

COAL AGE

MCGRAW-HILL COMPANY, INC.
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Many Cures but Patient Still Weaker

THOSE who persist in their search after a cure-all for the many ills which afflict the commercial side of the coal industry continue their pursuit with untiring zeal—and bitter disagreement as to the correct formula for the prescription. The mine workers insist that a complete unionization of all the coal fields alone can bring a sane recovery. The non-union operators are as firm in the contrary belief. Many of the diagnosticians ignore the labor symptoms. Some prescribe price control as the only medicine. Others swear by seasonal rates. Still others plead for birth control in mining operations so that new openings may not swallow up the business now feeding the famished older mouths. Others, bitten by the superman germ, would have a Will Hays or a Judge Landis sit in supreme judgment. Every suggestion, it will be noticed, involves the creation of some new agency, the forging of some new instrument. That the industry might make great progress in working with what it now has apparently is too prosaic a contingency to appeal to the imagination of the panaceists.

“When Herrin Gets Going—”

“MOBS were all over the streets,” testified Policeman Ross Lisenby of Herrin, Ill., at the inquest over a recent gun battle where leaders of rival factions were killed. “It would have meant suicide for me to have interfered. When Herrin gets up and gets going it gets dangerous around here for a copper.” And then Policeman Ross Lisenby sat down. Without knowing it he had delivered a powerful argument for a state police force for Illinois. Up in the state house at Springfield during the present session of the legislature that testimony by Policemen Lisenby no doubt will be used to support the perennial state police bill now to the fore.

There is no doubt that Policeman Lisenby knows whereof he speaks. When Herrin gets up and gets going, it is suicide for a handful of town police to interfere. That was one reason why nobody interfered when that mob of men, mostly union miners, one day in 1922 accepted the surrender of twenty-one non-union miners, then shot and cut most of them to death and dragged the last of the victims through the streets of Herrin so as to finish the butchery in a Herrin graveyard.

“When Herrin gets going—”; but why should Herrin be permitted to get going? The police force that a community of that size can afford to maintain is always and invariably insufficient—even if it wills to assert itself. Militiamen are always too late for Herrin. So why should there not be a force big enough, ready enough and willing enough to prevent the Herrins of Illinois from getting going? That’s what a part of the

citizens of Illinois, including many coal men, are asked right now, as always. “Because state police are cosacks riding down organized labor at the dictation of employers!” shouts back the labor press of the state as always. And so the battle for public opinion rages. The outcome is uncertain, for, in spite of the logic of the case, and in spite of all the Herrins of the state’s recent history, labor is strong at the state house.

Prevention—and Cure

ROCK dusting is a cure for explosions, but it is not a preventive measure, for an explosion may occur at the face in a mine where the entries are well dusted. Even though it is extinguished at the entry, it will, nevertheless, generate carbon monoxide with possibly fatal results and may kill several men. So it is rightly argued that it is better to prevent the accident altogether; which is true. But it is well to have the cure because the prevention is not absolutely sure. There are so many men and so many places in a mine that it is certain that not every one of them can be kept absolutely safe.

What was believed to be a dust explosion occurred in Cumberland, England, though a pool of water stood at the face. If such an explosion occurs at a mine that is not rock-dusted the explosion is likely to spread. Who can say that in such a mine the coal dust may not be raised in sufficient quantities to involve the whole mine with most disastrous results? So rock dusting also is needed.

It is well to have that secondary protection even in mines where the utmost precaution is taken everywhere against the preliminary causes of such a disaster. It is well not to overlook the dangers at the face but equally is it well to look with apprehension to the dangers in the entry. Where every precaution is taken at the face great confidence may become established in the minds of men and management—until an explosion occurs. Then if the roadway and airways have not the needed degree of protection, it will be seen that the maximum assurance can be attained only by measures that are aimed at both prevention and cure.

Why Not Long Face?

“LONGWALL” and “modified longwall” are terms that have been much used, stretched, distorted and perhaps even abused during recent years. This has been particularly noticeable since the introduction of machine mining. Strictly speaking longwall mining has in the past been the designation of a method of operation by which all coal is removed and only gob left behind. It may be either advancing or retreating, although the former is by far the more common. It is a method of mining but little followed in this country except under exceptional conditions, such as those prevailing in northern Illinois and a few other fields.

New methods of mining have, however, brought difficulties of expression. To designate such methods of operation as that followed in the so-called V-system of mining or the 100- to 300-ft. faces worked by means of conveyors, the term modified longwall has been much used. The modification or change from the true long-wall system of mining embodied in this method of working is so great as to bear small resemblance to the type of operation from which it derives its name. In fact, the development of the mine prior to machine operation resembles nothing so much as the panel system of room-and-pillar operation. Obviously, then, the designation modified longwall is more or less of a misnomer.

In order specifically to designate long machine-operated faces, such as those worked by portable conveyors, or by mining machines employing long conveyors, whether these faces be V-shaped or straight, the name "long face" has been suggested. This term would appear to possess certain well-defined advantages as it would apply to methods of extraction by means of panels or blocks, where the actual faces from which the coal is produced would be in most cases several times the length of face worked by hand methods without the aid of mechanical contrivances other than cars and tracks. Certain it is that the confusion and misunderstandings engendered or resulting from the somewhat loose employment of the terms previously mentioned must not be permitted to endure. Some more definite understanding must be reached.

When Proved, What of It?

IT IS EASY to pick flaws in the flame safety lamp, and, indeed, it can be convicted as the cause of not a few tragedies. But what of it? Little enough, till we feel assured of a substitute. The trend of legislation is to give us more safety lamps rather than less. Thus the proposed code for West Virginia demands additional use of such protection rather than a diminution. Colorado's law gives every man a flame safety lamp in a gaseous mine even though an electric lamp is carried. In some anthracite mines a few of the miners carry both, even though machines are not used. Dan Harrington is right, the flame safety lamp has its dangers but it seems to us that he was not constructive in his picking of flaws.

He shows us that men competent to handle safety lamps are the men who mishandle them, but shall we deprive them of the right and duty of using them? Rather we should question whether inherent in the work for which they use safety lamps there is not a temptation to use them wrongly.

The danger of misuse lies in the fact that flame safety lamps are quite likely to be extinguished. Either this fault must be overcome or we must find some safe way to provide for reignition, or failing that, it is necessary to provide some means by which the temptation to relight the lamps in a unsafe place may be removed. The safety lamp manufacturers need to consider the first two demands. The third is one for the owner of the mines and his official aids.

When a fireboss gets in the dark he naturally desires to relight his lamp. If he has no flashlight or electric lamp, he is unwilling to stumble on his way to a place where he can relight his lamp without disaster, so he

lights it, if he can, where it goes out. In a few seconds it becomes filled with an explosive mixture if it is in an atmosphere of that character. Even if he lights it by an internal igniter, and it is not protected by an absolutely impervious sheathing, it will, when it explodes, shoot flame through the gauze and explode the gaseous atmosphere by which it is surrounded. Evidently one precaution is to see that the fireboss has a light available by which he can make a speedy exit to an igniting station or to a place where another ignited lamp is available or to the surface. But if this station is far away he cannot be induced to travel to it. He will prefer to find some improper means of opening his lamp. This is a grave temptation when a man is miles underground and he cannot light the lamp without losing an hour or more and having a grueling walk into the bargain. It would be much better to provide means for opening the lamp not too far from the scene of his labors or to place a lighted lamp for his alternative use at some similar point. With such a place provided, the mine owner would be better assured that no risks would be taken or that the fireboss would not be compelled in the morning to report that the part of the mines which it is his duty to inspect could not be operated because it had not been inspected.

Opinion seems to favor the unwritten rule that men who are cutting and loading shall have both electric lights and flame safety lamps, the one for effective lighting, the other for gas testing. There is less risk that such men will tamper with their safety lamps. If the lamp is extinguished the man, it is true, will go on working without it but as he is not moving around with the lamp, it should be less subject to extinguishment, especially when used by a machine man, for in his case it need not be carried in the hand except when being actually used for testing. It can be safely carried at other times on the machine truck.

The loader will carry it from place to place of operation, but his moves will be short. However, as he has many tools he may carry it carelessly and it may be extinguished. Still, it is better for him and the cutting crew to have it and occasionally be found working with it extinguished, than for them to work always and entirely without it. With two lamps, one for each of the cutting crew and one for each of the loaders where two work together, there will be less risk that both lamps will go out leaving the men without means of testing for gas.

To have men working with or without machines in a gaseous mine without flame safety lamps or some means of discovering gas if it occurs, is extremely dangerous, and most managers and superintendents would feel safer if every man were provided with a flame safety lamp. Furthermore, in a mine where all the lamps are tended in a lamp house, as is the case where every man carries a flame safety lamp, there is less likelihood that the fireboss will go into the mine with defective equipment, for all the necessary repair parts almost inevitably will be kept on hand. The fireboss is prone in his hurry to rush off to his work without giving his lamps the proper care, and the superintendent and mine foreman are liable to leave the work to some incompetent subordinate but, where there is a well-established lamp house, competent, trustworthy lampmen are likely to be found with all necessary tools and materials available for their use.

How Much Coal Is Left in Pennsylvania?

Two Principal Seams the Upper Freeport and the Pittsburgh Beds—Reese Estimates 44 Billions Still Recoverable as Against 75 Billions Originally in the Ground—Beds Vary In Quality from Place to Place

BY O. R. KUHN
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THE EARLIEST RECORD of coal mining in Pennsylvania dates back to 1760 when a coal mine was opened on the Monongahela River opposite Fort Pitt, now Pittsburgh, but it was 1840 before there was any recorded production, and from that date the output grew, and for many years Pennsylvania has been the largest producer of bituminous coal.

From 150 to 180 million net tons of bituminous coal is produced annually in Pennsylvania in addition to 85 to 100 million tons of anthracite. At this heavy rate of production it seemed likely that the coal would rapidly become exhausted, so accurate surveys have recently been made to establish the quantity of coal still remaining which will be accessible in the future.

In 1909 M. R. Campbell, of the United States Geological Survey, estimated the bituminous coals of Pennsylvania to have an extent of 14,200 square miles and to contain, when mining first began, about 112,574,000,000 net tons. He also figured that the supply remaining at the close of 1907 was about 110 billion tons, which would leave a supply at the present time of over 105 billion tons.

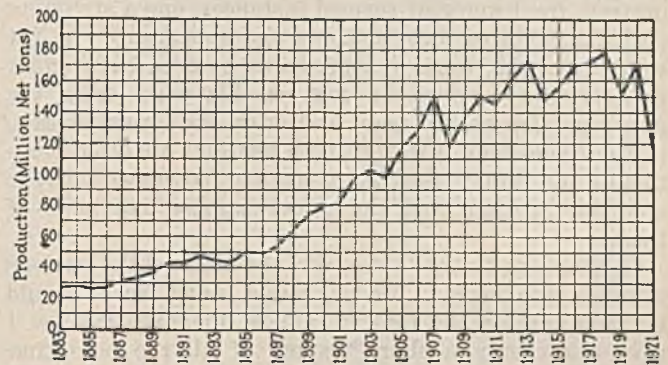
More recent and more accurate estimates, made by John F. Reese of the Pennsylvania Geological Survey during 1921 and 1922, place the reserve of recoverable coal at between 43 and 44 billion tons, and the original supply at slightly over 75 billion tons. In arriving at these figures Mr. Reese considered only thirteen or fourteen coal beds as being of any commercial value, although there are over thirty known distinct bituminous coal beds in Pennsylvania.

The bituminous coal beds of Pennsylvania lie in the western half of the state and embrace the north eastern end of the Appalachian Series. These coals belong to the Upper Carboniferous Formation, the lowest lying within the Pottsville Series and the highest being contained in the Dunkard Series.

The changes that caused the various coals to be laid down, took from 100 to 200 million years, according to

the latest estimates, during which time, the area, now called Pennsylvania, was sometimes above and sometimes below the level of the sea, sometimes a plain, sometimes a swamp, and sometimes under water. This was repeated with many variations until the region became a graveyard for old vegetable matter, which at times was pressed down and at other times pushed up.

During this upheaval the rocks were compressed, fractured, and heated, and this action probably drove



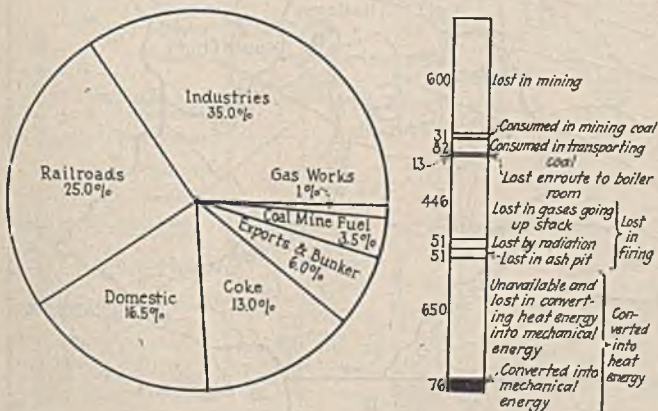
Bituminous Coal Produced by Pennsylvania 1883-1921

The flattening off of the Pennsylvania output is clearly marked and shows the effect of the competition of other states, notably West Virginia. In 1922 and 1923 Pennsylvania produced 113,148,308 and 171,879,913 tons respectively.

out part of the volatile matter or gas from the marsh deposits and at the same time pressed the carboniferous matter into coal. The effect of this action is most pronounced in the eastern part of Pennsylvania and decreases as you proceed westward. In what is now the anthracite region in Lackawanna, Luzerne, Carbon, and Schuylkill Counties, nearly all the volatile matter in the coal was driven off and the coal was compressed into what is known as anthracite, or hard coal.

As you go westward the action was probably less severe, more of the volatile matter remained and the coal not so hardened by compression, is known as semi-anthracite coal. Still further west, in Cambria, Clearfield, and Clinton Counties the effect was still less and the coal contains 18 to 20 per cent of volatile matter, and is known as low-volatile bituminous or smokeless coal. As you work still further westward the volatile matter increases to 33 and 34 per cent as in the Pittsburgh District, and to as high as 40 per cent in the Mercer, Butler and Lawrence County fields.

Many people have the false impression that the coal from a specific seam or bed in a district is all alike, that is, that Pittsburgh coal, by which is meant coal from the Pittsburgh bed, mined in Washington County is the same as the Pittsburgh coal from Fayette County. This is a grave error and should be corrected, for though coals in various districts are, for the most part, similar, still there are times when coal from the same seam, from mines side by side, or even from the same mine, show a wide variation in analysis, so that the coal purchaser should know, not only the district and



Where Coal Is Used and Wasted

Mining losses are little compared with consuming wastes. The public is learning this and is availing itself of that fact by using greater economies. Heat, however, is an elusive quantity and even with the best of equipment we shall never be able to retain all of it.

Table I—Seams of Coal, Their Tonnage and Occurrence

Series	Bed or Seam	Recoverable Reserve Net Tons	County Containing Largest Reserve
Dunkard.....	Washington.....	947,688,850	Greene
Monongahela.....	Waynesburg.....	2,523,638,950	Greene
	Sewickley.....	1,246,453,950	Greene
	Redstone.....	411,500,000	Westmoreland
	Pittsburgh.....	8,130,113,650	Washington
Conemaugh.....	(Reserve not considered of any economic value.)		
Allegheny.....	Upper Freeport...	10,718,904,000	Westmoreland
	Upper Freeport...	4,147,730,000	Indiana
	Lower Freeport...	3,561,030,000	Somerset
	Upper Kittanning	1,310,800,000	Butler
	Middle Kittanning	7,615,800,000	Cambria
	Lower Kittanning	770,600,000	Clarion
	Clarion.....	2,183,900,000	Butler
Pottsville.....	Brookville.....	252,700,000	McKean
	Mercer.....	10,000,000	Mercer
Total.....		43,830,860,000	

seam from which the coal comes but also the approximate analysis and the qualities.

By qualities, I mean whether the coal will work in a gas producer, coke oven, or for whatever purpose it is desired, for I know of several instances, one a stripping coal, that showed ideal analysis and appearance and yet would not coke, work in a producer, or even burn under boilers. On testing the coal at this point from the upper portion of the seam and from the lower portion, it was found that, although both portions analyzed practically the same, the lower sample possessed all the qualities desired, and the upper sample had none of them.

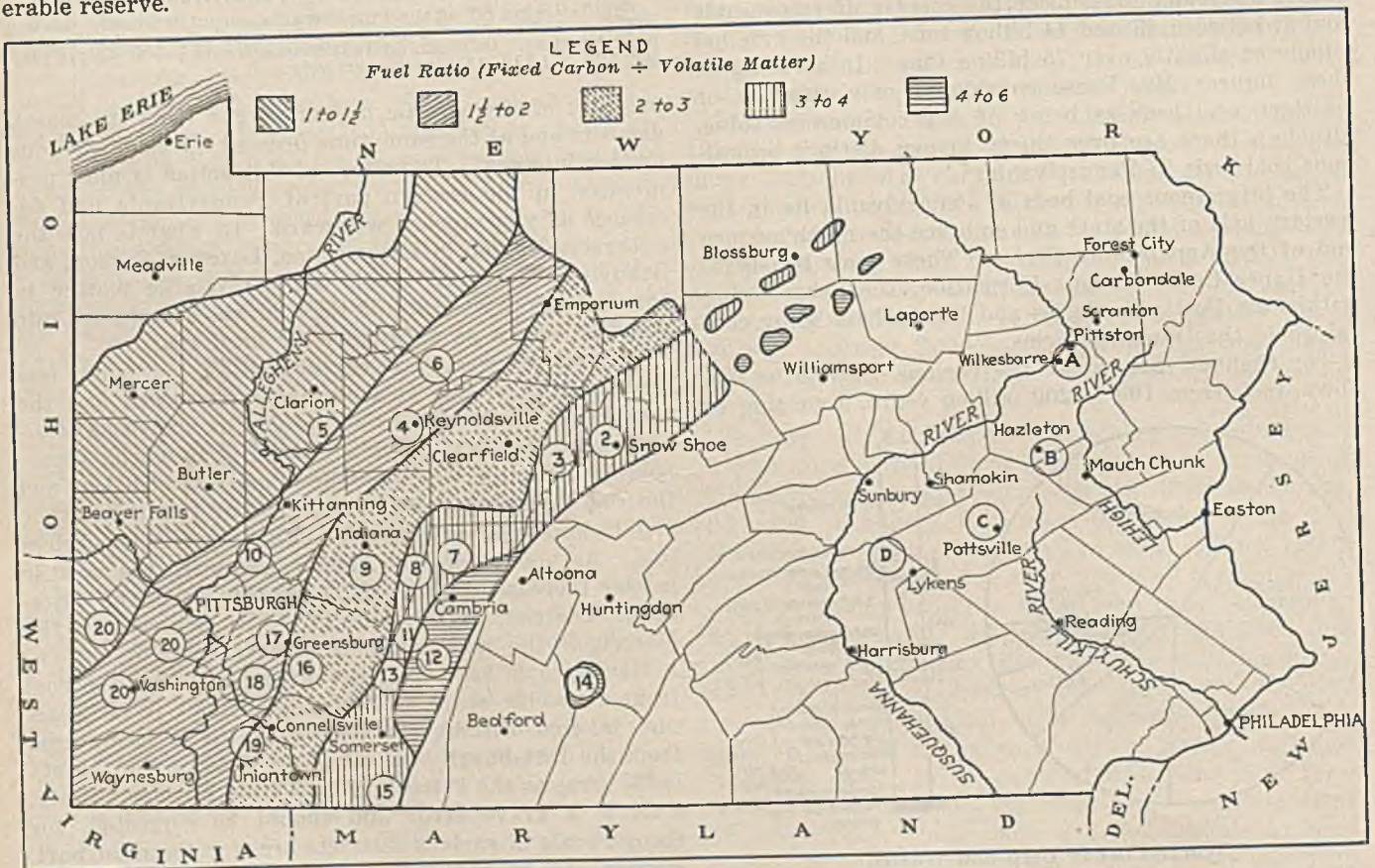
If one were to try to describe the coals of the various counties and beds in Pennsylvania, much space would be required for the topic is almost inexhaustible, so I give below only a short resumé of all the beds that have any economic value in the order of their recoverable reserve.

Upper Freeport—The Upper Freeport, "E," Lemon, or Kelly coal bed underlies practically the entire western part of Pennsylvania and contains the largest recoverable reserve of coal of any of the beds, the latest figures being estimated at 10,718,904,000 net tons. This seam is extensively mined and although more coal, in the high-volatile districts, is produced from the Pittsburgh bed, as this bed is depleted the Upper Freeport will probably be the largest producer.

The coal in this bed varies from a few inches to 10 ft. thick and usually contains two partings. The thickest part of this seam is in Allegheny and Indiana Counties although it is mineable in practically all of the districts. Around Johnstown, in Cambria County, this seam averages 3½ ft. in thickness with one parting near the floor. The largest recoverable reserves of the Upper Freeport bed are in Westmoreland, Indiana, Allegheny, Fayette, Washington, and Armstrong Counties. As a rule the coal is soft and contains from 18 to 34 per cent of volatile matter. It is fairly high in sulphur.

Pittsburgh—The Pittsburgh coal bed is the second largest in Pennsylvania and by far the most important in Washington, Greene, Fayette, Westmoreland, and Allegheny Counties. This seam is in the Monongahela series, is the highest of the large beds, and contains a recoverable reserve of 8,130,113,650 net tons, although this reserve is fast being depleted.

The Pittsburgh seam is probably the most famous bituminous coal bed in America and varies from 4 to 9 ft. in thickness, averaging about 7 ft., and is remarkably uniform throughout. The bed is divided into 2 to 4 benches. Despite this fact it is probably more easily mined than any other of the beds. The famous Westmoreland, Youghiogheny, and Pittsburgh Gas coals



Zones Showing Percentage of Volatile Ratios in Pennsylvania Bituminous Coal
 The mining districts to which reference is made by number are: (1) Blossburg, (2) Snowshoe, (3) Clearfield, (4) Reynoldsville, (5) Low Grade Div., (6) Shawmut, (7) Cambria, (8) Two Lick, (9) Indiana, (10) Allegheny River, (11) Johnstown, (12) Southfork-Windber, (13) Quemahoning, (14) Broad Top, (15) Meyersdale, (16) Latrobe, (17) Greensburg, (18) Youghiogheny, (19) Connellsville, (20) Pittsburgh

Table II—Bituminous Coal Reserves in Pennsylvania

Estimated by John F. Reese of Geological Survey of Pennsylvania, Aug. 1, 1922

County	Original Deposit	Mined Out	Recoverable
Allegheny	3,180,000,000	969,200,000	1,486,900,000
Armstrong	3,750,700,000	107,290,000	2,491,100,000
Beaver	1,116,400,000	1,400,000	560,000,000
Blair	61,900,000	11,900,000	25,000,000
Bradford	39,000,000	300,000	19,000,000
Butler	4,550,000,000	30,000,000	2,300,000,000
Cambria	5,383,000,000	466,900,000	3,638,080,000
Cameron	42,000,000	100,000	20,000,000
Centre	442,000,000	60,000,000	184,000,000
Clarion	1,817,000,000	37,000,000	1,059,000,000
Clearfield	3,992,000,000	308,210,000	2,165,400,000
Clinton	93,000,000	5,000,000	44,000,000
Elk	610,000,000	27,000,000	297,000,000
Fayette	5,229,734,000	899,544,000	2,604,400,000
Greene	10,330,094,000	42,490,000	7,011,400,000
Indiana	6,339,400,000	299,200,000	4,288,700,000
Jefferson	3,420,000,000	180,000,000	1,900,000,000
Lawrence	611,000,000	300,000	311,000,000
Lycoming	68,000,000	200,000	34,000,000
Mercer	368,000,000	40,000,000	172,000,000
McKean	320,700,000	300,000	136,000,000
Somerset	6,091,800,000	187,384,000	3,986,000,000
Tioga	124,400,000	23,200,000	52,000,000
Washington	10,526,023,000	557,763,000	5,481,680,000
Westmoreland	6,381,504,000	1,218,141,000	3,297,500,000
Broad Top Field	391,000,000	46,843,000	265,800,000
Total	75,259,055,000	5,519,665,000	43,830,860,000

come from this seam. The coal is soft and friable, and large areas in Greene, Washington, Westmoreland, and Fayette Counties are unusually low in sulphur content. This coal also has such excellent coking qualities that it has earned for the Connellsville product the reputation of being the standard coking coal of the world.

Lower Kittanning—The Lower Kittanning bed, also known as the "B," Bloss, or Miller seam, lies from 145 to 200 ft. below the Mahoning Sandstone in the Allegheny formation and contains a reserve of 7,615,800,000 net tons. This is the lowest of the large beds and underlies practically all of the western part of Pennsylvania with the exception of Allegheny, Greene, and Washington Counties. It is the most persistent, uniform, and reliable coal of the Allegheny formation and although the workable thickness seldom exceeds 4 ft., the seam varies in thickness from 2 to 7 ft.

In 11 counties this seam is exposed in workable thickness and purity, and its commercial output is over 25 million tons annually. The coal has a content of from 15 to 16 per cent volatile matter in the eastern counties of the bituminous field and increases as one goes westward until it reaches about 39 per cent in Beaver

County. In parts of Cambria and Somerset Counties the sulphur is fairly low, but otherwise both sulphur and ash are generally rather high, although much high-grade steam coal comes from this bed.

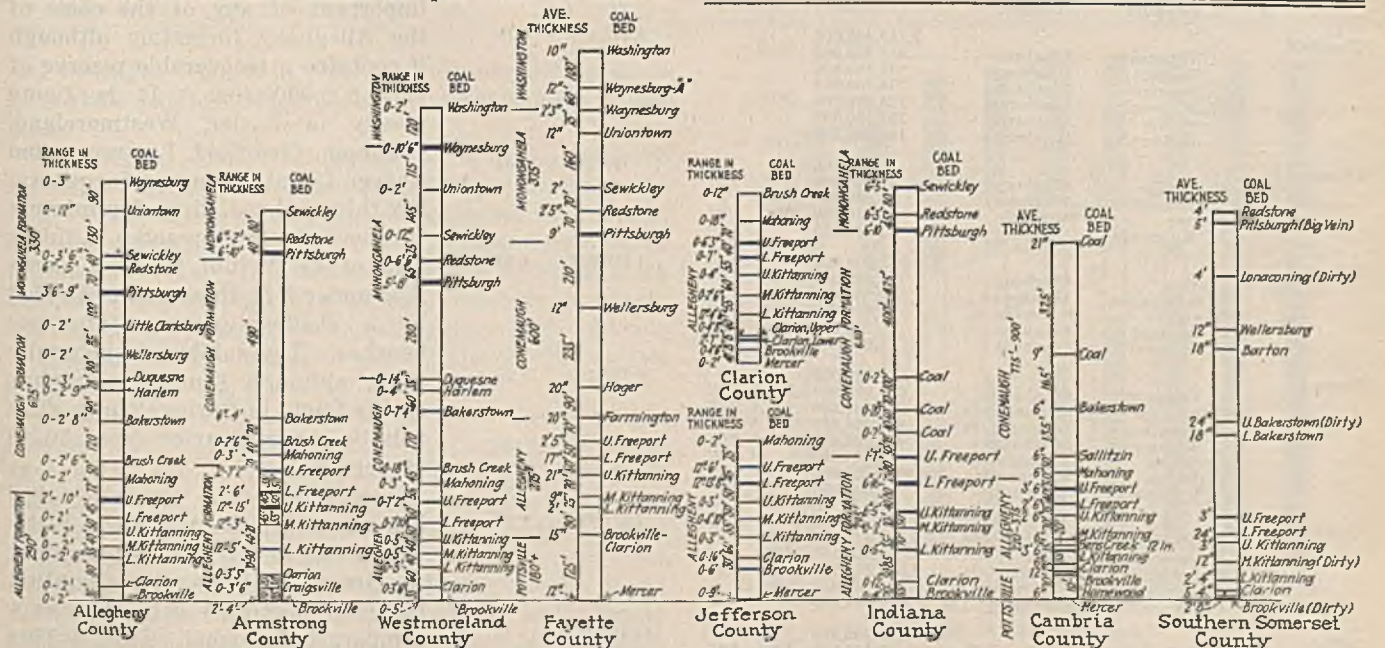
Lower Freeport—The Lower Freeport or "D" bed lies from 30 to 80 ft. below the Mahoning sandstone and is most prevalent in Indiana, Cambria, Clearfield, Jefferson, and Armstrong Counties. It is the chief bed in the Clearfield district and contains a recoverable reserve of 4,147,730,000 net tons, averaging from 2 to 6 ft. in thickness. This seam is broken up into two or more benches by shale partings. As it is mined mostly in the central part of the state where the low volatile coals are found, it is usually of high calorific value. In parts of this bed the sulphur and ash are fairly low, especially in Clearfield County.

