

# COAL AGE

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## Gods of Hill or Plain

**I**N EARLY DAYS when tribes met death, disease and accident, they went no more to localities thus accursed. They did not inquire into causes; they did not seek remedies. The gods of the hill or of the plain were against their rash intrusion and that was enough. In Africa today the tribesmen react in a similar manner.

In the days following the entry of the Conquistadores into Mexico, gold mines were opened. The gold-bearing rock was progressively removed, forming larger and larger chambers without pillars, till at last the places caved, burying all the unfortunates who were excavating them, and mining ceased.

Did they try safer methods? Did they make trial of making smaller chambers separated by massive columns or long pillars? Not at all; they deserted the mines and opened new ones. An evil spirit reigned in the deserted workings; why tempt his wrath? Perhaps the new mine would be under the jurisdiction of a more benign deity. But the same methods were tried, and death and accident dogged the new mines like the old, till men began to believe that evil spirits haunted all mines.

We have not left these old ways entirely behind, even in America. We find a system of operation accompanied by danger, and we condemn it in a wholesale manner. We do not ask why it fails, but are disposed to accept its dangers as inherent. Auxiliary ventilation is an example. In a few cases, it has been, apparently, the cause of death. Few are asking just why it has had that bad result. Some are condemning it as utterly wrong in principle, and others are still installing it in the same unsafe manner as before, with recirculation of air, insufficiency of air supply, discontinuous operation and fans driven by motors that spark in gas-laden air.

Why not ascertain just what these misapplications of technique are and remedy them? Why not determine the causes of disaster and avoid them? The changes in technique are simple and not burdensome. They can be made, if the right spirit prevails. Many developments in the past have been similarly dangerous, but gradually a way to avoid their hazards has been found. The correction of bad technique in auxiliary ventilation is simple, even obvious, and not as recondite as the avoidance of accident in railroading or stationary boiler operation.

Statistics are being accumulated as to the accidents due to auxiliary ventilation. Unfortunately we have and can have no such statistics as to open and broken doors and stoppings, as to defective line brattices or to stoppings built too tardily. The evidence is swept away by resulting explosions. One proven fact is more potent than a hundred surmises, and the presence of a motor that can spark is regarded as a proven cause of an explosion if one occurs in the neighborhood, whereas open doors, defective or missing line or cross brattices are

mere surmises to which no one pays statistical attention. They are not even listed in tabulations of causes. Everyone knows that they may have existed and may have been the cause of the explosion; sometimes there is evidence that they did exist, but the penalty we pay for them in death and destruction cannot be definitely computed and being incomputable is written down as zero. Could any mistake be more lamentable? Figures often lie, and the best of statisticians cannot compel them to be truthful.

When confronted with trouble the real engineer hunts for solutions. He is not disposed to condemn a useful innovation merely because it can be made unsafe by careless installation. To take such an attitude would be to bid farewell to progress, for scarcely any change in equipment can be made without concomitant risks of misuse, and the systems and means it displaces had their risks also, which have been only partially removed by the traditions and technique acquired by long use.

## Forging Ahead

**S**ECRETARY HOOVER opposes government control of mines because he believes that the coal industry will eventually find a cure for the various ills and evils which now beset it. He, therefore, advocates a federal hands-off policy. If those intimately familiar with the intricate problems encountered in producing and marketing coal are unable to find a solution for the industry's difficulties to whom can they apply for aid?

Much constructive effort is now being exerted along progressive lines and a spirit of mutual helpfulness is strongly in evidence. Before the World War the industry advanced at a comparatively slow rate in the technique of engineering and management. At that time few men dared depart radically from the beaten paths of orthodox practice. Conservatism naturally limited the speed of general progress by holding originality in check.

Today, although precedent and established practice are given due consideration, little is taken for granted. To exactly the degree that individual thinking permeates the industry will the technique of production and marketing advance. The manager, superintendent and engineer is no longer so wrapped up in himself and his own individual sphere that he cannot appreciate the difficulties of others and learn from their experience. He realizes that his own contributions to progress are in themselves small and can become effective only in so far as they are correlated with the discoveries of others. He is, therefore, broad-minded and is constantly analyzing his problems from many angles. He is also willing to pass his data on to others in exchange for theirs; and such an interchange of ideas cannot fail to be beneficial to all concerned. This spells progress for the whole industry.



