards to himself and others. Most accidents are due to ignorance or carelessness, therefore, safety precautions should be started, not when an accident has occurred but before equipment is purchased or installed.

A Mine That Is One of the Showplaces of Utah



Black Hawk Mine Portal and Tipple Operated by United States Fuel Co. at Hiawatha, Utah

This mine is generally considered the principal operation of the company. The mine operates in a seam of coal 28-ft. thick and is capable of producing nearly half a million tons annually. More than 300 men are employed when the mine is in full blast. Every safety precaution applicable in Utah is used in this property. Its mine equipment and methods are such that they grip

the attention of any visitor, as might be suggested by the massive concrete portal and three-track main haulage shown in the picture. The mine opening is a drift high in the side of a mountain. Trips are hauled to the portal by motors and let down the hill by tramway to the five-track up-to-date steel tippel illustrated at the top of the page.

Coal Seams of Alabama—Their Output, Analyses, Ash-Fusing Point and Geologic Structure

Steep Pitches, Thin Seams, Faults and Large Partings Frequently Make Operation Difficult but Some Beds Are Clean and Flat—Coking Coal Will Suffice to Smelt All Iron in Field

BY MILTON H. FIES

Vice-President, De Bardelben Coal Corporation,
Birmingham, Ala.

PIG IRON was manufactured in Alabama many years before the mining of coal. Iron ore and red-cedar charcoal were used for that purpose. Tradition says that Alabama iron was used to shoe the horses of Andrew Jackson's soldiers. No coal was produced until 1830. In that year it was mined in Tuscaloosa County, in the vicinity of what is now the University of Alabama, and shipped on flat boats—obviously during the wet season, for there were many shoals—down the Warrior River to Mobile.

About that time the first railroad, the Decatur & Tecumseh, was being constructed in northern Alabama to overcome the obstructions to freight traffic caused by the now well-known Muscle Shoals in the Tennessee River. This railroad was patterned after a railroad at Mauch Chunk, Pa., which was used for hauling anthracite from the Panther Creek Valley. The Alabama railroad, which required about four years to complete, was forty-six miles long and was used solely for the transportation of cotton. Although it was a failure, it demonstrated the practicability of the undertaking, and the succeeding railroads, which were begun in 1834, 1848, 1852 and 1853, added immeasurably to the development of the coal resources of the state.

Between the years 1830 and 1860 practically all the coal mined in the state was dug from the outcrop near the river or from the river beds and shipped by boat to Mobile. The transportation of coal down the Warrior River was a risky proceeding, required much skill and frequently was accompanied by heavy losses. It is recorded that this coal was sold to the gas company in Mobile in 1844; it probably was mined from the Black Creek seam.

In 1914, on the completion of Lock 17, the Warrior River became a navigable stream from nine miles above Cordova, Ala., to Mobile. It offers a great opportunity for the future development of the coal resources of the state.

Coke for foundry use was first made in Alabama in 1855. It was twenty-one years later, however, in 1876, that pig iron was made from Alabama ore with Alabama coal.

Coal and ore mines in Alabama during the "War between the States" aided the South materially and caused great concern to the federal government until federal troops, in 1865, captured the iron works and coal mines. This war awakened the nation, and the South especially, to the possibilities of Alabama's resources. Since that time, notwithstanding difficulties and obstacles, the growth has been most marked.

The perfection of the process of the manufacture of open-hearth steel from Alabama pig iron, on Thanks-

giving Day, Nov. 30, 1899, marked the beginning of substantial development in Alabama. The production of coal for the twenty-four years 1900-1923, inclusive, was 355,583,769 tons; the production for the preceding twenty-four years was 74,329,369 tons. To the perfection of the open-hearth process no small part of this increase is due. After the consummation of this process large producing companies that were making pig iron began comparing the coal and ore resources and, in the main, adopted the policy of withdrawing coal from the commercial markets.

COAL SEAMS MAINLY OWNED IN FEE

The coal seams in Alabama are owned mainly through fee or mineral rights, although a number of operations pay a royalty on the coal they mine. The royalty paid varies from 5 to 7c. per ton on the low-grade high-ash coals to 15 to 20c. per ton for the best-grade coals. The nature of the ownership of coal lands determines to a large extent the percentage of recovery from a given area. As it has been found costly to mine pillars under land where the surface is owned by individuals, the size of pillars left to protect the surface is of prime consideration. Some coal companies in this state where the ownership is in fee leave such large pillars between rooms that they can be recovered easily by robbing, but when such companies are in possession of the mineral rights only, pillars of sufficient size only to support the surface are left, and consequently they are lost. Longwall or semi-longwall mining is prohibitively expensive where the surface is not owned by the coal company.

In Alabama coal seams, where the coal lies close to the surface, are prospected mainly by sinking test pits on the outcrop, at intervals of about $\frac{1}{4}$ mile, and then tying up these prospect pits with levels. Where the acreage is large, it is not uncommon to put down diamond-drill holes into the body of the property, even though coal along the outcrop persists in thickness, quality and regularity as to elevation. When the development of a coal property is proposed, with only the coal showing on the outcrop and then pitching into the body of the property, prospecting is done along the outcrop, and where the pitch is not too great or the basin shown by geological study not too deep, drillholes are put into the body of the property. Where the depth of the coal prohibits diamond drilling, geological study of the strata above the coal is made to determine the probable persistency of the seam.

In a region where the coal seam changes, both as to direction and character, without warning and in comparatively short distances, this latter method is not satisfactory, and development following such prospecting involves great risk. In one case where seven

NOTE—First part of article, entitled "Alabama Coal-Mining Practices," to be presented at the Birmingham meeting of the American Institute of Mining and Metallurgical Engineers.

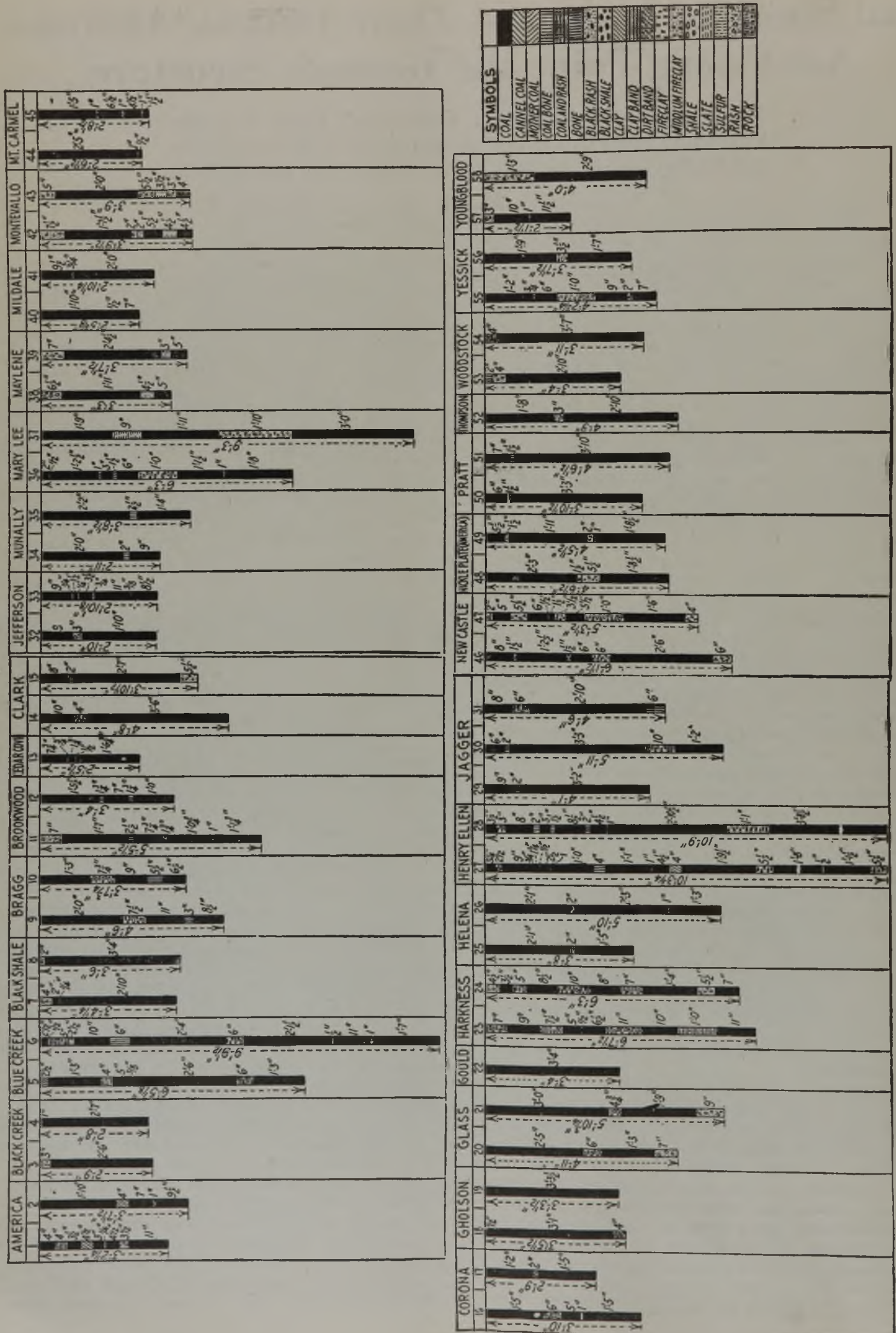


Fig. 1—Typical Sections of Alabama's Thirty Seams, Which Range in Thickness From the 25-in. Young Blood Deposit to the 10 ft. 9 in. of Henry Ellen Coal

Table I—Coal and Coke Production in Alabama, 1870-1923

Year	Coal	Number of Men Killed	Tons Produced per Life Lost	Number Employees per Life Lost	Coke
1870	13,200				
1871	15,000				
1872	16,800				
1873	44,800				
1874	50,400				
1875	67,200				
1876	112,000				
1877	196,000				
1878	224,000				
1879	280,000				
1880	380,000				60,718
1881	420,000				109,033
1882	896,000				152,940
1883	1,568,000				217,531
1884	2,240,000				244,009
1885	2,492,000				301,180
1886	1,800,000				375,054
1887	1,950,000				325,020
1888	2,900,000				1,030,510
1889	3,572,893				508,511
1890	4,090,409				1,072,942
1891	4,750,781				1,282,496
1892	5,529,312				1,501,571
1893	5,270,042	17	310,000	529	1,168,085
1894	4,361,312	19	229,200	470	923,817
1895	5,705,713	38	150,150	217	1,444,359
1896	5,745,617	28	205,201	353	1,479,437
1897	5,893,771	38	151,122	326	1,443,017
1898	6,466,741	45	143,705	220	1,663,020
1899	7,484,778	40	187,119	323	1,787,809
1900	8,273,362	37	223,603	386	2,110,837
1901	8,970,617	41	218,186	345	2,148,911
1902	10,329,479	50	206,590	358	2,552,246
1903	11,700,753	57	205,276	340	2,693,497
1904	11,273,151	84	135,204	210	2,340,219
1905	11,900,153	185	64,325	93	2,576,786
1906	12,851,775	96	133,873	191	3,217,068
1907	14,424,863	154	93,668	131	3,096,722
1908	11,523,299	108	106,697	174	2,335,602
1909	13,790,268	129	106,901	156	3,047,510
1910	16,139,228	238	67,812	92	3,231,399
1911	15,011,853	209	71,827	108	2,756,697
1912	16,513,040	121	136,471	193	2,881,861
1913	17,907,284	124	144,413	203	3,531,505
1914	15,525,903	126	123,222	190	3,092,771
1915	15,266,831	63	242,331	366	2,958,062
1916	18,234,625	118	154,531	214	4,385,493
1917	20,413,811	108	187,298	256	4,868,598
1918	19,521,840	110	177,473	239	4,344,726
1919	15,928,196	93	171,277	276	3,397,748
1920	17,391,437	78	222,967	352	3,982,472
1921	13,015,017	80	162,688	334	2,547,664
1922	18,757,681	183	102,501	160	3,760,064
1923	20,919,303	89	235,048	133	4,689,641

from the actual mining of coal in these basins has furnished tangible information and the risk has been eliminated.

Table I shows production of coal mined in Alabama from 1870 to 1923, the number of men killed, the number of tons produced per life lost, the number of employees per life lost during the same period, and the tons of coke produced annually from 1880 to 1923, inclusive. Table II shows the tons of coal produced from the various seams, according to counties, for the Warrior, Plateau and Coosa fields for 1923. Table III shows the production from the Cahaba field, according to counties and seams, for 1923. Table IV shows the average number of days coal mines worked in the ten most important coal-producing states, according to compilation of the U. S. Geological Survey, from 1917 through 1921. Table V shows average analyses, as furnished by the U. S. Bureau of Mines, covering all seams mined in Alabama, together with the fusing temperatures of the ash.

Fig. 1 illustrates typical sections of thirty seams mined in the state. The production of the mines is used as follows: Railroads, 30 per cent; other steam users, 13 per cent; furnace companies, 43 per cent; domestic, 10 per cent; bunker, 4 per cent.

The average distribution by states of Alabama's production of coal is as shown in Table V.

About 60 per cent of the coal produced is put through a cleaning process, for which washeries and mechanical cleaners are extensively used. The bulk of the coke output produced is used in the blast furnaces of the state.

Estimates of the ore and coking-coal reserve must of necessity be an approximation. A fair estimate of the red-ore reserve has been placed at 1,500,000,000 tons; the brown-ore at 75,000,000 tons. If the high-silica red and brown ore could be rendered available for smelting through concentration, it is probable that the total reserve would be increased by fully 1,000,000,000 tons. However, a method of concentration has not yet been devised.

The estimated tonnage of coking coals in the Warrior field is given at 4,195,328,000. Though the coking-coal reserve, which does not include coals in the Cahaba field, which probably will be used for coking, is in

drillholes were put into a body of coal consisting of 750 acres, and from twelve to fifteen test pits were opened on the outcrop, two faults were encountered in the mining that the prospecting did not reveal.

In the Cahaba field, where the coal pitches and lies in basins, geological study and test pits on the outcrops have been the only means of prospecting. When this field was first developed many operators came to grief; it is only within recent years that a knowledge gained

Table II—Production in 1923, from Different Seams of Warrior, Plateau and Coosa Fields, According to Counties

Name of Field and Seam	Blount County		Cullinan County		Jefferson County		Marion County		Tuscaloosa County		Walker County		Winston County		Etowah County		Total Number of Mines	Total Production, Tons	
	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons					
<i>Warrior field</i>																			
America			12	373,362							7	385,716					19	759,078	
Black Creek	1	221,207	1	16,526	9	496,021	4	184,332			12	736,224	3	9,400			30	1,663,710	
Blue Creek			3	59,438					2	227,132							5	286,570	
Brookwood									10	473,457							10	472,457	
Carter									5	86,610							5	86,610	
Corona											5	476,138					5	476,138	
Jagger											14	1,007,118					14	1,007,118	
Jefferson			5	363,697							1	1,950					6	365,647	
Mary Lee			19	3,705,812							24	2,399,598					43	6,105,410	
Milldale									6	414,619							6	414,619	
Mt. Carmel											21	830,017					21	830,017	
Pratt					28	4,910,951					21	400,337					49	5,311,288	
Total	1	221,207	1	16,526	76	9,909,281	4	184,332	23	1,201,818	105	6,237,098	3	9,400			213	17,779,662	
<i>Plateau field</i>																			
Underwood		163,231														2	9,905	Several small mines	173,136
<i>Coosa field</i>																			
None active																			

Total production from all beds in active coal fields, 20,919,303 tons. Total number of mines, as reported, 272 (in a number of cases several openings were considered as one mine). Total number of active seams, as reported, 29.

Table III—Production in 1923, from Different Seams of Cahaba Field, According to Counties

Name of Seam	Bibb County Number of Mines	Bibb County Production, Tons	Shelby County Number of Mines	Shelby County Production, Tons	St. Clair County Number of Mines	St. Clair County Production, Tons	Tuscaloosa County Number of Mines	Tuscaloosa County Production, Tons	Jefferson County Number of Mines	Jefferson County Production, Tons	Total Number of Mines	Total Production, Tons
Black Shale.....			1	21,210							1	21,210
Bragg.....									2	122,642	2	122,642
Clark.....	2	155,642	1	43,903							3	199,545
Gholson.....			2	79,368							2	79,368
Glass.....									1	200,461	1	200,461
Gould.....									1	800	1	800
Harkness.....					3	357,024					3	357,024
Helena.....			7	235,991	1	50,396					8	286,387
Henry Ellen.....					3	392,360					3	392,360
Montevallo.....			3	122,722					1	14,858	4	407,218
Thompson.....	9	365,784	2	88,075							11	453,859
Nunnally.....									4	35,182	4	35,182
Wadsworth.....			2	3,253							2	3,253
Woodstock.....	7	471,069					1	150			8	471,219
Yessick.....	1	700									1	700
Youngblood.....	2	204,915									2	204,915
Total.....	21	1,198,110	18	594,522	7	799,780	1	150	9	372,943	56	2,966,505

excess of the iron-ore reserve, one must not lose sight of the fact that the ownership of the ore is limited principally to a few iron-producing companies, whereas the ownership of the coal is in many individuals. The total estimated coal reserve in Alabama at the end of 1920 is placed at about 67,000,000,000 tons by Marius R. Campbell, of the U. S. Geological Survey.

About 77 per cent of the coal of the state is produced with permissible explosives and 23 per cent with black blasting powder; Alabama was one of the pioneers in the use of permissible explosives. About 50 per cent of the coal mined is undercut with machines.

Investigations made for the U. S. Coal Commission showed that the average total recovery from all seams mined in Alabama has been only 68 per cent, after allowance was made for all losses. At some few mines in the Cahaba field, under extremely bad top conditions, the recovery has been only 50 per cent. The percentage of recovery is steadily increasing in a number of the mines, especially in mines of the large producing companies, as the result of improved systems of mining.

The situation with reference to the best grade coals used for domestic purposes is not unlike that in the anthracite fields of Pennsylvania. In Alabama the

highest grade coals sold for domestic purposes occur in seams 36 in. or under, lying flat or in thicker medium or steeply pitching seams with bad top, gas and much water. The slack coal from these seams (which produce the lump and other domestic sizes), which varies from 40 to 80 per cent of the total tonnage, must be sold in competition with the steam run-of-mine coals produced from the thicker low-grade coals. As a result, the slack obtained from the high-grade coals is sold

Table IV—Average Number of Days Coal Mines Worked per Year, from 1917 to 1921, in the Ten Most Important Coal-Producing States

State	U. S. Geological Survey				
	1917, Days Mine Worked	1917, Days Mine Worked	1919, Days Mine Worked	1920, Days Mine Worked	1921, Days Mine Worked
Alabama.....	273	278	239	247	166
Colorado.....	263	255	225	255	164
Illinois.....	243	238	160	213	152
Indiana.....	221	227	148	192	128
Kansas.....	216	234	182	204	137
Kentucky.....	214	230	189	182	152
Ohio.....	210	223	164	188	134
Pennsylvania					
(bituminous).....	261	269	218	244	151
Tennessee.....	241	265	201	234	154
West Virginia.....	225	238	200	198	149

at a loss and the lump and egg coals are sold at the higher prices. The producer of domestic coals, therefore, tries to obtain as much of the larger sizes as is possible.

The coal fields of the state are the Warrior, Cahaba, Coosa and Plateau (see Fig. 2). More than 99 per cent of the coal is obtained from the Warrior and Cahaba fields, and the Warrior produces from six to seven times as much as the Cahaba.