Upper Kittanning—The Upper Kittanning bed, also known as the "C" prime or Cement seam is most prevalent in Somerset County, although it is of considerable importance in Cambria, Clearfield, Butler, and Jefferson Counties. About 3,561,030,000 tons of this coal

Table III—Grades of Coal in Pennsylvania with Fuel Ratios, Heating Values and Analyses

(Fuel ratio is the fixed carbon content divided by the content of volatile matter. In the table, the analyses are those obtained after revising ash content and moisture so as to be the same in each instance)

Type and District	Fuel Ratio	British Thermal Units	Approximate Analysis			
			Moisture	Volatile Matter	Fixed Carbon	Ash
Anthracite						
Eastern Pennsylvania	10	13,850—13,250	3	5	86	6
Semi-Bituminous						
Sullivan and Wyoming Counties	10—7	14,000—13,650	3	9	82	6
High-Rank Semi-Bituminous						
Broad Top Field	7—5	14,600—12,000	3	13	78	6
Low-Volatile Steam or Smokless						
Clearfield-Cambria	5—3½	14,850—14,250	3	17	74	6
Medium-Volatile Steam						
Indiana and Connellsville	3½—2½	14,640—14,000	3	22	69	6
Medium-Volatile Steam or Byproduct						
Connellsville-Latrobe	2½—1.85	14,350—13,750	3	27	64	6
High-Volatile Steam or Gas Coal						
Pittsburgh-Shawmut-Allegheny River	1.85—1.40	14,250—13,700	3	33	58	6
High-Volatile Steam or Gas Coal						
Butler-Lawrence Co.	under 1.40	13,750—13,000	3	40	51	6



Strategic Relation of Coal Beds in Different Parts of the State of Pennsylvania

By such studies of the thickness of the intervals between beds they can be the more readily identified or correlated, but if such intervals were ascertained more extensively than at present and were plotted on maps of the coal fields we could then visualize what upheavals occurred in the periods for which plots are made and so form conclusions valuable in tracing actions favorable and adverse to coal deposition. Such maps would be of interest to the scientist and coal buyer alike.

Table IV—Coal Beds in Pennsylvania, Their Formation, Reserves, Thickness, Production and Price

County	Coal Bed	Formation	Estimated Recoverable Reserve, Tons	Range in Thickness of Bed	Production 1920 Net Tons	Avg. Price 1920
Allegheny			1,486,900,000		16,047,575	\$3.72
	U. Freeport	Allegheny	1,127,600,000	2'0"-10'0"		
	Pittsburgh	Monongahela	280,100,000	3'6"-9'0"		
Armstrong	Redstone	Monongahela	79,200,000	0'6"-5'0"		
			2,491,100,000		5,975,063	3.75
	L. Kittanning	Allegheny	1,001,000,000	1'0"-5'0"		
	U. Freeport	Allegheny	943,000,000	2'0"-7'2"		
	L. Freeport	Allegheny	387,100,000	2'0"-6'0"		
Beaver	Brookville	Allegheny	87,300,000	2'0"-4'0"		
	U. Kittanning	Allegheny	69,900,000	1'0"-15'0"		
	Pittsburgh	Monongahela	2,800,000	6'0"-10'0"		
			560,000,000		170,900	4.13
	L. Kittanning	Allegheny	215,000,000	1'0"-3'0"		
Blair	U. Freeport	Allegheny	186,000,000	0'6"-5'0"		
	M. Kittanning	Allegheny	85,000,000	1'0"-3'0"		
	L. Freeport	Allegheny	40,000,000	1'0"-4'0"		
	Brookville	Allegheny	30,000,000	0-1'2"		
	Pittsburgh	Monongahela	4,000,000	5'0"-6'0"		
Bradford			25,000,000		158,257	4.54
	L. Kittanning	Allegheny	10,000,000			
	Brookville	Allegheny	8,000,000			
	U. Freeport	Allegheny	4,000,000			
	U. Kittanning	Allegheny	2,000,000			
Butler	L. Freeport	Allegheny	1,000,000			
			19,000,000		(x)	
Butler	Brookville	Allegheny	11,000,000			
	L. Kittanning	Allegheny	8,000,000			
Cambria			2,300,000,000		1,542,307	4.79
	Brookville	Allegheny	700,000,000	1'0"-4'6"		
	U. Freeport	Allegheny	450,000,000	1'0"-9'6"		
	M. Kittanning	Allegheny	450,000,000	0-4'6"		
	L. Freeport	Allegheny	200,000,000	0-3'0"		
	U. Kittanning	Allegheny	200,000,000	0-4'6"		
	L. Kittanning	Allegheny	200,000,000	0-3'6"		
	Clarion	Allegheny	100,000,000	0-7'0"		
Cameron			3,638,080,000		18,967,754	4.04
	L. Kittanning	Allegheny	1,348,100,000	* 3'6"		
	I. Freeport	Allegheny	900,730,000	* 2'6"		
	U. Freeport	Allegheny	711,920,000	* 3'6"		
	U. Kittanning	Allegheny	612,430,000	* 2'6"		
	Brookville	Allegheny	43,600,000	* 1'0"		
Centre	Clarion	Allegheny	20,300,000	* 0'6"		
			20,000,000			
	Brookville	Allegheny	9,000,000	2'0"-4'0"		
Clarion	Mercer	Pottsville	9,000,000	1'0"-4'0"		
	I. Kittanning	Allegheny	2,000,000	* 3'0"		
			184,000,000		1,735,045	4.30
Clearfield	Brookville	Allegheny	108,000,000	2'0"-5'0"		
	L. Kittanning	Allegheny	50,000,000	26"-5'6"		
	U. Kittanning	Allegheny	13,000,000	2'0"-3'6"		
	M. Kittanning	Allegheny	6,000,000	0-4'0"		
	L. Freeport	Allegheny	5,000,000	2'0"-6'0"		
	U. Freeport	Allegheny	2,000,000	2'6"-5'0"		
			1,059,000,000		1,567,095	3.98
Clinton	L. Kittanning	Allegheny	400,000,000	1'0"-4'6"		
	Clarion	Allegheny	350,000,000	2'0"-7'0"		
	Brookville	Allegheny	224,000,000	0-4'6"		
	M. Kittanning	Allegheny	30,000,000	0-2'6"		
	U. Kittanning	Allegheny	30,000,000	0-4'0"		
	L. Freeport	Allegheny	16,000,000	0-7'0"		
Elk	U. Freeport	Allegheny	9,000,000	0-6'3"		
			2,163,400,000		9,242,416	4.16
	L. Kittanning	Allegheny	855,300,000			
	L. Freeport	Allegheny	537,500,000			
	U. Freeport	Allegheny	234,500,000			
Greene	W. Kittanning	Allegheny	224,000,000			
	Brookville	Allegheny	207,100,000			
	M. Kittanning	Allegheny	106,800,000			
			44,000,000		327,296	3.61
	Brookville	Allegheny	19,000,000	2'0"-5'0"		
Indiana	L. Kittanning	Allegheny	15,000,000	0'6"-5'0"		
	Mercer	Pottsville	8,000,000	0'6"-5'0"		
	M. Kittanning	Allegheny	2,000,000			
			297,000,000		1,258,834	4.07
	Clarion	Allegheny	120,000,000	1'6"-5'6"		
Fayette	L. Kittanning	Allegheny	84,000,000	2'0"-5'0"		
	Mercer	Pottsville	82,000,000	2'0"-4'0"		
	L. Freeport	Allegheny	8,000,000	3'0"-4'6"		
	U. Freeport	Allegheny	3,000,000	* 6'0"		
			2,604,000,000		30,742,236	3.27
Greene	U. Freeport	Allegheny	1,029,000,000	* 2'5"		
	Pittsburgh	Monongahela	909,300,000	* 9'0"		
	Waynesburg	Monongahela	919,800,000	* 2'3"		
	L. Kittanning	Allegheny	198,000,000	* 2'0"		
	Sewickley	Monongahela	123,600,000	* 2'0"		
	Redstone	Monongahela	75,700,000	* 2'5"		
	U. Kittanning	Allegheny	59,000,000	* 1'9"		
			7,011,400,000		2,078,835	4.23
Indiana	Pittsburgh	Monongahela	2,831,453,650	0'3"-9'0"		
	Waynesburg	Monongahela	1,119,453,950	4'0"-9'0"		
	Sewickley	Monongahela	1,647,858,950	0'4"-5'6"		
	Washington	Washington	735,148,850	thin		
	U. Freeport	Allegheny	677,484,000			
Indiana			4,288,700,000		11,414,048	3.66
	U. Freeport	Allegheny	1,652,800,000	1'0"-7'0"		
	L. Freeport	Allegheny	1,374,800,000	0'6"-16'0"		
	L. Kittanning	Allegheny	1,239,900,000	0-5'0"		
	Pittsburgh	Monongahela	21,200,000	6'0"-10'0"		

remain. It lies from 80 to 100 ft. below the Mahoning sandstone and is remarkable for the variety of its composition as well as for its irregularity in occurrence. The sulphur varies also from $\frac{1}{2}$ to 3 per cent. The coal from this seam in some parts of Somerset County is of low sulphur content and is high-grade smokeless steam coal; otherwise the ash and sulphur contents are fairly high.

Waynesburg — The Waynesburg seam contains a reserve of about 2,523,638,950 tons and is found in noticeable quantity only in Greene, Washington, and Fayette Counties. This coal is really the highest workable bed of the Monongahela series, lying about 390 ft. above the Pittsburgh coal. It averages about $3\frac{1}{2}$ ft. thick and is divided by a shale parting from 1 to $2\frac{1}{2}$ ft. thick. This coal is generally fairly high in sulphur.

Brookville — The Brookville bed or "A" seam lies almost immediately above the Homestead sandstone, and has a recoverable reserve of 2,183,900,000 net tons. It is the lowest bed in the Allegheny formation and underlies most of the counties in western Pennsylvania with the exception of the gas-coal districts of Washington, Greene, Fayette, Westmoreland, and Allegheny Counties. It averages from 4 to 8 ft. in thickness although it is commonly too impure and sulphurous for marketing. The coal varies from medium to high-volatile.

Middle Kittanning — The Middle Kittanning or "C" seam is the least important of any of the coals of the Allegheny formation although it contains a recoverable reserve of 1,310,800,000 tons. It is found mostly in Butler, Westmoreland, Jefferson, Clearfield, Lawrence, and Beaver Counties, but is in general too thin and too dirty for mining. In some places it reaches a thickness of $4\frac{1}{2}$ ft., but in most places it is under 3 ft. thick and is divided by a shallow parting into two benches. The sulphur is generally high, although some low sulphur coal is found in Butler County. The volatile matter varies from 20 to 40 per cent.

Sewickley — The Sewickley bed lies about 110 ft. above the Pittsburgh coal and is widely persistent in Greene and Fayette Counties, but is economically valuable over a comparatively small area. This bed is credited with a recoverable reserve of about 1,246,453,950 tons

Table IV—(Continued)

County	Coal Bed	Formation	Estimated Recoverable Reserve, Tons	Range in Thickness of Bed	Production 1920 Net Tons	Avg. Price 1920
Jefferson	L. Freeport	Allegheny	1,900,000,000		5,346,458	\$3.84
	L. Kittanning	Allegheny	450,000,000	1'0"-13'8"		
	Brookville	Allegheny	430,000,000	0 - 3'0"		
	U. Freeport	Allegheny	400,000,000	0 - 6'0"		
	M. Kittanning	Allegheny	250,000,000	1'0"- 6'0"		
	U. Kittanning	Allegheny	220,000,000	0 - 4'9"		
Lawrence	Brookville	Allegheny	311,000,000		157,934	3.42
	M. Kittanning	Allegheny	96,000,000	0 - 4'0"		
	L. Kittanning	Allegheny	90,000,000	2'6"- 4'0"		
	Mercer	Pottsville	20,000,000	0 - 3'0"		
	L. Freeport	Allegheny	8,000,000	1'6"- 6'0"		
	U. Freeport	Allegheny	7,000,000	2'0"- 7'0"		
Lycoming	L. Kittanning	Allegheny	34,000,000		67,932	4.17
	M. Kittanning	Allegheny	20,000,000	2'0"- 7'0"		
	U. Freeport	Allegheny	10,000,000	1'0"- 7'0"		
Mercer	Brookville	Allegheny	4,000,000	2'0"- 7'0"	530,427	4.43
	Mercer	Pottsville	172,000,000			
	Sharon	Pottsville	110,000,000	3'6"- 4'0"		
	L. Kittanning	Allegheny	48,000,000	0 - 4'0"		
	M. Kittanning	Allegheny	10,000,000	0 - 5'0"		
	M. Kittanning	Allegheny	2,500,000	0 - 2'0"		
McKean	Mercer	Pottsville	136,000,000		85,700,000	2'0"- 8'0"
	Brookville	Allegheny	85,700,000	2'0"- 5'0"		
	L. Kittanning	Allegheny	50,000,000	2'6"- 3'0"		
Somerset	U. Kittanning	Allegheny	3,986,000,000		10,532,967	4.30
	L. Kittanning	Allegheny	2,188,500,000	3'0"- 4'0"		
	U. Freeport	Allegheny	910,700,000	2'4"- 5'0"		
	L. Freeport	Allegheny	525,700,000	3'0"- 4'6"		
	Brookville	Allegheny	219,600,000	2'0"- 2'6"		
	Clarion	Allegheny	62,900,000	3'0"- 5'0"		
	Pittsburgh	Monongahela	54,600,000	2'8"- 4'0"		
	Redstone	Monongahela	16,100,000	* 5'0"		
	Sewickley	Monongahela	5,400,000	* 4'0"		
Tioga	Brookville	Allegheny	52,000,000		763,611	4.20
	M. Kittanning	Allegheny	18,000,000	1'0"- 2'6"		
	U. Kittanning	Allegheny	12,000,000	1'0"- 3'0"		
	L. Kittanning	Allegheny	12,000,000	2'6"- 5'0"		
Washington	Pittsburgh	Monongahela	5,481,680,000		23,321,195	3.71
	U. Freeport	Allegheny	3,516,860,000	4'0"-12'0"		
	Waynesburg	Monongahela	995,900,000	0 - 7'0"		
	Washington	Washington	668,380,000	4'0"- 8'0"		
	Redstone	Monongahela	212,540,000	0 - 4'0"		
Westmoreland	U. Freeport	Allegheny	88,000,000		24,510,146	3.46
	Pittsburgh	Monongahela	3,297,500,000	0 - 7'0"		
	L. Kittanning	Allegheny	1,859,200,000	5'0"- 8'0"		
	M. Kittanning	Allegheny	538,300,000	0 - 5'0"		
	Redstone	Monongahela	431,700,000	0 - 5'0"		
	Waynesburg	Monongahela	297,500,000	0 - 5'0"		
	Waynesburg	Monongahela	163,200,000	0 - 6'0"		
Broadtop Field	Clarion	Allegheny	7,600,000	0 - 10'6"	265,800,000	1,625,516
	L. Kittanning	Allegheny	124,700,000			
	U. Freeport	Allegheny	94,300,000			
Small Mines			46,800,000		2,524,000	6.03
Totals			43,830,860,000		170,607,847	\$3.76

* Average thickness.

and averages from 5 to 6 ft. in thickness with a 2- to 3-in. shale parting which occurs near the middle of the seam.

Washington—The Washington bed is in the Dunkard formation and is the highest of the Pennsylvania coals. It is found only in Greene and Washington Counties in any quantity and is said by Reese to have a reserve of 947,688,850 tons. This bed is usually 8 to 10 ft. thick but is so broken up with partings that it is nearly worthless. The sulphur is usually rather high and due to the location of the seams the volatile matter is also as a rule excessive.

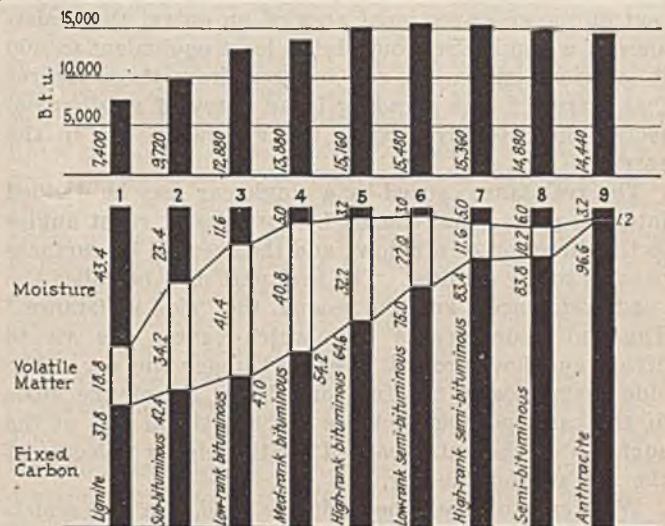
Clarion—The Clarion seam is most prevalent in Clarion, Huntington, Elk, Butler, and Somerset Counties and contains a reserve of about 770,600,000 net tons. This seam is of workable thickness in only a few places and rarely attains a thickness of over 4 ft. It is mined in the Shawmut district and lies about 35 ft. above the Brookville coal. The coal in Indiana County is of medium volatile whereas in Armstrong and Clarion Counties the percentage of volatile matter is very high. It is only occasionally that any of it is low in sulphur which seriously detracts from its value.

Redstone—The Redstone bed is found mostly in Westmoreland, Washington, Allegheny, Fayette, and Somerset Counties and contains a reserve of about 411,500,000 net tons. It ranges from 3 to 4 ft. in thickness, but in most of the territory it is too thin to mine under existing conditions.

Mercer—The Mercer beds are generally found in McKean, Elk, Mercer, Lawrence, Cameron, and Clinton Counties and are mined in the Blossburg and Broad Top districts. They are said to contain a reserve of about 252,700,000 tons. The Mercer group of seams embrace the second horizon of commercially valuable coal in the Pottsville formation.

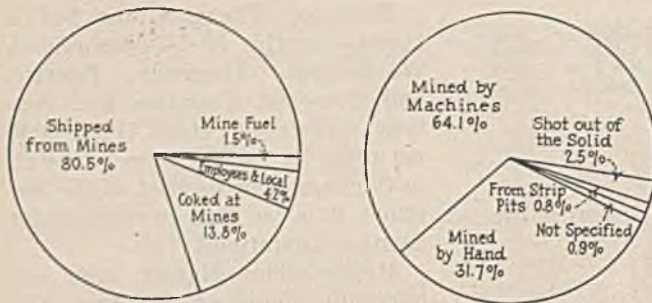
This group has a thickness varying from 15 to 60 ft. and consists of a valuable series of about 52 ft. of dark shales including fireclays and two coals. The coals, which are seldom of any economic value, are generally patchy, irregular, or lenticular, hence it is impracticable to attempt to identify the coal of a single horizon in distant parts of the basin. Occasionally the coal has a low sulphur content, but that is not the usual characteristic.

Sharon—The Sharon bed is the lowest coal considered in Pennsylvania and contains only about 10,000,000 tons reserve in Mercer County. This coal varies from a few inches to 5 ft. in thickness but the reserve is so small and the bed is so deep that it will probably never be of any economic importance. The sulphur and ash are generally low in the Sharon coal.



Shows Chemical Composition and Heat Giving Power of Coal of Several Ranks (Based on ash-free basis)

Pure carbon does not make an ideal fuel. The free or at least easily liberated hydrogen gives the greatest heat. A hydrogen fuel would be vastly superior to one of carbon. That is why the semibituminous coal gives such wonderful heating power.



What Is Done with the Coal and How It Is Mined

Little of it goes into mine fuel. More would so go if none of the mines purchased power. By making more power at the mines by approved methods much unshippable coal could be directed to a useful purpose.

Berlin-Quakertown-Coleman-Philson — These seams are in the Conemaugh formation between the Allegheny and Monongahela series, but the beds have never been considered of any economic value although they are mined locally in some parts of Somerset County.

Car Resists Air as Much as 100 Ft. or More of Entry

Cars When Separated Give Greater Resistance to Air—When Coupled End Resistance of Only One Wagon Need Be Considered

AS A RESULT of tests in the Experimental Mine of the U. S. Bureau of Mines it has been determined that if the area of the surfaces of a single car at right angles to the flow of air is between 15 and 20 per cent of the cross-sectional area of the entry, the resistance caused by the car will be, in round numbers, equal to that caused by 100 ft. of the unobstructed entry and that each additional car coupled to the first will add 25 ft. of entry to the equivalent resistance. If five cars were coupled together the equivalent resistance would be 200 ft. of clear entry. If the five cars were separated from each other, the resistance would increase, and when the separation became 25 ft. or more the resistance of the five cars would be equivalent to that of 500 ft. of clear entry. If a car occupied 40 per cent of the cross-sectional area of an entry, the resistance of a single car would be at least equivalent to 400 ft. of clear entry. It can be seen from these figures that a trip of cars standing in an entry of small cross-section may totally change the volume of air in the entry.

The resistance caused by a single car may be divided into two parts: that caused by surfaces at right angles to the direction of air flow; and that caused by surfaces parallel to the air flow. The first part may be called the "end resistance," and the second, the "side resistance." The end resistance is that which causes the air to divide and flow around, over and under the car. The side resistance is the friction of the air on the sides of the car, and also includes the additional loss at the surfaces of the entry caused by the higher velocity of the air around the car.

With cars of the type and size used, the end resistance of a single car was three times the side resistance, and consequently 75 per cent of the total resistance caused by the car. The end resistance will probably vary as some power of the ratio of the end surface area of the car to the cross-sectional area of the entry.

The side resistance will vary with the length of the car, the character of the surfaces over which the air rubs, and inversely with some power of the clear area left for the passage of the air. Further research is necessary to determine these relations exactly.

When two or more cars are coupled together, the end resistance of the trip is the same, irrespective of the number of cars, and is numerically equal to that of a single car. The side resistance, however, is the resistance of a single car multiplied by the number of cars, and the total resistance is the sum of the end and side resistances, assuming a uniform entry in all cases.

When two cars which have been coupled together are moved apart, the resistance caused by them increases. This is due to the fact that as they are separated the air tends to rush into the opening between them, and assume the distribution it would have had if the cars were absent. This then introduces an end resistance on the second car, which was absent when the cars were coupled together. The resistance will increase as the cars are further separated until the space between them becomes long enough for the air to assume its regular distribution. The resistance of the two cars is then twice that of a single car, and further separation causes no change in resistance. This holds good for any number of cars when they are separated from each other. The smallest separation which produced maximum resistance in the present tests was about 25 ft. of clear space between bumpers.

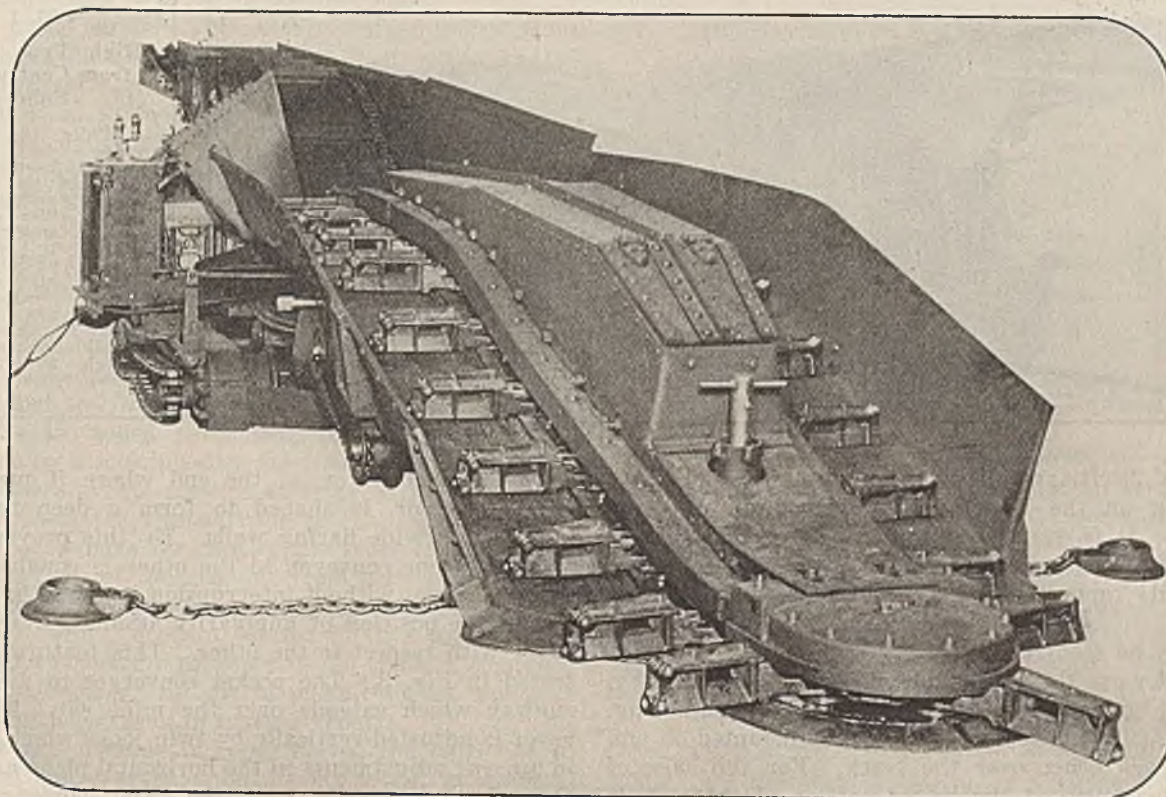
The tests with different sized cars were not entirely satisfactory because there were too few of them. As a first approximation, however, it may be said that with a single car the resistance will increase with the square of the ratio of the end area of the car to the cross-sectional area of the entry. Whether this is also true with a number of cars cannot be said without further experiments. From one line of reasoning it may be argued that with a number of cars the increase would be more nearly as the cube of this ratio, but it is best to make no assumption until tests have been made.

