

COAL AGE

McGraw-Hill Company, Inc.
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Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. Dawson Hall
Engineering Editor

Volume 27

NEW YORK, APRIL 30, 1925

Number 18

Waste in Research

CO-OPERATION between mining research in the United States and Great Britain is recemented by the arrival of Foley, Wheeler, Clifford and Chapman. It is good to know that what we ascertain, the British will not concurrently be at pains to rediscover, and what the British learn we shall not be compelled to determine over again by costly experiment. France, Belgium and, let us hope, Germany, will soon join in, and we shall have all nations combining to meet their common problems. Some day the millennium will stroll along Pennsylvania Avenue and we, having achieved co-operation with foreign countries, will perform also that impossible task of getting the Bureau of Standards, the Department of Agriculture, the Geological Survey, and the Bureau of Mines not to duplicate one another's studies; but we are looking too far ahead into the misty realms of the impossible. The "baseless fabric of a dream" is co-operation at the Capitol.

What Is Bone Coal?

REGULATIONS as to bone coal in anthracite preparation are difficult of enforcement and will be difficult so long as the purchaser is not told how to determine a distinct line of demarkation between coal and bone on the one hand and between bone and slate on the other. It is clear that the operators could undertake to prescribe the total percentage of ash in the whole coal product, but that would involve a considerable change in methods, and opposition to it would, accordingly, be strong. Only by the employment of chemists could the ash percentage be determined. Analytical methods are slow and that is another disadvantage.

A half measure would be to make a specific-gravity determination and to term "bone" that coal which lies between two specific gravities, and "slate" everything heavier than the higher of the two densities. One objection to this system is that anthracite of equal purity from different regions probably varies in specific gravity, due to the difference of pressure and mineralization to which it has been exposed. Unless the specific-gravity limits were varied with the region from which the coals came, the heavy anthracites in the southern region might be at a slight disadvantage, for the coal in the northern region, being lighter, the quantity of slate in the bone could be greater in that region than in the southern without resulting in a mixture of an excessively high specific gravity.

The densities that would accord with certain percentages of impurity could be determined for each area of the anthracite field, and the standards could be set to accord therewith. It would be simpler, however, but not so exact, to apply a uniform density test for all kinds of anthracite. Whether that would be feasible is a matter for determination.

The suggestion that a physical instead of an ocular or chemical test be used may involve more difficulties

than are immediately apparent, but it is worthy of consideration. It has the advantage that it is not new, having been used for many years in making washery determinations. It is certainly more accurate than an ocular analysis such as has hitherto been used, but it will be found a little more difficult and perhaps slower. A system of separation by visual tests must always be uncertain and unscientific as it is subject to the personal equation and to the uncertainty as to whether the heart of the bone has less, or more, carbon than the surface.

Only Clean Buckwheat Will Do

FOR YEARS the anthracite operators have been waging a campaign to foster the use of the so-called steam sizes of coal for domestic or house-heating purposes. Without in any way indorsing the decision it may be said that to many people Scranton anthracite typifies the best that the region produces, forming a sort of standard by which all other coals are judged. The experiences, therefore, of two men who have long resided in Scranton, in their attempts to burn buckwheat No. 1 in their house furnaces will be interesting in that they shed much light upon the entire problem of fine anthracite utilization. It is believed that these experiences are typical of others.

In Scranton, as elsewhere, the steam sizes sell for several dollars less per ton than do the domestic grades, so that to both householders there was a pecuniary incentive to burn buckwheat. Although it is difficult to retain this small size on the grate of an ordinary house furnace, this difficulty was surmounted by both consumers. The first carried a bed of ashes on his grate by which the fuel bed proper was supported; the second laid a piece of old screen jacket on the grate and built his fire on top of it, removing the ashes through the clean-out door.

These two men attacked the problem of buckwheat utilization for domestic heating from entirely different angles and obtained widely divergent results. Mr. A utilized natural draft; Mr. B used a blower. Residents of coal-producing communities, such as Scranton, enjoy at least one advantage over those more remotely situated in that they can visit many collieries and buy their fuel direct from the one delivering the best product. After trying coal from various sources with mediocre to unsatisfactory results, Mr. A "went on a still hunt" for a breaker or washery that produced and sold real coal. After visiting several plants he found one—and only one—that produced a buckwheat with less than 3 per cent of extraneous ash or rock. He immediately laid in a supply of this fuel and experienced no difficulty in heating his house with it during the past winter. Of course this coal required careful firing and manipulation of the grate to avoid excessive loss to the ash-pit. The grate was never shaken violently, and any clinker that might form was gently broken with a straight—not a hooked—poker.

Mr. B pinned his faith to a blower. His furnace and heating plant strongly resembled A's. He bought his fuel supply from the most convenient source (it contained roughly 9 per cent of slate and rock) and attempted to *make* this material burn by forcing air into the ash-pit. After fussing with his furnace all winter and trying two or three different kinds and sizes of blowers he, like many another, has come to the conclusion, "Never again!"

The experiences of these two men, which are probably not exceptional, carry their own obvious moral. Anthracite producers cannot expect to sell steam sizes containing any high percentage of rock for domestic purposes and "get away with it" for any great length of time. When clean, buckwheat No. 1 can be burned in a house furnace if good natural draft is available; when it is dirty, even rather elaborate draft systems fail to give satisfactory results.

Again Co-operation Is Crushed

REASONS for the determination of the union in North Wales that co-operation in coal mines must be suppressed are not quite clear, but the action is not the less drastic for that reason. The Vauxhall Colliery in North Wales was closed five weeks ago because the operation of the mine was unprofitable. When the owners notified the miners, the latter decided to make arrangements with the former to work the mine co-operatively and raised in their home town a fund of \$3,500, many of them subscribing to this fund themselves. The neighborhood realized, as did also the miners, that it would be unprofitable for the seven hundred workmen to be idle. After operating steadily for five weeks without touching the guarantee fund, the miners found that they were making more money than before. True the working period which normally is seven hours was slightly extended, but most of the workmen were making much more than the minimum wage.

Apparently the North Wales Miners' Association feared that the operators of this mine might arouse a nation-wide campaign for the repeal of the seven-hour day act, for lower wages and the substitution of a local for the national wage scale. The men were disposed to work more energetically, and it was feared that their higher wages might draw undesirable attention to their former habit of deliberately shirking work. If it were proved that the men could do more and make more wages with the scale unchanged, there was danger that the general public would demand a wage decrease, the present scale being predicated on the idea that a miner working his best could earn even with the high wages only a bare subsistence.

The union proposed to suspend the miners outright but the officials of the Vauxhall branch most humbly expressed their "regrets" and agreed to cancel the contract after the three months had expired during which the agreement remained in force. Later, however, the miners disavowed the action of their leaders and declared it to be their intention to renew the contract and to continue to operate the mine. Had the men accepted the union's ultimatum they would have gone on the dole with a lot of ne'er do wells who will accept charity from the nation rather than undertake to knuckle to their work and make their occupation profitable.

In America the objection to co-operative coal-mining has not been to its efficiency but rather to the fact that the miners were willing to work co-operative mines at a loss, receiving full wages but deducting from their pay the losses of operation and thus receiving a wage equivalent really less than was promised in the scale. Many co-operative mines also have been willing to accept a reduced wage scale realizing that a lessened wage with steadier work was better than a full wage with irregular work.

In North Wales these do not appear to have been the difficulties. The miners, apparently, had been lagging at their work in order to get the minimum wage and keep their *confrères* working and, consequently, they were able, when their own interest was more clearly at stake, to make full wages without losses in operation. The union in Great Britain, apparently, is even less in favor of efficiency and frugal activity than the union in the United States. No wonder British coal owners are appalled when they view the future at mines knowing that the men they employ are corruptly and dishonestly attempting to reduce production.

Dangers of Electric Barns

ELECTRICAL FIRES underground are becoming increasingly common and demand careful study from mining engineers. Motors need constant watching because being exposed to moisture and a dusty atmosphere they are likely to develop short circuits and trouble, causing burnouts with a blaze that may set fire to the mine and cause a loss running to millions of dollars. The average mining superintendent is not interested in the condition of motors, and it may be difficult to make him realize that just because efficiency and a saving in repair costs is thereby effected he must be willing to pay for inspection and upkeep.

If once, however, he realizes that a burning armature may cause a mine fire and prevent a mine from working for a whole year or even more, his attitude will change. He is beginning to visualize this danger, and better installation, more regular inspection and prompter repair with the temporary removal of machinery in bad condition will result. Especially will he realize that oil, grease and rags must be kept away from motor equipment everywhere and more especially underground, for a fire started by a burning armature may be spread by such means.

A little foolish economy in installation, a little carelessness in removing the covers of a battery locomotive, a little too great a burden put on inspectors, electrical engineers and electricians may end in a fire, which will keep several times as many men busy for months and in the most dangerous of all work—fire fighting. This thought should give anyone pause. A good plan is to trowel or spray cement mortar over the coal around such equipment and thus make it immune to fire as has long been the practice in underground stables. Certainly, all pumphouses, substations and motor barns should have such treatment.

Some mines, sensing the risk of short circuits, have protected their haulageways with concrete so that the roof, often of coal, is not likely to fall, bringing with it the trolley wire and starting a dangerous fire. The cementing of the walls is a further protection should the roof by any possibility prove too heavy for the cement coating to support it.

Figures Tell Story of Coal Industry's Struggle To Adjust Itself Following the War

Data from Coal Commission's Vast File Shows Labor and Mine Costs, Realizations and Margins in Many Fields — How Union and Non-Union Costs Compare

By David L. Wing
Washington, D. C.

INFORMATION that was obtained by the U. S. Coal Commission about costs of production, and investments and profits of bituminous operations is based primarily on reports made by coal operators themselves. While most of the cost data is from sworn reports made to the Coal Commission, that for the period 1916-1918 is derived from similar reports made to the Federal Trade Commission or collected by the agents of that body direct from the books. Use was also made of cost figures for 1919 and part of 1920, originally reported by operators to the Na-

tional Coal Association. The statistics shown in this article are general summaries covering large areas or aggregates of coal fields. They are useful primarily for the light they throw on broad questions of policy. They have, however, little application to local problems because of the wide differences between fields in natural conditions, operating methods, available markets, etc. For such problems the more detailed figures for the particular fields have a specific value. In subsequent articles there will appear a statement and analysis of such figures for the principal fields.

The cost of production figures given here show the per ton labor and total f.o.b. mine costs, sales realizations, and margins. The f.o.b. mine costs contain no sales expense, and the sales realizations are on the basis of sales made f.o.b. the mine.

Table I shows a comparison of the averages of 1,180 identical operators in 83 fields in 23 states, for the years 1918, 1921, and 1922. These operators produced 66 per cent of the total output in 1918, 65 per cent in 1921, and 57 per cent in 1922. It is interesting to note that their average sales realizations—\$2.60 per ton in 1918, \$3 in 1921, and \$3.01 in 1922—closely correspond to the Geological Survey figures of "average value" of coal for the entire output of those years; namely \$2.58, \$2.89, and \$3.02 per ton in 1918, 1921 and 1922 respectively. These 1,180 operators, therefore, can be safely taken as representative of the industry.

The Northern Appalachian region was taken to include the coal fields of Pennsylvania, Maryland, West Virginia and Ohio; the Southern Appalachian region

PICKING THE HIGHLIGHTS

THE UNITED STATES Coal Commission collected a vast bulk of information about the coal industry. The last Congress provided for the printing of the Commission's voluminous report. But most coal men will appreciate having Mr. Wing pick out for them the most important facts from the most important fields. In this article he sets forth what the Commission learned about the differences in costs and realization between union and non-union fields, the course of costs and margins since 1916 and a number of other statistical highlights. In forthcoming articles he will develop from the huge report other chief points covering costs and investments in the bituminous fields.

those of Virginia, Kentucky (except western Kentucky), Tennessee and Alabama; the Eastern Interior region those of Indiana, Illinois, western Kentucky and Michigan; the Western Interior and Southwestern region those of Iowa, Missouri, Kansas, Arkansas, Oklahoma and Texas; the Great Plains, Rocky Mountains and Pacific region those of Montana, Wyoming, Colorado, New Mexico, Utah and Washington. Comparable figures with 1918 were not obtained for the North Dakota fields.

Not one of the years shown in Table I can be considered typical, however. During 1918, the bituminous coal operators, under the stress of war demand, produced the largest tonnage ever mined in the country in a single year. During 1921, there was a severe business depression, and in 1922, there was a five-months' strike in many of the fields, while, at the same time, there was a record production in others. In 1918, the sales realizations were controlled by the price-fixing policies of the Fuel Administration which was endeavoring to stimulate a large production, in 1921 they were affected by lack of demand, and in 1922 by strike conditions.

Since the pre-war period there have been no typical years in the bituminous coal industry. The year 1919 was one of business depression. On the other hand, the year 1920, while a year of business prosperity, cannot be considered typical because of the unusual transportation conditions brought about in the East by the railroad switchmen's strike and the ensuing buyers' panic. Nor can the years 1923 and 1924, even were statistics available, be considered typical.

To show the course of labor and total f.o.b. mine costs from 1916 to 1922, use has been made of returns from 217 identical operators who produced about 16 per cent of the entire output. Interpolations for the f.o.b. mine costs have been made for 1919 and 1920 from the returns of 264 operators, 83 of whom are among the 217 operators. While 217 operators is but a small number, those included are fairly representative for the purpose shown, since what is being measured is the ebb and flow of the tide, not the depth and volume

Table I—Average Labor and F.o.b. Mines Cost, Sales Realizations and Margins per Ton of 1,180 Operators in 83 Fields, 1918, 1921 and 1922

Region	No. of Operators	1918				1921				1922			
		Costs		Sales Realization	Margin	Costs		Sales Realization	Margin	Costs		Sales Realization	Margin
Labor	Total F.o.b. Mine	Labor	Total F.o.b. Mine			Labor	Total F.o.b. Mine			Labor	Total F.o.b. Mine		
Northern Appalachian	653	\$1.38	\$1.95	\$2.62	\$0.67	\$1.84	\$2.70	\$2.89	\$0.19	\$1.74	\$2.64	\$2.98	\$0.34
Southern Appalachian	135	1.44	2.06	2.71	.65	1.94	2.96	3.11	.15	1.49	2.28	2.65	.37
Eastern Interior	199	1.45	1.87	2.36	.49	2.11	2.74	2.83	.09	1.95	2.54	3.02	.48
Western Interior and Southwestern	114	2.20	2.75	3.01	.26	3.23	4.16	4.08	a .08	3.03	3.94	3.88	a .06
Great Plains, Rocky Mountains and Pacific Coast	79	1.63	2.18	2.67	.49	2.27	3.21	3.51	.30	2.02	2.88	3.30	.42
United States	1,180	\$1.46	\$2.00	\$2.60	\$0.60	\$2.00	\$2.83	\$3.00	\$0.17	\$1.84	\$2.65	\$3.01	\$0.36

a Amount by which total f.o.b. mine cost exceeded sales realization.

of the sea. These 217 operators have felt, in common with the rest of the industry, this shifting back and forth. They are widely enough distributed to reflect general movements and not to emphasize unduly local conditions.

There were two general increases of wage rates in 1917, the first being on April 1 and the second on Nov. 1. In 1919 there was a general increase as of Nov. 1. In 1920 there were two increases, one on April 1, and

Table II—Per Ton Costs of 217 Operators, 1916-1922

Year	Labor	Costs Total F.o.b. Mine
1916	\$0.83	\$1.12
1917	1.11	1.49
1918	1.47	1.98
1919		a2.33
Jan.-March, 1920		a2.46
April-Sept., 1920		a3.01
1921	1.87	2.77
1922	1.82	2.51

a Interpolated from reports of 264 operators of whom 83 were common to the group of 217 operators.

another, limited to day men, in the fall. Since, 1920, there have been marked decreases in the rates of wages in the non-union fields but in the unionized fields the wage scale has remained at the 1920 level.

The labor cost per ton must not be confused with the wage rates paid or the earnings of the workmen. The labor cost per ton during a specific period is the total amount paid out for labor divided by the number of tons produced. The changes in labor cost are, therefore, a resultant of several forces which may act in the same direction or in opposite directions. The labor costs are affected chiefly by changes in wage scales and changes in rate of production. Other causes are changes in mining practice and in market demand and also the attitude of labor.

The general differences of cost-of-production conditions in 1921 and 1922 between the unionized and non-union fields are clearly brought out in Table III.

In 1918 the average labor cost for the 434 operators in the non-union fields was 91 per cent, in 1921, 85 per cent, and in 1922, 76 per cent of that for the 746 operators in the unionized fields. The lower labor costs in the non-union fields and the consequent ability of those operators to sell their coal at relatively lower prices are fundamental difficulties which confront the operators employing union labor.

According to recent reports the labor cost today in some of the non-union fields is back to the 1917 average. Since conditions differ widely from field to field it is not safe to push too far a generalization drawn from averages for large producing areas. Those who are interested in the conditions locally can best study that subject from the detailed information available for the separate fields.

There are three kinds of statistics available to indicate whether coal operations have been profitable or otherwise—those that show excess of cost over realization, those showing excess of realization over costs and, finally, those showing excess of realization over both cost of coal and cost of capital used by the company.

The difference between the average cost at the mine of the coal produced and the average sales realization is called the margin. Where the cost is greater than the sales realization, obviously, the operation is a loss; but, it does not follow that the operation is necessarily profitable because the sales realization exceeded the f.o.b. mine cost.

The per-ton cost at the mine, as shown by the U. S. Coal Commission, contains no allowance for interest on the money invested, whether borrowed or owned and invested by the stockholders themselves. This is in strict accordance with the generally accepted cost-accounting practice which does not include interest—actually paid or theoretically determined—as an item of cost. In ordinary business practice, however, an operation is not considered profitable which makes no return for the use of the money invested in the enterprise further than its mere replacement or amortization at the end of a number of years.

Table III—Comparison of Costs and Sales Realizations per Ton of 1,180 Operators in Union and Non-Union Fields, 1918, 1921 and 1922

Region and Year	Production Tonnage (Millions of Tons)	Unionized Fields (746 Operators)			Non-Union Fields (434 Operators)		
		Labor	Total F.o.b. Mine	Sales Realization	Labor	Total F.o.b. Mine	Sales Realization
Northern Appalachian:							
1918	134.0	\$1.43	\$2.00	\$2.70	\$1.28	\$1.88	\$2.49
1921	88.6	1.97	2.79	2.95	1.64	2.55	2.80
1922	63.8	1.99	2.92	3.24	1.51	2.36	2.72
Southern Appalachian:							
1918	0.7	1.57	2.06	3.01	1.43	2.06	2.71
1921	0.6	2.53	3.62	3.25	1.93	2.94	3.10
1922	0.3	2.37	3.56	3.53	1.47	2.27	2.64
Eastern Interior:							
1918	77.3	1.45	1.87	2.36			
1921	57.0	2.11	2.74	2.83			
1922	52.6	1.95	2.54	3.02			
Western Interior and Southwestern:							
1918	18.4	2.20	2.74	3.01	0.3	2.33	3.26
1921	10.5	3.23	4.15	4.07	0.2	3.31	4.56
1922	8.4	3.02	3.92	3.86	0.2	3.34	4.48
Great Plains, Rocky Mts. and Pacific Coast:							
1918	16.6	1.55	2.04	2.55	14.2	1.72	2.34
1921	9.9	2.20	2.97	3.35	11.8	2.33	3.41
1922	11.6	2.04	2.84	3.23	10.0	2.00	2.91
East of Mississippi River:							
1918	212.0	1.44	1.95	2.58	111.2	1.33	1.93
1921	146.3	2.03	2.78	2.90	83.1	1.72	2.66
1922	116.7	1.97	2.76	3.14	90.7	1.49	2.33
West of Mississippi River:							
1918	35.0	1.89	2.42	2.79	14.5	1.74	2.36
1921	20.4	2.73	3.58	3.72	12.0	2.34	3.43
1922	20.0	2.45	3.29	3.49	10.2	2.03	2.94
United States:							
1918	247.0	1.51	2.01	2.61	125.7	1.37	1.98
1921	166.7	2.11	2.88	3.01	95.0	1.80	2.75
1922	136.7	2.05	2.84	3.19	100.9	1.55	2.39

Table IV—Course of Costs, Sales Realizations, and Margins, 1916-1922

Year	217 Operators			264 Operators			1,180 Operators		
	F.o.b. Mine Cost	Sales Realization	Margin	F.o.b. Mine Cost	Sales Realization	Margin	F.o.b. Mine Cost	Sales Realization	Margin
1916.....	\$1.12	\$1.35	\$0.23	.....	.....	.....	.....	.....	.....
1917.....	1.49	2.29	.80	.....	.....	.....	.....	.....	.....
1918.....	1.98	2.57	.59	\$1.93	\$2.53	\$0.60	\$2.00	\$2.60	\$0.60
1919.....	.....	.....	.....	2.28	2.50	.22	.....	.....	.....
Jan.-Mar., 1920.....	.....	.....	.....	2.39	2.69	.30	.....	.....	.....
Apr.-Sept., 1920.....	.....	.....	.....	2.93	3.82	.89	.....	.....	.....
1921.....	2.77	2.91	.14	.....	.....	.....	2.83	3.00	.17
1922.....	2.51	2.97	.46	.....	.....	.....	2.65	3.01	.36

Notes:—The figures for 217 and 264 operators contain 83 operators in common; the 1,180 operators are inclusive of all the other operators.

For a coal operation, therefore, to be considered profitable in the ordinary business sense, the margin must be larger than an amount that simply pays for the use of the money invested.

The rate of investment per ton varies greatly from mine to mine and from field to field. Comparisons between the margins of different sets of operators are of much less value than comparisons at different periods of the margins of the same sets of operators. Such comparisons do give some idea of the relative profitability of those operations from year to year. It should also be borne in mind that the amounts paid for federal income and excess profits taxes were not deducted from income before arriving at the margin.

The Coal Commission was able to secure records from 217 operators covering the period, 1916-1918, and 1921-1922; from 264 operators covering the period 1918-1922; and from 1,180 operators for the years 1918, 1921, and 1922.

Table IV shows their f.o.b. mine costs, sales realizations, and margins. The 217 operators produced about 89,500,000 tons in 1918 (16 per cent of the entire output for that year); the 264 operators produced 86,500,000 tons in 1918 (15 per cent of the output); and the 1,180 operators produced 372,000,000 tons in 1918 (66 per cent of the entire output).

That 1917, 1918, and April-Sept., 1920, as compared with 1919, 1921, and 1922 were more profitable is obvious from a glance at the margins, but a more accurate idea of the relative profitability is obtained by comparing the relation of the margin, either to cost or to the sales realization, as shown in Table V. It may be pointed out in the case of the 217 operators that while the amount of margin in 1922 was double that of 1916, it formed a smaller proportion of the sales realization in 1922 than in 1916.

Profits are included in a statement of the return on the investment. What properly constitutes investment on which to compute profits, however, is an open question. The U. S. Coal Commission obtained for the 10-yr. period, 1913-1922, inclusive, detailed reports for 88 operators who had an annual production of 250,000 tons or over. These companies furnished detailed statements showing their investments, the income received, and many other details, as carried on their books. Their production averaged about 74,000,000 tons annually throughout the period, or about 15 per cent of the total output of the country during those ten years.

In Table VI there is shown, in the first column, the rate of return of the net income applicable to the total investment in coal operations, such investment including borrowed money, while the second column gives the amount, in cents per ton, of the net income to this total investment. The third column of the table shows the

rate of return of the net income applicable only to the stockholders equity both in coal operations and outside investments. The figures show, from year to year, a great variation in the profits which are computed before the payment of federal taxes.

Subsequent to 1916, because of the existence of the income and excess profits taxes, the book investment values of many companies were increased, appreciations being added to bring the book values of 1913 up to the estimated market value of the property of that date. The average investment per ton of output for the four years, 1913-1916, was \$3.04, while that for the six years, 1917-1922, was \$4.83.

A small part of this increase is due to a drop in production tonnage from 77,000,000 per year during the years 1913-1916, to 72,000,000 per year during 1917-1922. A substantial part of the increase, however, is due to the additions through revaluations of the properties. Thus, in 1920, the total book investment value of the 88 operators for all assets used only in coal production was \$363,995,944, of which \$113,096,995, or about 30 per cent, consisted of "write-ups" placed on the books. Had these revaluations been on the books during the years 1913-1916, the rate of return on investment during that earlier period would have been substantially lower than is shown in Table VI.

