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COAL AGE

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DEVOTED TO THE OPERATING, TECHNICAL
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COAL-MINING INDUSTRY

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COAL AGE

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

R. DAWSON HALL
Engineering Editor

Volume 27

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Number 1

Happy New Year

CHRISTMAS is a celebration of the heart and New Year's Day one of the head. On Christmas our hearts go out in affectionate impulse to our friends, our neighbors and the world in general. New Year's Day is more personal, the day when we look back at the twelve months past and forward into the year to come. There's a canniness about the New Year's celebration. Back of the festivity are resolutions, a purpose and forethought. We come back to the problems of everyday life.

This brings to mind the fact that the close of last year revealed, at least to union operators, the advantages and need of the utmost efficiency. Business briskened—for the efficient. Record runs were made—by those who had a good sales organization and mines which could produce coal cheaply. Others still found it hard to compete. Business improved—for the provident and only for them. In Illinois the operators who in idle times had prepared for low-price production found that their efforts gave them control of the market.

The argument is strong, therefore, that in union mines the course in 1925 must be charted on lines of economy of operation. There is none too much coal demand and those with well-planned mines and a competent personnel will monopolize it. If we prepare for competition we shall get the major part of the business. The tonnage in 1925 will be greater than in the year just past, for there is greater industrial activity and there are smaller stocks on hand.

The union fields will get more business than in 1924, but not enough that all will have an equal part of it. What there is will go to those who have pared their operating costs to the quick. In non-union fields all the mines, doubtless, will operate, but their profits will be determined by the vigilance they exercise in eliminating the last dollar of cost.

Widen the Circle

NO STOCKS are more closely held than those of coal companies, and consequently the coal industry is a fair target for unfavorable criticism, inordinate taxation and improper regulation. It would help greatly if the stocks and bonds were more widely distributed. The power companies have deliberately sought to put both in the hands of their consumers. The telephone companies have made a similar and successful effort. Thus they have everywhere persons favorable to them, and they are not oppressed.

It would be well, indeed, if the coal industry were similarly situated. Instead, it is an industry apart, which few understand, with which few, if any, sympathize and in which only a few have an interest. To be thus isolated is to invite class legislation and other oppression. Bring the outsider in, let him take a hand in the game and he will be less likely to begrudge the winnings when he realizes the chances of loss.

Capitalize Your Adversities

SOMETIMES we see men who have lost their energy and vision, holding what should be regarded as responsible positions on the staffs of coal companies. After years of effort trying to introduce new ideas and methods they have come to believe they have been battling their heads against a stone wall. It is discouraging to see the old management proudly pointing to a rickety steam hoist installed in grandfather's day and acclaiming satisfaction with anything that will still run regardless of its inefficiency, danger, and high maintenance costs.

One man we know has been bucked on all sides by the operating department of a large coal company but still shows his pluck by declaring, "I'm going to accomplish all I can now and against the odds of today, even though it might be easier to delay the attempt until tomorrow." He is not of the type to succumb to discouragements.

The engineer, with only one good leg, who stands on his wooden support and feels the feeder lines to find out if they are warm from overloads, knows how to capitalize his adversities.

The industry owes much to such men as these because they are the type which do the things today that others think can be more easily accomplished tomorrow.

Colorado Moves Toward Greater Safety

NO ONE, we hope, will criticize James Dalrymple's efforts to have laws made that will insure Colorado mines of greater safety in operation. Most of the proposals he expects to submit to the coming Legislature are excellent. We believe that the mine owners of that progressive state will be among those favoring the passage of some such laws.

However, we are sorry to see that the operators are to be allowed to leave their mines without rock dust provided the dust of the mine contains 30 per cent of water. Unfortunately such a provision is almost impossible of ascertainment. A mine may be satisfactorily wetted one day and lacking in the required percentage of water a day or two later. The air circulating in the mines dries up the water rapidly but does not deplete the rock dust. So, a rock-dust test is a real appraisalment of safety and a moisture test is an inquiry of merely temporary interest. Great Britain's recent explosions have been in mines supposed to be properly wetted and in consequence that country has made rock dusting obligatory in all mines but those which produce anthracite. Colorado should do no less.

Nor are we pleased to see that it is reported that the law will require that all shotholes be tamped to the mouth with clay or other incombustible. If that provision is to be interpreted as meaning that there should be no air space or loose rock dust in the hole it is probably an undesirable requirement. If a carefully

regulated air or loose rock-dust space be provided of a measured and certain volume, larger coal will be obtained, and the permissible will do its work without the violence that a more densely charged explosive would create.

However, it must be remembered that no Governmental authority has passed on such spacing, so perhaps Mr. Dalrymple awaits a conclusion, and until the safety of the method is proved beyond all doubt, he prefers to follow the methods believed in the past to be safest. He can move for revision should the advocates of open spacing and loose rock dust have the best of the argument. He, doubtless, has an open mind, but would move slowly and conservatively.

In a short while we shall know definitely whether the rule is for the best. Our difficulty will be to be assured that the right spacing always is used and that the full length of tight tamping required is provided. That can be made a matter of exact definition, and means probably can be found whereby shot loaders could be prevented from exceeding the exact allowance. We fear, however that the West has not been following the possibilities of open spacing, a method that tends to safety because it makes a quick explosive do its work as efficiently as one that is slower without the risk that an overcharge will shatter the coal to powder. Such a provision would make management and men more favorable to the introduction of permissible powders which the text of the law as proposed requires.

Let Fine in Size Be Fine in Quality

FOR YEARS the producers of anthracite have sought to market their small sizes for use as house-heating fuels. For years, also, the householder has been yearning for some fuel that would satisfactorily serve as a substitute for the high-priced domestic sizes. If some cheap yet efficient and satisfactory means for burning buckwheat, rice and barley sizes could be produced, therefore, everybody would be happy, as both producer and consumer are seeking this common goal.

Several obstacles stand in the way of successful domestic utilization of small anthracite. The first of these is the procurement of furnace grates with apertures sufficiently small to retain the buckwheat sizes. Most house furnaces, stoves and ranges as shipped out by the manufacturers are fitted with grates suited to ordinary domestic fuels. Naturally the fine sizes leak through them almost as readily as water goes through a sieve. When in his efforts to economize, the householder seeks out the local dealer handling his particular furnace and requests a grate with smaller draft openings he is told that no such grate is made, only the regular pattern being available. If the would-be purchaser is insistent he is informed that if he will go to the nearest foundry and have a set of patterns made he probably can get the kind of grate that he wants. This entails an excessive expense, as the patterns will cost far more than the castings.

Drafting, or providing the fire with sufficient air, forms the second difficulty. This can be overcome by providing mechanical draft either forced or induced. With forced draft air is blown into the ashpit of the furnace, thus placing the air below the grate under sufficient pressure to drive it through the fuel bed. This is a simple and effective means of furnishing the necessary draft. It is open to the objection, however, that if

any of the passages between the fuel bed and the chimney are restricted or if the chimney is not large enough or high enough to maintain a slight vacuum within the furnace it will "leak" gas. This is highly objectionable as the escaping gas is likely to permeate the entire house.

Induced draft is far more satisfactory from the standpoint of gas leakage. When this method is used the draft fan is placed between the furnace and the chimney, the products of combustion, or a portion of them being passed through it on their way to the stack. Air is drawn through the fuel bed by suction, and the liability to gas leakage is small.

But, supposing that these two difficulties have been satisfactorily overcome, there yet remains the coal itself. The standards of preparation of this fuel are not exacting enough, and its quality, at least as received, usually is extremely uncertain. The small sizes have long been considered as the dregs of the mine product and have been prepared accordingly.

Although small sizes of anthracite of inferior quality may be burned successfully in power-plant or industrial furnaces where firings are frequent or continuous, as in the case of the stoker, and the force of the draft may be regulated to suit the requirements of any particular instant, such coal imposes a severe handicap on the householder. The domestic furnace necessarily is fired heavily at infrequent intervals. The draft produced by a miniature fan or blower, such as those now made for the purpose, is small at best, and the fire, though aided by this draft, sickens and lies dormant if any large quantity of extraneous ash is present. This material is not only worthless as a heat producer but is totally inert in a fuel bed. This deadening action or resistance to ignition and combustion is out of all proportion to the percentage of inert material contained in the fuel.

There is some reason to believe that extraneous ash more seriously impedes the ignition of the fuel it contaminates than inherent ash, and as it can be eradicated, at least in large measure, there is no reason why the householder should not be provided with a fuel that he can burn readily. Any considerable percentage of slate or rock in the small sizes of anthracite unfit them for domestic use even though the heating equipment employed by the householder is capable of burning small coal satisfactorily—that is so long as it really is coal.

The moral of all this is obvious. Before the producers of small anthracite sizes can hope to dispose of this product as a domestic fuel, not only must means be available for burning these sizes but the consumer must have some assurance that the fine coal he is offered will have some semblance of uniformity, not only in size but in quality. At present any attempt of the ordinary individual to buy his winter's supply of fuel on specifications is met with derision.

The householder is not always in a position to demand and insist upon getting coal of a certain quality. In reality he cares little who produces his fuel or where it comes from so long as it answers his requirements satisfactorily. With coke, oil, bituminous coal and in many cases gas all available for house heating the domestic consumer is chary about making the investment necessary in order to utilize small anthracite sizes. After having made this investment he will be especially rancorous—and justly so—if he gets "stung" with coal so full of slate and rock that it is unburnable in his equipment.



Strip Pit and Cableway

Wasting Strip Pit Spoil by Means of a Cableway

Two Coal Beds Being Stripped—Both Have Been Worked Twice Already—Coal Picked from Rock and Rock from Coal—Rock Dumped on Slate Bank, Coal Discharged to Cars and Taken to Breaker

BY FRANK A. KNEELAND
Associate Editor, *Coal Age*,
New York City

STRIPPING introduces many problems, one of which, and in many cases a highly important one, is the disposal of the spoil. So far as actual digging is concerned, be this in either overburden or coal, there is little question but what the railroad type of power shovel is more rapid than the full-revolving machine of equal size. In many strip pits, however, it is essential that the spoil be lifted through a greater height than can be attained by the railroad shovel. Also it may be highly advantageous to load the coal cars at some point that could not possibly be reached by any type of power shovel yet built.

Such conditions prevail at a small stripping of the Pennsylvania Coal Co., near its No. 14 colliery which, in turn, is located near Plains, Pa. This strip pit resembles many another throughout the anthracite region and elsewhere in that the coal is now being worked for the third time. When operations were first started the coal was attacked by underground mining. By the methods then in vogue and by the standards then prevailing the mine, or this particular portion of it, was worked out and abandoned. Later on the outcrop was stripped as far down as was economically profitable at the time and the deposit, or that portion of it here in question, was again abandoned as being exhausted. Today improved appliances as well as better methods and an increased market value for the product render it profitable to strip the surface from much of the coal left in place by the original underground operations.

Both the Pittston and the Checker beds are being uncovered at this stripping. The Pittston bed is at this point about 8 ft. thick and the Checker bed which overlies it and is separated from it by approximately 10 to 12 ft. of rock is about 6 ft. thick. Both measures

have been worked by underground mining. The coal of the Checker seam appears to be appreciably softer and more friable than that of the lower measure.

For digging both overburden and coal a Bucyrus "250" railroad type of steam shovel is being employed. Compared with some of the shovels used in coal stripping today this machine is of small dipper capacity, short reach and low lift. It is, nevertheless, fairly rapid in its action and reliable in operation. It cannot, however, reach the present position of the track by which coal is taken to the breaker.

CABLEWAY CHEAPLY DISPOSES OF SPOIL

In order to dispose of the spoil at this stripping a short electrically driven Lidgerwood cableway has been constructed. This is about 450 ft. long and spans the



Fig. 1—Shovel Discharging to Cableway Skip

While the shovel makes its next dip the crew will sort out the coal from the rock and lay it to one side. Coal so laid out may be seen in front of the shovel side jack. Later this will be loaded into the skip and by it discharged to a mine car.

NOTE—As may be seen in the headpiece, the cableway spans the strip pit approximately at right angles to the direction of travel of the steam shovel. The coal cars are spotted under the cableway on a berm far beyond the reach of the shovel both horizontally and vertically. Slate is disposed of at the right, and the motor driving the cableway is located in the tower to the left.

open cut approximately at right angles to the shovel travel. Material, either coal or rock, dug by the shovel is taken away by this device, the coal being deposited in mine cars on a track berm beside the pit and the rock being wasted on the rock dump.

The two towers of this cableway are wooden structures about 70 ft. high. Each is carried on tracks that extend parallel to the cut made, and to be made, by the steam shovel. The whole cableway may thus be moved along as the stripping progresses in either direction. The tracks may, of course, be added to or extended as necessity may require.

The present method of operation is as follows: Suppose that the shovel is digging chiefly in rock. In ground that has been first mined and is as badly caved as that found here it is the exception rather than the rule that the machine can get a dipper-full of either rock or coal unmixed with the other material. Accordingly, when the shovel is digging in ground that is chiefly rock it dumps this material into the skip of



Fig. 2—Dumping on the Rock Bank

In order to save all coal possible a man is stationed on this bank to pick out what coal has been missed by the pit crew laying it to one side. This is later loaded onto the skip and transferred to the mine car for transportation to the breaker.

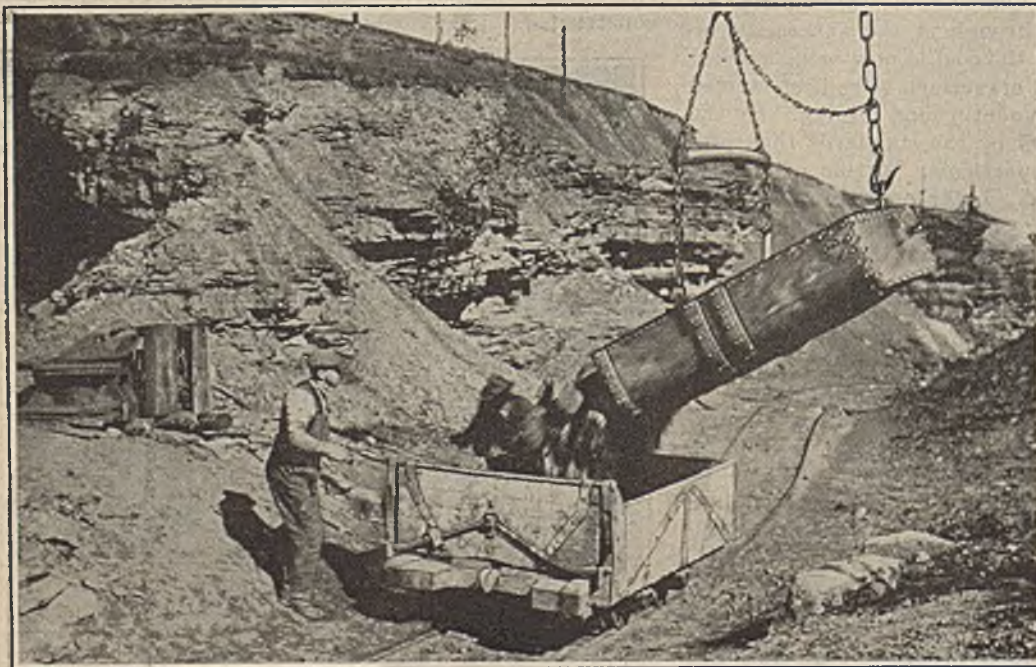


Fig. 4—Loading a Coal Car

Inasmuch as the skip hangs freely from the cableway there is more or less recoil or kick and consequent movement of the skip as the coal slides out. This movement also results in a certain amount of spillage over the sides of the car. This is not altogether objectionable, however, as it offers an excellent opportunity for picking out any slate and rock that may have escaped the pit gang and for building topping upon the car. Coal leaving this stripping for the breaker appears to be perfectly clean and devoid of all extraneous material.



Fig. 3—Hoisting a Skip Load of Coal

Directly behind the skip may be seen a pillar of the old underground workings. What remains of an old room, breast or chamber may be seen to the right of the shovel boom. In the pillar the top of the Checker bed and the bottom of the Pittston bed may be plainly seen. The digging that the shovel is called upon to perform is not particularly hard but it is seldom that a dipper full of either rock or coal can be obtained that is unmixed with the other material.

the cableway that has been lowered and rests on the ground alongside. While the shovel is making its second dip the pit crew pick out of the dumped material all the coal that is readily perceivable laying it to one side. The same procedure is followed after the second dump. This fills the skip and after the coal is removed from it the yoke chains are attached, the skip hoisted, traversed to the rock bank and there discharged.

In order that no coal may be lost a man is stationed on the spoil bank who picks out of the rock the pieces of coal that have escaped the pit gang, throwing them to one side. During slack periods in the pit, this coal is gathered up, loaded into the skip and dumped into the coal cars.

If the shovel is working in material that is mostly coal a slightly different procedure is followed. Such material is dumped into the waiting skip as was the rock, but this time the rock is picked from the skip's contents instead of the coal. When the skip is full it

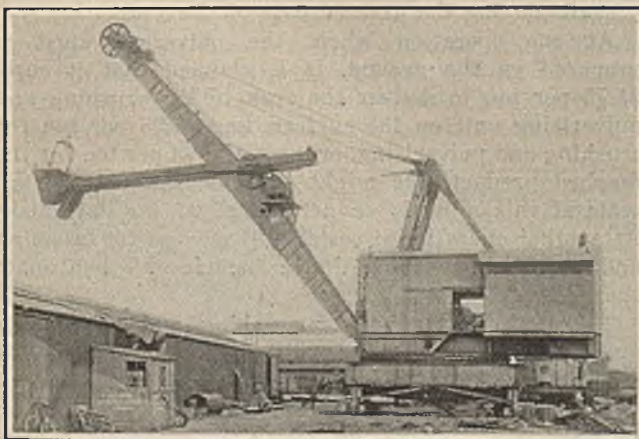
is hoisted, traversed to a point above the coal track and its contents discharged into a mine car which is spotted under the cableway. Here the car trimmer removes any slate and rock that was missed by the pit gang. There is a further separation, of course, at the breaker. All of the various operations at the strip pit and adjacent to it are clearly shown in the accompanying illustrations.

To recover coal from areas supposedly long since worked out, is by no means a new proposition in the anthracite region. Development of the modern long reach steam and electric shovel has done much to render such areas amenable to recovery. It is interesting to note, however, that spoil may be wasted by other means than overcasting or hauling away in dump cars. It may quite possibly develop that where the quantity of overburden to be disposed of is not large and space for its disposal is fairly close at hand, the aerial cableway in the future may be utilized far more extensively than at present.

Big English Shovel Loads Australian Coal Eight Tons per Dip

Production of coal by open pit is by no means confined to the United States. The State Electricity Commission of Victoria, Australia, recently purchased from Ruston & Hornsby, Ltd., of Lincoln, England, the big full-revolving electric shovel shown in the accompanying illustration. This machine, which in many respects strongly resembles the one illustrated and described in *Coal Age* of Dec. 4, 1924, p. 789, will be put to work digging brown coal at Morwell, Victoria, Australia, in the Latrobe River Valley, where it is estimated 10,000,000,000 tons of this fuel is available within an area of 60 square miles.

This shovel, or as the English call it, "crane navy," is designed to make a cut 75 ft. deep, and 60 ft. wide. It is estimated that with it two men can dig 3,000 tons of coal in 8 hr. One man acts as operator and controls all movements of the machine, the second serving as an attendant or oiler. The dipper has a capacity of 10 to 12 cu.yd. and will fill an 8-ton car at one dip. The machine will be able to discharge a full dipper of coal at a point approximately 70 ft. above the rail and 100 ft. horizontally from the center of rotation.



Big Shovel in Builders Yard, at Lincoln

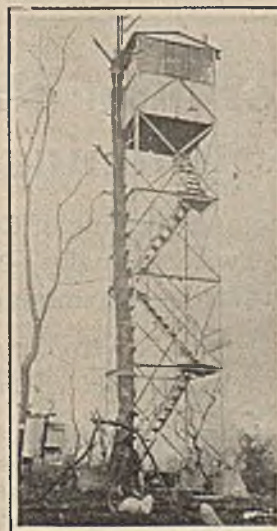
This shovel bears a remarkable resemblance to some American machines that have been used in coal production for years. It has a lift of about 70 ft. and a reach of approximately 100 ft. from the center of rotation. As brown coal or lignite is comparatively light the dipper capacity has been made 10 to 12 cu. yd.

Energy is brought into this shovel as 6,600-volt alternating current. Within the cab it is converted to 440-volt direct current and supplied to the hoisting, crowding, swinging and trip motors at this potential.

The single hoisting cable is of slightly over 2 in. diameter and has an ultimate strength of 150 tons. Four, 4-wheel trucks, one at each corner of the underframe, all power-operated, support this shovel. The revolving superstructure is carried by, and turns upon, a 30-ft. circle of rollers. A complete cycle of operation—digging, swinging to place, discharging, swinging back and lowering ready for another dip—requires approximately one minute. The weight of this shovel in working order is about 350 tons. The electrical equipment installed upon it was furnished by the British Thompson-Houston Co. of Rugby:

Fire Tower Guards Elkhorn-Piney Coal Co.'s Woods at Powellton, W. Va.

Recognizing the need to protect the timber of the state for the mining industry, for construction and for preservation of the water supply and wild game, the State of West Virginia has erected fire towers from



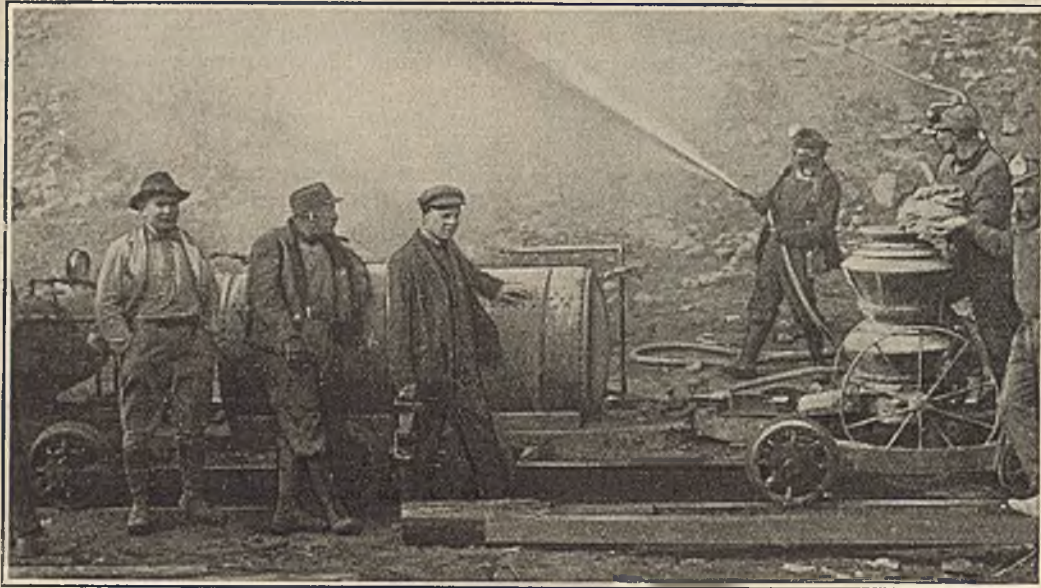
Fire Tower

At an elevation of 2,350 ft. above sea level this fire tower serves a total area of 150 square miles. It seems to have been built after the fire had done much of its fatal work.

which watch can be kept of the woods for miles in all directions. One of these is situated on the property of the Elkhorn-Piney Coal Co., at Powellton, W. Va. During the spring and fall men are kept in these towers 24 hr. per day, but when the woods are damp and the season unfavorable to fires the entire state department is reduced to only two men, the chief and his assistant. A telephone, see box on tree, is provided at each tower. The room contains a stove, is cased all around and is provided with maps and instruments for locating the direction of and the distance to, any fire spotted. Fire deputies are appointed in most towns and these men can command the necessary help to fight fires, the law providing a fine to any one refusing to go. The coal company co-operated in the building of the tower donating the plot of ground on which it stands.