The Warrior coal field is located north and west of Birmingham and comprises parts of Jefferson, Winston, Marion, Fayette and Tuscaloosa counties and all of Walker County. Its known area is about 13,000 square miles. According to Henry McCalley, formerly assistant state geologist: "There is no way of telling how far its strata may extend to the southwest and west, under the overlying Cretaceous and Tertiary formations." There are six groups of seams, making in all twenty-three regular coal beds. By the term "regular" is meant regularity as to horizon, not regularity as to thickness, quality or pitch. The seams vary in thickness from a few inches to 16 ft. All the seams are more or less variable, and none is of workable thickness for the whole length of its outcrop nor as the seams extend into the field.

The Cahaba field lies southeast of the Warrior field, from which it is separated by the Silurian and



Fig. 2—Where Alabama Mines Its Coal

The Warrior field produces about 85 per cent of the total. Cahaba region yields almost all the remainder. Bibb, St. Clair, Shelby and Jefferson counties contain the coal heart of the state.

Cambrian measures. This field is 68 miles long and from 5 to 8 miles wide; it contains a surface area of 394½ square miles. There are eleven basins, not including the "Overturned Measures."

Coal seams in this field are principally pitching. The roof conditions generally are not so good as in the Warrior field, and more pumping must be done. Considerable methane is encountered, which, together with a variation in the pitch and thickness of the seam, makes mining more difficult than in the Warrior field. Columnar sections of the coal strata in both the Warrior and Cahaba fields are shown in Fig. 3.

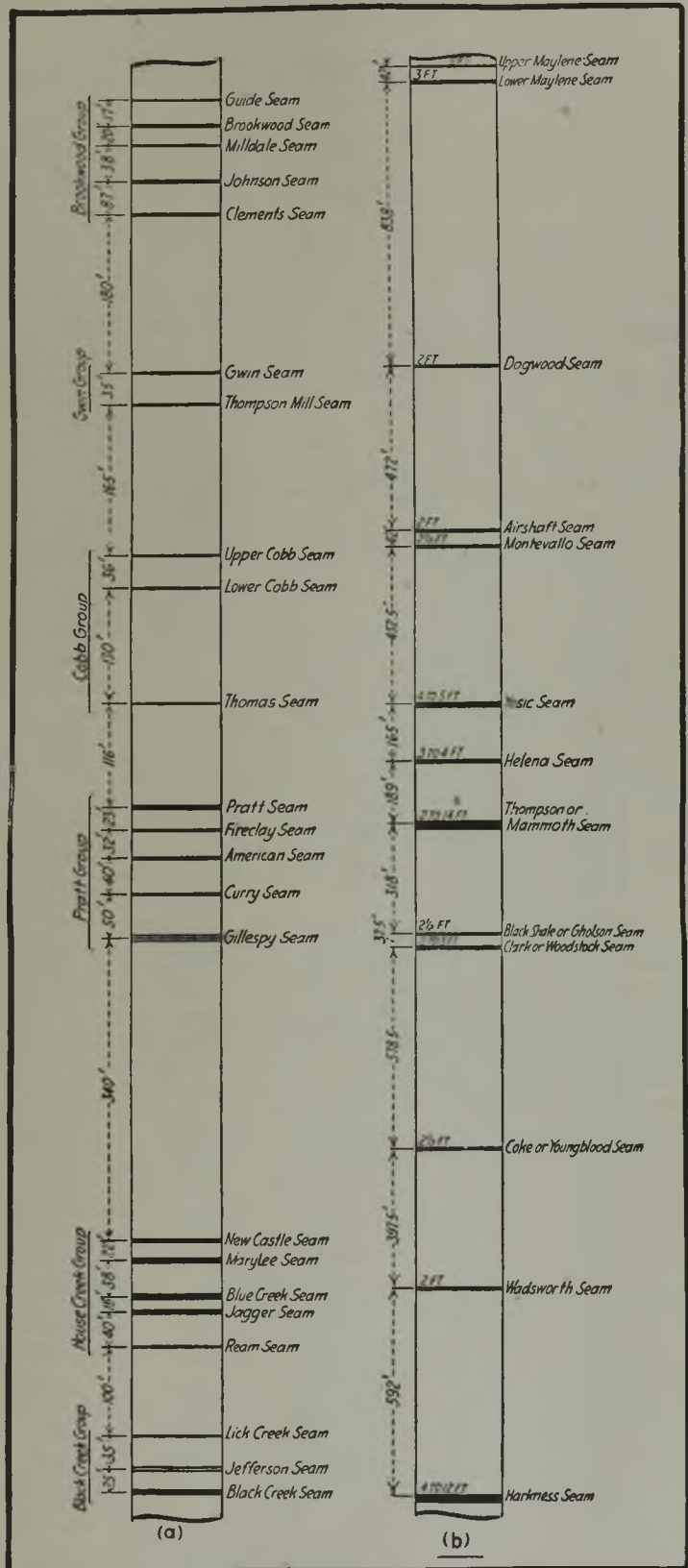


Fig. 3—Sections of Two Important Fields

Section (a) is in the southeast edge of the Warrior coal basin and (b) is in the Cahaba basin near the town of Montevallo.

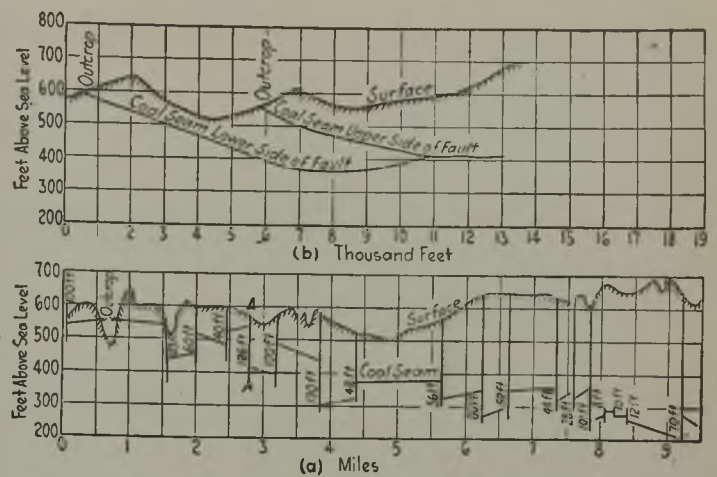


Fig. 4—Alabama Mining Is Difficult

Here is shown in (a) a dislocation fault in the Pratt seam of the Warrior field. A thrust fault (b) is shown along A-A.

The Coosa field lies mainly in Shelby and St. Clair counties and produces little or no coal.

The Plateau region includes those coal measures known geologically as the Plateau field. The Plateau region consists "of the high, wide, flat and plainlike areas of the tops of Cumberland Mountain, Sand Mountain, Raccoon Mountain and Lookout Mountain."

Table V—Distribution of Alabama Coal by States

	Per Cent.		Per Cent.
(1) Alabama.....	67.0	(6) Tennessee.....	1.5
(2) Georgia.....	10.9	(7) Arkansas.....	0.6
(3) Mississippi.....	9.5	(8) Texas.....	0.6
(4) Louisiana.....	8.0	(9) South Carolina.....	0.1
(5) Florida.....	1.8		

The Plateau region, of which the coal measures are a part, comprises about 4,500 square miles. The coal measures in this field never have been mined profitably. Several furnaces north and east of Birmingham were built in this region, with the hope of procuring an adequate and suitable fuel and ore supply; but all of these ventures proved failures as far as procuring raw material in this region is con-

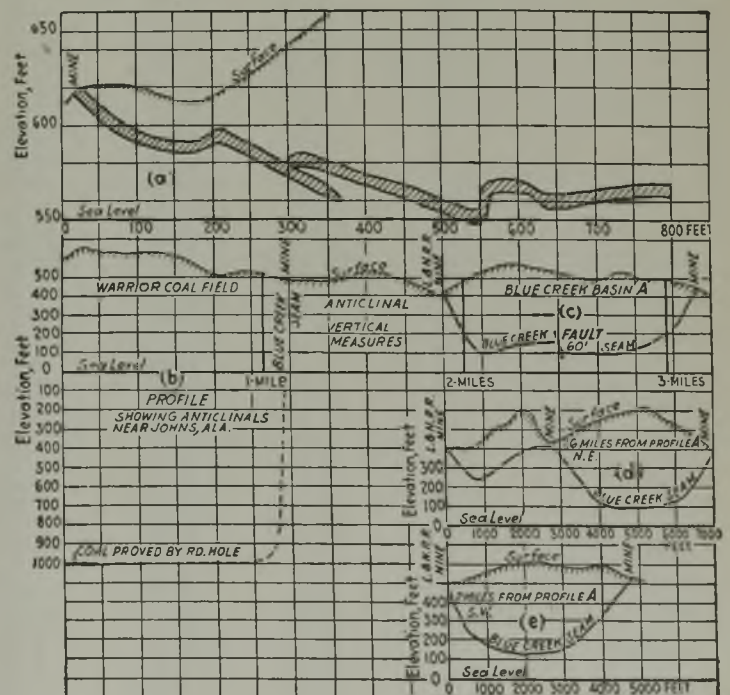


Fig. 5—Blue Creek Basin Conditions

This region is typical of Warrior field in which there are nineteen faults in nine miles. The sections of this figure are: (a) thrust faults; (b), (c), (d) and (e) regional profiles.

cerned. The coal seams in this field are pockety, irregular and uncertain.

When the term "regular" is applied to coal seams in Alabama it is used only in its geological sense and not with the meaning given by the engineer. In the Warrior and Cahaba fields the chief producers, the pitch, thickness and character of the seams vary greatly in a limited area. Though the examples here cited probably should not be considered typical, they are fairly illustrative of that with which the producers of coal in Alabama must contend.

In the Warrior field adjacent to Ensley the greatest quantity, as compared to all the other seams, of high-grade coking coal has been produced from the Pratt seam. Some idea of the difficulty of coal mining in Alabama may be gleaned from Fig. 4 (a) which shows a profile parallel to and 1/2 mile from the outcrop, showing dislocation faults actually proved by mine workings on the Pratt seam in the Warrior field. In nine miles there are nineteen faults, the throw of which varies from 8 to 130 ft., and there is no regularity in the pitch of the coal. In (b) is shown a thrust fault along A-A.

Some of the problems of Alabama coal seams are illustrated in Fig. 5. A profile of the Blue Creek basin of the Warrior field, showing thrust faults, as proved from mine workings, is shown at (a); a profile

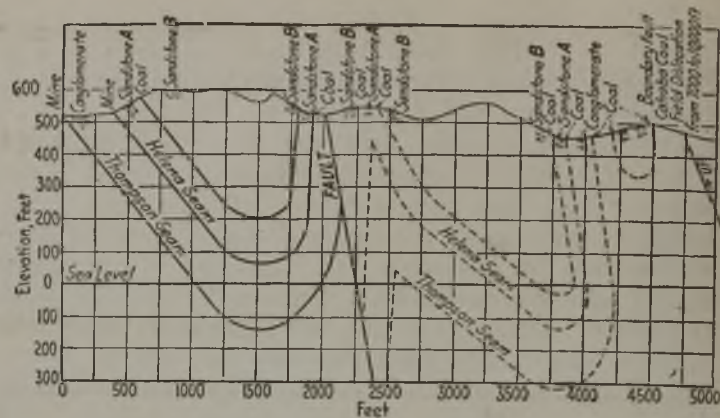


Fig. 6—How Coal Lies in Helena Basin

Full lines show proven conditions and dotted lines are a determination of the seams from geological studies.

of the anticlinals near Johns, in the same basin, is shown at (b). At (c) and (d) are profiles through the same basin, (c) being 1.6 miles northeast of (a) and (d) 2 miles southwest. A profile across the Helena basin, in the Cahaba field, is shown in Fig. 6. The full lines represent the seams as proved by mine workings as far as the fault; the broken lines are determinations of the continuation of these seams from geological studies. They give a fair indication of what may be expected beyond the fault.

Table VI—Average Analyses and Fusing Temperatures of Ash from Alabama Coal Seams*

Seams	Moisture, Per Cent	Volatile Matter, Per Cent	Fixed Carbon Cent.	Ash, Per Cent.	Sulphur, Per Cent.	B.t.u.	Fusing Temperature of Ash, Degrees F.		
							Minimum	Maximum	Average
America...	0.94†	30.06†	60.30†	8.69†	1.79†	13,872†	2,365	2,855	2,570
Black Creek...	2.61†	29.56†	59.27†	8.55†	1.76†	13,591†			
Black Shale...	1.28	34.18	61.03	3.49	1.04	14,521	2,010	2,800	2,430
Blue Creek...	3.41	33.39	59.71	3.41	1.02	14,237			
Bragg...	1.50	36.20	59.80	2.50	0.60	14,670	2,060	2,110	2,080
Brookwood...	4.60	35.10	57.90	2.40	0.60	14,210			
Carter...	0.77	24.40	65.04	9.78	0.72	13,912	2,620	2,910	2,830
Cedar Cove...	3.84	23.64	63.01	9.48	0.70	13,478			
Clark...	0.80	34.20	58.20	6.80	1.50	14,070	2,150	2,180	2,160
Corona...	2.30	33.60	57.40	6.70	1.50	13,860			
Gholson...	0.66	29.61	59.68	10.04	1.07	13,671	2,800	2,910	2,730
Glass...	3.58	28.74	57.89	9.74	1.00	13,270			
Henry Ellen...	0.85	30.41	60.53	8.00	0.91	13,977	2,540	2,850	2,730
Jefferson...	2.80	30.00	59.33	7.86	0.90	13,699			
Johns...	1.20	34.30	57.60	6.90	2.40	13,900			
Monte Carlo...	4.10	33.30	56.00	6.60	2.30	13,500			
Pratt...	1.15	35.68	55.61	7.55	0.65	13,915	2,060	2,500	2,210
Warrior...	2.31	35.26	54.96	7.46	0.64	13,750			
Warrick...	1.28	39.37	49.54	9.81	2.28	13,030	2,230	2,440	2,360
Yates...	2.44	38.91	48.95	9.70	2.25	12,878			
Youngblood...	1.31	35.79	59.36	3.53	0.66	14,480	2,090	2,410	2,210
Zimmerman...	3.01	35.17	53.34	3.47	0.67	14,232			
Alabama...	0.70	31.60	55.50	12.20	0.70	13,280	2,390	2,450	2,420
Alabama...	2.50	31.00	54.60	11.90	0.70	13,030			
Alabama...	0.75	30.90	60.32	8.03	1.87	13,934	2,450	2,510	2,470
Alabama...	2.97	30.21	58.97	7.85	1.83	13,622			
Alabama...	1.21	33.27	55.31	10.21	2.02	13,393	2,090	2,660	2,300
Alabama...	2.33	32.90	54.67	10.09	2.00	13,319			
Alabama...	1.23	34.43	55.76	8.57	0.62	13,569	1,910	2,790	2,270
Alabama...	3.71	33.53	54.36	8.38	0.59	13,255			
Alabama...	1.43	33.50	53.50	11.57	0.88	13,212			
Alabama...	2.52	33.13	52.91	11.44	0.87	13,091			
Alabama...	1.48	29.72	52.92	15.87	0.95	12,336	2,390	2,930	2,670
Alabama...	2.95	29.29	52.09	15.66	0.94	12,213			
Alabama...	0.81	33.22	59.34	6.61	3.22	14,151	2,060	2,420	2,260
Alabama...	2.25	32.74	58.48	6.48	3.15	13,947			
Alabama...	1.11	30.37	56.08	12.42	1.11	13,072	2,200	2,950	2,740
Alabama...	2.86	29.82	55.11	12.19	1.10	12,841			
Alabama...	1.40	37.15	53.95	7.50	0.45	13,603	2,190	2,470	2,330
Alabama...	2.99	36.55	53.08	7.38	0.44	13,070			
Alabama...	0.61	31.75	63.03	4.60	0.93	14,566	2,090	2,800	2,420
Alabama...	2.11	31.26	62.09	4.52	0.91	14,347			
Alabama...	1.36	37.21	53.85	7.57	0.84	13,719	2,090	2,470	2,330
Alabama...	2.51	36.78	53.22	7.48	0.83	13,481			
Alabama...	1.00	31.08	53.89	14.03	2.04	12,849	2,390	2,510	2,450
Alabama...	2.97	30.46	52.82	13.75	2.00	12,593			
Alabama...	0.63	34.97	56.27	8.13	0.97	13,787	2,190	2,410	2,300
Alabama...	2.22	34.41	55.37	8.00	0.95	13,566			
Alabama...	0.51	29.66	62.81	7.00	1.59	14,317	2,180	2,850	2,390
Alabama...	2.45	29.60	61.46	6.38	1.57	14,149			
Alabama...	1.79	35.73	55.53	6.93	0.60	13,646	2,060	2,400	2,190
Alabama...	3.00	35.29	54.83	6.86	0.59	13,518			
Alabama...	1.47	35.22	59.57	3.73	1.07	14,390	2,110	2,390	2,240
Alabama...	3.19	34.61	58.52	3.67	1.05	14,138			
Alabama...	2.35	30.43	46.24	20.98	1.57	11,221	2,240	2,340	2,280
Alabama...	4.21	29.85	45.36	20.58	1.54	11,008			
Alabama...	1.08	35.25	58.39	5.28	1.28	14,395	2,010	2,220	2,090
Alabama...	2.71	34.67	57.43	5.19	1.26	14,373			
Alabama...	1.41	30.52	54.85	13.17	0.81	12,840			
Alabama...	3.14	29.98	53.90	12.96	0.80	12,506			

* Table compiled by J. J. Forbes, Bureau of Mines, Birmingham, Ala., analysis made at the Laboratory of Bureau of Mines, Pittsburgh, Pa.
 † Analyses on "air dried" basis; this order applies in each seam given.
 ‡ Analyses on "as received" basis; this order applies in each seam given.



News Of the Industry



Sees Shortsighted Policy in Snatching Britain's European Coal Trade

No Lasting Good in Forcing American Product Into Unnatural Markets
—Exported Raw Material Can Be Turned to Finished
Product—British Prosperity Threatened

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Elation is being manifested in some quarters because the demoralized state of British commerce has given the United States a chance to snatch away some of that country's coal markets in Europe. The American coal trade is not a unit in believing there is any permanent or even temporary good in forcing our coal into unnatural markets. To begin with, our resources of smokeless and gas coals are relatively limited when compared with our deposits of lower-grade coals. It would be in the public interest, it is argued, to have the life of the high-grade fields extended as much as possible, so that that coal could be used to sweeten the output from lower-grade fields. Were well-financed organizations to apply forced draft to the export of this high-grade coal the day would not be distant when it would not be available for mixing with southern Illinois coal, for instance—an eventuality which would spell disaster to the Chicago steel industry.

While there are some in the coal trade, as well as out of it, who think it is bad national policy to export raw materials when we are in a position to turn such raw materials into finished products, the preponderance of opinion is that we should extend our export of coal within reasonable limits. The overwhelming desire is to say nothing that would discourage aggressiveness in foreign trade or the employment of all the keenness we can muster to extend our general commerce. There is present, nevertheless, a decided conviction that we have little to gain and much to lose by attempting to strip the British of markets that naturally are theirs.

Even were it possible for us to take advantage of the present situation, when the British are laboring under great disadvantages, we would contribute dangerously to European instability. More than one-tenth of the people of Great Britain depend directly on the coal industry for their daily bread. England lives by trading, and not by manufacturing. Coal is the keystone in its economic arch. It may be within our power to loosen that

stone a little, but it would bring about unexpected complications.

The United Kingdom and its colonies and dominions are our best customers. Were we to take away any substantial portion of its coal markets, we would decrease in multiplied ratio that country's ability to buy our animal products, our breadstuffs and our machinery. Even were we to sell large amounts of coal in Europe it would be at best an insignificant benefit to one-half of one per cent of our population.