Table V—Relations of Margins to F.o.b. Mine Costs and Sales Realizations, 1916-1922

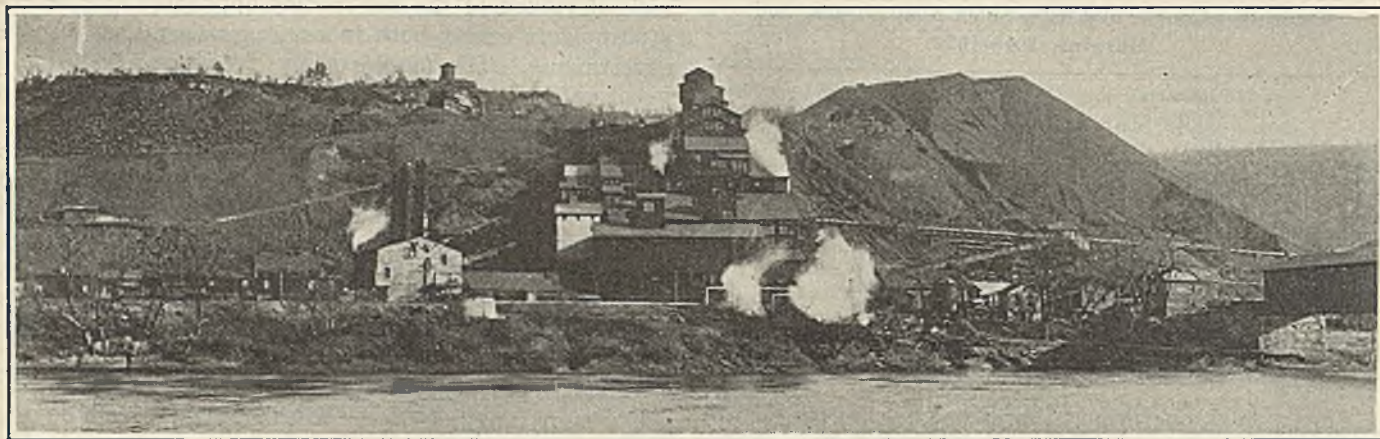
Year	Per Cent the Margin formed of—					
	F.o.b. Mine Cost	Sales Realization	F.o.b. Mine Cost	Sales Realization	F.o.b. Mine Cost	Sales Realization
1916.....	20.6	17.1	.....	.....	.....	.....
1917.....	53.7	34.9	.....	.....	.....	.....
1918.....	29.8	23.0	31.1	23.7	30.0	23.1
1919.....	.....	.....	10.3	8.8	.....	.....
Jan.-March, 1920.....	.....	.....	12.5	11.2	.....	.....
April-Sept., 1920.....	.....	.....	30.3	23.3	.....	.....
1921.....	5.6	4.7	.....	.....	6.1	5.7
1922.....	18.3	15.5	.....	.....	13.6	12.0

Table VI—Return of Total Investment, and Stockholders' Equity for 88 Operators, 1913-1922

Year	Return on Total Investment in Coal Operations		Rate of Return on Stockholders' Equity	
	Per Cent	Costs per Ton of Output	Per Cent	Per Cent
1913.....	5.7	\$0.17	5.7	.....
1914.....	3.8	.13	2.6	.....
1915.....	4.0	.13	3.9	.....
1916.....	7.2	.21	9.1	.....
1917.....	21.5	.72	24.8	.....
1918.....	16.3	.61	7.5	.....
1919.....	7.5	.34	7.7	.....
1920.....	20.3	.89	20.6	.....
1921.....	5.4	.30	5.1	.....
1922.....	7.1	.36	7.0	.....

Another indication of the profitability of the business may be found in the amounts of income tax paid per ton of production. In computing the following figures it has been assumed that the tax paid in a given year is based principally on the output of the preceding year. For the 88 operators, the taxes paid were: 1917, 23c. per ton; 1918, 24c.; 1919, 6c.; 1920, 23c.; 1921, 5c. Returns for 1922 were not available.

The U. S. Coal Commission was furnished by the United States Treasury with a statement compiled from the tax reports as originally submitted by 1,234 bituminous coal operators in the United States for the years, 1917-1921. The following figures showing the percentage of net income to invested capital, before deducting federal taxes, are taken from the statement: 1917, 26.47 per cent; 1918, 16.04 per cent; 1919, 6.33 per cent; 1920, 25.07 per cent, and 1921, 2.59 per cent.



Breaker, West End Coal Co., Mocanaqua, Pa.

Buckwheat Coal Demands Real Recognition in Anthracite Merchandising Problems

Insecurity of Industrial Market and Unsatisfactory Price Conditions Controlling Sales Force Serious Study of Field for No. 1 Buckwheat as Domestic Fuel

By Sydney A. Hale

Special Contributor, *Coal Age*,
New York City

IF RECOGNITION of the desirability of widening the domestic market for No. 1 buckwheat coal has come somewhat late in the history of the anthracite industry, that tardiness has been more than offset by the vigor with which many hard coal producers have been attacking the problem in recent years. First placed upon the commercial market about 1878, early merchandising efforts were directed towards selling this size to industrial power plants. A secondary market was developed with the rapid growth of the large office and apartment buildings in the eastern cities. This market was acquired, however, at the expense of broken and, to a lesser extent, at the expense of egg coal, which sizes were used in the older and smaller buildings.

Increasing competition with bituminous coal and, since the war, with fuel oil and the advances made in the design and installation of equipment to burn the sizes smaller than No. 1 buckwheat have been narrowing the industrial market. Today it is an axiom of the trade that distribution of anthracite steam coals is limited to a territory within a 100-mile radius of the mines. Even in that territory the fight for business between anthracite and competitive fuels grows more bitter day by day. The secondary market, which may be considered a domestic coal market as the bulk of the deliveries to consumers in that market is made by wagon or truck, has also been subject to the same restrictive influences, but, probably, in a smaller degree.

SMALL HOUSEHOLDER THE OBJECTIVE

The domestic market that is the subject of special consideration at this time is that of the individual householder. Of course, an endeavor is being made to

recover lost ground in the field of the office building and the large apartment house. The Anthracite Coal Service recently established in New York, and authorized in a number of other eastern cities, is a development in that line. A more intensive campaign to regain trade in the industrial field is also on. The fuel engineer is becoming a more popular member of the sales staff of the anthracite distributor and he is assisting in selling the steam sizes in power plants in competition against bituminous coal and fuel oil where the contract hinges upon a cold dollars-and-cents analysis of actual fuel costs. No little success has attended his efforts the past few months. The reduction in price made by some of the major producers at the beginning of the present season is expected to help this movement still further.

Insofar as it relates to the actual disposition of the tonnage, the immediate problem with respect to the marketing of No. 1 buckwheat to the industrial plant and to the large office and residential building is less acute. However, despite the headway which has been made, there is no real promise of permanency in these trade victories. Moreover, the basis upon which they have been won is hardly satisfactory. Competitive selling in a price market where the maximum realization is considerably less than the cost of production cannot be called unduly attractive from a financial standpoint.

LOSSES ON STEAM SIZES PILE UP

Although the junior sizes—except in instances so rare that they may be ignored—have always been sold at less than the average cost of production, the situation is much more serious than it was a few years ago. Increasing costs, the burden of which has been placed upon the larger sizes, have widened the price spread between stove coal for example, and No. 1 buckwheat from \$2.12 in 1901 to \$5.43 in 1925. The percentage of small sizes

NOTE—Fifth of a series of articles on the merchandising problems of the anthracite industry. Preceding articles in this series appeared in the issues of April 2, April 9, April 16 and April 23.

which must be marketed is growing. Much of the coal now being recovered in second mining is more or less crushed, thinner seams are being exploited and the more highly pitching seams, and more coal is coming from the southern end of the anthracite region where the measures are more friable and under greater cover than in the north. These facts preclude any hope that the operators might have that the percentage of fines will in the future decrease. The evidence all points in the opposite direction.

WOULD CREATE NEW MERCHANDISING PROBLEMS

With increasing sales resistance, revealed both in actual losses of business to competitive fuels and in price trends, forward-looking anthracite sales executives have been impressed with the necessity for developing a new market to absorb the surplus output of No. 1 buckwheat. The more enthusiastic secretly cherish the idea that it may be possible eventually to place all the tonnage of this size shipped with the domestic trade. Such a consummation would mean not only stabilization in prices, but, if the merchandising basis were sound, an advance that would make this size carry more of the cost load.

A complete change in the character of the distribution of this size would create new merchandising problems as perplexing and as complicated as those now confronting the anthracite industry. The likelihood of an early realization of this metamorphosis, however, seems so remote that serious consideration of all save one of these problems may well be deferred. The problem which must be faced is the question of the effect widening the domestic market for No. 1 buckwheat—and also for pea—will have upon the existing trade in the larger sizes.

Normal shipments of No. 1 buckwheat in recent years have approximated 9,500,000 gross tons per annum; pea shipments have been close to 6,000,000 tons. Although a substantial proportion of the former moves through retail channels to the wagon steam trade and to the office, apartment house and institutional buildings, it is obvious that the success of a campaign of the type indicated in the preceding paragraph would require, not only an individual householder market for between eight and nine million tons—or possibly more—of No. 1 buckwheat, but a new market equally broad for the larger domestic sizes.

In other words, every ton of buckwheat sold to the small domestic consumer displaces an equivalent quantity of egg, stove or chestnut or a competitive fuel. For reasons which will be developed later, egg size anthracite seems to be the most susceptible to displacement in a drive to put No. 1 buckwheat into the householder's cellar. If the anthracite industry can induce substitution of buckwheat for a competitive fuel, the resultant gain is readily apparent. The chances that this could be accomplished at the outset, however, are not promising. The most likely prospect for small anthracite is the man who is now burning the larger sizes.

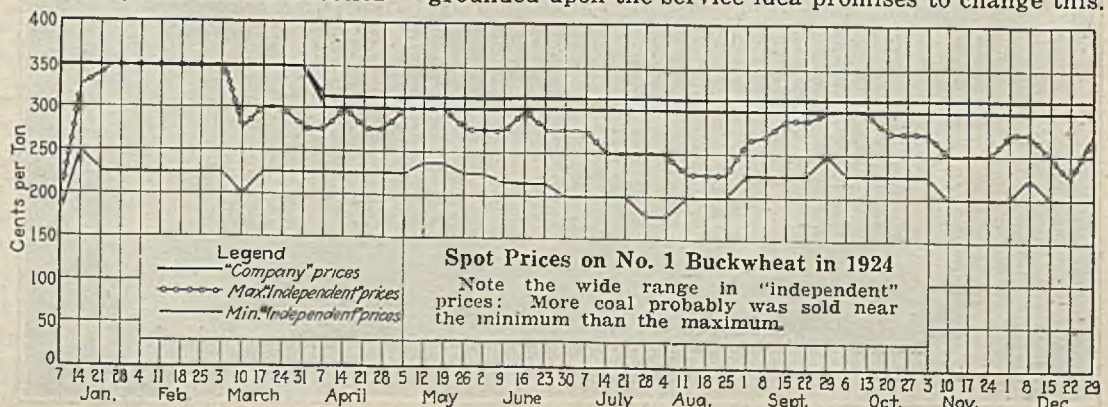
Retail distributors in some parts of the East—notably in New York City and in Long Island towns—are keenly alive to this fact. Because the movement of the larger sizes—particularly stove and chestnut—has been the least troublesome and because the development of a market for No. 1 buckwheat in the domestic trade is still in an embryonic stage, it is possible that some of the shippers have not weighed this necessity as carefully as they might had the initial campaign been to remove No. 1 buckwheat from the steam trade entirely.

But whether the energy of the anthracite producer is devoted to placing all this size through retail channels or only the surplus production which the steam and quasi-domestic trades will not absorb, the essential fact that it means the creation of a market for that much additional tonnage remains. If the larger sizes of anthracite are displaced, it means a double merchandising effort: first, to sell the buckwheat to present consumers of egg, stove and chestnut; second, to find a new market for the egg, stove and chestnut no longer used by those consumers. If the No. 1 buckwheat could go to the consumers who do not now use hard coal, the merchandising effort, of course, would be greatly simplified. In the long run, however, it is immaterial in what ratio these two fields of possible consumption are developed because, regardless of size, there is no escaping the necessity of creating a new market for whatever tonnage may be sold.

TIES IN WITH LARGER QUESTION

This point is emphasized, not with the idea that the attempt to widen domestic demand for No. 1 buckwheat should be discouraged, but to show that the problems in connection with the marketing of this size tie in directly with the larger merchandising problems of the industry discussed in earlier articles in this series (*Coal Age*, April 2, p. 495; April 9, p. 538). As a matter of fact, there are possibilities in the marketing of No. 1 buckwheat which make it one of the strongest weapons that the anthracite industry has in the fight to hold its present business against competition and to extend its area of distribution.

What has been said with respect to No. 1 buckwheat also applies with diminished force to the merchandising of pea coal. Although storage piles of the latter size have been uncomfortably large and financially burdensome at various seasons of the year to the major producing interests, the operators have succeeded in one way and another in working off most of their stocks. The methods employed, however, have not been satisfactory either to the producers or to the distributors. The application of sound merchandising principles grounded upon the service idea promises to change this.



But, probably even more so than in the case of No. 1 buckwheat, the change will be made at the expense of the larger sizes. If the householder can be sold on the idea that he can use one-third to one-half, or more, pea coal, there will be that much tonnage of the larger sizes released for a new market.

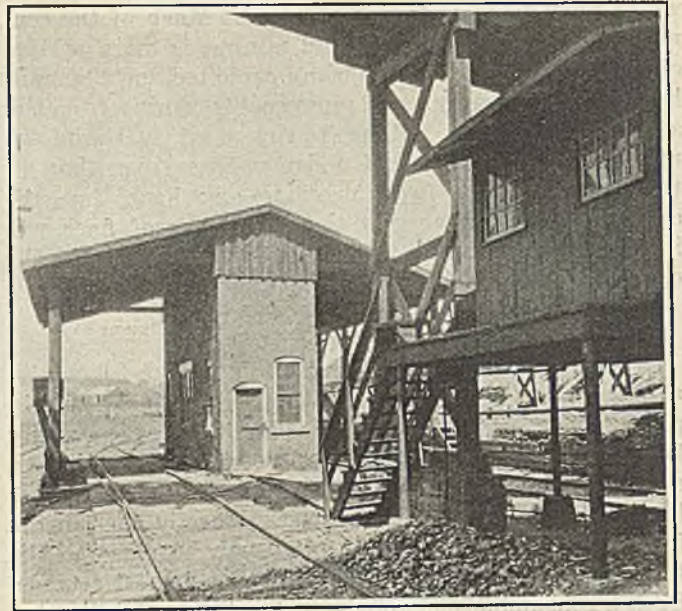
A superficial consideration of these drawbacks might lead to the conclusion that efforts to find a domestic market for small coal are misdirected. It might be said that a drive to merchandise No. 1 buckwheat would further complicate, rather than simplify, the problems of the anthracite industry. It might be said that it would be a case of jumping from the frying pan into the fire with no opportunity to leap back into the skillet if the fuel bed grew too hot. And there are men in the industry who would indorse these views.

There are, however, many reasons why a policy of *laissez-faire* cannot be accepted. Two, already set forth in preceding paragraphs, stand out above all others. They are the insecurity of the existing industrial market for No. 1 buckwheat, which will not absorb all the present production, to say nothing of the increasing percentage of fines which appears inevitable in the future, and the unsatisfactory price conditions controlling that market. However much the anthracite industry might wish to leave this problem to posterity, present necessities will not permit it.

MARKETING MUST DEPEND UPON SERVICE

The producers' predicament may, and does, furnish the urge for the movement to widen the market. But it would be foolish to believe that a household demand could be built upon the operators' necessities. As in the case of pea coal, the successful merchandising of No. 1 buckwheat to the householder must depend upon service to the consumer. If this size has no real place in the consumer's bins, no amount of pleading or compulsion is going to make the ultimate buyer give it a permanent place in his annual fuel budget. It becomes pertinent, therefore, to survey briefly the market possibilities of this coal as a strictly domestic fuel as a groundwork for any subsequent discussion of the merchandising problems peculiar to this size.

These possibilities fall naturally into two well-defined

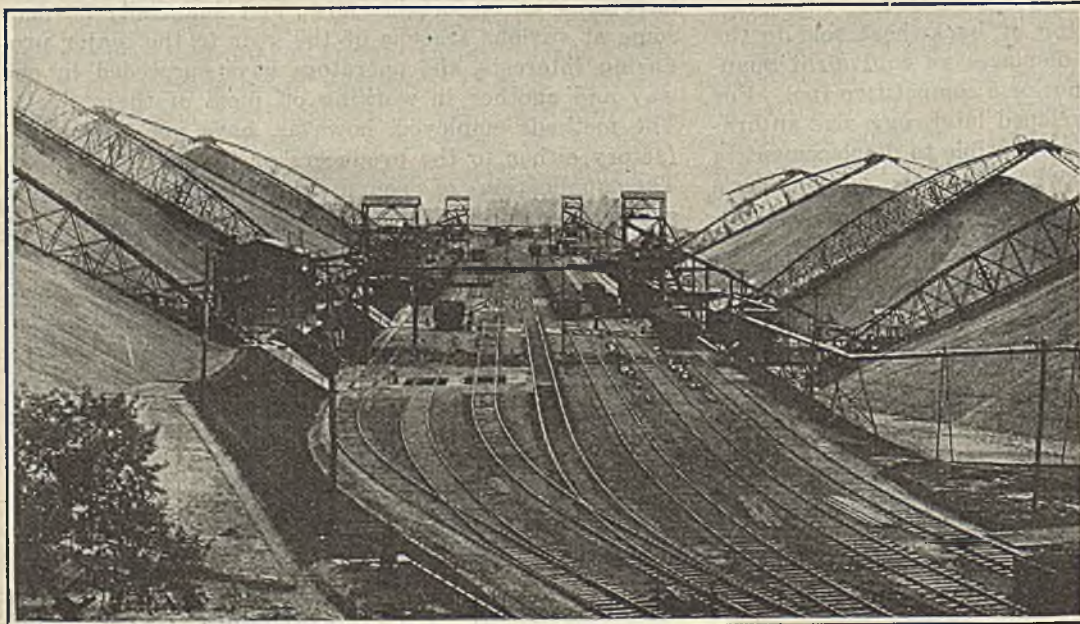


Scale and Inspectors' House, Throop, Pa.

With the domestic sizes of anthracite selling at \$8.25 to \$9 per gross ton at the mines, accuracy of weight and care in preparation are doubly important to the buyer. The final inspection of the coal before shipment is generally made by a force that is attached either to the sales department or to the administrative division—not the mine staff. The new standards of preparation recently adopted by the majority of the producers raise this inspection to a new plane of service.

groups. The first group covers the possibilities with ordinary heating equipment; the second, the possibilities with auxiliary equipment and special types of furnaces primarily designed for the efficient combustion of small coal in the residential heating plant. Theoretically the field of the first group is as wide as that pictured for pea coal. Actually it is somewhat more limited by reason of physical conditions and greater consumer resistance.

If any large percentage of No. 1 buckwheat is used in the ordinary heating plant, it will require very delicate manipulation of the grates. Husky shaking, such as the irate and shivering paterfamilias indulges in when he tries to prod the fire on a cold morning, would shoot the coal into the ash-pit. This drawback, it is true, also exists where pea is burned straight on the ordinary grate, but the greater fineness of the smaller size in-



Bridgeport Transfer

Mine, intermediate and terminal storage yards are used by big producers to balance supply and demand and to enable them to continue operations when demand as between different sizes is uneven. Obviously, however, plants like the one shown, with a capacity of 480,000 tons, add to the cost of marketing, especially when coal is carried in storage unduly long.

creases the chances of the coal's trickling between the grate bars into the ash-pit. Against this drawback might be set the fact that enterprising consumers who are willing to experiment are burning this size successfully in ordinary heating plants. Proper natural-draft conditions, of course, are essential.

Whatever the practical or psychological objections to using No. 1 buckwheat exclusively in an ordinary domestic heating plant may be, they have no force when raised against the use of this coal in conjunction with the larger sizes. Firing each size separately, householders have found that they can obtain excellent results with one-third to two-thirds buckwheat. As a fuel for banking purposes, No. 1 buckwheat has a slight edge upon pea, because it readily packs into a tight blanket which holds the fire over night.

SPECIAL AUXILIARY DEVICES OFFERED

In the field of special equipment, manufacturers have endeavored to aid the buckwheat campaign with special grates, forced-draft and magazine-feed heaters. One of the most popular styles of natural-draft grate can be installed in the ordinary household furnace at a cost of between \$175 and \$200. Many of the special grates, however, are not constructed with the wants of the individual householder in view, but to carry the loads in larger, quasi-domestic heating plants.

There are some devices on the market which are designed to admit an air supply over the fuel bed. The forced-draft auxiliaries are electrically driven and, it is claimed, automatically controlled so that they will cease to function when the natural draft is strong enough to effect efficient combustion. In the early days of the buckwheat drive that was inaugurated late in 1923, considerable publicity was given to motorized equipment which promised to feed the coal, supply the draft and remove the ashes. Without at this time attempting to pass judgment upon the merits of devices of this character, it may be remarked that the mortality in the popularity of such equipment has been unusually high.

MAGAZINE FEED HEATER A SUCCESS

The magazine-feed type of furnace is represented by the Spencer, the Newport and the Molby boilers. All three are long past the experimental stage and enjoy a reputation for giving excellent service. Their field, however, must necessarily be developed slowly. Unlike the auxiliary devices heretofore mentioned, their installation means discarding in its entirety the furnace which the prospect may be using. This, of course, limits immediate sales to new buildings or to old buildings where age has rendered the furnace originally installed unfit for further use or where, if obsolescence has not exacted its final toll, the owner's disgust has outlawed the old equipment. This last contingency among a certain class of home-owners is not so infrequent that it may be set down as a rarity. The initial cost of the magazine-feed type is considerably higher than the cost of auxiliary devices or an ordinary furnace.

The foregoing brief survey marks the fields to be cultivated. It is apparent that cultivation must be a process of education: teaching the consumer in one case how to burn No. 1 buckwheat with his present equipment and, in the other, educating him on the advisability of installing special equipment. How the industry has set about to meet this merchandising problem will be discussed in a later issue.

Prompt Painting Lengthens Life of Steel

BY C. E. REYNOLDS
Parnassus, Pa.

It is a good plan to paint all structural steel as soon as it is unloaded from the railroad car. This should be done before the various shapes are stored in the mine yard. The priming coat sometimes applied prior to shipment by the manufacturer or fabricator does not offer sufficient protection from the weather to prevent rusting throughout any long storage period. Small pieces such as those intended for the legs or collars of three-piece sets may be delivered to the mine without any protective coating whatever.

It is practically as easy to do a good job of painting as a poor one. But to secure best results the paint should be applied while the steel is green, that is, before it has started to rust. On steel that will never be subject to acid water or corrosive gases, one or two coats of graphite paint suffices. If the service conditions to which the material will be subjected are exacting an asphalt or coal-tar paint should be applied. This will afford excellent acid protection.

The life of steel mine timbers is appreciably lengthened by painting before erection. After being put in place their life may be appreciably prolonged by the regular, periodic, brush- or spray-painting of all accessible surfaces. More money can be saved in steel by such a procedure than can be spent in regular painting.

Producing a Good Oxyacetylene Flame

Producing the right flame for oxyacetylene cutting and welding is an art discussed by Arthur Henkell in the April number of the Union Pacific Coal Co.'s *Employees' Magazine*. With the oxygen and acetylene gas tank gages set at the right pressures for a particular job, the operator then adjusts his flame. Says Mr. Henkell:

"The two gases are mixed at the base of the torch tip. In preparing to light the torch, the oxygen valve is usually opened a trifle allowing a slight amount of oxygen to escape, whereupon the acetylene is turned on. With a low pressure outfit the valve is opened wide and after the torch is lighted the adjustment to a neutral flame is made by opening the oxygen valve. Before the oxygen valve has been opened to its proper position, a large open flame is all that is noticed, but as the valve is opened slowly two smaller cones appear, the larger of the two falling away very noticeably as the oxygen valve is opened, and at the neutral point the two cones have just merged. A neutral flame is one having neither an excess of acetylene nor of oxygen, and is readily found by manipulating either valve.

"The flame can be eye-tested at any time with either valve, if the acetylene valve is opened or the pressure increased the two cones will appear. If the oxygen valve be closed a trifle the two cones will appear and are easily merged by opening the oxygen valve or closing the acetylene valve a trifle. The appearance of two cones always denotes an excess of acetylene while a short, pointed, brushy flame denotes an excess of oxygen. A neutral flame is used in nearly all welding operations and gives off the highest temperature obtainable with the torch. An excess of acetylene will carbonize the weld while an excess of oxygen will oxidize or burn it. A slight excess of acetylene is used in welding aluminum and also in some classes of brazing."

Keeping Prepared Sizes to Maximum Proportion

What Can Be Done by Supervision to Get Large Clean Anthracite Run-of-Mine—Making a Record of Mine-Car Contents—Testing an Entire Breaker with a Known Coal Tonnage

By F. B. Davenport
Scranton, Pa.

DURING THE PAST few years the extensive reclamation of culm banks has brought problems of its own. Not infrequently, it may be added, these reclamations have made necessary an engineering investigation to determine what percentage of prepared sizes come from the culm bank and the mine respectively, but it is not of this which this article will treat.

A certain going colliery in the Wyoming Valley come under my observation some years ago. The breaker originally obtained all its coal from underground sources, so that when the reclamation of a culm bank was begun careful tests were necessary to adjust the royalty.

Shipments, for one month in 1919, when the coal was coming direct from the mine, were as shown in Table II, that month's run being regarded as fairly representative. From an inspection of the figures set forth in Table III, it is apparent that the working of the culm bank seriously decreased the percentages of prepared sizes shipped. This had, it is true, been anticipated, but it was not expected that the results would be as marked as those shown in the table. It became necessary to establish some criterion as to what the percentages should be both as to size and refuse, so that it would be possible to tell from the result whether the shooting and preparation at the face was at all times kept up to that certain degree of perfection which the test would prove to be practicable. The miners were paid by the car and it was desirable to ascertain whether they were doing severally all that could be done to produce large coal with minimum impurity. The first part of this investigation consisted in an inspection of the run-of-mine product as it arrived at the dump in the mine cars. Hourly records were kept and at the end of ten days a fairly valuable compilation was available.

STANDARD FORM OF RECORD

In order accurately to chronicle or log an inspection of this kind it became necessary to devise a standard form of record and at the same time put down the notebook data in such shape that they would be accurate and concise, yet give all necessary facts. Naturally, any such procedure as spanning or measuring the topping on a mine car arouses the suspicion of the miners.