Progress in Cutting Machines in Britain

In 1901, the tonnage of coal cut by machines in Great Britain, excluding Ireland, was 3,044,321 or 1.4 per cent of the total output. In 1913 the tonnage had risen to 24,369,516 tons or 8.5 per cent of the nation's coal production. In 1923 the figure rose to 47,526,439 tons or 17.2 per cent of the national output. In the last-mentioned year 5,764,805 tons were cut by percussive machines; 8,156,053 by bar machines; 14,216,031 by disk machines and 19,363,065 tons by chain machines. The number of tons mined by each of these types was larger in 1924 than 1923.



Cement-Gun Distributing Rock Dust

Rock Dust for Mine Protection, Fire Fighting, Shot Stemming and Cushioning

Unequal Drying and Wetting of Coal and Rock Dust Is One Reason for Dusting Mines Twice Annually—Mine Fire Fought by Powdered Rock from Explosion Barrier—Stemming Spreads Dust Fifty Feet from Face

BY EDWARD STEIDLE

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Carnegie Institute of Technology, Pittsburgh, Pa.

PHYSIOLOGICAL tests have shown that rock dust which contains 25 per cent of free silica or less is not likely to be harmful. Mineral dusts that are soluble in the secretion of the respiratory tracts, or that form a colloid-like mixture with them, should not be harmful to health even when breathed continuously for some time and in considerable quantities. We should not be too seriously concerned regarding the physiological effect of rock dusting.

Little of the rock dust distributed in a mine is suspended in the air except during the actual operation of coating the passageways or preparing concentrated areas or loading barriers, and if warranted a standard respirator may be worn by the workman engaged in such work. The trip-riders are probably those most concerned, and even they should suffer no unusual inconvenience or ill effect. The only other time when dust is really suspended in the air in appreciable quantity is when it is actually fulfilling the purpose for which it was intended.

It is therefore believed that a number of the shale formations associated with the coal measures will contain less than what will be found to be the allowable quantity of silica. These, provided they also have a

sufficient freedom from combustible matter and moisture, will be suitable for rock-dusting. This being so, it will certainly be more economical to crush and pulverize the rock at the mine than to look to outside sources. Transportation charges, at least, will be saved. It is doubtful whether pulverizing can be done efficiently underground because of the moisture which prevails during the greater part of the year.

At one operation where the pulverized dust is prepared on the ground, it is claimed that it costs \$1.75 per ton to deliver the rock to the crushing and pulverizing unit on the surface, and \$1.25 per ton for crushing and pulverizing, or a total of \$3 per ton for the finished product. It might be added that the wage scale at this mine is on a basis of \$7 for day labor. At another operation it costs \$1.91 per ton for crushing and pulverizing, which figure includes all legitimate charges.

There are a number of crushing and pulverizing units on the market which will effectively prepare dust for rock-dusting purposes. To date only two types of plants have been installed at mines, and there are no reliable data available on which to judge their relative merits.

The reduction plant which has been recently erected at the Indianola mine of the Inland Collieries Co. consists essentially of a 9x12 New Holland rock crusher (jaw type), which has a capacity of about 1 ton an

NOTE—Second installment of article read at the annual meeting of the Coal Mining Institute of America, Dec. 4, entitled "Modern Methods of Rock Dusting Bituminous Coal Mines." The first installment appeared in *Coal Age*, Vol. 26, pp. 825-829 and was entitled, "How Rock Dust Cures the Epidemic of Mine Explosions."

hour, and produces a $\frac{1}{2}$ -in. or finer product. This crushed rock flows by gravity through a spout into a vertical bucket elevator, which discharges into a storage bin having a capacity of about 6 tons. From this bin the crushed material is fed through a spout into the revolving feed table of the pulverizer, which is a No. 24 Griffin mill, operating on the principle of the pestle and mortar.

It has a capacity of about 1 ton per hour and will pulverize dust, depending upon the screens employed, to any size up to and including 75 per cent through 200-mesh. This mill actually makes a finished product in one operation without the use of auxiliary screens or other separating apparatus. The manufacturer of this mill claims that 90 per cent of all the pulverizing equipment used in Great Britain for rock-dusting purposes is of this type. The pulverized material is discharged by gravity from the Griffin mill into a second bucket elevator, which discharges into a storage bin of approximately 6 tons capacity. The dust bin is provided with a spout and gate for drawing off the dust into bags or mine cars as may be required. It is improbable that a mechanical dryer will have to be employed in connection with a crushing and pulverizing plant, providing that the raw material is stored in a dry place for a reasonable period.

In addition to considerations such as percentage of free silica, combustible matter and moisture, there is another important factor in that the dust should dry out faster, or at the same rate that coal dust does. During some months of the year the mine will be much cooler than the ventilating air and moisture will be deposited all over the inside of the mine like drops of rain. The fine rock dust will be the first to attract this moisture reducing the safety of the mine. For obvious reasons, a dangerous condition also will exist if in the autumn the coal dust dries out faster than the rock dust.

In some of our Western states, particularly in Utah, mining companies are using "adobe" as a rock-dusting material. This type of clay takes up moisture easily, and gives it up with much reluctance. From a theoretical standpoint, therefore, adobe, which is a form of clay, is a poor material to use for rock-dusting. When it is dry it is easy to pulverize, but rock dust is certainly a more efficient material, will insure the operator more certainly against disaster and is well worth the extra cost that may be involved in its use. A number of mining men in western Pennsylvania have questioned whether burned refuse rock is suitable for rock-dusting purposes. In most cases the free silica content of this material is within the allowable range and the combustible material is nil. No one has actually used

"red-dog" for rock-dusting but it is believed that it will, for obvious reasons, fall in the same category as adobe.

About 85 per cent of the coal-dust explosions in this country have started in narrow work, either along the haulageways or at the faces of development workings. Rock-dusting, therefore, should be done first on all haulageways and other used narrow work up to and including room-necks, and up to and including the face of all development workings. Dusting should start at the face and proceed towards the shaft or other opening. Some mining men believe that it will not be necessary to rock dust unused back entries. No fine coal dust is made on these entries, and furthermore no explosion will occur without a source of ignition.

REQUIRES 2 TO 4 LB. PER LINEAR FOOT

Rock-dusting consists of spreading a thin layer of dry rock dust on the surfaces of ribs, roof, and timber. For initial dusting, depending upon conditions, 2 to 4 lb. is required per linear foot. It may or may not be necessary, depending on sizing and analysis records, to apply rock dust directly on the floor. As already indicated, the roadways usually contain a relatively high percentage of incombustible material, and some dust always bounds off the ribs during dusting and settles on the floor. It might be well to add here that fine coal dust settling on the rock-dust coating will stick to the rock dust, and will not run off and fall to the floor as was originally expected, but it takes weeks fortunately under normal conditions for any appreciable quantity of coal dust to settle on rib, roof and timber.

If rock dust is blown into a ventilating current, the greater part of the dust is deposited in the first 200 ft. of passageway and particularly on the floor. Only the microscopic dust is carried along in the air current and finally deposited on the floor, rib, roof and timber, but some of the finest of this may even be carried out of the mine by the ventilating current.

Several mines in western Pennsylvania have started applying rock dust by hand. In one mine five men dusted 2,100 ft. of entry per 8-hr. shift at a cost of about 2.5c. per linear foot. Hand-method costs in Illinois have been as high as 5c. per linear foot. Hand dusting is better than no dusting and may be an excellent way to make a start. However, sooner or later it will be replaced by a more economical and effective method. With hand dusting not only are the workmen exposed in a degree to the dust, but also it is impossible to apply a uniform coating to the surfaces being treated.

The country is full of ingenious dusting machines,

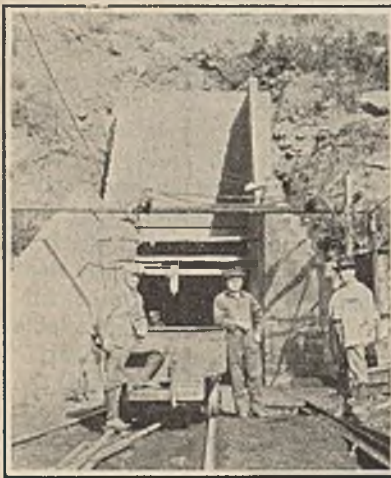


Rock Springs Dusting Machine

The Union Pacific Coal Co. went early to dusting under the leadership of Eugene McAuliffe. Its machine seems less flexible and automatic than some which have since been made, but these defects can easily be corrected.

but most of them are not perfected, consequently they are inefficient and not economical. Nevertheless, all of them have done their part in helping the "cause." Some will survive and new designs will be built. In any event the designers and mining companies concerned are to be praised for their initiative and resourcefulness. Some machines use a fan as an injector and others use compressed air or a blower. Some use a small blower, the dust in some cases being fed into the air current outby the fan, whereas in other machines the dust is introduced into the fan through its intake. Some employ stationary nozzles whereas others employ nozzles which are flexible. In some cases the dust is mixed with water and applied in a wet condition; and in one case the workings are first wet down with water and then dust is applied by a blower. These two later methods are unsatisfactory and can not be termed "rock-dusting."

The direct and dry method of applying the dust is, of course, most sound in principle. This can be accom-



Led New Mexico

First mine in that state to dust. Property of Phelps-Dodge Corporation, Dawson, N. M. The two men at the car are H. L. Smith and J. E. Jones.

plished by either a fixed nozzle, or one which is flexible and operated by hand. A rock-dusting unit may be transported by a mine locomotive or it may be self-propelling. In any event it is not likely that a large-scale machine will ever be operated by one man.

One of the best known dusting machines at the present time is the machine designed by officials of the Inland Collieries Co., Indianola, Pa. No less than five different models were built before a satisfactory machine was produced. The first of these was of the injector type and employed compressed air. The last machine consists essentially of a 3-ton tub mounted on a truck and transported by a regular mine motor.

A pair of drums revolving toward each other in the bottom of the tub feeds the dust into a series of funnel-shaped port holes, leading to a pipe underneath the tub, through which a current of air is forced by a centrifugal fan on the back end of the truck. The dust is obviously aerated and carried through a flexible nozzle on the front end of the machine, and deposited directly on the surfaces being treated. The nozzle by means of a flexible joint can be made to swing in any direction outby. The feed is controlled by opening and closing the ports, and the driving motor is of the inclosed type.

This distributor and locomotive with two men will lay a uniform coat of dust on ribs, roof and timbers over a distance of one mile or more in an 8-hr. shift. A tub-full will dust about a half-mile of entry. This machine is now on the market, and about fifteen are already in use.

Another distributor which works efficiently is the one recently designed by officials of the Pittsburgh Coal Co. As usual, the plans for this machine were changed a number of times before a satisfactory design was produced. The last distributor consists principally of a 1,400-lb. hopper mounted on a truck and transported by a mine locomotive. A small spiral conveyor in the bottom of the hopper feeds the dust into a pipe under, and at one side of, the hopper, through which pipe air is forced by a motor-driven, high-speed fan, mounted on the rear of the truck. Thus the dust is aerated and carried through an ingenious fixed nozzle on the front end of the truck, and deposited directly on the surfaces being treated.

EFFECTIVE NOZZLE DESIGN

The nozzle consists of two half cones made of sheet metal, the semicircular base of the cones extending from the front end of the truck like the open end of a horn. One half cone fits into the other leaving an intervening space. The bisection of the cones leaves a flat place in each. This flat place is that part of the double semi-cone which is nearest the floor. An adjustable shutter regulates the dust that is ejected toward the track, but in all other directions the same quantity of dust is ejected through the open space between the cones. In an 8-hr. shift two men with this unit can lay a uniform coat of dust on the floor, rib, roof and timber over a distance of one mile or more. One hopper full will dust about 700 ft. of entry.

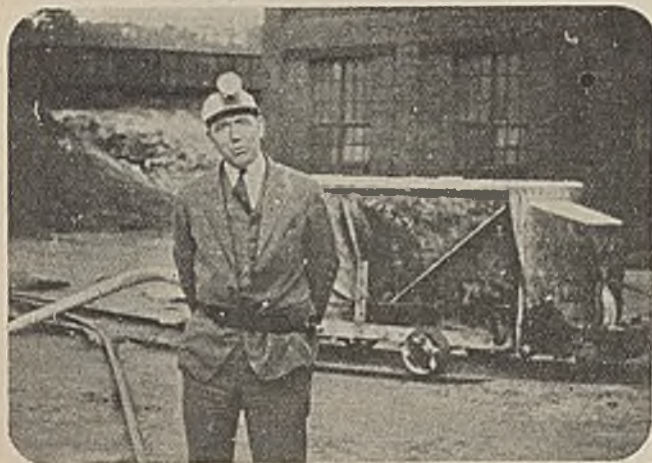
Flexible and fixed nozzles, like everything else, have their advantages and disadvantages, and experience will decide their relative merits. Also, it is true that numerous types of dusting machines can be devised, but the development of any particular type into an efficient apparatus will be costly. Rock dust is a difficult material to handle, because of its relatively high specific gravity, its high angle of repose and its tendency to pack.

In practice it has been found that most distributors actually waste dust in that they apply it too thick and not uniformly. This, of course, is due in a measure to the inexperience of the operator, but it is of utmost importance that the feed mechanism of the distributor be such as will apply a uniform coating.

Rib, roof and timber samples taken after rock-dusting usually contain 75 per cent of incombustible and often run as high as 90 per cent. On first thought this may be considered an advantage, but in reality the rock-dust coating in time becomes contaminated by various agencies, and it is desirable to apply new dust from time to time as warranted. Dusting should be done in the direction of the air current so that the workman will not be troubled with the dust and can conveniently inspect the surfaces being treated as an advance is made.

Minimum cost can only be realized by systematic dusting with an efficient distributor. Few reliable cost data are available, and the range of variation is so great that even wide generalizations are apt to be unsatisfactory. The most desirable figures will be unit costs per ton of coal mined and on a long-time basis. The mines in which rock-dusting is being done have worked rather irregularly during the past year and consequently the best cost figures we have are on the basis of the linear feet of entry dusted. These figures range from 1c. to 7c. per linear foot. It must be remembered that as in the case of all other reliable cost data the costs

of rock-dusting must account for every item of expense and not merely the cost of labor and dust. It is reasonable to expect that two men with an efficient distributing unit will be able to dust effectively two or three miles



A Section from a Bureau of Mines Reel

R. M. Lambie, chief mine inspector of West Virginia, during an inspection trip at the Indianola mine. Mr. Lambie hopes to be able to incorporate the rock dusting of coal mines as part of the law of his state.

of entry in an 8-hr. shift and that the cost may somewhere approach 1c. per linear foot. In the mines of one company two men are now rock-dusting over 6,000 ft. of entry in an 8-hr. shift or in 4 hr. of actual dusting. It is apparent that no company will get minimum rock-dusting costs until it has had a due amount of experience.

It is fairly well understood that rock-dusting will be required at least twice each year, once in the early Fall as the mine dries out, and a second time about the first of the new year. However, careful inspection will determine when dusting is required. Haulageways should always be cleaned up prior to dusting operations.

A number of the mines in Utah are using a soil known as adobe, for ballast on main intake haulageways, but the method is rather undependable. Other companies are using the "mudite plan," which is really "guniting," and on dry intake courses the applied material, when thoroughly dried, appears to be fluffy. However, this method is also uncertain, as we know definitely, from experience in this field, that even limestone which is exposed over the summer months does not thoroughly dry out anywhere in the mine, excepting on dry haulage-roads near the intake. At some New Mexico mines, pine trees are dragged along the haulage-roads to aid in stirring up the adobe. Rock dusting, however, will fail just as sprinkling failed at Dawson, Castlegate, and other places, if it is not applied effectively.

Rock-dust "barriers," or heavy concentrations of rock-dust called "zones," may be used to advantage at desirable points, but they must necessarily be considered as secondary defenses. No practical mechanical method has been devised so far for dusting back or trackless entries, and it is possible that the barrier, or zone, or indeed the hand-dusting method may be the final solution of this problem. A vast assortment of barriers are now in use, principally in the Rocky Mountain States. One type of barrier made of lead-covered sheet steel to prevent corrosion, is now on the market.

In Great Britain two scientists are now experimenting with a colloidal oil mixture as a medium for laying coal dust. The application of a sticky substance to the floor, rib, roof and timber of a mine roadway, in order to provide an adhesive film or coating on which the fine particles of coal dust would be caught is not a new idea. Sodium chloride (common salt) in the powdered state or dissolved in water was suggested before opinion "hardened" in favor of rock-dusting.

OIL PRESENTS FIRE HAZARD

It is interesting to note also that when the oil mixture dries out it leaves a cakey residue similar to that obtained in briquetting. This method will never come into practice, principally because of the fire hazard, but it is mentioned here to show that engineers are still studying preventive measures for mine explosions in order to provide better and simpler methods of treatment.

Rock-dusting has many advantages additional to the protection it affords against explosions. About 90 per cent of the light emitted by a lamp underground is absorbed by the coal. The rock dust, and particularly that prepared from limestone, greatly increases the illumination and consequently increases the efficiency of the workman and decreases accidents. One company is installing a crushing and pulverizing unit and will prepare dust from shale made in the mining operation for dusting back entries and for barriers if such are ever employed. However, this same company will purchase crushed limestone, pulverize it at the mine, and use it on all main haulageways, claiming that the motormen are enthusiastic over the results of the increased illumination. It is also possible that limestone dust will protect steel timber, prevent spalling of roof and coal, and in a measure neutralize acid mine water.

Rock-dust may be an efficient fire-fighting material and is, no doubt, much safer to use than either water or chemicals. It is reported that a terrific fire



George S. Rice and J. W. Paul

George S. Rice conceived the idea of rock dusting many years ago before he heard from Great Britain that it was being advocated there. He and Mr. Paul have preached in season and out of season for years and only recently have their recommendations been followed with any prospect of permanent result. This picture is another cutting from the Bureau's motion-picture reel.

in dry coal in an Illinois mine was successfully extinguished with the use of rock dust. It was impossible because of the heat to get sufficiently close to the fire to employ water or chemicals, and in consequence the

local officials had started to seal off the fire. As soon as the company inspector, who is a rock-dust enthusiast, arrived on the scene, he stopped the sealing operation and began to fight the fire with shale dust, an unlimited quantity of it then being available in troughs and barriers throughout the mine.

ADVANCE UNDER DUST BARRAGE

The attack started about 100 ft. from the fire on the intake and consisted in throwing dust from the troughs toward the fire. It is reported that the great cloud of rock dust seemed to cool the area so that an advance could be made and additional dust introduced. The roadway was propped, of course, as the advance was made. The dust sealed the fire, except in large crevices and in spots along the ribs. A second crew filled these crevices with shale dust and spread more dust along the rib where warranted.

In a short time the fire area, which was about 100 ft. long and 12 ft. wide, was completely covered with sev-



W. T. Reid Demonstrating Wet Adobe Spray

The dust is laid on wet like the plaster on a wall and the expectation is that it will soon dry and be ready in case of an explosion to fly into the atmosphere and give the desired immunity to disaster. Experiments are being made on the value of this protection in a tunnel at Wattis, Utah.

eral inches of dust. The remains of the fire and the coal, which was hot or warm, was then loaded out in the usual manner. No other serious fires have occurred in the mines of this company since the introduction of rock-dusting. A few have started, but shale dust was applied immediately and the fire was extinguished before it made any headway. It goes without saying that the management is enthusiastic about the use of rock dust as a fire-fighting material.

ROCK DUST AS A STEMMING MATERIAL

Rock dust may also have special merit as a stemming material for shotholes, as compared with clay and other inert substances. The use of rock dust as a stemming material was started in the Ruhr district of Germany since the World War, and it is claimed that the percentage of lump coal has been increased as much as 50 per cent, with a reduction in the consumption of explosives of 20 to 40 per cent; but preliminary tests made in the United States do not produce any such considerable results.

"Cushioned" blasting has been practiced by a few expert shotfirers, and its advantages have been recognized in connection with the use of "permissible explosives." Stemming consisting of loose rock dust will produce a cushioned effect. The procedure in brief

consists in placing one or more cartridges of rock dust in the hole on top of the explosive charge. Neither the explosive cartridges nor the cartridges of rock dust are slit. About 1 ft. of solid tamping is usually placed at the end of the dust charge or in the collar of the hole.

The explosion is supposed to compress the rock dust and wedge it tightly in the mouth of the hole, so that none of the gases can escape until they do their work in bringing down the coal. If this is true, there is no energy left to distribute the dust into the room. Some mining men believe that the force of the explosion really compresses the first rock-dust cartridge, completely blocking the hole at this point and does not affect the remaining cartridges.

In either case it is a question how well the gaseous products of combustion of a properly made shot aerate and distribute the rock dust. In case of a blownout shot, the rock-dust stemming may help to quench the flame. It is also doubted whether sufficient dust will be employed as stemming material to rock-dust a room effectively as the place advances, but at one mine where experiments were made with rock-dust stemming, it was found that the dust was distributed in the room as much as 50 ft. back from the face.

HELPS PRODUCE CLEANER COAL

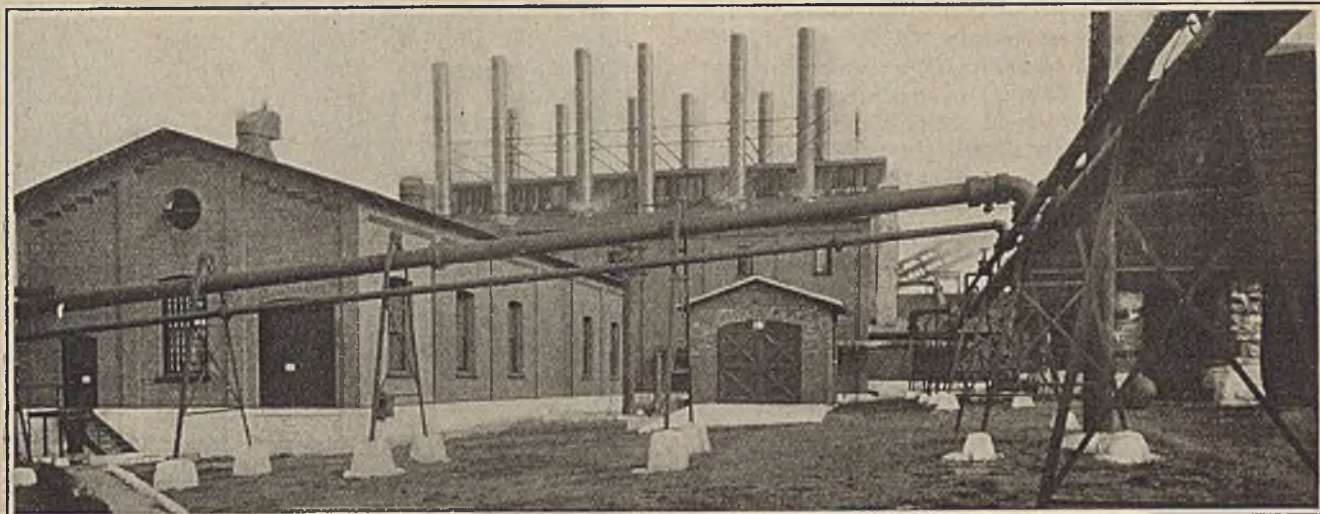
At this same mine a band of "bone" occurs in the middle of the bed, and it is important that this "bone" shall not be pulverized by the explosive charge. No quantitative tests whatever have been made in this country to determine the relative efficiency of rock dust as a stemming material, but the officials of this mine believe that more lump coal and cleaner coal is produced with 20 to 30 per cent less explosive.