The difference in resistance between loaded and empty cars was not much greater than the error of duplicate experiments in the present work, and has no practical significance. Cars had the same resistance when in unbroken entry and when opposite cut-through dead ends.

The resistance caused by cars was independent of the velocity of the air within the limits of error of the present experiments. The pressure loss varied with the square of the air velocity measured in clear entry or, stating the same thing in another way, it varied with the square of the volume of air passing per unit time.

The experiments made all agreed with the above conclusions qualitatively, and further experiments are projected to determine exactly the quantitative relations. The first of these can be made on a laboratory scale.

The foregoing expression of car resistances in equivalent lengths may be correctly applied only for the actual test conditions. Theoretically, the conversion of this data to a different set of conditions as to airway characteristics should be calculated on the basis that, with other conditions similar, the loss expressed in feet of entry will vary as $\frac{KP}{A}$, where K is the friction factor, P the perimeter and A the area.



Low-Type Loader

Coloder, Used by Pocahontas Fuel Co., Is Large Machine of Coal Commission Report

Has Been in Process of Development Since 1893—Its Action While Loading Is Similar to That of Arcwall Machine Making Cut—First Loader for Room Work That Loads from the Side

BY ALPHONSE F. BROSKY
Assistant Editor, *Coal Age*
Pittsburgh, Pa.

IN ITS REPORT on "Underground Management in Bituminous Mines," released in the fall of 1923, the U. S. Coal Commission devoted twelve pages to mechanical loading operation based on the performance of two types of machines. These loading machines were differentiated, one from another, by the terms "small" and "large," which defined their relative capacities. At the release of this report few mining men were able to recognize, by the somewhat meager description furnished by the commission, the identity of the "large" machine. At last the curtain is raised, and for the first time is exposed to the view of the mining public the Coloder, the "large" loading machine of the commission's report.

The Coloder—until recently named the Jones loader after its inventor, James Elwood Jones, vice-president and general manager of the Pocahontas Fuel Co.—is not a new machine. It is the product of thirty-odd years'

development dating back to 1893, in which year protection of the principles incorporated in it was sought in the U. S. Patent Office. Patents were duly granted and, incidentally, these constituted the first issued in this country for an underground loading machine. Since then a series of loading machines embodying old and new principles has been built by Mr. Jones and Norton A. Newdick of Columbus, Ohio. The old principles prevailed over the new, and the Coloder of today is based on a patent issued in 1902, with such improvements as later discoveries in the sciences of mechanical and electrical engineering have brought about and experience has shown to be advantageous.

Two types of this machine are now in service in the mines of the Pocahontas Fuel Co., the high and the low. The high type is now being used most extensively, for the reason that the Pocahontas No. 3 seam in the present mine developments of this company averages about 8 ft. in thickness. A new mine is being opened in this seam where the average thickness of the coal is only about 4½ ft. In this mine the low-type Coloder will be used. The high machine stands 63 in. above the rail, whereas the top of the low machine is only 42 in. above the rail. The Coloder has an average

NOTE—The type of Coloder shown in the headpiece will work in a 4-ft. seam of coal. The arms on the front conveyor gather the coal and convey it to the rear conveyor. These arms are attached to an endless chain and sweep down one trough in an idle or return strand, around the nose of the machine in gathering coal and up the second trough in conveying the coal. The direction of this gathering chain can be reversed at will. Directly behind the front conveyor can be seen the wide flaring sides of the rear conveyor which form a receiving pocket.

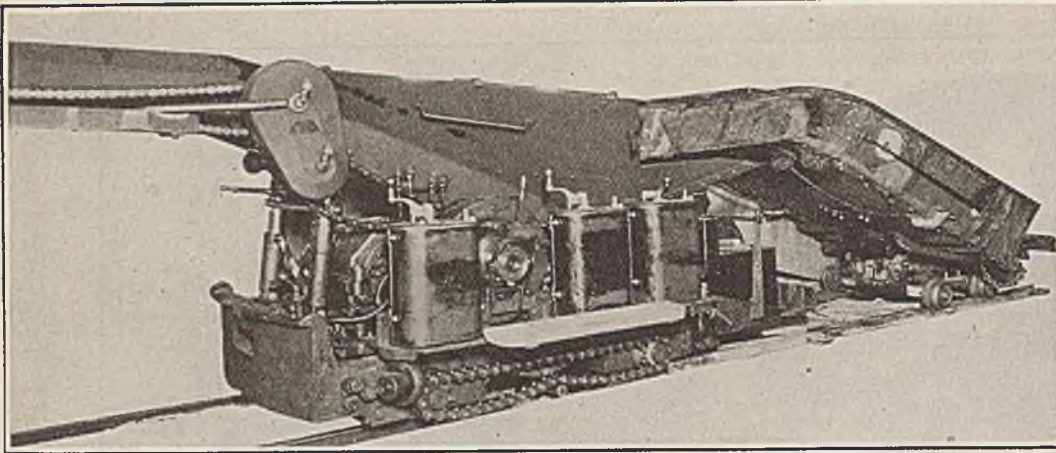


FIG. 1

High Type Seen from Controller Side

While the machine is being moved from place to place the front or gathering conveyor rides on a pony truck to which it is attached by a king pin. All movements effected by power are regulated by three reversible controllers which govern as many motors.

length of 29 ft. and may be made longer or shorter depending on the length of the discharge conveyor required. It is 8½ ft. wide and weighs 14 tons. Depending upon the conditions under which it is operated, its capacity ranges from 300 to 500 tons per eight-hour shift.

As may be seen readily in Fig. 2, the major units of the Coloder are three in number: The truck, the rear, or discharge, conveyor and the front, or gathering, conveyor. The conveyors are pivotally mounted on and overlap each other over the truck. For the sake of clarity, inasmuch as the larger portion of this article is devoted to a description of the design and performance of the front conveyor, I shall adhere to the order already given in describing this machine.

Because the truck of the machine remains on the track in the loading operation and, of course, moves from place to place on the track, it is provided with four soft cast-steel wheels on axles of heat-treated steel. The latter are mounted in double helical spring journal boxes. The rear end frame acts as a stop for the mine cars when the latter are backed toward the machine and the front end frame supports the self-propelling mechanism.

Although the Coloder is not intended to travel from place to place under its own power, it is provided with a self-propelling mechanism. This is utilized for moving the loader the short distances required in the loading operation. Rapid transportation is effected by the aid of one of two gathering locomotives which should be in constant attendance on the machine. The self-propelling mechanism consists of a reversible, series-wound motor which operates a spur and self-locking worm gearing and these, through chains and sprockets on the axles, impart driving motion to the wheels.

THREE CONTROLLERS FOR OPERATION

A rectangular cast-steel plate which is heavily ribbed forms the base plate. This base plate rides on anti-friction bearings and is pivoted directly beneath the pivotal point of the front conveyor so that it can be swung to the right or left over the truck. On it are mounted the front and rear conveyors and the power-transmitting mechanism for both. The base plate also supports all the electrical equipment attached to the machine. Every movement of the loader is made through the operation of three reversible controllers which regulate the performance of as many motors. No devices which function through the medium of compressed air or water are used on this machine.

The rear conveyor, at the end where it meets the front conveyor, is shaped to form a deep receiving pocket with wide flaring walls. By this provision the feed from one conveyor to the other is equalized, and the coal moves without interruption in its path, regardless of the position of angularity assumed by one conveyor with respect to the other. This feature is illustrated in Fig. 3. The pocket converges to a straight runway which extends over the mine car. The conveyor is adjusted vertically by twin jacks which operate in unison; adjustments in the horizontal plane are made through a manually controlled and power-operated mechanism.

ATTACKS FROM SIDE AND FRONT

The majority of the coal-loading machines now in use are of the frontal-attack type; that is, they load by sumping in toward the face, somewhat after the fashion of a breast machine while cutting. The movement of the Coloder while loading is more nearly like that of an arcwall machine when cutting coal. Like this type of cutting machine, it operates from a track and like the cutterbar of this cutting machine, the front conveyor of the Coloder is moved across the pile of coal which is being loaded. The Coloder, therefore, combines side and frontal attack in its movement while loading coal.

As shown in the headpiece of this article, one mechanical agency is utilized for both gathering the coal from the mine floor and carrying it to the rear conveyor. These two duties are performed simultaneously by a moving endless chain, to which at equal intervals are attached a number of conveying arms. These arms, in gathering, revolve in a semi-circular path at the nose of the front conveyor, sweeping the coal into either of two troughs which form the pan of this conveyor; and, in conveying, the arms follow the path of the troughs. Projecting from the end of each arm are two fish-tail bits. The direction of drive may be reversed at will so that either of the two troughs may be made to accommodate the passage of coal to the rear conveyor while the other carries the return flights of the chain. The pan of the front conveyor is outwardly flared at the outer edges of the two troughs. It is fabricated of plate steel, reinforced with steel bars and cast-steel brackets.

The nose of the front conveyor consists of a beveled steel casting which possesses a chisel-like action and keeps the gathering arms in contact with the mine floor while the machine is advancing into and loading a pile

of coal. This casting is protected from excessive wear on its under side by a renewable steel shoe.

Four-wheel carriers connected by forged-link sections form the endless front-conveyor chain. Between the links of these sections, and also between the sections themselves and their carriers, are located wearing blocks of composition bronze. When the chain encounters highly resistant obstacles, it is not subjected to excessive strain, two mechanical features being provided which allow it to adjust itself without breaking. One of these is the arrangement whereby each gathering arm is fastened to the chain by a single bolt, the strength of which is considerably less than that of the chain. With tight coal, for instance, one or perhaps two of these bolts will break without the chain being injured and will warn the operative of what is happening. As an added precaution the chain is further protected by a multiple-disk friction clutch in the main transmission. This feature also serves to protect the entire system for transmitting mechanical power.

The mechanisms for raising the front conveyor during the transit of the machine from place to place, and feeding the conveyor from side to side while the machine is loading, are not located on the truck of the machine, where their presence would cause a complication of machinery, difficult to make compact and even more difficult to reach in making repairs.

While the machine is being moved the head end of the front conveyor rides on a pony truck, to which it is coupled through the agency of a king pin. This arrangement is illustrated in Fig. 1. Upon the arrival of the machine at the face of a working place, the king pin is withdrawn to allow the conveyor to unload from the pony truck, after which the latter is lifted by a winch and hung on two chains in an inoperative position under the conveyor pan. This detail is shown in Fig. 2.

SIDE MOTION BY POCKET SHEAVE

As already explained, forward motion of the machine, while loading, is obtained by a chain drive on the wheels of the truck. Side motion, from the center of a place to either its left or right rib or from rib to rib, is accomplished by a pocket sheave which moves on a chain stretched across the working place. This chain is shown in Fig. 1. It is reeved over the sheave and at each end has attached to it a steel foot block which is anchored by a telescopic jack pipe.

The lower end of this pipe is seated in the foot block while the upper end is held by a niche made for this purpose in the mine roof. The pocket sheave is located under a housing on the gathering conveyor and is driven by a reversible motor through a double reduc-

tion, self-locking gearing which holds the gathering conveyor in any position in the path which it follows while gathering coal.

The track at the face of a working place is extended by short rail sections of special design which are coupled to the end of standard mine rails. Each section is 4½ ft. long and weighs 75 lb. This special rail section is termed "Coltrac," the name by which it is known in the patent papers covering it. One section of Coltrac is fastened to another without the use of any movable fastenings such as bolts and fish plates, and no mine ties are required to hold them to gage. The ends of each section of Coltrac are provided with automatic locking connections and the rail is channeled, so that the flanges of the wheels of the machine truck adjust these sections to gage.

EMPLOYS FIVE-MAN CREW

A crew of five men is required to operate the Coloder—the operative, a right-side man, a left-side man, a front man and a car trimmer. The right-side man and the left-side man work on their respective sides of the loader, setting up the jack pipes and performing miscellaneous duties incidental to the operation of the machine. The front man stands on the nose of the loader and picks down whatever coal hangs in a cut.

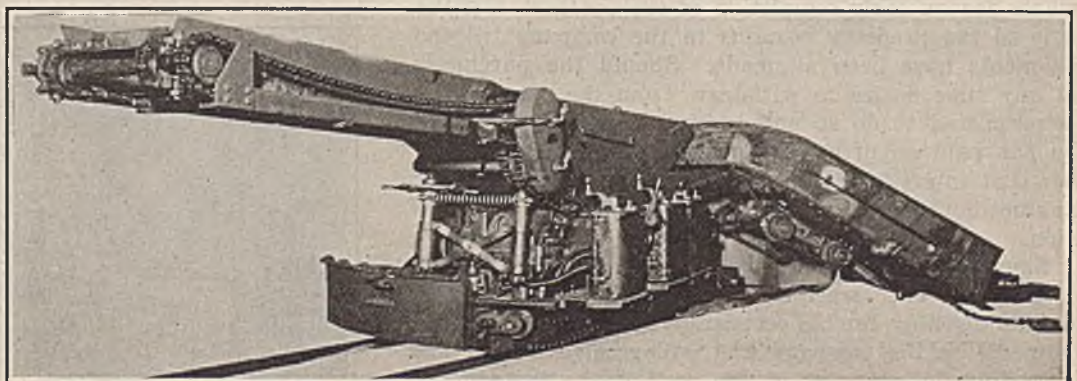
Let us follow through a few of the movements executed by the machine and its crew in the loading operation: The machine is backed by a locomotive to the face of a working place. While the front man and the car trimmer unload the gathering conveyor from the pony truck, the two side men unload the special extension track and the jack pipes, and the operative connects the power line to the machine. Immediately after this advance preparation has been made, which takes about one minute, the actual loading operation commences.

In its first movement the Coloder under its own power is sumped forward 5 or 6 ft. into the center of the pile of coal. While this first movement is being executed a jack pipe is set up near the right-hand rib and the feed chain adjusted for the second movement in which the machine is swung from the center of the cut to the right-hand limit of the working place. During the execution of the second movement a jack pipe is set up near the left-hand rib and the feed chain adjusted for the third movement in which the machine is swung across the width of the place starting from the right-hand rib. In this third movement the machine sweeps the clean path made in the second movement and loads coal as it swings from the center of the place to the left-hand rib. The fourth movement consists of sumping the machine along the left-hand rib while a jack

FIG. 2

High Type in Loading Position

Upon the arrival of the Coloder at a working place, the gathering conveyor which in traveling is carried upon a pony truck, is lowered into working position and the truck stowed away under the conveyor.



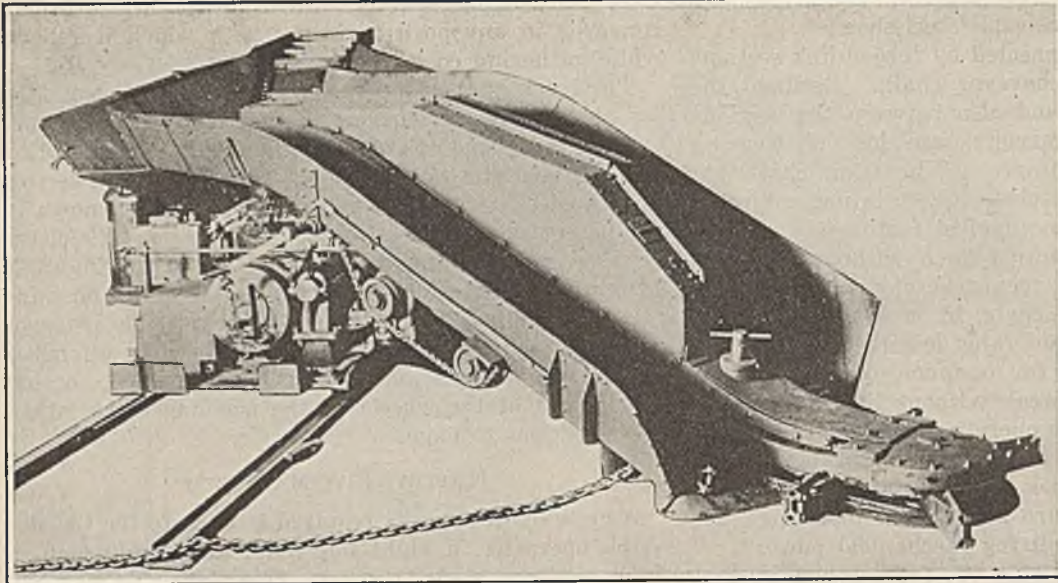


FIG. 3
Gathering Conveyor in Angular Position

While loading coal this machine is moved ahead under its own power and is swung in an arc from side to side by a pocket sheave which feeds on a chain. This chain is anchored to telescopic jack pipes which fit into a foot block at one end of the chain. The track is extended by the addition of short sections of patent rail. These special rail sections are provided with automatic couplings and are channeled so that they are adjusted to gage by the flanges of the wheels on the machine truck.

pipe is being set near the right-hand rib. In the fifth movement the gathering conveyor loads the coal lying in the advance arc which it describes in swinging from the left- to the right-hand rib. Similar movements are followed until the place is cleaned.

Without halting the loading operation, one of the two jack pipes is set alternately near the right- and left-hand ribs and the track is extended to conform with the advances made by the machine. The nose of the gathering conveyor moves in close contact with the mine floor which it sweeps clean of coal ranging in size from fines to a lump weighing as much as a half ton. Because of its design which lends it great flexibility, the machine reaches whatever coal lies close to irregular ribs and corners. In consequence, when a cut of coal is properly prepared, little or no hand shoveling is required.

After a place is finished, two men load the gathering conveyor on the pony truck while two other men disengage and load the jack pipes and the short sections of patent rail. During this time the operative disconnects the power line and winds up the machine cable, and a locomotive is coupled to the machine. The machine is made ready for moving to a new place in one to two minutes.

Coloders have been in successful operation in the mines of the Pocahontas Fuel Co., Inc., since 1918, and are now made available for use in the mines of other companies. They are manufactured by the Coloder Company, Inc., Columbus, Ohio. In an early issue of the paper an article will appear describing the performance of these machines and the methods employed in the mines where they are at work.

Steel Corporation Has House-Owning Plan

By three methods the employees of the United States Steel Corporation can become owners of their own houses with the active assistance of that company. They can purchase the houses owned by the company, they can buy houses of private owners or they can have buildings erected by a contractor approved by the corporation. A house can be purchased from the company on an initial payment of not less than 10 per cent of the purchase price, the rest of the payments to be made in monthly installments not exceeding ten to fifteen years with interest on deferred payments at the rate of 5 per cent per annum. The purchaser may anticipate payments at any time with special inducements for an early completion of the contract, but the title to the property remains in the company till the payments have been all made. Should the purchaser at any time desire to withdraw from the contract he is permitted to do so and receive back all the money he has paid on principal and interest thereon, plus 5 per cent interest less a rental based on 8 per cent per annum of the purchase price for the period of possession.

Should the employee desire to buy either a company dwelling or one owned by a private individual, or to build a dwelling for his occupancy, he can mortgage the property to the company and will receive a loan not exceeding 75 per cent of the cost of the investment,

the mortgage bearing interest at 5 per cent and being a preferential encumbrance on the property. For buildings built under this plan the company will furnish plans and specifications from its files free of charge and will require that they be erected subject to its inspection and approval. Title will be taken in the name of the purchaser and the loan may be repaid in installments. The company gives, if requested, an extension of time in case of reduction of earnings due to illness, disability or unavoidable suspension of work, this regardless of whether the purchase is made by installment payments or by mortgage.

Store and Office Building of the Pocahontas Fuel Co., at Itmann, W. Va.



Proposed Law to Make West Virginia Mines Safer

Rock Dusting Made Alternative to Sprinkling—Internal Combustion Engines Forbidden Where Injurious to Health—Lighting of Roadways To Be Required in All Electrified Parts of Mines

TO INCREASE the safety of the mines of West Virginia a subcommittee of a committee recently appointed to confer with reference to the mining laws of that state has formulated a law to replace that now in force. The provisions of such a law have been discussed at a series of conferences arranged by the state department held in various parts of the state.

The law as presented by the committee does not prescribe rock-dusting. Section 15 provides that, "In all mines accumulations of any coal dust shall, as far as practicable, be removed from the mine and all dry and dusty sections kept thoroughly watered down at all times, or rock-dusting and other improved means used for allaying dust." This enables operators to use dust in place of water if so disposed. In some states, as the law now unfortunately reads, rock-dusting without sprinkling would be unlawful. Rock-dusting with sprinkling being undesirable, where both rock-dusting and sprinkling are provided in the same place, the practice of rock-dusting is practically prohibited by law.

In the proposed law the use of internal-combustion engines underground is subjected to restrictions by the clause in Section 14 which provides that, "No product of petroleum or alcohol or any compound that in the opinion of the inspector will contaminate the air to such an extent as to be injurious to the health of the miner shall be used as motive power in any mine." This restriction does not rule the internal-combustion engine entirely out of the mine, as the exhaust of stationary engines can be put into the return without injury to the health of miners. Nothing is said as to the fire risk, though a fire caused by such an engine killed several men in the Villa mine near Charleston.

In Section 51 it is provided that, "All haulways having electric wire shall have electric lights not less than 200 ft. apart, and intersections shall be properly lighted." Apparently turnouts to entries are not covered by this provision.

MINING SCHOOL GRADUATES FAVORED

In several clauses the new law favors mining schools. The chief of the department, required by the law to be "a male citizen of West Virginia" and "a competent person" with at least "eight years of experience in the working, ventilation and drainage of coal mines, two years of which must have been in West Virginia," is credited with two years of experience if he has received "a diploma from any accredited engineering school."

Again when giving the qualifications for district

mine inspectors, after stating that they must be citizens of the state and have had at least six years experience in coal mines, the law adds that a diploma from any accredited school of engineering shall qualify as two years' experience.

In the case of mine foremen, however, it does not count as it is hoped it will in Pennsylvania. The mine foreman is required to be a citizen or resident of the state and must hold a certificate of competency for such position, issued to him by the department of mines

SUGGESTED LAW requires that coal-cutting machines in gaseous mines be flameproof but nothing is said as to machines cutting clay, drilling rock or coal or loading either. Explosives must be tamped to mouth of hole. Apparently air spacing and loose rock dust are forbidden. Inflammable material must be used for tamping. Two safety lamps must be provided at every mine whether gaseous or non-gaseous. Safety lamp boxes must be placed on all coal-cutting machines but only it would seem in gaseous mines, where also it is provided that no coal-cutting machine must be taken beyond the last crosscut without inspection for gas by some authorized and competent person.

after an examination held by that department and he must have "had five years' experience in the working, ventilation and drainage of coal mines." Where "the operations are so extensive that all the duties developing upon the mine foreman cannot be discharged by one man, competent persons having at least three years' experience in coal mines may be designated and appointed as assistants, who shall act under the mine foreman's instructions." No

reference is made to any scholastic training in reference to either of these classes of officials.

In a gaseous mine a fireboss or firebosses must be employed and these must be citizens or residents duly examined and certificated by the department of mines, and they must have had "at least three years' experience in mines liberating explosive gases."

EXAMINATION OF MACHINE RUNNERS

"Machine runners shall be compelled," says Section 38, "to undergo an examination to determine their fitness to detect explosive gas, before they are permitted to have charge of machines in mines liberating gas, unless they be accompanied by a certified fireboss or a man having passed such an examination, said examination to be given by the mine foreman."

Before "any operator or agent of a coal mine" shall make "any new or additional openings" he "shall submit to the chief of the department of mines, for his information and approval, a plan showing the proposed system of ventilation and equipment of the openings with their location and relative positions to adjacent development, and no such new or additional openings shall be made until approved by the chief of the department of mines."

One hundred cubic feet of air per minute must be provided for every person in the mines and as much more as the district mine inspector may require. Break-throughs for air shall be made in pillars not less than 80 ft. apart, but "with the approval of the mining department greater distances than specified may be

made where approved method of ventilation is provided." "Not more than sixty persons shall be permitted to work in the same air current, provided that a larger number, not exceeding eighty persons, may be allowed by the district mine inspector, where, in his judgment, it is impracticable to comply with the foregoing requirement."

"In all mines liberating explosive gas and where there is any reason to believe that gas will be encountered in the future workings and developments of the mine, the minimum ventilation shall be 150 cu.ft. per minute for each person employed and as much more as one or more district mine inspectors may deem requisite." In such mines all stoppings on the main entries shall be substantially built of masonry, concrete or other incombustible material which shall be approved by the district mine inspector." All doors shall be hung so as to close automatically. "Two safety lamps shall be kept at every coal mine whether such mine liberates firedamp or not."

Section 30 provides that, "No operator, agent or mine foreman shall provide a horse or mule stable inside of any mine, unless space for stable is excavated in solid strata of rock, slate or coal. If excavated in the coal seam, the wall shall be built of brick, stone or concrete not less than 4 in. in thickness or of steel plates and the said wall shall be built from the bottom slate to the roof. No wood or other combustible material shall be used in the construction of the inside of said stable."

SEPARATE VENTILATION FOR STABLE

"The air current used for ventilation of the said stable shall not be intermixed with the air current used for ventilating any other portion of the mine, but shall be conveyed directly to the return air current. No open lights shall be permitted in any stable in any mine. No hay or straw shall be taken into any mine, unless pressed and made up into compact bales, which shall be kept in a storehouse apart from the stable, constructed in the same manner as the stable. Under no circumstances shall hay be stored in the stable. All refuse and waste shall be removed from the stable and shall not be allowed to accumulate in the mine."

Trolley wires and positive feed wires must be placed on the opposite side of the track from refuge holes or necks of rooms, when so ordered by the department of mines. Wires placed across the necks of rooms shall be protected by boards which shall extend below

them or be provided with other approved devices that shall afford adequate protection from contact with them and resulting electric shock.

"Within six months after the act becomes a law all electric coal-cutting machines used in gaseous portions of the mines shall be flameproof and approved by the department of mines." "In any gaseous portion of a mine a coal-cutting machine shall not be brought within the last breakthrough next the working face until the machine man" or some competent person authorized or appointed for that purpose "shall have made an inspection for gas in the place where the machine is to work. If any explosive gas is found in the place, the machine shall not be taken in till the gas is removed."

FREQUENT EXAMINATION FOR GAS

"All cutting machines shall be provided with a box especially designed for carrying safety lamps for the protection of such lamps. No coal-cutting machine shall be continued in operation for a longer period in a gaseous portion of a mine than half an hour without an examination as above described being made for gas, and if gas is found, the current shall at once be switched off the machine and the trailing cable shall forthwith be disconnected from the power supply."

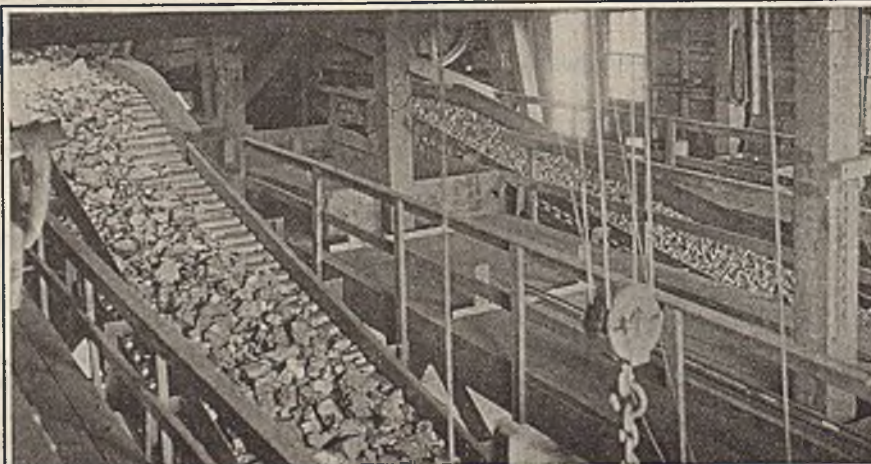
Too much is said about coal-cutting machines. Some cut in clay and are just as dangerous as those cutting coal when gas is present. Nothing appears to be said about electric drills or loading machines which need equally drastic legislation. The explosion at Glen Rogers was said to be due to an electric drill that was not flameproof.