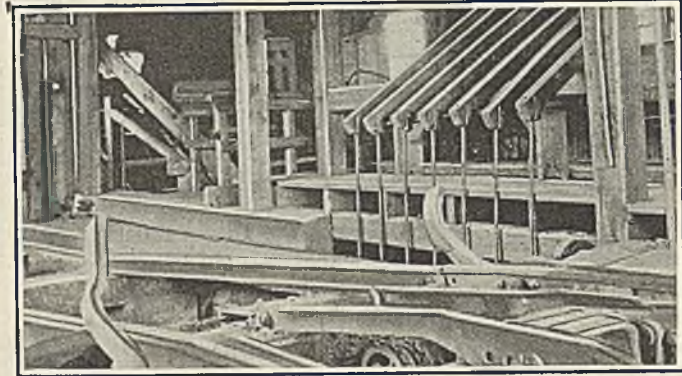


Fig. 1—General Arrangement of a Dump

Although anthracite is a decidedly brittle material small provision is made at many mines to prevent its breakage. It is accordingly slid out of the cars that bring it to the dump house and subjected to a drop of appreciable height that results in much clipping of corners, breakage of lumps and general degradation.

Consequently, to do this openly and accurately is not always possible.

The inspectional guide shown in Table IV was accordingly established and used with a fair degree of satisfaction. The various factors affecting the contents of a mine car of coal were considered and each was given a number. This guide was kept in the back of the notebook for ready reference. Of course other remarks and observations were tabulated but the numbers covered the main topics. By the use of this system, suspicion was allayed, yet a true idea gained of each mine-car load of coal as it was dumped.

KEEP CHECK ON MINERS

The method of recording observations was thus made extremely simple, and the observer could record all facts openly without exciting suspicion. As each car was dumped its contents were observed and the result set down, due record being made of the check number of the miner loading the coal. Thus a car from miner No. 10 was recorded: 10/34. This showed that this car had less than standard topping, and that the coal contained much doubtful material such as bone, rock and slate and, in this case, much fine material or culm. On the afternoon of the same day another car from the same miner and similarly loaded came to the dump,

Table I—Size Standards Referred to in Succeeding Tables, Colliery "A"

Trade Name	Punched Plate, Round Hole, in.		Principal Use
	Through	Over	
Broken.....	4	3½	Gas manufacture and blast furnaces
Egg.....	3½	2½	Gas manufacture and blast furnaces
Stove.....	2½	1	Domestic use
Chestnut.....	1	¾	Domestic use
Pea.....	¾	¾	Domestic use
Buckwheat No. 1..	¾	¾	Steam making
No. 2..	¾	¾	Steam making
No. 3..	¾	¾	Steam making
No. 4..	¾	¾	Steam making

Table II—Output of Breaker for One Month Before Culm-Bank Coal Was Added, Colliery "A"

	Egg	Stove	Nut	Pea	Nos.		Total
					No. 1 Buck-wheat	2 & 3 Buck-wheat	
Total shipments.....	1,694.15	1,055.12	1,274.14	616.15	595.11	887.00	6,094.07
Retained in pocket.....	5.00	20.00	38.00	5.00	2.00	18.00	88.00
	1,699.15	1,075.12	1,285.14	621.15	597.11	905.00	6,182.07
Percentage.....	27.5	17.4	20.9	10.0	9.6	14.6	100.
Percentage of prepared coal.....	65.8						
Percentage of fine coal.....	34.2						

Table III—Percentage Output of Colliery Including Culm-Bank Material, Colliery "A"

	Jan.	Feb.	March	April	May	June	July	Aug.
Egg.....	24.31	25.69	23.07	19.86	15.35	13.27	10.10	8.96
Stove.....	15.85	16.10	13.84	13.89	15.26	12.19	10.19	11.62
Nut.....	19.33	19.67	16.92	19.06	18.45	20.87	23.62	25.39
Percentage of prepared sizes	59.49	61.46	53.83	52.81	49.06	46.33	43.91	45.97
Pea.....	10.21	11.02	11.32	11.37	12.35	15.16	17.58	11.85
Buckwheat								
No. 1.....	10.93	9.68	12.80	11.88	13.26	13.79	13.77	14.11
Nos. 2 and 3.....	19.37	17.84	22.05	23.94	25.33	24.72	25.00	28.07
Percentage of small sizes...	40.51	38.54	46.17	47.19	50.94	53.67	56.45	54.03
Total percentage	100.00	100.00	100.00	100.00	100.00	100.00	100.36	100.00
No. of Mine Cars								
Dumped.....	4,038	3,504	3,771	3,098	3,200	3,588	3,491	3,639
Bank No. 1.....					561	363	356	523
Bank No. 2.....	404	413	1,042	1,243	1,380	1,427	1,313	1,597
Bank No. 3.....						74	177	247

Table IV—Indices of Mine Cars as Dumped, Colliery "A"

Appearance	Index	Remarks
Perfect Car.....	0	High topping and apparently clean coal.
Excellent.....	1	6-in. topping and apparently clean coal.
O.K.....	2	6-in. topping and usual coal.
Doubtful.....	3	Average topping.
Dirty.....	4	Average topping, excess culm and refuse.
Low.....	5	Below standard and subject to dockage.
Bad Appearance.....	6	Discolored.
Condemned.....	7	Consigned to "court house".

and it was discovered later that this man was using too much explosive.

A characteristic record of these observations ran about as follows: 10/34, 11/34, 17/47, 99/2, 51/2, 64/0, 70/0, 50/0, 1/46, 96/3, 1/6.

It is surprising what a variation is possible in the contents of mine cars when a close analysis of the coal is made. Tables V, VI and VII, which tabulate results obtained in this investigation, serve to illustrate this point. In compiling the results shown the content of each car was hand-screened, picked and weighed.

Inasmuch as the individual cars showed such large variations it was decided that a complete run-of-mine test was necessary. This would cover the contents of the mine cars not only as dumped but also as they became after preparation in the breaker. Accordingly the latter was closed down, and the mine cars dumped into standard steel-hopper railroad cars. These were sent to the scales, were weighed, returned, their contents discharged and put through the breaker. The result of this test is shown in Table VIII.

Material for another day's run was loaded, but, because of a breakdown in the breaker, the full three days' run could not be held longer. As a result only the nine standard steel cars (indicated in Table VIII by an asterisk) were unloaded, this constituting the test.

The breaker chutes, pockets, etc., were first cleaned out, two empty cars placed to receive the refuse and a dump car set in position to receive the silt. The

Table V—Test of Mine-Car Material, Car Index 14/0, Colliery "A"

Size of Coal	Round Mesh, in.	Retained on Screen			Per Cent Total Material
		Coal, Lb.	Rock, Lb.	Total Material, Lb.	
Lump.....	44	1,544.5	85.0	1,629.5	
Broken.....	34	274.0	143.0	417.0	
Egg.....	24	306.0	179.0	485.0	
Stove.....	14	324.0	147.0	471.0	
Nut.....	4	297.0	198.0	495.0	
Total prepared sizes.....		2,745.5	752.0	3,497.5	78.53
Pea.....	4	187.0	158.0	345.0	
Buckwheat, No. 1.....	4	191.0	47.5	238.5	
Buckwheat, Nos. 2 and 3.....	4	254.0	.....	254.0	
Total steam sizes.....		632.0	205.5	837.5	19.00
Dirt.....		.....	110.0	110.0	2.47
Total.....		3,377.5	1,067.5	4,445.0	100.00
Per cent, material.....		75.98	24.02	100.0	



Fig. 2—Car Dump and Conveyor to Breaker

Rough handling is the treatment normally accorded anthracite coal. Appreciable degradation of the product takes place between the mine car and the crushing roll. Much of this could be avoided through the installation of the proper equipment.

culm or silt chute was closed off, two men shoveling this material into the dump car. Naturally, a certain quantity of spillage was lost. Lip screenings were caught in barrels.

The nine standard steel cars, indicated by the asterisks in Table VIII, were unloaded and run through the breaker. These contained 497 tons of run-of-mine coal representing the contents of 257 mine cars or wagons. The results are shown in Table IX. For purposes of comparison a *résumé* of the tests on individual mine cars, full details of which are set forth in Tables V, VI and VII, is shown in Table XI.

Several details of the accompanying data require explanation. Thus the inspection given the railroad cars was much closer than that ordinarily accorded them. This was shown by the fact that though two of them were found to contain a greater percentage of impurities than was deemed permissible, they were, when later examined, cleared by the regular inspector.

There also was apparently an excessive quantity of coal and good bone in one car of refuse, this material coming chiefly from the picking table and from

Table VI—Test of Mine-Car Material, Car Index 50/0, Colliery "A"

Size of Coal	Round Mesh, in.	Retained on Screen		Total Material, Lb.	Per Cent Total Material
		Coal, Lb.	Rock, Lb.		
Lump.....	44	2,818.0	16.0	2,834.0	
Broken.....	34	220.0	5.0	225.0	
Egg.....	24	202.0	9.5	211.5	
Stove.....	14	197.5	16.0	213.5	
Nut.....	4	172.0	8.5	180.5	
Total prepared sizes.....		3,609.5	55.0	3,664.5	91.95
Pea.....	4	82.0	7.0	89.0	
Buckwheat, No. 1.....	4	79.5	13.0	92.5	
Buckwheat, Nos. 2 and 3.....	4	92.5	.....	92.5	
Total steam sizes.....		254.0	20.0	274.0	6.86
Dirt.....		.....	47.5	47.5	1.19
Total.....		3,863.5	122.5	3,986.0	100.00
Per cent, material.....		96.9	3.08	100.0	

Table VII—Test of Mine-Car Material, Car Index 63/34, Colliery "A"

Size of Coal	Round Mesh, in.	Retained on Screen		Total Material, Lb.	Per Cent Total Material
		Coal, Lb.	Rock, Lb.		
Lump.....	44	1,523.00	.....	1,523.00	
Broken.....	34	291.50	110.25	401.75	
Egg.....	24	249.75	132.00	381.75	
Stove.....	14	156.25	260.50	416.75	
Nut.....	4	222.00	169.25	391.25	
Total prepared sizes.....		2,442.50	672.00	3,114.50	80.25
Pea.....	4	149.50	100.00	249.50	
Buckwheat, No. 1.....	4	140.90	86.35	227.25	
Buckwheat, Nos. 2 and 3.....	4	241.00	.....	241.00	
Total steam sizes.....		531.40	186.35	717.75	18.51
Dirt.....		.....	48.00	48.00	1.24
Total, lb.....		2,973.90	906.35	3,880.25	100.00
Per cent, material.....		76.64	23.36	100.00	

Table VIII—Coal Set Aside for Breaker Test, Colliery "A"

First Day's Run		Second Day's Run		Third Day's Run	
Scale Wt. Tons	Mine Cars	Scale Wt. Tons	Mine Cars	Scale Wt. Tons	Mine Cars
54.13	29	53.12*	...	56.08	30
55.16	30	54.00*	...	55.12	29
54.08	28	55.12*	...	51.09	28
56.08*	30	55.06*	...		
55.12*	29	54.16*	...	163.09	87
51.09*	28	60.05*	170		
		31.10	16		
328.06	174	365.01	186		

* Indicates run of mine used in the following test. The complete test, therefore, consisted of 497 tons of run-of-mine material from 257 mine wagons or cars.

Table IX—Results of Breaker Test, Merchantable Coal, Colliery "A"

Kind of Coal	Car Wt., Tons	Inspection Test			
		Per Cent Slate	Per Cent Bone	Per Cent Coal	Per Cent Bone
Birdseye—(14.95 per cent ash)	47.10	5	2		
Stove	45.13	5	2		
Egg	46.02	5	0		
Stove	25.05	5	4		
Nut	44.00	7	5		
Pea	34.07	8	0		
No. 1 Buckwheat	39.08	5	0		
Birdseye—(14.10 per cent ash)	14.10				
Nut	45.16	3	2		
Egg	45.11	2	2		
Refuse				Per Cent Coal	Per Cent Bone
Rock, coal and bone	57.94	7	4		
Rock, coal and bone	24.10	21	12		
	82.04				

Estimated as in Pocket	Sizes Merchantable Product			Pocket Coal Added	Per Cent
	Tons	Total	In Cars, Tons		
Egg	3	..	91.13		
Stove	6	..	70.18		
Nut	5	14	89.16	250.47	64.95
Pea	1	..	34.07		
Buckwheat, No. 1	2	..	39.08		
Buckwheat, Nos. 2 and 3	5	8	62.00	135.15	35.05
		22		385.62	407.62 tons

the egg and stove sizes. Usually this material would be sent through a rejigging process and be reclaimed, the oversize going to the stove-coal roll whence it would be returned for reparation. In this test, however, all this material was diverted to the refuse car to be weighed. Later a special roll test was made, and the general results of the original test altered accordingly. This served as a check upon and, in a measure, authenticated the primary data.

All of the foregoing data apply to one mine plant, which for convenience may be designated as colliery "A." The figures hereafter presented are set forth for purposes of comparison and refer to another plant, which here might well be called colliery "B." This latter plant was also a going operation that came under observation about the same time as colliery "A."

Colliery "B" absorbed and prepared a considerable



Fig. 3—A Small Anthracite Breaker

Some breakers are huge structures, both in height and ground area, rivaling many a city office building; others are much smaller and more inexpensive. The quality of preparation made in the smaller building in many instances is fully equal to that attained in the more pretentious structure. Size of breaker thus has small influence on the efficiency of the equipment installed.

Table X—Recapitulation, Colliery "A"

		Net Tons
Run of mine		497.0
Mine wagons or cars	257	
Merchantable coal		407.62
Refuse	82.04 tons	82.04
Culm (caught)	3.10 tons	3.10
Total		492.76
Loss or unaccounted for		4.24
		497.00
Mine-car yield	1,595 tons	
Mine-car content	1,933 tons	
		Lb.
Weight per cubic ft. mine car, coal		58.8
Weight per cubic ft. mine car, content		71.3

Table XI—Résumé of Tests on Mine Cars, Colliery "A"

Mine-Car Test	Coal per Cent	Rock per Cent	All Material per Cent	Car Yields, Tons—Coal	All Material
1	75.98	24.02	100	1.507	1.984
2	96.90	3.08	100	1.725	1.779
3	76.64	23.36	100	1.328	1.732
			Average	1.553	1.832

quantity of "foreign" run-of-mine, yet separate tests of the fee and foreign coals showed practically the same yields of prepared sizes. The operation, however, was such that best results were not obtained. This was because of the rough treatment to which the coal was subjected, the inadequate and antiquated equipment employed and the fact that suitable tests were not made periodically. The results obtained during two months of operation of this plant are shown in Table XII.

One interesting detail in the operation of colliery "B" was the varied car tonnages obtained with inbound foreign coal and the outbound prepared product loaded into the same cars. The figures showing the difference in these loaded car weights are set forth in Table XIII. From this table it will be seen that seven standard railroad cars held 73.15 tons less coal when loaded with sized products than when loaded with run-of-mine. This is equivalent to about 19.5 per cent of the tonnage handled. The discrepancy in weights doubtless arises chiefly from two causes; namely, (1) the lesser proportion of heavy material, such as rock, slate and bone, in coal that has been passed through the breaker, and (2) the greater percentage of voids existing in a product that is uniform in size or nearly so.

Both collieries "A" and "B" were electrically operated and used mine cars of approximately the same size. During cold weather from three to possibly five tons of buckwheat coal were burned per day at each plant for steam-heating the breaker.

Table XII—Results of Two Months' Operation of Colliery "B"

Size of Coal	First Month, Tons	Per Cent	Second Month, Tons	Per Cent
Egg	118.25	8.78	215.65	13.92
Stove	299.35	22.25	310.55	20.04
Nut	345.75	25.70	273.25	24.09
Total prepared	763.35	56.73	799.45	58.05
Pea	105.10	7.80	183.70	11.85
Buckwheat, No. 1	88.85	6.65	214.90	13.87
Buckwheat, Nos. 2 and 3	387.75	28.82	251.40	16.23
Total small sizes	581.70	43.27	650.00	41.95
Totals	1,345.05	100.00	1,449.45	100.00

Table XIII—Difference in Car Loadings, Colliery "B"

Car No.	Inbound, Run-of-Mine, Tons	Net Weight	Kind of Coal Outbound	Net Weight, Tons	Difference, Tons
44,842	58.80	58.80	Egg	41.50	17.30
24,561	50.00	50.00	Nut	40.90	9.10
28,537	50.90	50.90	Nut	38.40	12.50
100,597	60.35	60.35	Buckwheat, Nos. 2 and 3	48.00	12.35
45,457	49.10	49.10	Nut	42.60	6.50
1,146	51.80	51.80	Buckwheat, Nos. 2 and 3	47.60	4.20
1,538	51.45	51.45	Nut	40.25	11.20
		372.40		299.25	73.15



Trees Help to Reduce Costs Of Coal Mining

Wood Shortages and Tremendous Increases in Mine Timber Prices Drive Many Companies to Convert Big Acreages Into Valuable Forests

By R. J. Arthur
Scranton, Pa.



HOW CAN TREES HELP reduce the cost of coal? Mining companies in various sections of the country are interesting themselves in forestry in order to answer the question. Already some real progress has been made by reforestation of waste surface lands, especially in the anthracite region. It is, therefore, worth while to consider what the experience of several companies has been.

The purchasing agent for one of the large anthracite companies said this spring: "Today our timber problem is not so much a question of price as of supply." To those who believe timber is in plenty throughout the region, this may sound far-fetched. However, anthracite mines consumed 567 million board feet of lumber in 1923, which was about seven board feet for every ton of coal produced. This drain on the timber output of Pennsylvania is severe and is already leading to a shortage of the special classes of wood preferred for mine use.

Long grained timber such as chestnut, oak, pine, spruce and hemlock are demanded because they crack and split long before they break. Thus they give mine workers a warning when a settling of the rock structure overhead starts. Short-grained woods are not desired as they break without warning. In several cases the coal companies are restricting the kinds of timber used in various phases of mining. One large company now confines the species used for prop timber to white oak, hard maple, pitch pine, hemlock and beech. Hemlock and beech each comprise not more than 10 per cent of the aggregate.

Note—The headpiece shows a good, healthy growth such as converts surface acreages from waste spaces into profitable areas. This is an example of the forestry work of the Pennsylvania Coal Co. Dead and diseased trees and poor species such as aspen, and fire cherry are kept out of this tract in order to stimulate oaks and maples.

Not only is there a reported scarcity of mine timber, but prices are rising. R. Lynn Emerick, district forester of Scranton, employed by the Pennsylvania Department of Forests and Waters, submits a table of comparative figures showing how the cost of mine timber, quoted in running feet, has increased over a 10-yr. period from 1913 to 1923 thus:

	1913	1923
6-in. props	2c.	5½c.
8-in. props	3c.	8½c.
10-in. props	6c.	12c.
12-in. collar timber	10c.	18c.
5-ft. mine ties	8c.	22c.
Sprags	\$12 per M.	\$27.50 per M.

To protect themselves against the rising costs of mine timber, several of the anthracite coal companies and a few of the soft coal operators are laying plans which ultimately will result in their own production of most—or all—of the timber they need.

Although activities along this line have not been under way long, reports made by coal company foresters show clearly that the move is not only a wise but a highly profitable one even in its early stages.

To demonstrate this, here is a paragraph from a report by G. Miles Robbins, land engineer of the Pennsylvania Coal Co.:

"It should be noted that, during the year 1922, forest protection cost the real estate department \$317.78. The net income from forests that year was \$875.97. Forest fire protection in 1923 cost exactly \$288.13. The income received during that year from timber harvested on an 'improvement cutting' basis was \$2,382.89, leaving a net income of \$2,154.76."

However, the company was not paying a forester's salary. Mr. Robbins' own expenses were covered in the real estate department budget and forest fire fighting when need arose was done by crews of miners.



This Is Not Really No-Man's Land

Instead, it is an acreage belonging to a coal producing company. The area is a dead waste, thanks to the ravages of fire, improper logging, at some previous time, and to lack of reforestation. But there is hope for this region. A coal company that owns it is about to plant it to chestnut, oak, pine and hemlock, all of which are long-fibre woods especially satisfactory for underground use.

Everyone knows that forests prevent floods and erosion of the soil, and that they protect fish and game, besides furnishing lumber, fuel, shade in the summer, and the like. But scarcity and the increasing prices of mine timber are the factors that impel mining companies into forestry operations.

The Pennsylvania Coal Co. was one of the first mining companies in the anthracite region to protect its woodlands. A survey of the timber lands of that company and the Hillside Coal & Iron Co. was started in June, 1920, and finished in the following year.

The timber lands were carefully examined and the area and location noted on blue-prints. These areas were divided into two classes: (a) Areas which had a sufficient number of young trees and seedlings to insure a good stand of timber if allowed to mature—this growth consisting mainly of oak, maple, beech, ash and a few scattered pine, poplar and chestnut trees—and (b) areas which were covered with a thin growth of young trees and seedlings, or small, open fields. Most of this land can be used for no other purpose than that of growing timber. These timber lands are located in Wayne, Lackawanna, Luzerne and Susquehanna counties and cover an area of 18,000 acres; 15,000 of which are under the direct control of the Pennsylvania Coal Co.

In order to protect these woodlands and increase the annual growth of timber, so that a certain quantity of wood could be harvested annually, three things had to be done. The present stand of timber required guarding from fire, the land had to be reforested either naturally or artificially, and all timber harvesting had to be put on an "improvement cutting" basis.

The first and most important factor in reforestation is keeping fires out of the timber zone. Fire destroys humus, seed, seedlings, small trees and often injures and finally kills larger trees. The company has at the present time a force of picked men who are employed at the mines but whose further duty it is to extinguish forest fires. Such a group of men is called a fire crew. At the present time a fire crew consists of one fire warden and five men who can be summoned quickly.

Forest lands can be restored either by natural or by artificial regeneration. If fires are kept out of the

woods, a large percentage of the timber lands would reforest themselves and cost much less than if the work were done by artificial regeneration. No trees should be planted unless there is good protection against fire and against browsing cattle.

Harvesting should all be done on an "improvement cutting" basis, or in such manner as to improve the forest by the removal of defective, inferior grade, and crowded trees. At the present time all Pennsylvania Coal Co. timber is cut thus.

A. C. Silvius, a graduate forester, who has many years of practical experience, and who is now in charge of the forestry work for the Philadelphia & Reading Coal & Iron Co., in discussing practical forestry as developed by that company, pointed out that the company has divided its forest area of 170,000 acres into four districts and the districts into fifteen ranges. Each range or division is in charge of a regularly employed warden or ranger. Each district is administered by a district ranger or forester.

The company has 18 or 20 wood choppers cutting timber to supply the mines. These men have been doing more or less selective cutting, following rough silvicultural methods, for about twelve years.

During 1921 this organization cut and delivered to the collieries 6,800 tons of logs, props and laggings, while in 1922, due to the strike, only 4,200 tons were produced. The total cut including contract and timber



Here Is a Remedy for Waste Land

This is a native Pennsylvania red pine. It was planted as a seedling in 1920 with 40,000 others in one of the Pennsylvania coal regions. By the end of last summer it had attained the height shown here—6 ft., 3 in.—and is now well on its way to become valuable mine timber. Many coal companies operating both in anthracite and bituminous regions are conducting careful programs of reforestation with trees like this.



G. Miles Robbins

He is land engineer in charge of forestry operations for the Pennsylvania Coal Co.

account is credited with the estimated value of the timber as it stood in the woods prior to harvest and any balance after the cost of logging and hauling is deducted, is placed in the "forest improvement" account.

The company's forester has expressed the opinion that the forests are growing at least 100,000 tons annually, which is far less than these areas can and should produce. The company is cutting less than the present growth or sustained yield.

DEPARTMENT MORE THAN SELF-SUPPORTING

With an average timber department field personnel of 35 men, and half this number used and employed at purely protective and improvement work, the department has been more than self-supporting. To cite the constructive development work done in 1922 on the 170,000 acres, the following items of chief expenditure are mentioned:

Planting trees and nursery development.....	\$1,950
Roadside cleaning and improvement cuttings.....	1,600
Painting and blazing boundary	125
Surveying and mapping	650
Fire extinction	3,500
Removing fire hazards, etc.	1,150
Brushing and mowing roads, trails and fire lands.....	6,275
General protection	3,500
General administration and supervision.....	4,250
Stationery and printing	440
Tools and supplies	100
Co-operation (state)	540
Total	\$23,040

In 1922 the company planted 110,000 forest trees of the following quantities and kinds: Seventy thousand

department labor for 1921 was 37,475 tons, while for 1922 it was 27,150 tons.

In the marketing of the timber the colliery at which it is delivered is charged a price slightly less than the ruling quotation on the same material in the outside market. This is done because the timber now being taken is of a somewhat inferior quality.

The land department "stumpage" ac-

Scotch pine, 5,000 Norway spruce, 14,000 Japanese larch, 1,000 hard maple, 10,000 white pine and 10,000 white ash. The forestry nursery was enlarged to accommodate 90,000 one- and two-year seedlings. During the spring of 1923 about 256,000 seedlings were set out.

The fire record for 1922 showed that \$10,317 damage was done by forest fires on the company's land. It cost the company \$3,298.13 to extinguish fires or an average cost per acre of 85c. The average damage per acre was \$1.53. The average damage per fire was \$48.42.

In commenting on his organization, Mr. Silvius said, "Our forestry organization functions in a manner similar to that existing on the state forests except that greater stress is laid on utilization. This is necessary because the products of the forest must bear the entire cost of operating the department."

It might be assumed that only anthracite operators have awakened to the need of the practice of forestry on their lands. This is not the case.

The board of directors of the Clearfield Bituminous Coal Co. passed a resolution not many weeks ago to the effect that two million forest trees are to be planted annually on its property. This company has already started its own tree nursery, it has two trained foresters in charge and maintains its own sawmill and woods operations.