Regardless of what we might be able to do just at this time, it is quite apparent that in the long run we cannot sell any appreciable amount of coal in old-world markets. England is in a similar position with regard to her coal trade as she was with the war. She had to win it and she has to maintain her coal trade. Those who think the British can be permanently dislodged from many of their coal markets are underestimating their tenacity and their skill.

British Must Use Mechanical Aids

There can be no disputing that the fact that we are in a position at this time to compete with the British in Europe is an indictment of the British industry. It is evident that it must undergo a decided psychological change and must find some way to make extended use of mechanical aids, but it will work out its salvation eventually.

Just at present one of the important things in the interest of the success of the Dawes plan and the rehabilitation of our European customers is to interfere as little as possible with that process. England, with all its financial solvency, is likely to be less prosperous soon even than is Germany. It is equally as important in the stabilization of Europe and more important to the United States, in particular, that Great Britain be restored to prosperity just as Germany is being restored.

Those who contributed the thoughts on which this article is based were careful to point out that their remarks apply only to overseas exports and not to the coal shipments going to Canada. This business must be

Labor Portfolio for Lewis?

Speculation is going the rounds in official circles at the national capital as to the reward Mr. Lewis is to receive in the event of a Republican victory at the polls. His name is being mentioned in connection with the labor portfolio. If for any reason he is not chosen for that post, it is expected fully that he is to be given some other important place.

The consensus in Washington seems to be that Warren Stone, president of the Brotherhood of Locomotive Engineers, had the better of the argument with John L. Lewis, president of the miners' union, in regard to the operation of the brotherhood's mine in West Virginia. Politically, Mr. Stone suffered severely and his reputation as a trade unionist has been hurt badly.

kept on all fours with our internal commerce, all agree. In building up our coal trade with Canada we have assumed an obligation which we must continue as long as it is in the market for our coal. Every time there is a strike in this country someone shouts for an embargo against shipments to Canada, but even during the most critical shortage of the war period no thought ever was given to any suggestion which would differentiate between the allotments accorded our states and the Canadian provinces.

Railroads Place More Orders For Equipment

The American Car & Foundry Co. has received an order for 600 mine cars from the Berwind White Coal Mining Co., and the Pennsylvania Coal Co. has placed an order for 100 mine cars with the Pressed Steel Car Co.

The Clark Car Co., of Pittsburgh, has received an order from the Tennessee Coal, Iron & Railway Co. of Birmingham, Ala., for four 30-yard extension side-dump cars. The Lehigh & New England has given a contract for the repair of 300 gondola cars to the American Car & Foundry Co.

Officials of the leading equipment companies expect further large car inquiry in the near future. The Atchison will come into the market for 5,000 additional freight cars and more passenger coaches and the Burlington is likely to inquire for 2,500 additional freight cars soon.

Britons to Make Study of American Explosives

Washington chemists entertained at dinner Sept. 21 in honor of Prof. E. C. Bailey, of the University of Liverpool; Prof. F. G. Donan of the University of London; Prof. J. F. Thorpe of Imperial College, London; Sir Richard Threlfall and Sir Robert Robertson, explosives chemist for Great Britain.

Prof. Fritz Haber, Director of the Kaiser Wilhelm Institute of Physical Chemistry, of Berlin, was in Washington on the day of the dinner and it was suggested that he be included among the guests. This raised determined protest from certain of the Washington chemists and no invitation was extended to Professor Haber.

Professor Thorpe and Sir Robert Robertson have come to this country to make a study of American explosives.

While British coal mines have made more progress in the application of rock dust to prevent explosions than has been accomplished by American mines, they have not been so uniformly successful in developing safe types of explosives. The U. S. Bureau of Mines is to conduct tests for the English explosives-testing station on British "permitted" explosives, to determine wherein they differ from the "permissible" explosives approved by the Bureau of Mines for use in gaseous and dusty coal mines. This work is being done in pursuance of an arrangement for the exchange of information between the British and American mining bureaus.



C. Lorimer Colburn

Recently resigned from the staff of the U. S. Bureau of Mines to enter private practice as a consulting mining engineer at Denver, Colo. During the last three years Mr. Colburn has become well known as a safety engineer, having been assigned in 1921 to co-operate between the U. S. Bureau of Mines and National Safety Council. He visited the coal-mining membership of the council to assist them in enlarging their safety program. During the past year Mr. Colburn has been serving as director of the Joseph A. Holmes Safety Association, and the number of chapters has been doubled and the influence of the chapters has been increased. Most of the safety chapters have been organized at coal-mining operations. During the World War Mr. Colburn was a captain of engineers.

Mine-Supply Houses Merge; \$2,500,000 Involved

More than \$2,500,000 is said to be involved in a deal announced Sept. 18 whereby the Banks Supply Co. of Huntington, W. Va., acquired a majority of the stock of the Miller Supply Co., one of the largest mine, mill and railway supply houses in the Huntington district. The capitalization of the Banks Supply Co. will be increased to \$1,400,000.

The Miller company and its branches will be consolidated with the Banks company as soon as possible and the personnel of both organizations will be held intact, it was said. J. C. Miller, W. J. Harvie and T. G. Tinsley, all of the Miller firm, will be added to the directorate of the Banks Supply Co. and another director will be elected by the stockholders.

Anthracite Circular Prices For October, 1924

(Gross Ton, F.O.B. Mines)

	Broken	Egg	Stove	Nut	Pea
Lehigh & Wilkes-Barre.....	\$8 00	\$8 75	\$9 00	\$8 75	\$5 75
Pattison & Bowns	8 90	8 90	9 15	8 90	5 50
Phila. & Reading	9 15	9 15	9 40	9 15	6 00
Lehigh Valley....	8 50	8 75	9 05	9 05	5 75
Lackawanna.....	8 00	8 75	8 75	8 75	5 75
Lehigh Coal & Nav.....	9 25	9 25	9 50	9 25	6 00
Del. & Hudson...	9 00	9 00	9 00	9 00	6 00
Thorne, Neale & Co. (Temple Coal Co.).....	.....	9 20	9 55	9 20	5 75
M.A. Hanna & Co	8 80	9 15	9 65	9 25	5 75

Prices for steam sizes, as quoted by companies, are as follows: Buckwheat No. 1, \$3 @ \$3.15; rice, \$2 @ \$2.25; barley, \$1.50; birdseye, \$1.60.

Output and Value of Coal from Illinois 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 (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees				Average number of days worked
								Underground		Surface	Total	
								Miners, a	All others	Surface	Total	
Bond, Jefferson, Johnson and White.....	305,768	9,915	6,384	.....	322,067	\$738,000	\$2.29	422	149	82	653	109
Bureau.....	429,125	62,212	34,035	.....	525,372	1,855,000	3.53	1,041	317	157	1,515	139
Cass, Edgar, Greene, Hancock, Moultrie, Schuyler and Warren..	104,275	17,152	9,749	.....	131,176	344,000	2.62	149	35	17	201	176
Christian.....	3,760,389	172,142	55,451	.....	3,987,982	8,640,000	2.17	2,463	879	441	3,783	178
Clinton.....	636,803	71,569	36,700	.....	745,072	1,767,000	2.37	937	286	117	1,340	90
Franklin.....	13,286,349	124,149	285,491	.....	13,695,989	37,711,000	2.75	9,498	4,791	1,948	16,237	166
Fulton.....	2,051,722	71,758	27,344	.....	2,150,824	5,864,000	2.73	2,039	687	240	2,966	172
Gallatin.....	26,400	700	2,000	.....	29,100	78,000	2.68	158	69	40	267	34
Grundy.....	164,910	16,422	12,805	.....	194,137	774,000	3.99	260	96	44	400	199
Henry.....	20,000	36,624	1,756	.....	58,380	177,000	3.03	90	17	16	123	185
Jackson.....	1,267,348	51,639	35,097	.....	1,354,084	3,409,000	2.52	1,035	408	206	1,649	156
Knox.....	.....	15,636	508	.....	16,144	48,000	2.97	33	5	5	43	167
La Salle.....	227,643	304,457	13,583	.....	545,683	1,918,000	3.51	629	169	125	923	198
Livingston.....	3,863	38,218	1,470	.....	43,551	159,000	3.65	110	24	16	150	121
Logan, McLean, Putnam, Will and Woodford....	681,793	157,402	45,026	.....	884,221	2,458,000	2.78	1,158	317	163	1,638	215
McDonough.....	.....	2,861	.....	.....	2,861	12,000	4.19	16	.....	.....	16	92
Macon.....	20,037	170,274	7,347	.....	197,658	777,000	3.93	266	139	30	435	167
Macoupin.....	6,966,593	114,167	192,730	.....	7,273,490	16,634,000	2.29	4,738	2,078	620	7,436	165
Madison.....	3,416,031	280,526	114,288	.....	3,810,845	9,110,000	2.39	2,914	1,209	357	4,480	147
Marion.....	638,148	37,940	44,200	.....	720,288	1,748,000	2.43	671	226	101	998	155
Marshall.....	283,263	22,830	11,982	.....	318,075	1,228,000	3.86	517	133	50	700	228
Menard.....	21,193	50,994	2,164	.....	74,351	227,000	3.05	160	48	31	239	101
Mercer.....	119,903	10,277	1,275	.....	131,455	385,000	2.93	112	31	21	164	214
Montgomery.....	2,645,489	43,038	64,363	.....	2,752,890	6,829,000	2.48	2,371	1,055	303	3,729	143
Peoria.....	1,013,860	127,252	9,656	.....	1,150,768	3,015,000	2.62	1,070	346	136	1,552	185
Perry.....	2,293,692	147,767	83,089	.....	2,524,548	5,223,000	2.07	2,498	903	466	3,867	123
Randolph.....	1,635,369	31,806	35,297	.....	1,702,472	4,188,000	2.46	1,387	609	204	2,200	149
Rock Island.....	3,000	25,200	1,067	.....	29,267	77,000	2.63	48	11	6	65	138
St. Clair.....	4,643,852	384,072	124,024	.....	5,151,948	10,821,000	2.10	4,780	1,362	618	6,760	133
Saline.....	5,134,291	66,733	131,877	.....	5,332,901	14,283,000	2.68	4,745	2,020	801	7,566	138
Sangamon.....	7,040,597	309,594	126,854	.....	7,477,045	17,369,000	2.32	6,093	2,114	835	9,042	179
Shelby.....	28,878	26,761	4,000	.....	59,639	210,000	3.52	127	34	16	177	160
Stark.....	.....	8,639	5	.....	8,644	31,000	3.59	20	1	2	23	180
Tazewell.....	630,205	132,353	7,929	.....	770,487	2,081,000	2.70	610	166	72	848	216
Vermilion.....	3,799,454	324,640	52,575	.....	4,176,669	10,571,000	2.53	2,202	873	700	3,775	232
Washington.....	410,613	44,143	15,475	.....	470,231	1,279,000	2.72	454	215	66	735	117
Williamson.....	10,073,511	94,907	263,322	.....	10,431,740	26,170,000	2.51	8,373	3,078	1,568	13,019	139
Total, excluding wagon mines	73,784,367	3,606,769	1,860,918	.....	79,252,054	\$198,208,000	\$2.50	64,194	24,900	10,620	99,714	158
Wagon mines served by rail.....	58,021	.....	.....	.....	58,021	180,000	3.10	.....	.....	.....	.....	.....
Grand total.....	73,842,388	3,606,769	1,860,918	.....	79,310,075	\$198,388,000	\$2.50	.....	.....	.....	.....	.....

(2) Includes also loaders and shotfirers.

West Virginia Produces 18.4 per Cent Of Country's Soft Coal

**H. L. Gandy Tells Operators of State's Importance in the Industry—
Seven Roads Handle One-Third of Total Shipped—
Industrial Concerns Returning to Coal**

"West Virginia has 18.5 per cent of the present value of the bituminous development and future reserves, according to the Engineers' Valuation Committee of the U. S. Coal Commission," said Harry L. Gandy, executive secretary of the National Coal Association, at a meeting of the West Virginia Coal Association at White Sulphur Springs, W. Va., Sept. 19, 1924. "During the year 1923, according to the production figures of the U. S. Geological Survey, the West Virginia output of bituminous coal was 18.4 per cent of that of the country, being exceeded only by that of Pennsylvania.

"The product of the West Virginia mines and quarries, according to the last census figures, was 9.3 per cent of the total value of the products of mines and quarries in the United States. Great strides have been made in the production of bituminous coal and I feel quite sure that with the excellent railroad facilities here available, the day will come when the percentage of West Virginia manufactured products will be much higher.

Speaking of the relationship of the bituminous-coal industry to the prosperity of the railroads, Mr. Gandy said: "Seven railroads, the Norfolk & Western, the Chesapeake & Ohio, the Virginian, the Louisville & Nashville, the Illinois Central, the Pennsylvania and the Burlington, loaded about 175,000,000 tons of bituminous coal last year. That was nearly one-third of the year's production and considerably more than one-third of the total amount shipped by rail. These roads received \$279,626,648 for handling bituminous coal, which is 32.6 per cent of the total revenue received by all railroads of the country for handling that commodity.

"From the best data available these seven lines used 41,335,760 net tons of bituminous coal in 1923 at a cost of \$117,664,595, or about \$2.85 per ton. The amount spent for bituminous coal was less than half of the amount received as revenue for handling bituminous coal. Thus we have seven of our important coal roads spending for the bituminous coal necessary to move practically all of their traffic, only about 42 per cent of the amount received as revenue from that commodity.

"It is further interesting to note that while these roads received \$279,626,648 for handling bituminous coal, their total gross operating income, after deduction of operating expenses, was \$280,241,861.

"The public knows but little about coal. Most people order coal for their homes or their places of business without any more thought than would be exhibited by a man going into a store and ordering a suit of clothes made out of cloth, without specifying the kind of cloth. There are perhaps as many varieties of coal as there are of cloth. There are varying kinds for all uses and conditions. The right kind of coal

for a particular use will carry its load to the satisfaction of the user. Not only should there be more widespread information regarding this treasure house of heat and of power but there should be a dissemination of information as to the derivatives of coal. We are only a few years along the way in the extraction of byproducts, and I dare say that the coming years have in store great progress in the better utilization of coal.

"No less eminent an authority than the Director of the Geological Survey recently pointed out that a less percentage of the electricity for public utilities was generated by water power in 1923 than in 1919. That can mean nothing else than that the demand for electricity has grown faster than the development of water power. More and more industrial concerns are finding out that with tranquillity in the coal world the question of the use of coal or of oil is an economic one and these two fuels are finding their correct place. A careful perusal of trade papers and other sources of information shows that the order of the day in New England and other parts of the East is that industrial concerns are again returning to coal.

"There is a significance in the establishment of service bureaus by the anthracite industry to increase the satisfactory utilization of their product and in the widespread and persistent effort of manufacturers to sell and place oil-burning devices.

Form Research Committee

"Recently, however, the National Coal Association has created a Research Committee to the end that there may be gathered and disseminated among the operators and the public fundamental facts which may be helpful in advancing the use of the product of this industry.

"Day after day we read of consolidations that are taking place in the bituminous-coal industry, but even so they are not keeping pace with consolidations in other lines of business and of trade, and are in no sense affecting the competitive situation. I have been impressed for some time that affiliation of purchasing agents and combinations of the users of coal are worthy of the serious consideration of the operators.

"Heretofore we have been inclined to think of a combination as one which gathered together various units of the same kind of production. Now we have great combinations under which there is being gathered all sorts of units of production. For instance, take the circulars which, according to press reports, recently went to Ford agents in the Northwest, advising of the shipment of coal mined at Ford mines, loaded into Ford cars, hauled on a Ford railroad, transported in Ford freighters and unloaded on the Ford docks at the head of the lakes. All of these are in

Iowa Miners and Operators Join to Advertise

An advertising campaign to be financed jointly by the operators and mine workers will be opened Oct. 7 by coal-mine operators and miners of Appanoose County, Iowa, to continue seven months. Twenty-two mining companies and approximately 3,500 miners in Sub-district 1 of District 13, United Mine Workers are co-operating in the campaign. The operators have agreed to contribute an amount equal to that raised by the union. It is estimated that \$49,000 will be raised.

addition to many other units of different kinds of production owned by that concern. Combinations of that kind are not in violation of the law, but their size and the effect they have on the business and industrial life of the nation will bear following very closely."

Coal Exports Fall in August; Canadian Shipments Low

Total bituminous coal exports from the United States during August, amounting to 1,392,862 gross tons, showed a decline from shipments during July, when 1,630,849 tons was exported, but have been exceeded during 1924 by only June and July shipments, according to the Coal Division of the Department of Commerce. A large part of the decrease was due to smaller shipments to Canada, 1,049,346 tons being exported in August against 1,202,400 tons in the preceding month.

Overseas exports of bituminous coal during the month in question were 335,671 tons against 418,500 tons in July. A considerable part of this decrease was caused by smaller shipments to Italy, only 89,040 tons going to that country during August against 115,055 in the previous month.

In the South American trade important decreases were witnessed in shipments to Brazil, the August exports amounting to only 80,892 tons against 104,959 tons in July. There were no August shipments to Argentina or Chile, although exports to those two countries during July were 19,104 and 6,905 tons, respectively. The total exports to South American destinations during August were 90,389 tons as compared with 139,098 tons in July.

Exports of anthracite during August amounted to 257,090 tons against 290,097 tons in July, the decline being mainly due to decreased shipments to Canada.

Total shipments of coke amounted to 42,308 tons in August against 48,983 tons in July, the decrease being largely due to smaller shipments to Canada, 34,953 tons in August against 40,438 tons in the preceding month.

Mother Jones, nationally known friend of the coal miner and champion of union labor, called at the White House Sept. 26 and pledged her support to the President. She said no man or set of men control the labor vote.

Enjoins Tennessee Miners Against Coercion; Right To Strike Is Recognized

Five local unions of the United Mine Workers, their officers and several hundred individual members, all of whom were named, in Grundy and Marion counties, Tennessee, were enjoined Sept. 20 by Judge Xen Hicks, of the U. S. Court for the Eastern District of Tennessee, in a sweeping order against interfering with the operations of any of the mines operated in these counties by the Tennessee Consolidated Coal Co.

In addition by means of a restraining order members of the union were forbidden to enter the houses of the company which they have been occupying since a strike by the miners began on April 1.

In the opinion Judge Hicks said, in part:

"In these labor disputes, labor—the miners in this case—has the right to strike, the right to refuse to work, the right to use all peaceable means to persuade others not to work, the right to use all peaceable persuasion, the right to assemble for that purpose and to congregate in halls for that purpose, but it has no right to go to the extent of violence, threats, coercion and intimidation."

In discussing this particular case the opinion goes on to say: "It must be admitted that the situation in Grundy and Marion counties is estranged and the feeling intense. All the coal mines have been shut down since April 1. The coal drum of the New Whitehall Coal Co. was blown up with dynamite at a loss of between \$8,000 and \$10,000 when an attempt was made to operate."

Judge Hicks also cites in the opinion the action of a county sheriff who appointed union men as deputy sheriffs to maintain order. The sheriff was scathingly criticized in the opinion, which stated that some of the very defendants had been named as deputy sheriffs for the purpose of arresting themselves.

On the other hand contentions of plaintiff's counsel to term action of the miners in seeking to maintain the wage scale of 1920 throughout the country by the national and district unions as "a conspiracy" was not upheld in the opinion, which stated that though such action might be a conspiracy, it was not an unlawful conspiracy and the miners were within their rights as long as unlawful threats and intimidations were not used.