It is possible that this increase in lump coal and reduction in quantity of explosive is due more largely to partial "air-spacing," closer supervision and more accurately placed and drilled holes. However, if rock-dust stemming will make it easy to secure a better "spreading" effect with permissible explosives than is usually obtained, the matter should certainly be given careful consideration.

Rock-dusting is the most reliable, as well as the cheapest, method at present known to prevent and limit coal-dust explosions on entries and adjacent narrow workings. However, it cannot be handled in a haphazard manner, and, like all safety measures, must be done thoroughly to be effective. Likewise, as in the case of our other safety measures, it must be considered as simply an extra precaution.

PROPER VENTILATION ESSENTIAL

Furthermore, it is well to emphasize the fact that rock dust alone will not make our bituminous mines entirely safe. As pointed out, fine, dry coal dust can be killed as it is made, and its accumulation in dangerous quantities can be prevented. It is also imperative that we take advantage of "approved" equipment and appliances and permissible explosives. Last, but not least, we must properly and conscientiously inspect and ventilate our mines, and thereby prevent an accumulation of gas which is the common source of ignition for all coal-dust explosions. In conclusion, it may be stated that while there is much to be learned regarding both methods and costs, still there is no apparent reason whatsoever for delaying the application of rock-dusting in our bituminous coal mines, thus making them safe.



Coal Mines Can Make Power Economically in Centralized Generating Plants

Whether Power Is Purchased or Generated at the Mines Charges for Maximum Demand Must Be Paid—Continuity of Service Is Paramount in Gaseous or Wet Mines—
Plants Should Be Located at Load Center

By C. H. MATTHEWS

General Engineer, Westinghouse Electric & Manufacturing Co.,
East Pittsburgh, Pa.

THE PRESENT generation is so accustomed to the use of electric power that we can hardly conceive of mining operations being conducted entirely by manual labor, much less the ventilation of mines by hand bellows or the use of hand-operated hoisting windlasses.

After the steam engine was perfected the whole system of mine operation was changed. Relatively large tonnages were handled, even before the advent of electric power. The steam engine made possible the development of the electrical industry so that today we have electrical equipment to meet the various needs incident not only to mining but to all industries.

Progress has been made since the days when electric power for mining operations consisted of one or more small direct-current generators driven by inefficient, simple non-condensing engines. We have now efficient condensing turbines driving generators of large capacity. It is true we still see a few small isolated plants generating electric power as in former years, but many of these plants are gradually being abandoned in favor of some form of central-station power supplied either from public-utility stations or mine power plants.

In some localities lack of suitable water for boiler use and the availability of an adequate supply of cheap electric power distributed by public utilities has encouraged mine operators to employ electric drive. Consequently, many small, old-time, isolated boiler plants have been abandoned.

When applying electric power to large mining operations it is not always feasible from an economic standpoint to abandon all boiler plants and steam-driven equipment in favor of electric drive.

A small local power company may not be able to supply sufficient electric power for large mine opera-

tions, its service may not be as reliable as that demanded by the mine management or it may be unable to compete with the operating costs of privately owned plants, especially those where steam-driven equipment is already in successful operation and where it would require an enormous sum of money to change to electric drive.

Coal mining companies which have many small mines scattered over several counties could show little saving by installing their own generating station and transmitting power over long distances, especially if a reliable power company is already established in the territory.

Where a group of mines under one management is within a range of forty or fifty miles and where the power requirements are of such magnitude that a plant of economical size can be built, then a privately owned station would pay handsome dividends on its investment.

LOCATE AT MAIN OPERATION

The electric generating station should be located at the load center of the mine property and at the main operation where boilers are already in service for generating steam for hoists, fans, air compressors and pumps. The outlying mines may then be served by electric power and all small isolated boiler plants can be abandoned.

Due to the frequent starting and stopping of hoists, mine loads are of a fluctuating nature. The greatest demand for power occurs during the eight-hour working day period.

Where a large quantity of water is handled and where during certain seasons of the year sudden floods occur, the unusual demand upon the generating station

requires the installation of more generators than normally can be used economically. It would, therefore, seem that the added investment for equipment that is seldom used, except during the working day and for handling flood waters, would wipe out the economies effected by the privately owned plant. But it must be remembered, on the other hand, that all power companies when contracting for the delivery of power at a given demand must provide for the maximum load requirements. A user of power must therefore pay a maximum-demand charge whether he buys electrical energy or generates it; consequently the private mine plant and the public-service station stand on much the same footing, so it is well worth while to make a careful investigation and study to determine whether power can be more cheaply generated than purchased.

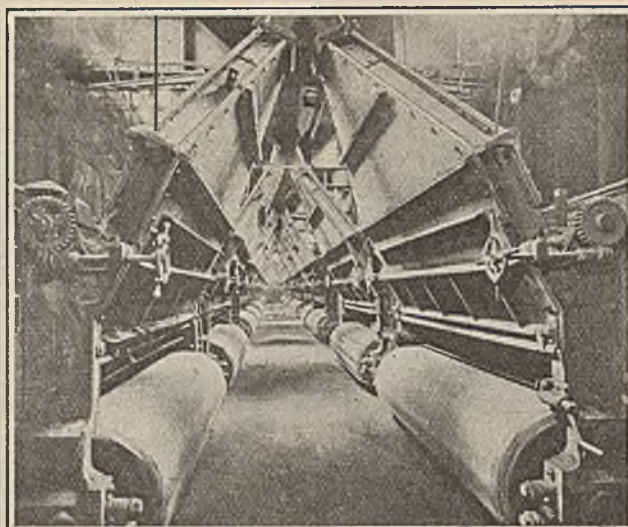
Operators of large mining properties have frequently found it more economical to install and operate their own generating equipment and wipe out the investment by the savings effected than to purchase power from a public-service corporation.

BUILD FOR FUTURE EXPANSION

An electric generating station for coal mine operation should be of sufficient capacity to handle all existing electrical load and be so designed that extensions easily can be made to supply power for future developments. On account of the unusual distribution of load over the twenty-four hour period, a careful study should be made to determine the size of each generating unit so that the highest economy can be obtained even under adverse conditions.

The greatest power demand occurs during the working day and in general is caused by loads produced by hoists, fans, air compressors, tippie or breaker drives, coal-cutting machines, pumps, shops, larry cars, locomotives, loading machines, and lights. During the sixteen-hour idle period the plant furnishes power for hoists and locomotives, handling men and supplies, charging locomotive storage batteries, pumping, ventilation and lighting.

In some mines all coal is cut at night, and many ventilating fans are operated at reduced speed when the men are out of the mines. During idle days power is required only for pumping, ventilation and intermittent hoisting. Development work, such as driving tunnels and sinking shafts or slopes, may be carried on during the whole twenty-four hour period, thus requiring power



Twenty Stokers Here, Count Them

No part of a plant is more important than the boiler and stoker equipment. Here economies must be made in every way possible. These stokers use only that fuel which has no market value. The cost of storing this low-grade fuel on idle property is more expensive than burning it.

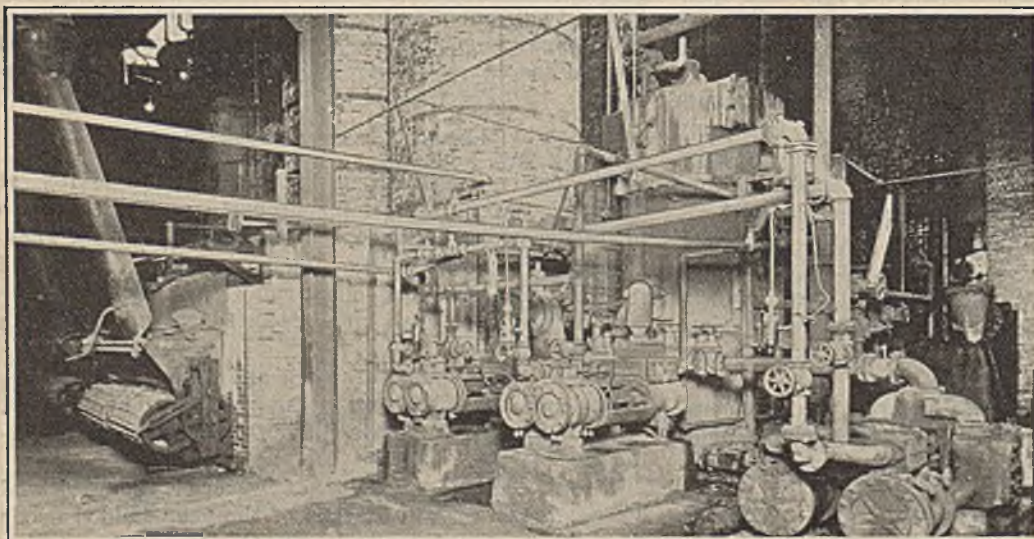
for hoisting and for compressing the air that is needed for operation of drill equipment and small pumps.

Where a large quantity of water is handled, the power required for pumping operations forms a big percentage of the normal eight-hour day load, and during flood seasons the pumping load alone may exceed the demand required for all other equipment during the working day. All these factors have a bearing not only on the size of the plant, but also on the most economical size of each generating unit.

Modern power plants require a water supply suitable for boiler use and sufficient for condensing purposes. Ample storage space for fuel must be provided for operation of the plant if the usual supply is suspended due to strikes or similar causes. Cooling ponds or towers should be near the plant to save piping and tunnel connections.

As mining operations extend over large areas, it is usually difficult to find solid ground on which to locate a plant. Stacks, boilers, turbo-generators and buildings require solid foundations and if located over mined areas the mine workings must be rock packed and filled with slush.

Space is required, preferably near the plant, for



Coal Mine Plant

Bituminous coal mines burn about 2 per cent of their output for power-generating purposes. Large modern plants operated at the mines afford cheap and reliable energy for mining. Naturally, the number of boilers and other power-plant equipment is commensurate with the quantity of power generated.

transformers, bus structures, oil circuit breakers and lightning arresters, especially if voltages above that generated are needed for distant transmission of power. It is desirable to locate the plant near a railroad for ease in handling equipment and supplies, but if this is impossible the mine tracks will suffice. Only in rare cases is it possible to obtain all the desired advantages, and the final location of the plant is usually a compromise.

It is imperative that every precaution be taken to insure against power interruptions so that fans, hoists, and pumps will be in continuous operation. The failure of power causes the fans to stop and if the hoists are also inoperative the lives of the men are endangered, besides the mines may be flooded if the pumps are out of service for any great length of time.

The design and installation of the power-plant equipment and distribution system must, therefore, be such that the failure of any one part will not interfere with the delivery of power from other units. The arrangement of the generating room depends upon the size of

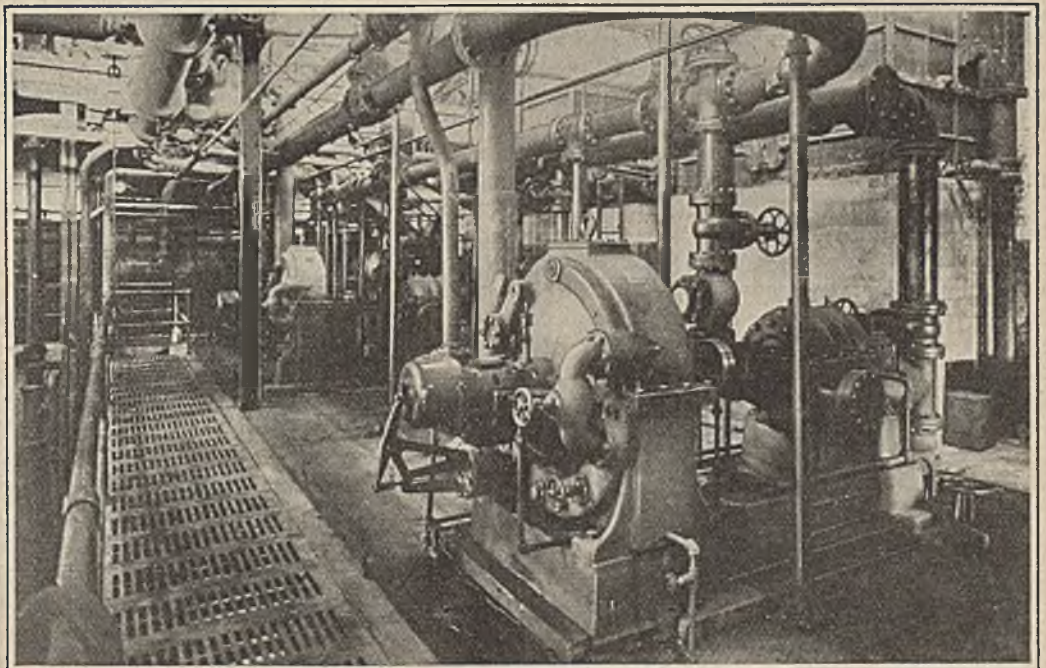
and switch inclosures. This space may not extend the whole length of the generating room and need not be of the same height as the turbine room, which must be high enough to accommodate the crane. Auxiliary equipment, such as boiler feed, condenser and cooling pond pumps and air washers, are located in the basement under the turbine floor.

Switchboard-cell structures, motor controls and similar equipment can be located in the basement under the switchboard. In small plants where hand-operated circuit breakers are used they may be mounted on the same floor as the control board in which case the basement can be the operating floor. Only a walkway would then be needed around the turbines and generators, and the switchboard room would be a small addition to the main building. Where barometric condensers are used, little basement headroom is needed and all equipment can be on one floor level.

Adequate space should be left for dismantling and repairing apparatus. One end of the generating room can be kept free for repairing equipment, filtering and

A Flexible Layout

Nearly all well-managed plants which are at present furnishing power to mine properties are continually expanding. Such changes are evidence of their success. The arrangement of auxiliary equipment should always be such that extensions may be made as the mines require more power.



the generators, type of condensers, location of auxiliary apparatus, switchboards and space available for the plant. Small turbo-generators can be located with their axes parallel to each other and still be housed in buildings with reasonably short roof trusses. Large generators should be arranged with their axes parallel to the side walls of the building, so that this structure will not have to be unnecessarily wide.

The walls of the turbine room should consist largely of windows to light the station and should have adjustable steel sash arranged so that ample ventilation can be obtained. The turbine-room basement is usually at the ground level, and as surface and low-head jet condensers are located directly under the turbine, the top of the turbo-generator foundations will be from 10 to 15 ft. above the basement floor. This determines the elevation of the operating floor where the switchboard equipment, exciters and motor-generator sets or synchronous converters are located.

Adjoining and forming a part of the generating room, space must be provided for the switchboard, battery

testing transformer oil, and for temporary storage of material during construction. Railroad tracks should enter the building to facilitate repair work and the installation of equipment.

The lighting system in the generating room should be ample for all needs but need not be elaborate. Every turbo-generator room, whether large or small, should be provided with an overhead traveling crane.

Generating units of small or moderate capacity are usually shipped completely assembled, and being of comparatively light weight, can be installed without the use of a crane but if desired they can be dismantled and the crane can then handle the various parts. In large plants the units are of such size that they are seldom shipped assembled, so that it is an easy matter to make the installation if a crane is available. The crane should be of sufficient capacity to handle only the heaviest piece of the dismantled unit, as it would not be economical to install one that could lift a large turbo-generator.

For small plants a hand-operated crane is entirely

adequate and can be suspended from the roof trusses on the necessary I-beam tracks. Larger plants should have the crane rails supported by columns built into the wall and the hoist at least should be motor-operated. It can be controlled by a chain or rope from the operating floor.

A coal-mining load being of a fluctuating character, the turbines must successfully handle high peak loads and have good speed regulation. As turbo-generators are designed for a maximum rated output, the average load handled should be at some point on the load curve between one-half and full load so that the generator can carry the peak loads without overheating. If the generator capacity has been properly determined the turbine should be designed so that the most efficient water rate is at about three-quarters load.

Standard 60-cycle turbo-generators usually operate at 3,600 r.p.m. up to and including 6,000 kw., and at 1,800 r.p.m. above this capacity, whereas 25-cycle machines all operate at 1,500 r.p.m.

The generator voltage is determined by the quantity of power to be distributed locally, the transmission voltage required and the limit of switching equipment for the lower voltages. Generators of small and moderate capacity are usually wound for 2,300 volts; whereas with larger machines it may be desirable to generate at voltages as high as 13,200.

Steam turbines require a pure mineral oil of excellent quality, free from acid and from a tendency to resinify. It should have a low sulphur content. As the oil is circulated around the bearings by a pump, it should be of low viscosity and free from mechanical impurities. Modern practice is to purify turbine oils by drawing the oil from the turbine reservoir to a purifier, of either a centrifugal or filter type, where it is purified

and then returned to the turbine. This method gives an almost indefinite life to the oil and shows a remarkable advantage over the other systems, as the turbine is always supplied with good oil.

The dusts of coal and ash are found in suspension in the air around any boiler plant and are drawn into the generator windings by the ventilating fans on the rotor. Dust clogs up the air ducts and covers the generator coils and thus causes a dangerous rise in temperature. High-volatile coal dust is easily ignited by a spark and may cause a fire in the windings, which would be hard to extinguish as the rotor continues to revolve for some time after the steam to the turbine has been shut off.

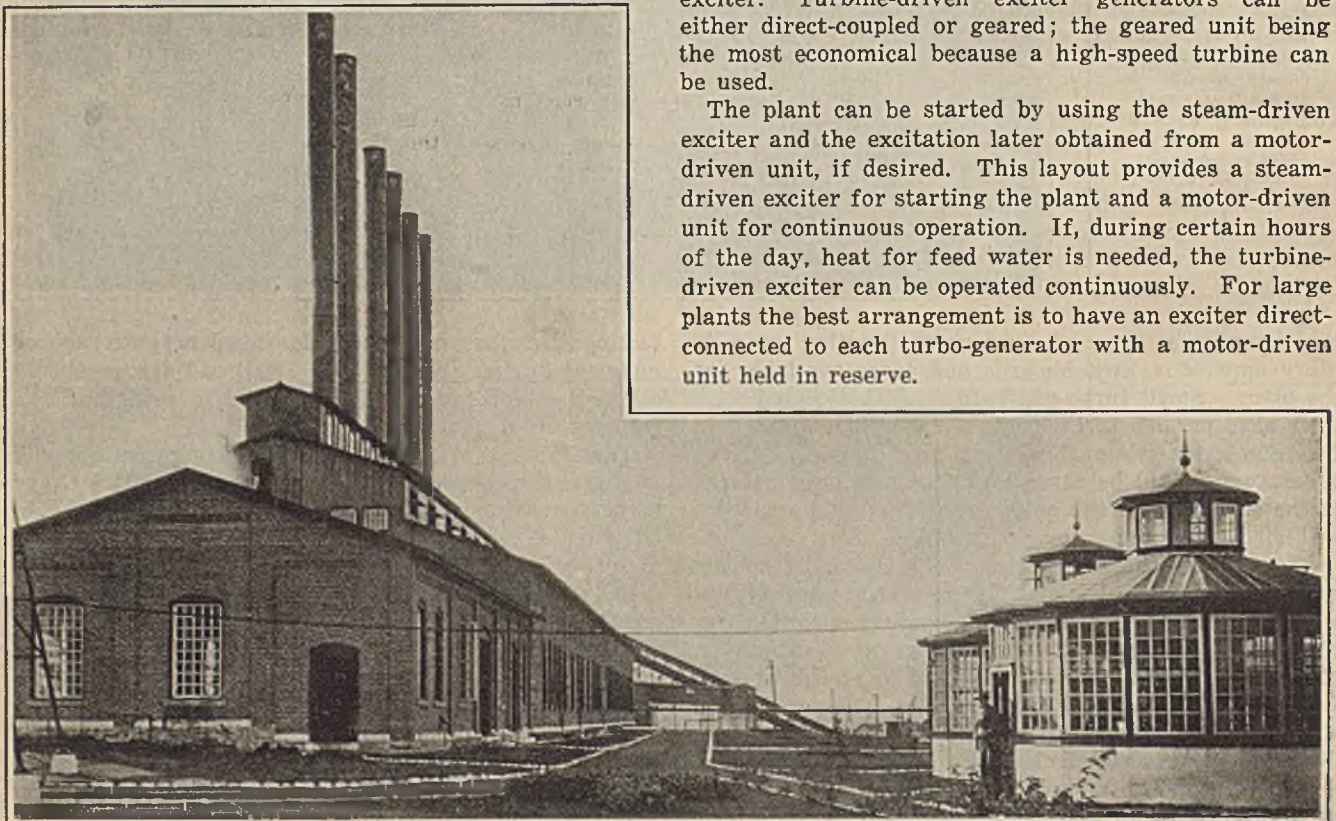
Air washers assure a reasonably clean supply of air for the generator windings and thus keep them free from an excessive accumulation of dust, so that the generator can carry its rated load without overheating.

The only power needed to operate an air washer is a squirrel-cage induction motor to drive a small centrifugal pump for forcing water through the air spray. The motor can be controlled by an auto-starter operated either by hand or automatically with push-button control.

If the plant is located near a tippie or breaker where the air contains a large quantity of coal dust, the closed system of generator cooling is the most desirable, as the best of washers do not remove all the dust. By the use of the closed system, fires in the generator windings can easily be extinguished, as the small quantity of oxygen present cannot sustain combustion. Steam jets or carbon dioxide can be used to smother any fire that otherwise might gain headway.

Plants of small and moderate capacity can best be handled by having one turbine and one motor-driven exciter. Turbine-driven exciter generators can be either direct-coupled or geared; the geared unit being the most economical because a high-speed turbine can be used.

The plant can be started by using the steam-driven exciter and the excitation later obtained from a motor-driven unit, if desired. This layout provides a steam-driven exciter for starting the plant and a motor-driven unit for continuous operation. If, during certain hours of the day, heat for feed water is needed, the turbine-driven exciter can be operated continuously. For large plants the best arrangement is to have an exciter direct-connected to each turbo-generator with a motor-driven unit held in reserve.



Here Is A Plant Built to Serve and Last

Often the power plant located at the mines is a thing apart from the rest of the property. Under such circumstances it is similar to a central station. It is sometimes a great economic advantage to have a permanent market for a certain volume of the output of the mine. Large-scale production usually permits lower operating costs per ton.



News Of the Industry



Talk of Revolutionary Labor Policies Set at Rest by Selection of Green

Continuation of Gompers Policies Expected—Closer Co-operation with Miners' Union Foreseen—Stands for Observance of Contracts and Discipline Within Union

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Any uncertainty that may have existed as to the major policies of the American Federation of Labor have been removed by the selection of William Green to head that organization. None doubts that the new president will do his best to continue the Gompers policies. As secretary of the United Mine Workers Mr. Green always has subordinated his own personality to that of the various presidents under whom he has served. There is reason to believe that he has been the source of many of the mine workers' policies, however. In at least two important instances when his counsel was not followed, subsequent developments proved that the union would have been better off had his advice prevailed. The selection of Mr. Green absolutely sets at rest the talk of revolutionary changes in the conduct of the American Federation of Labor.

There is particular significance to the coal industry in the selection of William Green, not only in that it removes a familiar figure from the Indianapolis office of the United Mine Workers but because his intimate knowledge of the needs of coal mine labor is certain to result in closer co-operation between the Federation and the United Mine Workers.

Acrimony is a thing which Mr. Green always has avoided. He has the reputation of opposing any action prompted by vengeance or a spirit of "getting even." He always has exerted a quiet and conservative influence within the organization of the mine workers for a sane administration of the union. He stands for observance of contracts and for discipline within the union. He came originally from Ohio, where the relationships between the mine owners and the men have been more amicable than in most of the mining regions.