It will be conclusively demonstrated that practical forestry by coal companies is more than a myth, by the following figures, which show the gradual increase in the number of trees obtained annually by Pennsylvania mining companies from the state for planting:

Year	No. of Trees	Year	No. of Trees
1917	155,000	1921	393,100
1918	131,000	1922	840,000
1919	200,400	1923	1,137,175
1920	320,000	1924	2,315,895



A. C. Silvius

Forester for the Philadelphia & Reading Coal & Iron Co. He oversees forestry work on 170,000 acres.

Beauty Combined With Utility

This is an example of what is done with hillsides in the watersheds of the anthracite region. Timber there is a most important item in the cost of coal. In 1923 the anthracite field consumed 567 million board feet of lumber or about seven board feet per ton of coal mined. Between 1913 and 1923 the cost of this material practically doubled in the Scranton territory. No wonder anthracite mining companies are going in extensively for reforestation!



Conference at Pittsburgh Treats Coal Problems

Dust of 200-Mesh Generates Higher Pressure in Explosion Than Finer Sizes
—Will Pulverized Fuel Reduce Demand for Coal?—Dr. Wheeler
Talks of Coal Origin and Constitution

By A. F. Brosky

Assistant Editor, *Coal Age*
Pittsburgh, Pa.

EXPLOSION of coal dust, spontaneous combustion in mines and storage piles, the growing use of pulverized coal and its effect on industrial fuel demand, the future of coking, and subjects relating to the origin, geology and constitution of coal were treated at a coal conference in the Pittsburgh station of the U. S. Bureau of Mines on April 23. The conference lasted through the morning and afternoon and was attended by not more than 100 men. This was a slim attendance considering the importance of the meeting.

Dr. R. V. Wheeler, professor of fuel technology at the University of Sheffield, England, was one of the principal speakers. Dr. Wheeler also delivered two lectures in Pittsburgh at separate sessions but in conjunction with the coal conference. These are reported at the end of this article.

The conference on coal was the second annual open conference of U. S. Bureau of Mines men, British experts and others representing state and private interests. A number of pressing problems confronting the coal industry were discussed. A. C. Fieldner, superintendent of the Bureau's Pittsburgh station presided.

After a few words by George S. Rice and an illustrated talk on the "Origin of Coal" by Dr. R. Thiessen, research chemist of the bureau, Dr. C. R. Fetke, professor of geology, Carnegie Institute of Technology, spoke on the "Geology of Coal."

Then followed a talk by Dr. Wheeler on the "Constitution of Coal with Special Reference to Inflammability of Coal Dust and Spontaneous Combustion." He urged the need for more knowledge of the composition of coal, which will involve long and weary studies, adding: "Though it is possible to carry out empirical tests of inflammability and spontaneous combustion of coal, one can never rely entirely upon the results obtained by them."

COMPOSITION OF COAL DUST IMPORTANT

It is possible to determine in a relative way the resinous constituents of coal, which, in small sizes of dust, are highly inflammable. But fineness of coal dust is only one factor; its composition is another which must not be overlooked. Varying finenesses of coal dust interfere with tests to arrive at the degree of inflammability due to composition. While the volatile proportion of coal indicates in a general way its inflammability, it should not be relied upon entirely as a measure.

C. M. Bouton, research chemist of the Bureau, talked on the "Inflammability of Coal Dust with Special Reference to Effect of Fineness of Particles." The relation is of importance in the study of powdered coal as a fuel as well as of its influence in coal dust explosions in our mines. So far, the Bureau has confined its laboratory study of this relation to tests in which is

observed the liberation of heat from uniformly sized samples of fine dust.

Each 0.1-gm. sample is projected as a cloud by a puff of air or oxygen in a closed vessel and ignited by an electrically heated filament of metal wound on ceramic material. As it is easier to measure the maximum instantaneous pressure in the vessel than it is to ascertain directly the heat generated, from the former is determined the latter. Pressures at each instant are measured by a Taffanel manometer which involves an optical lever mechanism and a moving photographic film. One of the chief difficulties encountered in carrying out these tests lay in the dispersion of the fine dust particles as a cloud in the sealed vessel. Nevertheless, it is believed fairly accurate results have been obtained by this method.

Mr. Bouton states that colloidal (infinitely small) particles of coal dust do not settle on the surfaces of mine passages but are carried out by the ventilating currents. Sizes larger than 10 mesh are not known to take part in producing an explosion. Although it is generally conceded that fine particles are more inflammable than the course, the laboratory tests as carried out in the Bureau of the relative inflammability show that the extremely fine sizes may not be as explosive as those of approximately 200 mesh.

SEPARATED SAMPLES INTO FOUR FRACTIONS

In the tests, samples of coal dust from the Pittsburgh seam were separated into four fractions by a process of air-elutriation. The limits of these sizes are respectively 0 to 10 microns (a micron is 0.001 cm. or 0.00039 in.), 10 to 15 microns, 15 to 25 microns and 25 to 74 microns. The larger limit of the last sample, 74 microns, is equivalent to the measurement of a 200-mesh screen opening.

An analysis of results of one representative test of four samples follows: Sample 1, in which the particles varied in size from 0 to 10 microns, produced a maximum pressure of 294 gm. per sq.cm., equivalent in evolved heat to 34.4 calories; sample 2, in which the size varied from 10 to 15 microns, produced a maximum pressure of 352 gm. per sq.cm., equivalent in evolved heat to 42.0 calories; sample 3, in which the size varied from 15 to 25 microns, produced a maximum pressure of 570 gm. per sq.cm., equivalent in evolved heat to 67.5 calories; sample 4, in which the size varied from 25 to 74 microns, produced a maximum pressure of 425 gm. per sq.cm., equivalent in evolved heat to 50 calories.

It is seen from an inspection of these data that the two samples of middle sizes produced a greater maximum pressure than the first sample which is the finest. The smallest size sample contained 36.5 per cent volatile and 2 per cent ash while the coarsest size sample analyzed 38.2 per cent volatile and 4 per cent ash.

All sizes show only partial combustion in the tests. This fact might lead to the belief that the dust particles contain a small proportion of readily combustible material which is at once attacked by oxygen, after which no further combustion takes place. It is not yet known why the smaller sizes in the tests are less combustible than the larger, but it is conjectured that the variations with size in the chemical composition of particles may be due to the difference in friability of the coal constituents.

The rosy prospects for the utilization of pulverized coal in industry were treated in a paper by P. Nicholl, fuel engineer of the U. S. Bureau of Mines on the "Significance of Pulverized Fuel Combustion to the Coal Mining Industry." He said coal men should not fear that the greater efficiency of powdered coal will cut down industrial demand for coal. Cheaper production of a finished product inevitably leads to a greater demand for it and consequently for the raw product. Mr. Nicholls' paper will appear in a later issue of this magazine.

A talk on the "Relative Influence of Coal Constituents on the Washing and Preparation of Coal," illustrated by a series of curves on lantern slides and dealing chiefly with the effect of washing on the sulphur content of coal, was delivered by H. F. Yancey, engineer of the U. S. Bureau of Mines.

J. D. Davis, fuel chemist, U. S. Bureau of Mines, spoke on "Spontaneous Heating of Coal in Mines and in Storage." Although certain constituents of coal are likely to oxidize faster than others, tests at the bureau have shown little difference in the rate. It is probable that oxygen first combines with coal to form solid unstable products which readily break up, yielding nascent oxygen. The latter attacks the coal giving the ordinary oxidation products: Water, carbon dioxide and carbon monoxide. Pyrites in a finely divided state is believed to accelerate heating.

Results from experiments indicate that the lower the rank of bituminous coal, the more rapid the heating and that the rate of oxygen absorption is directly proportional to the rate of heating.

If a coal, of normal moisture content, is supplied with oxygen or air which has been saturated with moisture at room temperature, the heat absorbed by evaporation of moisture from the coal may, at 70 deg. or thereabouts, be sufficient to overbalance the heat of oxidation and thus cause cooling of the coal. When the tests were started at temperatures of 40 deg. C. or above, and none of the generated heat was allowed to escape, all bituminous coal tested, if moderately dried and supplied with dry oxygen, showed characteristic heating curves. The latter were presented by means of lantern slides in the conference. Mr. Davis believed all these coals will heat to ignition.

A paper on the "Present Status and Possible Future of Byproduct Coking" was read by Dr. Joseph H. James, head of the department of chemical engineering of the Carnegie Institute of Technology. Dr. James outlined the progress of the day in coking processes.

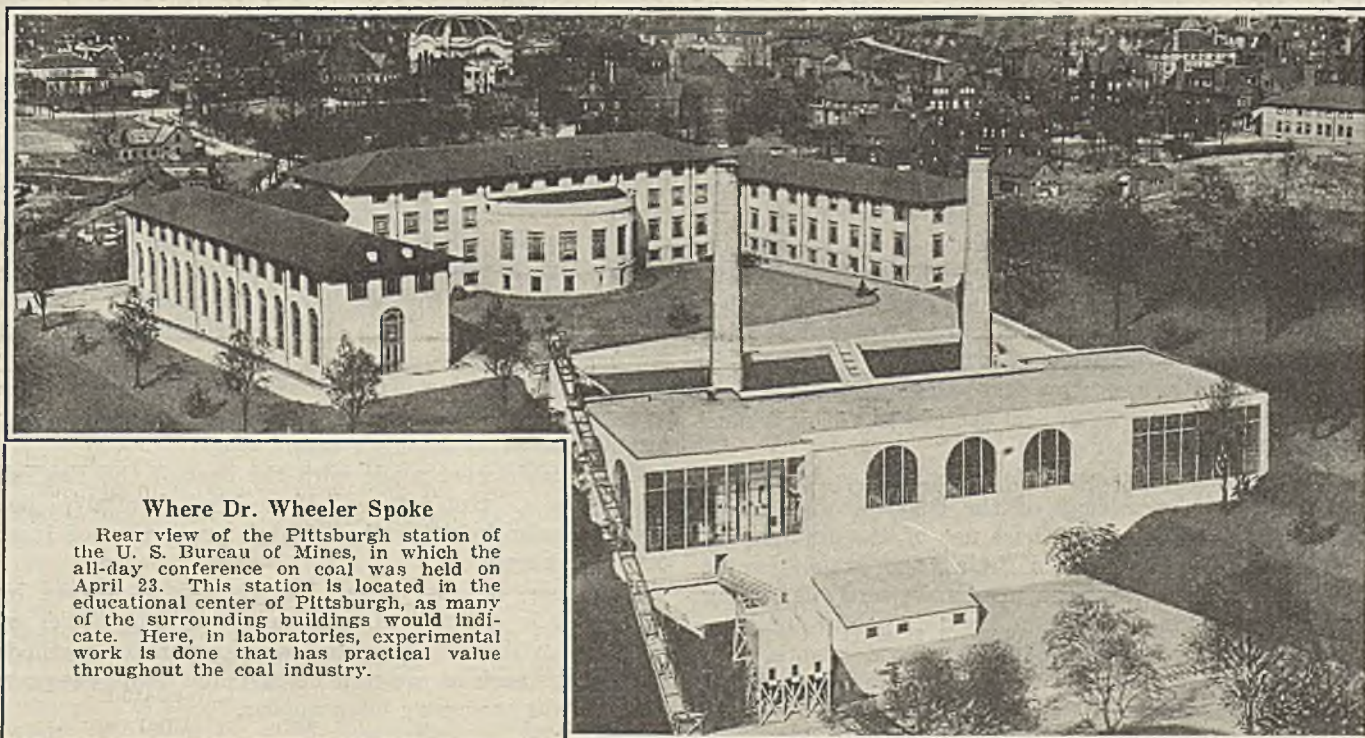
He described several methods of high-temperature and low-temperature distillation and remarked about the increasing efficiency in the use of coal in American steam plants. The average consumption of coal per kw.-hr. was lowered from 3.2 lb. in 1919 to 2.4 lb. in 1923.

Dr. Wheeler said he knows of no low-temperature carbonization processes in commercial operation either in England or in continental Europe. Most of the schemes are operating only on paper.

DR. WHEELER DELIVERS TWO LECTURES

Dr. Wheeler's two lectures given in conjunction with the all-day "Conference on Coal" were delivered in the administration building of the Carnegie Institute of Technology. The first, on the night of April 22, was entitled "Constitution and Origin of Coal." On the following evening he delivered the second, on "The Relation of Constitution and Origin of Coal to Practical Problems in Mining, Storage and Utilization." There was an attendance of about 300 at the two lectures.

Dr. Wheeler, in his first lecture, said the elements of ancient plant life which go to make up coal are no different from those which are contained in the plants



Where Dr. Wheeler Spoke

Rear view of the Pittsburgh station of the U. S. Bureau of Mines, in which the all-day conference on coal was held on April 23. This station is located in the educational center of Pittsburgh, as many of the surrounding buildings would indicate. Here, in laboratories, experimental work is done that has practical value throughout the coal industry.

flourishing in the present day. The principal constituent of coal is cellulose which exists in some stage of decomposition, though it is one of the more resistant parts of plant life remaining in coal. The cuticles are resistant as are also resins. Those substances which are resistant have accumulated in coal, those most susceptible to decomposition have disappeared.

Turning to the factors entering into the chemical and physical separation of coal into a few of its complex parts, he said solvents as a class are without action on coal. This makes analysis difficult. Chloroform has a slight solvent action on coal. Pyridine, when allowed to act on bituminous coals, extracts from 10 to 40 per cent of the resinous substances. The insoluble matter will not coke but that which is soluble forms a fluffy weak coke.

In England, for the sake of simplicity, bituminous coal is divided into three parts which are spoken of as *alpha*, *beta* and *gamma* compounds. Alpha compounds are those which are insoluble in pyridine, beta compounds are those which are soluble in pyridine but insoluble in chloroform, and gamma compounds are those which are soluble both in pyridine and chloroform. Of these, the gamma compounds, which form a sticky mass of paraffin hydrocarbons, are of the most immediate importance.

Attempts have been made to analyze coal in three ways: By the use of pseudo solvents (pyridine and chloroform); by the use of reagents, and by destructive distillation. The first and last methods have been the most successful, though they have been far from satisfactory. Nitric acid, an oxidizing reagent, is too violent in its action to be of any use in coal analysis. Air is a mild oxidizing agent of coal. It is possible after drawing air through a mass of coal at temperatures of 100, 150 and 200 deg. C. to oxidize certain of its ingredients which are then soluble in an aqueous solution of caustic potash. The extract is brown in color. Hydrogen peroxide is a mild solvent of coal ingredients.

Dr. Wheeler touched lightly on four physical parts of coal which are fusain, vitrain, clarain and durain. Fusain is the sooty parting on cleavage planes of bituminous coal, the only part which soils the fingers. He dislikes the application of the term "mother of coal" to this part, suggesting the term "mineral charcoal" in its stead. These four parts have different characteristics as observed by the naked eye, or under a microscope.

In days gone by, it was the impression in England that durain is opaque and structureless. This impression was made current because petrographic sections could not be made thin enough either to be transparent or to show structure. It remained for Dr. R. Thiessen, of the U. S. Bureau of Mines, to prepare for the British investigators several sections of durain which were thin enough for the observation of structure. The English have developed a new way of observing structure, in which polished surfaces of coal are etched with chromic acid.

Professor Wheeler began his second lecture by saying that a lack of knowledge of the constitution of coal hinders us in making the best use of it. In a broad sense the ultimate analysis giving the proportion of elements in a coal and the proximate analysis giving the percentages of volatile and fixed carbon are of little value to the user of coal. What is wanted is some form of analysis which may be expressed in terms that will enable the consumer to determine more accurately the

uses to which various coals can be put. Coal is made up of resins, cuticles, spore-exines and solidified jelly. If a true analysis of these constituents could be made, their proportions in a coal would express properties the knowledge of which would aid materially in determining the best use for each coal.

But how will knowledge of coal expressed in this way be of assistance to us? There are three answers: First, it will enable us to determine the flammability of coal dust as an aid in the study of mine explosions and powdered fuel. Resins liberate a high proportion of inflammable gas. Consequently if a coal contains much resin, one would feel sure that it is highly inflammable. Second, it will permit of a better understanding of the weathering of coal on the surface and spontaneous combustion underground. Those ingredients in coal which are most readily oxidized are coalified ulmins. Third, it will make us more familiar with the coking properties of various coals. The coking properties of coal vary with the proportion of gamma compounds (mostly resinous substance) which it contains.

EFFECT OF GAMMA COMPOUND

Mr. Illingworth, of England, has studied the effect of various proportions of gamma compound constituent on the coking quality of coal. He has also studied the degree of ease with which the gamma compound content of coal is decomposed. He holds that gamma compound should represent at least 5.6 per cent of a coal if the latter is to make good coke. The gamma compounds also should show considerable stability in the presence of heat. At 450 deg. C. only half of these compounds should be decomposed.

He arrived at these conclusions by a series of tests in which charges of coal were coked at two different heats. The charges were composed of ground bituminous coals sieved to standard sizes with which were mixed varying percentages of coal without coking properties. Calcined anthracite was utilized for the latter purpose. The charges were coked (1) by rapid heating in a muffle furnace at 760 deg. C. for a period of seven minutes and (2) by a slow heating for a period of three hours, during which period the temperature was raised from that of a cold furnace to 760 deg. C. Only one of the two heats was applied to any one charge. The fast heat determines the quantity of gamma compounds in a coal and the slow heat their stability.

The gamma compounds act as the binding material in coke. These become fluid on the application of heat and run over the mass of the coke aggregate, later decomposing and forming a hard mass. In his experiments Mr. Illingworth has discovered that the pure coking coals which he used have little crushing strength when coked alone. When these were mixed with high percentages of calcined anthracite (as much as 80 per cent), this crushing strength was greatest. With the slow rate of heating the crushing strength is never as great as with the high rate.

These tests were made with the best of the English coking coals. Not only will these bind themselves but they will also hold together a high proportion of inert or non-coking coals.

Professor Wheeler concluded his second lecture by saying it is difficult to express the coking power of coal, but with the continuous development of methods of analysis such as are now being made, some adequate scheme will sooner or later appear.



News Of the Industry



Large-Scale Mergers Seen as Only Relief For Sorely Beset Coal Industry

Most Other Schemes Would Involve Legislation of Regulatory Character, Which All Interests Seek to Avoid—Success of Steel Corporation Holds Out Encouragement

By Paul Wooton

Washington Correspondent of *Coal Age*

Large-scale consolidations among coal producing companies, in the opinion of competent authorities, offer the only available relief from the present intolerable situation in the coal industry. Many leads have been followed in efforts to find the way to stability for the industry, but each of these, save two, has proved to be a blind alley.

Were co-operative district selling agencies legal, decided relief could be obtained, as they would permit united action to prevent overproduction, which is the cause of most of the trouble. Before this plan could be put into effect, however, legislation would be required, and legislation is the one thing that the coal industry is most anxious to avoid. Regulatory features would be inserted before any coal bill could get through, all admit. For that reason there is no sentiment for a drive to put over the district selling agency idea.

The success that has attended the application of the consolidation plan in the steel industry holds out encouragement to the producers of coal. The United States Steel Corporation embraces 45 per cent of the country's production and the transaction has been approved by the Supreme Court. Subsequent consolidations among independents have been set up around Bethlehem and Midvale. This constitutes a legal means of stabilization which does not require legislation. Moreover, the idea has been indorsed by the American Federation of Labor and is coming to be understood generally as being in the public interest.

Depression Favors Mergers

In coal the process of consolidation, to be effective, would not have to go nearly so far as it has done in steel. The present is the natural time for such action. A period of intense depression is the signal in all lines of business for a tendency toward mergers.

The thought is expressed that this is just the time that the railroads, other utilities and large consumers should provide for their own future needs by acquiring coal properties. Large consumers, it is held, should abandon their policy of letting the other fellow lose

money in such times as these. They would be better advised, it is contended, were they to buy up coal lands and make provision for systematic production and a permanent supply of fuel.

When the prices of coal mines and coal lands were at their peak, during the war and just afterward, many utilities and large consumers bought coal properties. That policy appears to have been abandoned at just the wrong time.

Little Hope for Lower Wage

Not all operators are convinced that relief via the wage-reduction route leads into a blind alley. There is increasing appreciation, however, that wage reductions would have to be drastic to bring about any recovery in the union fields, and even then the union operators would have to pass on the entire reduction. Moreover, there is no reason to believe that any wage reduction can be obtained. The union appears to be adamant. The administration has no thought of attempting to bring about a reduction. Even if it did, the union would find in such a move a pretext for striking. The Southern producers who could keep on working doubtless would not object to furnishing the country's coal for a period of time at \$6 a ton.

Friends of the administration are inclined to believe that the attacks on the federal policy of hands off in the present situation are coming from a few operators who, since it would not close their mines, would benefit from a strike. It is admitted that the Jacksonville agreement has had a more disastrous effect on the union operator, as distinct from the non-union operator, than had been anticipated, but it was obvious at the time that the industry had reached a point where the deflation of its excess capacity could not be delayed longer. It was a foregone conclusion that any process of deflation would bear hardest on the union operator. No conceivable substitute for the Jacksonville agreement could have had any other effect.

Sight frequently is lost, it is believed, of the absence of any alternative to the course pursued at Jacksonville.

German Leaders Marvel at American Miners' Wages

Dr. Wilhelm Funcke, managing director of the Good Hope Smelting Co., of Oberhausen, Rhineland; Dr. Karl Hoelzer, designing engineer of the same company, and Dr. Heinrich Unterberg, managing director of the Rhinepreussen mines at Homberg, on the Lower Rhine, were guests of S. D. Dimmick, vice-president and general manager of the Glen Alden Coal Co., during a tour of the anthracite region on April 22 and 23. Dr. John G. Kreer, vice-president of the American Wood Impregnation Corporation of New York City, accompanied them.

Labor wage rates in Germany, they explained, while now at comparatively high levels—higher than at any time in the past—are still only about one-fourth of the prevailing scale in this country. The miner in Germany, who works a full eight-hour day, as against the practice here, gets 7½ marks, or about \$1.85 a day, as compared to the average of \$8.90 in the anthracite field. The workers corresponding to the "company men" here get 6½ marks, or about \$1.50 a day, as against \$5.50 in this region.

There was, of course, the alternative of demanding a reduction of wages. This had been tried unsuccessfully in 1922. After that failure many operators saw little chance of winning anything if a strike was called and there was the certainty that all business would be lost to the non-union fields for an indefinite time. There also was the specter of calling down regulation on their heads.

Had there been a strike the union operators might have benefited temporarily from higher prices, but that would have made the permanent solution more difficult, as it would have brought in new capacity.

Five Killed by Explosion in Pennsylvania Mine

An explosion at the Humphrey Mine of the Westmoreland Coal Co., near West Newton, Pa., April 26, caused the deaths of five construction workmen.

One man, on the tippie when it was wrecked by the force of the blast, was blown to bits, and the bodies of the four others were found early the next day along the slope about 600 ft. inside the mine.

Carriers Oppose Extension Of Transshipment Rates to Black Tom Pier Deliveries

Extension of tidewater transshipment rates to bituminous coal handled over Black Tom pier—part of the New Jersey terminals of the Lehigh Valley R.R.—was demanded by the Harbor Coaling Corporation in a hearing of its complaint against the Baltimore & Ohio and other tidewater lines held before Charles W. Griffin, special examiner of the Interstate Commerce Commission, in the assembly room of the Merchants' Association, Woolworth Building, New York, April 24. The base transshipment rate to the piers served directly by the Baltimore & Ohio, Jersey Central, Pennsylvania and Reading railroads is \$2.79 per gross ton. The local rate, which the complaint pays on deliveries to Black Tom, is \$3.09.

Henry D. Tudor, principal witness for the complainant, testified that since his company leased part of the Black Tom facilities several months ago and reconditioned them for coal handling, it had been developing a business in coaling tugboats. Most of these take from 10 to 20 tons at a coaling. The coal was dumped into a pocket for storage, and then weighed out and discharged into the tugs as needed. At other piers in the harbor, the witness said, the \$2.79 rate applied, putting complainant at a 30c. disadvantage in competing for business. Rival companies, he asserted, would watch the tugs coming to Black Tom and then telephone the owners in an attempt to steal the business. As proof of the injustice of applying the local rate to the pier, Mr. Tudor said that it was impossible to get within a half mile of Black Tom with a truck.

Historically, explained J. T. Carbine, coal freight agent of the Pennsylvania R.R., transshipment rates lower than the local charges are the outgrowth of competitive conditions which developed back in the early '90's when the Southern lines made such a drive for Northern business that actual rates to the Northern ports were depressed and it became necessary for the Pennsylvania and the New York Central to acquire control of certain lines reaching the Southern ports to prevent bankruptcy. From an operating standpoint, the lower rates were justified because the traffic was handled in such large units. The Pennsylvania, for

The Davy Mad Dog Story

A mad dog in England nearly deprived the coal mining world of the benefit of the Davy safety lamp. Sir Humphry Davy, who later invented the lamp, was one day walking with his own dog when a canine suffering from hydrophobia attacked it. Sir Humphry assailed the mad dog with his walking stick and was bitten severely on the leg. He managed to seize the dog by the neck and held it down until it was killed. Then, as the story goes, he deliberately opened his penknife and cut from his own leg the lacerated flesh before time enough had elapsed for the poison to take effect.

example, had constructed its low-grade line to South Amboy primarily to handle the bituminous coal tonnage. Movement to Black Tom means a two-line haul with greater delay and less favorable grades.

Answering the contention that companies engaged in coaling tugs at the Greenville pier were unduly preferred over the complainant, Mr. Carbine said that, in addition to the transshipment rate, such companies were charged 38c. when the coal was handled through storage pockets. Mr. Carbine and the other railroad witnesses insisted that existing railroad pier facilities enjoying the transshipment rate were ample.