## Management's Returns

AT A CERTAIN MINE four men tended the loaded side of a shaft bottom. A small capital expenditure was made in an automatic scale and three men were left.

Market returns went still lower, necessitating further economies. The track crew spent a day realigning the switches and regrading the track to get a favorable pitch to make the cars run easier, after which only two men were left. The two men now easily handle the same tonnage that the four previously did. Thus the same amount of work is done yet two men have been released to more productive efforts.

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## The Lengthening Public Shadow

INDUSTRIAL CONFLICTS which affect the comfort and well-being of any substantial part of the public at large no longer can be conducted as private wars between employers and employees. The public, once a shadowy figure, has become a distinct factor in the situation. The interests of the public have ceased to be merely a figure of speech, an aspiration of the idealist; they are real, and those industrialists who ignore them do so at their own peril.

The economic history of the United States since the Civil War is heavy with painful illustrations of the fact that no essential industry can persistently flout public opinion without receiving public rebuke and chastisement. The steam and electric railroads both have learned the cost of defying a higher sense of public ethics in business. The steel industry, in many ways an outstanding example of sound public relations, could not hold out against the mass of public opinion in favor of the eight-hour day.

Much of the disrepute in which the coal industry is held by the public at large has its origin in the unsatisfactory relations between the operators and the miners. This unsatisfactory status several times in recent years has interfered with the normal flow of coal and encouraged panicky markets. The very smoothness with which the bituminous industry functions in the matter of supply and low prices during the stretches when no labor conflict threatens the steadiness of operations has emphasized the seasons of strife and helped to create the common impression that the coal industry is in a state of perpetual warfare.

The industry cannot wholly escape responsibility for this erroneous conception. Natural resentment that the public expresses no concern over their future when operators and miners are sweating to make a profitable living in times of peace has led to a calloused, if honest, indifference to public clamor when the industry is engaged in an internal struggle over wages. Natural resentment, however, should not blind either the operator or the miner to the changing character of the public interest in coal and to the effect that interest may have upon the future of the industry.

A few years ago the public viewed a cessation of production in the unionized bituminous fields with frantic alarm. Desire for tonnage was paramount to all other considerations. Today, thanks to the exploitation of the non-union districts, the public attitude is one of anger. Instead of pleading for peace, the public threatens punitive action and damns both sides to the dispute

with impartial zest. As was demonstrated in the anthracite strike of 1925-26, the public is no longer for "peace at any price."

Even a private business, such as coal mining, has certain public obligations which it must discharge. One of the biggest problems now confronting it is to convince the public that labor relations within the industry can be and will be placed upon as high a level as that which may be claimed for any other major industry. It is one of the problems which must be met in the Central Competitive Field negotiations if those negotiations are to exhaust their possibilities for constructive achievement.

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## Provide the Safeguards

ONE MORNING a few weeks ago a crew of men was engaged in changing the plates on a shaking screen. Shortly after they had carried a plate up the smooth sloping surface of the screen and while they were still upon it tightening the bolts the screen suddenly began to vibrate. A yell instantly broke from every throat and in a few seconds the screen stopped.

This starting of the screen did not particularly endanger anybody but there was a unanimous feeling of indignation among the men because had the screen started a few minutes sooner, while they were handling the plates, serious injuries might have resulted. The circumstances surrounding this incident were apparently somewhat peculiar. The starting button was located on the wall near the picking table, not over 20 ft. from the screen, and in plain sight. How could anyone have been so forgetful or careless as to start the screen while men were working upon it?

When finally traced down it was found that this screen was started by a slate picker who was cleaning up around the table preparatory to the day's start. He wanted to move some fine coal that the changing of the plates had caused to be dropped into the chute feeding the picking table and was so intent upon his work that the presence of the crew working on the screen entirely slipped his mind.

There is, perhaps, nothing particularly unusual in this case of forgetfulness on the part of the slate picker. It merely demonstrates—in this case without serious consequences—that when chances are habitually taken an accident is sure to occur sooner or later.