In any mine where coal is dislodged by solid shooting the district mine inspector is authorized to prescribe the condition under which it shall be done. "In no case," says another section, No. 64, "shall more than one kind of explosive be used in the same drill hole and every blasting hole shall be tamped full from the explosive to the mouth and no inflammable material shall be used for tamping. Dynamite shall not be used in blasting coal. No fuses shall be used unless permission is granted by the mine foreman, and in no case shall fuses be used of less length than the drillhole."

The law is none too complete and the sub-committee will doubtless strengthen it before it is presented. Surely West Virginia operators desire that it shall not be defective or any less protective than the best of laws on the statute books of any other state that produces coal in commercial quantity.

Rachel Mine Tipple

An interior view of the tipple of the Rachel Mine, located in the Fairmont low-sulphur gas field, Downs, W. Va. The illustration shows block and egg coal in the process of taking the moving side-walk.



Limits Fall Of Coal

By raising or lowering the boom, the fall of the coal can be limited so as to be little, if any, greater and sometimes much less than the diameter of the small sprocket that at the end of the boom engages its rollers.



News Of the Industry



Coal Men Profess to See Too Much Regulation in Oddie Bill

Emergency Control Measures Have Made the Industry Wary—Senator's
Opposition to Government Ownership and Operation Overlooked —
Investigation and Inspection to Be Voluntary

By PAUL L. WOOTON
Washington Correspondent of *Coal Age*

If there were any doubt as to the attitude of coal operators toward Senator Oddie's proposed bureau of coal economics it was dispelled last week at the meeting in Washington of the government relations and the tax and cost accounting committees of the National Coal Association. A spokesman for the bituminous industry, in discussing the constitutional basis for this legislation, said:

"It is accepted generally that the federal government is justified in undertaking some supervision of business when either a natural or artificial monopoly exists or when such a step is necessary to conserve a natural resource facing early exhaustion. The bituminous-coal industry falls in neither category. To use Dr. George Otis Smith's phrasing, 'nature enforces the anti-trust statutes in the bituminous industry.'

"The Supreme Court on several occasions has pointed out that the production of coal does not constitute interstate commerce. An act of Congress a few years ago denied transportation to the products of child labor, but the Supreme Court found the law to be unconstitutional. Senator Oddie's proposal is on all fours with that act. The Federal Trade Commission attempted to set up that interstate commerce goes to the source of the commodity, but the Supreme Court of the District of Columbia and the Court of Appeals have denied this contention. The Supreme Court of the United States still has to pass on the question as it is presented in that particular case."

If the wholesalers, retailers and anthracite operators have not expressed similar views already it is certain that they entertain them. This attitude on the part of the industry is perfectly understandable since it was born of the unhappy experience of coal men with successive measures of emergency control and regulation.

It can be said, however, that this attitude is not generally understood on Capitol Hill. The lawmakers were far removed from the travail which has accompanied many of the relationships between the government and the coal

industry. In addition there is a feeling on Capitol Hill that the coal operators have failed to catch Senator Oddie's spirit.

The metal mining industry long has known, as have those coal operators who have made his acquaintance, that he is a friend of the mining industry. He is opposed to government ownership and operation. He is a staunch Republican and is in thorough sympathy with the Republican policy which stands for a minimum of government in business. In fact he helped to write the Republican platform at Cleveland last summer. He is a conservative and comes from Nevada, a state where mining is the only major activity.

When a man of such impulses and with such viewpoints has a suggestion to make his associates are at a loss to understand why the coal industry does not regard him as worth listening to, even if it does not accept a legislative suggestion which he has put forward avowedly for study and discussion.

Senator Denies Regulation

Senator Oddie has stated repeatedly that his only purpose is to promote the general welfare, including that of the coal industry. He has no desire to regulate the production or distribution of coal. He thinks Congress and the public should have essential information about it, but he contends that there is no more regulation in his conception of a Department of Mines than there is in the Department of Commerce or the Department of Agriculture. He hopes to do for mining what Secretary Hoover is doing for manufacturing and what the Secretary of Agriculture does for farming. He fails to see where his bureau of coal economics is inconsistent with this purpose. If regulation lurks in his bill he fails to see it.

There are others in Congress who take the same view. They fail to see that the collection of current information is an act of regulation. They fail to see that co-operation with trade associations or discussion with an advisory committee, or plans for "proper and adequate storage of coal by consumers," or the other twenty-seven items which the Secretary of

Soft-Coal Men Indorse Coolidge Economy

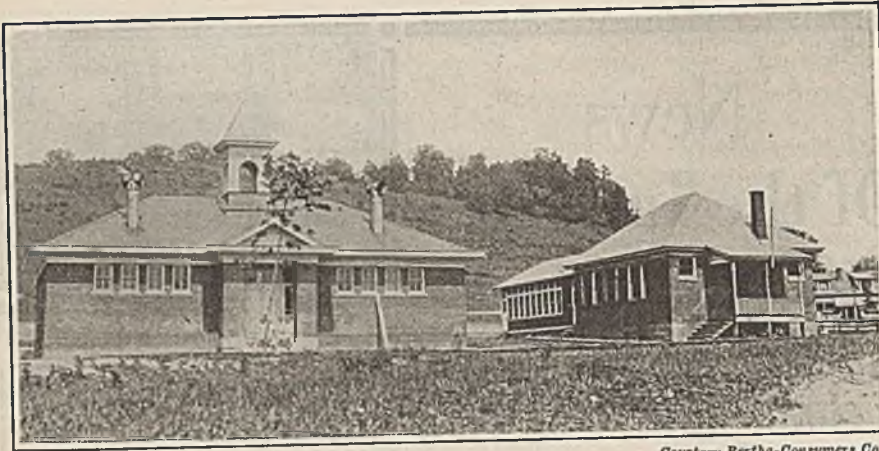
The support of the bituminous coal industry was pledged to President Coolidge in his program for economy and curtailment of government activities on Jan. 30 by the government relations committee of the National Coal Association. Representing the principal producing fields of the United States, twelve members of this committee, headed by Walter H. Cunningham, of Huntington, W. Va., and with S. Pemberton Hutchinson, of Philadelphia, president of the association, in attendance, adopted a resolution at Washington endorsing the statement made last week by the chief executive to the business organization of the government.

Citing these words of the President, "We are occupying fields that should be abandoned," the resolution declares that "Calvin Coolidge puts his finger on the crux of the situation. We have too many federal bureaus now. Elimination of these superfluous bureaus will bring lower taxes and better business conditions for all."

Mines is supposed to discuss with the industry, will amount to regulation.

The discussion is purely voluntary. The responsibility of committee members is purely personal and the Secretary of Mines is given no authority to take any action other than to make the discussions public. The legislators fail to see that the provisions for technical investigations of fuel economies constitute regulation. This is exactly what the Bureau of Mines is doing and has done for a long time, to the great benefit of the country. The bill simply proposes the continuance of this work on the same voluntary basis.

Even the arrangements for the inspection of coal are on a purely voluntary basis. The only requirement laid on all shippers is that coal moving in interstate commerce be accompanied by statements of quality. The bill does not attempt to set minimum standards of quality or provide any penalty for shipping coal of less than certified quality, other than notice thereof to the buyer and seller. In comparison with the pure food law this is regarded as innocuous indeed. It is a very different thing from the prohibition against any shipment of impure coal advocated by the New England mem-



Courtesy Bertha-Consumers Co.

School Houses at Eureka Mine

Teaching the young idea how to shoot has been amply provided for at this operation of the Bertha-Consumers Co., located at Randall (near Morgantown), W. Va.

bers of Congress. If they ever have their way the industry will realize quickly the difference between regulation and Senator Oddie's position.

There are only two things in the bill which give color to any fear of regulation. One of them is the section which revives the Federal Fuel Distribution law of 1922 in the event of an emergency. This section is hardly germane to the bill but is thought to have been made a part of the measure to disarm those who are clamoring for drastic legislation. The other feature which apparently has waved the red flag in the eyes of the industry is that which makes compulsory certain reports. A company refusing to report may be denied cars for shipments intended to move interstate. This is the point around which the discussion rages. It is quite clear that most of the opposition to the bill is excited by this provision.

The industry feels that this provision is an interference with private rights and business privacy, but Senator Oddie goes to extraordinary lengths to provide that there be no violation of privacy and writes into the bill meticulous directions to the Secretary of Mines as to how the material is to be safeguarded, so that the secretary could not override it even if he should desire to do so.

For 136 years American business has been subject to a compulsory requirement to report in connection with the census. It never has been supposed that this constitutes either regulation or violation of privacy. The coal business has been making the reports required by this law since 1840, and probably has quite forgotten that these five- and ten-year census returns are compulsory. Like Moliere's bourgeois gentleman they have been talking prose all of their lives and never have been aware of it.

It is true that this particular call for facts is laid on coal and not on other businesses, but sight apparently is lost of the fact that nearly every state does the same thing in making compulsory returns to the mining inspection department. Those returns have not been regarded as constituting regulation.

Another view held on Capitol Hill is that there is no analogy between the Oddie provision and the first child labor

law. That law was declared unconstitutional because it sought to do by indirection a thing Congress was precluded from doing directly: that was to interfere with the police power of states. The Oddie provision does not interfere with the states' police power. It is predicated on the right of Congress to obtain information essential to intelligent legislation. In that view Senator Oddie is supported by some of the highest constitutional authorities that Congress has the right to call for information necessary to legislation when the business is interstate in character.

Need Not Pay Tax on Coal Used at Mines

Anthracite producing companies are not required to pay the Pennsylvania State anthracite tax upon coal they mine and consume in their own boiler plants and washeries, according to an opinion of Judge William M. Hargest, of the Dauphin County Court, handed down Jan. 26, at Harrisburg. The decision was in an important test case, but the questions raised did not touch the constitutionality or other phases brought out in others of the series of court tests.

The opinion was in the case of the state against the Scranton Coal Co. and involved \$2,249.35, representing tax on coal used in the company's eight collieries and one washery. The decision said:

"The produce which the company used and which is taxed in this case is not a marketable product. The language of the statute subjects to tax coal which is 'mined, washed, screened or otherwise prepared for the market.' It does not impose a tax upon coal when it is mined unless the mining alone would result in preparation for market.

"The test of marketability is not whether it is used. It is possible that other manufactories might equip plants to use this product, but if the amount of refuse in it is so large as to make it impracticable to pay the freight in hauling that refuse there would be no demand for the product away from the mine which produces it, and certainly in that event it would not be marketable."

J. C. Dysart Dead; Helped Form Pittsburgh Coal Co.

James Crawford Dysart, captain of industry, philanthropist and director and member of the executive committee of the Pittsburgh Coal Co., a resident of Hollidaysburg, Pa., died of pneumonia in Miami, Fla., Jan. 28. He was almost 84 years old.

Mr. Dysart was born in Hollidaysburg, April 25, 1841. In 1865 he associated himself with his father in the lumber business, later opening a coal and lumber yard in Altoona. In July, 1880, he went to Scottsdale, where he erected a coke crushing plant for the H. C. Frick Coke Co. After several years he sold his interests and built a large plant at the Hutchison Bros. coke plant in Westmoreland County, which he operated for two years, when the H. C. Frick company purchased the plant. He then went to the Frick company's offices in Pittsburgh and took charge of the company's coke business. He went from there to Mt. Pleasant, where he operated the plant he had erected, and remained for three years. Leaving the Frick company's service, Mr. Dysart went to Pittsburgh and took charge of the Chartiers Block Coal Co. While there he acquired a large interest in the company, which was subsequently sold to Pickands, Mather & Co., of Cleveland.

In the latter part of 1899, in association with Upson A. Andrews, Mr. Dysart acquired a large number of options in the Pittsburgh district and, in January, 1900, formed and completed the organization of the Pittsburgh Coal Co. The capital stock consisted of \$30,000,000 of preferred stock and \$30,000,000 of common stock. The Pittsburgh Coal Co. is now the largest coal company in the United States and Mr. Dysart remained a director and member of the executive committee to the time of his death.

Throughout his life Mr. Dysart was identified with various philanthropies. In 1904 Mr. and Mrs. Dysart moved to Hollidaysburg, where she died in 1920. He took a special interest in the Y.M.C.A. and presented Hollidaysburg with a building and equipment at a cost of more than \$100,000. Just two weeks before his death he gave \$67,500 toward the erection of an addition to the Presbyterian Home for Aged Women at Hollidaysburg. He was interested in good roads and gave liberally of his time and money to further road construction. Just recently he offered his native town a library, but this project was not completed. The body was brought to Hollidaysburg for burial in the Dysart family vault.

Charles P. White, chief of the Coal Division of the Department of Commerce, left Jan. 22, for a trip embracing Pennsylvania, Ohio, Indiana, Illinois, Kentucky, West Virginia and Virginia and will see representatives of the coal industry and interested parties en route. His itinerary probably will include Pittsburgh, Cleveland, Chicago, Terre Haute, Indianapolis, Cincinnati, Louisville, Charleston and Richmond.

Coal Industry Settles Its Own Troubles In Southwestern Field

Joint Labor Board Handles Many Mining Disputes and "Coal Court" Makes Kansas City Retailers Behave—
Two Hundred Rows Settled

The coal industry of the Southwest is rapidly developing its own judiciary. Recently a "coal court" was organized by dealers in Kansas City to maintain the ethics of the trade. But as long ago as last May, when operators and miners of Kansas, Oklahoma, Arkansas and Missouri put their names to a three-year contract, a "supreme court" was established for the benefit of all engaged in coal production in the district.

On the bench sit W. L. A. Johnson, Kansas City, Mo., general commissioner of the Southwest Interstate Coal Operators' Association, representing the operators, and John P. White, of Des Moines, Ia., one-time international president, United Mine Workers, representing the miners. Functioning under the title of Joint Interstate Commission, it has been their duty to interpret the contract and settle labor disputes over which members of the joint board of operators and miners have disagreed. From their decision there is no appeal.

Since the latter part of May, when the commission heard its first case, it has settled almost two hundred disputes, and has been largely responsible for the district's freedom from labor trouble in the last eight months. Only in Oklahoma has there been any conflict, and there only in mines not under the jurisdiction of the commission.

Malpractice Punished

The retailers' "coal court" in Kansas City is organized so that any coal dealer accused of giving short weight, substituting one grade of coal for another, or any similar unethical conduct, will be tried, and on conviction his punishment will be determined by a court of his "peers." The court was established by an agreement signed by fifty dealers, at the suggestion of the city inspector of weights and measures. Its purpose is to maintain public confidence by disciplining dealers guilty of dishonest practice without the reputation of the industry as a whole suffering through police court publicity.

The court is composed of four representatives of coal companies, John Dolan, of the Ryan Coal & Grain Co. and Norvin H. Vaughan, of the Ransom Coal & Grain Co., both members of the Coal Credit Bureau; and J. H. Buckley, of the Consumers Fuel Co., and J. D. Bruce, of the Bruce Cherokee Coal Co., representing independent dealers; with John V. Crowe inspector of weights and measures, ex officio chairman.

The court's members were elected for one year. It will meet once a month to hear complaints. Its hearings will be kept secret, but its decisions will be final. In a letter mailed Jan. 19 to Kansas City dealers Mr. Crowe announced that failure to abide by the court's rulings would be punished by arrest and police court action.

Dealers were warned that some of the old excuses for short weight no longer hold. The court will refuse to excuse the dealer who says, "Gasoline and water tanks on the trucks were filled after the tare weight was taken;" or, "A chute was on the opposite side of the truck and wasn't noticed;" or "The truck was loaded so high some of the coal rolled off." These are only a few of the old stand-bys mentioned specifically as having no standing in the court.

Dealers have been notified they will be expected to weigh equipment at least twice a day, and oftener if changes are made which would cause its weight to vary. They also were notified that they will be expected to deliver the kind and grade of coal the customer orders, that substitutions are barred, and that if they sell coal as "forked," "screened" or "rescreened;" "forked," "screened," or "rescreened" it must be.

Railroads Publish New Rate Increases to Northwest

The revised rates from central Illinois, ordered when the southern Illinois rates were ordered, have been published, the new rate (to become effective Feb. 19) being \$3.05 to the Twin Cities. This is a differential of 70 cents over the southern Illinois rate and is an advance of 42 cents. The Kentucky and splint district of West Virginia have a common rate of \$5.40, an advance for Kentucky and a decline for West Virginia. If these rates are permitted to go into force they will revise the trend of all-rail buying still further. There will be some diversion of splint business into fields that have used more Kentucky coal heretofore, and some shifting of business which has heretofore gone to central Illinois and Indiana. Just how much of a change will follow can be determined only when the changes become effective.

The proposed schedule will be subjected to a vigorous attack on behalf of various shippers as well as by the independent dealers of the Twin Cities and of their association, the Twin City Coal Exchange. They see in these changes a diversion to the dock trade and a step to give the docks practically a monopoly in and around the Twin Cities. These changes were to have been made effective at the time that the southern Illinois rates were changed, last September, but were suspended by the Interstate Commerce Commission. It is still a question whether they will be permitted to go into force upon the date set, for the opposition will try everything possible to prevent it. The Minneapolis Street Railway Co. sees an increase of \$50,000 a year in its freight bills and the Northern States Power Co. as much more.

Merely a Coincidence

It is well known that the use of coke has been resorted to in combating the smoke evil of our American industrial cities. It is not generally known, however, that the first legal pronouncement against smoke as a public nuisance was made by Chancellor Sir Edward Coke, Chief Justice of the King's Bench of England during the early part of the 17th Century.

Chancellor Coke settled the question for all future time in the Aldred case in 1616, the year of Shakespeare's death. This decision definitely made smoke a nuisance against which a court might issue an injunction and the aggrieved person might recover damages.

In spite of the coincidence in names, the word coke, which is the name given to the fixed carbon residue left after coal as been "gasified," was derived from an old English term, "coaks," meaning cinders.

Union Carbide Co. Wants Utah Lamp Law Changed

The Utah Industrial Commission has been asked to modify its order on the lighting of coal mines. Hearing has been set for Feb. 17. The petitioner is the Union Carbide Sales Co., of West Virginia. The present order of the commission requires that all men entering any of the largest coal mines of the state shall be equipped with electric lamps, approved by the U. S. Bureau of Mines. The order was passed in April last following the Castlegate disaster and has the effect of a state law until altered by the commission.

The West Virginia company urges that the present ruling be reconsidered, and that the "unusual climatic conditions in Utah and conditions existing in some Utah coal mines shall be named as reasons for issuing such ruling, so that the chief mining inspector can prescribe the kind of lighting that should be used in any coal mine according to his judgment and discretion." It is asserted that experience in the largest coal producing areas of the country has proved that open lamps are safe, and it is stated that the belief is that all coal mines in Utah are not gaseous or dangerous for the use of open lamps.

New York Anthracite Prices For February, 1925

(Gross tons f.o.b. Mine)

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

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

Non-Union Output Passes That of Union Operations In Central Pennsylvania

For the first time since the United Mine Workers was organized in the central Pennsylvania bituminous district, which has at various times produced practically 11 per cent of the entire soft-coal output of the country, the non-union mines of the district in January, 1925, produced more coal than did those in which only union miners are employed.

Owing to the slump in the union areas production is below the average. A considerable portion of the district is non-union, notably Somerset County and counties to the west. For a long time the non-union mines produced from one-fourth to one-third of the coal. A steady gain prevailed throughout 1924 until by the close of January the non-union field is producing more than 50 per cent of the coal.

A number of the operators and miners in the northern portion of the district are ignoring the 1924 scale by subterfuge. Under the Jacksonville agreement operators cannot produce coal and compete with other fields. In order to get orders and hold them, and at the same time realize a profit, miners are working in a number of union operations six days a week, for which they receive four days' pay according to the scale. By working two days gratis the miners receive the 1917 wage and the operators can sell at a profit in competition with the non-union field. In other instances the miners are loading 2,400 lb. of coal and receive pay for 2,000 lb. at the scale price. By either method the miners have employment where otherwise they would have none and the operators are able to fill their orders in competition with others.

United Mine Workers officials, who oppose any deviation from the scale, admit that they have not been informed of these acts on the part of their members; nevertheless operators are continuing the practice with the consent of their men. Operators claim that existing conditions justify this action. In districts where this method of operation is not in vogue the mines are closed down and are likely to remain closed as long as the present scale stands.

Coal Shippers Want One Free Reconsignment

Some sentiment is rolling up to give weight to the appeal to coal-carrying railroads for one free reconsignment of coal. A hearing on the question has been arranged by the coal, coke and iron ore committee of the Central Freight Association at Pittsburgh, Pa., on Feb. 6. From various sections of the country, especially from Chicago, will arise a strong argument at the hearing in favor of the one free reconsignment, such as is now granted to rail anthracite going northwest, but denied all bituminous coal.

The situation was surveyed with many hot words at a luncheon of the Chicago Wholesale Coal Shippers' Association last week. It was pointed out that the railroad restriction against reconsignment was made to meet condi-



Phelps-Dodge Corporation Believes Clean Milk Makes for Health

This corporation has followed the lead of many other companies and maintains a dairy farm, thus assuring that its employees get that great desideratum—milk from healthy cows protected from deterioration and contamination in handling, both at the dairy and in distribution.

tions not now prevailing and certainly should be removed to enable wholesalers to give more prompt service to buyers, especially to buyers of Eastern long-haul coal. It can be supplied more readily if the jobber can have coal in transit to himself so that the buyer need not always wait the time required for a shipment to make the full distance from the mines.

As it stands now, if a car is rejected even for lack of storage capacity or any other legitimate reason, and reconsignment to some point beyond is necessary, the shipper pays the railroad \$2.70. "It amounts to confiscation," declared one speaker, and the audience, thinking of today's narrow margins on coal, applauded.

Utah Seeks New Ways to Make Mines Safer

A special effort is to be made to determine the cause of coal-mine disasters in Utah, and two able engineers from New York are now in the Carbon County coal fields to make a thorough study of conditions there. They are Prof. Edward K. Judd, mining engineer, and J. K. Mabbs, a research engineer. They came to Utah at the invitation of a committee composed of coal operators and citizens who held a meeting recently at the Chamber of Commerce in Salt Lake City with the view of determining some plan of campaign for making coal mining a safe occupation in the state. As a result of the investigations of the two men named it is hoped to evolve some new scheme in connection with safety work in coal mining.

E. O. Howard, a banker in Salt Lake City, was chairman of the inviting committee; Harold P. Fabian, another business man, acted as secretary; William Mooney, manager of the Kinney Coal Co.; L. F. Rains, president of the Carbon Coal Co.; D. D. Muir, Jr., vice-president and general manager of the United States Fuel Co.; J. H. Tonkin, president of the Independent Coal & Coke Co.; J. B. Smith, president, and T. R. Stockett, manager of the Spring Canyon Coal Co.; and A. C. Watts, chief engineer, and C. B. Hotchkiss, Utah Fuel Co., represented the coal industry on the committee.

\$100,000,000 Merger Near In West Virginia

Negotiations are reported to be nearly complete in the merger of a large group of bituminous coal mines in West Virginia under one operating organization. Charles R. Flint of Flint & Co., Inc., 25 Broad Street, New York City, announced on Feb. 2 that publication of all details covering the combination, which is believed to be the largest of its kind on record, is expected soon. Names of the bankers who will underwrite its securities, he said, are being withheld until all details of the combination are determined.

Mr. Flint, known as "the father of trusts," has been consolidating large companies for about thirty years. He said this combination would take in the properties of eighty small companies, the names of which are little known in the East. They operate about 150 mines and control about 75,000 acres of developed coal lands. The invested capital approaches \$100,000,000. The mines have an annual production of more than 20,000,000 tons. Most of them are located near Fairmont, Morgantown and Clarksburg. It is planned to take in other organizations later. Associated with Mr. Flint is A. H. Bickmore, of Bickmore & Co.

Plans for the consolidation, according to Mr. Flint and Mr. Bickmore, originated with the producers.

Coal River Road Offers to Sell To Chesapeake & Ohio

A direct offer of sale of the Coal River & Eastern R.R. to the Chesapeake & Ohio Ry. has been made by James W. Carmalt, counsel for the Coal River & Eastern. The offer to sell was made because of the ruling of the Interstate Commerce Commission that "Before the applicant is permitted to operate in the Laurel Fork in interstate commerce the Chesapeake & Ohio should be given further reasonable opportunity to buy the line and furnish the required facilities."

The Chesapeake & Ohio has been informed that the owners of the Coal River & Eastern R.R. consider the Laurel Fork property worth as much as the Long Branch Fork of the C. & O. which the Chesapeake & Ohio recently purchased for \$2,802,000.

Industrial Marketing Sessions Held by McGraw-Hill Co.

A three-day study of industrial marketing was conducted by the McGraw-Hill Co., Inc., in a meeting held at the Pennsylvania Hotel, New York City, Jan. 28-30, followed by a banquet, at which the speakers were Malcolm Muir, vice-president McGraw-Hill Co.; Julius H. Barnes, former president U. S. Food Administration Grain Corporation, 1917-1919, and former president U. S. Chamber of Commerce; Fred I. Kent, vice-president, Bankers Trust Co., representative of the United States on the Organization Committee of the Reparations Commission, and David Sarnoff, vice-president, Radio Corporation of America. E. J. Mehren, vice-president of the McGraw-Hill Co., presided. Herbert Hoover, Secretary of Commerce, sent a letter which was read by F. M. Feiker, vice-president, Society for Electrical Development.

Sheaf of Coal Bills Before Pennsylvania Legislature

Senator Robert D. Heaton, Schuylkill County, offered in the state Senate of Pennsylvania last week a bill to repeal the anthracite tax of 1½ per cent on coal prepared for the market.

A series of six bituminous coal bills, sponsored by Representative James T. Heffran, Washington, was introduced in the House. The bills are all safety measures.

One of the bills amends an act of 1911, providing that when one mine is working a seam of coal under another mine that is working an overlying seam and the two mines are operated by different companies, the operator working the underlying seam shall allow the mining engineer of the upper seam operator to make a survey of the lower mine. Another amendment to the 1911 law defines dampness in a mine as at least 30 per cent moisture.

An amendment to an act of 1923 provides that graduates of a coal-mining course of a recognized institution shall be eligible for examination as mine foreman, fireboss or assistant.

A fourth bill amends an act of 1911 so that storage battery locomotives must bear the approval plate of the U. S. Bureau of Mines and be approved by the State Secretary of Mines. An amendment to an act of 1891 provides that certificates to mine foremen and assistant foremen can be granted to citizens of the United States only.

A new bill provides for the appointment of miners' examining boards and prescribes their powers. The boards are to consist of nine members to be appointed by the Governor, each member to serve for two years and to be paid \$7.50 a day for days actually spent in examination work.