C. H. Asher, general coal freight agent of the Baltimore & Ohio R.R., emphasized the railroad view that transshipment rates should be limited to piers reached over the rails of the principal coal-carrying lines. An exception had been made in the case of the Jersey Central and Reading, but in that case the Baltimore & Ohio had joined in the extension of the transshipment rates to those piers because it was necessary to obtain trackage rights over those roads to reach its own piers at Staten Island.

William B. Gheen, coal freight agent of the Philadelphia & Reading, supported the contention that a further extension of transshipment rates would effect a diffusion of traffic flowing to tidewater that would defeat the operating economies now possible under the present system.

Fayette-Greene Producers Discuss Live Questions At "Shop Talk" Meeting

"Shop talk" on top cutting, purchased power and automatic control as applied to mining featured the meeting following a dinner given by the Fayette Greene Coal Producers Association on the evening of April 23 at the Uniontown Country Club, on the outskirts of Uniontown, Pa. Frank B. Dunbar, general superintendent of the Hillman Coal & Coke Co., presided.

W. D. Snyder, of the General Electric Co., delivered a paper on "Automatic Control as Applied to Mining," in which he described the application of automatic control to hoists, pumps, battery charging equipment and substations, and how it functions in actual use.

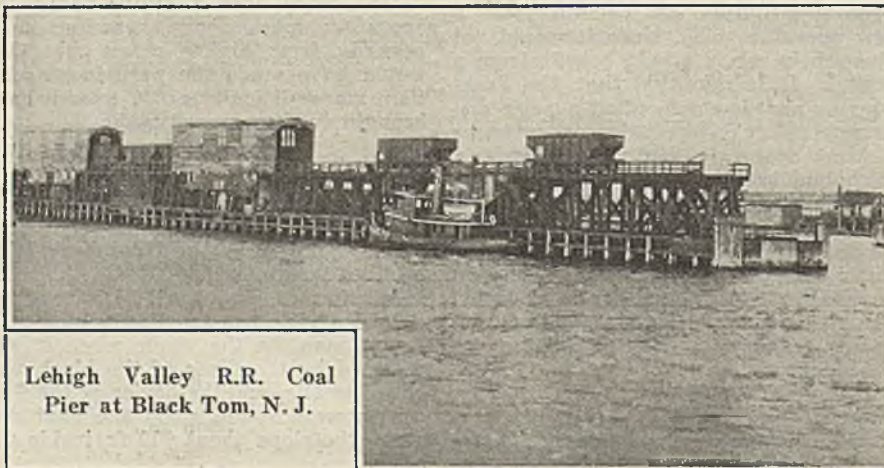
In commenting on automatic control, R. A. Wood, of the Westinghouse Electric & Mfg. Co., offered the assurance that after all the modern substation is not comparatively new and therefore does not involve untried equipment. It is made up of such tried devices as oil circuit breakers, transformers, meters, relays and contactors. The most recent advance in connection with the use of these lies in the devising of connection diagrams which cause a new sequence of operation in the modern mine substation. Although only about 10 per cent of the operators at present use automatic controls, it is encouraging to know that about 50 per cent of new automatic installations are being made by those who have experienced the advantages derived from them.

"Top Cutting" was treated in a paper by John Forsythe, master mechanic of the Buckeye Coal Co., Nemaquin, Pa. In addition to describing the various types of top cutting machines now in use, Mr. Forsythe pointed out their advantages, chief of which are their greater cutting capacity as compared with other types of cutting machines, the maintenance of greater safety in working places and the saving in timber cost which they effect.

Top cutters cause the suspension of a larger cloud of coal dust than do other types of machines, but this disadvantage can be overcome by sprinkling the kerf by a water jet at the end of the cutter bar.

In a paper entitled "Purchased Power" John A. Malady, electrical engineer of the Hillman Coal & Coke Co., outlined the factors which should be considered when making a decision as to whether a company should go from mine generated power to purchased power. He also offered the procedure which he follows in making the change.

W. B. Milligan, power engineer of the West Penn Power Co., declared that the majority of coal companies generating their own power do not correctly compute the final cost of generating power. They fail to include in the cost many replacement items and, until recently, figured the cost of coal at the mining cost instead of the market price. Public utility companies, he said, are in a position to practice many economies which are out of reach of coal companies who generate power.



Lehigh Valley R.R. Coal
Pier at Black Tom, N. J.

Government Bureaus Seek Bids on Coal Supplies

Sealed proposals have been requested by George S. Pope, chief engineer, Government Fuel Yards, Washington, D. C., on the following shipments of bituminous coal, bids on which will be opened at 10 a.m., May 25, 1925: 20,400 tons of low volatile nut and slack, 137,100 tons of low volatile mine run, 41,200 tons of high or low volatile mine run, 26,000 tons of high or low volatile nut and slack or slack and 2,000 tons of gas coal over not less than 1½-in. screen. Shipments are to be made between July 1, 1925, and June 30, 1926.

Sealed proposals have been requested by the Bureau of Supply, Treasury Department, Washington, to be opened May 5, for supplying bituminous lump and run-of-mine coal to public buildings under the control of that department, in the following amounts: 3,830 tons for delivery at points in Wisconsin, Minnesota, North and South Dakota; 1,960 tons for delivery at points in Kansas, Missouri and Nebraska; 2,530 tons for delivery at points in Indiana, Illinois, Missouri and Iowa.

Sealed proposals have been requested by the Bureau of Supply, to be opened May 9, for supplying approximately 14,000 tons of lump and run-of-mine bituminous coal to be delivered at points in Missouri, Arkansas, Oklahoma, Texas, Louisiana, New Mexico, Arizona, Colorado, Kansas, Nebraska, North and South Dakota, Wyoming, Utah, Montana, Idaho, Washington, Oregon, Nevada and California.

Sealed proposals for furnishing approximately 108,500 tons of bituminous coal, run-of-mine, nut or pea, or 2-in. screenings, have been requested by the Office of the Chief Engineer at Madison, Wis., until 3 p.m. May 5, 1925.

U. S. and Britain in Pact To Safeguard Miners

Great Britain and the United States have entered into a humanitarian coalition in an effort to devise further safeguards for the men who work in coal mines. In this way Prof. R. V. Wheeler, of the British experiment station at Eskmeals, characterized the arrangement between the two governments, which now has been tried out long enough to make it clear that much good can be accomplished.

In the course of remarks at a dinner tendered the visiting officials, April 20, by the Washington Section of the American Institute of Mining and Metallurgical Engineers, Professor Wheeler said that the two great nations should set as their mark the complete suppression of propagation of explosions. Every lead to that end should be followed, he declared.

Dr. S. C. Lind, of the Fixed Nitrogen Laboratory, pointed out that the increasing use of powdered coal had created an insistent demand for more information as to the propagation of flame, which is certain to lead to more research on the subject. The results, he anticipates, will be valuable in connection with safety work.

George S. Rice, chief mining engineer of the Bureau of Mines, who



James W. McQueen

Late president of the Sloss-Sheffield Steel & Iron Co., whose sudden death was reported in *Coal Age* last week. Mr. McQueen, who was 49 years old, had been president of the Sloss-Sheffield company since February, 1918. The company is a large holder of coal operations in Alabama.

served as toastmaster, expressed the hope that international co-operation would be extended to safety codes and standardization.

There was discussion of the advantages and disadvantages of mandatory powers in connection with such work as that performed by the Bureau of Mines and by the Mines Department of Great Britain. The consensus among the members of the Bureau of Mines staff present was that such powers would discourage co-operation on the part of industry, which they regard as an indispensable factor in obtaining successful results.

E. J. Foley, of the British Mines Department, declared that his department always acted on the assumption that the industry knows more about its business than anyone else, so that mandatory powers rarely are invoked. Even when action is taken under them, he explained, it usually is at the request of a majority to obtain compliance on the part of a minority in action for the common good. He cited as an example the enforcement of a mutual drainage plan. The problem of water in the area had become very burdensome. So that the burden might be distributed equally the government enforced an equitable allocation of costs on a tonnage basis.

C. L. Dering Retires from Coal Business

After more than forty years in the coal business, thirty-six of them as head of the Chicago wholesale firm bearing his name, Charles L. Dering will retire from business May 1 and turn the business over to the J. K. Dering Coal Co., McCormick Building, Chicago.

Mr. Dering entered the trade in the coal division of the old Ohio Central R.R., after which he operated mines in Iowa for three years, when he returned to Chicago and organized his own company. He was president of the American Wholesale Coal Association for one term, retiring from office in June, 1924.

Major E. M. Tutwiler Dies On World Tour

Major E. M. Tutwiler, of Birmingham, Ala., died suddenly, April 20, on board an ocean liner en route from India to San Francisco. He was on a world tour.

Major Tutwiler was born in Palmyra, Va., Oct. 18, 1846. Returning to the Virginia Military Institute after serving in the Confederate army he was graduated from that institution in civil engineering in 1867. After several years spent in Illinois and Pennsylvania, he went to Birmingham in 1881 and joined the engineering forces of the old Georgia Pacific R.R., now a Southern Ry. line, and when the railroad was completed he was placed in charge of the mineral interests of the road in Alabama. He was manager of mines for the Old Sloss Iron & Steel Co. for a while, later leasing the Blossburg mines, which he operated successfully, after which he formed a partnership with the Adler interests in the development of coal properties.

In 1889 he formed the Tutwiler Coal & Coke Co., which holdings were merged with the Birmingham Coal & Iron Co. later, and now form a link in the properties of the Woodward Iron Co. At the time of his death Major Tutwiler was president of the Black Creek Coal & Coke Co., operating mines in the upper part of Jefferson County, but had taken no active part in administrative duties for several years, his business enterprises being operated by his sons. Major Tutwiler, who went to Birmingham practically without funds, amassed a fortune during his active business career. He is survived by his wife and three sons.

Farrington Against Wage Cut And Co-operative Mines

Frank Farrington, president of the Illinois District, United Mine Workers, has written a letter to William Mitch, secretary of District No. 11, at Terre Haute, Ind., denying reports that Farrington was trying to have a referendum taken among the Illinois miners on the question of accepting lower wages. "At no time has such a proposition ever entered my mind," said he.

In his letter Farrington also condemned co-operative mining, declaring "we are opposed to our members operating mines on a co-operative basis because experience has taught us that where they do so they do not get the wages called for in our state contract and in practically every case they do all of their deadwork without getting the compensation they are entitled to for doing it and because we know that where mines are operated on a co-operative basis the men are obliged to work for less than the contract calls for and on that account we have discouraged and in fact we have prohibited our members from participating in such projects."

The question of co-operative mining in District 11 is still hanging fire, according to word from district officials. President Tyler Lawton said the question would be settled when he and International President John Lewis had a conference.

Deadlock Persists in Strike In Nova Scotia

A conference between representatives of the British Empire Steel Corporation and the United Mine Workers called at Halifax by Premier Armstrong of Nova Scotia with a view to settlement of the strike in the Cape Breton coal field, after having been in session for five days was broken off on April 18 without any conclusion being reached or any prospect of a settlement.

The Premier strongly urged the immediate reopening of the mines on the 1924 wage scale. Public opinion, he said, would stand for nothing else and the people of Nova Scotia would not accept dictation from any quarter. If the corporation persisted in its attitude he might deem it necessary to force a settlement by legislation. Before the adjournment of the conference President Wolvin of the corporation as a heavy taxpayer of the province, protested against the grant of \$20,000 for the relief of sickness in the mining areas, and on leaving he said: "We are going out from this conference prepared to do our dirtiest, and we presume you intend doing the same."

After the close of the conference Mr. Wolvin issued a lengthy statement setting forth the position of the company, stating that he believed an agreement could have been reached on every disputed point with the exception of the wage scale, on which President McLeod of District 26, United Mine Workers, would not recede from his position that there could be no reduction of wages.

It was pointed out on behalf of the company that it had not made any profit last year; that last year's output was 370,000 tons less than that of the previous year; that market prospects for this year were very poor unless the company could quote substantially lower prices for its product. The company has made all possible economies to reduce the cost of mining, and the only way left is through a reduction of wages.

Supreme Court to Rehear Claire Furnace Case

The U. S. Supreme Court, at its session April 20, ordered the Claire Furnace case restored to the docket and assigned for reargument Nov. 2, next. While no announcement of the reasons for directing reargument was made by the Court, it is presumed to be because of changes in the personnel of the Court since the original argument in December, 1923, Justices Butler and Stone having gone on the bench since that time.

The case is of widespread importance, involving the authority of the Federal Trade Commission and of Congress itself to compel business and industrial corporations to submit reports as to the details of their business, even though these details are not to be made public excepting in the form of averages. In view of recent demands in some quarters that a large measure of reports be made to some agency by coal operators, and other agitation of a similar character affecting other indus-



Francis Hodgkinson

Chief engineer of the South Philadelphia works of the Westinghouse Electric & Manufacturing Co., who recently received the Elliot Cresson gold medal from the Franklin Institute. The award, according to the official announcement, was made to Mr. Hodgkinson in recognition of his achievements in the field of steam turbine design and construction during the past thirty-one years.

tries, the Claire Furnace case has assumed a position of magnitude.

As the result of instructions from Congress to make studies as to the costs of various necessities, the Federal Trade Commission early in 1922 sent schedules to numerous companies producing steel and steel products, and some of them producing coal, coke, iron ore, pig iron and other products, asking them to furnish reports giving in detail the quantities of finished or semi-finished products, capacity of plants, sale prices, costs of manufacturing the products, and other items. The Claire Furnace Co. and twenty-one other corporations applied to the District of Columbia Supreme Court for an injunction against the commission, which was granted, on the ground that the commission had not differentiated between intrastate and interstate business of the companies. The commission had contended that the interstate and intrastate business were conducted as a single, non-separable whole. On appeal, the District of Columbia Court of Appeals sustained the lower court, and the commission appealed to the U. S. Supreme Court.

The companies contend that no complaint of violation of any law has been made against them and that to attempt to compel them to file such reports is violative of the Fourth and Tenth amendments of the federal Constitution; that Congress has no authority over the business of the corporations excepting sale and purchase in interstate commerce and cannot compel such reports even to get information to assist in shaping legislation, and hence cannot delegate such authority to any agency of government, such as the Federal Trade Commission. On the other hand, the Federal Trade Commission contends not only that Congress has authority to order such reports but that the commission itself has such authority under the powers granted it in its organic act.

Glen Alden, Pennsylvania And Lehigh Valley Coal Co. Merger Said to Be Near

Special to Coal Age

SCRANTON, PA., April 28.—With a lapse of but a few months since the completion of the last consolidation of anthracite producing companies, coal trade circles are now buzzing with fresh reports of a merger. This time independents are not mentioned. The reports, which lack official confirmation, have it that the following companies will be operated under the one head: the Glen Alden Coal Co., the Lehigh Valley Coal Co., the Pennsylvania Coal Co. and possibly the Hudson Coal Co.

The George F. Baker interests, of New York, are said to be engineering the latest merger. Mr. Baker is credited with being the controlling factor in the Delaware, Lackawanna & Western, the Erie and the Lehigh Valley railroads, with, of course, heavy interests in the coal companies which have been divorced from these coal-carrying roads—the Glen Alden, the Pennsylvania and the Lehigh Valley companies.

The proposed consolidation has been common gossip in financial and coal trade circles for some time. It is coming to the front at this particular time with the announcement by L. F. Loree, president of the Delaware & Hudson R.R., of a tentative plan for a fifth trunk line to be built around the Delaware & Hudson. It is a counter-proposal to the regrouping plans originally drafted by the "Big Four," and has been presented to the Interstate Commerce Commission.

Mr. Loree suggests that a supplementary system be formed to include in addition to the D. & H., the Lehigh Valley and the Lackawanna, as well as several minor roads.

Plans for the consolidation of the D. L. & W. Coal Sales Co. with the Glen Alden Coal Co. are under consideration by officials of both organizations, it is reliably reported here. The D. L. & W. Coal Sales Co. is the distributor of Glen Alden coal. At the mid-year meeting of the coal producing company, which is scheduled for early in May, it is expected that some announcement of the intended merger will be made. According to one plan spoken of the coal company will trade, share for share, Glen Alden stock for stock of the coal sales company. The market prices of the stocks do not show a great difference.

A similar plan of consolidating the Lehigh Valley Coal Sales Co. and the producing company is also reported to be under way.

Eastern coal-carrying railroads made the best group showing of the principal systems of the country last year in earnings per mile. Of the 45 largest carriers, Lackawanna had the largest gross revenue per mile. Central R.R. of New Jersey was second and Reading third. The Pittsburgh & West Virginia had the largest net operating income per mile, with Reading second and Lackawanna third. The Pennsylvania obtained the largest amount of revenue, followed by the New York Central, Southern Pacific and Atchison.

Non-Union Output Mounts Steadily In Strike Regions of West Virginia; Union Leaders Placed Under Arrest

Late reports indicate that non-union output of coal in northern West Virginia is growing daily despite the strike. During the first four days of last week the tonnage was 82 per cent non-union. There were 3,564 cars of coal loaded on an open-shop basis, and 766 cars on a union basis.

Non-union mines experience no difficulty in obtaining men. Some returned to work a few days after the strike started and gaps left by strikers were filled by miners from other sections of the country. It is reported that a number of union miners from Illinois, Indiana, Ohio and Pennsylvania have come here to work, so that the union in a sense is obliged to reclaim some of its own members from the Central Competitive Field.

Van A. Bittner, chief representative of the United Mine Workers in northern West Virginia, issued a circular letter April 22 in which he attacked the accuracy of the production figures announced by the operators. He asserted that "85 per cent of all the non-union production was stopped." He alleges that 1,000 mine guards have been retained by non-union coal companies, that more than 1,000 families were evicted, and that hundreds of the union members have been thrown into jail on trumped-up charges.

An order of attachment directing the arrest and appearance in Federal District Court at Wheeling, on April 28, of a number of officers of the United Mine Workers to answer a charge of violation of a federal injunction against the miners' union, was issued April 21 by Federal Judge W. E. Baker.

Named in the order are John L. Lewis; Van A. Bittner; Leo Hall, president of the Ohio district organization; Frank Ledvinka, subdistrict president, and other miners' union officers of the Panhandle district.

The attachment order was issued upon petition of the West Virginia-Pittsburgh Coal Co., which operates mines in the Panhandle district. The petition for the attachment order charged the miners' union and individual members among other things with intimidation, picketing and coercion, which was claimed to be a violation of an injunction granted by the late Federal Judge Alston G. Dayton in 1909.

The Soper-Mitchell Coal Co. started to work on an open-shop basis in Scotts Run April 20. One man is dying in the Glenwood Hospital near Benwood, from the effects of a bullet wound in the base of the brain, and another is in a precarious condition at the same institution from being beaten with a club over the head, while twenty-two men and one woman are in the Marshall County jail at Moundsville as the result of an attack by 200 miners and their wives, Sunday afternoon, April 19, on the home of a non-union coal miner at Glendale, in the Panhandle.

Incendiarism broke out in full blast in the Scotts Run section of the Fairmont field on the night of April 27, when three tipples of the Gilbert Davis Coal Co., Morgantown, were burned down, entailing a loss of \$200,000. Tipples at mines Nos. 1 and 3 on Scotts Run and at mine No. 2 on the Guston Run spur of the Scotts Run branch of the Monongahela Ry. were burned down simultaneously at 9 o'clock. State mining inspectors say that the interior of the mines are not affected by the flames. The mines were about to work non-union, it is reported.

Two Pittsburgh Banks Closed By Coal Depression

The Carnegie Trust Co. and the First National Bank of Carnegie, near Pittsburgh, Pa., both headed by John A. Bell, coal-mine operator, closed their doors April 27. The combined deposits in the two banks exceed \$6,000,000.

Peter Cameron, State Secretary of Banking, issued the following statement:

"The reserve fund of the Carnegie Trust Co. has been below the legal requirements for some days. Although every effort has been made by the company to build up the reserve fund to the required amount, it has failed to do so, owing to the frozen condition of its assets, which in turn is a direct result of the stagnation that has obtained in the bituminous coal industry of Pennsylvania for some months, the Carnegie Trust Co. being the holder of obligations of coal companies aggregating a considerable sum.

"Because of these conditions it was my duty as the Secretary of Banking to take possession of the business and property of the trust company in order that the interests of the depositors and other creditors might be protected."

In a statement made by Mr. Bell, who is president of both the closed banks, he said:

"The First National Bank of Carnegie is in fine shape and will be reopened for business, but I cannot say when."

Mr. Bell is declared to be a victim of the depression in the bituminous coal industry, in which his holdings are large. His financial difficulties—extending over a year or more—have been the subject of study by some of the biggest financial and business persons of the country, including Secretary Mellon and Harry F. Sinclair, the oil man.

Mr. Bell is chairman of the board of directors of Colonial Trust Co. of Pittsburgh, president of the Burgettstown National Bank, president of the Carnegie Coal Co., director of the Carnegie Dock & Fuel Co., president of the Clements Mercantile & Land Co., director of the Frauenheim-Logansport Coal Corporation, president of the Freehold Bank, president of the Grove City National Bank, president of the Harmon

Henry Ford to Engage in Wholesale Coal Trade

Henry Ford will engage in the wholesale coal trade in the Northwest, selling through the regular coal distributing channels, according to an announcement made last week. Business will be solicited from regular retail dealers and from large consumers. Orders will be filled from the old Superior Coal & Dock Co. dock at Superior, Wis., which has been leased by the Ford interests, and will be stocked by Ford freighters, carrying coal from Ford mines in Kentucky. The statement from the manager of the Minneapolis branch plant is that it is not now the intention to use the Ford organization, but regular coal channels. Where a regular Ford dealer is equipped to handle coal and wishes to do so he may be allowed to. R. O. Eastman, an experienced coal man from California, is to have charge of the coal department of the company. Administration of coal affairs will be handled from the office of the new plant at the high dam on the Mississippi River, but probably no stocks of coal will be carried there.

Creek Coal Co., director of the Interstate Pipe Co., director of the Leonard Oil Development Co. and president of the Salkfield Coal Co. and of the Taska Coal Co.

A couple of years ago Mr. Bell bought out his partners, Jesse H. Sanford and J. T. M. Stonerod, issuing bonds for their stock. To meet interest payments on the bonds he hypothecated his stock, which last Friday was sold at public sale, being bought by Messrs. Sanford and Stonerod. Elections are being held which will place Messrs. Sanford and Stonerod among the officials of the two banks again. No other changes in the personnel of the management are expected.

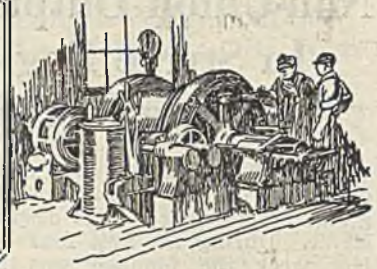
Pittsburgh Coal Co. Closes Six More Mines

The Pittsburgh Coal Co. last week closed the following six mines: Moon Run Mine; Somers Mine, at Monessen; Champion Mine, near McDonald; Dickson Mine, Montour No. 9 and Black Diamond Mine, on the Monongahela River, near Donora. Since last fall the Pittsburgh Coal Co. has had 18 of its 54 mines in the Pittsburgh district in operation. Recently it announced the permanent abandonment of 16 of the remaining 36 idle mines. With the closing of these 6 mines, 12 are left in operation.

In a letter to employees at these mines, T. M. Dodson, vice-president in charge of operations, says that the company can no longer afford to operate these at a loss and that they will not be reopened until something is done by the men to help meet the competition of non-union labor, since Mr. Lewis, president of the miners' union, has refused to consider negotiations for a new scale at lower wages.



Practical Pointers For Electrical And Mechanical Men



Visual Indicator Sounds Alarm When Water Level Approaches Danger Point

At many mines pumps are installed to withdraw water from a tank or sump into which water is continuously flowing. Should the supply of incoming water be cut off the pump would soon run itself dry and the motor driving it, becoming unloaded, might speed up even to the danger point. Not infrequently such pumps form only a small part of the equipment intrusted to the care of a single person. It is, consequently, advantageous to equip such a pump with both a visible and an audible indication of its condition.

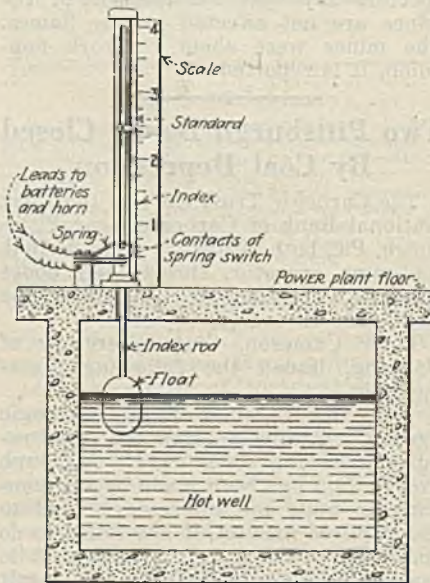
Such a case exists at the hot-well pump at one of the power plants of the Kingston Coal Co., Kingston, Pa. In order that the attendant shall have ample warning of the condition existing in the hot well—that is of the height of the water—the indicator shown in the accompanying illustration has been installed. This not only gives a visual indication of the stage of the water in the hot well but sounds an alarm should its level sink to a dangerous point. This indicator was made entirely from odds and ends picked up about the plant.

A piece of $\frac{3}{4}$ -in. wrought iron pipe, with a slit planed in its side slightly longer than the difference in levels of the water at the high and low points, is set vertically on the floor above the hot well. A hole is drilled in the floor below this pipe through which an old condenser tube, attached to a float at its lower end and bearing an indicator at its top, works up and down within this pipe. The indicator index is, of course, attached to the tube through the slot in the pipe. A suitable scale is placed behind the index point in such a position that an accurate indication is afforded of the depth of the water in the hot well.