The unions enjoined were Local 2763, at Tracy City, Grundy County; Local 3509, at Palmer, Grundy County; Local 2572, at Coalmont, Grundy County; Freemont local, Grundy County; Local 4185, at Morganville, Marion County, and Local 1778, at Cartwright, Marion County.

The international organization of the United Mine Workers of America, its officers and Provisional District 19 and its president, William Turnblazer, against whom injunctions were sought, were not enjoined, the opinion stating that insufficient evidence was submitted against these defendants.

D. H. Pape Joins N. C. A. Staff

Delbert H. Pape, of Ogden, Utah, has joined the staff of the National Coal Association as assistant to Harry L. Gandy, executive secretary. Mr. Pape will devote his attention largely to field and membership activities.

Mr. Pape is 40 years of age and has had a broad experience in coal production. After receiving a high school and



Delbert H. Pape

business college education, he went directly into the mines, working under every classification of labor up to and including the position of foreman.

From 1914 to 1922 he was general manager of the Lion Coal Co., at Ogden, Utah, embracing the Wyoming Coal Co. and the Union Fuel Co. in Wyoming and the Wattis Coal Co. in Utah. In co-operation with P. J. Quealy, of the Gunn-Quealy and the Kemmerer coal companies, he helped organize the Southern Wyoming Coal Operators' Association, and during the war was appointed by United States Fuel Administrator Dr. H. A. Garfield as distributor of coal mined in southern Wyoming, which appointment was made upon the recommendation of all other Wyoming operators and the Union Pacific R.R. officials.

'Patronize Home Industry' Move in Indiana

Miners and operators in the Hoosier coal fields are considering starting a campaign in the state to induce coal consumers to buy coal produced in Indiana, instead of buying non-union coal from other states, according to officers of the United Mine Workers. Similar campaigns have been started in other states and have proved successful, it was said. Indiana, according to officers of the mine workers' organization, consumes a large amount of coal that comes from Kentucky and West Virginia. There is no good reason, they say, why consumers should send out of the state for coal when they can obtain just as good coal at home.

Safety Congress Session Opens in Louisville

Contending that the trade and other associations should co-operate in promoting safety, Richard F. Grant, president of the Chamber of Commerce of the United States and president of the Susquehanna Collieries Co., made the opening address at the Monday morning, Sept. 29, session of the thirteenth annual congress of the National Safety Council at Louisville, Ky., at which a large number of executives and safety men were present. Mr. Grant was the spokesman for an association which itself represents a larger number of representative bodies than perhaps any other in the United States. Other speakers were Norvin E. Green, president of the Louisville Safety Council, and Huston Quin, Mayor of Louisville.

The treasurer's balance showed for Aug. 31 \$4,589 on hand and \$47,290 invested. The total assets less depreciation were \$84,438, with accounts payable of \$3,047.

In the afternoon the Secretary of Labor, James J. Davis, discussed the fundamentals of our industrial safety problem, and Dr. Arnold L. Jacoby, director psychopathic clinic, Detroit, Mich., showed how mental factors entered into the accident problem, making some men more prone to casualties than others.

C. F. Kettering, of the General Motors Research Corporation, discussed the public-safety problem, declaring that 99 per cent of our actions are dominated by instinct rather than by intelligence and that instructions to workers must be repeated with painstaking care. If this is not done the instructions progressively deteriorate. "Jamie" Heron, of Chicago, spoke on ways of building men for safety, and A. W. Whitney, chairman of the American Standards Committee, reported on the standardization of safety codes. The new National Safety Council film, "A Word to the Wise," was shown.

Big Panhandle Mines Merged In \$2,500,000 Deal

In one of the largest coal deals consummated in West Virginia in some time John C. McKinley, president of the Richland Coal Co., of Wheeling, acquired the Otto Marmet Coal & Mining Co., with which are associated the Black Betsy and Marmet Halm Coal Co. The deal is said to involve approximately \$2,500,000.

The properties transferred are located in Putnam, Kanawha and Mason counties and include about 11,000 acres of coal in addition to two railroads leading from the mines to terminals and river piers, as well as three boats and a large number of barges. Storage facilities and elevators at Cincinnati also are included.

The purchaser will make improvements to increase the output from 200,000 to 500,000 tons a year.

The new owner operates the Richland-Marshall and Mound Shaft mines, at Moundville; the McKinleyville mines, in Brooke County; the Richland mine, north of Wheeling, and various other properties in the northern Panhandle.

Dawes Plan Seen as Stimulus to Widen Markets for American Products

Characterizing the Dawes plan as a boon to the world, "without a liability in it," an authority in an unexcelled position to judge believes the industrial activities it will promote will result in greatly increasing markets for our products, while the greater volume of German goods in the channels of world trade is not likely to affect us seriously.

As things are shaping, keenest competition will arise in iron and steel. Plants in the Ruhr have been re-equipped and brought up to the most modern form because the situation has been such that profits could be invested best in equipment. Some working agreement is certain to be made between the producers of the raw material in Lorraine and the steel makers in the Ruhr. In addition to being one of the world's most favored centers for steel manufacture, the Ruhr will have an additional advantage, for a time, in that the standard of living has been reduced greatly and low rates of wage will be acceptable. The living standard will rise gradually, but the steel makers will continue to enjoy an advantage until this differential in their favor is overcome.

Our industry is preparing to meet this situation by installing more labor-saving machinery. An indication that our manufacturers have on their fighting clothing is seen in their recent success in obtaining an order for 35,000 tons of corrugated iron in Argentina, an order for which the Continental industry was striving.

On the other hand, the British steel makers are in a bad way. Few of their plants are modern. Instead of striving to reduce their costs effort appears to be concentrated on yelling at the government. Both labor and capital in Great Britain seem to have fallen into a psychological rut which is hampering them in meeting the increasing difficulties which they are facing. Such a large proportion of the British trade is with other countries that it is certain to be hard hit by the rehabilitation of Germany. A much smaller proportion of our trade

is export. In addition, we are in a frame of mind which will do much toward enabling us to hold our own in the export market.

An indication of the commercial demoralization which has overtaken the British is had in the fact that an American coal company apparently is in a position to compete successfully with Great Britain for a large block of Italy's requirements.

Our technical industries are entrenching themselves at home by a great expansion in the practice of mass production of standardized goods, which because of their low price are finding increasing markets abroad—a stronger position than that occupied by the German industry, which in catering principally to the foreign trade cannot take advantage of the economies of quantity production, but must meet the diverse requirements of many lands. There is every reason, however, for our manufacturers to start at once to increase their selling efforts abroad.

Russia at this time is making substantial purchases here of cotton, machine tools and certain other commodities. No confidence can be placed in the future of Russian trade. The establishment of buying commissions in foreign countries, including the United States, tends to bear out every pessimism which has been expressed in connection with the commercial policies of the Soviet authorities. Absolute control of purchasing centers in Moscow. Purchases are shifted quickly for political reasons. The German police, for instance, raided one of the Russian offices and in retaliation all the buying being done in that country was discontinued and transferred to other countries. Similar action was taken when the Russian authorities were displeased by developments in Italy and Switzerland.

This is a new phenomenon. No permanent commerce could be built up under such conditions. An official in Washington might make a nasty remark about the conduct of affairs in Moscow and our manufacturers would

Mines Bureau Engineer Reaches Mine Disaster Via Air Mail Service

Dr. Hubert Work, Secretary of the Interior, on Sept. 24 addressed this letter of thanks to Postmaster General New for the speedy transportation of a U. S. Bureau of Mines engineer by the Air Mail Service to the scene of the mine explosion at Sublet, Wyo., Sept. 16:

"Permit me to thank you for the recent co-operation extended by the Air Mail Service of your department to the Bureau of Mines of this department, in responding to the call for aid at the recent mine explosion near Sublet, Wyo. The Bureau of Mines engineer of that district, on reaching Cheyenne, found that he was unable to get a train to Rock Springs for many hours. He accordingly requested the Air Mail Service to transport him from Cheyenne to Rock Springs, and, on official confirmation of the request, this was done. As this was a situation in which the lives of miners were imperiled, the action of your department in co-operating to provide speedy transportation to the scene of the disaster was especially appreciated."

find the business they had built up transferred over night to some other country. Russia is buying in this country at this time partly to cater to us and partly because prices are lower. Once that recognition has been obtained much of this business is likely to be placed elsewhere to aid in gaining some further objective. The Russian agents, however, are preaching as they buy. They say much larger orders would be placed were Russia recognized. This argument is being pressed in connection with their purchases of cotton, and our cotton trade is taking the bait. Sight is lost of the fact that with any return approximating normal, Russia again will become an exporter of cotton.

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

(In Net Tons)

Ports	Railroads	1924			1923			1922		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo	Hocking Valley.....	4,056,708	119,464	4,176,172	2,992,191	90,429	3,082,620	1,746,575	47,846	1,794,421
	Big Four†.....	1,375	46	1,421						
Sandusky	N. Y. C.-Ohio Central Lines.....	38,159	1,412	39,571	1,008,393	31,639	1,040,032	37,430	772	38,202
	Baltimore & Ohio.....	1,110,205	34,710	1,144,915	1,799,619	53,101	1,852,720	1,775,250	45,936	1,821,186
Huron	Pennsylvania.....	2,051,571	63,376	2,114,947	1,903,616	58,689	1,962,305	1,230,372	51,553	1,281,925
	Wheeling & Lake Erie.....	463,986	23,395	487,381	929,100	34,780	963,880	13,403	2,565	15,968
Lorain	Baltimore & Ohio.....	1,116,887	88,422	1,205,309	2,055,327	116,176	2,171,503	32,852	24,147	56,999
	Pennsylvania.....	941,049	109,060	1,050,109	1,155,136	120,378	1,275,514	97,291	45,016	142,307
Cleveland	Erie.....	205,809	7,454	213,263	542,678	24,061	566,739			
	Baltimore & Ohio.....	332,410	58,593	391,003	489,935	43,940	533,875			
Fairport	New York Central.....	615,871	71,283	687,154	2,256,891	158,990	2,415,881	44,391	20,086	64,477
	Pennsylvania.....	700,496	51,796	752,292	1,333,344	58,592	1,391,936	55,201	40,335	95,536
Ashtabula	Bessemer & Lake Erie.....	1,034,305	137,462	1,171,767	1,781,915	139,319	1,921,234	99,846	7,840	107,686
	Pennsylvania.....	374,051	50,843	424,894	395,920	53,604	449,524	28,607	42,534	71,141
Total.....		13,042,882	817,316	13,860,198	18,644,065	983,698	19,627,763	5,161,218	328,630	5,489,848
*1923 Storage Loading.....		182,060	4,940	187,000						

NOTE—Tonnes cover coal line hauled into ports by railroads as shown.

*Coal loaded into vessels in December, 1923, after close of navigation (shown in December, 1923, report) and forwarded from Lake Erie ports during 1924 season of navigation.

†Lake coal into Toledo over Big Four Route and dumped by Ohio Central machine. Compiled by Ore & Coal Exchange, Cleveland, Ohio: H. M. Griggs, mgr



Practical Pointers For Electrical And Mechanical Men



Bad Mechanical Features Spoil Good Locomotive Performance

Because a Mine Locomotive Is Considered To Be an Electrical Machine, Mechanical Details Should Not Be Neglected, They Influence Its Operation

Aside from the many electrical details of a mine locomotive which must always be kept in proper operating condition there are equally important mechanical features to be considered. From the mechanical engineer's point of view derailments of mine locomotives may be caused by the following: Insufficient elevation of the outer rail on curves; too great a difference in size of wheels on one axle; the changing of one pair of wheels on a locomotive without changing the other pair; improper location of wheels with respect to the end-thrust point, usually located at the end of the axle; incorrect shape of wheel tread; wheel not bored true; curves too sharp for the wheelbase of the locomotive; locomotive not properly balanced; hitchings to cars made too high, thus unbalancing the locomotive, especially on grades; broken springs on one or more journals.

BAD TRACK, BAD RESULTS

The results from insufficient elevation of the outer rail are well known. Too great a difference in the size of wheels on the same axle forces one wheel to slip continually because one side of the locomotive cannot travel faster than the other; this also causes the wheels to climb the rails at curves.

If one pair of wheels is changed and not the other, in many cases the locomotive will travel at an angle to the track instead of parallel to it. Curves in tracks cause the operating part of the tread on one wheel of a pair to move in toward the center of the locomotive and outward on the other. The same is true if the thrust blocks or plates are not properly set. A correctly shaped pair of wheels will move over on a curve so that the inside wheel is turning on a smaller diameter than the outside wheel; therefore, when repairing and machining wheel treads, the exact shape of a new wheel and tread should be maintained.

If the radius of a curve is too small the locomotive will climb the outside rail. If wheels are not bored at right angles to the tread as they run over the tracks the wheel gage may become too narrow on one-half a revolution and too wide on the other half or, worse yet, cause the locomotive to wobble along the track. This produces a changing wheel gage from too wide to too narrow and increases the liability

of the wheels to drop through or climb the rails.

If the locomotive is not properly balanced the high end tends to climb the rail at curves. This same result will be produced if the car hitchings are too high and the trip heavy. Broken journal springs tend to unbalance the weight on the wheels.

If a deep groove is allowed to wear in the wheel treads the slipping-over effect on curves to compensate for the difference in rail length is prevented. The false flange thus formed pounds the frogs and damages the locomotives and track. Locomotive frames must be kept tight and square; otherwise all parts are under a strain and the axles do not stand at right angles to the track and the wheels cannot run parallel.

J. F. MACWILLIAMS,
Power Engineer.

Pennsylvania Coal & Coke Corp.,
Cresson, Pa.

Oxy-Welding Made It Better Than New

Every shop in the country working with metals may not have among its equipment a punch press of such dimensions as the one illustrated here. Still there are few shop owners that are not faced at one time or another with the specter of a shutdown because of damaged machinery. Thus the main point in the following incident should be interesting as typical of the wide variety of repair and reclamation work done by welding.

We may start with the statement that when broken equipment is carefully repaired with a reinforced oxyacetylene weld it is stronger at the repaired section than it was originally. Some skeptics might say, "Yes, probably," or "Undoubtedly, in laboratory tests, but does the same hold good in practice?"

It does! But to answer the question most satisfactorily is to prove it.

Fig. 1 shows a punch-press frame, a gray-iron casting weighing approximately two tons. A piece of metal too thick or tough broke the casting squarely off at the level of the table. The frame was cracked through a hollow rectangular section 19 in. wide, 20 in. deep, 6 in. thick at the front, 1½ in. at the back and 2 in. at the sides.

After the edges were carefully cut in a V shape and the frame accurately aligned it was preheated by gas burners and a good welding job done by competent oxyacetylene operators. The casting was carefully covered to protect it from any drafts while being welded, and this covering was left in place until after the casting had cooled.

After proper annealing the punch-press frame was put back in service and stood under the work for a year. Then someone again fed it too big a bite and it broke. Of course the frame was sent to the same shop which has welded it after the first accident. It



Fig. 1—Where First Fracture Occurred

Before this break was welded the joint was carefully cut in a V shape and preheated. A covering used to protect the metal from drafts was left around the frame until the metal had cooled after the weld was completed.

was again repaired and is shown in the second illustration ready for another term of service.

The point in the story is not that one good job deserves another nor that the competent welder is an ever-ready help in time of trouble but that the second break did not run through the old weld. This was left unharmed. Nor was the new break in the region preheated for the old weld. It was in



Fig. 2—Second Break in New Position

The repaired frame broke in a new place when loaded above capacity. The old weld remained intact. The second repair was made in the same manner as the first and the machine was again placed in service.

the crank bearing 4 ft. away. This, then, demonstrates the original proposition, that a second break in a properly made weld need never be feared.

J. F. IRBY.

Sled for the Mine Yard

A wagon is not always the easiest means of transporting materials about a mine yard. Whenever something is to be moved in a wagon it must be



Steel Sled, Strong and Sturdy

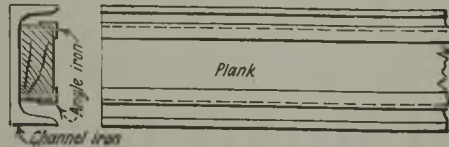
Materials may be easily rolled or shifted onto this sled. No need to strain workmen's backs or break machine parts due to falls.

lifted into the wagon box and again lowered at a delivering point. Aside from the extra labor required for this work, the damage to equipment due to falls or the injury of workmen often is expensive.

A sled or skid always is handy around a mine yard because of the uneven terrain and the ease with which materials may be loaded upon it. Fig. 1 shows the type sled used at No. 9 Mine of Old Ben Coal Co., West Frankfort, Ill. Fig. 2 shows how the inside of the channel frame has been filled to

make it stronger and easier for the driver to stand upon it.

This sled is drawn by mules and easily slides over the ground because of the smooth steel runners. The upper



Bottom Channel of Frame

The wooden plank in the center of this channel adds strength to the sled and provides a firm footing for the mule driver.

channels are not filled like the lower ones and therefore provide strong edges to hold materials from sliding off. The ease with which heavy barrels are moved about the property is remarkable.

Make Forge Coke on the Job

Illinois coal is hard to coke, especially after it has been exposed to the air as has the shallow coal in a strip pit. This small but effective outdoor coke



Coking Strip-Pit Coal

An inexpensive way to get blacksmithing fuel is this of the Black Servant Coal Co. Instead of using smithing coal it makes its own coke which usually can be done. It will work well if the coal is not too sulphury. The coal in a strip pit often has a low sulphur content, owing to its long exposure.

plant, consisting of a fireclay bowl within a housing of light steel, however, cokes it, supplying fuel for the

forges at the strip pit of the Black Servant Coal Co., Elkhaville, Ill., the new "Hartshorn" operation. The pipe seen in the illustration is an air line which drives a blast of air up through the coal.

Locomotive Batteries Save Money and Get Exercise

Often, when a mine is shut down, electric lights, nevertheless, are needed during the day and night. At such times it is often a problem to decide how the overhead charges can be kept as low as possible. If the boiler plant must be kept in operation and a generator must be in service continually men must be employed to operate them, and that is a heavy charge on an idle mine.

The main office of the Madison Coal Corp., at Glen Carbon, Ill., receives its lighting service from one of the mines nearby. During the summer the mine has been idle and in order to avoid keeping the boiler plant and generator in continual operation storage batteries supply the service.

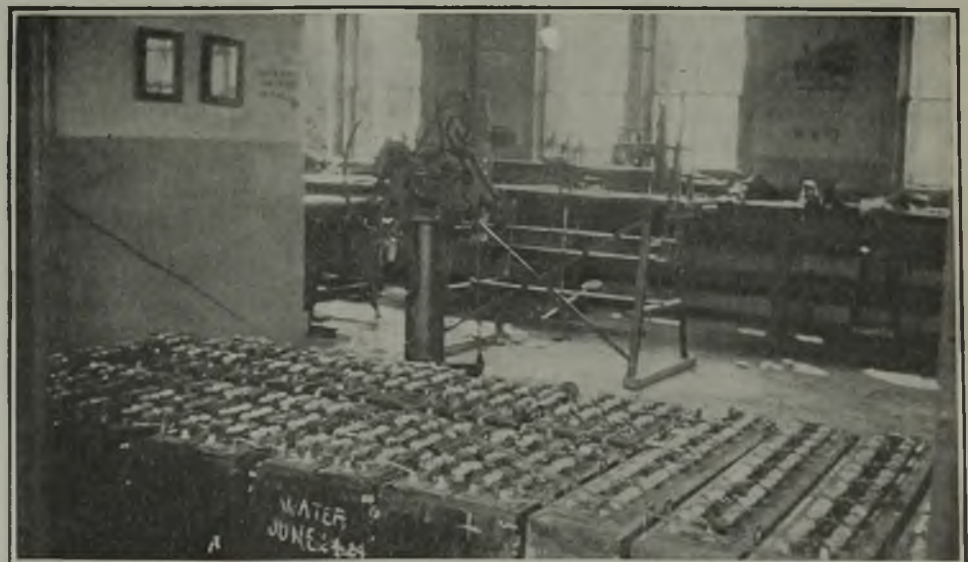
Occasionally, about once every two or three weeks, the boilers and generator are operated for the purpose of recharging the batteries, but as soon as the batteries are again charged to capacity the power plant is shut down.