Those who know intimately the new president of the A. F. of L. admit that he has not the ability or the vision which were such outstanding characteristics of Samuel Gompers, yet they expect him to be fully as successful in the conduct of the Federation because of his ability as an organizer and because he is certain not to deviate from policies which Gompers proved to be sound. Mr. Green has been

brought up in a school of bargaining for immediate objectives such as higher wages, shorter hours and better working conditions. He is thought always to have been opposed to a labor party and apparently is determined to continue to work through each of the existing parties. In fact the very selection of Mr. Green is taken to indicate a repudiation of the policy forced upon Gompers in lining up with the LaFollette party during the last campaign. He has no sympathy for communism.

Since Mr. Green's activities have been of a routine character he has had no opportunities to demonstrate his capacity for leadership. It is known that he possesses unquestioned courage, but whether or not his capabilities are of the outstanding sort necessary to dominate the turbulent spirits of the organized labor movement remains to be seen.

There is reason to think that Mr. Green gave no support to the movement among mine workers looking to the nationalization of coal mines. He is thought to have realized that this proposal never has appealed particularly to the rank and file of the union. With lack of enthusiasm within the organization he has opposed the making of an issue of a matter so calculated to offend public opinion. Regardless of what he may think of the ultimate feasibility of such a policy, it is regarded as certain that no nationalization of industry plans will be brought forward as long as Mr. Green heads the Federation of Labor.

Britain Closely Follows U. S. Output Figures

An indication of the closeness with which British interests follow the coal situation in this country is had in a recent arrangement whereby the U. S. Geological Survey dispatches production figures, collect, by cable each week. It is thought that the British attach more importance to coal as a barometer of general business than is the case in this country. Incidentally, it may be mentioned that the Survey's production figures recently have included more timely figures from Western states, due to the air mail.

L. & N. Buys Equipment For \$5,000,000

The Louisville & Nashville R.R. has contracted for \$5,000,000 worth of all steel rolling stock, it was announced last week from the office of W. L. Mapother, president of the company.

The new equipment includes twenty-five locomotives, 2,000 freight cars and twenty-two passenger cars. Of the freight cars 1,600 are of the gondola type for handling coal and 400 are of the "mill-gondola" type.

The American Locomotive Co. obtained the contract for the locomotives, the Pressed Steel Car Co. for the freight cars and twelve of the baggage cars, and the American Car & Foundry Co. for eight coaches and two dining cars.

Delivery of the rolling stock will begin the early part of 1925 and all will be delivered during the first six months, it was said.

Agreement Reached on Control of Zeigler Coal Co.

An agreement was reached at Chicago, Dec. 24, settling approximately three-fourths of the questions at issue in the litigation over the \$100,000,000 estate of the late Levi Z. Leiter, pioneer Chicago financier, involving Lord Curzon, former Foreign Secretary of Great Britain, whose first wife was Mary Leiter, a daughter of the financier. Joseph Leiter, a son and one of the trustees, turned over \$4,000,000 in securities for complete control of the Zeigler Coal Co. The controversy over ownership and control of it was the principal point at issue.

There remain to be heard the charges of Lady Marguerite Hyde, Duchess of Suffolk and Berks, that her brother Joseph has mismanaged the estate.

Lord Curzon joined Lady Hyde in the litigation because of the interests of his daughters in the mother's share of her father's estate.

Mr. Leiter was supported in his legal battle with the English heirs by his sister, Mrs. Colin Campbell, who will benefit under the settlement.

An issue of first mortgage 6½ per cent sinking fund serial gold bonds totaling \$4,000,000 has been put forth by the Zeigler Coal & Coke Co. This issue has no effect upon the continuing operating lease which the Bell & Zoller Coal Co. has on the mining properties. The bonds are being sold by the Continental & Commercial Trust & Savings Bank, of Chicago.

Outlaw Anthracite Strikers Going Back to Work

Wholesale defections from the ranks of the 12,000 employees of the Pennsylvania Coal Co. who walked out on an unauthorized strike more than a month ago began when 1,300 of the men who left the Underwood colliery of the company voted last Saturday to return to work Monday morning. The decision was reached at a secret meeting.

Union leaders declared that sentiment among the Underwood employees showed that the rank and file favored the resumption of operations. It was reported that 828 miners voted to return to work and that only eight cast their votes in the negative.

Company officials have completed arrangements for the return of the men to their former places. While they are no longer members of the United Mine Workers, due to action taken as a result of their unauthorized strike, steps are expected to be taken immediately to restore them to the union.

Joint Safety Conference at Springfield, Jan. 15-16

Ten associations and governmental agencies will co-operate with the Mining Section of the National Safety Council in a two-day mine safety conference to be held in the Elks Bldg., Springfield, Ill., Jan. 15-16.

The meeting will be held under the joint auspices of the Illinois Department of Mines and Minerals, the Illinois Coal Operators' Association, the Coal Operators' Association of Fifth and Ninth Districts of Illinois, the Central Coal Operators' Association, the Illinois Mining Institute, the Joseph A. Holmes Safety Association, the United Mine Workers of America, the U. S. Bureau of Mines and the National Safety Council.

An interesting program has been prepared in which miners, safety engineers and inspectors, foremen, bosses, superintendents, managers and other executives will participate.

The tentative program as decided at a recent meeting held at headquarters of the National Safety Council is as follows:

Morning Session, Thursday, Jan. 15.

Chairman—H. B. Adams, president, Central Illinois Coal Operators' Association.

1. Address of Welcome—Len Small, Governor of Illinois.
2. The True Causes of Mine Accidents (special reference to accidents at the face)—F. F. Green and C. E. Anderson, Valler Coal Co.
3. Maintaining Interest in Safety—Mr. Noonan, U. S. Fuel Co., Danville, Ill.
4. Accident Statistics in Illinois Mines—George L. Mercer, United Mine Workers, Springfield, Ill.

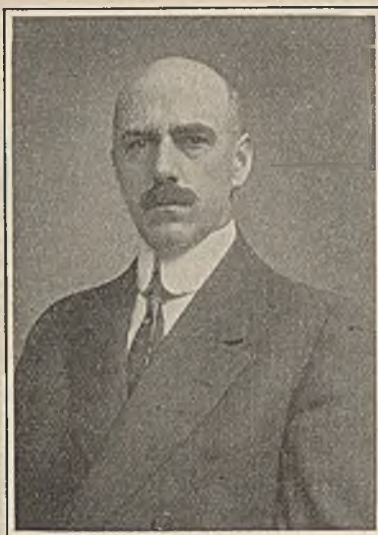
Afternoon Session

Chairman—Frank Farrington, president, District No. 12, United Mine Workers, Springfield, Ill.

1. Safety in Underground Transportation at Coal Mines.
 - a. Locomotives — Representative of Madison Coal Corp.
 - b. Tracks—Harry Treadwell, Chicago, Wilmington & Franklin Coal Co., Chicago.
 - c. Derailments — Speaker to be announced.
 - d. Mine Cars—Speaker to be announced.

Morning Session, Friday, Jan. 16.

Chairman, Martin Bolt, director of Illinois Department of Mines and Minerals, Springfield, Ill.



S. D. Warriner

The president of the Lehigh Coal & Navigation, of Philadelphia, presented his resignation as a member of the Anthracite Conciliation Board at a recent meeting of operators in Hazleton, Pa. His brother, J. B. Warriner, general manager of the Lehigh Coal & Navigation Co., was elected to succeed him.

1. Mine Fire and Fire Fighting—C. A. Herbert, U. S. Bureau of Mines, Vincennes, Ind.
2. Practical Methods of Rock Dusting—John Jones, Old Ben Coal Corp., West Frankfort, Ill.

Afternoon Session.

Chairman—C. H. Krause, president, Coal Operators' Association of the fifth and ninth districts of Illinois.

1. Safety from the Viewpoint of the Mine Physician—Dr. Higgins, Superior Coal Co., Gillespie, Ill.
2. Accident Prevention Educational Methods—Speaker to be announced.

Island Creek to Expand Loading Facilities

Application was filed last week in the offices of the United States engineers at Huntington, W. Va., by the Island Creek Coal Co. for permission to make improvements costing \$200,000 in the company's coal tipple there.

Loading from the tipple onto the barges for shipment to Cincinnati will be by means of a belt conveyor, which will enable the company to load 6,000 tons of coal daily instead of the present maximum of 4,000 tons, A. R. Beisel, general manager of the company, stated.

The entire tipple machinery will be completely overhauled, and the most up to date equipment installed. Mr. Beisel said. The belt conveyor will extend from a new rocker dump to the barges in the river.

The Island Creek Coal Co. has extensive mines in Logan County and transports its coal over the Baltimore & Ohio R.R. to its tipple in Huntington, where it is dumped into barges. The company owns two of the best fitted towboats on the river, the Catherine Davis and the W. K. Field, making regular trips between the Huntington tipple and Cincinnati.

Oil Heating Systems Cause Disastrous Fires

Daily fire reports from various parts of the country continue to record blazes causing death, injury and property loss from oil-heating equipment. Among recent news items of fires from oil burners are the following:

New York, Dec. 2.—Three families were rendered homeless by a fire caused by an oil burner in the building at 716 Lorimer Street, Williamsburg.

Ashland, Mass., Nov. 6.—Raymond Eldridge, oldest son of Mr. and Mrs. Charles H. Eldridge, of Leland Avenue, is a sufferer from severe burns received about the face and right arm as the result of an explosion in the oil burner of the furnace at his home.

Philadelphia, Nov. 22.—A blaze was discovered in the four-story apartment house of Dr. Jay F. Schamberg, 1402 Spruce Street, a very well-to-do section of the city. The blaze was due to the ignition of oil which had gathered at the base of the oil-burning heater. Due to the good work of the fire department, there was no great damage.

Washington, Nov. 4.—Fire caused by a poorly designed oil burner broke out in the new office building of W. H. West Co., Inc., 916 15th Street, N. W. Due either to a leak or to carelessness on the part of the janitor in failing to turn off the oil flow, a pool of oil formed on the cellar floor and caught fire when the burner was started up in the morning.

Lee, Mass., Nov. 10.—William H. Gross, 80 years of age, was burned to death last Monday in a blaze which destroyed his home. His housekeeper narrowly escaped a similar fate, being carried down a ladder from a second story window. The fire, which did \$20,000 damage in addition to taking its toll of human life, started from an oil burner which had been installed only the day before.

Eldora, Iowa, Nov. 20.—Sunday morning Miss Wilson went to the library and found the place full of smoke and the flames getting started in the ceiling of the furnace room. The trouble had started with an oil burner placed in the basement.

Boston, Nov. 1.—John H. Cunningham of 38 Light Street, Lynn, employed as stationary engineer at the A. M. Creighton Shoe Co. plant, 560 Broad Street, that city, was seriously burned about the face, head, hands and arms when an oil burner at the plant backfired as he was lighting it.

Springfield, Mass., Nov. 5.—Walter Bell, 24 years old, of 547 Worthington Street, a night watchman in the new Security Building in Vermont Street, is in the Springfield Hospital with serious burns about the face and hands resulting from an explosion which occurred when Bell undertook to relight the burners under the oil-burning heating plant with which the building is equipped.

Providence, Nov. 25.—The Broad Street fire station received a call summoning the apparatus to the house at 38 Cross Street, where oil overflowing from an oil heater was ablaze in the cellar.

Lawrence, Mass., Nov. 20.—An alarm called the fire department to the home of Mr. and Mrs. Simeon Legendre, 349 South Broadway, to extinguish a fire in the cellar caused by an oil heater.

Coolidge Hopes to Avoid Extra Session

While Senator Borah's suggestion that an extra session of Congress begin March 5 to consider problems of agriculture and to study the report made by the Harding Coal Commission doubtless appeals to the people of the Northwest, it is not expected to influence the administration. The President is understood to be hopeful that an extra session can be avoided altogether, but should an extra session prove to be desirable, it not be called before September. It is recognized that any discussion of coal in Congress, as Senator Borah suggests, is more likely to be divested of political considerations if it takes place immediately after, rather than immediately before, an election.



J. V. Maher, Ohio Operator, Dies at Age of 60

James Vincent Maher, coal operator, died Dec. 26 at his home in Cleveland, Ohio, following a short illness.

He was born in Westmoreland County, Pennsylvania, July 19, 1864, later moving to Altoona, where he received his education. On leaving school he became a stenographer for the Pennsylvania R.R., and later became connected with the Nickel Plate, Norfolk & Western, and Chesapeake & Ohio railroads.

He left railroad work to be traffic manager of the Pressed Steel Car Co. at Pittsburgh, of which he became general manager. In 1914 he opened the Detroit office of the Pursglove-Maher Coal Co. In 1917 he organized the Rosemary Coal Co., of which he was president at the time of his death. The company has mines at Flushing and Lafferty, Ohio. His wife and six children survive.

His brother, Thomas K. Maher, is president of the Maher Collieries.

Urge Heavier Canadian Duty On United States Coal

Coal mining interests in the Maritime Provinces of Canada are urging an increase in the Canadian import duty on bituminous slack coal and the placing of a duty on anthracite dust and screenings, with a view to assuring greater protection for the Dominion's coal and steel industries against foreign competition, which, it is claimed, is becoming keener every year, according to consular advices to the Department of Commerce from Canada. It is stated that the present duty on bituminous slack coal, in effect since no longer gives sufficient protection.

A delegation from Nova Scotia, headed by Premier Armstrong, made representations to Premier Mackenzie King on Dec. 2 for increased duties and for a continuation of the royalties paid by the federal government for carrying maritime coal to the interior, for their extension to cover shipments from Montreal westward by water, and

Coal Miners' Families Are Largest

Statistics collected by the Department of Commerce show that the average number of children ever born in American families in which the ages of the fathers ranged between 45 and 49 years, was the highest, 8.1, in the families of foremen, overseers and inspectors, and coal mine operatives, and the lowest, 3.3, in the families of dentists, physicians and surgeons.

Where the ages of the fathers range between 40 and 44 years, the highest average number of children ever born, or 7, those of coal mine operatives, and the lowest average, or 2.8, were those of architects. These ages of fathers were taken as, "on the whole, they probably represent completed families," according to the department.

Of children living with fathers who were between 45 and 49 years old the highest average number appears for coal mine operatives with 6.6, and the lowest average for dentists, physicians and surgeons, with 3.

With fathers between 40 and 44 years old the highest average of children living is 5.9, for coal mine operatives, and the lowest, 2.6, for actors and show men.

for an increase in the amount of the subvention from 50c to 75c or \$1. It was urged also that the Canadian National Rys. be asked to place orders for rails and cars with Nova Scotia industries, and that favorable freight rates be given on shipments of coal from Nova Scotia to Quebec and Ontario. Premier King assured the delegation that the government would give the matter careful consideration.

The present rate on bituminous slack which will pass through a 3-in. screen is 14c. per ton, round, and run of mine is dutiable at 53c. per ton. Anthracite and lignite coal and dust and coke are at present free of duty.

Utah Land Case Decision May Start Milners in New Coal and Iron Enterprise

It is expected that far-reaching effects will be the result of a decision handed down in federal court at Salt Lake City, Utah, last week by Judge Tillman D. Johnson in which title of purchasers of 5,564 acres of state land in Carbon County was upheld. The government had attacked the title on the ground that mineral rights remained with it. The case had been in litigation for nearly twenty years. The land was purchased from the State of Utah by the claimants.

Interesting Effects of Ruling

Here are some of the interesting and important results of the decision of Judge Johnson: The Independent Coal & Coke Co. will be left in undisturbed possession of its mines, opened on land purchased from the Carbon County Land Co. The Carbon County Land Co. will retain title to property said to be worth more than \$5,000,000. The State of Utah will receive payments from the Carbon County Land Co. during the next twenty years or more amounting to more than \$2,000,000. The way has been opened for the establishment in Utah of an important iron and steel industry by the Milner interests, of Salt Lake City, who have decided to consider development of the iron deposits on their land along with the mining of coal. The decision also establishes a precedent it is said, that will protect other owners of land purchased from the state under the same conditions.

In his decision Judge Johnson observed that if the federal government has known for six years that the land in question contained minerals, as it claimed, it should have taken action before or been willing to leave the purchaser of the property in undisturbed possession. Six years gave ample opportunity to take all steps that were considered necessary.

Output and Value of Coal from Montana and New Mexico Mines in 1923

(Compiled by U. S. Geological Survey)

State and County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees			Average number of days worked	
								Underground Miners, a	All others	Surface		Total
Montana												
Blaine.....	1,702	14,225	150	.....	16,077	\$39,000	2. 43	15	4	23	225
Carbon.....	1,258,107	35,988	72,875	.....	1,366,970	4,641,000	3. 40	858	382	274	1,514
Cascade.....	662,170	31,957	11,402	.....	705,529	1,969,000	2. 79	507	201	133	841
Musselshell.....	993,747	6,329	10,362	.....	1,010,438	2,855,000	2. 83	609	312	129	1,051
Sheridan.....	200	8,534	.....	.....	8,734	30,000	3. 43	15	.....	.....	15
Other counties (b).....	15,572	21,027	.....	.....	36,599	108,000	2. 95	50	11	7	68
Total, excluding wagon mines..	2,931,498	118,060	94,789	.....	3,144,347	9,642,000	3. 07	2,054	910	547	3,511
Wagon mines served by rail....	3,331	.....	.....	.....	3,331	10,000	2. 92	.....	.....	.....	.....
Grand total.....	2,934,829	118,060	94,789	.....	3,147,678	9,652,000	3. 07	.....	.....	.....	.....
New Mexico												
Colfax.....	1,514,968	17,305	6,430	257,335	1,796,038	6,334,000	3. 53	1,408	623	281	2,312	
McKinley.....	783,687	10,482	27,246	.....	821,415	2,996,000	3. 65	766	270	183	1,219
Rio Arriba.....	32,032	87	1,100	.....	33,219	98,000	2. 95	41	9	6	56
San Juan.....	88	3,972	.....	.....	4,060	9,000	2. 22	6	1	1	8
Other counties (c).....	224,951	6,838	11,913	.....	243,702	1,179,000	4. 84	301	122	77	500
Total, excluding wagon mines..	2,555,726	38,684	46,689	257,335	2,898,434	10,616,000	3. 66	2,522	1,025	548	4,095	
Wagon mines served by rail....	16,739	.....	.....	.....	16,739	52,000	3. 11	.....	.....	.....	.....
Grand total.....	2,572,465	38,684	46,689	257,335	2,915,173	10,668,000	3. 66	.....	.....	.....	.....

(a) Includes also loaders and shotfirers. (b) Chouteau, Gallatin, Hill, Pondera, Richland, Roosevelt and Toole. (c) Lincoln, Santa Fe and Socorro.

Should Exempt Coal from Operation Of Sec. 28 of Merchant Marine Act, Says the Daggett Report to Hoover

An exhaustive report on Sec. 28 of the Merchant Marine Act has been rendered to Secretary Hoover by Stuart Daggett. Sec. 28 restricts to American ships the benefits of export and import railroad freight rates which are lower than domestic rates. In summing up his report, Mr. Daggett, who is the dean of the College of Commerce of the University of California, says in part:

"Coal is a low grade commodity largely carried in tramp steamers. American boats are not anxious for coal cargoes. The export trade in coal, moreover, suffers because American coal, unlike British, moves with the current of traffic instead of against it. Coal should be exempted from the operation of Sec. 28.

Would Exclude Demurrage

"The most obviously desirable amendment to the present law is one which will expressly restrict its operation to railroad rates and will exclude matters of free time, demurrage and storage. The provisions in export and import tariffs relating to detention of export and import freight are not concessions but recognition of unlikeness in conditions under which domestic and foreign business is carried on. Failure to continue tariff provisions of this type constitute a discrimination against foreign trade which American merchants should not be asked to bear.

"It deserves consideration also whether power to suspend the operation of Sec. 28 may not be allowed some responsible body when such suspension appears to be in the public interest. The provisions of the Panama Canal Act relative to railroad ownership of competing water lines may be recalled in this connection. The Shipping Board at present feels that its hands are tied by direct mandate of the law, whereas such an amendment would clothe the board or some other selected body with discretionary authority.

Says Statute Is Imperfect

"In lieu of the present provisions of Sec. 28 with respect to export and import rates and charges, a flat increase of 5 or 10 per cent in railroad export and domestic rates has been suggested on all commodities which move out of or into the country in foreign ships. A change of the law in this sense will avoid many of the difficulties connected with the administration of Sec. 28, created by the competition of seaboard cities. The change will be an improvement upon the present law, but it is not recommended because the statute, even if so amended, will be too imperfect to defend.

"The writer avoids in the present studies so far as possible the expression of general opinions with respect to Sec.

28. The remarks which follow seem, however, to be pertinent at this place.

"Much confusion is caused in the discussion of Sec. 28 by the refusal of Congress to define the word 'adequacy.' It is worth while insisting, therefore, that the only definition of adequacy which will avoid fundamental changes in railroad rate structures through the operation of this statute, as well as considerable alterations in the conditions under which the trade of the United States is carried on, is one which interprets adequacy as competence to transport 100 per cent of the nation's foreign business.

Low Grade Freight Affected

"On the general question your reporter takes the following view:

"From the point of view of the merchant marine, Sec. 28 is an unsatisfactory device for rendering aid to shipping because it applies to only a fraction of our foreign commerce, and because the most important tonnage yielding commodities which move to the seacoast on a substantial rail haul and are therefore affected by the section are low grade articles such as grain, coal and lumber. These three articles alone make up more than a third of all tonnage exports and constitute more than half of the tonnage upon which Sec. 28 will operate. American ships do not desire additional freight of this sort and will not profit by it.

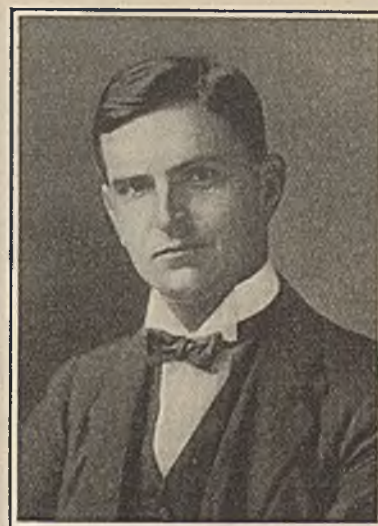
"From the point of view of the foreign trader and of the communities which act as intermediaries in foreign trade, Sec. 28 has the following fundamental defects:

Would Have Unequal Effect

"(1) The law works unequally. It operates, that is to say, to the especial disadvantage of shippers and communities which have enjoyed low export and import rates without affecting shippers or communities which have not enjoyed low export and import rates.

"(2) The law is uncertain. There must be a through contract for transportation from point of domestic origin to foreign destination or vice versa, if Sec. 28 is to work as simply as its authors appeared to have conceived its operation. Where there is no through contract and where the presence of an American ship of the type and with the sailing date needed for the desired movement cannot be guaranteed in advance, it becomes extremely difficult for the vendor to set a price, or for the buyer to make a firm offer (in case of sale f.o.b. factory) because the expense of rail transportation to the seaboard cannot be known.

"It is, moreover, likely that some of those shippers who take a chance in exporting under Sec. 28 will be able to secure space in American ships and some will not, which will bring about a difference in the cost of movement, for fortuitous reasons, between men who



Frank Hodges

Returning to the coal mines after being Civil Lord of the Admiralty in the British Labor Government. He was a coal miner, then secretary of the British Miners' Federation, then a member of Ramsay MacDonald's cabinet. Now that the labor government is out he is going back to the pits.

have equal right to the lowest charges.

"(3) The law tends to concentrate the foreign business of the country in a few coastal cities instead of distributing it among many cities. How far the actual concentration will take place will, of course, depend upon the willingness of the railroad carriers to accept the loss in revenue incident to the reduction of domestic rates to and from points of export to the export or import level, and partly upon peculiar conditions relating to movement of particular commodities. . . . In the typical case the railroad must accept a loss in revenue if export and import rates are to be retained, and while the revenue will sometimes be sacrificed, it is reasonable to believe that this will not universally be done.