On a pipe frame supporting the motor starting-box is mounted an old automobile "honk horn." This is energized by four dry batteries, the circuit from them containing a spring

liable to suck air, the pointer or index depresses this spring switch making contact and sounding the horn.

This indicator not only shows at a glance the height of the water in the hot well, but should the pumpman be busied with other duties and the water become dangerously low an audible warning is sounded. This has a distinct penetrating note of such timbre that it can be heard readily and recognized through or above all ordinary plant noises.



Cross Section of Hot Well

The level of the water in the hot well is indicated by the position of the pointer on the scale. Should the water level sink until the pump is liable to suck air the contacts of the spring switch are closed, sounding an automobile "honk horn."

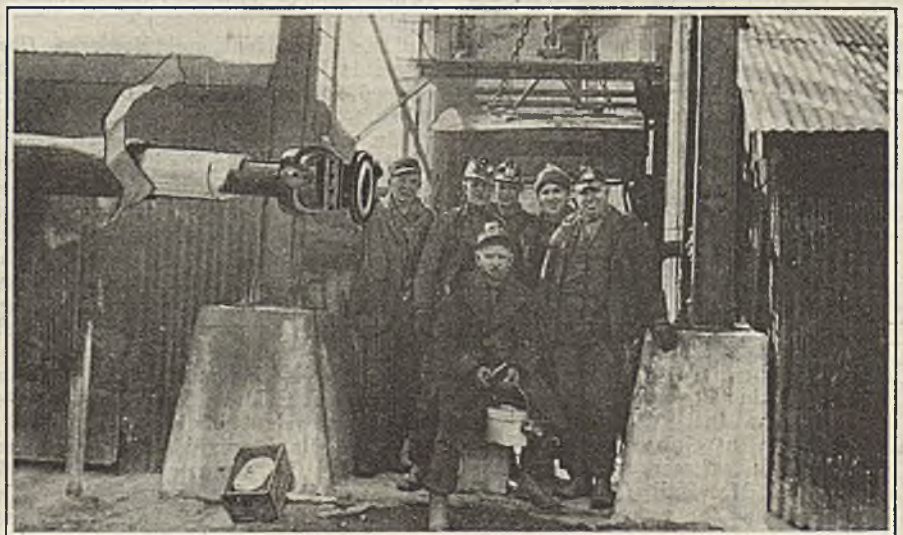
switch near the foot of the indicator standard. These batteries last about one year in this service. Should the level of the water in the hot well fall to a point where the pump is soon

Safety Shaft Gate Gives Top And Side Protection

A type of safety mine shaft gate is used by the Pennsylvania Coal Co., of Dunmore, Pa., which is unusual at anthracite mines. Instead of the upright gate commonly used, this device is a protective covering over the whole top of the shaft opening. It opens and closes as the cage ascends and descends.

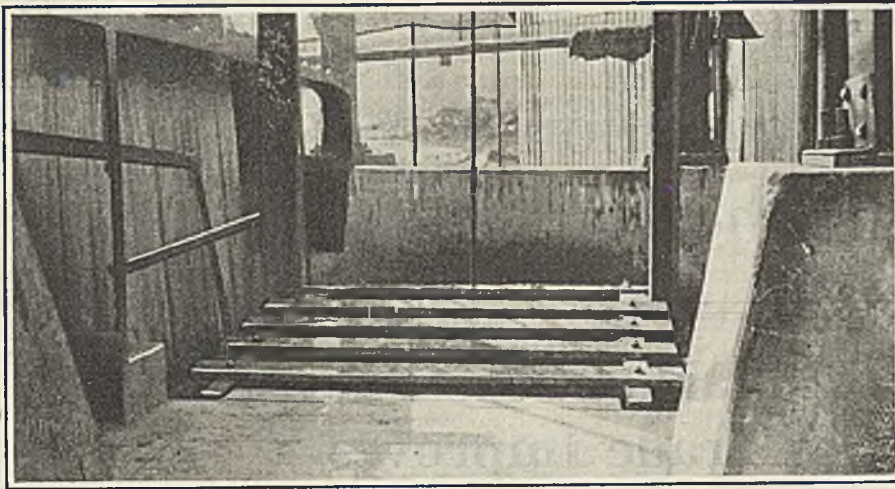
An advantage of this type of gate is that the shaft opening is completely covered. Should a person be working at the sheave wheel or upon its bearings, there is little danger of falling down the shaft.

There is always a certain amount of work about the headframe which



This Shaft Is Covered and Not Merely Inclosed

The ordinary type of gate merely surrounds the shaft and does not prevent things from falling into the opening from above. This type gives double protection. The illustration shows the gate in the position it occupies when the cage is below the landing.



Shaft Covering Automatically Rises and Lowers

This protector opens when the cage ascends through it and when the cage is below the ground level, the "gate" closes down, thus giving the top of the shaft complete protection all the time.

is done when a cage is below the ground level. Consequently there is the danger of men or materials falling down the shaft.

One of the most precarious jobs done over an open mine shaft is the greasing of the hoisting cable. A covering over the shaft, such as shown in the illustrations greatly minimizes the danger of falls.

Doubling Up on Safety

One of the safety features used on the electrically operated hoist at the Clifford shaft of the Hillside Coal & Iron Co., at Forest City, Pa., is that the gears are inclosed in efficient casings. The gear cover, shown in the illustration houses the first set of speed reducing gears on the hoist. Perhaps more interesting, however, is the flexible coupling between the motor, on the right, and the hoist. This coupling was, no

doubt, selected with care because it was the evident desire of the designing engineers to make the hoist room a model one.

The coupling is constructed so that the lubricant and all working parts are completely inclosed. No grease or oil can leak out. It will be noticed that the coupling has no projecting parts on which a workman's clothing may be caught.

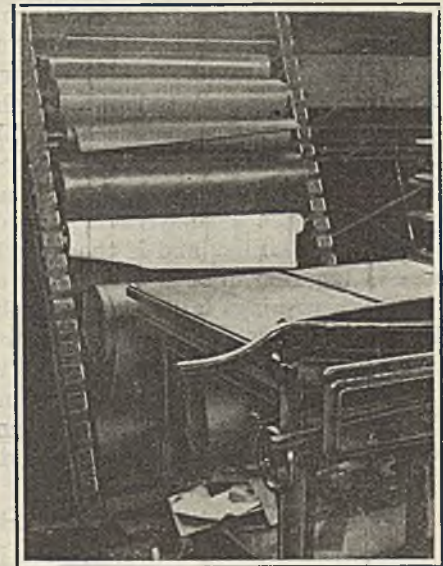
The small swinging disk on the side of the gear casing serves a double purpose in that it covers a peep hole or place to apply grease or oil to the gears.

Handy Way of Dispensing Insulating Material

In the Corning, Ohio, shop of the Sunday Creek Coal Co., a method of storing and handling insulating materials is provided which is economical of space and time. A paper shear 40 in. wide is located on a mezzanine

floor used as a part of the store department. Back of, and within about 18 in. of the shear table is a rack for holding rolls of the various kinds of insulating materials commonly kept in stock for armature winding. The rack consists of two 4x4-in. wood pieces 8 ft. long spaced about 4 ft. apart and leaned against the wall so as to stand at an angle of approximately 70 deg. with the floor. Twenty pairs of notches are provided in the rack for holding the short lengths of 1/2-in. pipe on which the rolls of material are hung.

When photographed, the rack held various papers and cloths. When any particular material is needed, the free end of the desired roll is pulled over the graduated table

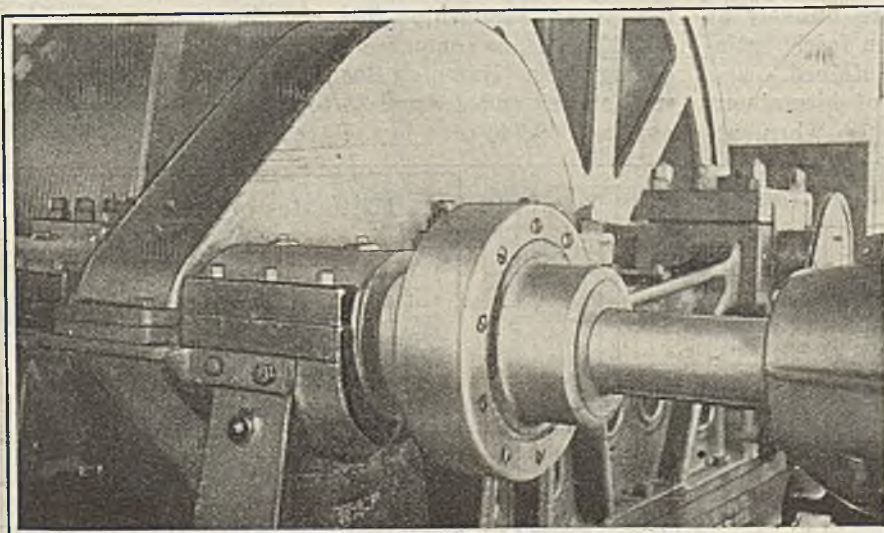


Storage Rack Close to the Shear

Cutting winding insulation to size directly from the roll saves much of the remnant waste which results from the more common practice of cutting off a piece to the approximate size and later cutting it to exact dimensions.

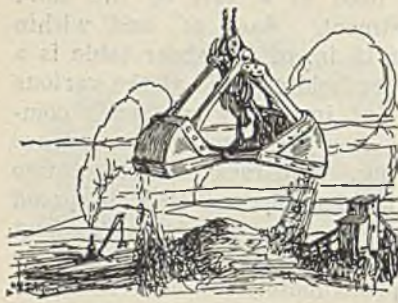
to the shear blade and the length wanted is cut off squarely.

This paper shear was purchased as a part of the winding department equipment, but inasmuch as the store room is located in the same building as the electric shop, it was decided to place the shear in the store room. The armature winders come into the store room and cut the insulating material, to exact size, directly from the roll. This saves the waste of remnants which would result if they cut from the roll a piece the approximate size required and then carried the piece into the winding room and cut it into strips to the exact dimensions necessary. Another advantage is that the shear is located so that the store keeper can use it when it is necessary for him to supply any of this class of material.

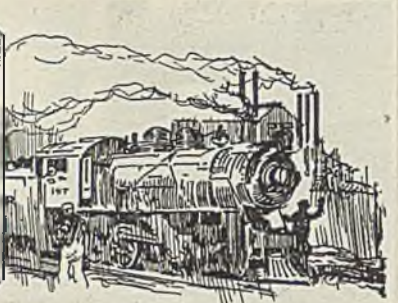


No Place to Get Caught by Gears or Coupling Here

Safe equipment such as this serves a double purpose: safety first and cleanliness also. It is always easy to keep good machinery in repair. No grease can work out of the coupling because it is completely sealed. The gear case prevents the spattering of oil commonly noticed around gear trains.



Production And the Market



Bituminous Coal Market Stuck in a Rut; Anthracite Trade Improves

With May at hand the outlook for bituminous coal producers is far from rosy with promise, each succeeding week showing monotonous resemblance in dullness to its predecessor. Lake shipments are gaining headway, of course, the early run to the Northwest docks being unusually heavy, but the effect on the industry as a whole is limited. Shutdowns continue to be reported in Illinois and Indiana and the Pittsburgh and Consolidation coal companies have curtailed operations. The failure of the union to make any appreciable headway in the West Virginia strike has heartened some operators in the Pennsylvania low-volatile field to try operating non-union, and if the experiment is a success, there is expected to be a general move in that direction.

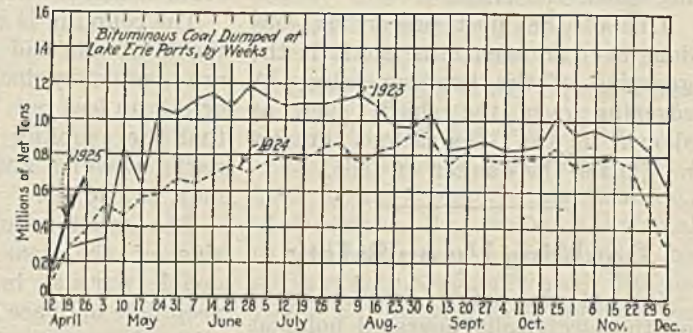
While screenings are conspicuously strong in most fields, even these weakened somewhat last week in the Middle West when a number of western Kentucky and Indiana producers shipped an unexpected quantity of crushed mine-run. Contracting continues to be backward, many industrials showing a disposition to take a chance with the spot market.

Anthracite Demand Picks Up

Anthracite trade shows a notable influx of strength. Demand for stove is quite heavy and egg and pea also are moving well. Chestnut is not in such insistent demand, but is far from sluggish. Steam sizes have improved somewhat, No. 1 buckwheat moving with greater ease and rice and barley holding their own. The present reduced rate of output is about sufficient to take care of demand, so that further resumptons are unlikely at present. Independent output is moving in fairly satisfactory volume and prices are well maintained.

A further decline in the production of bituminous coal took place in the week ended April 18, when, ac-

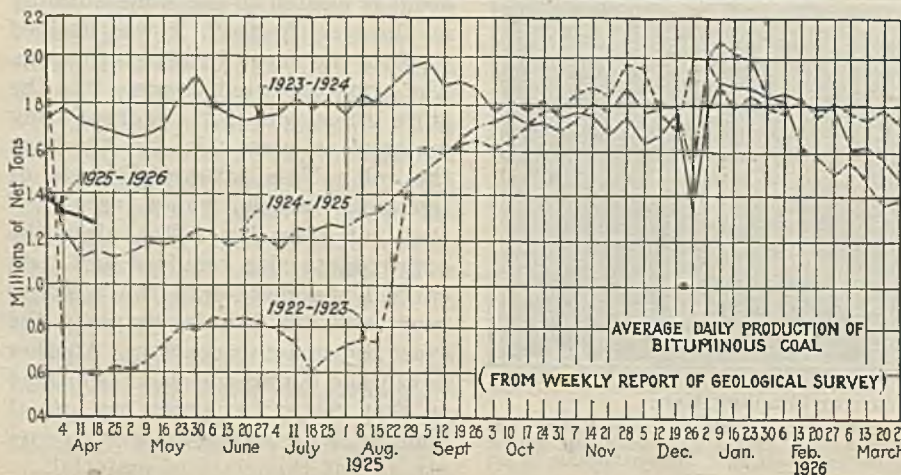
ording to the Geological Survey, the output was 7,509,000 net tons, as compared with 7,890,000 tons in the preceding week. The falling off was due in part to the partial observance of Easter Monday as a holiday. Nevertheless the total exceeded that of the corresponding week of last year, when 7,142,000 net tons was produced. Anthracite output in the week ended



April 18 was 1,567,000 net tons, as compared with 1,723,000 tons in the preceding week and 1,623,000 tons in the corresponding week of 1924.

Coal Age Index of spot prices of bituminous coal stood on April 27 at 162, the corresponding price for which is \$1.96. This compares with 161 and \$1.95 respectively on April 20.

Dumpings at Lake Erie ports during the week ended April 26 increased nearly 175,000 tons. According to the Ore & Coal Exchange, cargo dumpings were 627,604 net tons; steamship fuel, 30,136 tons—a total of 657,604 tons, as compared with 484,809 tons in the preceding week. Hampton Roads dumpings for all accounts in the week ended April 23 totaled 288,694 net tons, as against 369,746 tons in the previous week.



Estimates of Production

(Net Tons)
BITUMINOUS

	1924	1925
April 4.....	7,041,000	7,546,000
April 11 (a).....	6,983,000	7,890,000
April 18 (b).....	7,142,000	7,509,000
Daily average.....	1,190,000	1,251,000
Cal. yr. to date (c)...	156,791,000	148,523,000
Daily av. to date.....	1,659,000	1,567,000

ANTHRACITE

April 4.....	1,548,000	1,482,000
April 11.....	1,856,000	1,723,000
April 18.....	1,623,000	1,567,000
Cal. yr. to date (c)...	27,948,000	25,831,000

COKE

April 11.....	265,000	212,000
April 18 (b).....	256,000	201,000
Cal. yr. to date (c)...	4,380,000	3,791,000

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

Steam Coals Weaken in Middle West

Shutdowns continue the most conspicuous feature of the Midwest situation, three more of the largest and best equipped mines in Franklin County having just closed to remain down until market conditions promise operation at a profit.

Steam coals are not quite so strong as during the last two weeks. A number of west Kentucky and Indiana operators put their mine run through crushers, but the unexpected influx of screenings caused the price on some grades to drop to \$1.25@1.40. If any progress has been made with contracts it is so slight that it has no bearing on the general market.

Eastern coals are moving into this market in fairly large quantities, and prices are being maintained fairly well because a great deal of Eastern coal is finding outlet to the Lakes. Few quotations are out for May shipment, as producers show a marked tendency to keep their prices to themselves until the very last minute.

Franklin County operators probably will make their usual increase and it is reliably reported that Kentucky

producers will tack on 15c. a ton straight through. There seems to be an air of mystery over the anthracite situation, some expecting a slight decrease while others predict a slight increase.

There is practically no activity in the Carterville field. Seven or eight mines are trying to work part of the time, but the most any of them gets is about two or three days a week. Screenings are in good demand but none is available from shaft mines.

In the Duquoin field conditions are unusually bad with nearly all mines down except one or two, and they are getting one or two days a week. Prices are about cost. In the Mt. Olive field conditions are about as bad as they can be. A little railroad coal is moving and a little steam, but no domestic. Crushers are busy in this field making steam sizes.

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

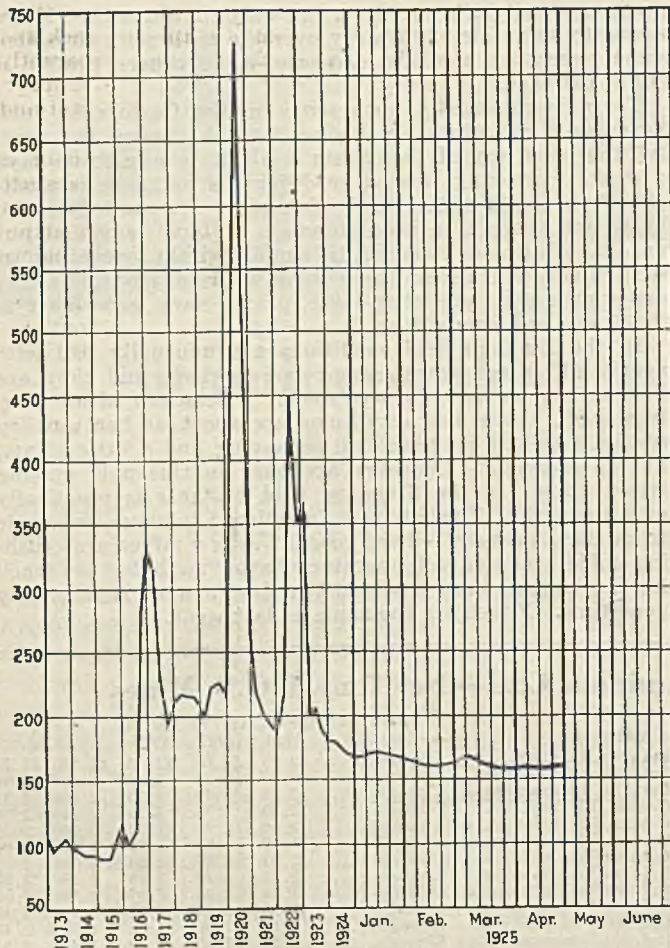
Table with multiple columns for Market Quoted, dates (Apr. 28, 1924, Apr. 13, 1925, Apr. 20, 1925, Apr. 27, 1925), and prices for various coal types (Smokeless lump, Clearfield mine run, etc.) across different regions (Low-Volatile, Eastern; Midwest; High-Volatile, Eastern; South and Southwest).

*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, and prices for various anthracite types (Broken, Egg, Stove, Chestnut, Pea, Buckwheat, Rice, Barley, Birdseye) across different regions (New York, Philadelphia, Chicago, Cleveland).

* Net tons, f.o.b. mines. † Advance 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
	April 27	April 20	April 13	April 28
Weighted averaged price	\$1.96	\$1.95	\$1.95	\$2.07

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.

Conditions are unusually quiet at St. Louis. A little retail coal is moving, mostly for current needs, and there has been a little activity in anthracite and smokeless for early storage for customers who are leaving for the summer months, but this is small. Current needs call for cheaper coal and dealers' yards are pretty well supplied with everything. Yards, however, are putting in a little anthracite with an anticipation of business coming later, and a little smokeless also is coming in. Wagonload steam is unusually quiet and carload steam is good when obtainable on screenings only. Country steam is hard to find and there is practically no country domestic business. In the past week two fairly good sized retailers suspended operations with heavy obligations and little assets.

Trade Drags in Kentucky

While a good many contracts have been placed in Kentucky in the past few weeks it is reported that a number of concerns which have been contracting for their requirements have decided to buy in the open market this year because of low prices and other favorable conditions.

Prices at the mines show very little change. In western Kentucky jobbers are asking \$1.10@\$1.30 for screenings; \$1.25@\$1.50 for mine run; \$1.50@\$1.75 for nut and \$1.75@\$2 for block, egg and lump, but some product of strip mines has been offered under the market.

Eastern Kentucky has a fair demand on egg and 2-in. lump at \$1.75@\$2. Some block is selling as low as \$1.75 also, but is usually \$2, with some super grades at \$2.25. Nut is \$1.50@\$1.75; mine run, \$1.15@\$1.50, and screenings,

\$1@\$1.25. Some of the better grades of gas mine run are not being offered at under \$1.50, and are selling as high as \$1.75.

Reports from eastern Kentucky indicate that a number of mines have received some good railroad contracts, principally from the Louisville & Nashville R.R., and are relatively well fortified on production over the next several months.

Big Early Run of Coal to Northwest

In the Duluth market consumers are buying only from hand to mouth, as is usual when everyone is just finishing up on last year's supply, and the new orders are not ready to be placed. One of the biggest runs of coal in many years came into the port in the first few days of navigation. Twenty-two cargoes arrived, of which four were anthracite, and twenty-three are reported en route, of which seven are hard coal. Seven boats were waiting at the docks here.

The market on bituminous remains firm as quoted, as also does anthracite. There seems little possibility of a change in hard coal as some small orders are being booked. The 10c. a month raise in price of hard coal will start May 1. Some inquiries are in for coal for municipalities and schools. This is both for bituminous and anthracite.

Though most independent mining companies on the iron ranges are dead the Steel Corporation is bringing up coal, though it had a considerable tonnage on docks at the opening of navigation. This looks as if the Steel Corporation were getting ready to operate extensively.

Exceptionally warm weather in the Twin Cities has quashed what little buying for domestic and heating-plant use had been developing. Many small orders, which were coming in faster than could be handled, were cancelled. On the whole, the market is marking time, no one buying beyond instant needs.

The real drawback to business is the propensity to shop for price, as much cheap coal is available. Despite the efforts to gage the needs of the market so as to avert distress coal as much as possible, it has not been possible to accomplish much.

Little has resulted from recent changes in freight rates though the general impression is that they will mean greater tonnage in the dock trade. There will be some shifting of Eastern coals that have been finding a market all-rail, and the lower rate on smokeless against a higher rate on other grades doubtless will increase smokeless tonnage.

Quotations show no change for the week; southern Illinois is \$2.75; central Illinois, \$2.25; Indiana, \$2.50; western Kentucky, \$1.75. Dock prices are unchanged.

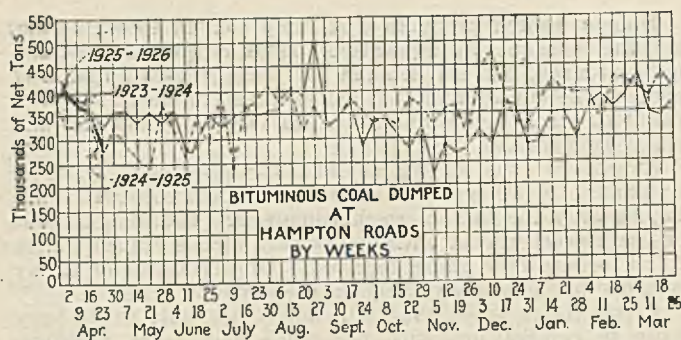
The coal market in Milwaukee is seasonably quiet, with prices on a summer basis. Pocahontas is down \$1 to meet the cut on anthracite and coke. It is selling at \$10.75 for egg and lump, and \$10.25 for nut, with an extra charge of 75c. a ton if carried to bin chutes. Record-breaking high temperature for April has flattened the domestic demand, leaving only the normal industrial consumption to interest dealers, who now are giving thought mainly to the usual summer canvass for orders to provide for the fuel season of 1925-26.

Colliers have kept the docks busy during the past week. The receipts thus far since the opening of navigation aggregate 170,415 tons—66,265 tons of anthracite and 104,150 tons of bituminous coal. The fact that the existing agreement between operators and miners in the anthracite region expires Aug. 31 next doubtless will cause dealers to get in as large a tonnage of anthracite as possible before that time in order to be on the safe side.

Western Markets Very Quiet

As summer approaches the coal market in the Southwest grows steadily duller. Kansas mines are working less than 25 per cent of normal time. There is practically no demand for domestic sizes. The industrial demand remains fairly constant, and, by crushing mine run to augment screenings, operators are avoiding the huge surplus of lump that otherwise might accumulate in the process of supplying it. Oklahoma and Arkansas mines still are idle.