Men working upon machines of any kind should be impressed with the necessity of acquiring the habit of opening the main switch controlling current input to the driving motor or otherwise cutting off the power so as to positively avoid accidental starting. Even opening the switch is not always sufficient precaution, especially on machines—such as conveyors—with remote control. Padlocking the switch in the "off" position, removing the fuses, placing a "man working" sign on the switch or stationing a man near it to see that it is not closed are further precautions that are fully justified in many cases.

This topic should not be overlooked at safety meetings. Foremen should be instructed to insist that the necessary precautions be taken. Perhaps a few "pointed" signs might help. In any case the mine management should not wait until someone is injured or mangled in a gear or burned electrically before providing safeguards against "forgetfulness."



# Why Methane and Carbon Dioxide at Times Appear Unexpectedly in Mines

It is the earth movements that have devolatilized coal and it is squeezes that repeat that action. When gases suddenly appear in mines it is not because they are freed but because the pillars in their collapse actually generate them. The kind of gas evolved as a result of this action depends on the present chemical constitution of the coal after the thrusts and compressions it suffered in prior geologic ages.

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**M**ETHANE, THE GAS of our mines, is generally supposed to be liberated as a result of the metamorphism of the carbonaceous matter from which coal is formed, when such metamorphism has taken place with the exclusion of air and in the presence of water. It is further assumed by many that methane, thus formed in remote geological times, has remained to the present day occluded in the coal.

This occlusion theory does not seem acceptable, because, in many mines, on both sides of the Atlantic, more than 1,000 cu.ft. of methane is often liberated per ton of coal mined. G. S. Rice tells us that, even under normal conditions, certain mines in British Columbia discharge as much as 5,000 to 8,000 cu.ft. of methane per ton of production. (See "Bumps and Outbursts of Gas in Mines of Crowsnest Pass Coalfield." Report by George S. Rice, 1918.) Certainly the coal could not have retained any such volumes of gas under high pressure ever since that far-remote time when it became solidified and was covered by earth strata.

Speaking last December at Lille before the Geological Society of Northern France, L. Morin, general manager, Liévin Collieries, said that scientists are now inclined to believe that methane results from a partial distillation of coal due to geological upheavals which took place ages after the strata, including the coal, were formed. At the time they were deeply buried, hard and rigid. For this reason, any geological action that could overcome their resistance would inevitably create, at the same time, by friction, heat sufficient to distill the volatile matter of the coal.

As confirming this theory, attention is called to the well-known fact that the volatile content of any given coal is generally less in disturbed areas than it is where the seam is regular. It is also true that, as the volatile matter thus decreases in the coal itself, the quantity of methane present in the seam increases. In

crumpled zones and at anticlines, where all gaseous seams are especially dangerous, one sometimes finds that a highly volatile coal has been transformed into a natural coke, which is called "cinder coal" (*charbon braise*) by Continental miners and "burnt coal" by the British.

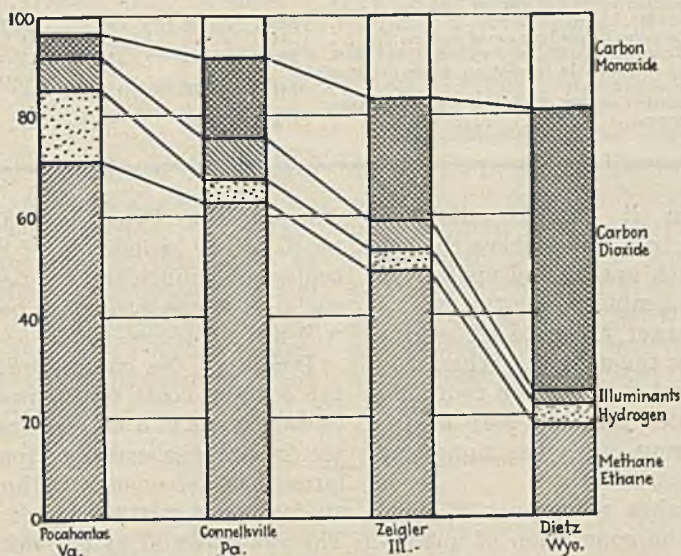
In this connection I might refer to a paper, in the Transactions of the Institution of Mining Engineers, by Professor Briggs of the University of Edinburgh, entitled "The heat due to strata movements and its effects in certain coal seams," and to another paper "Un cas de modification chimique de charbon par une faille" (a case of chemical alteration of coal due to a fault), by Prof. Stainier of the University of Ghent, in the "Annales des Mines de Belgique, 1925."