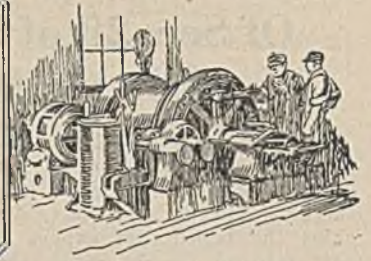
Law Difficult to Administer

"(4) The difficulty of administering the law is very great, especially in the case of export shipments which are sorted or rehandled at the port of exit, and the task of providing adequate supervision is likely to prove expensive.

"One may not unreasonably believe that appreciation of the defects in the statute which have just been mentioned, and not foreign influence or mere dislike of change, is responsible for the well nigh universal opposition to Sec. 28 expressed by exporters, importers and seaboard communities alike. Your reporter has tested sentiment in many industries since this inquiry has been begun. While a considerable number of lines of business believe that they will not be affected, in only one—the steel industry—has any support been found for the application of the law. The support in this case comes from the representative of the Bethlehem Steel Co., who frankly takes the position that his company will gain more from a possible increase in shipbuilding that might follow from Sec. 28 than it will lose as an exporter of steel or of the products of steel."



Practical Pointers For Electrical And Mechanical Men



Converts Lathe Into a Roller Shear For Cutting Sheet-Steel Sections

NCESSITY continues to be the mother of invention. When the Pittsburgh Coal Co. began to build rock-dusting machines for use in its mines the workmen had difficulty in cutting sheet steel in the form of circles and other curves. The central shop of the company, at Library, Pa., is probably the best equipped mine-repair shop in the country, but nevertheless the cutting of steel sheet in the shape of a curve so as to leave a smooth clean edge ready for electric welding, presented a real difficulty.

To handle this work, a device was built which can be used on one of the large lathes, converting it into a roller shear. The change can be made in a few minutes' time, the shop being equipped with a traveling crane for handling heavy material. Fig. 1 shows the individual motor-driven lathe with the shear attached. Figures 2 and 3 are close-up views of the shearing rollers.

The upper roller is driven by the lathe at a moderately slow speed; approximately 3 r.p.m. This results in a cutting speed of about 6 ft. per minute. The lower roller, which is supported on the carriage of the

lathe, acts as an idler. Two iron bars, also fastened to the carriage, function as rests for the sheet being cut.

The arbor on which the upper roller is mounted was made from a

solid piece of steel shafting of about 6-in. diameter. One end of the shaft was turned to a reduced diameter for a length of several feet and

tempered. The faces taper away from the cutting edge at an angle of about 10 deg. with the center line of the arbor. The face, near the cutting edge, is knurled slightly, this being done so that the rollers will pull the material into the shear. The carriage is adjusted so that the side of the lower roller bears lightly against that of the upper, and the elevation is such that the rollers have a slight overlap. This is clearly shown in Fig. 3.

The cutting rollers which are of about 8-in. diameter are made of high-carbon steel and are properly

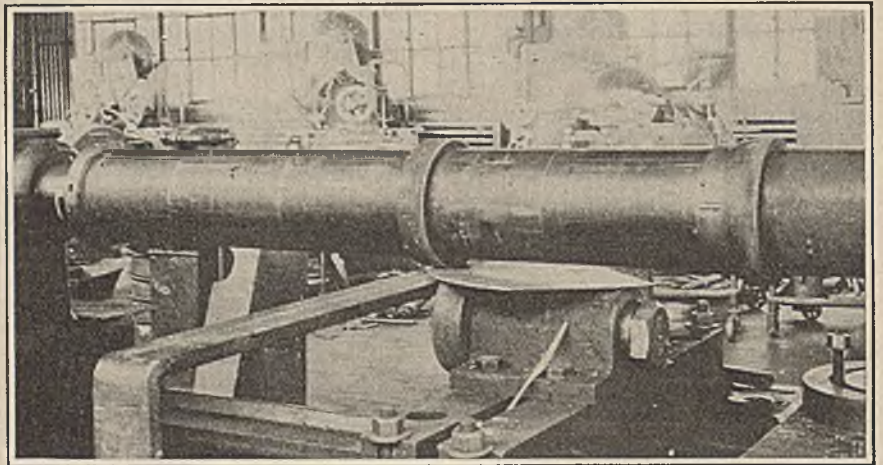


Fig. 2—Cutting a Corner Off a Piece of Scrap Plate

Edges of the rolls are knurled slightly so as to pull the sheet into the shear. Adjacent to the tail stock of the lathe can be seen the round spanner nut which screws onto the solid part of the arbor, thus clamping the roller, by means of spacing sleeves, against a shoulder.

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tempered. The faces taper away from the cutting edge at an angle of about 10 deg. with the center line of the arbor. The face, near the cutting edge, is knurled slightly, this being done so that the rollers will pull the material into the shear. The carriage is adjusted so that the side of the lower roller bears lightly against that of the upper, and the elevation is such that the rollers have a slight overlap. This is clearly shown in Fig. 3.

The shear was designed for cutting metal about $\frac{3}{8}$ in. thick, but it will probably cut sheets $\frac{1}{2}$ in. thick without undue strain. In Fig. 3 can be seen a small piece of $\frac{1}{8}$ -in. sheet metal, the end of which has been cut on a curve with a shear. The straight cut in this same piece of metal was made when it was put into the shear. When cutting on a straight or curved line, the sheet is

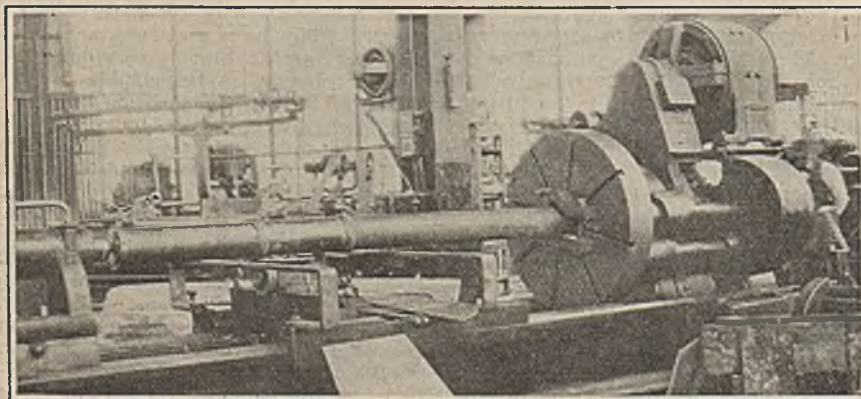


Fig. 1—Lathe Temporarily Converted Into a Roller Shear

When the Pittsburgh Coal Co. began to build its rock-dusting machines a shear for cutting light steel sheet was needed, one which would cut a curve section. Parts were made which in a few minutes time can be added to a large lathe thus converting it into a roller shear.

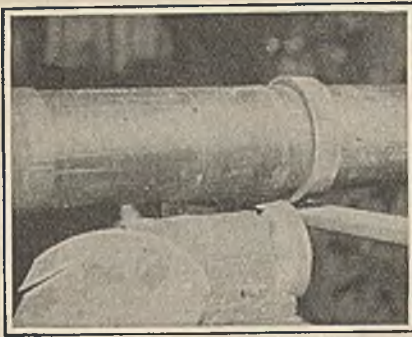


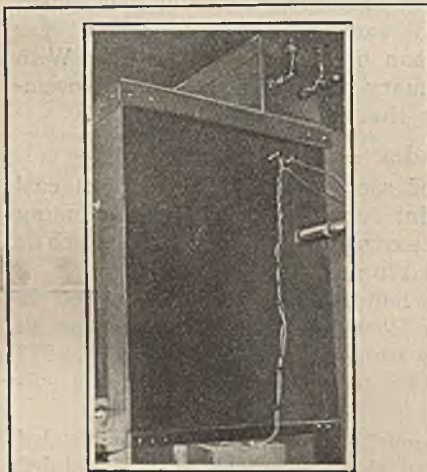
Fig. 3—Edges of Rolls Overlap

The rollers are made of high-carbon steel, and are properly tempered. With this shear a sheet can be cut on a curve as easily as on a straight line.

manipulated or guided by hand, it being surprisingly easy to hold it so as to make the cutting edge follow the mark.

Oil Supply to Fan Engine Protected by Bell

The 350 hp. uniflow engine which drives the 15-ft. fan at the Coalwood, W. Va., mine, of the Consolidation Coal Co., is lubricated by gravity feed from a tank mounted on a plat-



Signal Wires Warn Engineer

A float-operated contact device was installed in this tank and connected to a bell in the power plant.

form above the engine. Not long after the engine was installed a bearing was damaged as a result of a failure of the oil supply. This prompted the design of an alarm for warning the power-plant engineer when the oil level in the supply tank is low.

A picture of the tank is reproduced herewith. On the side of the tank, near the top, can be seen two porcelain tubes insulating the wires which are connected inside to a float-operated contact. The dry cells, used for operating the alarm, are in the wooden box which can be seen on the platform under the tank. The

electric bell is mounted in the power plant which is located about 50 ft. from the fan. It is reported that this device has operated twice, each time notifying the engineer that danger impended because the supply of oil was getting low.

Where Coils Are Handled With Consideration

The weakest point in an electric motor is generally the coil insulation. The slot space for that purpose usually is limited. Every possible precaution should be taken in handling coils to keep the insulation in perfect condition because otherwise in forcing the wires into the slots the insulation is almost sure to be injured. The idea conveyed by the old saying that a chain is no stronger than its weakest link, may well be applied to the parts of an electric motor. The winding is no more reliable than the weakest point in the insulation of its hundreds or thousands of feet of wire. The electrician who does the winding is sometimes blamed for troubles which result from the use of aged, or damaged coils.

To the electrical man who has had his troubles because of the carelessness with which the mine-stores department has handled armature coils, it is refreshing to see the way in which the Pittsburgh Coal Co. takes care of its stock of this material. The accompanying illustration was taken in the wareroom of its central shops at Library, Pa. Here we see steel cabinets, with doors and adjustable shelves, used for storing coils. Several rows of such cabinets are used for this purpose.

The cabinet has two distinct advantages over the open bin. The coils are kept clean and are not damaged by being bumped or by having metal parts from adjacent bins, laid



Coils Stored in Steel Cabinets

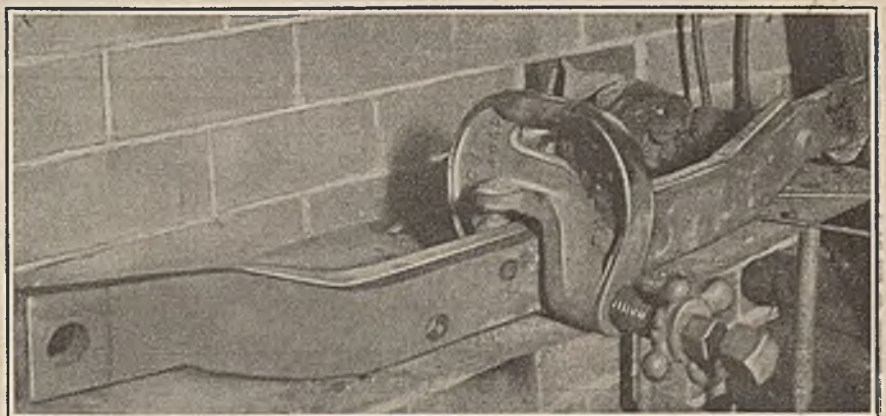
This illustration does not represent a cabinet in a factory, but in a mine repair shop. Here coils are kept clean, dry and safe. Several rows of such cabinets are provided for this purpose.

or carelessly thrown in upon them.

The room in which the coil cabinets are located is that used by the men employed by the stores department. There is not even a partition between the office and the coil stores. This room is heated during cold weather, and thus the coils are kept so dry that they are always ready for use. The light color of the coils in the picture indicates that they have not been impregnated with varnish or compound. A. B. Kiser, electrical engineer of the Pittsburgh Coal Co., explained that it is the company's practice, when purchasing coils to specify that they be not impregnated.

Broken Hanger Mended

When a motor hanger or cross member of a mine locomotive frame is fractured it is good practice to reinforce it with a strap of steel of equal thickness, cut to proper shape. The broken hanger is clamped to the reinforcing bar; then, both are drilled through and riveted, after which they are securely welded. This kink is of particular value when it is necessary to repair a fracture across a bolt hole, as the illustration shows. This idea originated in the machine shop of the Island Creek Coal Co. of Holden, W. Va.

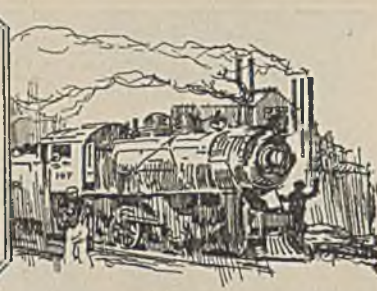


Old Parts Can Be Repaired and Made as Strong as Ever

It is often difficult to obtain the proper size of material to replace a broken part. This hanger iron was repaired by applying a brace to the broken section.



Production And the Market



Coal Market Gains Confidence with Appearance of Cold Weather and Better Industrial Outlook

At last, apparently, the turn in the long lane has come, and the coal trade is more hopeful. A real blast of winter weather over a broad expanse of territory has brought the stimulus needed to sharpen the interest of many of the coal consumers who have shown a hesitant attitude during recent weeks. As a result consumption is picking up, distress coal is less in evidence, inquiries are more numerous and interest in the renewal of expiring contracts is to be noted. Shutdowns at a number of mines over the holidays promise to cut down overproduction materially, with a firmer tendency in prices as a natural consequence.

The steel industry continues to show improvement, many mills nearing capacity output as the demand increases. Most other lines are making slight gains, but there is still much room for betterment in textiles. Practically all branches of business take a hopeful view of prospects for the new year, based on sound fundamental conditions. William Green, the new president of the Federation of Labor, pronounces labor conditions reasonably satisfactory, though the coal operators of central Pennsylvania seem to take a somewhat different view.

Anthracite Market Easy

In the anthracite market there is still plenty of room for improvement, independent prices lacking firmness, though no formal reductions have been made. The labor troubles at the mines have had no appreciable effect thus far on the supply of domestic sizes, but rice and barley are less plentiful. Chestnut and stove are in strongest demand, but egg and pea also have firmed up slightly. Buckwheat is comparatively easy, while rice and barley are somewhat stronger. The likelihood of any serious effect on the market by reason of the strike probably disappeared last week, as numer-

ous defections from the ranks of the strikers seemed to presage the collapse of the walkout.

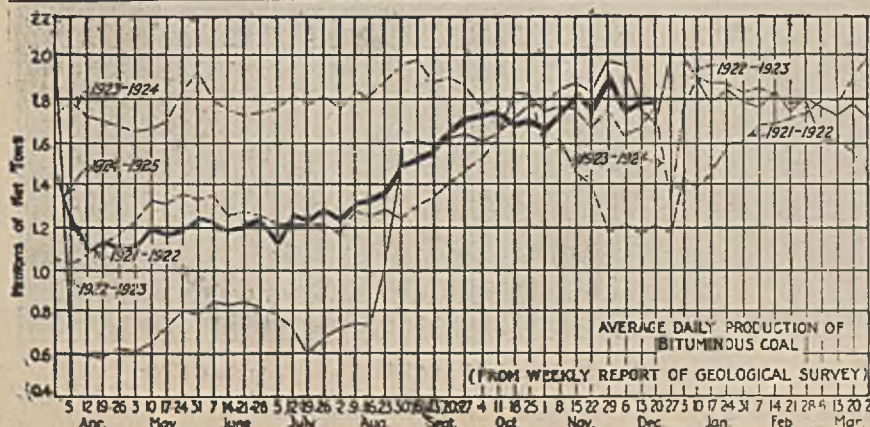
Coal consumption during November was 10 per cent larger than in October, according to the National Association of Purchasing Agents. Consumption of anthracite and bituminous in November was 40,130,000 tons as compared with 35,679,000 tons in October, while the estimated stock of coal on hand as of Dec. 1 was 57,376,000 tons, as compared with 57,754,000 tons as of the month previous, a decrease of 378,000 tons. Of all industrial firms reporting stocks and consumption of coal, the survey of the association shows that 72 per cent showed increased consumption during November, 17 per cent about the same amount used, and 11 per cent used less coal than in the previous month. With the exception of January consumption during November was greater than that of any month in 1924.

Price Index Again Advances

Coal Age Index of spot prices of bituminous coal advanced another point during the past week, standing on Dec. 29 at 171, the corresponding price for which is \$2.07, compared with 170 and \$2.06 on Dec. 22.

The advent of the holidays saw a big falling off in activity at Hampton Roads, dumpings of coal for all accounts during the week ended Dec. 25 totaling 331,913 net tons, compared with 400,099 tons during the previous week.

Output of bituminous coal during the week ended Dec. 20, according to the Geological Survey, totaled 10,760,000 net tons, compared with 10,723,000 tons in the previous week and 10,543,000 tons in the corresponding week of 1923. Anthracite production in the week ended Dec. 20 was 1,867,000 net tons, compared with 1,772,000 tons in the preceding week and 1,925,000 tons in the corresponding week a year ago.



Estimates of Production (Net Tons)		
BITUMINOUS		
	1923	1924
Dec. 6	9,829,000	10,612,000
Dec. 13 (a)	9,936,000	10,723,000
Dec. 20 (b)	10,543,000	10,760,000
Daily average	1,757,000	1,793,000
Cal. yr. to date (c) ..	534,679,000	455,280,000
Daily av. to date	1,788,000	1,521,000
ANTHRACITE		
Dec. 6	1,837,000	1,814,000
Dec. 13	1,947,000	1,772,000
Dec. 20	1,925,000	1,867,000
Cal. yr. to date (c) ..	91,824,000	88,291,000
COKE		
Dec. 13 (a)	240,000	192,000
Dec. 20 (b)	256,000	209,000
Cal. yr. to date (c) ..	17,647,000	9,343,000
(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 Business Is Fine!

Domestic demand is strong and screenings are bringing a good round price in Midwest markets, now that Christmas holidays are on and stiff cold weather has had a week's run through the Central and Western states. All Illinois and Indiana domestic coals are bringing full circular prices—\$3.50 for best southern Illinois lump and egg and for Indiana Fourth Vein lump; \$3 for central Illinois and Indiana Fifth Vein lump; \$1.75@\$.2 for screenings from all fields.

This condition is expected to continue for a while even though a wave of much warmer weather was prophesied for the Midwest region to start the first of this week. Low production in all fields until after New Year's and generally improving industrial activity are counted on to hold up screenings fairly well even though domestic demand continues strong. One of the many indications of this is the late November contract by the Standard Oil Co. for 100 cars a day of central Illinois screenings. This makes a big reduction in the available supply of screenings produced in that territory and, under present conditions, makes central Illinois spot screenings scarce indeed with the average price up close to \$2.

Railroad tonnage in southern Illinois is slow but there are some inquiries that may develop into big orders for

quick shipment in a few days. The storm tied up railroads so that the movement has been greatly retarded, causing congestions at East St. Louis on account of the ferry being out of order. Screenings are strong at \$1.75@\$.2, but indications are that they will weaken along in January. In the Duquoin field similar conditions prevail excepting that prices are being cut to move the coal. Through all this territory the strip mines have been busy up to the present, but the weather has temporarily put them out to some extent.

In the Mt. Olive field the storm tied up the mines for three or four days and some of them are not working on account of no business. Screenings are going on contracts and a little of the domestic sizes is moving north and west. Mines are getting from two to four days a week when they can work. In the Standard field conditions are bad. There is a good demand for steam sizes but lump is not moving and all mines have "no bills."

Throughout the entire Illinois field many mines last week lost several days on account of wires being down that prevented empty cars moving and they were unable to get in touch with the main office. Colder weather will bring a stimulation to all fields, but there is nothing to indicate that prices will improve.

At St. Louis regular winter weather developed a good domestic business on soft coals but there is very little doing

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

Low-Volatile, Eastern		Market Quoted	Dec. 31 1923	Dec. 15 1924	Dec. 22 1924	Dec. 29 1924†	Midwest		Market Quoted	Dec. 31 1923	Dec. 15 1924	Dec. 22 1924	Dec. 29 1924†
Smokeless lump.....	Columbus....	\$3.35	\$4.10	\$3.85	\$3.75@	\$4.00	Franklin, Ill. lump.....	Chicago.....	\$3.35	\$3.25	\$3.25	\$3.25@	\$3.50
Smokeless mine run.....	Columbus....	1.85	2.00	1.90	1.75@	2.10	Franklin, Ill. mine run....	Chicago.....	2.35	2.35	2.35	2.25@	2.50
Smokeless screenings.....	Columbus....	1.25	1.25	1.10	1.00@	1.25	Franklin, Ill. screenings....	Chicago.....	1.85	1.60	1.75	1.85@	2.00
Smokeless lump.....	Chicago.....	3.50	3.85	3.75	3.50@	4.00	Central, Ill. lump.....	Chicago.....	3.00	2.85	2.85	3.00	
Smokeless mine run.....	Chicago.....	2.10	1.85	1.85	1.75@	2.00	Central, Ill. mine run....	Chicago.....	2.10	2.20	2.20	2.15@	2.25
Smokeless lump.....	Cincinnati..	3.10	3.75	3.75	3.50@	4.00	Central, Ill. screenings....	Chicago.....	1.35	1.65	1.75	1.85@	2.00
Smokeless mine run.....	Cincinnati..	2.10	1.85	1.85	1.75@	2.00	Ind. 4th Vein lump.....	Chicago.....	3.10	3.10	3.10	3.25@	3.50
Smokeless screenings.....	Cincinnati..	1.75	1.15	1.20	1.25		Ind. 4th Vein mine run....	Chicago.....	2.60	2.35	2.35	2.25@	2.50
Smokeless mine run.....	Boston.....	4.65	4.10	4.10	3.90@	4.25	Ind. 4th Vein screenings....	Chicago.....	1.65	1.55	1.70	1.80@	1.90
Clearfield mine run.....	Boston.....	1.85	1.95	2.00	1.65@	2.40	Ind. 5th Vein lump.....	Chicago.....	2.50	2.75	2.75	3.00	
Cambrist mine run.....	Boston.....	2.50	2.30	2.35	2.00@	2.75	Ind. 5th Vein mine run....	Chicago.....	2.10	2.10	2.10	2.00@	2.25
Cambrist mine run.....	Boston.....	2.10	2.15	2.15	1.80@	2.50	Ind. 5th Vein screenings....	Chicago.....	1.55	1.30	1.55	1.65@	1.80
Pool 1 (Navy Standard)..	New York....	3.00	2.80	2.80	2.65@	2.95	Mt. Olive lump.....	St. Louis....	3.10	3.00	3.00	3.00	
Pool 1 (Navy Standard)..	Philadelphia..	3.00	2.70	2.70	2.50@	2.90	Mt. Olive mine run....	St. Louis....	2.50	2.35	2.35	2.25@	2.50
Pool 1 (Navy Standard)..	Baltimore....	2.10	2.05	2.05	1.95@	2.25	Mt. Olive screenings....	St. Louis....	1.85	1.10	1.10	1.00@	1.25
Pool 9 (Super. Low Vol.)	Philadelphia..	2.30	2.15	2.15	2.00@	2.25	Standard lump.....	St. Louis....	2.85	2.75	2.75	2.75	
Pool 9 (Super. Low Vol.)	Baltimore....	2.00	1.70	1.70	1.65@	1.80	Standard mine run....	St. Louis....	1.95	1.95	1.95	1.90@	2.00
Pool 9 (Super. Low Vol.)	Philadelphia..	2.30	2.15	2.15	2.00@	2.25	Standard screenings....	St. Louis....	1.55	1.05	1.05	1.00@	1.15
Pool 10 (H.Gr.Low Vol.)	New York....	1.85	1.80	1.80	1.80@	2.00	West Ky. lump.....	Louisville..	2.85	2.35	2.20	2.25@	2.50
Pool 10 (H.Gr.Low Vol.)	Philadelphia..	1.85	1.75	1.75	1.65@	1.90	West Ky. mine run....	Louisville..	1.65	1.55	1.55	1.35@	1.75
Pool 10 (H.Gr.Low Vol.)	Baltimore....	1.90	1.55	1.55	1.50@	1.65	West Ky. screenings....	Louisville..	1.35	1.10	1.05	1.00@	1.25
Pool 11 (Low Vol.).....	New York....	1.60	1.60	1.60	1.50@	1.75	West Ky. lump.....	Chicago.....	2.85	2.35	2.35	2.25@	2.50
Pool 11 (Low Vol.).....	Philadelphia..	1.65	1.45	1.45	1.35@	1.60	West Ky. mine run....	Chicago.....	1.75	1.55	1.50	1.40@	1.65
Pool 11 (Low Vol.).....	Baltimore....	1.75	1.45	1.45	1.40@	1.50							