The situation in Colorado is lethargic, due to balmy weather. The mines are working only about two days a week and a good many have been closed down, due to the light demand as well as the controversy over the revision of wages. The Industrial Commission has concluded its



At the rehandling wharves at this end the state of the spot market is no better than at Hampton Roads. There is a constant push to sell coal, and in most quarters there is such determination to hold business that prices on cars and delivered at consumers' storage have sagged correspondingly; \$5.25 on cars Boston is rumored for good coal, and contracts are being taken that reflect about the same basis alongside dealers' wharves.

All-rail from central Pennsylvania there is no change whatever. The standard grades are to be had on the same minimum basis that has prevailed for months, and there is the same uneven rate of production by the mines that are still operating. It all forms a most discouraging outlook for those interested in deriving a living return from the operations concerned.

Inactivity Marked at New York

At New York consumers of bituminous coal continue to stay out of the market, demand having dwindled to almost nothing. Reduced production has had a steadying effect on the tidewater situation, where a daily average of about 1,500 cars is reported instead of the usual 2,000 cars.

Producers and shippers hope for better business as the time for the expiration of the anthracite agreement draws nearer. Some large contracts terminate in June and July and these are already under way of renewal. Prices being discussed are said to range around the present maximum spot market quotations.

Further reductions in spot market prices are not looked for, operators believing they have about reached the bottom. Railroads are taking advantage of the low prices and are said to be laying in heavy reserves.

Operators profess to see no signs of betterment at Philadelphia and are marking time until there is a general improvement in business. Building has not started with the rush that was hoped for and this has affected the coal trade. The knit goods trade continues to display signs of improvement, after having been in the throes of dullness for at least two years. The falling off in the iron industry, however, has been the disappointment of the spring, and until this business reasserts itself no one looks for real active business in coal.

Some Pennsylvania operators in the low-volatile fields are preparing quietly to operate non-union, and if these few succeed, there will be a general move in that direction.

The tidewater market is even duller than other branches of the trade. There has been very light bunkering during the week, and only one clearance of a tidewater cargo.

At Baltimore industries are not using sufficient coal to create a good selling market, and production, even under restrictions now existing, is in excess of actual demand. The strike in northern West Virginia does not worry the trade particularly, at least taken as a whole. Quotations are about the same as they have been for several weeks past, at least as far as steam coals are concerned. Sharp competition in gas coals has sent quotations to a lower level than for some weeks past. The export situation suffers from a lull.

Seasonal dullness pervades the Birmingham market with a very much slackened demand for all grades of fuel as compared with a few weeks back. Domestic coal is exceptionally hard to move, very little spot business being offered and dealers taking little tonnage on contracts. Domestic contracts have been signed up as liberally as was expected by the trade but deliveries are being deferred. Inability to dispose of domestic sizes is handicapping the movement of business on steam orders.

Inquiry in the steam trade is confined principally to cur-

rent requirements, very few new contracts being negotiated, consumers evidently being convinced that the open market will afford ample protection for some time yet. Utilities, railroads and industrial concerns in the habit of contracting for fuel are making new agreements. The Seaboard Air Line closed a contract the past week for 450,000 tons of mine-run coal at a concession from last year's figure. The contracts of the Frisco and the Atlantic Coast Line are now being figured on, bids being in hands of fuel officials.

Although the market has been gradually weakening for several weeks and demand is now at the lowest point for the year, quotations on standard grades are reported as unchanged.

Anthracite Demand Strong at New York

Demand for anthracite at New York is strong. There is a heavy call for stove coal and a good movement of egg and pea sizes. Chestnut is not in heavy demand but it is not dragging. Independent coals are moving in good shape and those operators whose mines are working are able to obtain slight advances over line company prices for the favorite coals.

Present output is just about sufficient to take care of the demand. Consumers have not yet been aroused to the advisability of laying in next winter's supply and this enables retail dealers to make quick deliveries of orders now being received.

There is a little more strength in the market for the smaller coals. No. 1 buckwheat is moving more easily and rice and barley are maintaining their strength of the past few weeks.

The hard-coal trade at Philadelphia has greatly improved during the week, some of the consumer trade having begun to come along with summer filling orders. As the result of this better buying production is being well disposed of. The trade still continues to be chary of the new sizes, especially pea and nut, which in some instances seem too small.

Retail prices are extremely wobbly and even concerns quoting the highest prices are inclined to shade when in competition with the cutters. There is hardly a dealer now who does not also give a cash discount for prompt payment. Many of the leading dealers declined to do this in other years, but are using it now to meet the cheap competition.

Steam sizes are slow, although barley manages to maintain its hold, but buckwheat and rice are in plentiful supply and are at times moved at cut prices by independents.

Baltimore dealers are getting scattered orders for delivery of coal on the April schedule, but there is no real snap to the business. All sizes are now in liberal supply.

Anthracite demand at Buffalo is only fair and the outlook is not pleasing at the best. Those who use coke are not so very much disturbed. Coke is quiet, but the shippers are pretty well satisfied with the progress they have made lately and will look for a good demand to return when fall weather is here. Curb prices remain at \$9@9.50 for furnace sizes; commercial oven prices being \$4@4.50 for foundry and \$3.10@3.25 for furnace.

Connellsville Coke Trade Sluggish

Extreme dullness continues in the Connellsville coke market, in keeping with the sharp downward trend in the iron and steel trade in the past week or two.

Spot furnace coke continues quotable at the general range of \$3@3.25. Some coke has accumulated on track, and probably would go at \$3, but buyers of small lots, mainly carloads, for non-metallurgical use, are not always satisfied with the quality and in a few instances have bid up to \$3.25 to get quality.

Spot foundry coke holds up in price, with very limited sales, being \$4@4.50 depending on brand, the average of sales being pretty close to \$4.

Car Loadings, Surpluses and Shortages

	Cars Loaded		
	All Cars	Coal Cars	
Week ended April 11, 1925.....	917,284	138,065	
Previous week.....	922,375	131,487	
Week ended April 12, 1924.....	880,937	129,704	
Surplus Cars			
All Cars Coal Cars			
April 15, 1925.....	343,048	177,916	
April 7, 1925.....	344,258	184,461	
April 14, 1924.....	305,981	180,620	
Car Shortage			
.....			
.....			
.....			

Foreign Market And Export News

British Coal Trade Expands Slightly; Output Below 5,000,000 Tons

Slight trade improvement in Britain has resulted in a slight pickup in the Welsh coal trade. Stocks continue to be heavy and reduced output is still greatly in excess of demand. The state of the industry may be gaged by the returns from the coal docks operated by the Great Western Ry., which show a decline of over a million tons of coal exported for the first quarter of this year.

Around 40,000 miners are now unemployed in Wales and many have left the district for Yorkshire, where slightly better conditions prevail. For many months now nearly all the Welsh operators have been selling below cost but still above the German and North English coals, which are several shillings cheaper per ton. The Portuguese State Ry. has placed a contract for 31,000 tons of coal. The Palestine Administration is inquiring for 25,000 tons of Welsh steams.

The Welsh Miners' Federation has now formulated the demands to be presented to the operators, which are in brief: Any new agreement shall be on the 1914 basis, plus percentage on cost of living as shown by the Board of Trade returns; the Sankey award of 2s. per man per day shall be reinstated; membership of the federation shall be a condition of employment; in connection with night work five nights shall constitute a week, and payment shall be 1½ turn for each single turn, and miners shall be guaranteed two weeks' holiday with pay every year.

The Newcastle market has experienced a slightly heavier demand in consequence of the Easter holidays and there is little coal available. This is recognized to be a passing phase and has had no effect on prices.

Newcastle has obtained a contract to supply the Norwegian State Rys. with 35,000 tons of Wear steams over April and May at 18s. 2d. f.o.b., and 15,000 tons of the same coal from June to September at 18s. 4d. f.o.b. There are several contracts to supply gas coals, the largest being for Oslo Gas Works, 15,000 tons of Holmside gas coal at 17s. 10½d. per ton.

Coal output by British collieries in

the week ended April 11, a cable to *Coal Age* states, totaled 4,494,000 tons, according to official returns. This compares with 5,293,000 produced in the preceding week.

Firmier Tone at Hampton Roads; Supplies Curtailed

Business at Hampton Roads last week showed little improvement, although the market gained strength through curtailment of supplies at tide-water. Many mines continued to operate on a three-day a week basis, and supplies were dwindling.

Foreign movement showed a slight improvement, and bunker trade and coastwise business were holding their own. The tone of the market was somewhat stronger, but shippers in the main were striving to keep operations as near normal as possible.

French Market in Doldrums; Domestic Prices Changed

The French coal market shows no change in the general situation in industrial coals. New contracts on sized products for household consumption, which usually are renewed April 1, are dragging a little because there are still some stocks in the retail merchants' yards. The delay is only temporary, however, as there is no doubt whatever of the renewal of these markets.

At the mines there are no stocks to speak of, except a little dry smalls and screened.

The Nord and Pas-de-Calais collieries have maintained for the second quarter the prices on industrial coal and coke in effect since Jan. 1. Coals for home use have been touched up; a decrease of 4 frs. has been applied to semi-bituminous washed peas for the Vosges region (at the extreme sales limit of the Nord collieries) and bituminous nuts have nearly everywhere been cut 5 fr. Freights remain unaltered.

Between April 1 and 6 the O.R.C.A. received 54,156 tons of coke, or a daily average of 9,000 tons. It has been officially announced that this fuel will be advanced 1.55 fr. to 145.70 fr., in-

cluding O.R.C.A. expenses, on truck, Sierck, while the same grade is quoted at 130 fr. in Belgium.

U. S. Domestic Exports of Fuel In March

	1924	1925
Anthracite, tons.....	309,243	200,953
Value.....	\$3,297,389	\$2,251,833
Bituminous, tons.....	1,135,284	918,746
Value.....	\$5,727,821	\$4,155,645
Coke, tons.....	52,729	65,980
Value.....	\$458,213	\$499,462

NINE MONTHS ENDED MARCH

	1924	1925
Anthracite, tons.....	3,061,652	2,620,477
Value.....	\$33,649,184	\$29,457,043
Bituminous, tons.....	13,453,704	10,855,228
Value.....	\$68,370,553	\$49,174,220
Coke, tons.....	586,827	492,343
Value.....	\$5,553,157	\$3,988,122

Export Clearances, Week Ended April 25, 1925

FROM HAMPTON ROADS		Tons
For Jamaica:		
Nor. Str. Bueland, for Kingston..		5,212
For British West Indies:		
Nor. Str. Bratland, for Castries....		3,010
For Italy:		
Ital. Str. Prereste, for Genoa.....		7,694
For Cuba:		
Br. Str. Canadian Settler, for Havana		4,212
Br. Str. Kelsemoor, for Antilla....		1,142
For New Brunswick:		
Dan. Str. Paris, for St. John.....		3,038
For Canal Zone:		
Amer. Str. Achilles, for Cristobal..		12,047
Amer. Barge Darien, for Cristobal..		7,253
For Brazil:		
Br. Str. Roseric, for Rio de Janeiro.		6,482
For Danish West Indies:		
Nor. Str. Songel, for Curacao.....		3,638
For France:		
Fr. Str. P. L. M. 21, for Marseilles.		8,182

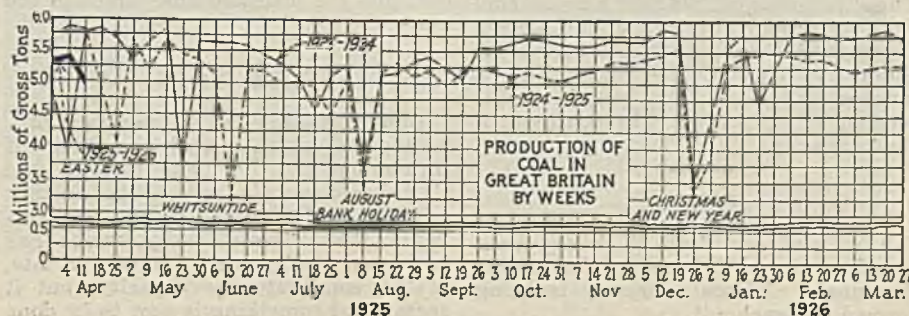
FROM PHILADELPHIA		Tons
For Martinique:		
Am. Schr. Gladys M. Taylor, for Trinite, Francois and Laurentine Bays		2,005

FROM BALTIMORE		Tons
For Chile:		
Nor. Str. Samnanger, for San Antonia (coke)		2,005

Hampton Roads Pier Situation		April 16	April 23
N.&W. Piers, Lamberts Pt.:			
Cars on hand.....	1,156	1,488	
Tons on hand.....	75,260	10,008	
Tons dumped for week.....	107,478	85,208	
Tonnage waiting.....	5,000	5,000	
Virginian Piers, Sewalls Pt.:			
Cars on hand.....	701	985	
Tons on hand.....	49,300	70,050	
Tons dumped for week.....	84,397	55,525	
Tonnage waiting.....	2,986	3,500	
C. & O. Piers, Newport News:			
Cars on hand.....	1,757	1,599	
Tons on hand.....	85,815	78,615	
Tons dumped for week.....	138,255	117,030	
Tonnage waiting.....	7,725	5,050	

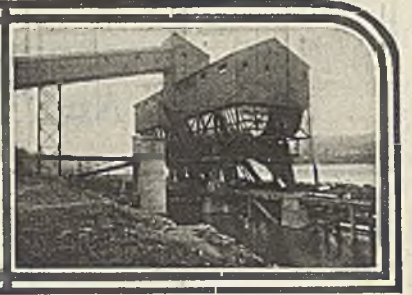
Pier and Bunker Prices, Gross Tons		PIERS	BUNKERS
		April 18	April 25†
Pool 9, New York....	\$4.70@4.85	\$4.70@4.85	
Pool 10, New York....	4.50@4.65	4.50@4.65	
Pool 11, New York....	4.25@4.50	4.25@4.50	
Pool 9, Philadelphia..	4.65@4.90	4.65@4.90	
Pool 10, Philadelphia..	4.30@4.55	4.30@4.55	
Pool 11, Philadelphia..	4.25@4.30	4.25@4.30	
Pool 1, Hamp. Roads.	4.30	4.35	
Pool 2, Hamp. Roads.	4.15	4.20	
Pools 5-6-7, Hamp. Rds.	4.00	4.10	
Pool 9, New York....	\$4.95@5.10	\$4.95@5.10	
Pool 10, New York....	4.75@4.90	4.75@4.90	
Pool 11, New York....	4.50@4.75	4.50@4.75	
Pool 9, Philadelphia..	4.80@5.10	4.80@5.10	
Pool 10, Philadelphia..	4.60@4.75	4.60@4.75	
Pool 11, Philadelphia..	4.45@4.65	4.45@4.65	
Pool 1, Hamp. Roads.	4.35	4.40	
Pool 2, Hamp. Roads.	4.25	4.25	
Pools 5-6-7, Hamp. Rds.	4.10	4.15	

Current Quotations British Coal f.o.b. Port, Gross Tons
Quotations by Cable to *Coal Age*
Curdif: April 18 April 25†
Admiralty, large.... 26s. @ 26s. 6d. 26s. @ 26s. 6d.
Steam smalls..... 16s. 6d. 15s. 6d.
Newcastle:
Best steams..... 16s. 9d. @ 17s. 17s. 6d. @ 20s.
Best gas..... 20s. @ 20s. 6d. 19s. @ 19s. 6d.
Best bunkers..... 18s. 18s. @ 18s. 6d.
†Advances over previous week shown in heavy type; declines in *italics*.





News Items From Field and Trade



ALABAMA

At the annual meeting of the Sloss-Sheffield Steel and Iron Co., April 15, John L. Kaul and W. H. Kettig of Birmingham, and Bernard Baruch, Jr., of New York, were also elected to membership on the board. All administrative officials were re-elected.

ARKANSAS

Early in April Watson & Son acquired the Arhal Kirkpatrick coal mine at Paris, and will develop it.

CALIFORNIA

Two fifty-year leases on coal land in Shasta County were filed April 14. In all 960 acres are involved in the leases just recorded. Ben Hall, Yreka, owner of 360 acres adjoining the Milton Hunt and E. C. Frisbie properties, and Benjamin F. Bibbens, owner of 600 acres in the same section, are the lessors. Their lands are located in the Oak Run and Clover Creek sections.

COLORADO

Herbert E. Curran has been named a member of the State Industrial Commission by Governor Morley. He succeeds William I. Reilly, who has served as a member of the board for the last six years. Mr. Curran has been secretary of the commission for the last four years. The State Legislature adjourned April 18 and did not confirm the appointment of Mr. Curran. Dan S. Jones was appointed member of the State Public Utilities Commission to succeed Grant S. Halderman and the appointment was confirmed by the Senate.

The Colorado Fuel & Iron Co. for the first quarter of 1925 reports net earnings from operations of \$1,436,205, compared with \$1,548,624 in the same period last year. The income above fixed charges amounted to \$826,934 and a balance of \$569,752 was carried to surplus.

The Trinidad-Las Animas chamber of commerce is doing what it can to stimulate the coal trade of its region. Among other things it offers \$25 to the school boy or girl who writes the best slogan of not more than six words to convey the idea that coal mining is the major industry of the territory. The new state mining code is by no means as rigid as that of Utah, but there are a number of changes in the mining law to make Colorado operations safer. It provides that a man must have at least six months' experience as a fire boss before he can become superintendent, and

that the superintendent must read the daily report of the mine and sign the report to prove that he is familiar with conditions underground. It also is provided that every coal mine must have emergency equipment; the chief coal mine inspector of the state is given authority to revoke the certificate of any fire boss he believes incompetent, and additional powers are given to the chief and deputy inspectors over the mines. To increase the revenue the present coal tax of one-third of one per cent per ton mined is raised to four-tenths of one per cent.

The state coal mine inspector's report for March shows a decrease in Colorado production for that month of 263,169 tons compared with the same period a year ago. The decrease to date from Jan. 1 is 227,741 tons compared with the same period a year ago and the number of days worked per mine for 1925 to date is 47.1 contrasted with 50.7 for the same period a year ago.

ILLINOIS

The Crozer-Pocahontas Co. announces the removal of its Chicago offices from the Fisher Building to 1516 Bell Building, 307 North Michigan Avenue. John Pynchon is Western sales agent.

The Old Ben Mine No. 8 at West Frankfort, suspended operations on April 22 throwing 850 miners out of work. D. W. Buchanan, of Chicago, president of the company, explained that poor market conditions forced the closing of the mine indefinitely.

INDIANA

The Carlisle mine, Carlisle, has reopened on the co-operative plan, the mine having been leased by miners formerly employed by the Carlisle Coal Mining Co., owners of the mine. The lease is for two years and is to the Carlisle Fifth Vein Coal Co. Some fifty miners have taken stock in the new company and all the preliminary steps of organization have been taken and the charter of the new company issued. The directors are: William Russell, Hud Ford, Herman Liston, John Brown, Clyde Shake, French Crance and J. A. Gumere. Will Cooper, who for a number of years has been superintendent of the mine, will continue in that capacity.

IOWA

A vein of coal 4 ft. thick has been struck on the A. C. Lunsford farm, near Savannah. A local company is being formed to develop it.

KANSAS

A steam-shovel coal-mining plant was erected in three weeks by the French Coal Co. at Scammon. The shovel was moved from Montrose, Mo. The French company expects to begin actual production of coal by May 1.

The Pittsburg Chamber of Commerce will give a banquet for the miners participating in the Kansas first-aid and mine-rescue meet to be held in Pittsburg, June 13. Pittsburg business men also will contribute the money to send the team winning the state meet to the national meet in Springfield. John B. Hynal, an expert sent by the Bureau of Mines, now has thirteen teams in active training.

KENTUCKY

A report from Whitesburgh is to the effect that the Imperial Elkhorn Coal Co. resumed on April 20, after being down from April 1.

Garrett B. Wall, vice-president of the Chesapeake & Ohio Ry., in a statement at Huntington, W. Va., April 22, announced that the road would exercise an option to purchase the Sandy Valley & Elkhorn R.R. The consideration was not made public. Mr. Wall said the Chesapeake & Ohio would consolidate the Sandy Valley line with its Big Sandy division in the coal fields of eastern Kentucky.

MISSOURI

Frank Fenix, of Joplin, has been appointed by Governor Baker as chief inspector of the State Mining Bureau. He succeeds J. E. Roberts, of Kirksville, who was appointed under the Hyde administration. Fenix has been a deputy in the bureau under Roberts. Dallas E. Ingersoll, of Huntsville, will take the place vacated by the promotion of Fenix. O. L. Hennenger, of Vandalia, who has been secretary of the Mining bureau for the past four years, was reappointed. The force of deputy inspectors will be divided between the coal and the lead and zinc mines in the state.

NEW YORK

Buffalo bituminous shippers are preparing to increase their handling of bituminous coal to Lake Ontario and Canadian ports via Sodus Point on that lake, which is reached by the Pennsylvania R.R. The difficulty, which has cut down the operations much of late, is the small storage capacity, but it seems that something is now to be done

to make good in that direction. An effort also is making to increase the movement of this coal northeastward from Erie, Pa., this season.

Two cargoes of soft coal, totaling 17,800 tons, have already arrived at Buffalo from Sandusky by lake from Kentucky and West Virginia. An effort to reduce the rail rate to the lake, made some time ago, seems to have failed, as the plan to increase this movement largely is said to have been given up. The amount received last season was 683,500 tons.

OHIO

The Ohio Collieries Co. has resumed operations at Mines Nos. 255 and 281 located near Gloucester, which were closed down because of a strike. The trouble, which was over a division of work with idle miners at nearby mines, has been adjusted. It is reported that Sunday Creek Mines 209 and 211 have been closed down permanently.

With requests for instructions in first-aid practice in various industries of the state rapidly increasing, Herman R. Witter, director of the Department of Industrial Relations, assigned Mine Inspector Val D. Brown, of Pomeroy, to join the federal mine rescue car when it reached that city recently. While the training of first-aid teams in mining and its allied industries is being carried on in southern Ohio, inspectors are working from the state's mine rescue car, "Black Diamond," in eastern Ohio. A state contest will be held July 18, at Zanesville, where teams thoroughly instructed in first aid will compete for prizes and various honors.

Proposals for municipal and school coal are now attracting the attention of producers and shippers in Columbus and central Ohio.

The Blackstone Coal Co. and the Hobson Mining Co., two corporations formed about six months ago to take over the three mines in the Pomeroy field formerly owned by the Maynard Coal Co., are both operating. Quite a few men are employed at all of the mines and the companies have sold con-

siderable coal since they started operations.

OKLAHOMA

As a result of the controversy between the operators and miners of the Henryetta district, not a pound of coal has been mined since April 1. The trouble arose when the operators issued orders for all mines to be cleaned out and shut down April 1 unless the miners were willing to go back to the 1917 wage scale. The operators declared that under the present wage scale it was impossible to produce coal and sell it at a profit against fuel oil, but that if the miners would agree to go back to the 1917 scale all mines—forty-two of them—would continue to operate throughout the summer. The miners refused to accede and the shut-down was ordered. There are about four thousand coal miners in the district.

PENNSYLVANIA

Mining officials in the Lansford region say that the new breaker being erected there by the Lehigh Coal & Navigation Co. will be the largest in the anthracite field. The structure is being built by the McClintic Marshall Co., of Pottstown. The breaker is to handle the output of three mining slopes.

Conditions in the Connellsville coke region have not changed much in the last week. The H. C. Frick Coke Co. has closed down its Continental No. 1 plant, near Uniontown. This is a 400-oven plant and has not often been idle. The Monessen Coal & Coke Co., a subsidiary of the Pittsburgh Steel Co. has reduced operations to half time. The Superior Coal Co. has resumed operations after being idle for a few months.

Citizens of Port Carbon a town threatened with serious damage from inundation by the Schuylkill River, caused by filling of the channel by coal dirt and culm from the mines, won a victory in court recently when all of the coal companies named in the complaint promised to dredge the stream at their own expense. The dredging is expected

to allow the culm to be swept down the river.

Figures made public April 22 at the Department of Mines, Harrisburg, showed that anthracite production in Pennsylvania declined more than 5,000,000 tons in 1924 compared with 1923. The output in 1924 was 87,277,449 tons, compared with 92,663,854 tons in 1923.

David S. Hammond, representing the Fuel Corporation of America at Lebanon, has been elected secretary of the Lebanon Chamber of Commerce, effective May 1.

TEXAS

The holdings of the Consumers Coal Co., Bastrop, were sold at auction recently by the sheriff's department to Joe Oriotti, of San Antonio, on a bid of \$40,000. The mines are at present in operation and it is understood that extensive improvements are contemplated by the new owners.

UTAH

John H. Tonkin, president and general manager of the Independent Coal & Coke Co., with headquarters in Salt Lake City, announced on April 15 that wages would be reduced 20 per cent at the company's Kenilworth Mine. In the evening the miners held an open-air meeting and by a vote of about ten to one decided to discontinue work. About 250 miners are on the Kenilworth payroll.

John Smith, safety engineer of the Union Pacific Coal Co., and Glen Knox, superintendent of the Gunn-Quealy mine at Sweetwater, have been appointed by Gov. Nellie T. Ross on the newly created board of Wyoming coal mine inspectors. The other member is Matthew Morrow, of Evanston. These three will constitute the board and will serve until 1927. The appointments are effective from April 1. Mr. Knox is a new member while Messrs. Smith and Morrow were reappointed.

Coal output in Utah in March, as compiled by the U. S. Bureau of Mines in co-operation with the Geological Survey, was 301,977 tons as compared with 300,640 in February. The production in March in 1924 was 259,585 tons; in March, 1923, 339,801; in March, 1922, 434,022; in 1921, 284,573, and in 1920, 527,606 tons.