I might refer also to G. S. Rice's above-cited report in which he says on p. 16, speaking of a most gaseous coal field: "Usually coal of the Cretaceous period, which is the normal age of the Crowsnest beds, is 'sub-bituminous' and is sometimes called 'black lignite.' But in the uplifting of the Rocky Mountains the Crowsnest coals were advanced to bituminous and semi-bituminous stage by heat and pressure;

moisture and gas from the coal substance being expelled. The gas, when it is retained by impervious or nearly impervious covering, saturates the coal-beds and enclosing strata."

Mr. Rice also says, page 19 of the same report, "The methane found in coal-measures is generally believed to have been derived from the partial distillation of the bituminous matter in the coal seams and bituminous shales and to have resulted in the natural process of coal formation from chemical reactions which were aided by heat and by the pressures resulting from the heavy overburden and the process of mountain building."

But is the gas found in mines always to be ascribed to events of such antiquity? Explosions of methane



Yields of Gas of Four Representative Coals at 500 Deg. C.

Semi-bituminous coal such as that at Dietz, Wyo. yields large quantities of carbon dioxide and water the percentage of which latter is not shown here. The expression volatile combustible matter is with such coals a great misnomer, and indeed it is only less so with such a coal as the Pocahontas. But the carbon dioxide percentage of the latter is low and the percentage of methane, ethane, hydrogen and illuminants high, more nearly justifying the initials "V.C.M." which in times past were quite generally accepted as expressive of volatile matter in general.



may occur in mines where previously no gas has ever been detected and where the most careful investigation, made as shortly as practicable after the conflagration, also fails to detect gas. Sometimes, the gas may remain in the workings long enough after the explosion to permit investigators to determine beyond a doubt that it was methane that caused the trouble.

However, in no case of this kind hitherto, has the occurrence of the deadly gas in the mine been explained satisfactorily. It is now believed to be due to the mine roof crushing the pillars left to support it, such crushing taking place with enough force and suddenness to heat up some of the coal in the pillars to a temperature at which some of their volatile matter will distill.

The fact that, in the distillation of coal, methane is evolved in large quantities at comparatively low temperatures, say below 500 deg. C., bears out this explanation. Of this, more will be said later. When I say that the crushing must be sudden, I mean that it must be accomplished so rapidly that, despite the dissipation of the heat, the coal will be raised to a point sufficiently high that the volatile matter contained in it will be distilled.

It goes without saying that, in a mine where the pillars are weak, danger from such unexpected visitations of methane is greater than in a mine where the roof is adequately supported. The larger the area of weakly supported workings, the greater the danger. When only a small part of the mine is affected by sudden roof subsidence, the volume of generated methane may be too small to do much harm. It may even pass unnoticed and probably often does.

But when the subsidence takes place over a large un-pillared area, it may cause the generation of quantities of methane large enough to be a source of much danger, even if no men be working in the crushed zone. The compression of the empty spaces where the squeeze occurs causes part of the air therein contained, together with some of the gas freshly generated, to be driven into working parts of the mine, where the mixture will ignite at the first open light with which it comes in contact.

Most of us are familiar with, or have heard of, great air-blasts resulting from roof subsidence. If methane as the result of such a blast is mixed with the air, there must be danger, even in the absence of open lights or any other cause of ignition, for although the men may be saved from an explosion, they will be in danger of being suffocated. Then, besides danger from the gas itself, there is that resulting from roof falls and the projection of coal from the ribs. Furthermore an air-blast of the more severe kind will throw about timbers, tools and other mine paraphernalia.

When the mine is at great depth, say more than 1,000 ft. and where the overlying measures are made up of thick and rigid rocks that are hard to break, a squeeze may be accompanied by bumps. Though a squeeze that

thus announces itself may not be sufficiently severe, nor sudden enough, to result in a gas emission of the kind just described, bumps should always be a signal for the men to run to safety, especially if the mine be one in any part of which weak pillars are standing.