High-Volatile, Eastern		Market Quoted	Dec. 31 1923	Dec. 15 1924	Dec. 22 1924	Dec. 29 1924†	South and Southwest		Market Quoted	Dec. 31 1923	Dec. 15 1924	Dec. 22 1924	Dec. 29 1924†
Pool 54-64 (Gas and St.)..	New York....	1.60	1.50	1.50	1.40@	1.65	Big Seam lump.....	Birmingham..	3.85	2.85	2.85	2.50@	3.25
Pool 54-64 (Gas and St.)..	Philadelphia..	1.70	1.50	1.50	1.40@	1.60	Big Seam mine run....	Birmingham..	1.95	1.60	1.70	1.50@	1.90
Pool 54-64 (Gas and St.)..	Baltimore....	1.50	1.45	1.45	1.40@	1.50	Big Seam (washed).....	Birmingham..	2.35	1.85	1.85	1.75@	2.00
Pittsburgh so'd gas.....	Pittsburgh..	2.50	2.40	2.40	2.30@	2.50	S. E. Ky. lump.....	Chicago.....	3.10	2.60	2.50	2.40@	2.60
Pittsburgh gas mine run..	Pittsburgh..	2.25	2.10	2.10	2.00@	2.25	S. E. Ky. mine run....	Chicago.....	1.85	1.50	1.45	1.40@	1.50
Pittsburgh mine run (St.)	Pittsburgh..	2.00	1.85	1.85	1.75@	2.00	S. E. Ky. lump.....	Louisville..	3.00	2.60	2.60	2.85@	2.75
Pittsburgh slack (Gas)...	Pittsburgh..	1.65	1.20	1.30	1.25@	1.35	S. E. Ky. mine run....	Louisville..	1.75	1.40	1.40	1.25@	1.60
Kanawha lump.....	Columbus....	2.60	2.30	2.30	2.10@	2.50	S. E. Ky. screenings....	Louisville..	1.35	.95	.95	.85@	1.10
Kanawha mine run.....	Columbus....	1.60	1.55	1.55	1.45@	1.65	S. E. Ky. lump.....	Cincinnati..	2.85	2.35	2.35	2.00@	2.60
Kanawha screenings.....	Columbus....	1.10	.90	.95	.85@	1.05	S. E. Ky. mine run....	Cincinnati..	1.50	1.50	1.45	1.25@	1.65
W. Va. lump.....	Cincinnati..	2.60	2.20	2.15	1.85@	2.05	S. E. Ky. screenings....	Cincinnati..	1.25	.90	.90	.90@	1.10
W. Va. gas mine run....	Cincinnati..	1.55	1.50	1.50	1.35@	1.65	Kansas lump.....	Kansas City..	4.75	4.75	4.75	5.00	
W. Va. steam mine run....	Cincinnati..	1.35	1.40	1.40	1.30@	1.50	Kansas mine run....	Kansas City..	3.00	3.00	3.00	3.00@	3.25
W. Va. screenings.....	Cincinnati..	1.30	.95	.95	.90@	1.10	Kansas screenings....	Kansas City..	2.00	2.30	2.30	2.50	
Hooking lump.....	Columbus....	2.60	2.55	2.50	2.35@	2.65							
Hooking mine run.....	Columbus....	1.80	1.60	1.60	1.50@	1.75							
Hooking screenings.....	Columbus....	1.30	.80	1.10	1.05@	1.15							
Pitta. No. 8 lump.....	Cleveland..	2.45	2.40	2.40	2.00@	2.85							
Pitta. No. 8 mine run....	Cleveland..	1.90	1.85	1.85	1.85@	1.90							
Pitta. No. 8 screenings....	Cleveland..	1.55	1.35	1.50	1.50@	1.60							

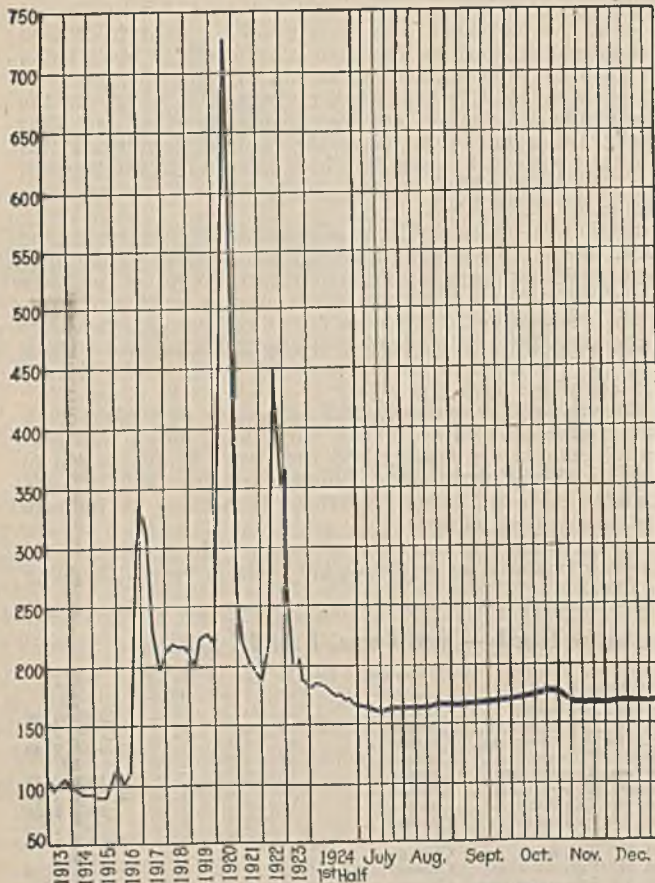
* Gross tons, f.o.b. vessel, Hampton Roads.

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

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

	Market Quoted	Freight Rates	Dec. 31, 1923		Dec. 22, 1924		Dec. 29, 1924†			
			Independent	Company	Independent	Company	Independent	Company		
Broken.....	New York....	\$2.34	\$8.00	\$8.00@	\$9.25	\$8.00@	\$9.25	\$8.00@	\$9.25	
Broken.....	Philadelphia..	2.39				9.15		9.15		
Egg.....	New York....	2.34	9.50@	10.00	8.75@	9.25	8.75@	9.25	8.75@	9.25
Egg.....	Philadelphia..	2.39	9.85@	11.00	8.75@	9.25	9.45@	9.75	8.80@	9.25
Egg.....	Chicago*	5.06	9.60@	12.50	8.00@	8.35	8.17@	8.40	8.08	
Stove.....	New York....	2.34	9.85@	11.00	8.75@	9.25	9.50@	10.25	9.00@	9.50
Stove.....	Philadelphia..	2.39	9.85@	11.00	8.90@	9.25	10.10@	10.75	9.15@	9.50
Stove.....	Chicago*	5.06	9.60@	12.50	8.00@	8.35	8.80@	9.00	8.53@	8.65
Chestnut.....	New York....	2.34	9.85@	11.00	8.75@	9.25	9.75@	10.25	9.75@	10.25
Chestnut.....	Philadelphia..	2.39	9.85@	11.50	8.90@	9.25	10.00@	10.75	9.25@	9.40
Chestnut.....	Chicago*	5.06	9.60@	12.50	8.00@	8.35	8.61@	9.00	8.40@	8.41
Pea.....	New York....	2.22	5.75@	6.25	6.15@	6.65	4.50@	5.50	4.50@	5.50
Pea.....	Philadelphia..	2.14	6.00@	7.25	6.35@	6.60	5.75@	6.00	5.50@	6.00
Pea.....	Chicago*	4.79	6.00@	6.75	5.40@	6.05	5.36@	5.75	5.36@	5.75
Buckwheat No. 1.....	New York....	2.22	2.00@	3.00	3.50		2.00@	2.25	3.00@	3.15
Buckwheat No. 1.....	Philadelphia..	2.14	2.00@	3.50	3.50		2.50@	3.00	3.00@	3.15
Rice.....	New York....	2.22	1.35@	2.25	2.50		1.85@	2.00	2.00@	2.25
Rice.....	Philadelphia..	2.14	1.50@	2.50	2.50		2.00@	2.25	2.00@	2.25
Barley.....	New York....	2.22	1.10@	1.50	1.50		1.25@	1.50	1.30@	1.60
Barley.....	Philadelphia..	2.14	1.00@	1.50	1.50		1.50	1.50	1.50	1.50
Birdseye.....	New York....	2.22	1.60		1.60		1.60	1.60	1.40@	1.75

* 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	
	Dec. 29	Dec. 22	Dec. 15	Dec. 31
Weighted average price	\$2.07	\$2.06	\$2.04	\$2.17

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.

in anthracite, smokeless or coke. Wagonload steam business shows some improvement and carload steam business is good. Country domestic is moving all grades unusually well, but country steam is slow. A good improvement in steam is reported in the Chicago and Omaha markets and a fairly good tonnage of domestic has gone to Kansas City and St. Joseph. Indications are that the demand for domestic all over will be unusually good after Jan. 1. There are no changes in local prices.

Kentucky Is Slower

The Kentucky coal trade is rapidly closing down until after the holidays, it being reported from the operating sections that the miners have been busy for months and are willing to take a rest, while the operators confronted with a dull market and lots of "no bills" on track, are more than willing to slow down production. A number of mines don't figure to start producing again until Jan. 5, although some started up on Dec. 29. However, just a few days of light production along with cold weather should start domestic sizes moving, reduce offerings of screenings and make for a generally better market.

Prices on prepared sizes are a shade stronger in block this week as a result of cleaning up of some of the unsold coal on track and lighter production. Screenings are holding about level, in spite of the fact that a good many buyers are out of the market until January. The coldest weather of the winter over the past few days has aided retailers in moving coal, but they are not buying much replacement stock. A few industrial consumers have bought a little coal in anticipation of slowing down and higher prices over the holidays. However, there is still a good deal of transit

coal available, and there was some congestion reported in the C.&O. yards at Russell, Ky., of "no bills" which have been piling up there from the Big Sandy district of Kentucky and sections of West Virginia.

West Kentucky block is \$2.25@\$2.50, lump is \$2@\$2.25, while egg, which has been a little harder to move in all fields, is \$1.90@\$2.25 for two sizes. In eastern Kentucky some of the finer prepared blocks are quoted as high as \$3, but the market is \$2.25@\$2.75, with some fine coal at \$2.50. Lump is \$2@\$2.50, with not much at over \$2.25 in the 2-in. size. Egg is slow at \$1.75@\$2. Screenings are 90c.@\$1 on most quotations.

Northwest Wants More Action

The end of the year at Duluth finds the coal trade in a healthy condition with docks working overtime and every prospect for a movement of anthracite which will help to clear the stocks of that coal that have accumulated during the turn to smokeless soft.

Frankly the chief item of interest here now is hard coal. It is estimated that 475,000 tons is still on docks, which shows that outside points have been ordering in the past month, as a month ago the stocks were reported at 600,000 tons. The supply of substitutes is running short now, and it is estimated that by Jan. 1 the buying public will of necessity turn to hard. Anthracite has started to move locally already, however, but this is among those consumers who would rather pay the difference in price now that smokeless soft has reached such a high figure.

There are about 4,750,000 tons of soft coal on the docks. No fear is felt for the disposal of this, as the weather bids fair to remain cold and while business is rushing now, many new inquiries are being received daily. The buying now is mostly from dealers, but industries will come into the field after the first of the new year.

Total receipts for the year were 7,730,878 tons of soft and 1,289,994 tons of hard. Hard coal decreased 129,990 tons from 1923 and soft coal 3,537,459 tons. It must be remembered that stocks were on docks at the opening of navigation this year. Prices are unchanged.

Pickup at Twin Cities Disappoints

At the Twin Cities, despite some of the most vigorous weather that has been known in December in many years, the demand for coal is not showing the expected pickup. Of course continued severe weather cannot but force a larger consumption and an increased demand, but it seems that it will register only in hastening the day when replenishment is necessary.

A disturbing feature is the uncertainty of prices, and the wide spread of quotations at retail on presumably the same grades of coal. A number of new concerns have sprung into the retail game within a year or so. It is difficult to account for their price variations unless substitutes are being used. In general, all-rail prices are steady, and screenings are recovering steadily. Southern Illinois lump is \$3.50; western Kentucky lump \$2.50; Indiana lump, \$3. Screenings are from \$1 for Kentucky to \$1.60 for southern Illinois. Dock prices are without change on any of the grades.

Cold Keeps West Busy

As a relief from the situation of the last few weeks, in which operators of the Southwest were struggling to clear their tracks of "no bills," this week all are from four to five days behind in their deliveries. The entire Southwest was blanketed with sleet and snow, held together by rain and frozen solid in a below zero temperature.

Kansas screenings are generally quoted at \$2.50, with some selling as high as \$2.75. Kansas lump is firm at \$5 and nut at \$4. Mine run is quoted at from \$3 to \$3.25.

The effect of the winter weather has been less evident in the Arkansas semi-anthracite market, as most buyers of this grade laid in larger supplies early in the season than did buyers of the Kansas domestic sizes. Arkansas screenings are scarce at \$2. There has been no change in quotations on Arkansas lump.

As a result of zero weather which struck Salt Lake City and its trade territory along with other sections of the West, coal mines in Utah are increasing their output. Several mines are already working six days a week. In one of the adjoining states served by Utah mines the thermometer registered one day more than 50 deg. below zero. In Salt Lake City and Utah it has been colder than in many years.

Operators are experiencing some difficulty in getting shipments through owing to the deep snow everywhere. The dealers, however, have the worst end of it. The cold weather has struck the city at a time when the bins which were filled up in the summer and fall are getting low. Several of the smaller dealers in Salt Lake City are already out of coal. H. F. Fernstrom, president of the Utah-Idaho Retail Coal Dealers' Association, said he has not known coal dealers at Salt Lake City to be so busy for six or seven years. He did not expect the city to suffer a fuel shortage, he said. The larger dealers are fairly well stocked.

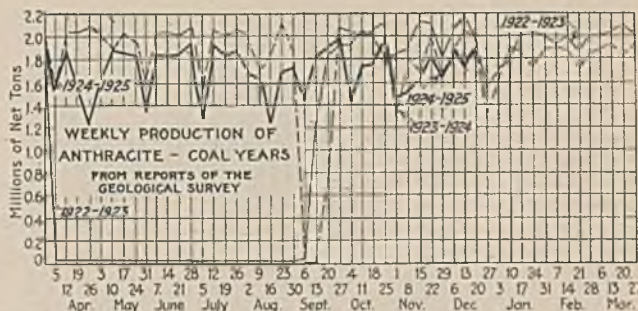
Ohio Trade Quiet but Firm

Actual figures at Cincinnati now support the assertions of a letdown in production, but "no bill" cars still hold the whip hand so far as bituminous is concerned. Low prices are still forced by the excess, though certain West Virginia and Kentucky selling agents refuse to meet this or the low quotations made by price cutters. Because of the wide spread in the price of lump and block, the position of egg is weak. Run of mine is the backbone of the market and with advanced quotations on slack and with lower production, it shows a disposition to go higher. Smokeless trade is quiet so far as immediate deliveries are concerned, but orders booked for January are fairly good. Run of mine is stronger as the Pocahontas field is marking time through the holidays. Slack is firm, Standard No. 3 commanding \$1.25 and tending to advance. Retail business has been confined to small lot deliveries but snow, cold weather and the passing of Christmas lend a more hopeful attitude. The water stage is excellent for movement down the river unless there is a heavy freeze.

During the holiday season the Columbus coal trade has shown a quiet tendency both at retail and for steam coal, although the most activity was noted in domestic circles. Many dealers are holding off until after inventories, though a fair run of business has been booked from retailers who specified shipment after the first of the year. The colder weather has stimulated retail trade to a certain extent, but this has not yet been reflected on the wholesale end of the business. Retail prices have become slightly stronger. Pocahontas and other smokeless grades are still in the best demand and there is a good demand for splints and Kentucky block. Ohio mined grades are rather weak and there is no immediate prospect for improvement in the demand. Steam business also is awaiting inventories of stocks. Many of the larger users have ample reserves for some time, though some increase in fuel consumption is reported along certain lines of manufacturing. Public utilities are good purchasers. There is still a fair tonnage of distress coal, but this is gradually disappearing. Screenings are rather scarce, due to reduced production of lump and other prepared sizes and consequently are ranging from \$1.05 to \$1.25 per ton. Production in Ohio fields is very low, many large operations having been closed completely. Co-operative mines are producing the larger share of the output. Production in the Hocking Valley, Pomeroy and Jackson fields is estimated at about 17 per cent of capacity.

Cleveland Trade Optimistic

Zero weather at Cleveland has given stimulus to local coal markets due to the necessary greater consumption of both steam and domestic coal all around, not only for heating but for steam purposes as well. Furthermore, production is decidedly off on account of the holidays, and the number of mines operating in the eastern Ohio field is less than at any time during 1924. Freight movement has perforce slowed down considerably. Slack and nut-and-slack continue very scarce and spot prices are holding at the high level reached a week ago, \$1.30@1.60, the latter figure obtaining in exceptional sales. A general feeling of optimism as to better business conditions soon is now extant throughout this section. Output in the eastern Ohio field for the year up to Dec. 20 is estimated at 14,786,000 tons, or a little better than 40 per cent of the capacity of the district. During the week of the 20th the mines worked about 40 per cent of full time and it is reported that the railroads are taking about 60 per cent of the output from this field for fuel at the present rate of operations. Production during the holiday week is expected to show a decided slump because of complete shutdown on Christmas day and operations at only a little better than 30 per cent during the remainder of the week.



Pittsburgh Market Is Sluggish

Demand at Pittsburgh continues to be poor. It looks as if the industries have been limiting purchases prior to inventory, though reports are favorable as to the general state of business and industry. The steel industry, in particular, promises to show an operating rate of about 80 per cent for December. A severe cold snap that came suddenly promises to stimulate sales of domestic coal. No change is noted in the district as a result of the wage advance in the Connellsville region, which had been shipping scarcely any steam or gas coal. Prices are unchanged.

Loadings in central Pennsylvania in the week ending Dec. 20 were 16,240 cars, as against 15,960 in the previous week. Up to the same date in December the loadings were 48,155, as compared with 40,216 for the same period in November.

At Buffalo the weather has of late done what it could to encourage activity by the coal buyers. The jobber is getting lean picking as many heavy consumers are buying their supplies direct. Not only leading railroads, but also certain big smelting companies either own their own mines or have connections with the operators without going to the jobbers. The surpluse of coal continues, but not much of it is shipped here unsold, as the chance of severe loss is too great. Slack continues strong, mostly because the production of lump, from which it is derived, is not heavy. Quotations remain at \$2.25@\$2.50 for Youghiogeny gas lump, \$2@\$2.25 for Pittsburgh and No. 8 steam lump, \$1.75 @\$2 for all mine run and \$1.35@\$1.50 for slack.

New England Market Stuck in a Rut

In New England the market for steam coal is in the same dull and uninteresting rut that has been typical for the past sixty days. Buyers are pursuing a close-hauled policy with respect to tonnage for January and February, feeling that there is no prospect whatever for unchanged prices in the first few weeks of the new year. There has been more seasonable weather the past few days, but apparently it has no effect on the demand for bituminous.

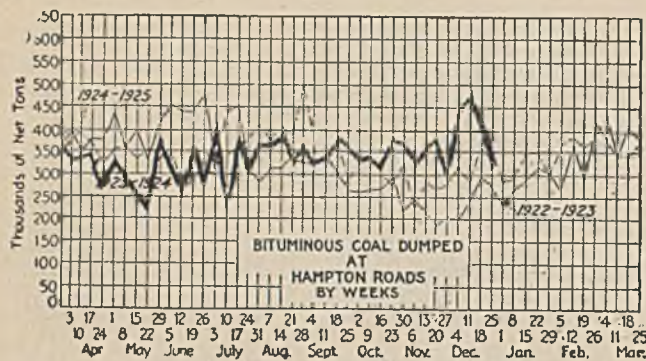
At Hampton Roads there are accumulations but they are not yet heavy enough to induce any serious reduction in the asking price f.o.b. vessel. Pocahontas and New River of highest grade is still commanding as high as \$4.20@\$4.25 per gross ton, but from that point depending upon grade, the range is downward to \$4, and in special instances to \$3.80@\$3.90.

For inland delivery from points like Boston, Providence and Portland there is perhaps less distress coal than was the case a week ago; \$5.35 is an open price per gross ton on cars Boston, but a few factors are able to sell single car lots as high as \$5.50 to buyers who discriminate between grades.

All-rail from central Pennsylvania there is no change. In territory exclusively all rail there is only feeble request, and within the larger area now accessible from rehandling wharves at tidewater there is only a much restricted outlet. The smokeless coals continue the dominating influence in the larger part of this section.

Watchful Waiting in Atlantic Seaboard Markets

Nothing of moment transpired in the New York market during the last week. As the year ends buyers are watching the situation closely, ready to place orders should there be a sudden spurt due to weather conditions or heavy demand because of scarcity of steam sizes of anthracite caused by the strikes in the hard coal fields. Some attention is being paid to contracts for the new year by both oper-



ators and consumers. Nothing definite has yet been learned regarding prices but it is thought in some quarters that the best coals might be quoted around \$2.75 per ton and good coals from \$2.25 up. During the past week or ten day sales have been made for immediate delivery subject to billing after Jan. 1. Demand for slack jumped suddenly and was quoted at \$1.30 to \$1.50. There was a heavy call for bituminous prepared coals from Northern New York State and from New England. Quotations for Broad Top product ranged from \$3.75 to \$4.25 depending upon the size. Tide-water coal is in good demand and movement is easy.

With improving industrial prospects in Philadelphia much confidence is expressed by the trade that the coming year will be productive of much better business than the one now passing. Textiles in particular are showing improvement, and the iron trade is moving forward steadily, with those industries buying a fair amount of coal in excess of current use. Colder weather also has had its impress upon the business. Concerns whose contracts expire with the first of the year have been solicited for a renewal of this trade and a fair amount of tonnage has been closed. Contract prices vary but little for the good coals, quotations running around \$2.20@ \$2.35 for high grade steaming fuels. The tide trade is still of very little note locally. The best news of late is that a line of ocean carriers is converting its fleet back to steam. There is no fluctuations of moment in the price situation.