LIGHT SUPPLIED FROM BATTERY

The batteries used for the lights also supply power to the electric repair shop which has been in operation quite frequently during the summer. Here electric repairs are made for all the mines of the company.

In the illustration a locomotive battery is shown in the repair shop. Aside from driving the shop equipment the battery supplies current for lights around the mine and in the main office.

There are many advantages to this scheme aside altogether from the cost of operating the boiler plant and generating unit. Idle batteries deteriorate more rapidly than those in service, and this arrangement furnishes plenty of exercise for the cells and keeps them in good condition.



Battery Furnishes Electric Energy for Lights and Repair Work

All the electrical energy required during the idle period of the mine is received from this battery set up in the electric repair shop. To recharge the cells the boiler and power plant need be operated for only a day every two or three weeks.



Production And the Market



Bituminous-Coal Market Gains in Firmness; Demand, Output and Prices Stronger

Further improvement marked the bituminous-coal market during the last week. In keeping with general business conditions, much of the increase is seasonal, and extreme caution is in evidence throughout the trade. Such barometers of trade as freight-car loadings, however, are indicative of healthy conditions. Advancing prices are due largely to domestic demand, offset somewhat by a tendency toward softness in slack.

Much attention is centered on the developments in western Kentucky, where the non-union drive is making headway. If this movement is entirely successful, it is expected to bring the producers of steam coal in Illinois into the same desperate straits in which are the union fields that compete with eastern Kentucky and southern West Virginia.

Conditions in Kanawha Field Unsettled

In the Kanawha field, where the operators on the Chesapeake & Ohio are making a determined drive to eliminate the union, two large operators, Mike Gallagher, of the Paint Creek Collieries, and Jim Paisley, of the Kelly Creek Collieries, continue idle. Each of these operators agreed with John L. Lewis to sign the Jacksonville scale, which precludes them from joining the drive to open on a non-union basis. They are remaining neutral by not reopening their mines as union operations, which incidentally they could not afford to do. It is understood that this is a bitter disappointment to Mr. Lewis.

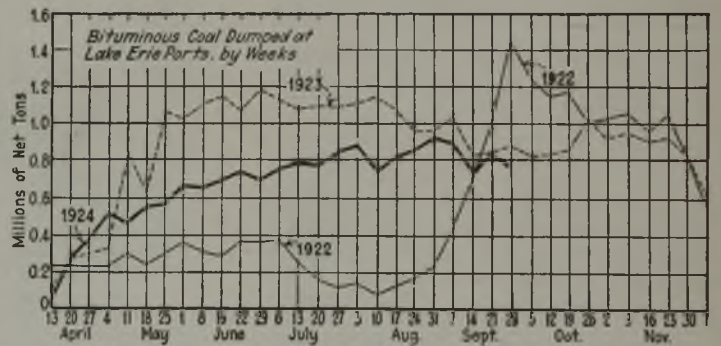
Coal Age Index of spot prices continues to advance, registering its fourth successive weekly gain, the figure as of Sept. 29 being 170, the corresponding price for which is \$2.06. This compares with 169 and \$2.04 respectively on Sept. 22.

Activity at Hampton Roads showed a sharp reaction last week, dumpings of coal for all accounts during the seven-day period ended Sept. 25 totaling 356,557 net

tons, compared with 383,710 tons in the previous week.

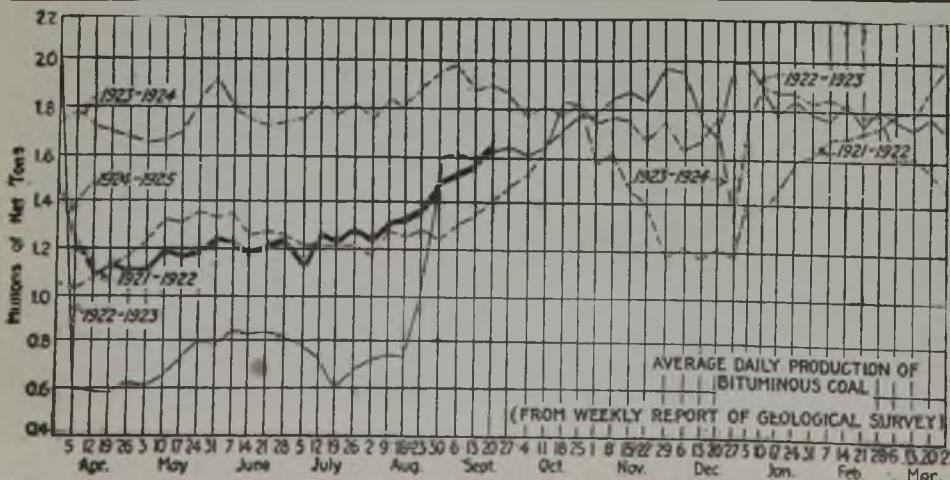
Movement up the lakes seems to be definitely on the wane. Dumpings at Lake Erie ports during the week ended Sept. 28, according to the Ore & Coal Exchange, were as follows: For cargo, 734,246 net tons; for fuel, 39,686 tons, compared with 770,331 and 45,957 tons respectively during the previous week.

Output of bituminous coal continues to show marked improvement, the total for the week ended Sept. 20, according to the Geological Survey, being estimated at 9,902,000 net tons, an increase of 373,000 tons over the week ended Sept. 13, when 9,529,000 tons was produced, according to revised figures. Production is now at the



highest level reached since the first week of March. Anthracite output also gained during the week ended Sept. 20, totaling 1,851,000 net tons, compared with 1,820,000 tons during the previous week.

The anthracite market is notably active, the demand for independent coals being good and line companies moving their product without difficulty. There is a heavy call for stove and chestnut has perked up markedly. Egg is moving fairly well also, and though pea is in more limited demand, it is moving without much trouble. Steam sizes are moving more readily, buck-wheat showing considerable strength.



Estimates of Production

(Net Tons)

BITUMINOUS

	1923	1924
Sept. 6.....	10,485,000	7,958,000
Sept. 13 (a).....	11,378,000	9,529,000
Sept. 20 (b).....	11,454,000	9,902,000
Daily average.....	1,909,000	1,650,000
Cal. yr. to date (c).....	399,666,000	322,004,000
Daily av. to date.....	1,796,000	1,433,000

ANTRHACITE

Sept. 6.....	3,000	1,451,000
Sept. 13.....	2,000	1,820,000
Sept. 20.....	877,000	1,851,000
Cal. yr. to date.....	69,367,000	65,909,000

COKE

Sept. 13 (a).....	317,000	111,000
Sept. 20 (b).....	335,000	121,000
Cal. yr. to date (c).....	14,130,000	7,326,000

(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 Still Active

Although warm weather prevailed for some time prices have not been reduced on domestic sizes of southern Illinois coal. Operators have enough orders to keep every open mine running to full capacity. It is true they are troubled somewhat in moving screenings, but the better grades from this field have not been materially reduced in price. Central Illinois has increased lump price 25c. per ton. Egg and mine-run prices are stationary, but screenings in a few cases have brought only a modest price.

Eastern Kentucky coal is difficult to obtain in gondola equipment, and prices are firm, but shipments are fairly prompt. Pocahontas prices have not been established for October but no material increase is expected. Anthracite prices are expected to remain the same during October as they are at present. All in all the market, as viewed from Chicago, is healthy and nobody is complaining.

In southern Illinois fields there seems to be an epidemic in the demand for lump coal, especially from the Williamson and Franklin County fields. In the last week egg has begun to move, but the mines are oversold on lump for a month or longer. Egg is now oversold for a week ahead. Nut is slow and screenings are not moving. Railroad tonnage and train movement are good. Mines are getting from three to five days a week. All mines have "no-bill" screenings and nut on track. The Mt. Olive field has picked

up with a snap. Domestic coal is moving and the railroads seem to be taking the egg and nut sizes. Screenings are going on contract. In the Standard field the operators as always are getting selfish. They are giving their screenings away at 75c. and expect to get \$2.50 or \$2.75 for 2-in. lump when Mt. Olive 6-in. can be bought for the same price.

St. Louis domestic business continues good. This is principally on Carterville grades, although Mt. Olive is coming in strong. Standard is not in demand yet. Anthracite is moving fairly well. Smokeless is showing up better and coke is active. Wagonload steam business is beginning to appear while carload steam is still slow. Country domestic is good but country steam demand is negligible.

Kentucky Is Busy Too

Movement of coal from the western Kentucky fields continues heavy and at firm prices, with a slight increase in the minimum price on egg and lump from \$2.50 to around \$2.60. The top on these sizes is \$2.75. Block is \$2.75@ \$3. The market is quoted at 85c. to a dollar on screenings. Demand for prepared sizes is so heavy that operating mines are having no trouble in disposing of production. One of the difficulties is in getting proper equipment, flat bottoms being scarce.

All Kentucky demand is strong on prepared sizes, especially the larger ones; though screenings are weaker in

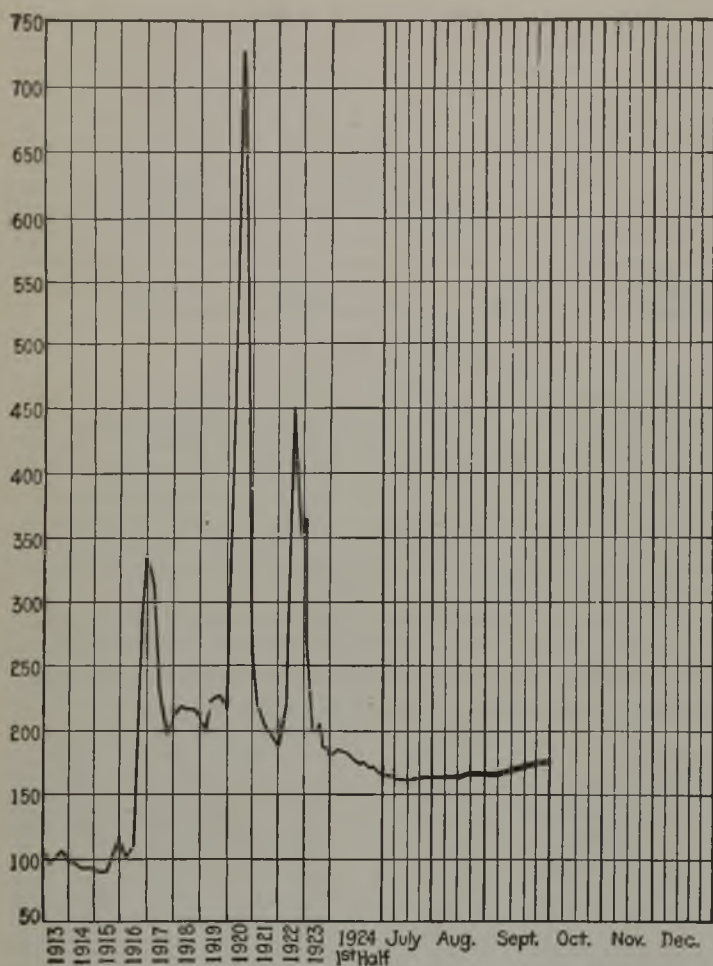
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest					High-Volatile, Eastern					South and Southwest											
Market Quoted		Oct. 1, 1923	Sept. 15, 1924	Sept. 22, 1924	Sept. 29, 1924†	Market Quoted		Oct. 1, 1923	Sept. 15, 1924	Sept. 22, 1924	Sept. 29, 1924†	Market Quoted		Oct. 1, 1923	Sept. 15, 1924	Sept. 22, 1924	Sept. 29, 1924†	Market Quoted		Oct. 1, 1923	Sept. 15, 1924	Sept. 22, 1924	Sept. 29, 1924†			
Smokeless lump	Columbus	\$6.10	\$3.60	\$4.10	\$4.00@ \$4.25	Franklin, Ill. lump	Chicago	\$4.05	\$3.35	\$3.35	\$3.25@ \$3.50	100 54-64 (Gas and St.)	New York	1.75	1.50	1.50	1.40@ 1.65	Big Seam lump	Birmingham	3.75	3.10	3.10	2.50@ 3.25			
Smokeless mine run	Columbus	3.70	2.00	2.10	2.00@ 2.25	Franklin, Ill. mine run	Chicago	2.85	2.35	2.35	2.25@ 2.50	Pool 54-64 (Gas and St.)	Philadelphia	1.75	1.50	1.50	1.40@ 1.60	Big Seam mine run	Birmingham	1.95	1.75	1.60	1.50@ 1.75			
Smokeless screenings	Columbus	2.35	1.20	1.20	1.15@ 1.30	Franklin, Ill. screenings	Chicago	1.30	1.65	1.35	1.25@ 1.50	Pool 54-64 (Gas and St.)	Baltimore	1.60	1.35	1.40	1.35@ 1.50	Big Seam (washed)	Birmingham	2.35	2.00	1.85	1.75@ 2.25			
Smokeless lump	Chicago	6.10	3.85	3.85	3.75@ 4.00	Central, Ill. lump	Chicago	3.10	2.60	2.85	2.75@ 3.00	Pittsburgh so'd gas	Pittsburgh	2.55	2.40	2.40	2.30@ 2.50	S. E. Ky. lump	Chicago	3.35	2.50	2.85	2.75@ 3.00			
Smokeless mine run	Chicago	2.85	1.90	1.90	1.85@ 2.00	Central, Ill. mine run	Chicago	2.10	2.20	2.20	2.15@ 2.25	Pittsburgh gas mine run	Pittsburgh	2.25	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run	Chicago	2.25	1.60	1.60	1.50@ 1.75			
Smokeless lump	Cincinnati	6.10	3.85	3.85	4.00	Central, Ill. screenings	Chicago	.95	1.45	1.15	1.10@ 1.25	Pittsburgh mine run (St.)	Pittsburgh	2.05	1.85	1.85	1.75@ 2.00	S. E. Ky. lump	Louisville	3.25	2.50	3.00	2.75@ 3.25			
Smokeless mine run	Cincinnati	2.75	1.85	1.85	2.00	Ind. 5th Vein lump	Chicago	3.35	2.85	3.10	3.00@ 3.25	Pittsburgh slack (Gas)	Pittsburgh	1.25	1.35	1.25	1.10@ 1.20	S. E. Ky. mine run	Louisville	2.00	1.50	1.55	1.35@ 1.75			
Smokeless screenings	Cincinnati	1.85	1.35	1.10	1.15@ 1.25	Ind. 4th Vein mine run	Chicago	2.60	2.35	2.35	2.25@ 2.50	Kanawha lump	Columbus	3.15	2.10	2.10	2.00@ 2.25	S. E. Ky. screenings	Louisville	1.05	.90	.90	.85@ 1.00			
*Smokeless mine run	Boston	4.80	4.15	4.20	4.20@ 4.35	Ind. 5th Vein screenings	Chicago	1.25	1.60	1.35	1.25@ 1.50	Kanawha mine run	Columbus	1.85	1.40	1.40	1.3@ 1.55	S. E. Ky. lump	Cincinnati	3.60	2.50	2.60	2.50@ 3.00			
Clearfield mine run	Boston	2.20	1.90	1.90	1.45@ 1.35	Ind. 5th Vein mine run	Chicago	2.50	2.50	2.60	2.50@ 2.75	Kanawha screenings	Columbus	1.05	1.05	1.05	1.10@ 1.20	S. E. Ky. mine run	Cincinnati	1.60	1.45	1.50	1.35@ 1.75			
Cambria mine run	Boston	2.85	2.25	2.30	2.00@ 2.75	Ind. 5th Vein screenings	Chicago	2.10	2.10	2.10	2.00@ 2.25	W. Va. lump	Cincinnati	3.50	2.30	2.35	2.50@ 2.75	S. E. Ky. screenings	Cincinnati	1.00	1.05	1.00	.90@ 1.10			
Somerset mine run	Boston	2.35	2.05	2.05	1.75@ 2.50	Mt. Olive lump	St. Louis	3.00	2.75	3.00	2.75@ 3.00	W. Va. gas mine run	Cincinnati	1.75	1.45	1.50	1.50@ 1.75	S. E. Ky. lump	Cincinnati	1.60	1.45	1.50	1.35@ 1.75			
Pool 1 (Navy Standard)	New York	3.25	2.75	2.75	2.50@ 3.00	Mt. Olive mine run	St. Louis	2.25	2.50	2.50	2.50	W. Va. steam mine run	Cincinnati	1.75	1.35	1.35	1.35@ 1.60	S. E. Ky. mine run	Cincinnati	1.60	1.05	1.00	.90@ 1.10			
Pool 1 (Navy Standard)	Philadelphia	3.25	2.40	2.40	2.50@ 2.90	Mt. Olive screenings	St. Louis	1.25	1.75	1.25	1.25	W. Va. screenings	Cincinnati	1.10	1.05	.90	.90@ 1.00	Kansas lump	Kansas City	4.50	4.50	4.50	4.50			
Pool 1 (Navy Standard)	Baltimore	2.60	2.60	2.60	2.85@ 2.85	Standard lump	St. Louis	2.80	2.55	2.75	2.75@ 3.00	Hooking lump	Columbus	3.10	2.40	2.50	2.40@ 2.65	Kansas mine run	Kansas City	3.00	3.50	3.25	3.00@ 3.50			
Pool 9 (Super. Low Vol.)	New York	2.50	2.10	2.10	1.80@ 2.35	Standard mine run	St. Louis	2.05	1.80	1.80	1.75@ 1.85	Hooking mine run	Columbus	1.85	1.55	1.55	1.50@ 1.75	Kansas screenings	Kansas City	2.60	2.50	2.35	2.35			
Pool 9 (Super. Low Vol.)	Philadelphia	2.60	2.15	2.15	1.95@ 2.35	Standard screenings	St. Louis	.55	.95	.95	.75@ .90	Hooking screenings	Columbus	1.05	1.15	1.15	1.00@ 1.15									
Pool 9 (Super. Low Vol.)	Baltimore	2.40	1.85	1.85	1.80@ 1.90	West Ky. lump	Louisville	2.55	2.60	2.85	2.75@ 3.00	Pitts. No. 8 lump	Cleveland	2.60	2.30	2.35	2.00@ 2.75									
Pool 10 (H.Gr. Low Vol.)	New York	2.10	1.80	1.85	1.70@ 2.00	West Ky. mine run	Louisville	1.85	1.60	1.65	1.50@ 1.80	Pitts. No. 8 mine run	Cleveland	1.95	1.85	1.80	1.85@ 1.90									
Pool 10 (H.Gr. Low Vol.)	Philadelphia	2.15	1.75	1.75	1.65@ 1.90	West Ky. screenings	Louisville	.75	1.00	1.00	.85@ 1.00	Pitts. No. 8 screenings	Cleveland	1.15	1.15	1.15	1.10@ 1.25									
Pool 10 (H.Gr. Low Vol.)	Baltimore	2.25	1.60	1.65	1.60@ 1.70	West Ky. lump	Chicago	2.60	2.45	2.70	2.75@ 3.00															
Pool 11 (Low Vol.)	New York	1.85	1.60	1.60	1.50@ 1.75	West Ky. mine run	Chicago	1.95	1.60	1.65	1.35@ 1.95															
Pool 11 (Low Vol.)	Philadelphia	1.85	1.45	1.45	1.35@ 1.60																					
Pool 11 (Low Vol.)	Baltimore	2.00	1.45	1.55	1.50@ 1.60																					

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

	Market Quoted	Freight Rates	Oct. 1, 1923		Sept. 22, 1924		Sept. 29, 1924†	
			Independent	Company	Independent	Company	Independent	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	8.00@ 9.25	9.15
Egg	New York	2.34	9.85@ 12.25	8.75@ 9.25	\$9.00@ \$9.50	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	9.25@ 10.00	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	9.00@ 9.50	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 @ 7.50	6.15@ 6.65	5.25@ 5.50	5.50@ 6.00	5.25@ 5.75	5.50@ 6.00
Pea	Philadelphia	2.14	6.75 @ 9.00	6.35@ 6.65	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	2.65 @ 3.50	3.50	2.25@ 2.90	3.00@ 3.15	2.50@ 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	2.15 @ 2.50	2.50	1.95@ 2.25	2.00@ 2.25	1.75@ 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
Rice	New York	2.22	1.15 @ 2.50	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		1.60

* 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

Index	1924			1923
	Sept. 29	Sept. 22	Sept. 15	Oct. 1
Index	170	169	167	196
Weighted average price	\$2.06	\$2.04	\$2.02	\$2.37

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.

price, demand is good considering present production, as a lot of large steam buyers are now stocking up fall supplies. The general belief is that the market is fairly close to the top for the time being. Eastern Kentucky hasn't any cause for complaint with a good car supply, low production cost and good prices. Non-union mines in western Kentucky are making some money, and union mines paying the full wage scale can make a little money at the present market.