The selection of C. W. Parkinson, of Waynesburg, a member of the House of Representatives from Greene County, as chairman of the House Committee on Mines, has created some talk among the members from the mining districts of the state, especially the anthracite region. Mr. Parkinson is an undertaker and merchant.

Technical Paper Has Big Opportunity for Service

Herbert Hoover, Secretary U. S. Department of Commerce, in a letter to James H. McGraw, president McGraw-Hill Co., said relative to the Industrial Marketing Meeting:

"I wanted to attend your convention to say a personal word of appreciation for the fine service which you, your company and your publications are rendering to American industry. It is a real disappointment to me that I cannot come.

"A big change has come in the spirit of American business and for this change you are in part responsible. I mean the change from rule of thumb and *laissez-faire* to scientific determination of facts and programs of action based on facts. The business press is probably the greatest force in making industrial opinion. The schools and colleges have an important place, the trade associations can do much in the fields of production and distribution, the government bureaus that keep in contact with business can help to promote sound leadership in industrial and economic thinking. All have an important place, but the business press and technical journals are in a unique position and have a unique opportunity. I believe that no organization of technical publications has come nearer to living up to this opportunity than the McGraw-Hill publications under the leadership of James H. McGraw.

"The thought that I have in mind is that your great group of journals can not only recognize and support sound industrial leadership; you can also initiate it. The field of your opportunity is practically limitless."

Would Require Resurfacing After Strip Mining

A measure of vital importance to the strip-mine interests in Indiana was introduced in the Indiana Legislature Jan. 24 by Timothy O'Connor which would make it mandatory for companies to resurface land denuded by stripping operations. The bill provides that it shall be unlawful for any company or individual engaged in mining coal to remove coal by the strip-mining process unless the surface be replaced as nearly as possible in its original condition. It is provided, however, that if no good service is promoted by the return of the surface the company may file a petition with the Department of Conservation and ask for exemption from replacing the surface. The bill carries a penalty clause making violation a misdemeanor and provides on first conviction for a fine of \$500 to \$3,000, or imprisonment not to exceed a year, or both, and for a second conviction a fine from \$1,000 to \$5,000 or imprisonment or both.

West Virginia Miners Form Rival Union

A rival to the United Mine Workers came into being in West Virginia last week. A charter was issued Jan. 28, at the office of Secretary of State Houston G. Young to the Mine Workers' Association of West Virginia, which it is understood will function in the same manner as the United Mine Workers.

Incorporators of the association named in the charter are J. S. Querrey, Charleston; Lincoln Holstein, East Bank; Robert Morris, Charleston; W. M. Farley, Ohley, and C. C. Matson, Charleston. At an organization meeting Thomas Cairns was elected president and five directors named for the association. Headquarters were established at 8½ Capitol Street, Charleston.

L. L. Dunbar, attorney for the association, announced that it will make contracts with individuals and coal operators to set a scale of wages.

Conditions in the coal fields of West Virginia, especially in the southern part, and lack of harmony in the ranks of the United Mine Workers in West Virginia are understood to be the two chief causes for forming the association.

It is reported that Mr. Cairns, president of the association, was at one time affiliated with the United Mine Workers as a West Virginia district official. It is also understood that others identified with organizing the association had previously been members of the old union.

Rockefeller Plan Bettered Since Inquiry Began

That the investigation made by the Russell Sage Foundation representatives of the Rockefeller Plan of Employees' Representation at the mines of the Colorado Fuel & Iron Co. was welcomed by the officers, employees and stockholders of that corporation was stated by John D. Rockefeller, Jr., in a statement last week. He said:

"The study which the representatives of the Russell Sage Foundation have made of the efforts to improve industrial relations in Colorado was welcomed by the Colorado Fuel & Iron Co., its officers, employees and stockholders.

"As to my own view of the results of the study, I can only repeat what I said publicly in January, 1916, just after the Colorado plan was put into effect, as follows:

"The acts of bodies of men in their relations with other men should always be illuminated by publicity, for when the people see clearly what the facts are they will, in the long run, encourage what is good and condemn what is selfish.

"This plan is not a panacea; it is necessarily far from perfect, and yet I believe it to be a step in the right direction. Carefully as it has been worked out, experience will undoubtedly develop ways of improving it."

"Attention may be called to the fact that the Sage Foundation's study was made several years ago and that in the natural process of development many of the difficulties referred to in the report have been overcome."

Book Review

Alberta Research Council Solving Province's Coal Problems

Has Excellent Smithy Coal and Fuels of Widely Variant Friability—Disintegration Loss Great in High-Moisture Coal—Briquetting Experience

GOOD work has been done by the Scientific and Industrial Research Council of Alberta as evidenced by its Fourth Annual Report of 76 pages published at Edmonton. The first research recorded has reference to screening and storing of coal and some interesting facts are given that we do not believe have been determined for United States coals, but they are vital and we take pleasure in presenting some of them in Table I. It will be seen that like United States coals some are friable and some can be mined so as to give a large percentage of lump and egg.

The ash-content tables have some value but not much. We are not greatly interested in the percentage of the whole ash in the coal that may be found in any particular size. We think the Honorary Secretary and Research Engineer, Edgar Stansfield, must know what percentage of ash was found in each size, but all he tells us in his second table about the McGillivray Creek coal, for instance, is what relation the ash in the lump, egg, nut, pea and dust bear to the average figure when that figure is placed at 100. The lump is 93; the egg, 116; the nut, 108; the pea, 101 and the dust 96. That is somewhat interesting, but rather as reviewers say "intriguing." It does not satisfy.

We care even less about the percentage of the total ash found in each size. Thus the Blue Diamond coal sample taken in 1921 had only one per cent of the total ash in its lump coal. Off hand one might think that a wonderfully clean size, but looking at Table I we learn the lump coal constituted only one per cent of the whole product and looking at the second table in the report to which reference has been made we learn that its percentage of ash was not low but 4 per cent above the average for the whole coal. Probably the persons who submitted the coal did not want useful facts made known. Look-

Table I—Percentage of Sizes in Alberta Run-of-Mine

Name of Size	Lump	Egg	Nut	Pea	Dust
Screen / Through	3-in.	1½-in.	1-in.	¾-in.	½-in.
Sizes... / Over...	3-in.	1½-in.	1-in.	¾-in.	½-in.
McGillivray Creek...	11	8	10	26	45
Greenhill.....	8	12	11	29	40
Mountain Park.....	11	8	6	22	53
Cadomin.....	14	16	10	24	36
Pocahontas.....	3	6	6	20	65
Blue Diamond, 1921.	1	5	6	26	62
Blue Diamond, 1922.	4	8	11	27	50
Saunders Creek.....	52	15	10	13	10
Footbills.....	48	17	12	15	8
Monareh.....	59	19	9	8	5
Big Valley.....	57	26	10	4	3
Pembina.....	44	20	11	16	9
Dobell.....	59	24	8	6	3
Tofield.....	57	20	9	9	5
Twin City.....	45	30	10	11	4

Table II—Equivalent Spacing for Bar Screens for Alberta Coal Areas

(Measurement in sixteenths of an inch)

Diameter of Circular Perforations	3-in.	2-in.	1½-in.	1-in.	¾-in.	½-in.
<i>Coal Area</i>						
Crowsnest.....	24	16	12	8	6	3
Mountain Park...	29	16	12	8	6	3
Brule.....	28	16	12	8	6	3
Saunders.....	25	20	16	12	8	6
Coalspur.....	28	16	12	8	6	3
Drumheller.....	26	18	14	9	7	3
Big Valley.....	25	18	12	8	6	3
Pembina.....	32	21	16	11	8	3
Tofield.....	26	17	14	10	7	3
Edmonton.....	33	..	12	..	8	3

ing at the tables we learn, however, that some coals have dust with lower ash than the average for the whole bed and some above the average, the figures ranging from 80 to 151.

SLACK AT TIMES IS CLEANEST COAL

In parts of West Virginia the under-cuttings are so clean that they are separately loaded. The impurity in the small sizes of some coal in the United States is so great that they need washing more than the large sizes, but it is not accorded them. Especially is that need great because the ash is often of clay of a low fusing point, and yet the coal is used under forced draft so that this feature is an important factor.

Another unusual table shows what space in a bar screen is equivalent to certain circular perforations. It varies greatly with the various kinds of coal. This information is contained in Table II of this review.

In the storage tests the value of lump is taken as 100, egg at 80 and nut slack at 40. The figures are for relatively small quantities in open storage and, as it is stated, would be less for large quantities stored in sheds, for in that case the coal would be better protected against deterioration. The loss in heat value was not determined. Table III of this review gives the results.

The booklet gives some information on domestic heaters but nothing of much interest. The smithy tests are of great value and may have an important influence on the producers of smithy coal in the United States, for the summary is as follows: "Smithy tests were made on several coals during the year. One of these was found to be very good for the purpose and another quite unsatisfactory, whereas a third could be used for simple work. These results confirm the idea that continued importation of Pennsylvania coal into this province is an absurdity." The amazing mistake, however, is made of placing the Georges Creek field of Mary-

Table III—Comparative Disintegration Losses of Domestic Coals of Alberta in Storage

Normal Moisture Content in Coal as Mined, per Cent	Comparative Disintegration Loss, One Year's Open Storage, per Cent
5 to 10	1 to 5
10 to 20	5 to 15
20 to 30	15 to 30

land in Pennsylvania. This has been corrected in Table IV of this report.

The report also gives some details of briquetting tests on a plunger machine of small capacity. It makes only twenty-five briquets per minute, usually weighing 4 oz. Thus the machine would make only about a ton and a half of briquets in an 8-hr. shift. For economical work it would seem that a larger machine and possibly one of a different type would have to be used. The conclusions are as follows:

(1) The quantity of binder required varies with the type of coal. Thus, a carbonized lignite requires from two to three times as much binder as a coking bituminous coal.

(2) The higher the temperature, the less time required for mixing, and prolonged mixing is harmful, especially if accompanied by abrasion of the particles.

(3) Although blowing steam through the mix has certain advantages, and is almost universally adopted in commercial work, a better briquet generally can be made under laboratory conditions without steam.

(4) Increase of temperature at the press increases the density of the briquet, but a limit is placed upon the temperature by the increasing tendency to stick to the plunger and by the friability of a hot briquet as it leaves the press. The tendency to stick to the plunger can be reduced by steam.

(5) Increase of pressure naturally increases the density of the product, but a large increase in pressure is required for a small increase of density.

(6) The effect of the size of particles in the crushed coal used on the quality of the briquet made is probably far less with a coking bituminous coal than it is with either anthracite or carbonized lignite. If the particles are too large, or the larger particles are present in too great a preponderance, the

Table IV—Results of Smithy Tests in Alberta

Test	Time Required for Test	Yield Point of Test	Failure Point of Test	Failure of Piece Weld
	min.	lb. per sq.in.	lb. per sq.in.	
<i>Lap Weld, iron:</i>				
McGillivray Creek	15	31,200	45,500	None
Greenhill.....	21	36,800	48,800	None
Saunders Creek.....	24	32,200	44,350	Partial
Big Valley.....	31	31,480	45,820	None
Georges Creek (1).	22	31,780	40,000	None
Georges Creek (2).	18	32,500	45,400	None
Unwelded bar.....		29,340	46,280	
<i>Butt Weld, iron:</i>				
McGillivray Creek	34		22,910	Yes
Greenhill.....	27	18,300	24,390	Yes
Saunders Creek...	40		17,800	Yes
Big Valley.....	36			
Georges Creek (1).	34	22,310	25,600	Yes
Georges Creek (2).	23	17,000	27,490	None
<i>Lap Weld, steel:</i>				
McGillivray Creek	17			
Greenhill.....	22		103,000	None
Saunders Creek...	13			None
Big Valley.....				
Georges Creek (1).	26		86,000	None
Georges Creek (2).	15		94,100	None
Unwelded bar.....			95,500	

briquet is coarse and friable. Finer crushing gives a smoother and more shiny briquet, but excessive dust increases the quantity of binder required.

The rattler losses with different mixing ratios and different binder is given in Table V of this article. The mixing ratio is the number of parts by weight of binder per 100 parts of coal.

In discussing water in coal a description is given of an air drier that removes the moisture in a current of air having a humidity of 60 per cent. The report gives a map insert which has been reproduced in part for this review with the names of some producing mines added. The report says: "There

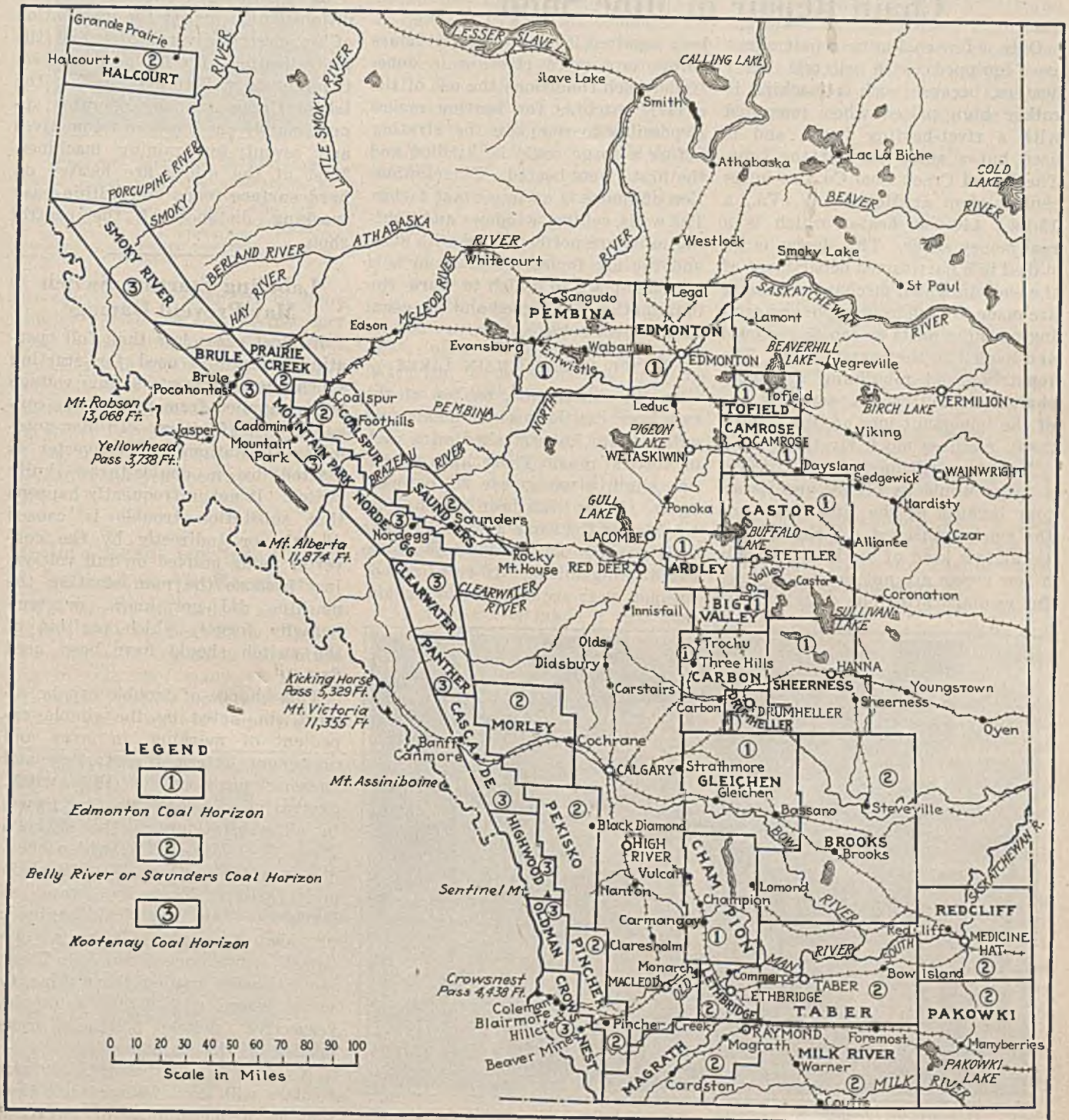
Table V—Comparison of Binders

Mixing Ratio.....	8	7	6	5	4
Binder	—Rattler Loss, Per Cent—				
Soft coal-tar pitch	14.6	18.7	21.6	31.9	100.0
Hard coal-tar pitch	16.4	17.4	28.3	48.4	
Oil asphalt	15.6	22.6	23.6	34.7	
McMurray asphalt	12.1	16.6			

are three coal horizons in Alberta from which coal is mined: namely, Kootenay, Lower Montana, and Upper Montana, all of Cretaceous age. The Lower Montana coal horizon occurs in what is known as the Belly River series throughout the greater part of Alberta, but which, in the foothills north of the North Saskatchewan river, is called the

Saunders formation by the Alberta Geological Survey. The Upper Montana coal horizon occurs in a series of strata widely known as the Edmonton formation.

"It should not be assumed that coals of an older formation are always of higher grade than those of a newer formation. Proximity to the mountains and the consequent pressure to which they have been subjected, have frequently had a greater influence on the character of the coals than the effect of mere age. Thus, the more westerly coals of the Edmonton formation are of distinctly higher grade than the eastern coals of the Belly River formation.

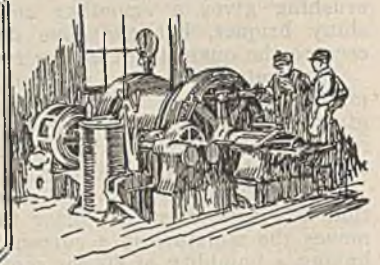


Alberta's Many Coal Fields Showing the Geologic Horizon of Each

In order to correlate the text of the review with the map it may be well to say that the McGillivray Creek mine is located at Canmore, the Greenhill mine at Blairmore, the Blue Diamond mine at Brule, the Pembina mine at Evansburg, the Dobell mine at Tofield and the Saunders Creek mine at Saunders.



Practical Pointers For Electrical And Mechanical Men



Electric Rivet Heater Speeds Up Chain Repair in Mine Shop

Only a few coal-mine repair shops are equipped with electric rivet heaters, because such a machine is rather high priced when compared with a rivet-heating forge, and is used but a small part of the time. The Island Creek Coal Co. has in its central shop at Holden, W. Va., a 15-kw., 440-volt heater which is a real money saver. This device is installed in a partitioned department of the shop in which mechanical repairs are made to such locomotive and mining-machine parts as can be removed and hauled to the central shop. The repairing and rebuilding of cutter chains and cutterbars, which is one of the important jobs of this department, requires much riveting.

In this particular case the use of a forge would be highly unsatisfactory because of the time delay and the smoke nuisance. A characteristic of this kind of work is that only a few rivets are put in at one time; for example after one cutterbar has

been repaired it may be several hours before any more riveting is done. Under such conditions the use of the electric machine for heating makes it possible to complete the riveting before a forge could be kindled and the first rivets heated. The elimination of smoke is an important factor. The walls, ceiling, windows and lighting units are not begrimed with soot, and the air fouled. The room is a pleasant place in which to work, the illumination being good and the usual dingy effect being absent.

MATCH CUTTER-CHAIN LINKS

In the illustration, on top of the two kegs are seen a number of cutter-chain links stacked on a rack of vertical pins. These links, which are slightly worn, are to be used again. They have been matched up in pairs of the same amount of wear and stacked on the pins so as to avoid being mixed. If two links of unequal wear are matched in a chain,

the shorter link takes all the strain and is likely to break in a short time.

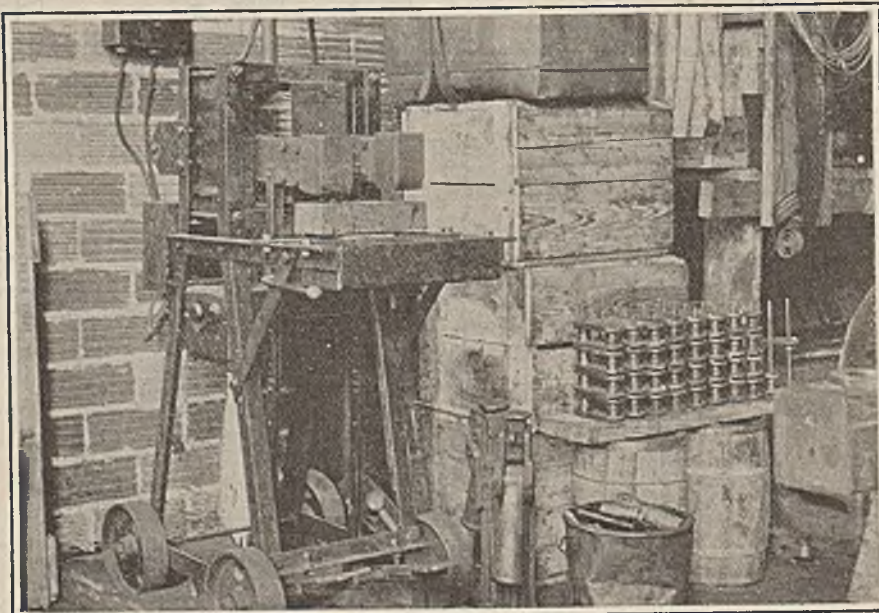
As to the size of company and conditions which justify the installation of an electric rivet heater and the centralization of work as described, it might be well to explain that the Island Creek company operates approximately one hundred locomotives and seventy-five mining machines. Most of the mines are located on hard surface roads and within easy trucking distance of the central shop.

Labeling Starting Switch May Prevent Damage

In most cases less than full operating voltage is used for starting synchronous converters, this voltage being supplied from taps on the converter transformers. In non-automatic substations the converter is started by a double-throw knife switch. It not unfrequently happens that substation trouble is caused directly or indirectly by the converter being started on full voltage, just because the man starting the machine did not know, or temporarily forgot, which position of the switch should have been used first.

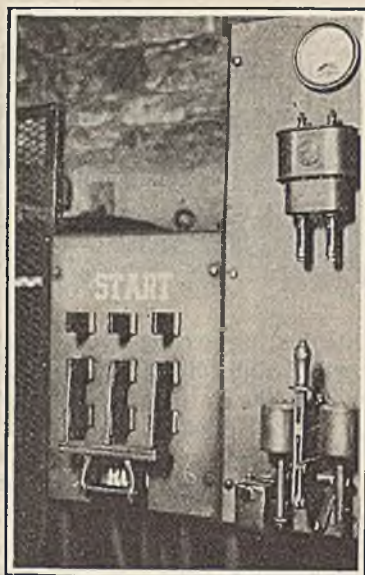
This chance of trouble can be almost eliminated by the simple expedient of marking, in large and prominent letters, the starting and running positions of the switch. Several years ago the starting panels in all substations of the Elkhorn Piney Coal Mining Co., which operates mines in southern West Virginia and eastern Kentucky, were so marked. The electrical engineer provided two paper stencils, one "start" and one "run." These stencils were mailed from mine to mine, where with white paint the respective switch positions were labeled on the slate panels.

No doubt our more ingenious readers will say: "Why didn't they put on a mechanical or electrical interlock which would positively prevent throwing the switch into the wrong position?" That leads one



Rivets Heated in a Few Seconds

This 15-kw. rivet heater is used principally for repair work on mining-machine cutterbars and cutter chains. Time is saved and smoke avoided. To the right is a supply of slightly worn cutter-chain links which have been mated in pairs of the same dimensions and stacked on a rack of vertical pins ready for use in repairing the next cutter chain.



Prevents Mistakes in Starting

Few power-converting substations have regular attendants and in consequence they are often started by men who are not always sure which is the correct method of performing the operation. Prominent marking of the switch positions leaves little excuse for mistakes.

directly to the desirability of using similar devices to compel the operator to manipulate the field switch, brush-raising mechanism, etc., properly, all of which points to the advantage of full-automatic substation equipment, even though located where it can be conveniently attended by a man employed nearby for other duty.

Boilers, Ready for Scrap Heap, Utilized as Air Receivers

The use of old boilers as air receivers is by no means new. In fact the anthracite region is now utilizing in this way many of the old cylindrical flueless boilers that only a few years ago it employed for

steam generation. The flues of the ordinary horizontal multitubular boiler in a measure unfit it for use in this way as such flues not only greatly decreased the capacity of the cylindrical shell but also largely increase the liability of leakage.

It is rather uncommon to see the drum of a Babcock & Wilcox type of boiler used for this purpose. The accompanying illustration shows the drum of such a boiler being fitted for use as an air receiver at the shops of the United States Coal & Coke Co., at Gary, W. Va. This company recently installed two big steam generating units fired with powdered coal. To make room for the new boilers several old Aultman-Taylor, stoker-fired units were torn out and scrapped. This made the old drums available for any purpose for which they could be advantageously utilized.

In order to convert these old drums into air receivers it became necessary to cut off the water leg, or connection into which the header nipples were expanded, and rivet a plain plate or patch in its place. With the proper tools this is by no means a difficult undertaking. In this instance the water legs were first cut off, a plate, cut to the proper size to cover the opening, rolled to fit the outside diameter of the boiler shell bolted in place and the rivet holes drilled to match those in the shell. The accompanying illustration shows the shell while this work was being done upon it.

An air receiver made in this manner not only serves as well as one made expressly for this purpose but puts to use material that otherwise would be consigned to the scrap heap. This is true economy.



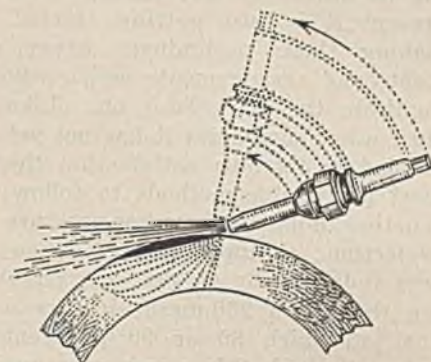
Converting a Salvaged Boiler Drum Into an Air Receiver

One patch already has been riveted over that part of the drum to which the water leg formerly was attached. The repairmen are riveting on a similar patch where the other water leg was cut off the boiler drum.

Preheating Metal Helps When Cutting Cast Iron

A large company which was removing structural steel work supported by cast-iron columns, cut away the steel without difficulty but found the removal of the cast-iron columns which were 9 in. in diameter with walls 1 1/4 in. thick, a job less easily accomplished, due apparently to the incorrect method in which the operative handled his blowpipe.

Nine columns were to be cut and the operator had worked two hours and used two cylinders of oxygen before the first column toppled over. Inexperienced operators, when cutting cast iron, often lose the neces-



Makes Cutting Easier

By preheating in advance of the cutting operation much less oxygen is required than by other methods. A slow movement of the tip makes the work much easier.

sary heat for cutting because they fail to preheat the starting point to a sufficient temperature before turning on the cutting oxygen.

An experienced operative showed the company's men how these columns should be cut making a demonstration of the correct method on the second column. He started with the blowpipe head tangential to the column circumference and heated a good sized spot to the melting point; then he quickly opened the cutting valve and as the cut progressed around the circumference he gradually raised the blowpipe head until the tip was nearly perpendicular to the surface. At the same time he swung the blowpipe back and forth slightly, much as he would move a welding blowpipe in making a ripple weld. By moving it in this manner and not attempting to progress too rapidly it is possible to keep the region just ahead of the flame at sufficient temperature that the cutting oxygen will kindle and burn the iron instead of merely cooling it. This column was cut in a half hour and with less than half a cylinder.

Oxy-Acetylene Tips.