Baltimore Consumers Indifferent

Baltimore consumers are unmoved by reports of blizzard conditions in the Midwest and the announcement that the East was to get its share of biting cold weather and snow. Demand for both gas and steam coals continues light and prices are practically the same as they have been for several weeks past. Industry in this section apparently is standing pat on the facts that supplies of coal have been more than enough to meet all calls and there is still enough free coal here to meet early emergency demands, which has kept prices from rising. The gamble of the situation is whether any transportation holdup that comes will be serious enough in scope and length to create a local scarcity of fuel. The export situation since Dec. 17 has been rather flat, but a development of interest during the week was the receipt of Welsh coal from Swansea. The ship which brought in the fuel for the hard coal trade took a return cargo of bituminous coal for a Mediterranean port.

Propitious weather conditions came to the aid of the Birmingham market this week as cold rains fell and the temperature took a decided drop. Retail dealers, who have been fairly busy with deliveries for several weeks, received a flood of orders as consumers hastened to lay in fuel. The wholesale trade has already felt the impetus and the mines are booking a good tonnage in the aggregate as orders are placed for one or more cars for prompt shipment, most of the business moving to the smaller cities and towns in the territory where dealers carried small reserves. The steam market is better than a week ago, general industrial demand having improved some, with additional coal moving on contracts to railroads and other utilities and plants which will operate practically without interruption during the holidays. The Mobile Railway, Light & Power Co. has made a five-year contract for washed Black Creek coal from this district, having converted its plant from the use of oil, which has been used as a fuel for the past five years. Bunker business was somewhat better at Southern ports. Both steam and domestic prices are stronger. Production in the week of Dec. 6 was 368,000 tons and Dec. 13, 382,000

tons as compared with 330,000 for the week of Nov. 29. About four days will be observed for the holidays at commercial and domestic mines while furnace operations will be idle from one to two days as a rule.

Anthracite Trade Lopes Along

Strikes in the Northern anthracite fields have not yet affected the supply of domestic coals at New York. There is a shortage of rice and barley, due in part to the cut in production and also to several days of real winter temperatures. It is not expected that the cut in output caused by the strikes will have any immediate effect on this market unless they be prolonged, as retail dealers are carrying large tonnages of most prepared sizes. Chestnut and stove lead the demand for domestic coals and the call for egg and pea is picking up. So far wholesale dealers and shippers have been able to meet all demands without trouble. Users of steam coals find buckwheat easy, but rice and barley are becoming short.

The Philadelphia anthracite market is weak, most independent operators having all sizes to offer to anyone in the trade who wants them. Company shippers are in almost the same condition, except that they have been unable to catch up on nut. As yet there have been no regular reductions in independent prices, although offers of egg and pea much below the quoted circulars of the individuals have been heard. Steam coals are draggy, with the possible exception of barley and this is not very active. The two former sizes can be bought from independents for from 25 to 50c. off circular.

Cold weather at Baltimore has brought about a boost in anthracite. A seasonal demand developed when the temperature dropped to about 17 deg. Coal men here figure that many thousands of householders bought in unusually small quantities the past fall and that a cold wave of one or two weeks' duration will bring about a consumption that should cause a decided renewal of ordering soon after the first of the year.

Demand for anthracite at Buffalo is pretty good now and it promises to continue as long as the severe weather lasts. There is not much prospect of the previous lack of demand being made up, but that seems to be mainly because of the increase of substitute fuels such as natural and byproduct gas, coke, smokeless soft coal and oil. All of these appear to be gaining on high-priced anthracite, and small sizes of anthracite and coke promise to do the same as soon as the consumer understands them. The Canadian anthracite trade continues pretty quiet.

Coke Buyers Scarce at Connellsville

Coke consumers, in the main, have been refusing to buy, and the Connellsville market is not really established at the advanced level that would come from the wage advance. Spot furnace coke had worked its way up to \$3.50@ \$3.65 and ought since the wage advance to have been, say, \$4.25@ \$4.50. At the end of last week some coke was picked up at \$3.75 and since then a limited tonnage has been sold at \$4.25. However it is practically certain that if there were anything like real market activity prices of \$4.25 to \$4.50 or thereabouts would obtain. As to contracts, all inquiry, even tentative, has dropped out. Foundry coke has been available at \$4.50@ \$5, which is scarcely any advance, but has met with very limited sale.

Domestic coke is not changed much in price at Buffalo. One dealer lately advertised it at a cut of 50c. a ton, making it \$9 at the curb, but the general price remains at \$9.50. The new wage scale in effect at Connellsville means that coke is going to cost more now. The quotations that come this way are \$4.50@ \$5 for foundry and \$3.35@ \$4 for furnace, home-made byproduct coke making corresponding prices as usual. The rate of freight remains at \$3.28 to Buffalo.

Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Dec. 13, 1924.....	956,761	191,854
Previous week.....	968,256	193,256
Week ended Dec. 15, 1923.....	879,052	176,128

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Dec. 14, 1924.....	223,431	100,793		
Dec. 7, 1924.....	208,451	59,961		

Foreign Market And Export News

British Market Feels Better Demand From Home and Abroad

The Welsh steam coal market is making some steady progress aided by a somewhat better demand from home and abroad, prices holding firm. Part of this improvement is, of course, due to seasonal conditions, and it is difficult to apportion the order between ordinary seasonal business and real extension. Operators are booking orders ahead for prices very near those ruling today and this is encouraging buyers. For the remainder of the year output is covered by demand, and no more shutdowns are expected. Those collieries working anticipate no more curtailment of shifts for this year. The Egyptian State Ry. is taking Welsh coal of Monmouthshire variety, though the extent and the allocation of the contract is not yet known. France is taking a little more Welsh coal, and South America has contracted for 100,000 tons of Monmouthshire large at 24s. 6d. f.o.b.

The North of England market reports an improved condition and gas coals are being well sold to Italy and Scandinavia. Newcastle has lost a substantial order to Germany for coking coals for the French State Railways. Germany also deprived Newcastle of an order for gas coals for Stockholm, though there was little variation in prices.

Production by British collieries in the week ended Dec. 13, a cable to *Coal Age* states, was 5,413,000 tons, according to official reports. This compares with 5,336,000 tons in the preceding week.

French Coal Output Exceeds 4,000,000 Tons in October

Output of French coal mines in October, 1924, totaled 4,103,516 tons for 27 working days, as against 3,837,378 tons for 26 working days in the preceding month. This is the first time in the history of France's coal industry that the monthly output has exceeded the four million tons.

Average daily production, as given in

the following table, shows the steady increase:

	Average daily output	Number of employees
For the year 1913	136,147	203,208
January, 1923	121,064	242,566
October, 1923	136,661	271,166
January, 1924	144,680	286,804
October, 1924	151,982	302,771

In the Nord and Pas-de-Calais basin, reconstruction of devastated mines and improvements in the others raised the daily output from 60,239 tons in January, 1923, to 88,381 tons in October, 1924. In the Central and Southern regions the daily output in October, 1924, was 46,412 tons. The mines of Lorraine yielded 17,189 tons a day during the same month.

Coke production from all French ovens was 230,694 tons in October.

Coal Industry in Spain Is Flourishing

Spanish coal producers have finally been forced to give way to the increasing importation of British coals at lower prices, after many weeks of sustained prices, says Assistant Trade Commissioner James G. Burke, Madrid.

For the past six months the native coal industry in Spain has been experiencing most favorable conditions in both the market offered and the matter of employment. During this period the output has never been equal to the demand, and future orders have been sufficient to sustain fixed prices, in spite of the fact that British coal was being brought in at lower prices and with growing importations.

Prices Weaken in Slow Market At Hampton Roads

Business at Hampton Roads is slow, reacting to the holiday lull, and prices have weakened in the face of slumping demand. Practically all mines serving these terminals are reported to have shut down for the holidays, and large accumulations at the piers are expected

to be cut down materially before Jan. 1, which may give some strength to the market.

Heavier shipments to New England are reported, but foreign business has been falling off. Bunker trade slackened through the holidays, and the trade was comparatively indifferent to business. Domestic business was on the upgrade, the price of Pocahontas coal having been increased from \$10.50 to \$11.50 a ton in the face of increasing cold weather.

United States Domestic Fuel Exports During November

	(In Gross Tons)	
	1923	1924
Anthracite, tons	369,429	282,950
Value	\$4,183,717	\$3,191,989
Bituminous, tons	1,253,445	974,346
Value	\$6,214,493	\$4,604,140
Coke, tons	49,363	57,227
Value	\$490,443	\$442,140

ELEVEN MONTHS ENDED OCTOBER

Anthracite, tons	4,215,821	3,267,483
Value	\$45,919,835	\$36,410,492
Bituminous, tons	18,076,953	14,171,961
Value	\$99,040,142	\$65,836,797
Coke, tons	1,059,819	532,398
Value	\$11,469,421	\$4,452,114

Export Clearances, Week Ended Dec. 27, 1924

FROM HAMPTON ROADS		Tons
For Brazil:		
Jap. Str. Holland Maru, for Rio de Janeiro		7,022
Braz. Str. Lages, for Pernambuco		6,627
For Cuba:		
Br. Str. Ryburn, for Havana		3,847
For Italy:		
Ital. Str. Maria Enrica, for Genoa		10,780
Ital. Str. Oceania, for Porto Ferrajo		5,560
For West Indies:		
Nor. Str. Skogheim, for St. Thomas		3,875

Hampton Roads Pier Situation

N.&W. Piers, Lamberts Pt.:			
Cars on hand	1,895	2,174	
Tons on hand	123,389	142,914	
Tons dumped for week	131,760	115,955	
Tonnage waiting	10,000	26,000	
Virginian Piers, Sewalls Pt.:			
Cars on hand	1,970	1,752	
Tons on hand	132,300	113,550	
Tons dumped for week	106,554	78,710	
Tonnage waiting	9,194	6,324	
C.&O. Piers, Newport News:			
Cars on hand	2,413	2,047	
Tons on hand	120,450	98,660	
Tons dumped for week	118,997	101,677	
Tonnage waiting	21,495	4,575	

Pier and Bunker Prices, Gross Tons

	PIERS	
	Dec. 20	Dec. 27†
Pool 9, New York	\$4.75@55.00	\$4.75@55.00
Pool 10, New York	4.40@4.65	4.40@4.65
Pool 11, New York	4.30@4.45	4.30@4.45
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	4.00
Pool 2, Hamp. Roads	3.90	3.90
Pools 5-6-7 Hamp. Rds.	3.95	4.00

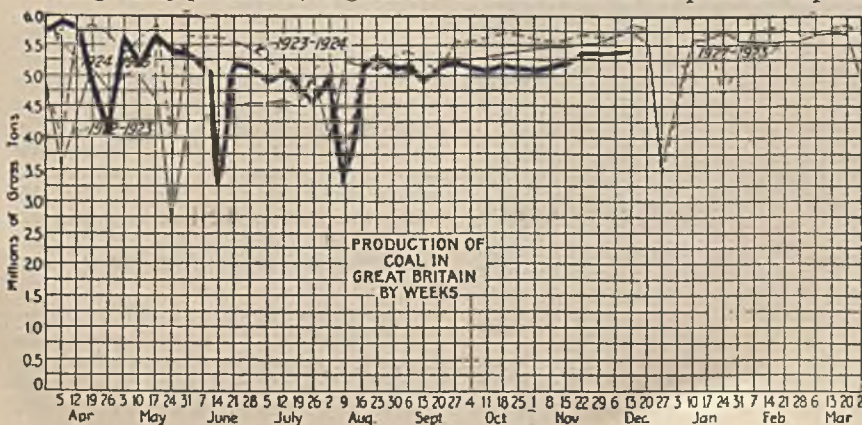
BUNKERS

Pool 9, New York	\$5.00@55.25	\$5.00@55.25
Pool 10, New York	4.65@4.90	4.65@4.90
Pool 11, New York	4.55@4.70	4.55@4.70
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	4.20	4.10
Pool 2, Hamp. Roads	4.00	4.00
Pools 5-6-7 Hamp. Rds.	4.10	4.10

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

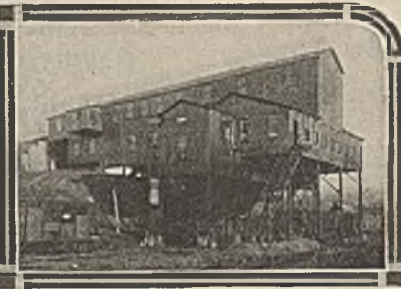
Quotations by Cable to <i>Coal Age</i>		
	Dec. 20	Dec. 27†
Cardiff		
Admiralty, large	27s. 6d. @ 28s.	27s. 6d. @ 28s.
Steam smalls	16s.	17s.
Newcastle:		
Best steams	18s. 9d. @ 22s. 6d.	19s.
Best gas	21s. 6d. @ 22s. 6d.	21s. 6d. @ 22s. 6d.
Best Bunkers	19s. @ 20s.	18s. 6d. @ 21s.

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





News Items From Field and Trade



ALABAMA

The State Board of Examiners will hold a session in the offices of Chief Mine Inspector C. H. Nesbitt, Lincoln Life Building, Birmingham, Jan. 19 to 23, 1925, for the examination of applicants for positions as mine foremen and bank bosses in Alabama coal mines.

The new 1,500-ton coal washery of the Pratt Fuel Corporation at its Dora operations, Walker County, has been completed and placed in operation. The cost of the plant was about \$65,000.

ILLINOIS

A petition for the incorporation of the village of Nason into a city was filed recently in the Jefferson County court. The town is the home of the new coal mine of the Nason Coal Co., of Chicago.

Vernon G. Leach, who had been combustion engineer for Bell & Zoller Coal Co., has joined the Nason Coal Co.

The Illinois Third Vein Coal Co. has closed its mine at Ladd. This mine has been for years a good producer. It had been in operation for thirty years, originally being the property of the Whitebreast Fuel Co. Before the development of the southern Illinois mines Ladd coal was shipped to all parts of the state and had a good market in the territory served by the Northwestern and the St. Paul railroads. During recent years business has fallen off. Already two mining towns in Bureau County have been wiped out through the suspension of mines, these being Marquette and Seatonville. The St. Paul Coal Co. mine at Cherry, however, will be operated in the future upon a full time basis. The St. Paul Coal Co. also has made a contract with a firm at Clinton, Ia., for the sale of the slag from the mine dump, which is to be used for the manufacture of building tile.

C. F. Breen has been appointed superintendent of the St. Paul Coal Co.'s mines at Cherry and Granville succeeding James Steele, who resigned Nov. 15.

INDIANA

The Bunsen mine, owned and operated by the U. S. Steel Corporation, opened the week of Dec. 15. The mine employs about 500 men.

Fifteen million dollars is a conservative estimate of the drop in the amount paid miners in the bituminous field surrounding Terre Haute during the past year. From Oct. 1, 1922, to Oct. 1, 1923, \$13,193,555.74 was paid miners in

Vigo county alone. At that time there were 40 mines in operation. Miners employed numbered 8,700. In the district surrounding Vigo County, of which Terre Haute is the seat, \$10,000,000 is the estimate of the payroll. An estimate of the payroll for the year ending Oct. 1, 1924, is \$4,500,000.

A movement has been started in the Indiana bituminous field to boost William Mitch for secretary-treasurer of the United Mine Workers, to succeed William Green, elected president of the American Federation of Labor. Mitch has been head of District No. 11. The effort to boost Mitch started last week in the Clinton field and soon spread among his friends in the district. They in turn are passing the word out through the state.

KANSAS

Leon Besson, state mine inspector of Kansas, has called a meeting of miners and operators in Pittsburg Jan. 12 to arrange for a state first-aid and mine-rescue meet to be held next spring. After preparations were well under way to hold the state meet in Arma last May the project had to be abandoned on account of inactivity in mining at that time.

Matt Walters, of Scammon, the first president of District 14, United Mine Workers, and Joseph Variot, Pittsburg, who was secretary-treasurer of the district several years ago, will be the contenders for the presidency of the run-off election of the Kansas miners on Feb. 10. Walters led the field though failing of the majority required for election. Con O'Donnell, Frontenac, was third in the election on Dec. 9, the returns from which have just been canvassed, and William Bogartz, the present president, was a weak fourth, receiving only 194 votes. Less than 2,500 votes on president were counted. Hundreds of miners wrote in the name of Alexander Howat for president, but these were not counted. Many miners refrained from voting as a protest against the barring of Howat from the ballot.

Recent petitions by coal companies, defendants in damage suits by miners, to have cases transferred from the District Court at Pittsburg to the U. S. District Court are interpreted by attorneys for the miners as an attempt to render the Kansas state compensation law inoperative. The petitions, two in cases against the Western Coal & Mining Co. and one against the Central Coal & Coke Co., all were denied, but an attorney for the coal companies said

the district judge's decision will not end attempts to have the compensation cases removed to the United States court.

KENTUCKY

W. J. Lester, of the Kentucky Washed Coal Co. of Nonnel, recently stopped off at Louisville on his way back from Chicago, where he was looking up matters in connection with installation of a washing plant in Western Kentucky, which will be at the big strip operation of his company, and which will be ready in January.

Holding that every taxpayer is entitled to a hearing, the Franklin Circuit Court, Judge Ben Williams, on Dec. 12, ordered proof taken by affidavits or depositions in the case of the Consolidation Coal Co. against the State Tax Commission, protesting unfair assessment of its property in Pike and Letcher Counties. Hearing was set for Jan. 15. Attorneys and representatives of the State Tax Commission argued that time for filing proof had expired, and moved for dismissal, which was overruled. Counsel for the coal company moved to submit the case, but the commission asked for time.

The Zach Grass Coal Co., Bulan, has changed its name to the Duam Mining Co.

John A. Creech, of Winchester; P. V. Cole, of Harlan, and others formed a committee which went before the Interstate Commerce Commission, in Washington, on Dec. 16, with an application for permission to build a railroad up Clover Fork, in Harlan, and tunnel the Black Mountain, tapping a rich coal and lumber region and opening a route to tidewater. It is understood that the committee represents interests which recently took over a small railroad which started work on the proposed tunnel and later abandoned it because of limited finances.

The West Kentucky Coal Co., at its Paducah marine ways, where it operates a complete boat and barge building plant, for construction and repair of river coal handling equipment, recently built some barges for the William Lorimer Lumber Co., of Jonesville, La., which were taken South on Dec. 15, when the Marcia Richardson, steamer, started South with a big tow of coal for Memphis and other lower river points.

The United Mine Workers of America, District 23, Western Kentucky, on Dec. 11, approved re-election of present office holders of the International, naming John L. Lewis, Philip Murray and

William Green, as president, vice-president and secretary-treasurer, respectively, and re-elected the officers of the district union, of which Wes Ames has been president since succeeding Lonnie Jackson some months ago. John Duncan is vice-president and H. H. Vincent, secretary-treasurer. W. D. Duncan was named international board member. E. M. Hardin and Walter Blackburn, of McHenry; Logan Bobbitt and L. G. Smith, Drakesboro, and James L. Dunlop, Earlington, were named members of the district board.

The Winston-Elkhorn Coal Co., operating on the Pike County border, in eastern Kentucky, has been placed in receivership, its indebtedness being given at over \$90,000. Dullness in coal sales over the spring and early summer was given as the cause.

MISSOURI

Residents of St. Louis and vicinity who had discarded their coal burning equipment for fuel oil burners of the type requiring an electric motor for regulation suffered severe hardships when a blizzard swept the district the night of Dec. 18. An all-day rain turned into sleet as the mercury dropped and many electric power lines fell from the weight of the ice or were broken by falling trees and poles. When the electric current failed, the motors of the oil burning equipment stopped, shutting off the flow of oil.

NEW YORK

Announcement has been made that the Virginia Iron, Coal & Coke Co. will buy from preferred stockholders one-half of their holdings of the senior stock of the corporation at \$80. The offer is made to stockholders of record Dec. 31 and will end at the close of business Feb. 2, 1925. The Bank of Manhattan has been designated as depository in New York for stock tendered under the offer.

OHIO

G. C. Weitzell, president of the New Pittsburgh Coal Co., of Columbus, a subsidiary of the Pittsburgh Coal Co., will leave soon after the first of the year for a four months' stay in various parts of Florida. A portion of the time will be spent at Tampa and neighborhood.

The offices which Dexter & Carpenter, Inc., and its predecessor, Dexter & Carpenter, maintained in Cincinnati for the past two years have been closed following a visit of E. Kelly Downey. W. O. Richardson, who has been in charge for about a year, announced that he has incorporated the Richardson Coal Co. and its offices have been established upon the fourth floor of the Dixie Terminal Building.

W. D. McKinney, former secretary of the Southern Ohio Coal Exchange, is closing up the affairs of that organization. About two months ago the members decided to liquidate and stop activities. This action was brought about by lack of demand for the product of the southern Ohio field. J. R.

Pritchard, former commissioner of the organization, also is functioning to a certain extent on compensation matters. So far no effort has been made to reorganize the exchange.

About 40 employees of the Blanchard-Zanesville Mining Co., Zanesville, a producing company, holding a contract to supply the Ohio Power Co., at Philo with coal, have brought legal action to collect wages amounting from \$200 to \$88 each. C. A. Snyder of Zanesville has been named receiver of the company which has stopped operations.

William S. Harman, coal and coke wholesaler, of Columbus, has been appointed one of fifteen chairmen who are to conduct a campaign throughout the country for \$17,500,000 for the University of Chicago, according to an announcement by Harold H. Swift, vice-president of Swift & Co. and president of the board of trustees of the university. Mr. Harman, who is a graduate of the University of Chicago in the class of 1900, will have charge of campaign activities in the state of Ohio.

PENNSYLVANIA

An appeal has been made that both sides of the controversy that confronts miners and operators in the Central Pennsylvania coal field get together. Jefferson, Indiana and the Clearfield regions are the worst hit, as many of the mines have been closed down indefinitely. The Business Men's Association of Punxsutawney has addressed a plea for immediate action to B. M. Clark, president of the coal operators' association, and to John Brophy, president of the miners union of District No. 2.

The large mining operation of the Northwestern Mining & Exchange Co., near Cramer, Jefferson County, which employs 400 men, has been closed down indefinitely. This shaft mine had been in operation steadily but at a loss owing to the wage scale under which the company was compelled to operate, and suspension seemed to be the only remedy.

Altoona city, owner of an extensive watershed in the Allegheny Mountains at Kittanning Point, a few years ago expended \$60,000 to construct a pipe line to carry mine drainage from a number of coal mines in the vicinity of

Glen White, Dogtown and Coupon past the municipal water system. Coal companies operating above the shed have refused to assist in caring for the mine drainage. The commissioners of the city are of the opinion that the cost of the drainage system must be paid for by the coal companies, especially since a court decision in another county specifies that no coal company may use the streams of the state for drainage purposes.

A recent meeting of coal operators, inspectors, mine foremen and state coal mine officials, in Shenandoah, was addressed by State Mine Inspector P. C. Fenton, who discussed the machinery used in the production of coal and the accidents reported as caused by the machines. He also took up the subject of powder accidents.

The Susquehanna Collieries Co. has increased its reputation for modernization of coal mining with the announcement that a completely equipped hospital constructed of concrete near Richards shaft at Mt. Carmel, has been completed. The hospital is 15 ft. long, 12 ft. wide and 9 ft. high. It is heated by electricity and contains all necessary hospital equipment. An electrically heated bottom shanty also is being constructed by the company for the comfort of the workers. This structure will be used as a waiting room.

A new steel breaker at Oak Hill, near Hazleton, which was put into operation Aug. 1, 1924, broke the production record of the structure which it succeeded three times during a recent week in face of flood conditions in the workings. The new records established were 508, 511 and 512 mine-car loads on successive days. The Oak Hill colliery was taken over in 1922 by the Pine Hill Coal Co. and a two-year program was outlined for extensive developments and improvements. A daily production of 2,000 tons will be reached early in 1925. The Chance sand flotation process is used in cleaning the coal. The company's available coal is estimated at 35,000,000 tons.