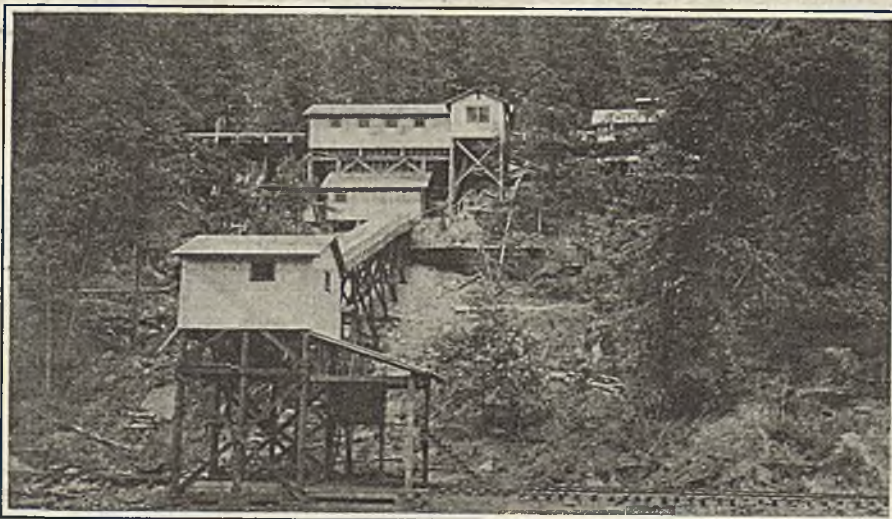
VIRGINIA

Allen B. Gibson, formerly with the Steamship Fuel Co. in Norfolk, has opened the Norfolk office of the Coal River Collieries Co., owned by the Brotherhood of Railroad Engineers.

WEST VIRGINIA

Field engineers probably will complete their financial valuations this week of the properties involved in the proposed \$100,000,000 merger in northern West Virginia.

A fire occurred in the bottom of the shaft of mine No. 41 of the Bethlehem Mines Corporation, near Barrackville, April 18, when a steel worker let a hot rivet fall in it. Company fire fighters quickly extinguished the blaze. There



Headhouse, Conveyor Line and Tipple, at Fidelity Mine
Plant of the Stearns Coal & Lumber Co., at Fidelity, McCreary County,
southern Kentucky

was an explosion at this mine last month, when thirty-three miners were killed.

Six additional mines of the Consolidation Coal Co. have been closed down, according to an announcement by Frank R. Lyon, vice-president of the company. Only two mines of the company are now in operation in the entire Fairmont region. The mines just closed are Shaft No. 38, Highland No. 36, Short Line 62, Kinnickinnick No. 25, Ida May No. 87 and Baxter No. 96. About 850 men are thrown out of work by the shutdowns.

A verdict for \$10 was returned April 18 by the circuit court at Huntington in the case of trustees of the Cole & Crane estate against the Main Island Creek Coal Co. The plaintiffs sued for \$275,000. Damage to mines at Omar, leased by the Main Island company from the Cole & Crane estate was alleged in the suit, the plaintiffs contending that coal remaining in the property had been made unminable by employment of impractical methods and failure to correct evils of which the trustees, through their engineer, Robert Carson, had complained.

The U. S. Circuit Court of Appeals on April 18 reversed the decision of the U. S. District court of the southern District of West Virginia in its award of \$900,000 damages to the White Oak Coal Co. against the government. The judgment was the largest in the history of the district court. The White Oak Coal Co., a subsidiary of the New River company, operating in the New River field, in its suit, claimed that coal to the value of the amount named in the suit had been confiscated by the government for fuel purposes shortly after the start of the war when the price of fuel was high. It is expected that the case will be appealed to the U. S. Supreme Court.

WASHINGTON, D. C.

In order that the public may know whence its coal supply comes, the U. S. Geological Survey began last week the weekly publication of coal production figures by states. The production table, carrying the figures of twenty-four states, is accompanied by a plate of eight diagrams, each diagram representing a state. The diagrams show the trend of production, based on index numbers, computed from the average daily output, with the 1923 rate as the basis.

CANADA

The construction of the Ontario Hydro-Electric Commission's proposed steam auxiliary power coking and heating plant will proceed this summer, according to an opinion expressed by Mayor Foster of Toronto, last week. The Ontario government appropriated \$10,000,000 for the project. It is said that the daily output of gas will be 13,500,000 cu.ft. and 1,930 tons of coal will be carbonized daily to produce 1,353 tons of coke a day. That would mean 493,845 tons of coke a year, or a little more than half of Toronto's domestic demand of anthracite per annum.

Traffic

Outlaws Atlanta Switching Boost

Tariffs which would limit the absorption of switching charges by the Louisville & Nashville R.R. and effect an increase in the charges on delivery to a large number of points within the Atlanta (Ga.) industrial district have been ordered vacated by the Interstate Commerce Commission in a mimeographed report in I. & S. Docket No. 2295, Coal and Coke from Kentucky and Tennessee Mines to Atlanta. Under tariffs now in force the L. & N. absorbs the entire switching charge of all connecting lines at Atlanta except the Southern. To points on that line within the Atlanta switching district, the L. & N. absorption is limited to \$2.25 per car. In the tariffs suspended and now ordered canceled, the L. & N. proposed to similarly limit its absorption to deliveries on all other lines in the district except the N. C. & St. L., to which it would pay \$2.25 additional for hauling cars from its interchange point at Cartersville, Ga., to the interchange with the Atlanta joint terminals.

In making the proposed revision, the L. & N. selected points in the district designated by names other than Atlanta, such as Armour, East Point, Decatur, etc., regardless of whether they are within the switching or the corporate limits of the city, and to such points it sought to limit the amount of its absorption of connecting lines' switching charges. All points not designated by names other than Atlanta were considered within Atlanta proper.

As a general rule the charge of the terminal lines is \$2.25 per car for switching to industries within approximately three miles of the interchange tracks at which coal is delivered by the L. & N. To points beyond charges range from 15 to 31c. per ton. The proposal would leave the charges to 381 industries unchanged, and would affect 137. In addition, the respondent proposed a revision in the specific rates on coal from the Kentucky and Tennessee mines to points within the district and to several points outside to which present rates closely approximate the rates to Atlanta from 14.6 to 25.5c. per ton on the plea that such increases were necessary to comply with the fourth section of the interstate commerce law.

Class Rates Unreasonable

Application of the sixth-class rate of \$2.80 per gross ton on the movement of bituminous coal from Boston, Mass., to Hills Grove, R. I., a distance of 53 miles, was found unreasonable by the Interstate Commerce Commission in its mimeographed report in Rhode Island Malleable Iron Works vs. New York, New Haven & Hartford R.R. The defendant urged that the movement was sporadic and that the rate covered the absorption of Boston & Albany switching charges at Boston. The commission, which had found the class rate of \$1.80 on a haul of 28 miles unreasonable in an earlier case, agreed with the complainant that the rate should not have exceeded \$1.85 and ordered reparation on that basis.

Public Utility Joins Railroads Against Assigned Car Rule

The Public Service Electric & Gas Co. of New Jersey filed a bill in equity April 17 in the U. S. District Court at Philadelphia, Pa., joining with nearly 100 railroads, steel companies, coal corporations and other concerns for revocation of the Interstate Commerce Commission order restricting the use of privately owned coal cars. This is the first public utility to join in the case. It owns 600 cars, purchased for \$1,750,297 in 1920.

Coal Firms Win Reparation

The Kanawha Black Band and the Glen Coal companies have been awarded reparation for unreasonable charges paid upon shipments of coal from mines on the Kanawha Central Ry. to various interstate destinations between June 24, 1922, and July 13, 1923. The Interstate Commerce Commission, by a decision effective the last named date, held that the combination rates then charged were unreasonable to the extent that they exceeded the district rates maintained by trunk line carriers which handled coal originating on the Kanawha Central and delivered to the Chesapeake & Ohio at Brounland, W. Va.

Prior to June 23, 1922, charges to Brounland had been assessed on the basis of \$8.50 per car. Subsequently tariffs were filed naming the Kanawha district rate plus 40c. per ton to Brounland. The 40c. factor was condemned by the commission in Kanawha Black Band Coal Co. vs. Chesapeake & Ohio Ry. Co. et al., 78 I. C. C. 429. In a mimeographed report in Kanawha Black Band Coal Co. et al. vs. Kanawha Central Ry. Co. et al., the commission upholds the contention of the complainants that total charges paid by the complainants between June 24, 1922, and July 3, 1923, were unreasonable to the extent that they exceeded the district rates plus \$8.50 per car. Reparation awarded.

B. & O. Lowers Rate to Northwest

The Baltimore & Ohio R.R. is naming a new coal rate tariff from mines east of the Ohio River to Northwestern territory, including points in the Dakotas, Illinois, Iowa, Missouri, Minnesota and Nebraska. They are 30c. to 75c. a ton lower than present rates.

The Northern West Virginia Coal Operators' Association has engaged Attorney E. J. McVann, of Washington, D. C., to represent it before the U. S. District Court in Philadelphia on May 25, when railroads, steel companies and other private car owners will attack the recent Interstate Commerce Commission order against assigned and privately owned coal cars on the ground that the commission exceeded its authority. Mr. McVann represented the association at the oral arguments before the Interstate Commerce Commission in Washington, D. C., on Monday, April 27, when the lake differential case was under consideration.

Recent Patents

Machine for the Manufacture of Fuel Briquets from Peat; 1,526,360. John Campbell, Detroit, Mich. Feb. 17, 1925. Filed March 26, 1923; serial No. 627,851.

Mining Machine; 1,526,558. Edmund C. Morgan, Chicago, Ill.; Olive E. Morgan executrix of said Edmund C. Morgan, deceased. Feb. 17, 1925. Filed Sept. 21, 1916; serial No. 121,359.

Mining Bit; 1,526,565. James E. Redmond, Butte, Mont., assignor of forty-nine one-hundredths to Wm. C. Siderfin, Butte, Mont. Feb. 17, 1925. Filed June 16, 1923; serial No. 645,848.

Coming Meetings

National Retail Coal Merchants Association. Annual convention Traymore Hotel, Atlantic City, N. J., May 11-14. Resident vice president, Joseph E. O'Toole, Transportation Bldg., Washington, D. C.

The American Society of Mechanical Engineers. Spring meeting, May 18-21, Milwaukee, Wis. Secretary, C. W. Rice, 29 West 39th St., New York City.

Mine Inspectors' Institute of America. Annual convention, Jefferson Hotel, Peoria, Ill., May 19 and 20. Secretary, G. B. Butterfield, 179 Allyn St., Hartford, Conn.

Chamber of Commerce of U. S. A. Thirtieth annual meeting, May 20-22, Washington, D. C.

Manufacturers' Division of the American Mining Congress. National exposition of coal-mining equipment, Cincinnati, Ohio, week of May 25. Secretary of American Mining Congress, J. F. Callbreath, Munsey Building, Washington, D. C.

National Association of Purchasing Agents. Tenth annual convention, Milwaukee, Wis., May 25-28. Secretary, W. L. Chandler, Woolworth Building, New York City.

International Railway Fuel Association. Seventeenth annual convention, Hotel Sherman, Chicago, Ill., May 26-29. Secretary, J. B. Hutchinson, 6000 Michigan Ave., Chicago, Ill.

American Wholesale Coal Association. Ninth annual convention, French Lick Springs Hotel, French Lick, Ind., June 1 and 2. Secretary, G. H. Merryweather, 1121 Chicago Temple Bldg., Chicago, Ill.

Illinois & Wisconsin Retail Coal Dealers' Association. Annual meeting, June 9-11, at Lake Delavan, Wis. Secretary, I. L. Runyan, Great Northern Bldg., Chicago, Ill.

Mid-West Retail Coal Association. Annual meeting at Kansas City, Mo., June 9-10, Baltimore Hotel.

Pennsylvania Retail Coal Merchants' Association. Annual convention, June 11 and 12, Hotel Bethlehem, Bethlehem, Pa. Secretary, W. M. Bertolet, Reading, Pa.

National Coal Association. Annual meeting, June 17-19, Edgewater Beach Hotel, Chicago, Ill. Executive Secretary, Harry L. Gandy, Washington, D. C.

International Chamber of Commerce. Third general conference, Brussels, Belgium, June 21-27.

American Society for Testing Materials. Twenty-eighth annual meeting, week of June 22, Chalfonte-Haddon Hall, Atlantic City, N. J. Secretary-treasurer, C. L. Warwick, 1315 Spruce St., Philadelphia, Pa.

American Institute of Electrical Engineers. Annual convention, Saratoga Springs, N. Y. June 22-26. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

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

Twelfth National Foreign Trade Convention. Seattle Wash., June 24-26. Chairman, James A. Farrell, National Foreign Trade Council, Hanover Square, New York City.

Tenth Exposition of Chemical Industries, Sept. 28 to Oct. 3, at Grand Central Palace, New York City.

Fourth National Exposition of Power and Mechanical Engineering, Nov. 30 to Dec. 5, at Grand Central Palace, New York City.

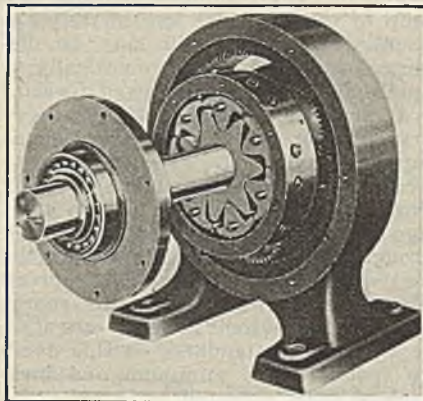
Coal Mining Institute of America. Annual meeting, Dec. 9-11, Pittsburgh, Pa. Secretary, H. D. Mason, Jr., P. O. Box 604, Ebensburg, Pa.

New Equipment

Spring Plunger in Reducer Eliminates Back Lash

A new inclosed speed reducer, manufactured by W. C. Lipe, Inc., 208 South Geddes Street, Syracuse, N. Y., employs full planetary construction, having two or three planets (depending on the service) mounted in a cage that is supported on both ends on ball bearings. The studs on which the planetary gears rotate are supported on both ends in this cage. The planetary gears are bronze bushed. The low-speed shaft is connected to the cage by means of a flexible connection which is mounted in the end flange of the planetary gear cage.

In the annular flange or ring, spring plungers are mounted with the plungers extending inward and engaging on each



Well Balanced Speed Reducer

Spring plungers in this unit always keep the teeth of the gears in tight contact, thus eliminating vibration and back lash.

end of the rocker. In operation, as power is applied to rotate the high-speed pinion, the cage starts to revolve and the low-speed shaft remains fixed until the rotation of the cage causes the teeth of the toothed sector to engage with the teeth of the rockers. By this arrangement the rocker is tilted, compressing the spring plunger on either side, until the rocker bottoms on the inside of the annular flange. After this the low-speed shaft picks up the load. The employment of the rocker gives positive contact and does not operate on the springs.

The advantages of the spring plungers are claimed to be positive. In the first place, when the springs of the plungers are being pressed, the only load the motor has to assume is sufficient power to compress seven, eight or more springs, depending upon the horsepower and size of the reducer. This means that while the springs are compressing the rotor of the prime mover has a chance to start with practically no load and picks up the load gradually. Also, while the springs are being compressed, the teeth of the gears are held in tight contact, thereby eliminating all vibration and back lash.

The high- and low-speed shafts are

concentric with each other in perfect axial alignment. The pinion on the high-speed shaft floats and equalizes the load between the planetary gears, eliminating all side strains, and gives a perfect torque. The whole reducer is totally inclosed, being also both dust and fool proof. Gear reductions from 4:1 up to 25:1 in any size up to and including 500 hp. can be obtained.

Automatic Rotary Dump Makes Big Savings

In accordance with a tendency, well-defined in the coal industry today, toward the use of solid-body mine cars, V. T. Barkley, of Pittsburgh, Pa., has developed a new type of rotary dump adapted to the discharge of such cars. Unlike most rotary dumps designed in the past, this one is not only gravity actuated but automatic in its operation. It is known as the Barkley automatic gravity rotary dump, and has been in successful operation at two mines in Pennsylvania for the past two years. It is now being manufactured by the Mine Equipment Co., of Pittsburgh.

A general view of this device is shown in Fig. 1, and the details set forth in Fig. 2. The dump platform is supported by means of bearings embracing a stationary shaft, at the forward end of which is mounted a cushioned positive dustproof stop so arranged as to engage the bumper of an oncoming car. A rear stop is also provided. This absorbs the rebound of the car from the front stop. Positive control of rotational movement is obtained by a crank mounted on the main shaft which is off center to the dump platform. To this crank a piston working in an oil dash pot is connected.

CLAMPS GRIP LIKE ICE TONGS

Two cams mounted on the shaft actuate two pairs of clamps, which, acting like ice tongs, hold the car in place during discharge. Although the shaft and frame are set level the track rails are sloped causing the empty mine car to run off the dump when released.

The dump normally is held in position by two spring buffer fastenings, one at either end, which are engaged by locking pins at each end of the frame. These pins, as well as the bumper stops, are connected to a trigger which is automatically moved sideways to engage the front wheels of an oncoming loaded car. A second trigger is located behind the rear wheels of a car when spotted on the dump. This is connected to the front trigger.

When the dump is empty the bumper stop is lowered and in the clear, the front trigger is out of and the rear trigger is in its wheel-engaging position and the platform is locked and level transversely. When a loaded car comes onto the dump its front wheel depresses the rear trigger, thereby releasing the front trigger and moving it into posi-

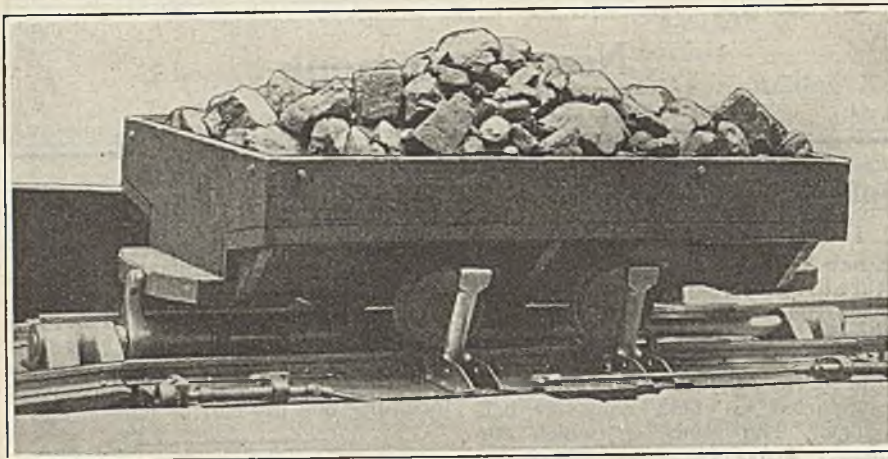


Fig. 1—Ready to Discharge a Car's Contents

Simplicity is the keynote of this dump's construction. As the device starts to revolve under the action of gravity the wheels are gripped by the clamps and held firmly to the rails until the car is righted after which they are released. The car then gravitates off the dump platform.

tion to engage the car wheel. Further movement of the car causes this front trigger to be depressed.

This raises the bumper stop until it engages the bumper of the car which is thereby spotted. It next withdraws the locking pins leaving the dump free to revolve about the main shaft, which it does by reason of its eccentric mounting. After the mine car's contents has been discharged the dump returns to its upright position where it is again locked in place. As this is accomplished the bumper stop is moved out of the way leaving the car free to gravitate off the dump.

Succeeding mine cars pass through the same cycle of operations. The speed of the dump in its rotation and in its righting movement is controlled by the oil dashpot, the cylinder of which acts as a counterweight.

During the discharge of its contents the mine car is held in position on the dump by the two pairs of quick-acting clamps that close over the wheels or the edges of the body. These are automatically operated and can be adapted to any type of mine car. They may be so constructed as to be able to handle, consecutively, cars of different heights and widths.

While the dump is inoperative no mine car is "stored" upon it. If for any reason it becomes desirable to pass

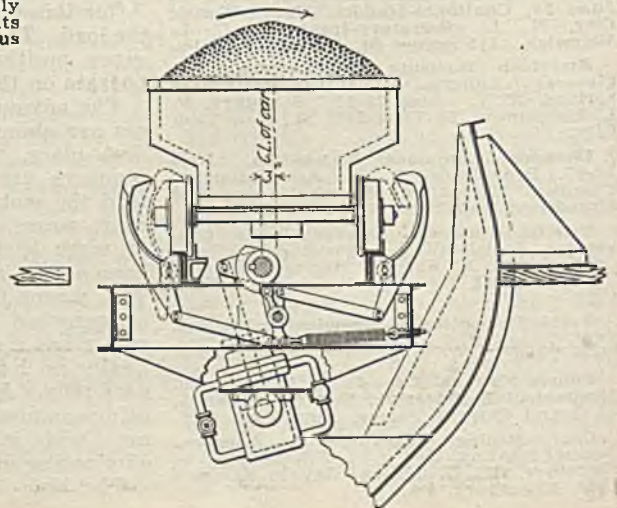
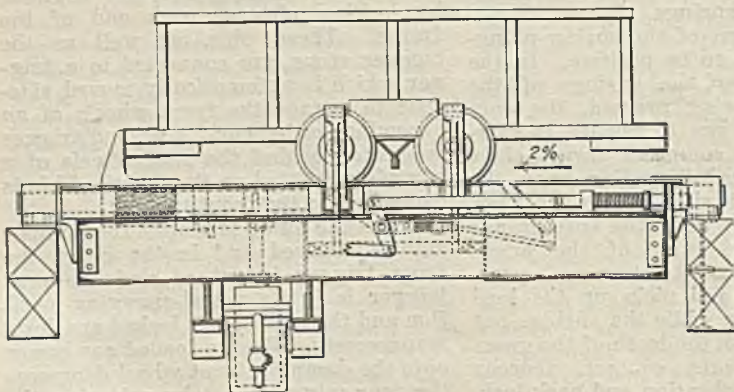
one or more cars across it without discharging their contents, the throwing of a hand lever moves all triggers and stops out of their operative positions.

Some of the advantages inherent to a dump of this kind are immediately apparent. An entire trip may be discharged regularly and automatically as rapidly as the cars are moved forward by a car feeder or trip maker. Loaded cars entering this dump do not touch empties leaving it. The destructive effects of bumping are thus entirely eliminated. All stress incident to stoppage of the car on the dump is absorbed through the bumper where it has the least detrimental effect. An appreciable saving is made from this source alone. Being automatic in its operation the wages for attendance on this dump are reduced to a minimum and inasmuch as it is actuated by gravity, its power consumption is nil. Breakage of coal during discharge is small because the car's contents moves with it and rolls against a curved housing plate that just clears its edge.

As this dump is simple and compact in construction its initial cost is small and few changes are necessary for its installation in an existing structure. It embodies principles long incorporated in the construction of the crossover, the end-discharge and the kickback types.

Fig. 2—Details of the Dump's Construction

Constructional features of the dump are here set forth. Cams, bumper blocks and other details are such that although the only actuating force applied to this device is the action of gravity its entire operation is automatic. Attendance on this dump is thus reduced to the lowest possible point.



Obituary

Milford H. Coffin, 66 years of age and a former resident of Salt Lake City, Utah, died at his home in Boise, Idaho, in the second week of April. He was the original promoter of the Mutual Coal Co. in Spring Canyon, Carbon County, Utah. At the time of his death he was organizing the Equitable, another mutual concern.

Jullus Hellweg, 71, secretary of the Baltimore Coal Exchange for more than 20 years, died in Baltimore recently. Mr. Hellweg was a man of great energy. When the war broke out he went to the first officers' training camp of the state, going through the full course of hard and intensive training with men young enough to be his grandchildren, but was of course later ruled out because of age.

David Talbot Day, who for forty-five years had been active in geological circles, died in Washington, D. C., April 15. Funeral services were held in the same city April 18, with interment at Baltimore. Dr. Day was the father of the Minerals Resources Division of the U. S. Geological Survey. When he became a member of the Survey in 1886, statistics of mineral production were obtained from secondary sources. He organized the work and established the policy of close personal contact between the technical men at the Survey and the producers of minerals. Dr. Day was born in Ohio, Sept. 10, 1859. He was graduated from Johns Hopkins in 1881 and obtained the degree of Ph.D. from that institution in 1884. He was an instructor in chemistry at the University of Maryland for a few years prior to joining the Geological Survey. He was in the service of that agency continuously from 1886 to 1914. Most of his work was on the chemical side of geology. In 1914 Dr. Day was appointed a consulting chemist on the staff of the Bureau of Mines. His work on the Rittman process of petroleum refining attracted wide attention. He also did extensive work for the Bureau of Mines on oil shale. For many years he was secretary of the Joseph A. Holmes Safety Association.

New Companies

Articles of incorporation for the **Al-Burn Coal Co.**, Terre Haute, Ind., have been filed. The corporation, which is to purchase certain holdings near West Terre Haute, is incorporated for \$27,000. The incorporators are: Claude W. Asbury, William M. Gambill, Charley R. Cummins, Thomas Irwin, James Marlow, Thurlow W. Asbury, Conrad Asbury and Alonzo H. Kelsner, of Hymera, Ind.

The **Ogden Consumers' Mutual Coal Co.** of Ogden, Utah, has incorporated with a capital of \$50,000, 2,500 shares of \$10 preferred stock, and 2,500 shares of \$10 common stock. C. J. Cotterell of Ogden is president, and J. C. Ellsworth, secretary.

The **East Point Coal Corporation**, of Duluth, Minn., has filed articles of incorporation to develop and operate coal mines and coal properties. The capital stock is \$50,000. The incorporators are, W. H. Hamilton, John W. Neukom and E. B. Norris, all of Duluth.