Problems In Underground Management



Vesta Coal Co. Sees Advantages in High-Pressure Rock Dusting

The Vesta Coal Co., subsidiary of the Jones & Laughlin Steel Co., has drawn up a program for rock dusting its mines at California, Pa. At present it is just getting started, making those preliminary experiments and arrangements which will facilitate the work later on. Like most other companies it has not yet decided to its own satisfaction the most practicable methods to follow. Whether to use high- or low-pressure projection; to apply dust of a fineness indicated by 60 per cent passing through a 200-mesh sieve or a dust of which 80 or 90 per cent passes through this screen opening; to make wide application of dust troughs, shelves, etc., or to depend upon the dust distributed on the coal, roof and bottom, are a few of the problems this company is considering.

SURFACES EASILY COVERED

It is disposed to lean toward high-pressure dusting because of the ease with which surfaces of pot holes and long stretches of high roof are covered. A few of the mine officials object to that type of dusting because with it the particles of dust rebound and settle on the floor. Joseph Edwards, general superintendent of the company, declares that this is an advantage, at least in the first application. The discharge acts somewhat like a sand blast, removing whatever coal dust rests on and in irregularities in the ribs and roof. In subsequent dustings this difficulty might be overcome in three ways: (1) By the exercise of greater skill in pointing the projected stream of dust. This the operatives may be reasonably expected to acquire as they gain experience. (2) By using a finer dust, as indeed the company plans to do. (3) By using only a reasonably high pressure finally but applying the first coat of dust under heavy pressure. By reasonably high

pressure is inferred say 15 to 25 lb. per sq.in.; by heavy pressure is meant 60 to 70 lb. per sq.in.

Several of the mines of this company are joined together underground. Only where connecting entries cross the boundary lines of adjoining mines will the company resort to the use of rock-dust barriers. It prefers to rely on the more positive protection of dust distributed over every practicable square foot of underground surface.

Experiments are now being made with a cement projecting machine in which any degree of pressure, from low to high, can be obtained in dusting haulage entries. On one day four men in four hours, actual working time, succeeded in applying 16,000 lb. or about 200 sacks of dust along 3,000 lin.ft. of entry. The equipment consisted of the machine, a mine car loaded with sacks of dust, a compressor and a locomotive. These were coupled out by the order given. One man managed the hopper and compressor, one charged the hopper with sacks of dust, which were carried from the car, the third man drove the locomotive and the fourth man handled the hose. The hose works quite satisfactorily without any nozzle. However, the company is experimenting with a nozzle that has been made in its shops.

It is conceded by Mr. Edwards that too much dust, 5.3 lb. per lin.ft., was applied in the 3,000-ft. stretch. Since then the men have learned how to judge the quantity being applied. Peripheral channel samples were taken after dusting and their analyses indicate an average incombustible content of nearly 80 per cent. The roadways were cleaned up prior to the dusting operation. Samples before dusting were not taken.

Although the dust must be transferred sack by sack from the storage car to the feed hopper, the capacity

of this dusting arrangement is satisfactorily high, judging from the work and the rate at which it was done. The dust loader's job is fatiguing; but with the four men handling the four respective duties turn about, which arrangement might be made with an experienced crew, a day's work for each man need not be excessively tiresome.

Even if the company decides not to use this equipment for its haulage roads it will certainly use it with about 150 ft. of hose to dust the back entries and other out-of-the-way places that are not provided with tracks. Each stopping will be punched to accommodate a pipe through which the hose will be handled from the machine on the haulage ways to the return entries. With high pressures short lengths of hose have never clogged, and it is not anticipated that any trouble will result when a greater length is used. The dust will clog in damp air; but dusting is most needed when a mine is dry and when the water content of the air, consequently, is low. If need be, a small air dryer could be added to the equipment.

DETAILS OF SIMPLE AIR DRYER

An air dryer could be made similar in every detail to the simple gas-scrubbing receptacle used in gas plants. A short length of light 10-in. pipe could be stopped at the intake end by a perforated head and on the outlet end by an airtight head fitted with a coupling for a hose or pipe leading to the compressor. Inside this receptacle could be placed a bed of coke through which the air would be drawn. This would separate the water from the air, the former dropping to the bottom of the pipe and being drained at intervals by a petcock. Of course the pipe would have to be sloped slightly to cause the water scrubbed from the air to accumulate directly over the cock. The transportation of rock dust under high pressures for long distances through pipe or hose possibly may require a device of this sort.



Production And the Market



Bituminous Coal Market Shows General Weakness; Production Still High

The gradual tendency to softness that had been in evidence for two weeks in the bituminous coal market developed last week to such a marked weakness that there was an almost general sag throughout the trade. Light demand in the Middle West caused a general decline in prices in that section. "No bills" were in evidence in all sizes, running time fell off and talk of shutdowns increased. Trade in the Northwest, however, holds steady and dock interests express confidence in being able to clean up before the opening of lake navigation. More moderate weather has taken the edge off the sharp demand in the Southwest, prices remaining at the old levels, however. Business picked up a little in the Kentucky fields, which has helped running time, but prices have not undergone any change. Severe weather has had little effect on the West Virginia fields, overproduction of both smokeless and high-volatile coals serving to hold down prices.

Conditions continue in a muddled state in Ohio, high-volatile coals showing queer spreads in price as the result of keen competition. Some distress stock, in fact, is reported to have sold for 25c. per ton. Domestic trade, however, has felt the stimulus of more cold weather. More mines have closed in the eastern Ohio field and still more are likely to follow suit unless demand improves. While operation in the Pittsburgh district has improved slightly the pickup has not come up to expectations.

Accumulations Flatten New England Market

New England trade is hopeful despite the fact that prices have sagged again from the pressure of accumulated coal at Hampton Roads. Some factors have found it necessary to shop around to move the stocks that have piled up. New York and Philadelphia markets experienced a slight pickup, but the improvement

was scarcely as great as the visitation of stiff weather had led many to expect. The Baltimore trade continues to hope for the best, but feels bitterly disappointed at the failure to realize the rosy predictions unloosed at election time. At Birmingham there is a gradual but steady improvement in demand, the market showing increasing firmness with a slight advance in prices.

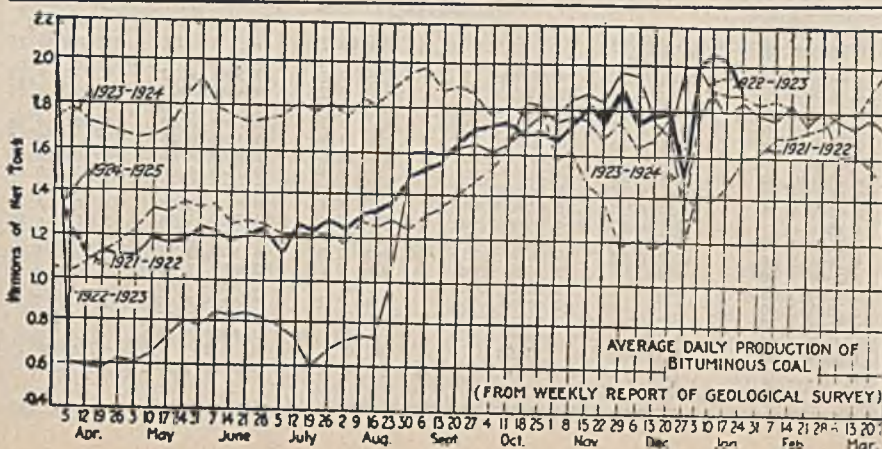
Activity is not as marked as usual at this time of the year in the anthracite market. Since the settlement of the Pittston strike interest in hard coal has lost some of its keenness. Egg continues to show signs of regaining strength though chestnut is still far in the lead and gaining in demand. Stove is slipping slightly. Steam sizes still show notable strength as a result of the strike. Independent coals require some urging to move, though prices are being maintained.

Price Index Slumps

Coal Age Index of spot prices of bituminous coal receded sharply during the last week, standing on Feb. 2 at 169, the corresponding price for which is \$2.05, compared with 173 and \$2.09 respectively on Jan. 26.

Activity at Hampton Roads last week held pretty close to the level of the previous week, dumpings of coal for all accounts during the period ended Jan. 29 totaling 390,205 net tons, compared with 399,740 tons handled during the week ended Jan. 22.

Production of bituminous coal during the week ended Jan. 24, according to the Geological Survey, was marked by a sharp decline. The total output is estimated at 11,387,000 net tons, a decrease of 641,000 tons from that of the week ended Jan. 17, when 12,028,000 net tons was produced, according to revised figures. Anthracite output during the week ended Jan. 24 was 1,740,000 net tons, compared with 1,803,000 tons in the previous week.



Estimates of Production

(Net Tons)		
BITUMINOUS		
	1924	1925
Jan. 10.....	12,337,000	12,593,000
Jan. 17 (a).....	11,992,000	12,028,000
Jan. 24 (b).....	11,951,000	11,387,000
Daily average.....	1,992,000	1,898,000
Coal yr. to date.....	462,336,000	383,041,000
Daily av. to date....	1,849,000	1,528,000
ANTHRACITE		
Jan. 10.....	1,840,000	1,785,000
Jan. 17.....	1,884,000	1,803,000
Jan. 24.....	1,782,000	1,740,000
Coal yr. to date.....	74,509,000	72,244,000
COKE		
Jan. 17 (a).....	261,000	262,000
Jan. 24 (b).....	263,000	265,000
Cal. yr. to date (c)...	899,000	920,000

(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 Trade Sags

General weakness prevailed throughout the Midwest markets during the week. Light demand from all sources reduced going prices on practically all coals from everywhere. Southern Illinois association shippers could not get the circular on much of their large lump and egg with independents undercutting them by a good 50c. and in some cases 75c. So Franklin County lump moved at \$3.50 instead of \$3.75. Other sizes from that field slumped too. Central Illinois suffered in most territories, not even holding a good steam market in the nearby Chicago market. This was partly because of heavy tonnages of distress Eastern coal in Chicago and partly because of a general let-down in demand. Indiana coals of all sizes followed the Illinois downward trend. Smokeless lump and egg sank below \$4 and mine run hardly could attain \$1.75.

All Midwest producing fields were burdened with "no bills" in all sizes. Running time was somewhat reduced and the talk of shutdowns increased. Railroad tonnage held up fairly well in most sections, however. Rail service, of course, is excellent.

In St. Louis fairly reasonable weather prevails and dealers are moving some coal, but not in the volume that has moved in the past during January. This is largely accounted for by the use of oil. Little effort is made by St. Louis re-

tailers to compete with oil or gas in spite of the strong price argument the coal man can now make. Country domestic is fairly active. Domestic everywhere is mosly for the middle grade and cheaper coals. Much retailer resentment continues because prices of southern Illinois high-grade coals are felt to be too high even now, and in many sections Kentucky and Alabama coal is coming in fast. Country steam has slowed up and local carload is easy. Wagonload trade continues good. There have been no important changes in prices.

Cold Helps in Kentucky

At Louisville demand for coal improved a little during the last week of January, as a result of below zero temperatures on Jan. 28 and a 5 1/2-in. snowfall, the heaviest since 1921. The touch of severe weather has started a better domestic demand, somewhat better steam demand, and is resulting in both retailers and steam consumers placing a little more business. Mines while producing well haven't much unsold stock on track, resulting in running time being better than it was. Gas-coal buying has been fair as a whole, both from gas plants and byproduct plants.

Prices may stiffen up within a few days if the weather remains bad, but there has been no advance reported so far, as mines need business too badly for that. Screenings

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

Table with columns for Market Quoted, Feb. 4, 1924, Jan. 19, 1925, Jan. 26, 1925, Feb. 2, 1925. Rows include Low-Volatile, Eastern (Smokeless lump, Clearfield mine run, etc.) and High-Volatile, Eastern (Pool 54-64, Pittsburgh gas mine run, etc.).

South and Southwest

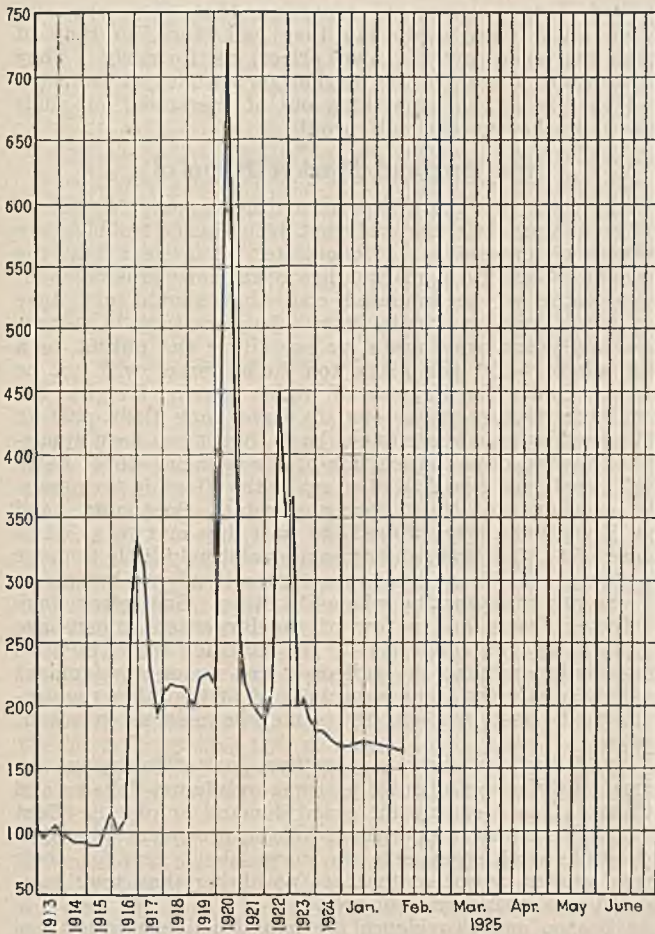
Table with columns for Market Quoted, Feb. 4, 1924, Jan. 19, 1925, Jan. 26, 1925, Feb. 2, 1925. Rows include Big Seam lump, Big Seam mine run, S. E. Ky. block, etc.

*Gross tons, f.o.b. vessel, Hampton Roads. †Advances over previous week shown in heavy type; declines in italics. ‡The term block is used instead of lump in order to conform to local practice, but the same coal is being quoted as heretofore.

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

Table with columns for Market Quoted, Freight Rates, Feb. 4, 1924, Jan. 26, 1925, Feb. 2, 1925. Rows include Broken, Egg, Stove, Chestnut, Pea, Buckwheat No. 1, Rice, Barley, Birdseye.

* 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	1925			1924
	Feb. 2	Jan. 26	Jan. 19	Feb. 4
Weighted average price.....	\$2.05	\$2.09	\$2.11	\$2.26

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.

have been in rather heavy production, and prices have been weaker, some eastern Kentucky screenings having been reported sold as low as 55c. on a direct order of fifty cars, but best prices reported to the trade through jobbing circles appear at around 75c., with just a little business as low as 65c. Western Kentucky screenings are 90c. @ \$1.15, while \$1 is the top for eastern Kentucky Hazard and Elkhorn, a few small lots of Harlan gas screenings being reported to have sold up to \$1.10.

Good block coal is selling at right around \$2.50 a ton, some western Kentucky being priced at \$2.40 and up to \$2.75, while some eastern Kentucky coal is \$2.25 and as high as \$3. Lump sizes are \$2.25 @ \$2.50 in both fields, and egg, \$2.25 @ \$2.50 for western and \$1.75 @ \$2.25 for eastern. Nut is \$1.75 @ \$2.10; mine run, \$1.25 @ \$1.50.

The cold weather of last week in West Virginia was not of sufficiently sustained duration to cause any advance in the price of high-volatile prepared. About all it did was to check for the time being the softening of prices, but without permitting of any recovery. There still is a marked overproduction as to all grades.

Further gains have been scored in the output of the smokeless area of West Virginia, which now amounts to about 1,000,000 tons a week. Large production here too is having its effect on prices, which have dropped about 25c. a ton although a few days of cold weather tended to stiffen lump and egg a little.

There was not as much increase in demand in the Upper Potomac and western Maryland fields in January as had been generally anticipated but despite the fact there was a sharp increase in the tonnage originating in the fields mentioned during the month. Toward the close there was

a little better line of inquiry but business does not appear to be developing very rapidly.

In Virginia territory production is high and the district is in excellent condition financially. Contract business, however, is the big factor in Virginia although sufficient spot business has been obtained by companies in the district to enable them to speed up output to over 80 per cent of potential capacity.

Northwest Trade Is Steady

Docks at Duluth now have every expectation of cleaning up on their coal by the opening of navigation. Two docks have openly come out with such a statement, one saying that all soft will be cleared easily and the other is as hopeful for anthracite as well.

Whatever the situation may be in the spring it is certain now that coal is moving readily, and if the market is anywhere nearly as good as it promises at present things will be rosy at the opening of navigation.

Buying at present is more diversified than it has been for months. Soft coal is in demand in iron mines, homes, industrial plants and commercial buildings, and even anthracite is moving at a fast rate. Prices are unchanged in both hard and soft coal. A jump may be expected within thirty day, however. Screenings, while a drug on the market several weeks ago, are now practically gone.

Railroads are taking more coal, and the advent of the Chicago, Milwaukee & St. Paul into local territory has made one more customer for the local docks.

The cold weather, which left a week ago, is back again in force, and there seems to be little promise of an early spring. This winter is classed as one of the most severe on record so far.

With January past and the winter about half over Milwaukee feels that it has been better than the average winter for the coal dealers. The local demand for fuel has been good, and the demand from outside consumers notably active; not only because the temperature has been far lower on the average than on the shore of Lake Michigan but because the industries are beginning to need more fuel.

At the Twin Cities the "old-fashioned winter" has not lived up to the press-agented promises. Business has been fair, but there was no mad rush of orders or tempestuous insistence for immediate deliveries. Just now demand holds moderately steady. Prices have been well maintained in general. The dock prices have been steady, with \$5.25 for Hocking and \$5.75 for Youghiogheny. Southern Illinois lump is \$3.50; central Illinois, \$3, and western Kentucky, \$2.50.

Western Domestic Is Strong

The demand for coal in the Southwest, which had begun to weaken under mild weather, was revived by the return of zero temperature in the last week in January. Operators still are behind on orders for Kansas coal. Some are as much as two weeks behind on deliveries on lump while the average is a week. A similar situation exists in Oklahoma and Missouri, while in Arkansas, from which field there is little demand for domestic sizes, screenings are scarce at \$2. No prices have changed from last week.

In Colorado owing to moderation in weather conditions, a slackening up of the demand was noticed, particularly in steam coal. Orders for lump coal are being booked for February delivery and the demand is exceptional. Some difficulty is experienced with nut and pea coal, however. Operation of the mines for last week dropped from 85 down to 80 per cent. There are no changes in prices. There have been no interruptions in transportation and a surplus of labor exists.

In Utah the coal market is described as soft, due to weather conditions. There is an overproduction of intermediate sizes. The demand is for lump, slack being easy. Prices continue steady and the labor and car situations are good.

Mixup Continues at Cincinnati

More odd angles are to be found in the Cincinnati coal market this week than for many a day past. February circulars on smokeless show the same old solidarity of front with lump and egg quoted at \$4, run of mine at \$2 and the only doubt expressed as to what might be had for screenings. The high-volatile market is nervous, with some slack selling as high as \$1 and some, in big tonnage lots to the trade, down to 60c., while demurrage stuff is a drug

of the worst kind. Some of this, in distress, sold last week at 25c. a ton.

Hazard and southeastern Kentucky shippers have not changed front, still wanting \$2.75-\$3 for block, and only a few have a \$2.50 price. There are rumors of sales around \$2.25, but usually these are hard to pin down. On the other hand one Logan County (W. Va.) firm that has had a \$2 price since last September has not budged from its position and another company in that area is said to be out with a \$1.85 price for 4-in. lump wherever a \$2 price is being made. There are Kanawha operators, however, who make a \$2.50-\$2.75 price for their coals and stick to it.

Retail business was helped by the zero weather and heavy snows, though a small lot movement from now on is likely to be in order. Prices are unchanged.

Colder weather has stimulated domestic trade at Columbus, although the volume is not yet high. Zero temperatures have caused dealers to place larger orders for immediate shipments, as retail stocks as a rule are not very heavy. Consumers are placing better orders, mostly for Pocahontas, splints and Kentucky block. Some Ohio mined coal is being bought, but this goes largely to the rural sections. Retail prices range at the same levels which have prevailed for several weeks. There is considerable demurrage coal on the market, but this is being sold at better prices than prevailed for several weeks.

The steam trade is showing no signs of revival, though utilities are coming into the market better and a fair tonnage is being shipped to electric light and power plants. Iron and steel plants are using about normal tonnage while railroad requisitions are good. There is only a small amount of distress steam grades on the market and consequently prices are fairly well maintained. Hocking screenings are holding firm while West Virginia screenings, particularly from the Kanawha field, are weak.

Production is not improving to any extent in the southern Ohio field. The output is about 20 per cent of capacity. In other Ohio fields the output is about 41 per cent of capacity with prospects of a better run later on when iron and steel plants resume to a larger extent.

Operations in the eastern Ohio No. 8 field are running about 100,000 tons per week less than at this time a year ago, and additional mines have been closed during the past two weeks due to lack of orders. From present indications, it will not be surprising if additional mines find it necessary to close, due to slow demand.

Zero weather during the early part of the current week gave some stimulus to orders and inquiries, but demand has been so sluggish that spot prices have softened on the two grades of coal which were more in demand than all others; namely, slack and nut-and-slack, which have experienced a reaction, and spot prices thereon softened 5c. to 10c. per ton.

Trend at Pittsburgh Disappoints

Operations in the Pittsburgh district have been better in January than in December, but they are not up to the level of October. There is no upward trend in production at the present time and there is likely to be a little decrease. Report has it that there is considerable loaded coal on track, chiefly lump. There has been little loading of steam mine-run for a long time. Steam slack is off about 5c. at \$1.25@\$1.35. Gas slack is unchanged at \$1.40@\$1.50. Mine-run and lump are not quotably changed but seem to be a trifle softer. The general outlook for coal has grown poorer, and industrial conditions are not developing as well as expected. Railroad contracting for coal has been disappointing.

At Buffalo the bituminous market is quiet, with not much prospect of picking up right away. The trade seems well

supplied, large consumers reporting that they are still offered much more coal than they can store, so they of course are making their own prices, as formerly. They will continue to control the market for awhile yet, at least. The jobber is getting something out of the trade, but finds little in it that he can call profit.

New England Market Hopeful

While there is a more hopeful attitude among New England coal men it is realized that bituminous troubles are likely to be present for a long time. It is clear that the Hampton Roads f.o.b. market has once more broken under the pressure of accumulated coal that should not have been mined, and once more it will be necessary to retrace steps and start over again by curtailing the output to a point where \$4.50 per gross ton f.o.b. vessel will not be shaded. Under the impetus of higher marine freights the bituminous factors here seem to have done their part in holding prices on a less ruinous basis, but it has been apparent for several days that certain of the agencies were "shopping" to sell coal that had piled up at the Virginia terminals.

In consequence, No. 1 Navy standard Pocahontas and New River have been offered the past day or two at \$4.25 instead of \$4.40@\$4.50, and although relatively little tonnage has changed hands at the lower figure it affects buyers at this end and weakens the whole structure. Smokeless slack is offering freely and a few of the larger consumers are buying in sparing quantities. On contract there is little doing, and now that the railroads are under engagement for their supply the trade expects most of the other requirements to be met in about the same channels as in recent seasons.

All-rail business shows no further sign of improvement. Prices continue on about the same minimum levels, and nothing is heard of any increased demand or of any effort to put more mines in operation. Those producers who have high-grade coal seem able to move about half of their normal output on prices that are no higher than they commanded last spring and summer.

At Boston and Providence for inland delivery prices are reasonably firm at \$5.65@\$5.75 per gross ton on cars. The Boston retail market, however, shows no turn for the better.

Only Nominal Pick-Up at New York

Severe weather and heavy snowstorms failed to arouse interest in the bituminous coal situation to the degree expected at New York last week. Business did pick up a little but it was hardly noticeable. Producers filled standing orders at the low prices but new orders were entered at prices nearer the maximum quotations. More mines which have been closed for some time are about to reopen but it is with the understanding that the 1917 wage scale will prevail.

Consumers are not inclined to buy heavily now. They do not believe there will be any labor trouble in the soft coal fields this year, and with the non-union mines and other producers paying the 1917 wage scale look for low priced coal all year. Buyers are gradually ignoring pool numbers in making purchases and many operators are quoting prices on individual coals. The number of concerns going back to the use of coal is being added to almost daily.

The tidewater market is steady. Arrivals are mostly on consignment and there is comparatively little coal on the free list.

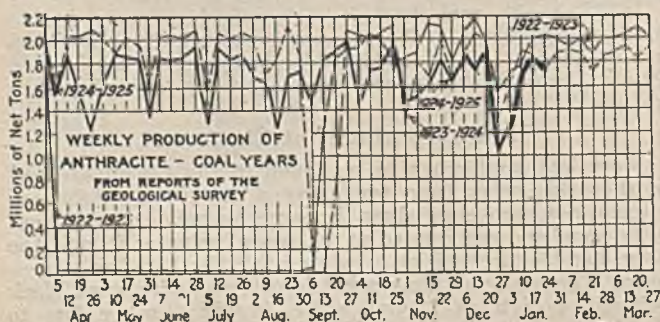
There has been no particular change in the Philadelphia market during the week, but it has not lost ground, for with all the good reports of the steel trade those interested in coal are still cheerful. More coal moved last month and is moving than at any time for a year.

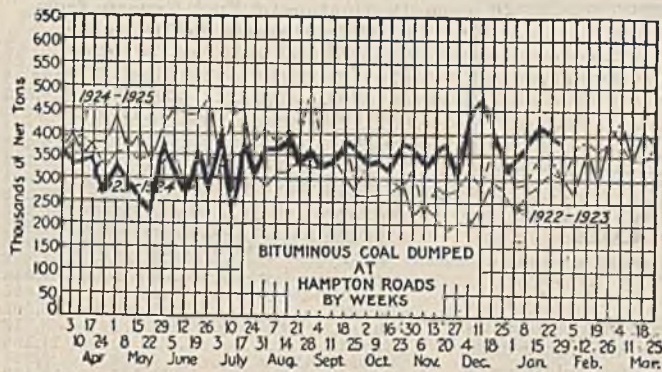
Many producers are booking contract trade, as the consumer is convinced that the lowest prices for spot coal were reached weeks ago, and are not likely to return for some time to come.

The gas coal market also is showing signs of strength and on the line of the B. & O. road the officials report that their shipments are running about 80 per cent of normal. Slack, however, continues very scarce and the price of it remains quite close to the poorer grades of mine-run coal.

Nothing is transpiring at tide to encourage shippers. There is a fair share of bunker trade, but the export business is barely noticeable.

Prediction of a business boom that followed the sharp stock market advances after the election of President





Coolidge has so far failed of materialization as far as the Baltimore coal trade is concerned. Certain lines of industry have shown signs of awakening, however, and for several weeks past there has been a feeling of optimism among business men generally as it is realized that the real effects of business advancement may not be felt by the coal men until existing stocks are further depleted and coal needs for an increasing business have to be met. There is a liberal supply of coal in Baltimore, despite extremely cold weather and heavy snows.