Coleraine, the oldest colliery in the Hazleton region, ceased operations Dec. 16 after eighty years of production, during which time it made fortunes for three groups of operators. The mine was opened and abandoned as worked out in the late seventies. W. T. Carter headed the group who reopened the place and abandoned it for the second time. The late A. S. Van Wickle reopened the mine and operated it for the past thirty years. The machinery and buildings will be dismantled and sold as scrap.

In a recent legal contest over valuations of coal lands fixed in Schuylkill County by the commissioners there J. B. Warriner, general superintendent of the mines of the Lehigh Coal & Navigation Co., in that field, set forth the claim that coal valuations in the Schuylkill Valley have decreased since 1914 and that there has been no increase, as claimed by the officials. Mr. Warriner held that mining of coal in the Schuylkill region costs far more than in the Scranton and Wilkes-Barre fields and furnished figures of the various companies to uphold his claims.



Retarding Scraper Conveyor at Mitchell Branch Mine

Installed at a mine of the Red Jacket Consolidated Coal & Coke Co., of Red Jacket, W. Va. The scraper retards the coal in its progress and prevents much breakage.

Officials of the Glen Alden Coal Co., of Scranton, and city officials are engaged in a controversy concerning responsibility for mine cave damage. The company officers declare that the city officials seek to hold them responsible for damage caused by former operators in the Se-Rob mine tract in West Scranton.

TENNESSEE

The Durham Coal & Iron Co., James Bldg., Chattanooga, of which T. L. Walle is president, is reported to have leased several thousand acres of coal land adjoining present operations, near Soddy, which it will develop.

UTAH

Thomas Stroup, formerly superintendent of the Clear Creek mines of the Utah Fuel Co., has succeeded Zeph Thomas as superintendent of the Castle-gate group under general superintendent William Littlejohn.

Utah coal production for November amounted to 435,139 tons, compared with 448,580 tons for the same month last year. It was the lowest November output since 1921, when but 316,750 tons of coal were mined in the state.

WASHINGTON

Three men were killed and two injured in a recent explosion in the Burnett mine of the Pacific Coast Coal Co.

The Victory Coal & Mining Co. with a mine seven miles from Centralia suffered a loss of \$10,000 in a fire Dec. 8 which destroyed the mine office and store building.

WASHINGTON, D. C.

The U. S. Civil Service Commission announces an open competitive examination for junior mechanical engineer (fuel combustion) on Jan. 21, 1925, to fill vacancies in various branches of the government service at an entrance salary of \$1,860 a year. Full information and application blanks may be obtained from the U. S. Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or custom house in any city.

The Secretary of the Interior has authorized the sale of coal leases on three small tracts of public land in the states of Wyoming and Colorado. The sales will be conducted through public auction by the registers of the local land offices in which the coal lands are located. Two of the areas are in Colorado and one in Wyoming. The tract located in Wyoming consists of 40 acres in Campbell County. According to the terms of the proposed lease there must be an investment of \$2,500 during the first three years and a minimum annual production of 750 tons after the fourth year, the government receiving a royalty of 12½c. per ton, mine run. The second tract, situated in Las Animas County, Colo., contains 40 acres. The highest bidder receiving the lease must expend \$300 during the first three years, guarantee to produce 275

tons of coal beginning with the fourth year and pay the government a royalty of 15c. a ton on mine run. The other area offered for sale consists of 70 acres in Archuleta County, Colo. A minimum investment of \$500 during the first three years and a guaranteed annual production of 475 tons beginning with the fourth year are included in the terms of the lease. A royalty of 15c. per ton, mine run, must be paid the government on all coal mined.

Traffic

To Hold Hearing on Proposal To Raise Hard Coal Rates

The Coal and Coke committee, Trunk line territory, announces a public hearing at 11 a.m. Jan. 7, 1925, in Room 401, 143 Liberty St., New York City, on a carriers' proposal to advance rates on anthracite, buckwheat No. 1, and smaller sizes from points of origin shown in Delaware & Hudson Co. tariff I.C.C. No. 13,470 to New York Central R.R. stations, Dobbs Ferry, Irvington, Tarrytown, Scarborough, Ossining and Croton, N. Y. The present rate on buckwheat No. 1 is \$3.15 per gross ton and on buckwheat No. 2 and smaller \$2.90 per gross ton. The proposed rate is \$3.28 per gross ton on each. The reason for the proposal is to place rates on a parity with those published by other originating anthracite lines.

Switching Charge Regulations By D. & H. Approved

The New York Public Service Commission has approved new regulations of the Delaware & Hudson R.R. governing absorption of switching charges of delivering lines on coal and coke, carloads which has moved over Delaware & Hudson lines. At Glens Falls, N. Y., absorption of Hudson Valley Ry. charges changed from 42c. to 38c. per ton (gross on coal and net on coke) as maximum. At Troy, N. Y., absorption of Boston & Maine charges changed from 40c. to 38c. (gross on coal and net on coke) as maximum. Effective Jan. 20, 1925.

North Dakota Commission Gets Petition on Lignite Rates

A petition is before the State Railroad Commission of North Dakota, which seeks to institute an advance in freight rates on lignite within the state. The Great Northern, Northern Pacific and Soo Line indicate that they desire to institute the Holmes & Hollowell schedule on coal from the docks into North Dakota or the scale of rates proposed by the examiners in the case before the Interstate Commerce Commission last summer. The Holmes & Hollowell schedule would be about 50 per cent higher than the prevailing lignite rates, while the tentative schedule suggested by the examiner is about 5 per cent lower than the Holmes & Hollowell schedule. The I. C. C. declined to institute the Holmes & Hal-

lowell schedule last summer, but suggested a conference upon a new set of rates, and its tentative suggestion of slightly under the Holmes & Hollowell schedule seems to be a hint of what would be approved.

Obituary

D. R. Phillips, general superintendent of the Elkhorn Piney Mining Co., which operates coal mines in Raleigh and Logan counties, West Virginia, and at Weeksbury, Ky., died in Kessler Hatfield Hospital, Huntington, Saturday afternoon, Dec. 27, after a short illness. Mr. Phillips had been long identified with the mining industry of the state, having served a number of years ago as a district mine inspector under J. W. Paul and John Laing. Later he held positions under several mining companies and a few years ago became identified with the Elkhorn Piney Coal Mining Co., which is a subsidiary of the Milwaukee Coke & Gas Co., with headquarters at Milwaukee. Mr. Phillips' headquarters were in Huntington and the mining interests in Raleigh County under his care were located at Stanaford.

Henry Lee Badham, one of the industrial leaders of Birmingham, Ala., died Dec. 20, after an illness of three weeks occasioned by poison from a throat infection for which he underwent an operation. Mr. Badham was born at Raleigh, N. C., Oct. 22, 1864, but came to Birmingham at the age of 21 years and for a number of years was prominently identified with the banking institutions of the city. In 1900 Mr. Badham acquired control of the Bessemer Land & Improvement Co. and reorganized the corporation into the Bessemer Coal, Iron & Land Co., being elected its president, a position he held at the time of his death. The company operated the Belle Ellen Mines Nos. 1, 2, 5 and 12, in Bibb County. He organized the American Trust & Savings Bank, one of the strongest financial institutions of the city, was a vice-president of the bank for many years and still retained membership on its board. Mr. Badham also was identified with numerous industrial enterprises in the district, in which he took an active interest.

Calry Littlejohn, chief mine inspector of Indiana and secretary of the Department of Mines and Mining, died at Christmas time after a series of illnesses that compelled more than one hospitalization. His death occurred in Indianapolis, which was his home.

Coming Meetings

American Engineering Council. Annual meeting Jan. 16-17, 1925, Washington, D. C. American Engineering Council, 29 West 39th St., New York City.

Northeast Kentucky Coal Association. Annual meeting Jan. 22, 1925, Ventura Hotel, Ashland, Ky. Secretary, C. J. Neekamp, 816 Ashland National Bank Bldg., Ashland, Ky.

American Management Association. Annual convention, Jan. 28-30, Hotel Astor, New York City. Managing director, W. J. Donald, 20 Vesey St., New York City.

American Wood Preservers' Association. Twenty-first annual convention, Feb. 3-5, Congress Hotel, Chicago, Ill. P. R. Hicks, secretary, Service Bureau, 1146 Otis Building, Chicago, Ill.

American Institute of Electrical Engineers. Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

Northern West Virginia Coal Operators' Association. Annual meeting, Feb. 10, Fairmont, W. Va. Executive vice-president, George S. Brackett, Fairmont, W. Va.

American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

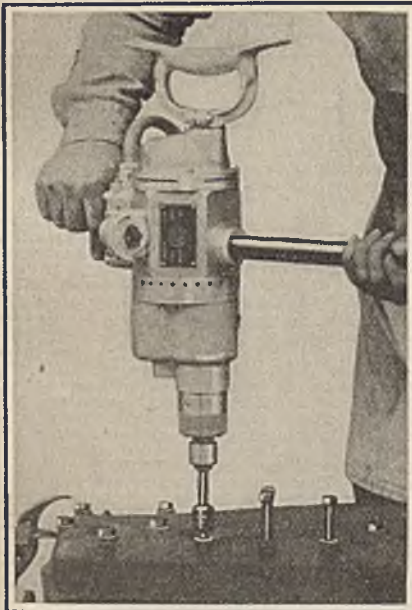
New England Coal Dealers' Association. Annual meeting, March 25-26, Springfield Auditorium, Springfield, Mass. Secretary, C. R. Elder, 141 Milk St., Boston, Mass.

New Equipment

Reversible Socket Wrench Speeds Repairs

In line with their practice of adapting the electric drive to hand tools having a rotating motion, the Black & Decker Mfg. Co., Towson, Maryland, has recently put on the market a No. 3 reversible electric socket wrench which is particularly adapted to assembling and disassembling gasoline motors or any other similar type of machinery.

This machine is essentially the same in construction and design as the portable electric drills except that the



Puts On or Takes Off Nuts

The clutch automatically tightens the nut to any degree and then releases.

spindle is provided with a clutch which automatically releases when the forward pressure on the tool is relieved. Due to the design of this clutch, a nut, bolt or stud can be driven to any desired tightness. A reversing switch is provided for use in disassembling motors and machinery and the electric socket wrench has ample power to kick loose nuts or bolts regardless of how tight they are drawn up. This machine is equipped with a quick-change chuck for holding different size socket wrenches.

Wide-spread interest has been shown in this item among motor-car manufacturers and the larger service stations on account of the great saving in time made possible by the use of this device over the old hand methods. A motor can be assembled or disassembled in a fraction of the time required by a workman to do the same job by hand.

This machine is equipped with spade handle, side handle and 15 ft. of electric cable.

Safe En Masse Lubrication

In the maintenance and operation of large installations of machinery scarcely any consideration is more important than adequate and positive lubrication of the bearings. Few attendants about ordinary installations of this kind have a more dangerous job than the oiler. This man must needs exercise continual vigilance lest his clothing get caught in the moving parts of the device under his care or he meet with some other mishap.

With the more or less general adoption of grease as a lubricant in place of oil, the risk run by the oiler has been somewhat lessened. This has been not only because grease requires application less frequently than oil, but also because a grease cup may perform its function when placed, though separated from the bearing, by a pipe of appreciable length. Thus the oiler is not required to replenish the supply of lubricant as often with grease as with oil, nor is he compelled to place himself in close proximity to the machinery in order to do so.

In order to still further facilitate the application of grease to machine bearings and render the operation safer, the Keystone Lubricating Co. has developed means whereby a large number of bearings may be continuously lubricated from a central point. A general plan of this device is shown in Fig. 2.

The apparatus employed consists of a manifold lubricator, a header line to

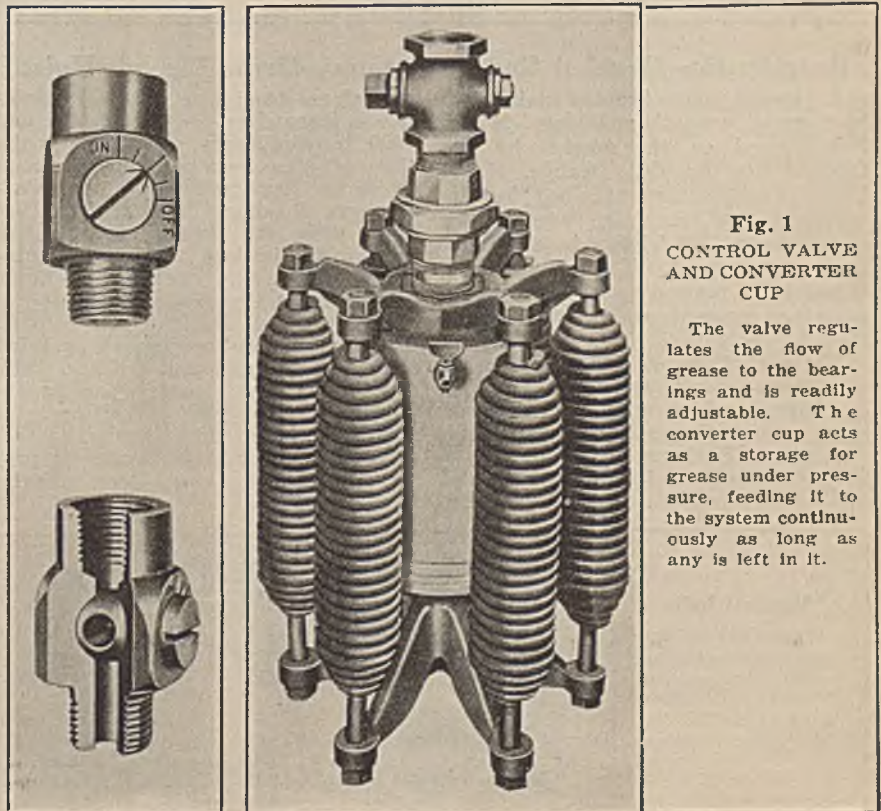
which is connected one or more converter grease cups, and branch lines. In each of these lines is placed a pressure reduction grease valve extending to the various bearings to be served. A gage to indicate the pressure of the grease in the header line is also advantageous although not entirely indispensable. Connections between the header and the bearings may be made by means of ordinary metal pipe or with grease-proof tubing. This latter is a special hose, the rubber of which is so compounded as to be immune to the action of grease and oil which is highly detrimental to a hose of ordinary construction.

The number of bearings that may be lubricated successfully in this way and the ultimate length of header lines that may be used, have not yet been determined definitely. Installations have been made and are now working successfully that embody headers 250 ft. long and serve as many as 175 bearings.

REQUIRES LITTLE ATTENTION

Once an installation of this kind has been completed and the necessary adjustments made, it requires little attention, this being confined almost exclusively to a periodic replenishment of the lubricant supply and a simultaneous raising of the pressure to the desired point. The manifold lubricator is so constructed that the grease pressure on the system may be raised to as much as 400 lb. per square inch.

Under ordinary conditions, however, such a pressure is excessive and unnecessary. The converter grease cups keep the pressure on the system approximately uniform over long periods of time or as long as grease remains in them. The pressure reduction grease valves, one of which is placed in each



**Fig. 1
CONTROL VALVE
AND CONVERTER
CUP**

The valve regulates the flow of grease to the bearings and is readily adjustable. The converter cup acts as a storage for grease under pressure, feeding it to the system continuously as long as any is left in it.

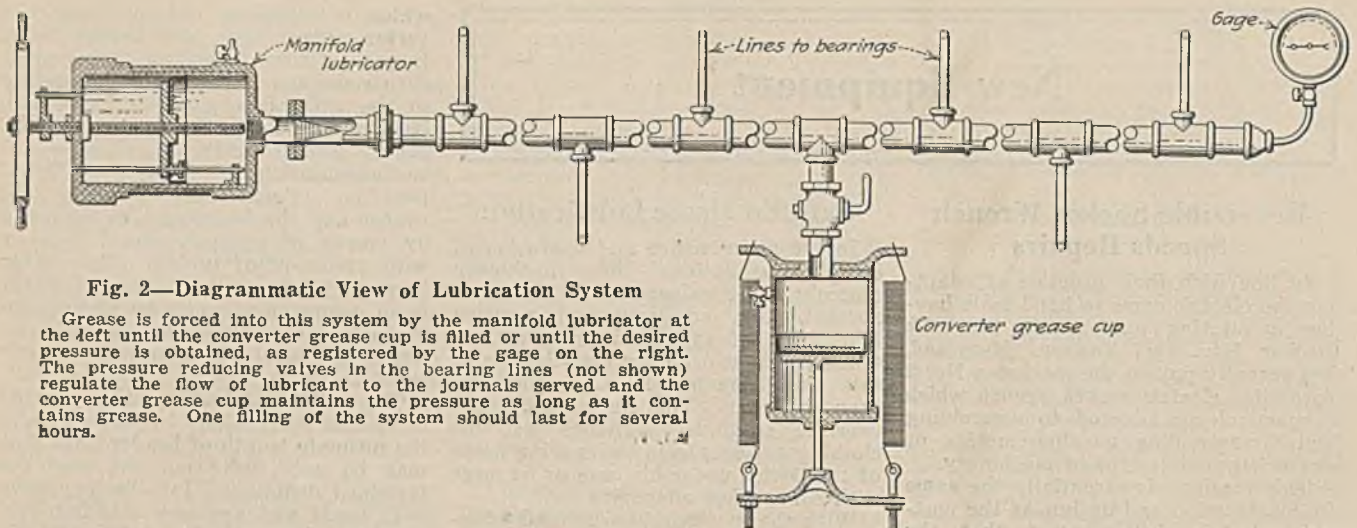


Fig. 2—Diagrammatic View of Lubrication System

Grease is forced into this system by the manifold lubricator at the left until the converter grease cup is filled or until the desired pressure is obtained, as registered by the gage on the right. The pressure reducing valves in the bearing lines (not shown) regulate the flow of lubricant to the journals served and the converter grease cup maintains the pressure as long as it contains grease. One filling of the system should last for several hours.

line to a bearing, regulate the flow of lubricant to the journal it serves.

These valves are in reality plug cocks. The plug instead of terminating in a handle is provided with a slot for a screwdriver. On the body of the cock are five markings corresponding to five settings of the plug, namely, full on, three-quarters, one half, and one-quarter on, and off. The screwdriver slot in the plug head is parallel to the passage through the plug so that the position of this passage is indicated by the position of the slot. Of course the plug may be adjusted to any position intermediate to those above named.

Not only does a lubricating system of this kind assure greater safety to the oiler but it also saves much of the time which otherwise would be consumed in lubricating the machine to which it is applied. Consider a belt conveyor as an illustration: One greasing station can be made to serve both upper and lower

runs of such a conveyor for a distance of, say 250 ft., upon either side of the station or 500 ft. in all. With troughing idlers every 5 ft. on the upper strand and bearing idlers every 10 ft. on the return strand, 150 idlers will require lubrication in the length of belt above assumed.

With hand lubrication this would mean the filling or the adjustment of at least 300 grease cups or one upon either end of each idler. By means of one of these lubrication systems all of this work can be performed at one operation from a single point. Furthermore, all bearings upon the entire system served will be lubricated continuously and positively as long as grease remains in the converter cups. This usually covers a period of several hours, its actual duration depending upon the capacity of the converter cups and the adjustments of the reduction valves.

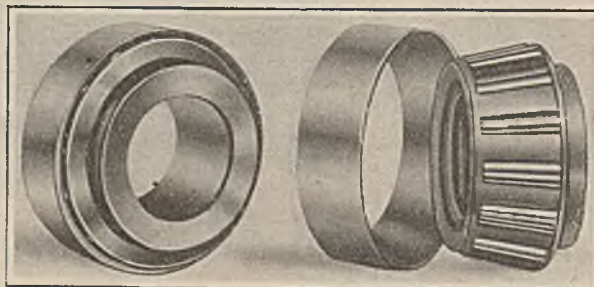
Bearing Has Beveled Races

A tapered roller bearing claimed to have great strength and long life has been placed on the market by the Orange Bearing Co., Orange, N. J. These qualities are obtained by the superiority of the cage construction in which an anti-friction bronze bearing metal is used. This roll retainer is carefully reamed to exact tolerance assuring constant and perfect alignment of the rollers.

The use of chrome-alloy steel, properly heat-treated and finished with precision, combine with the improved cage construction to obtain maximum strength. The taper roller bearing is interchangeable with other ball and roller bearings as a complete unit only.

Tapered Rolls

Tapered rollers and chrome-alloy steel races combined to make these units suitable for heavy-duty service.



Single-Drum Electric Hoist

A single-drum electric hoist, available in three sizes, 500 lb., 1,000 lb. and 2,000 lb. respectively, and known as the "Everedy," has been placed on the market by the Reading Chain & Block Corporation, Reading, Pa. The smallest of the three sizes weighs 215 lb. and is rated to lift its load at 41 ft. per minute on alternating current and 33 ft. per minute on direct current.

The standard length of lift is 15 ft. The crane is worm-and-gear operated and the gearing is self-braking. The motor is ceiling-mounted upon an extended support at one end of the hoist and may be removed conveniently. An automatic adjustable-limit stop is provided and works in conjunction with the hoist controller.

Trade Literature

The Aldrich Pump Co., Allentown, Pa., has recently published the following bulletins: Data No. 82, giving details of design for high-pressure road pump, built in three different sizes especially for contractors' requirements, and Data No. 50 giving engineering tables. These are both 8 x 11 in.

The Osgood Co., Marion, Ohio, has published Bulletin 247, describing its Continuous Treads for Railroad Type Shovels and including a brief history of the development of Standard Railroad Shovels. The bulletin has 6 pp., 8 x 11 in.; illustrated.

Some valuable information about chains, sprockets and gears is contained in Section Catalog No. 27 issued by the Stephens-Adamson Mfg. Co., of Aurora, Ill. The publication is not only a catalog of the full S-A line of chains and gears but also carries charts that make easy the task of finding pitch line speeds of sprockets, gears or pulleys, and for determining horsepowers and safe loads for such equipment. There also is some careful data on how to choose the proper chain or gear for every application. The catalog, a 224-page book, is offered free on request by the company.

Waugh Stoppers, Model 773 Series. The Denver Rock Drill Mfg. Co., Denver, Colo. Bulletin No. 70 A. Pp. 11; 6 x 9 in.; illustrated. Describes hand-rotated drills designed for fast drilling; the simplified construction reduces upkeep cost.

Allis-Chalmers Timken Roller Shaft Bearing. Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletin No. 4048. Four-page folder, 3 x 6 in. Designed to withstand both radial and axial thrust and to carry large momentary overloads. Eliminates most of the expense of lubrication, as greasing at intervals of from three months to a year is sufficient.

Science and Practice of Integral Waterproofing. The Truscon Laboratories, Detroit, Mich. Fourth edition. Pp. 32; 4 x 9 in.; illustrated. This edition contains a number of changes from the previous editions.

Hydraulic Damper Regulators. Atlas Valve Co., Newark, N. J. Bulletin No. 5A. Pp. 11; 6 x 9 in.; illustrated. The functions of damper regulators are listed under nine separate headings. Hydraulic operation as compared with other methods is treated, the uses of damper regulators in connection with all boiler pressures are covered in detail and diagrams show how to apply the regulators to boilers.

CR-9006 Enameled Resistor Units. General Electric Co., Schenectady, N. Y. Bulletin No. 48941A. Pp. 18; 8 x 10 in.; illustrated. Describes the uses and advantages of these units and gives standard ratings and dimensions. Applications are given for several different fields of service.

The TR Self-Start Motor. The Triumph Electric Co., Cincinnati, Ohio. Six-page folder, describing and illustrating the advantages of this motor.

Coal Handling Equipment. Orton & Steinbrenner Co., Chicago, Ill. Booklet No. 32. Pp. 6; 9 x 12 in.; illustrated. Describing cranes, shovels and grab buckets.