Retailers in Louisville have advanced prices 50c. a ton on prepared sizes, due to the steady advance in mine prices, and report that business is good.

Northwest Is Not Rushed

Coal business throughout the Northwest eased along during the week without any striking high lights, but domestic movement continued strong. At the Head-of-the-Lakes prices were unchanged throughout the list but a drop is imminent partly because of the steam situation. Heavy recent rains have amassed water power that is expected to replace some steam coal. Big surpluses of screenings, especially of Pocahontas coal, have piled up as a result of extensive business in the domestic sizes.

Thirty-one cargoes, five of them hard coal, arrived at Duluth last week. Sixteen are reported on the way, and of these four are hard. There seems to be no possibility of a shortage there this year, and in fact shipments may be materially reduced as a result of the torrential rains. There is a big demand for anthracite, and Duluth is shipping to the Dakotas and to Winnipeg. It seems certain that Winnipeg will be fed from Duluth all winter.

Twin Cities steam buyers are holding hard to their policy

of refusing to buy beyond immediate needs. The new situation with a 28c. increase on rates from southern Illinois to the Twin Cities places quite a handicap on coal from that region. But the suspension of rates for central and northern Illinois and from Indiana, until Jan. 8, gives those districts a chance to go after business formerly going to southern Illinois, and they are doing it. So the dock trade is not getting the Twin City and surrounding territory for its own as a result of the recent advance in rates.

Twin Cities quotations remain about as they have been. Southern Illinois lump is \$3.25 with screenings \$1.50@ \$1.75. Western Kentucky lump is \$2.50@ \$2.75, and screenings 90c. @ \$1. Indiana lump is \$2.75, and screenings \$1.50. Dock prices are on the same basis as before. Anthracite egg is \$13.20; nut, \$13.45 and stove, \$13.60. Lignite is coming to the district in a much reduced quantity.

The Milwaukee coal trade is experiencing a weather market. The spurt of last week has been followed by a slackening demand. However, a fair movement from the docks is reported. There is a demand for Pocahontas which is hard to meet because the mines are sold up for September and October and Pocahontas has advanced 50c. West Virginia splint also is wanted, and hard to get. Receipts of coal by lake at Milwaukee up to Sept. 24 aggregate 566,454 tons of anthracite and 1,586,210 tons of bituminous coal, a total of 2,152,664 tons. This record for both grades is 514,519 tons below 1923 for the same period.

West Is Stimulated

Southwestern domestic grades took a pronounced jump during the week, while steam slumped. Operators say the domestic demand would justify opening more mines, if the industrial market were stronger. As a result only a few mines are being reopened. No price changes have been made though some operators are quoting Arkansas screenings as low as \$1 a ton while the current quotation is \$2.

In Colorado the market is much better, thanks to cooler weather. The average working time of the mines in that district last week advanced to twenty-eight hours with only 30 per cent of the working time lost due to "no market." Prices have not changed.

In Utah a cold snap has stimulated demand. Retailers have been working overtime for several days. Salt Lake City's coal yards now have about 50,000 tons on hand. Retail prices are still unsettled. The next increase will doubtless be 50c. a ton on large sizes and 25c. on intermediate sizes. Operators say the consumer business is improving in Idaho and Nevada.

Ohio Markets Developing Strength

Domestic inquiry and purchases continue strong at Cincinnati. Some October prices have appeared that are much above spot figures. Some Hazard output is quoted at \$3 for block, \$2.50 for egg, \$2.25 for 2-in. and \$1.75 for run of mine. West Virginia offerings also have been advanced. Steam coals, generally speaking, are hanging back and slack has shown signs of softening. Much strength pervades the low-volatile division, though screenings are rather soft. Lake buyers are still in evidence, but no longer are in command. River business still lags because of conditions in the Kanawha fields, the low stage of the water and labor trouble among towboat men. Retail prices are unchanged, most of the dealers waiting to see what happens to the prices after Oct. 1.

Domestic trade at Columbus continues to improve steadily. Demurrage domestic coal is being reduced as the trade improves. Steam buying is haphazard, the larger users buying on the open market. Utilities are good consumers and a good tonnage also is going to public institutions and schools. Railroad consumption is only fair, but some lines of general manufacturing are showing a better buying spirit. Quite a few of the larger mines are being put into commission after lengthy idleness. The lake trade is steady with a fair tonnage moving.

Demand in eastern Ohio was strong enough last week to result in the largest week's output since March, but steam buyers are not in the market to the extent they should be at this time. The domestic market has been so active that spot quotations at Cleveland on Pocahontas and other smokeless fuels have risen 75c. to \$1 per ton. Practically no change is noted in spot prices on steam coals, f.o.b. Ohio mines. Ohio mines are having much difficulty in competing with non-union fields. Increased demand has not

thus far had any appreciable effect on prices. General railroad traffic is steadily increasing. Lake shipping is nearly a finished job, so far as this season is concerned.

Pittsburgh Still Below Normal

Shipments of domestic coal are increasing at Pittsburgh, but the movement is hardly up to normal. Slack is much weaker and quotations are off fully 10c. a ton, following a 10c. decline a week ago. Other prices are unchanged. Reports of the steel trade are of lighter buying of steel and a tendency among mills to reduce operations.

Production in the central Pennsylvania field is increasing, 13,910 cars having been loaded during the week ending Sept. 20, as compared with 13,303 the week previous. "No-bill" cars amount to 1,500. Prices at the mines are as follows: Pool 18, \$1.60@1.65; Pool 11, \$1.65@1.70; Pool 10, \$1.80@2; Pool 9, \$2.10@2.20; Pool 71, \$2.25@2.35; Pool 1, \$2.40@2.55.

The situation at Buffalo grows more quiet from nearly all sides. The demand for slack, which was producing a slightly better price, has fallen off. The attempt to change from anthracite to smokeless coal is not likely to amount to more than a wedge this year. Quotations are about as usual.

Spectacular Recovery in New England

The tidewater bituminous market at Boston has undergone a spectacular recovery, quotations for pool 1 New River and Pocahontas moving from the lowest figure since pre-war days to the highest that has obtained for several months, all within the week. This advance is directly due to a firming in spot prices at the southern loading piers. Demand for coal at Boston also has expanded considerably. At Mystic Wharf discharging ran up to 7,000 tons per day and about an equal tonnage has been discharged at the privately owned wharves. All of the dischargings at Mystic Wharf have gone out to consumers.

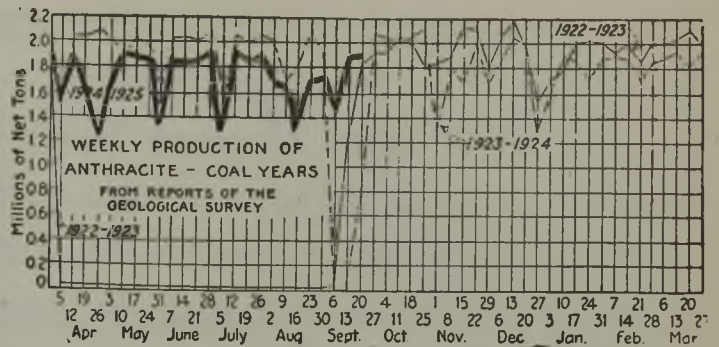
Prices have not undergone much improvement at Providence as yet, some tonnage still being available at \$5.30 on cars but that market has been on a higher level than Boston all along.

There also has been a little more action in Pennsylvania steam coal. Some fair business is reported, at good prices, up to \$2.50 net ton mine being obtained for medium volatile coal. Indications are not very promising for any marked expansion in rail coal, for tide coal still has the edge on price.

ying Heavier in Atlantic Markets

Increased buying at New York is indicated by a heavier movement of coal and an increase in inquiries. Incidentally two cargoes of Southern coal arrived here recently consigned to utilities. Reserve stocks are dwindling rapidly toward the danger point should there be any transportation trouble or a shortage of cars. Contract coals are moving better and contract holders are taking larger shipments. Tidewater movement is fair but prices remain about stationary. There is little free Pool 1 coal to be had.

Tonnage is moving better at Philadelphia. Stocks at manufacturing plants, except the utilities, are exceedingly low, but these concerns are buying more than current requirements. Industrial conditions are improving at an increasing pace. More contract coal is moving. On the B. & O. R.R. there is a shortage of cars. There has been more inquiry for contract prices lately and some additional tonnage has been closed for delivery between now and



April 1. Users of gas slack, principally cement manufacturers, have been taking some tonnages of late.

Inquiry at Baltimore continues to grow. Not only is the home market encouraging, but export movement has increased. Buying of industrial coals for storage is coming from the smaller industries. A demand is developing for some of the pools which have been practically stagnant for a number of weeks past.

Gradual expansion continues at Birmingham with small concerns starting up or making better time, which is tending to increase fuel requirements. The cotton-ginning season and activity at oil mills is consuming additional tonnage, and there is a good scattering of spot business. The railroads are increasing the tonnage taken on contracts as transportation conditions improve. Bunker and export trade is still slow.

Anthracite Gaining Headway

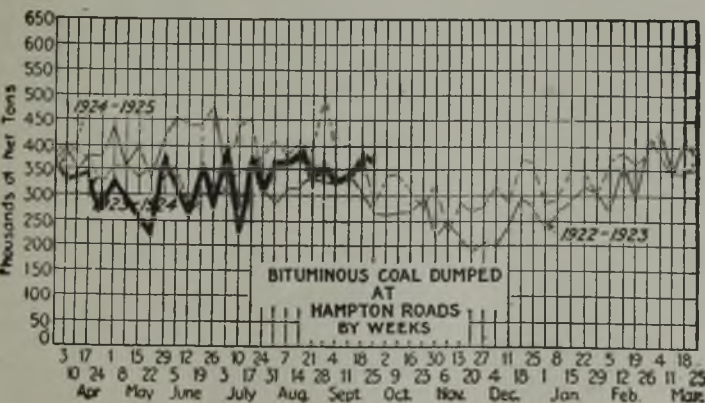
Demand is active at New York for anthracite, consumers endeavoring to fill their bins while movement is good. Independent coals are in good demand and the old-line companies are not having any trouble in moving their output. The call for stove is heavy, although chestnut has picked up considerably and is now in remarkably good shape for the New York market. Some of the smaller producers are well sold up on all of the larger sizes and are reluctant to book orders for straight stove coal. Egg also is in fair shape. The call for pea coal is slow but there is no difficulty experienced to move it. Buckwheat No. 1 shows more strength, with rice and barley moving readily.

The slow, steady accretion of business by Philadelphia retailers goes on, helped by cool weather. Stove is in increased demand. Company producers are close to sold up on the larger sizes, with pea the only slow moving size, and this showing more strength. Egg is going a trifle better with all shippers. Retail prices are moving upward. Steam sizes show considerable improvement.

Baltimore dealers report a fair amount of orders, but the volume is not at all commensurate with conditions created by the failure to store over the summer months in the usual amount. Coal men are hoping for an early cold snap to stimulate orders and allow them to get in a fair proportion of this coal before steady cold weather sets in.

Trade at Buffalo shows no tendency to recover as sunny days continue. The independent anthracite trade is quiet. Shippers are holding prices firm at about \$1 above the line prices. Chestnut and stove are most active. Furnace and the small sizes are very slow.

Demand in the Connellsville coke market is very light. Prices, however, show much stiffness, and this is clearly traceable to fear on the part of independent operators that their wage scales, in most cases about one-third below the Frick scale, may be difficult to hold if the Frick company should increase its operations much. Spot furnace coke remains quotable at \$3@3.10. Foundry coke continues in poor demand, but prices hold without any difficulty, production being very limited and operators quite indisposed to try to increase operations by cutting prices. Spot foundry remains at \$4@4.50, according to brand.



Car Loadings, Surplusages and Shortages

	Cars Loaded		Car Shortage	
	All Cars	Coal Cars	All Cars	Coal Cars
Week ended Sept. 13, 1924.	1,061,424	182,315		
Previous week.	920,979	149,473		
Week ended Sept. 15, 1923.	1,060,563	171,875		
	Surplusage		Car Shortage	
	All Cars	Coal Cars	All Cars	Coal Cars
Sept. 14, 1924.	167,157	84,197		
Sept. 7, 1924.	194,306	97,089		
Sept. 15, 1923.	69,080	19,790	12,245	6,478

Foreign Market And Export News

British Market Dull with Inland and Export Demand Far Below Normal

Shipments of Welsh coal of late have been slightly heavier than during July and August though the prospects on the whole are anything but bright. The inland trade has not expanded and export demands remain considerably short of normal proportions. On an output of slightly over a million tons per week, 10 per cent short of the total of some months ago, there are enormous stocks of coal, consisting chiefly of large coal of secondary and lower grades, and of vast quantities of small coal.

The superior Admiralty classes of coal remain scarce because of the closing of the Cambrian collieries several weeks ago. The result is that qualities are able to maintain prices fairly well. Further shutdowns are feared because of the unremunerative working conditions, the small Continental demand and the fact that Germany is successfully competing for the markets.

The Newcastle market is still in a deplorable condition and export business is very difficult to obtain. German competition in Europe is severely felt. Several Continental gas works are taking quantities up to 20,000 tons at prices averaging 26s. 6d., per ton, and Riga merchants are inviting offers of 25,000 tons of steam coals for shipment this year.

Coal output by British collieries during the week ended Sept. 13, a cable to *Coal Age* states, was 4,907,000 tons, according to the official reports. This compares with a production of 5,180,000 tons during the week ended Sept. 6.

Hampton Roads Market Active; Prices Stronger

Hampton Roads reports the best business of the last six months, with the market stiffening and with demand becoming more insistent day by day. Coastwise movement is consuming the bulk of the thought of the trade, together with Western demand and bunkers.

Shippers who were unable to dispose of mine-run coal two or three weeks ago at \$1.60 net ton mines, were unable last week to fill orders for the same at less than \$1.75. Some New England buyers were in the market offering \$4.25 net ton piers for pool 1. High-volatile coal generally was quoted \$4.10 @ \$4.15 at the pier for October delivery.

French House Coals More Active; British Imports Slump

The French industrial coal market continues dull but stocks are not of large volume. Business in house coals, however, is increasingly active.

Due to the high level of prices in South Wales, there has been a progressive falling off in imports of British coals. For the same reason smokeless patent fuel is being extensively made and tested in the Paris plants.

The prices of French sized coals for October are unchanged from those of September, ovoids alone being reduced to 117.20f. per ton.

Offers of German coal continue numerous in the open market, but deliveries are slow.

The supply of rolling stock both at the mines and at Rouen has left much to be desired and arrivals have been delayed. In Belgium the crisis is already very acute and threatens to be critical when the transport of the beet crop is in full swing.

Deliveries of indemnity fuels thus far in September have been at a daily average rate of 31,600 tons, as against 28,600 tons per day in August.

Coke deliveries to the O.R.C.A. during the first eleven days of September totaled 145,797 tons, or at the rate of 9,100 tons a day. The price of reparation coke probably will remain unaltered this month at 145.25f. delivered frontier station Sierck, O.R.C.A.'s charges excluded. Although no official statement has been made, it is re-

ported from an authoritative source that the Belgian price of reparation coke is reduced from 146 to 135f. (135 Belgian francs being equal to 126 French francs).

The situation in the Belgian coal market is unfavorable owing to acute foreign competition. The falling off in sales of industrial coals has led to larger price concessions. There has been a fair demand for half-bituminous sized coals, both in the Center and Charleroi coal fields. In dry duffs trading is satisfactory.

Export Clearances, Week Ended Sept. 27, 1924

FROM HAMPTON ROADS		Tons
For Brazil:		
Br. Str. Cape Comoria for Rio de Janeiro	6,909	
Br. Str. Clydemede for Rio de Janeiro	6,025	
For Canada:		
Ger. Str. Bolheim for Montreal	2,593	
For Cuba:		
Nor. Str. Vindeggan for Santiago	1,190	
For Italy:		
Ital. Str. Satsuma for Porto Ferrajo	7,003	
For Malta:		
Ital. Str. Albert No. 8	2,079	
For West Indies:		
Fr. Str. Caid for St. Pierre	1,197	
Br. Str. Chiswick for Barbados	4,880	
Amer. Schr. Mary G. Maynard for Hamilton	1,062	
Nor. Str. Jacob Christensen for Curacao	5,364	

FROM BALTIMORE		Tons
For Cuba:		
Am. Schr. Dolly Madison, for Caibarien	2,323	
For Canada:		
Nor. S.S. Sirrah, for Corner Brook	4,447	
For Porto Rico:		
Am. Str. Delisle, for Quanica (Coke)	531	

FROM PHILADELPHIA		Tons
For Cuba:		
Dan. Str. Betty Maersk, for Havana		

Hampton Roads Pier Situation

	Sept. 18	Sept. 25
N. & W. Piers, Lamberts Pt.:		
Cars on hand	1,447	1,249
Tons on hand	92,367	87,589
Tons dumped for week	122,868	100,419
Tonnage waiting	2,000	12,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,704	1,271
Tons on hand	111,100	87,150
Tons dumped for week	83,230	119,855
Tonnage waiting	13,038	2,900
C. & O. Piers, Newport News:		
Cars on hand	2,040	1,998
Tons on hand	105,865	104,210
Tons dumped for week	136,501	97,188
Tonnage waiting	1,075	4,640

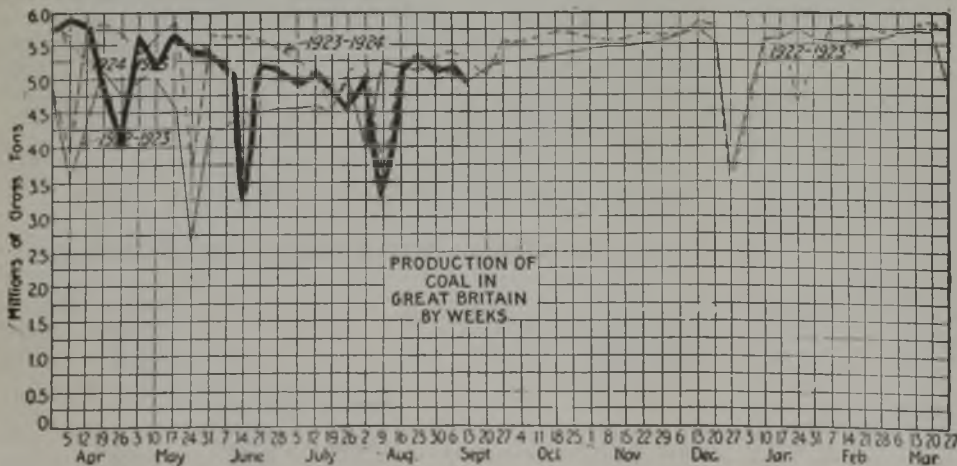
Pier and Bunker Prices, Gross Tons


	PIERS	
	Sept. 20	Sept. 27†
Pool 9, New York	\$4.60@55.00	\$4.75@55.05
Pool 10, New York	4.50@4.75	4.60@4.75
Pool 11, New York	4.35@4.50	4.35@4.60
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	4.10@4.25	4.25
Pool 2, Hamp. Roads	3.90@4.00	4.00
Pools 5-6-7 Hamp. Rds	3.85	3.90@4.00
	BUNKERS	
Pool 9, New York	\$4.90@55.30	\$5.00@55.30
Pool 10, New York	4.80@5.05	4.85@5.00
Pool 11, New York	4.65@4.80	4.60@4.85
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	4.10@4.25	4.25
Pool 2, Hamp. Roads	4.00@4.10	4.00
Pools 5-6-7 Hamp. Rds.	3.90	4.00@4.15

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


Quotations by Cable to <i>Coal Age</i>		
Cardiff:	Sept. 20	Sept. 27†
Admiralty, large	28s. @ 28s. 6d.	27s. 6d.
Steam smalls	15s. @ 15s. 6d.	15s. 3d.
Newcastle:		
Best Steams	19s. @ 24s.	19s.
Best Gas	21s. @ 22s.	22s.
Best Bunkers	19s.	18s. 6d.