Prices have not changed materially and there is no present indication of an upward trend in this direction. A condition of the fuel market which local traders do not seem to understand has to do with the recent drop in coke prices, the quotations being 50c. or more below those of a couple of weeks ago. The export situation has gone absolutely flat, the month of January showing but three shipments totaling 7,000 tons.

Steam buying continues to pick up at Birmingham and the market is assuming a firmer and more satisfactory position. Prices on some grades have increased slightly, quotations all along the line firming up. Cement plants, cotton and oil mills are among the largest buyers, while general industrial expansion is creating a heavier demand. Several rail lines in the district are taking better tonnage on contracts. Reports indicate a more favorable condition in the bunker trade than for some time past, all the principal shippers having moved more coal than usual to Southern ports for bunkering purposes. A large utility which has been using fuel oil for some years is now advertising for bids on coal for comparative purposes, and probably will revert to coal when its present contract expires, while other industries at present using oil are considering similar action.

Movement of domestic coal is slow, as unseasonable weather continues, and no improvement is expected short of an extended period of low temperatures. Some yards still have good stocks and those running low are replenishing in proportion to the outgo. A good deal of domestic coal has been sold to steam users and the distress tonnage is not large.

Quotations on Cahaba mine-run now range \$2@2.25; washed, \$2,@2.50; Black Creek, \$2.25@2.50 for mine-run, \$2@2.50 for washed; Pratt mine-run is \$2@2.25 f.o.b. mines. Other grades also are within the range last quoted. No change is reported in domestic prices. Car supply is sufficient as a whole, though certain classes of equipment are not as plentiful as desired.

Anthracite Only Moderately Active

The anthracite market at New York is not as active as usual at this time of year. Producers and sales agents are not having any trouble in disposing of tonnages but there is no rush of orders and retailers are reluctant to refill their bins. It is expected, however, that within the next week or ten days orders will be more plentiful.

Egg coal is regaining some of its former strength, with stove size slipping slightly. Chestnut is picking up in demand and in price. Some of the domestic coals were quoted at the local piers last week at about 25c. below the minimum quotations for rail delivery. The steam sizes have gained strength due to the shortage created by the strike. Buyers have no difficulty, however, in obtaining all the tonnage wanted.

New orders are not numerous and it is not believed that either the retail dealer or the consumer will be apt to buy any more coal in the next two months than will be actually

needed, as there is no desire on the part of either to carry stocks over into the next coal year beginning April 1.

The weather at Philadelphia has been helping coal consumption, but dealers complain that despite a plenitude of orders they have been losing money on account of difficult delivery. As a result one of the leading retailers on Jan. 29 advanced all prices 50c. a ton, making them as follows, per gross ton: Egg, \$15.25; stove, \$16; nut, \$15.75, and pea, \$11.25. A few others followed suit, while more advanced merely 25c. a ton.

Demand from the shippers continues good, but independents find that their coal needs a little urging to move. Prices for February are likely to remain the same as January.

The ending of the big local strike of 11,000 men in the Scranton field on Jan. 24, after being out eight weeks, has at no time had such effect on the local market, except possibly to draw some coal from here at a time when the producers were more than glad to sell it.

Nut continues in strong demand, and company customers are still a little short of this size. All other sizes are in good volume. Steam coals are still slow and the company producers are still compelled to store a portion of their output.

Baltimore retailers are busy with midseason orders for replenishing of householders' stocks. Cold weather has increased consumption, and practically every dealer in town is delivering lots of from one to four tons. Snow has slowed down deliveries also and some dealers are still busy catching up on orders that came into them during the very cold weather. Yard supplies are fairly liberal.

Anthracite trade is pretty good at Buffalo now, the winter being so severe that the fires have to be much heavier than usual. The supply is good and most retailers are raising their hitherto low averages. Much of the buying is only a ton at a time. Natural gas is plentiful and much dependence is placed on it. The competition from coke and so-called smokeless bituminous coal also is greater than it used to be. The demand for coal is growing and promises to be general before long. In Canada the trade has been good all the season. The demand for stove and chestnut keeps up, though the sellers do not pay any more attention to it than they have to. The move to introduce small sizes is still on.

Coke Market Recovering

The spot furnace coke market at Connellsville is gradually recovering from its recent slump in prices, which was caused by a large amount of coke accumulating on track, production having increased too much while there were two or three suspensions of contract shipments and one or two furnaces which had contracted for the quarter did not blow in as expected. There is still some distress coke, but it is not exerting so much pressure on prices and as operators have been decreasing production they expect to have the situation well in hand soon. Some operators are talking of holding their coke for \$4.50 but that is entirely out of line as a prospect. The spot furnace coke market seems to be quotable at the moment at \$3.65@3.85 with chances of its soon working up nearly if not quite to \$4.

In nearly all quarters it is now admitted that the wage advance of Dec. 16, clear up to the Frick scale, was altogether too strong, and that a halfway advance would have been quite sufficient. In the high sulphur district the old rates are being paid, and an occasional operator elsewhere did not advance or did not advance the entire distance. Operators on the high scale are now anxious to reduce wages part way, but is it not as easy to reduce as to advance they intend to go slow on this.

There are no negotiations on second quarter furnace coke. Just now a furnace probably would have to pay \$4.75, and while this is quite different from the original asking prices of \$5.50 and \$6 a few weeks ago it is too high to interest furnacemen, as the pig iron situation has not improved.

Foundry coke continues dull. Spot remains quotable at the general range of \$4.75@5.25, but sales generally are at nearer the lower figure.

Freight Loadings, All Cars and Coal Cars

	Cars Loaded	
	All Cars	Coal Cars
Week ended Jan. 24, 1925.....	924,254	201,229
Previous week	932,150	208,013
Week ended Jan. 26, 1924.....	891,481	204,396

Foreign Market And Export News

British Coal Trade Improves But Is Still Unsatisfactory

There is some improvement in the general state of the Welsh steam coal trade, though it is far from satisfactory, as prices during recent weeks have declined further, and with current contracts on a lower basis than those for last year, revenues are insufficient to meet the higher cost of production.

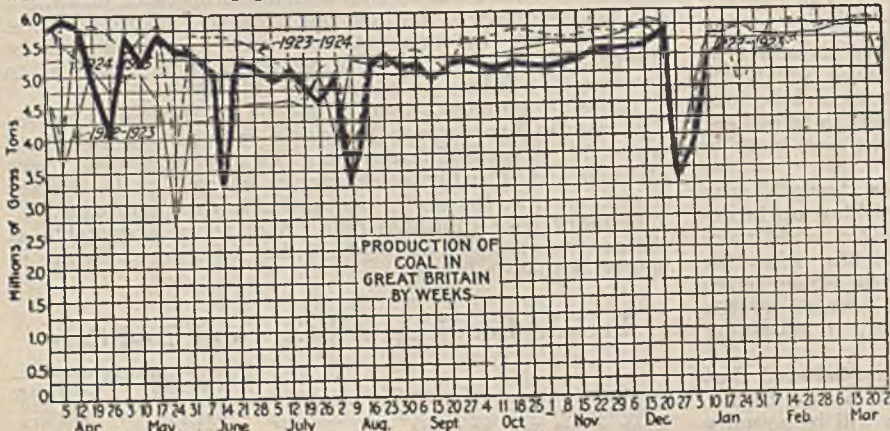
Quietly steady conditions rule in the Newcastle market. There is no great movement of business and the market position shows little change, but in the main the leading collieries are fairly well booked and have plenty of tonnage on hand to load. Business is poor and beyond the day-to-day movement and the contracts on hand there is little available. The Bordeaux Gas Works has contracted through a Paris firm for 7,000 tons of Wear special gas coals for shipment in three cargoes between February and April at 26s. 4d. per ton, c.i.f. A Luxemburg inquiry is circulating for 20,000 tons of patent oven coke for shipment until March.

The total coal shipments from the Tyne ports last year amounted to 18,910,384 tons, as compared with 21,553,964 tons in 1923, a decrease of over 2,500,000 tons. While cargo exports fell off to this extent, bunker coal shipped on board steamers increased from 767,964 tons in 1923 to 1,516,882 tons last year, largely as a result of a reduction in the Tyne dues to pre-war figures on vessels calling for bunkers.

Production by the British collieries in the week ended Jan. 17, a cable to *Coal Age* states, was 5,409,000 tons, according to official reports. This compares with an output of 5,201,000 tons in the preceding week.

Market at Hampton Roads Lags; Prices Still Low

The market at Hampton Roads was dull last week with prices showing a tendency to weaken. Heavy supplies at tidewater have not been offset by sufficient demand to provide the market with stimulus to keep prices strong.



Coastwise movement was slightly off, while bunker trade was only fair, and foreign movement was holding the low level of the past few months. Inquiries for foreign trade, however, serve as an indication that some business from that source might be expected soon. Domestic trade in retail lines was reported as only fair.

French Coal Market Dull and Featureless

The situation of the French coal trade is practically featureless. Output is amply sufficient to meet the demand, but stocks at the collieries are not large. In the new freight schedule the increase in transport charges is much more onerous for short distances than for long ones; from Bethune to Lille, for instance, a distance of 38 kilometers, the rate now is 11.13 f., an increase of 29 per cent on the previous tariff, while the rate from Lens to Paris (218 kilometers) has been raised to 25.56 f., an increase of only 16 per cent.

The National Federation of Miners has just presented claims for an increase in wages. The wage agreement at present in force in the Nord and Pas-de-Calais expires March 31.

Reparation deliveries in December to France consisted of 217,600 tons of coal, 338,100 tons of coke and 37,800 tons of lignite briquets, a total of 595,500 tons, as against 443,200 tons in November. During 1924, France was supplied with 4,291,300 tons of coal, 4,274,300 tons of coke and 520,000 tons of lignite briquets.

Fuel Imports to United States in December

(In Gross Tons)		
Anthracite	33,712	17,141
Bituminous	56,262	33,328
From:		
United Kingdom ..	4,913	5,975
Canada	37,998	18,268
Japan	5,028
Australia	7,754	9,085
Other countries ..	589
Coke	5,324	13,574

Destination of Fuel Exports from United States in December

	1923	1924
Anthracite	328,945	320,845
Bituminous	1,078,028	1,090,486
Exported to:		
France	12,502	12,313
Italy	26,662	97,370
Other Europe	7,442	3,009
Canada	850,469	727,142
Panama	25	19,276
Mexico	10,251	7,027
Br. W. Indies	11,729	14,928
Cuba	71,957	71,858
Other W. Indies ..	24,343	31,933
Argentina	9,540	15,665
Brazil	35,849	49,005
Chile	3,778
Egypt	11,156
French Africa	7,576	9,997
Other countries ..	10,783	16,129
Coke	44,951	51,307

Export Clearances, Week Ended Jan. 29, 1925

FROM HAMPTON ROADS		
		Tons:
For Cuba:		
Nor. Str. Gunnar Helberg, for Havana		3,735
Nor. Str. Krosfond, for Manat.		3,001
Nor. Str. Frenedes, for Puerto Tarafa		1,670
For Venezuela:		
Nor. Str. Fram, for Guanoco		250
For Brazil:		
Ital. Str. Anglo Linar, for Rio de Janeiro		11,859
Br. Str. Wentworth, for Rio de Janeiro		6,646
Jap. Str. Victoria Maru, for Rio de Janeiro		6,898
For British West Indies:		
Jap. Str. Chifuku Maru, for Barbados		6,993
For France:		
Ital. Str. Emanuele Accame, for Dunkirk		11,040
For Dutch Guiana:		
Amer. Schr. Charles Whittemore, for Paramaribo		1,011
FROM BALTIMORE		
For Canada:		
Am. Str. Margaret Dollar, for Vancouver		500

Hampton Roads Pier Situation

	Jan. 22	Jan. 29
N. & W. Piers, Lamberts Pt.:		
Cars on hand	1,665	1,723
Tons on hand	112,808	117,201
Tons dumped for week	122,773	149,463
Tonnage waiting	10,000	10,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,166	1,215
Tons on hand	81,959	85,159
Tons dumped for week	105,017	109,442
Tonnage waiting	26,123	21,492
C. & O. Piers, Newport News:		
Cars on hand	1,812	1,771
Tons on hand	88,225	85,845
Tons dumped for week	129,121	98,493
Tonnage waiting	14,790	9,475

Pier and Bunker Prices, Gross Tons

PIERS			
	Jan. 24	Jan. 31†	
Pool 9, New York	\$4.75@5.00	\$4.75@5.00	
Pool 10, New York	4.50@4.65	4.50@4.65	
Pool 11, New York	4.35@4.55	4.35@4.55	
Pool 9, Philadelphia	4.90@5.25	4.90@5.52	
Pool 10, Philadelphia	4.45@4.70	4.45@4.70	
Pool 11, Philadelphia	4.30@4.50	4.35@4.50	
Pool 1, Hamp. Roads	4.20	4.20	
Pool 2, Hamp. Roads	4.10	4.10	
Pools 5-6-7 Hamp. Rds. ..	4.00	4.00	
BUNKERS			
Pool 9, New York	\$5.00@5.25	\$5.00@5.25	
Pool 10, New York	4.75@4.90	4.75@4.90	
Pool 11, New York	4.60@4.80	4.60@4.80	
Pool 9, Philadelphia	4.90@5.25	4.90@5.25	
Pool 10, Philadelphia	4.75@4.95	4.75@4.95	
Pool 11, Philadelphia	4.50@4.70	4.50@4.70	
Pool 1, Hamp. Roads	4.25	4.30	
Pool 2, Hamp. Roads	4.15	4.15	
Pools 5-6-7 Hamp. Rds. ..	4.00	4.10	

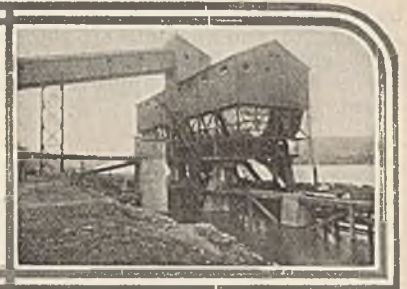
Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to <i>Coal Age</i>		
	Jan. 24	Jan. 31†
Cardiff:		
Admiralty, large	27s. @ 27s. 6d.	27s.
Steam smalls	16s. 6d.	16s. 6d.
Newcastle:		
Best steams	18s. 6d. @ 22s.	18s. 6d.
Best grs.	21s. 6d. @ 22s.	21s. 6d. @ 21s. 9d.
Best Bunkers	18s. @ 19s.	18s. @ 19s.

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



News Items From Field and Trade



ALABAMA

At a meeting soon to be held, industrial leaders of the Birmingham district will inaugurate a movement for the formation of a local charter of the National Safety Council. Carl Smith, from the Chicago offices of the national organization, will outline the work of the Council and assist in the formation of the local unit.

The Alabama By-Products Corporation plans to make extensive changes in its electrical equipment at Banner Mines, changing from a.c. to d.c. power and abandoning its local generating plant, power to be taken from the Alabama Power Co. Banner Mines is one of the largest operations of the company, convicts being employed in the production of coal.

The Hammond-Byrd Iron Co., Birmingham, announces the appointment of E. D. McKinney as manager of the coal sales department. Mr. McKinney formerly was manager of sales and traffic manager for the Alabama Co., which was recently absorbed by the Sloss-Sheffield Steel & Iron Co., and is well known in industrial circles. As sales manager Mr. McKinney will handle the distribution of the entire output of the Alabama By-Product Corporation and Pratt Consolidated Coal Co., recently merged with the former, which have very extensive operations, producing practically every grade of steam and domestic fuel.

COLORADO

The Colorado coal mine inspector's report has just been issued and shows the following increases in tonnage by counties in 1924 over 1923: Routt, 104,136 tons; Weld (lignite fields), 79,177 tons; Boulder (lignite fields), 46,083 tons; Fremont, 85,537 tons, and Huerfano, 33,583 tons. In other words, the Colorado production increased 141,774 tons. The average number of men employed for the year is 12,621; number of days worked per mine, 167.7.

ILLINOIS

The O'Gara Coal Co. has moved its entire accounting department from Chicago to the company's office building at Harrisburg, which gave rise to a report that the whole headquarters of the company had moved.

Although there was a blue cast to the appearance of the year 1924 in many coal quarters, the Bell & Zoller Coal Co., of Chicago, operating the famous big Zeigler No. 1 and Zeigler No. 2 mines in Franklin County, can point to a roseate 1924 record. The out-

put of the two mines was 33 per cent greater than that of 1923, totaling 2,543,000 tons of coal. No. 1 mine produced 1,119,069 tons though it was shut down for repairs part of the summer, and No. 2 mine produced 1,400,620 tons.

The Willis Coal & Mining Co.'s entire output of four mines in Randolph and Perry counties is now sold by the Ebony Coal Co., a sales concern organized by the Willis people and headed by their director of sales, E. L. May. The Ebony Coal Co. has offices in St. Louis and Chicago.

Thomas M. Dougherty, superintendent in charge of operations of the Old Ben Coal Corporation properties at Sesser and Rend City, has resigned and has accepted a similar position with the Black Star Mining Co. at Logan. He will move to the latter place and assume his new duties at once.

Many mines in southern Illinois are to reopen for the balance of the winter, and perhaps longer, on the partnership plan. The miners at these mines have realized finally that their employers can never meet present-day competition with the wage scale where it is and have in various localities signed up with the operators to work for what they can get out of it. In some places the men are even going into the mines and pumping, cleaning up and doing general clean-up work without pay. In order to do this they must first get permission from the union. The amount they will receive after the mine has been started depends upon the profits of the products marketed.

The Missouri Pacific R.R. is starting work on a new shortline road to run from Benton to McLeansboro. The road will handle freight and coal shipments only. The Missouri Pacific runs through the heart of the rich Franklin County fields.

Judge C. B. Thomas, former referee in bankruptcy in East St. Louis, has resigned from seven Illinois receiverships, most of them involving coal companies assigned him by Judge George W. English in the U. S. District Court of eastern Illinois. These resignations followed the introduction of a resolution in Congress by Representative Hawes, of St. Louis, asking for a federal probe into the affairs of Judge English's court. The resolution suggests irregularities. The coal company bankruptcies involved are those of the Southern Gem Coal Corp., the Southern Gen Coal Co., the Egyptian Coal & Mining Co., the Shedd Coal Co., the Chicago Fuel Co. and the Dodds Coal Co., all of which had been operating in Illinois.

The C. B. & Q. R.R., with connections into about sixty mines in the southern Illinois field, had a record-breaking November and December. Of the 719,885 tons handled in November, 244,393 tons was bought for company fuel. The December figures exceeded this by 10 per cent according to an estimate. All records were broken on Dec. 22, when 1,600 cars were moved loaded. In November this road handled 55.2 per cent of the coal loaded at mines where other roads have entry in the entire field.

Over 300 miners have gone to work at the Wasson Coal Co.'s No. 2 mine, at Carrier Mills, which has been idle for several months. This is the second mine to resume after long shutdowns. The Burr mine, at Carterville, with over 200 miners, has reopened also.

The new town of Crawford has been plotted where the new Edgewood cutoff of the Illinois Central R.R. will cross the new extension of the Big Four from Harco to Paulton. At this point the Big Four will connect with the Marion & Eastern. Crawford is on the western edge of Saline County near Williamson County. It has a growing population and the new mine of the Harrisburg Coal Mining Co. is going down fast. There is much activity along the line of the new cut-off through the coal fields in this locality.

The report of the hours worked and the tons hoisted in the Fifth and Ninth Illinois coal districts for 1924 shows that 21,447 fewer hours were worked and 2,252,324 fewer tons hoisted than in 1923. The total hours worked in 1924 were 46,390, as against 67,827 in 1923 and the total tons hoisted in 1924 was 10,570,814 as compared with 12,823,138 in 1923. Ninety per cent of the lost time and tonnage decrease is ascribed to "no market."

C. E. Parker, former secretary of the Chicago Collieries Co. and one of the directors, has resigned both positions to take over the recently purchased holdings of the Taylor-English Coal Co. at Catlin.

INDIANA

Albert C. Dally, 41, a state mine inspector of Indiana, has been named to succeed the late Cairy Littlejohn as chief inspector of the Indiana Department of Mines and Mining. Dally has been an inspector in the department for five years. His home is in Knightsville, near Brazil. He started work as a miner when 13 years old and remained in the same occupation until

he was named inspector. He is undecided as to who appoints his successor, although it is believed he makes the appointment with the approval of the board.

IOWA

The New Market Coal Co., New Market, is sinking a 200-ft. coal mine upon its property adjacent to that town. At 95 ft. rocks resembling sea shell were found and at 105 ft. petrified wood was found. Pullman Bros. are the principal owners of the new mine.

KANSAS

Igniting exhaust from a gasoline engine at the small shaft mine of Octave Toussaint near Pittsburg set fire to the tippie, which was entirely destroyed, causing a loss of \$2,000, on Jan. 22.

The French Coal Co., with headquarters in Pittsburg, capitalized at \$75,000, has applied for a state charter. It will develop a large tract of strip coal land east of Scammon. A shovel outfit will be moved from Montrose, Mo., to this location and it is expected to have the mine in operation by May 1. A. H. French, one of the principal stockholders, will be the active manager. Other men interested in the project are J. J. and R. G. Nesch, owners of the Pittsburg Paving Brick Co.

Mayer Coal Co. mine No. 7 near Weir, has been leased to Arthur Hook, of Weir. The mine formerly was the Fidelity Coal Co., No. 7. It was purchased by the Mayer company several years ago. It employs sixty-five men.

The Mulberry Shovel Co., composed of Mulberry and Arcadia men, has leased a large tract of land north of Arcadia and will begin strip-mining operations as soon as it can get a shovel onto the ground. This and several neighboring tracts, several thousand acres in all, are now being figured on as suitable for shovel operation. This section is immediately north of the Crawford County field that is now under full development.

KENTUCKY

The Hawley McIsaacs Coal Co. under contract with the Link-Belt Co. has rebuilt a tippie at its Morrison strip operation at Centertown, the plant resuming operation on Jan. 19 and getting out 28 cars on Jan. 21, with prospects of forty cars soon. Its Kershaw strip pit has been down on account of water and bad operating conditions.

Judge Charles H. Bush, of Hopkinsville, sitting as special judge in the Muhlenberg Circuit Court, at Greenville, on Jan. 21, dismissed appeals of about fifty union miners, in forcible detainer cases, appealed from decision of the county judge, where coal companies had filed detainer suits to force union men out of company homes, when the men refused to work or vacate. There were numerous other cases that were not appealed.

It is reported from Owensboro, that a number of mines that had been down since last April in the Muhlenberg County field have resumed non-union, with from 46 to 100 workers, and 5 to 10 guards each. There has been no trouble experienced, and the success of the operating companies is attracting more labor to the operations and influencing additional operators in starting their mines. Among mines which have gone non-union lately are the W. G. Duncan & Sons mine, Luzerne; Greenville Coal Co., Powderly; the Oakland Mines, Oakland, and the Liberty Gibraltar, Dovey, Brownie, Pacific, Rogers Brothers, Black Diamond, Wickliffe and Jim Thompson mines.

MISSOURI

A "Buy-Missouri-coal" campaign has been started by cities and towns in those sections of the state where Missouri coal can successfully compete on a price basis with other coals entering Missouri. Seventeen communities were represented at an organization meeting of the Missouri Mined Coal Association in Kansas City during January. The

organization has employed F. B. Lamson as secretary at \$200 a month and a stenographer-assistant at \$75 to flood such communities with propaganda showing the embarrassed condition of both miners and operators in those regions. The secretary will strive to get state and local institutions to buy Missouri coal and will labor otherwise to win business for Missouri coal.

An effort is being made to reopen the mine of the Assumption Coal Mining Co. A bond issue to raise \$10,000 to put the mine in operating condition has been discussed by stockholders and citizens of Assumption.

OHIO

W. W. Rice, who has been sales manager for the Philadelphia & Cleveland Coal Co., rail and river operators, with headquarters in Cincinnati, has resigned.

In the annual election of officers in the Fifth subdistrict of Ohio, an official tabulation of the vote shows that Frank Ledvinka, candidate for reelection as president, had a margin of only 357 votes over J. J. Hoge and of less than 600 over Robert Farmer. John Cinque was elected vice-president over Carl Ryan and Frank Blahovec by substantial pluralities and W. T. Roberts was elected secretary-treasurer over Joseph O'Grady, John Gross and William Kennedy by substantial pluralities. Two years ago Ledvinka defeated Hoge for the presidency by a four to one majority.

Despite protests from Gordon D. Rowe, Cincinnati smoke inspector, the Longview State Hospital will continue to use Ohio mined coal under orders from Governor A. J. Donahey. The inspector protested on the ground of the smoke nuisance and correspondence between the Governor's office and Cincinnati city officials ensued.

Woodruff, Massey & White and the Tuttle Coal Corporation have moved their Cincinnati offices from the Dixie Terminal to the tenth floor of the First National Bank Building.

PENNSYLVANIA

The report of the giant power survey board will shortly be made to the Legislature which is not expected to appropriate any large sum for its continuance.

A new colliery on the southern fringe of the anthracite region which will be less than 100 miles from Philadelphia was assured recently at a parley between officials of the Sherman Coal Co. and the Lehigh Valley R.R. The railroad has agreed to extend its tracks to the new plant and the coal company will erect a modern breaker. The breaker is to be the "last word" in construction. It is believed there are several million tons of coal in the undeveloped tract.

Citizens of Bellefonte and vicinity are fearful that they will be the losers of approximately \$150,000 which they paid for preferred stock in the Blanchard-McShannon Coal Co., organized a year ago to open mining operations at



Ready? Shoot!

When the photographer decided to take this picture of the store and office of the Pemberton Coal & Coke Co., at Big Stick, W. Va., most of the young 'uns who happened to be in the neighborhood, and some not so young, thought that it would look better with a little life in it, so a dozen of them lined up and looked pretty.



Courtesy Colorado Fuel & Iron Co.

Improvements at Office of a Colorado Coal Mine

These two views show the results of recent efforts at beautification on the property of the Fremont mine of the Colorado Fuel & Iron Co., at Florence, Colo.

Karthus by the stripping process. A petition has been filed with the district court asking for the appointment of a receiver and it has developed since that thousands of shares of common stock have been distributed without the knowledge, it is alleged, of the preferred holders of stock. The company paid one dividend and the first intimation that the company was not working on a paying basis came when it was found that costly machinery purchased had not been paid for.

The new \$100,000 coal dock recently installed in the Rutherford yards of the Philadelphia & Reading company was given a trial recently. The dock is said to be the latest word in coal handling and it has already been inspected by numerous coal dealers and mining officials.

All mines of the Johnstown division of the Bethlehem Mines Corporation are operating at the present time to furnish fuel for the Cambria steel plant in Johnstown. An increase of 20 per cent in output is noted in the past month. Mines in the division are the Cambria mines at Johnstown, Wehrum and Slickville.

A suit has been filed in the Clearfield County court by Attorney Bell Boulton on behalf of J. J. Kintner, erstwhile attorney for the United Mine Workers in District No. 2, seeking \$5,360, a balance of \$10,000 claimed for counsel fees. Kintner sets forth in his bill of particulars that he was hired on March 31, 1922, as general counsel for the officers of the union. In pursuance of his duties, he appeared in at least thirty-five equity suits, in six different counties, represented the district before the Supreme Court in Philadelphia and Pittsburgh and twice before the Interstate Commerce Commission. Fees and amounts to cover expenses at various times received by Mr. Kintner totaled \$4,640, and he brings suit for the balance claimed.

A transaction said to have involved \$3,000,000 was concluded at Philadelphia when the Susquehanna Collieries Co. bought 372 acres of anthracite land at Shamokin from the Lehigh Valley Coal Co. for developing purposes. This will be worked by the Cameron colliery, at the west of the borough, an anthracite operation for more than a half century.

Another independent anthracite operation known as "Tickle Back," which was financed by Philadelphia interests, will pass out of existence following the refusal of the Philadelphia & Reading

Coal & Iron Co. to grant a lease on property adjoining the present holding near the "D" office at Shamokin. It is one of the largest independent operations in the Mount Carmel section.

The Hazle Brook Coal Co., of Hazleton, has learned that its Lykens Valley vein is pinching out at its Mid-Valley operations near Mt. Carmel. The vein at first became dirty and is now practically gone. As a result the company has been forced to discharge fifty men who with others were working the vein. The vein was one of the main arteries of supply for the Mid-Valley No. 1 and No. 2 collieries. The new Raven Run breaker, recently built and electrically equipped throughout, will be placed in full operation within a short time and the Mid-Valley breakers of the company will be abandoned. It is expected that the new breaker will have a capacity sufficient to handle all Mid-Valley coal.

The day following his election as president of the Woodward local, Glen Alden Coal Co., United Mine Workers, Michael Evelock was discharged. The colliery foreman stated following the union president's discharge, that Evelock was found smoking a cigarette in the mines. The operation is a highly gaseous one, and smoking was prohibited under penalty of discharge.

Edgewood Park, used as a baseball field in Shamokin for a number of years, may soon be a thing of the past. The Susquehanna Collieries Co. in the near future intends to start mining operations under the property. The coal will be run to the Cameron breaker. The company has announced, however, that efforts will be made to save the park from being damaged by mine caves.

The Philadelphia & Reading Coal & Iron Co. has about completed the work of cutting out the coal at the bottom on the West Side Slope in the Alaska mines, preparatory to erecting a new and up to date hospital at this point. It will be fully equipped and will be modern in every respect.

Another decade has been added to the life of the old Buck Run colliery, at Minersville. J. B. Neale, president of the Buck Run company, has renewed a lease with the Philadelphia & Reading Coal & Iron Co., which will enable the company to mine thousands of tons of coal from the old Thomaston workings. The Buck Run company has been mining on the Thomaston tract for many years but there are huge deposits of coal still untouched, and these, under the new agreement, will

be made available for mining. The company also is engaged in huge stripping operations above the Crystal Water Co.'s dam at Minersville.

UTAH

A special committee appointed to investigate the situation by R. S. Lewis, president of the Utah section of the American Institute of Mining and Metallurgical Engineers, has reported that the laws and regulations governing the operations of the coal mines of the state are adequate and among the most stringent in any state. The committee consisted of Daniel Harrington, formerly in the Federal Bureau of Mines; Otto Herres of the United States Fuel Co., and B. W. Dyer, chief mining inspector for Utah.

J. E. Pettit, superintendent of the Panther mine, United States Fuel Co. and one time State Mine Inspector for Utah, and Leo Kinney, chief clerk at the Mohrland mine of this company, are members of the State Legislature now in session.

Coal production by Utah mines in December, 1924, totaled 508,312 tons, compared with the following totals in the corresponding month of previous years: 405,635 tons in 1923, 494,197 tons in 1922, 282,379 tons in 1921 and 526,155 tons in 1920. Output in 1924 was 4,463,704 tons; compared with 4,750,377 tons in 1923, 4,992,008 tons in 1922, 4,090,395 tons in 1921 and 6,004,788 tons in 1920.

The application of the National Coal R.R. for permission to construct a line in Carbon County to connect with the main line of the Utah Ry. will be heard in the immediate future by the Public Utilities Commission.

WEST VIRGINIA

Double tracking of the Tug Fork branch of the Norfolk & Western Ry. will be undertaken at once between Havaco and Gary, W. Va., a distance of three and a half miles, in order to permit of a larger movement of coal from the Gary mines of the United States Coal & Coke Co., where production has been steadily increasing recently. The railroad company plans to put a force of 75 men to work at once.

The committee on Mines and Mining of the House of Delegates of West Virginia will consist of the following members according to an announcement by Speaker Keatley: E. M. Tutwiler, of Fayette County (chairman); H. H. Andrews, of Boone; R. Marsh Dean, of Mineral; H. A. Bartlett, of Marion; Simon Solins, of McDowell; C. L. Heaberlin, of Raleigh County; Wallace C. Morgan, of Wyoming County; Harry Weiss, of Ohio County; James L. Deuley, of Brooke County; Harold B. McCrum, of Preston County; J. E. Hall, of Mingo County; W. C. Turley, of Logan County; Ben B. Brown, of Kanawha County; R. R. Lockhart, of Clay County, and C. C. Brammer, of Mercer County. Mr. Tutwiler, the chairman, is general store manager of the New River company, the largest company operating in the New River field. R. Marsh Dean is a well known operator of Mineral, having been chosen at a special election to succeed the late William Farris, of Mineral.

WYOMING

The Union Pacific Coal Co. inaugurated a new system of co-operative mine inspection recently. Each mine will be inspected quarterly by a committee of three composed of two miners and the safety engineer or a representative. One miner is to be chosen and paid by the United Mine Workers, while the other is to be a union man chosen and paid by the company. The findings of these committees will go directly to President McAuliffe and will contain recommendations for such new safety measures as the committee finds necessary.

CANADA

The Crow's Nest Pass Coal Co. has started to warm up its battery of coke ovens at Fernie, preparatory to re-starting the manufacture of coke. The ovens have been idle for four years, but the improved conditions since the men entered into the new wage contract have enabled the company to compete with other coal fields in the production of coke for the near-by smelters and for domestic purposes. Conditions at Coal Creek and at Fernie have been more prosperous since the men seceded from the United Mine Workers and formed the British Columbia Miners' Association than they have been at any time in the last decade.

At the annual general meeting of the Western Canada Coal Operators Association, which was held at Calgary recently, John Shanks, general manager for Brazeau Collieries, at Nordegg, was elected president; George Kellock, general manager for the McGillivray Coal & Coke Co., at Coleman, first vice-president and William McVeigh, general manager for the Elgin Coal Co., at Drumheller, second vice-president.

The Conciliation Board to investigate the dispute in the Cape Breton coal fields is to go ahead, according to word from Ottawa. J. M. Winfield, manager of the Maritime Telephone Co., Halifax, N. S., will be the third member and chairman of the board. James Murdock, Minister of Labor, stated that the board would do all possible to bring about a settlement.

The total coal production of British Columbia for the year 1923 was 2,542,987 tons. It is estimated that the total production for the year 1924 will be 2,095,648 tons. This represents a decrease of 447,339 tons, the loss being due chiefly to the long strike experienced in the Crows Nest Pass coal fields. The Vancouver Island collieries are expected to produce a total of 1,475,171 tons this year, or 99,492 tons less than in 1923. The output in 1923 was 179,990 tons less than in 1922. This steady decline indicates that fuel oil competition is having a destructive effect on coal. The Nicola-Princeton district is expected to just about hold its own with 228,356 tons. The Crows Nest Pass district, which last year produced 740,531 tons, figures very little in this year's production statistics. In northern British Columbia the Telkwa mines still are producing for a few months in the year with a view largely to meet the winter domestic re-

quirements of the city of Prince Rupert with about 1,081 tons.

Emphatic denials of the existence of any combine among coal operators or dealers handling Alberta coal, have been given by officials of three Edmonton companies who appeared before the Campbell Commission at its Edmonton sitting during the first week in January. The commission, which opened hearings in Winnipeg six weeks ago, was appointed to investigate the allegations of A. B. Hudson, a Winnipeg dealer and others, that there was in existence a combine which controlled prices and dictated that some dealers should not handle Alberta coal. Evidence given in Edmonton showed that Mr. Hudson could buy all the Alberta coal he wanted if he paid for it on the usual terms, and that there was no organization which dictated anything to the Alberta operators. The fact that a certain few Winnipeg dealers had had their supplies curtailed, was explained by a number of "n.s.f." checks which had been received.

Traffic

C. & O. Coal Traffic Gains Steadily

In 1924 the Chesapeake & Ohio transported 42,913,836 tons of coal, or more than in any year in the history of the road. In 1922 the C. & O. hauled about 25,000,000 tons and in the following year movement had climbed to nearly 33,000,000 tons. The management of the road have set as their objective 5,000,000 tons a month or 60,000,000 tons a year. Tonnage originated as follows: Logan, 16,659 tons; New River, 7,468,170 tons; Winding Gulf, 2,383,630 tons; Kanawha, 5,856,270 tons; Coal River, 3,478,290 tons; Kentucky, 5,170,141 tons; Long Fork, 1,329,490 tons; Millers Creek, 486,740 tons, and A. C. & I. Ry., 81,650 tons.

The following changes have been announced on the New York Central Lines, East. D. E. Gelatt promoted from general coal agent to assistant freight traffic manager; Allan McMichael from coal freight agent to general coal agent; George E. Taylor, formerly division freight agent at Corning, N. Y., succeeds Mr. McMichael as coal freight agent, all having headquarters at New York.

Association Activities

The annual meeting of the Northeast Kentucky Coal Association held at the Ventura Hotel at Ashland, Ky., on Jan. 22, was unusually well attended and a great deal of interest manifested. The report of the executive committee was submitted at the afternoon session and the year's work mapped out. President C. W. Connor, general manager of the Elkhorn & Shelby Creek Coal Co., presided. The election of officers resulted as follows: President, Cadwalader Jones of the By-Products Coal Co. of Wheelwright; First Vice-President, J. J. Fluck, Elkhorn Coal Mining Co. of Weeksbury; Second Vice-President, C. H. Beidenmiller, Glogora Coal Co., of Huntington, W. Va.; Treasurer, M. M. White, Sr., Colonial Coal & Coke Co., Prestonburg. The executive committee consists of the four officers named, together with the outgoing president, C. W. Connor, and R. C. Thomas, of the North-East Coal Co., Paints-

ville, and James P. Sallsburg, Blue Beaver Elkhorn Fuel Co., Prestonburg. C. J. Neekamp was re-elected as secretary and F. E. Durham as statistician.

Obituary

Walter F. Upson, aged 75, a well known coal operator, died at Newark, Ohio, Jan. 23, after a short illness. He operated the Dixie mines in Perry County, Ohio, and his sons took up the work for the past few years when he retired from active business.

New Companies

The Octo Coal Co. of Sullivan, Ind., was incorporated Jan. 25 for the purpose of mining coal. The company has a capital stock of \$10,000 and the incorporators are O. Steel, E. H. Dugger and George C. Hudson.

The Watters-Kelly Morris Co., Dellroy, Ohio, has been chartered with an authorized capital of \$50,000 to operate and develop coal mines and lands. T. F. Watters, C. F. Morris, R. B. Meade, T. Lee and M. Schauer are the incorporators.

The Firestone Coal Mining Co. was incorporated Jan. 24 at Boonville, Ind., with a capital stock of 600 shares of no par value stock to do a general mining business. The incorporators are Henry G. Roetzel, Charles L. Hart and Philip Lutz, Jr.

The Keeley Coal Co. has been incorporated at Dugger, Ind., with a capital stock of \$10,000 to mine and deal in coal. The directors are E. H. Smith, R. M. Teasley, J. L. Story, Ralph Moore and Oscar Terrell.

The Black Crystal Mining Co. has been organized in Indianapolis, Ind., with a capital stock of 1,000 shares of no par value stock to do a mining business. The directors are L. P. Robinson, T. S. Hood and Henry L. Hilkene, all of Indianapolis.

Coming Meetings

Pittsburgh Vein Operators Association. Annual meeting Feb. 9, Hotel Cleveland, Cleveland, Ohio. Secretary, D. F. Hurd, Cleveland, Ohio.

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.

Rocky Mountain Coal Mining Institute, Albany Hotel, Denver, Colo., Feb. 16, 17 and 18. Principal program subjects are rock dusting, underground loading and safety measures. Benedict Shubart, secretary-treasurer, 520 Boston Bldg., Denver, Colo.

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.

British Columbia Division of Canadian Institute of Mining and Metallurgy. Sixth annual meeting Feb. 18-20, Vancouver, B. C. Secretary, H. Mortimer Lamb, Vancouver, B. C.

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

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

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

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

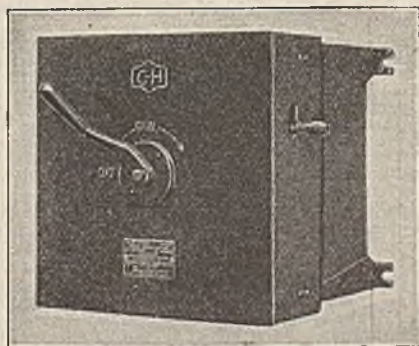
Mine Inspectors' Institute of America. Annual Convention May 19, 1925, at the Jefferson Hotel, Peoria, Ill. Secretary, G. B. Butterfield, Hartford, Conn.

New Equipment

New Starter Designed for Fynn-Weichsel Motor

The Cutler-Hammer Mfg. Co., of Milwaukee, Wis., has developed a line of starters for use with Fynn-Weichsel a.c. motors. The design of these starters takes care of cutting out resistance simultaneously in each of the two secondary windings found in this type of motor.

The small handle extending outside of the inclosure provides a safe and convenient means of tripping the latch which holds the starting lever in the running position, thus allowing it to return to the "off" position. No voltage



Manually Operated Starter

This complete unit is mounted with the necessary grid resistance to properly start small motors.

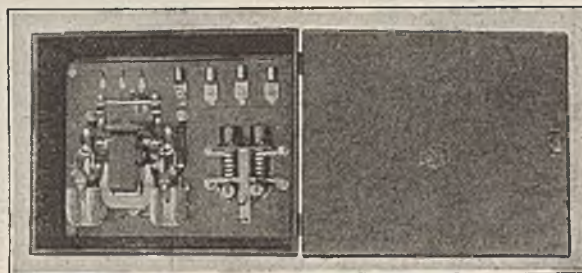
and overload release features are obtained by using with the starter, as described, a magnetic contactor and overload movement. An electrical interlock is provided so that in the event of voltage failure, the contactor opens and the manually-operated starter must be returned to the starting position before the contactor can again be closed. The face-plate starter is made for motors up to and including 50 hp. and all voltages.

For motors of larger capacity than suitably can be controlled on the face-

plate type starter, as described, a drum construction has been developed. The standard features of design are used with non-stubbing stationary fingers and revolving contacts mounted on insulated square steel shaft—all parts being readily accessible. A deadman's

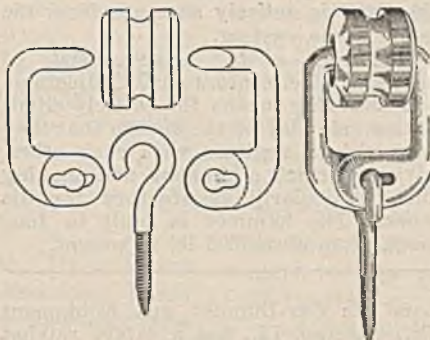
Made Safe by Relays

A primary magnetic contractor and overload relay is used with this outfit to protect it against abnormal surges or overloads.



Service Wire Bracket Can Be Easily Installed

A wire support for electric light, telephone and radio aerial wires has recently been developed by W. H. Pearl



Wire Bracket Made of Few Parts

The simple hook used with this bracket makes it easy to install it, either on wood or on brick buildings. The yoke consists of two malleable castings, which are locked in position by the screw-hook.

Co., 425 Harmon St., Indianapolis, Ind. This device consists of but few parts and is easy to install. A screw-hook on

handle is furnished which must be held down by the operative when starting. Pushing this lever down provides an auxiliary contact for closing the primary contactor. If the drum-controller lever is not held down until the final running point is reached, the magnetic contactor will open. If the motor is up to speed, and the contactor opens, the drum must be returned to the "off" position before the contactor can again be closed. The primary contactor and overload relay panel are shown in the inclosing cabinet, the door of which is open.

the end of the bracket may be turned with a screw-driver or pair of pliers and the unit which consists of a knob and yoke may be hung on. When used with an expansion shield the bracket can be installed on brick walls. It may also be used as a tree insulator for general utility purposes.

The yoke is made of two malleable castings which are thoroughly shearar-dized. The knobs are entirely covered with glaze, so that they will not absorb moisture.

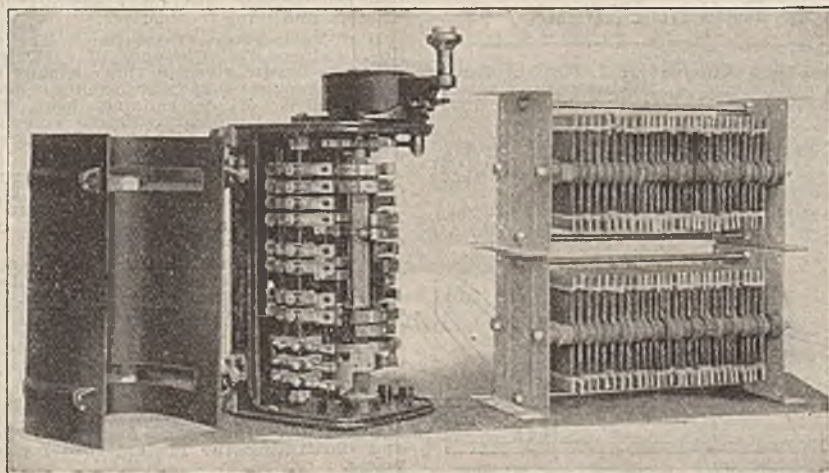
Hammers Heavily or Lightly Running at Full Speed

An air-cushioned hammer, which is different from anything that has gone before in the way of helve hammer construction, has recently been placed on the market by the Beaudry Co., Everett, Mass.

The hammer has no rubber bumpers, being cushioned entirely by air. This construction has several advantages. Little floor space is required for the machine and it can be operated either by a belt or by a motor directly geared to the flywheel without the use of any intermediate clutches or belts.

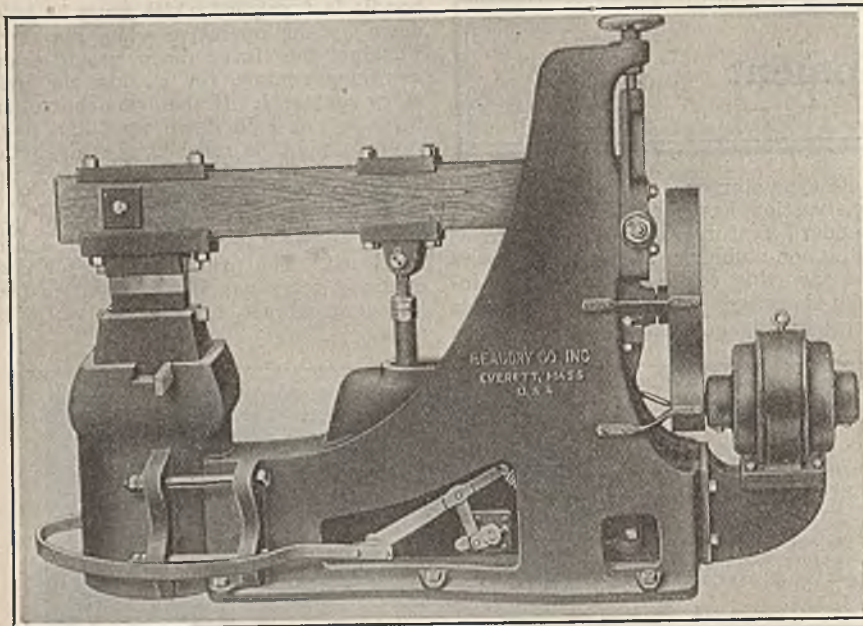
This machine will deliver its lightest tap or its heaviest blow at full speed, which means practically doubling the daily production. The strength of the blow is regulated, as heretofore, by simply applying more or less pressure on the foot treadle. This variation does not change the speed of the hammer but simply the strength of the blow and enables the operative to obtain light, quick blows which are so essential in finishing any forging.

When at rest the hammer is at its top stroke helve elevated and the dies are apart ready to receive the work. It gets into instant action at full speed and no time is lost. Its first blow is just as powerful as any of the succeeding ones and in addition it has this peculiar feature of enabling the operative to strike one full, positive blow the same as can be obtained under a drop hammer and after delivering same the hammer helve ascends to its pre-



Interior View of Drum-Type Controller

When large Fynn-Weichsel motors are employed a special type drum-type controller is used. This equipment provides even deadman protection.



Hammers Strike Light Blows at Full Speed

This self-contained machine compresses its own air. In one cylinder air is compressed and in the other it is distributed. A rotary valve regulates the force of the blow struck by the hammer.

vious position at the top of its stroke.

As will be seen from the illustration, the hammer is a self-contained unit, compressing its own air and depending on no outside supply. The hammer consists of a well-designed, semi-enclosed frame within which, cast in one piece, are two cylinders. In one cylinder the air is compressed and in the other it is distributed and used for actuating the hammer helve.

The rotary valve, operated by the treadle, is located between the two cylinders for regulating the amount of air and controlling the blow. The

power plant is entirely separate from the main frame and is readily removable. The hammer helve is adjustable for varying thicknesses of stock and the anvil is entirely separate from the main frame casting.

The pivot of the helve consists of hardened steel centers easily adjustable and affording means for entirely eliminating side play of the dies so that they may always register with each other, giving perfect alignment and making this particularly satisfactory for die work. The hammer is built in four sizes, from 40 to 200 lb. in weight.

Safety Ratchet for Control Of Ascending Trips

Where cars are being hoisted up a slope, either individually or in trips, it is frequently advisable to provide a safety ratchet of some type to make it impossible for the cars to run back down the slope if an accident happens to the hoisting medium. This is true not only where the cars are being hoisted by a rope, but also if they are being pulled up the slope by means of a locomotive, or are being fed up the slope by means of some type of car haul or car feeder.

In the past, quite a number of makeshift rear control horns have been designed, usually being made on the job or fabricated out of structural steel in some way that would "get by."

In order to take care of this prob-

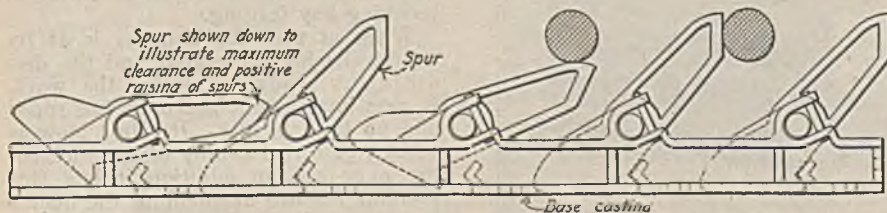
lem, the Car-Dumper and Equipment Co., Chicago, Ill., has a safety ratchet for rear control. This consists of a series of self-contained units, which can be bolted end to end, as indicated by the drawing. The individual spurs can be placed in this casting in a few minutes and locked, as illustrated, by a single blow with a small hammer. They can be removed with equal ease.

Recent Patents

Coal-Dust Eliminator; 1,503,870. Edwin Ball and James M. McHugh, Birmingham, Ala. Aug. 5, 1924. Filed Jan. 17, 1923; serial No. 613,276.

Step-Washing Plant for Ash, Coal, etc.; 1,503,876. Ernst Bongardt, Hersfeld, Germany. Aug. 5, 1924. Filed May 5, 1923; serial No. 636,948.

Coal-Screening Apparatus; 1,502,954. George S. Jaxon, Huntington, W. Va., as-



The Watkins Safety Ratchet for Rear Control

Because this device is made of a few simple parts it is easy to repair and operate. A single blow with a small hammer is all that is necessary to lock the individual spurs after they have been placed in position in the casting.

signor to the Link-Belt Co., Chicago, Ill. Aug. 5, 1924. Filed Sept. 16, 1922; serial No. 588,520.

Coal-Cutting Machine; 1,503,992. Matthew S. Moore, London, Eng., assignor to Cowlishaw, Walker & Co., Ltd., London, Eng. Aug. 5, 1924. Filed Jan. 24, 1923; serial No. 614,571.

Mine Shovel; 1,504,427. Robert S. Butler, Joplin, Mo. Aug. 12, 1924. Filed Oct. 11, 1920; serial No. 416,175. Renewed June 20, 1924.

Publications Received

The Origin and Constitution of Coal, by Reinhardt Thiessen. Preprint of Vol. XIX of the Proceedings and Collections of the Wyoming Historical and Geological Society, Wilkes-Barre, Pa. Pp. 44; 6x9 in.; illustrated.

Annual Report of Julius Klein, Director of the Bureau of Foreign and Domestic Commerce, to Herbert Hoover, Secretary of Commerce, for the fiscal year ended June 30, 1924. Pp. 66; 6x9 in.; illustrated.

Electrical Drafting and Design, by Calvin C. Bishop. McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City. Pp. 166; 6x9 in.; diagrams, tables and charts. Price, \$2. A practical book on electrical drafting and design covering the work that has to be done in the office of an engineer, a contractor or power company.

Substation Operation, by Edwin Kurtz. McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City. Pp. 261; 5½x8 in.; illustrated. Price, \$2.50. Discusses station layout and wiring, machines and auxiliary apparatus, operating procedure, keeping of station records, purpose and methods of testing circuits, use and care of safety equipment, and the principles of accident prevention and first aid.

The Mineral Industry, edited by G. A. Roush. McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City. Pp. 887; 6x9 in. Price, \$12.

A.S.T.M. Standards, 1924. American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa. Pp. 1230; 6x9 in.; illustrated. This book is published triennially and contains all of the standards of the society in their latest revised form. Price, \$11 in cloth and \$12.50 in half leather binding.

Trade Literature

Armstrong Shoveloder. Nordberg Mfg. Co., Milwaukee, Wis. Four-page folder describing and illustrating the operation of this machine.

Arc Welding and Cutting Manual. General Electric Co., Schenectady, N. Y. Bulletin Y-2007. Pp. 127; illustrated with photographs, diagrams and charts. The volume is divided into three parts; the first is devoted to general information on arc welding, the second to a training course for operatives, and the third gives a number of applications of arc welding.

Monitor Edgewound Resistors. The Monitor Controller Co., Baltimore, Md. Bulletin 67. Describes the adaptation of the resistor for use on electric trucks, tractors and mine locomotives.

High-Temperature Insulation. The Celite Products Co., Chicago, Ill. This is the same lecture given by this company last year with more definite information added on methods of determining heat flow through high-temperature walls composed of various materials. The book has 12 pp.; 6 x 9 in.; illustrated.

24-Hour Concrete. The Atlas Lumnite Cement Co., New York City. Pp. 31; 6 x 9 in.; illustrated. Information is given on the making of full strength 28-day concrete in 24 hours.

Electric Equipment for Cranes. General Electric Co., Schenectady, N. Y. Bulletin 48,732. Pp. 35; 8 x 10 in.; illustrated. Discusses the subject thoroughly, with particular reference to crane motors and control, brakes, etc. Information is given on operating characteristics and types of standard motors are listed.

Marion Gulf Stream Water Heater. Marion Machine, Foundry & Supply Co., Marion, Ind. Four-page folder describing and illustrating the heater; also contains prices.

The Hardinge Co., New York City, in its catalog No. 13 and Bulletin No. 17 describes the use of the Hardinge mill for pulverizing limestone and similar materials for dusting coal mines.