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





News Items From Field and Trade



ALABAMA

Chas. F. DeBardeleben, Jr., who has been superintendent of the Overton Mines of the Alabama Fuel & Iron Co., has been appointed general manager in charge of physical properties and operations.

The Southern Ry. will soon begin the construction of a new coal chute at Selma, to cost in the neighborhood of \$50,000, replacing one burned some time ago, according to announcement made by H. A. Debutte, superintendent of the Mobile division of the Southern Ry.

E. F. Powelson and a staff of engineers have arrived in Birmingham preparatory to beginning construction on the large plant of the Hercules Powder Co. to be built on a large tract of land at McAdory, near Bessemer. It is stated that the plant will have a capacity of 1,250,000 lb. of dynamite monthly and will be the most modern of its kind in the country.

In line with the rehabilitation of service on the Warrior River and the provision of additional equipment for the movement of coal and other freight to and from Mobile and other gulf ports, officials of the Inland Waterways plan to buy from the Tennessee Coal, Iron & R.R., 28 barges owned by the latter for a consideration of about \$600,000.

J. M. Cobb, for the past several years foreman in charge of the Birmingham station of the U. S. Bureau of Mines, has accepted a position with the DeBardeleben Coal Corporation as safety inspector at all works of the company.

The Red Star mine, on the properties of the Nelson Coal Corporation, recently acquired by the Pratt Fuel Corporation, which had been idle for some time, has resumed operations on a limited schedule.

Tentative arrangements have been made whereby the Ensley Southern Ry., formerly operated by the Southern Ry. system but recently thrown into the hands of a receiver, will be taken over and operated in connection with the Birmingham Southern R.R., a subsidiary of the Tennessee Coal, Iron & R.R. Co. The Ensley Southern affords Birmingham's only rail connection with Birminghamport, on the Warrior River barge line, and its acquisition by the Birmingham Southern will be immensely important to the interests of the Tennessee company and other shippers of the district.

Reports from Jasper are to the effect that L. B. Baird, former Alabama board member of the United Mine Workers,

is sponsoring a movement to organize locals in the Walker County field to be affiliated with District No. 20, which lost its autonomy about a year ago when its ranks became so depleted that the district organization was not self-supporting and had practically ceased to function since the 1920 strike. Better working schedules and more satisfactory conditions have been maintained in Alabama working on an open-shop basis, and indications are that little sympathy will be accorded the movement for reorganization.

ARKANSAS

The stripping plant of the C. C. & E. Coal Co. west of Clarksville has been bought by Winston Bros. Coal Co., of Minneapolis, Minn. W. O. Winston, Jr., is superintendent of the mine. It now employs 75 men and has a 1,000-ton capacity tippie. The new company has installed a Marion 350-ton electric shovel and it is announced locally that the plant is to be further expanded.

COLORADO

An offering of \$50,000 joint closed first mortgage 7 per cent serial gold bonds of the Bell Coal Co. and the Bell Mining Co. was recently made at par and accrued interest. The bonds are dated Aug. 1, 1924, and are due \$5,000 annually, 1926-35. The bonds are secured by the total assets of the companies and guaranteed as to principal and interest by the personal indorsement of R. M. Head and J. H. Head. The issue will finance expansion and improvement of the properties and business. The Bell Mining Co. owns and operates the Eureka mine, in Boulder County.

James McKeown is now superintendent of the Bear Canon Coal Co. at Valloroso.

On Sept. 9 a fall of rock in the Turner No. 2 mine of the Calumet Fuel Co., of which he is superintendent, so badly injured James R. Cameron's left arm that it was necessary to amputate it immediately. His foot was broken also. The accident occurred when Mr. Cameron was directing a crew of men in timbering the rock. He saw it moving and shouted to the men in time for them to jump to safety, but was caught himself. Mr. Cameron is well known in Gallup, N. M., where he was employed as engineer and as superintendent by the Gallup-American Coal Co., and in Eckels, W. Va., where he was resident engineer for the Guggenheim interests.

ILLINOIS

Austin N. Harloy has joined the Columbus Mining Co., of Chicago, to be in charge of the jobbing department and to handle the output of the company's two Indiana mines—the Bright Gem, at Jessup, and the Shamrock, at Riley.

Edward Leming has succeeded John Hayes as mine manager at the Kathleen mine of the Union Colliery Co., at Dowell, south of Duquoin. Hayes has accepted a similar position with a coal company at West Frankfort.

After working for 72 years in coal mines, John Egloff, of Murphysboro, has decided to "lay off" for his first rest. He is now 81 years of age and worked the greater part of his life in the old and now abandoned No. 9 Mine of the Consolidated Coal Co., at Murphysboro.

The Peabody Coal Co. will open its Mine No. 9, at Taylorville, this week. A new tippie has been constructed and other repairs made. About 500 men are employed.

A vein of coal 6½ ft. thick has been struck in the Coonsburg vicinity, near Lincoln, at a depth of 295 ft. This is approximately the same depth as the coal strata under Lincoln. The boring has been financed by farmers, but plans are being made to establish a wagon mine.

C. O. Wager, of the North Coal Co., states that his company is now operating its new mine on the North Main Street road, Kewanee. Coal is being mined from a 4-ft. vein which analyzes very well.

The Valley view coal mine, Coal Valley, has been reopened by its owners, Sackville and Wynn. The mine is now employing thirty-five men. It had been closed since last February.

Coal from the Rutland mine will be upon the market within the next two weeks. It has been over four years since this mine was operated. The Rutland mine was first worked more than thirty years ago and for many years was a prosperous operation.

A small mine is to be sunk on the Ferry farm south of Moline at once by the newly incorporated Highland Coal Co., of Rock Island, whose capital stock is \$25,000. Subscribers to \$11,000 of the stock are Henry Rohwedner, William Ferry; Louis Rohwedner, of Moline; Thomas Thompson, A. S. Thompson and Leroy Dehler, of Rock Island, and J. Hasper, of Cuba.

INDIANA

New shaker screens, picking tables and loading booms have been installed in the old tipple at the Shamrock mine of the Columbus Mining Co. at Riley.

To satisfy a judgment for \$100,916.66 obtained by the National Bank of Kentucky, of Louisville, against the Big Four Coal Co., arrangements are being made to sell the Liberty mine of the company, near Francisco, with the coal rights, property and buildings. The sale is being arranged for Oct. 10.

Indiana's largest coal mine, American mine No. 1, near Bicknell, started hoisting coal again Monday, Sept. 22, after having been closed for about six months. Because of its size, this mine does not hoist unless conditions are such as to warrant a fair weekly average of working days.

The Standard mine, near Wheatland, is to reopen soon, after having been stopped all summer. The stoppage for lack of market was aggravated by labor trouble. The mine installed coal-loading machines and the men picked to run the machines were called out by the union local. It is said that an agreement has been reached whereby the mine can reopen. This mine's entire output goes to the B. & O. R.R. While it has been shut down the railroad has been using West Virginia coal.

A strike of fire and gas inspectors employed in the mines of the Knox Consolidated Coal Co. in the Bicknell field called for Sept. 22 failed to develop, and the two large mines owned by the company operated. The mines threatened with a tie-up were the Indian Creek, which has been operating with 400 men for about three months, and the American mine No. 1, which has been closed for several months, but had been scheduled to resume operations. The American mine is the largest in the state and it was announced it would employ about 900 men. The threatened strike followed a controversy which began about three months ago, when the company reduced the wages of firebosses 20 per cent. It is reported that the controversy has been settled. Had the inspectors carried out their intention to go on strike, 1,300 miners would have been held out of the mines. There is no rule in the wage agreement providing for a definite wage for these inspectors, the matter being left to agreement between the company and the firebosses.

Increased activity in the Terre Haute and Clinton coal fields in the last few days gives promise that a revival of

the Indiana bituminous industry is at hand. More mines are working now than at any time since last February and optimism for better times is reflected in both miner and operator circles. A controversy between the miners and officials of the Chicago, Milwaukee & St. Paul R.R. over work trains to carry miners from Terre Haute to the mines in the Clinton field has been adjusted after tying up work at several of the mines for a few days.

KANSAS

W. Capen Shank, Pittsburg, president of the Carbon Coal Co. and identified with other coal interests, may again be a brother-in-law to a Missouri Governor. He held that relationship to Lon V. Stephens, who was Governor of Missouri a number of years ago. Another brother-in-law, Dr. Arthur W. Nelson, is the Democratic gubernatorial candidate in Missouri this fall.

John O'Leary and W. D. Van Horn, international board members of the United Mine Workers, sent into District 14 by President John L. Lewis to make a survey of conditions recommended that a corps of at least two organizers be sent into the field.

KENTUCKY

The recently organized R. L. Brown Coal Co., Evarts, is planning the installation of electric equipment and mining machinery for the development of a portion of the 500-acre tract of land acquired from the Standard Harlan Coal Co.

W. D. Coil, of Madisonville, has acquired about 3,000 acres of coal land in Pond River County.

It is reported that the fire in the Himyar Coal Co. mines at Domino has finally been extinguished, after a long effort, and through assistance of the U. S. Bureau of Mines. In the original explosion and fire a foreman and two men were killed. When an effort was made later to start the mines the fire broke out afresh. The plant will open in a few days. It employs about 300 men and has a capacity of about 25 cars a day.

The Sandy Valley & Elkhorn Railway Co., belonging to the Consolidation Coal Co., and purchased from the Baltimore & Ohio R.R., in 1922, embracing 31 miles of road, from Shelby Junction, in Pike County, to Dunham, in Letcher County, is fighting an effort of the State Tax Commission to increase its tax assessment \$3,396,579 to \$9,395,113.

The Cumberland Straight Creek Coal Co., at Logan Switch, near Pineville,

lost a \$10,000 tipple by fire on the night of Sept. 11, just after announcement had been made of plans for resuming operations on Monday, Sept. 15, at a reduced scale of wages, the mines having been down since April, because the workers refused to accept the reduction. It is believed that the fire was a plain case of arson, and a reward has been offered by company officials for arrest and conviction of those responsible. The plant is not far from the mines of the Liberty Coal & Coke Co., where several miners were shot last spring, and which resulted in the camp being under military guard for some weeks.

The Hawley McIsaacs Coal Co., at St. Charles, has installed a second stripping shovel in its operation, and expects to produce about 500 cars of coal in September, it having produced close to 250 cars last month. In August the Morrison Coal Co., at Centertown, Ky., produced 549 cars by the strip process, and the Kershaw Coal Co., at the same place, stripped 480 cars.

MARYLAND

Dr. J. J. Rutledge, chief mine engineer of the Maryland Bureau of Mines, and L. C. Hutson, director of vocational education of the Maryland Bureau of Mines, have established mining classes at Frostburg, Lonaconing, Westernport, Kitzmiller and Mount Savage. Plans also are being considered for classes in other mining sections of the state. The course consists of 33 lessons dealing with all the fundamental subjects relative to the mining of coal.

MINNESOTA

According to the manager of the Ford coal dock in Duluth, about thirty Ford agents in the Northwest have ordered coal in carloads from the company. As there were notices sent out to 478 dealers, the response does not seem to be sufficiently large to represent any serious tonnage.

Just before the increased rate on coal from southern Illinois became effective, Walter H. Newton, of Minneapolis, representative from the Fifth Minnesota district, wired a protest to the Interstate Commerce Commission against the increased rates becoming effective, and asking their suspension and a reopening of the case. The rates took effect, however.

MISSOURI

The Reed Coal Co., of Fulton, will start stripping coal on the Gohring farm, three miles west of Fulton, at once. The company's steam shovel will be used in the operations. About 26 acres of coal are to be taken out, J. F. Reed, head of the company said.

NEW YORK

O. W. Seaberg has been elected a vice-president of the Steamship Fuel Corporation of New York City and will also continue his former duties as sales manager. Mr. Seaberg has been connected with this company for some time



Hospital and Doctor's Office at Hanna, Wyo.

This is one of the towns of the Union Pacific Coal Co. in a small coal field many miles east of Rock Springs.

and is well known to the coal trade. Other officers of the company are Sanders A. Wertheim, president, and J. J. Ferranto, vice-president. The Wyoming Valley Coal Co., of which Mr. Wertheim is the president, now has fourteen retail yards located in various cities. Of these three are in Brooklyn, two in far Rockaway, two in Newark, two in Cedarhurst, L. I.; and one each in Jamaica, Springfield, Mass.; Bradley Beach, N. J.; Long Branch, N. J., and Red Bank, N. J.

J. F. Birmingham, president of the Delaware, Lackawanna & Western Coal Co., has resigned as a director of the Delaware, Lackawanna & Western R.R. The vacancy was filled by the election of Charles C. Smith, of New York.

OHIO

Owing to lack of demand the Elk Coal Co. mine at Roseville has been closed down indefinitely, throwing about 150 men out of employment.

Joe Darlington, general manager of the Cowan's Creek Coal Co. at Ice, Ky., with Alex Vowles, also of the operating end, were in Cincinnati recently conferring with the owners of these mines concerning further improvements to the mechanical equipment.

Fire of unknown origin recently totally destroyed the power house and boiler room of the Mid-Hocking Coal Co., at Corning, causing a loss of \$11,000. Steps will be taken to rebuild the power plant.

The Essex Coal Co., has put into operation the Lost Run and Jacksonville mines, which had been idle for some time.

The Northern Fuel Co., which has headquarters in Toledo and of which H. H. Heiner, Jr., is the head, has opened a Columbus office with W. S. Courtright, formerly with the New Pittsburgh Coal Co., in charge.

Mines of the North Hocking Co., near Murray City, employing about 125 men, are about to reopen. The mines have been shut down since last February.

PENNSYLVANIA

The Logan Coal Co., Philadelphia, has removed to Rooms 1018-1022 Packard Building, 15th and Chestnut Streets.

Shamokin Coal Co., of New York, under Delaware laws increased its capital from \$1,500,000 to \$1,625,000.

Cornelius Brislin, treasurer of the Warrior Run local union of the United Mine Workers, is being held in the Luzerne County jail on a charge of embezzling the entire funds of the local, amounting to \$2,700.

Officials of the A. S. Van Wickle estate have announced that there has been no agreement reached in the proposal of the Lehigh Valley Coal Co. to buy the boundary pillars between the Beaver Meadow colliery of the Lehigh Valley and the Coleraine mines of the estate. Coleraine, which was started 83

years ago and which after being abandoned twice has made fortunes for three sets of operators, is about worked out. Robbing pillars was the chief method of gaining coal for years.

On the afternoon of Sept. 20 eighteen teams representing seventeen mines gave an exhibition near West Newton, of their excellent training at the first annual first-aid contest of the Pittsburgh Coal Co. First place was given to the team from Montour No. 9 mine, which nosed out the Champion mine team by a small margin, the scores being 98.39 and 98.28 per cent. The teams that participated were chosen from a field of 1,000 men who were trained last winter by instructors from the U. S. Bureau of Mines and local physicians. Final selections were made during three months of intensive training prior to the contest.

Resumption of operations at the Weston colliery of the Dodson operating interests after a strike that started July 21 has already boosted coal tonnage carried over the Hazleton and Mahonoy Division of the Lehigh Valley R.R.

The Lehigh Valley Coal Co., Lytle Coal Co., Lehigh Coal & Navigation Co. and Philadelphia & Reading Coal & Iron companies are named defendants in a suit instituted by J. Stanton Christ, of Berks county for alleged damages for coal dirt washed down the Schuylkill River upon his land.

Ten miners were injured, one perhaps fatally, at the Lance colliery of the Lehigh & Wilkes-Barre Coal Co. near Plymouth when a cage lowering them to work dropped 40 ft. to the bottom of the shaft. The accident occurred when the steam reverse refused to work.

A new washhouse and carpenter shop for the Glen Alden Coal Co. are under construction on the property adjacent to the Baker colliery, in the Bellevue section of Scranton. The washhouse will be a one-story structure of brick, steel and concrete 48 x 78 ft. in size. The carpenter shop will have concrete footings and floor, steel frame and corrugated-iron sidings and roof. It will be 40 x 60 ft. in size and one story high.

The Buckeye Coal Co., subsidiary of the Youngstown Sheet & Tube Co., at Nemaquin mine, is installing a skip hoist in the main slope and a turn-over cage at the material shaft for hoisting rock in solid end cars, which is all that will be used at that mine. An endless-rope car haul to feed the railroad cars past the tippie as they are loaded also is being installed. This is one of the most modern mines in western Pennsylvania, and since being sunk three or four years ago, has been operating with temporary hoisting equipment. This mine is at Nemaquin, Washington County, on the Monongahela River, about twenty miles above Brownsville, on the Pennsylvania R.R. The mine continues to operate while this work is being done.

Business is improving so much in the Connellsville coke region that the H. C.

Frick Coke Co., subsidiary of the United States Steel Corporation, has started up the Continental No. 1 plant, near Uniontown, firing 200 ovens, one-half of the ovens at the plant, which had been idle for several months. The Oliver & Snyder Steel Co. also has fired 100 ovens at each of its three plants near Uniontown, and the Lincoln Coal & Coke Co. has reopened its mine and blown in some of its ovens at Keister, between Brownsville and Uniontown. All of these plants had been idle for several months. The Vesta Coal Co., subsidiary of the Jones & Laughlin Steel Corporation, has resumed operations at its No. 6 mine, a union mine on the edge of the coke region, in Washington County, on the Monongahela River, after being idle for eight weeks.

Surveys are being made of the coal banks of the old Harleigh Brookwood Coal company's colliery at Harleigh now part of the Markle holdings, by James W. Boyle, of Freeland. His coal company, the Harleigh Coal company, has leased these and will run them through a washery for preparation for market of the small sizes contained in the banks. It is planned to erect frames, screens and buildings in the next month and to have things moving by the time the demand for small sized coal develops.

The Tri-District Board of the United Mine Workers, in session at Wilkes-Barre, recently decided to notify diamond drill operators and crews engaged that they must become members of the miners' union. It was declared that these men come under existing agreements and that they should be subject to union jurisdiction. About 80 of these men are employed in the three districts. The board also concurred in the recommendation of the American Federation of Labor indorsing La Follette and Wheeler and Congressional candidates approved by the independent party. Circular letters were ordered sent to all local unions in the anthracite districts urging the support of the La Follette-Wheeler ticket.

TENNESSEE

The Liberty Coal Mining Co., 421 Decatur Street, Memphis, has increased its capital from \$75,000 to \$100,000.

The Richland Coal Co., Inc., of Dayton, of which E. M. Williamson is president, has mines under development at Soddy, near Montlake. Daily output is to be about 200 tons.

TEXAS

L. W. Stephenson, of the U. S. Geological Survey, is in Texas for several months to be engaged in field studies of the upper Cretaceous and in work on the new state map.

UTAH

William Littlejohn, general superintendent at Castlegate for the Utah Fuel Co., suffered a broken leg in an automobile accident Sept. 10 while driving on the Park road near the head of Horse Creek canyon.

L. F. Rains, president of the Carbon Fuel Co., Salt Lake City, acted as grand marshal in the twilight parade in Salt Lake City on Defense Day.

Preparations are in progress for a resumption of operations by the King Coal Co., originally known as the Star mine, at Musselshell, within a short time. The property has not been worked for several months owing to the depressed condition of the coal market. A rearrangement of the surface plant is planned and it is reported that the management will place a considerable number of men on the payroll.

VIRGINIA

The Norfolk office of the Logan County Coal Corporation, in charge of H. M. Fadley, will be moved to Richmond, Oct. 1.

WASHINGTON

In the process of reorganizing the Corbin coal interests, the Corbin Coal & Coke Co., capital \$10,000,000, was permitted by the Superior Court at Spokane to dissolve on Sept. 9. The interests of the company have been taken over by Corbin Coals, Ltd., a British Columbia corporation with a capital of \$5,000,000, according to the concern's lawyers. Only part of the stock of the Corbin Coal & Coke Co. had been issued. The British Columbia corporation controls several coal mines in that province.

WEST VIRGINIA

The principal office of the Oriole Coal Co. has been moved from Huntington, W. Va., to Pittsburgh, Pa. The New Howard Coal Co. has changed its principal office from Sprigg to Huntington.

Among West Virginia Coal companies that have surrendered their charters are the Candace Coal & Coke Co., the Colgate Coal Co. and the Virana Coal Co. The Penn-Mary Coal Co. has withdrawn from the state, mines formerly operated by it now being operated by the Bethlehem Mines Corporation.

The Buchanan Coal Co., at Buchanan, in the Fairmont region, with a normal output of about 2,000 tons per day, which has been idle for several months, started a small operation last week, at a reduced wage scale of about \$3.50 per eight-hour day for inside drivers, tracklayers, etc., and \$3 per day for outside labor.

Henry A. Phillips, of Pittsburgh, has increased his coal holdings in Clay district of Monongalia County through the acquisition of four tracts aggregating 285 acres of Pittsburgh coal. The undivided half interest in one tract of 160 acres, purchased from D. Richard White and wife, brought \$24,000 or about \$300 an acre; 30 acres on Jakes Run, \$6,048.75; 10 acres brought \$2,020, and 84 acres on Thomas Run brought \$16,885.80.

The Pond Creek Pocahontas Coal Co., subsidiary of the Island Creek Coal Co., of Holden, is putting in a new mine to tap 3,000 acres of Pocahontas

No. 4 coal which lies at a depth of 600 ft. on Dry Fork, McDowell County. A man shaft and a main shaft to be equipped with skips have already been sunk and a new tibble has been erected, though the latter is not yet in operation. Other mine buildings and a town are being planned. The mine will produce in the neighborhood of 2,500 tons daily.

New companies organized in West Virginia during August had an aggregate capitalization of \$260,000. They were the following: Crandall Mining Co., of Altman, capitalized at \$50,000; Duffy Brothers Coal Co., of McMechen, capitalized at \$10,000; Manufacturers Gas Coal Co., of Wellsburg, capitalized at \$50,000; Rogers Elkhorn Coal Co., of Virgie, Ky., capitalized at \$150,000.

The Crystal Block Coal & Coke Co. has increased its total authorized capital stock from \$500,000 to \$700,000. Other concerns increasing their capitalization include The Peerless Smokeless Smithing Co., from \$100,000 to \$500,000; New Howard Coal Co., from \$300,000 to \$400,000; Cardiff-Pocahontas Coal Co., from \$100,000 to \$150,000; The Peerless Smokeless Smithing Company has changed its name to the Peerless Fuel Co.

Roda No. 1 team of the Stonega Coal & Coke Co., tied with the Derby No. 2 team of the same company, won by a small margin in the play-off at the sixth annual first-aid meet of the Virginia Coal Operators Association on Sept. 20. The Roda team has been victorious for two years and has enabled the Stonega company to win the association cup three times in the last six years. Twenty-nine teams were entered. The American Red Cross, U. S. Bureau of Mines and the National Safety Council co-operated with the Virginia association in holding the meet.

WYOMING

W. C. Alden, of the U. S. Geological Survey, has completed his summer's geological work in Wyoming.

Mine exhaustion and operating troubles in Union Pacific Coal Co. coal lands in the Cumberland region have caused the company to employ A. R. Schulz, a former government geologist, to prospect the Cumberland region in an effort to locate deposits which will enable the company to open new mines without abandoning that district.

According to a recent announcement, the Sheridan-Wyoming Coal Co. will operate its own property in the future. D. P. B. Marshall, attorney for the firm, announced the cancellation of the company's contract with the Peabody Coal Co. for operating and selling. Harry N. Taylor, of New York City, will continue as president of the Sheridan-Wyoming company. He has held the office for the last year, succeeding Peter Kooi, of Sheridan. The Sheridan-Wyoming company will now organize its own operating and sales departments, and will hold in the field a great majority of the local personnel formerly employed by the Peabody. Edward Bottomley, who has been division super-

intendent in charge of operations in this field ever since the consolidation in 1920, has been invited to continue as general superintendent in charge of operations for the Sheridan-Wyoming company.

CANADA

Dr. Charles Camsell, chairman of the Dominion Fuel Board, states that only from 25 to 50 per cent of the consumers of domestic fuel who last year bought their winter's requirements during the summer have done so this year, and fears that this condition will disturb prices and cause considerable inconvenience.

At a special meeting of the preferred shareholders of the Dominion Coal Co. in Montreal on Sept. 23, a mortgage of \$15,000,000 on the company's property was authorized. President Roy N. Wolvin announced that a reserve fund would be created to be drawn upon for the payment of dividends in years when current earnings might be insufficient for the purpose.

J. E. McLurg, vice-president of the British Empire Steel Corporation, states that it is the intention of the company to send three or four of the mine managers of the Dominion Coal Co. on an educational trip through the coal districts of the United States.

The Coal Dealers' Association of Regina, Alta., states that owing to the protracted miners' strike there is serious danger of a coal shortage in that city. They have stocks on hand sufficient to last for only five or six days of cold weather and no plans are being made to relieve the situation by bringing coal from the East.

The Scranton coal mine, situated northwest of Drumheller, Alberta, was re-opened on Sept. 15, the miners accepting last year's contract. The output of 100 tons daily will be rapidly increased. Two other large mines are preparing to sign up with their men. John A. Henderson, of Winnipeg, part owner of the Gem mine, in Northern Alberta, states that there is more coal coming to Winnipeg from Alberta than is required to meet the present demands of householders who have been holding back orders on account of fine weather. All the mines west and south of Edmonton are working with non-union labor.

Industrial Notes

F. C. Ackerman, formerly fuel supervisor for the Baltimore & Ohio R.R. at Wheeling, W. Va., has severed his connections with that company and is now representing the Hulbert Oil & Grease Co., of Philadelphia, in the Wheeling district.

Martin G. Sperzel was elected a director and the vice-president of the **Royersford Foundry & Machine Co., Royersford, Pa.** at the regular Board Meeting held Sept. 10. He succeeds H. R. Will, who has retired from the company. Mr. Sperzel also will assume new duties as the company's general manager. He will continue, however, to be in charge of all sales including machine tools, punch and shear machines, and tumbling barrels, which heretofore have been directed from the home office at Royersford, Pa. Mr. Sperzel will be, as at present, in the Philadelphia office of the company, at 52 North Fifth Street.

Traffic

Ohio Coal Company Withdraws Rate Protest

The Ohio Collieries Co., Toledo, Ohio, has dismissed its protest pending before the state Public Utilities Commission against the coal and freight rates of the Hocking Valley R.R. on shipments from the Hocking and Pomeroy district to Columbus.

The case had been set for a second hearing by the commission for Sept. 24. The protest contended that the rate, \$1.26 per ton, was unjust and discriminatory as compared to the rates on West Virginia coal. One hearing already had been held at which the coal company produced evidence to substantiate its claim that rates should be lowered.

Governor Donahey a few days ago directed the Attorney General's department to take action before the Utilities Commission in an effort to have this inequality in rates adjusted for the benefit of Ohio miners and operators.

Dealers to Combat Higher Rates From Illinois and Indiana

'Coal dealers' organizations and other consuming interests are organizing throughout the Northwest to combat the proposed increase in rates on coal from Illinois and Indiana to Wisconsin, Minnesota and the Dakotas. These rates were ordered originally in the Lake Dock cases decision, but were suspended in so far as they applied to central and northern Illinois and to Indiana. They are now in effect on coal from southern Illinois, however. The suspension period ends Jan. 8 and hearings no doubt will be held before then.

Idaho Coal Rates Reduced

Lower freight rates on coal from the Brown Bear mine of the Teton Coal Co. to all points on the Oregon Short Line in Idaho were filed Sept. 18 with the State Public Utilities Commission by the railroad company.

The new tariff, prepared in compliance with the commission's order of Aug. 23, is made retroactive, its effective date being that of the order.

Virtually, the new rates are those compiled by Samuel N. Newton, rate expert of the commission, as alternatives for rates proposed in a tariff filed by the railroad company on July 12, which was suspended and made the subject of a commission hearing held at Pocatello on Aug. 4.

The original tariff was held to be discriminatory because it contained rates higher per ton-mile than those in effect for coal hauled from Wyoming and Utah fields. As amended, the rates were lowered from 5c. to \$1.70 a ton in nearly all points in the state.

The tariff is the latest step in the experiment, marked by an extended contest before the Utilities Commission, by H. F. Samuels, Progressive nominee for Governor, and his associates, Robert H. Harlin and Carl A. Reichert, to bring the old coal prop-

erties of the Teton valley into successful operation again. After commission hearings which resulted in an order requiring the Oregon Short Line to repair its tracks from Talbott Junction to the Brown Bear mine, an agreement was reached between the parties, the tracks were repaired and shipments of coal began on July 7.

Obituary

James M. McVey, president of the Cadell Ridge Coal Co., and a well-known operator of Fayette County, met instant death on the night of Sept. 19 when an automobile he was driving plunged down a steep embankment near East Bank, W. Va. Mr. McVey, who was 44 years old, had taken an active part in politics and was elected on the Republican ticket as a member of the Legislature from Fayette County, serving at the session of 1919. Succeeding him in that office was his brother-in-law, H. T. Lyttleton, who met death in the same way about two years ago near Glen Jean. At that time Mr. McVey was in the machine but escaped with a few bruises. The funeral was held at Charleston.

I. B. Parsons, 75, a pioneer of the Birmingham (Ala.) district, and for many years associated with various coal companies in exploiting coal lands in the vicinity of Birmingham, died Sept. 14 at a local infirmary after a brief illness. Mr. Parsons was born at Adger, Ala., and went to Birmingham when he was about 10 years old. Beside his coal-land work, he served a number of years as a deputy for the county. He leaves two sons and five daughters.

Frederick Rice Buell, formerly Lehigh Valley coal agent in Milwaukee, died Sept. 12 in the suburbs of Cleveland. He was born in Geneseo, N. Y., 70 years ago and was for some years, as a young man, connected with the wholesale anthracite business of Andrew Langdon in Buffalo. He had a diversified career, going to the Klondike in the gold rush there and once owning a ranch in Idaho. He was educated in Buffalo and the University of Michigan. His father, Frederick Buell, was Collector of the Port of Buffalo and his mother was a daughter of the Rev. Charles Backus Storrs, founder and first president of Western Reserve University, Cleveland. He left no descendants.

Coming Meetings

Alabama Mining Institute. Annual meeting, Oct. 7, Hotel Hillman, Birmingham, Ala. Secretary, James L. Davidson, American Trust & Savings Bank Bldg., Birmingham, Ala.

Illinois Coal Operators' Association. Annual meeting, Oct. 7, Chicago, Ill. Secretary, C. E. McLaughlin, Fisher Bldg., Chicago, Ill.

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.

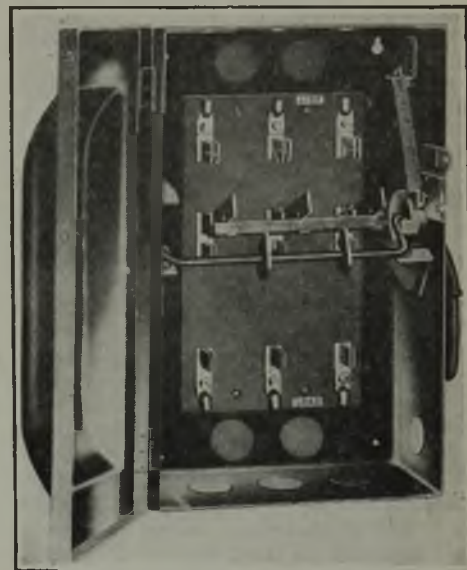
West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

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.

New Equipment

Safe Motor-Starting Switch

A safety switch suitable for use with small motors and under conditions where it is desirable to interrupt currents quickly has been placed on the market by the Trumbull Electric Manufacturing Co., Plainville, Conn. The fuse block is mounted over the switch base so that the fuses are readily accessible. Line leads can be brought in either at the top or bottom of the switch. The switch is provided with a



Quick Make-and-Break Switch

Switches like these are suitable for starting small motors. The quick rupture of the circuit is accomplished by a spring attached to the operating handle.

quick make-and-break device and an interlock.

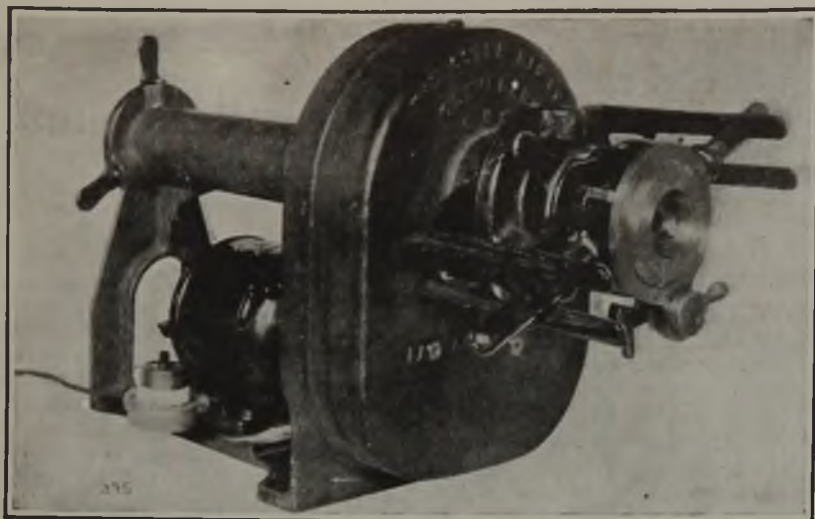
The construction is of the "dead-front" type, a shield being used to cover the line terminals. The switches are furnished fused or unfused two-pole or three-pole for 250-volt service, but 440-volt and 550-volt two-pole and three-pole switches will soon be placed on the market.

Power Drive for Die Stocks

Undoubtedly every man who has had the experience of pulling on a die stock knows of other jobs he would rather do. It's a back-breaking proposition. The large power pipe-threading machines used today are back savers and are great things for shop use; but what of a small, compact, power outfit capable of threading all sizes of pipe used generally in every-day work and as easily conveyed from job to job as a hand tool!

To meet the requirements of a tool of this character the Oster Manufacturing Co., Cleveland, Ohio, has brought out the machine illustrated herewith. A clear conception of the simplicity and compactness of this little unit may be gained from a study of the illustration presented.

It has both the qualifications desired



A Handy Machine for Use Where Much Piping Is Done

Pipe may be threaded, cut and fitted with this little power unit. It is portable and operates from the ordinary electric-light circuit.

—portability and the capacity for handling all sizes of pipes used mostly by anyone having pipe threading to do. It weighs but little over 200 lb. and may be conveniently handled by two men. The machine being designed to drive the No. 104½ Oster bulldog die stock gives it a range covering all sizes of pipe from ¼ to 2 in. inclusive. Its length over all is 2 ft. 11 in., width, 1 ft. 2 in.; height, 1 ft. 8 in.

A ½-hp. motor geared to the driving arms furnishes ample power to thread all sizes within the range of the machine. The driving arms maintain a no-load speed of 9 r.p.m. and approximately 8 r.p.m. under a load. The machine is not a rapid production outfit but it will keep two or three good men hustling to fit up the pipe it will thread. Running the machine from an ordinary electric-light socket eliminates the necessity of installing extra wiring. A built-in scroll chuck and auxiliary centering guide are two desirable features, no extra vise being required. Both the chuck and the guide are self-centering and self-locking.

Due to the fact that the gears are completely enclosed and running in oil, the machine operates with very little noise and wear.

The machine as a whole is claimed to be very durable, built to stand the everyday hard use over the ordinary business lifetime. The driving arms which are necessarily strong are of malleable iron. The chuck jaws and guides being subjected to much wear, are drop-forged steel, case hardened. The machine was originally intended to be used for driving the bull dog die stock. However, it was equally efficient in driving a hand cutter.

The cutter is placed on the pipe in much the same fashion as it is when about to be cut off by hand. The handle rests against one of the driving arms and the machine revolves it. All the operator does is to tighten it on every revolution. The machine later proved its ability to turn up fittings as well. The elbow coupling or tee is started by hand, one or two turns are given, a wrench is placed on it, and the driving arms do the rest. When the fitting is tight the operator simply snaps the switch.

Starter for High Voltage Induction Motors

An automatic high-voltage compensator has just been placed on the market by the Electric Controller & Manufacturing Co., Cleveland. This compensator is built for voltages as high as 2,500 and below. It is pushbutton operated and entirely automatic. With the exception of the overload panel, which is mounted on the top of the tank, the compensator is entirely submerged in oil and the tank is so designed that it is dustproof, weatherproof, vaporproof and fireproof. The compensator can be installed either indoors or outdoors.

A pushbutton supplied by energy from a low-voltage circuit which is taken from an independent transformer is so arranged that there is no danger

of the operator ever coming into contact with the high-voltage circuit. Because the starting transformers and the operating mechanism are entirely submerged in oil and automatically operated, all possibility of explosions or high-voltage flashes is removed.

This automatic compensator is so designed that continuous torque is ap-



No Moisture or Dust Can Get In This Automatic Compensator

Built like a transformer and sealed against moisture and dust, this unit is made safe for service anywhere.

plied to the motor from the time the pushbutton is pressed until the motor has been brought up to full speed. Operation of the starting switch causes the motor to be started under reduced voltage.

Contactors and Starting Transformers Submerged in Oil

All the current-carrying and transforming elements of this starter are operated in oil. A separate transformer supplies current to a pushbutton switch used for starting and stopping the motor. After the motor has reached the proper and safe speed it is automatically thrown across the line.