In mines where the cover is soft and pliable, bumps will not occur, even under thick cover, although squeezes may take place in such mines, suddenly or otherwise, which may or may not be accompanied by gas emission.

Bulletin 1 of the U. S. Bureau of Mines, published in 1913 and entitled: "The Volatile Matter of Coal," supplied the data from which Table I has been prepared.

The coals used in these tests were selected by the experimenters "as being representative of more or less

well-defined types and localities." Their analyses (air-dried) gave the results shown in Table II.

As shown in Table I the eastern coals produce, at a comparatively low temperature, much greater quantities of methane, ethane, etc., than of carbon dioxide. The reverse is true of the Wyoming coal where the yield of carbon dioxide much exceeds that of methane, ethane, etc.

The Interior Province coal, the Zeigler, produces a much larger proportion of carbon dioxide than eastern coals, but a much smaller proportion than some western coals. The conclusions to be drawn from these remarks will appear below.

Doubtless the gaseous mixtures obtained from both the eastern coals tested would be explosive enough to be dangerous in a mine. The proportion of carbon dioxide in the gas evolved from the Zeigler coal is quite large, but not enough perhaps to prevent ignition. In any case, the mixture is one in which no man could live. The gas given off by the western coal could not be made to burn, but even though it would not burn it would suffice to asphyxiate.

Technical Paper 140 of the U. S. Bureau of Mines: "The Primary Volatile Products of the Carbonization of Coal," tells us that: "With bituminous coal of the Pittsburgh type, volatile matter begins to distill in appreciable quantities at 250 deg. C. and, with the western coals, especially the sub-bituminous types, at a still lower temperature."

The quantity of methane that an eastern coal or a western one yields at 250 deg. C. seems to me to be too small to be a source of danger in ordinary mine operation. This cannot be said of the yield of carbon dioxide. Indeed, coals from Wyoming were found to liberate carbon dioxide at the rate of 200 cu.ft. per gross ton of coal at the temperature of 250 deg. C. It is only at temperatures exceeding 350 deg. C. that the liberation of methane becomes dangerously abundant.

Those who have had experience with squeezes and who know what magnitude their mechanical action sometimes assumes will readily believe that such action may sometimes raise the temperature of the coal to a point sufficient to distill methane in dangerous abundance.

Table I—Yield and Composition of Gas Obtained by Distilling 10 g. of Air-Dried Coals from Different Sources

	Source of Coal Treated			
	Pocahontas, Va.	Connellsville, Va.	Zeigler, Ill.	Dietz, Wyo.
Temperature of furnace, deg. C. ....	500	500	500	500
Highest temperature reached in coal, deg. C. . . .	390	390	390	390
Gas at 25 deg. C., c. c. ....	238	161	197	517
Composition of gas:				
Carbon dioxide, per cent. ....	5.5	15.9	23.8	54.3
Carbon monoxide, per cent. ....	3.5	7.8	16.5	19.6
Illuminants, per cent. ....	5.2	9.1	6.5	3.7
Methane, ethane, etc., per cent. ....	70.6	63.3	49.5	18.9
Hydrogen, per cent. ....	15.2	3.9	3.7	3.5
Calculated volume of gas per long ton of coal, cu.ft. ....	840	560	700	1,820
Carbon dioxide per long ton of coal, cu.ft. ....	46	89	168	983
Methane, ethane, etc. per long ton of coal, cu.ft. ....	596	352	346	345
Total combustible (explosive) gases per long ton of coal, cu.ft. ....	747	420	490	764
Proportion carbon dioxide to explosive gases, per cent. ....	6.3	21	34.2	128



As further explaining and as resuming the main idea this article was meant to convey, the following lines will now be cited: "It is evident that the geologically older Appalachian coals, as compared to the younger western coals, contain a larger quantity of bitumen or substances which readily liberate methane and ethane hydrocarbons and hydrogen.

"The western coals, on the other hand, in inverse ratio to their geologic age, produce larger quantities of carbon dioxide, carbon monoxide and water. The readiness with which carbon dioxide is liberated in large quantities even at the lower temperatures (300 to 500 deg. C.) indicates the presence of compounds having the direct carbon-oxygen linking, such as the complex alcohols, aldehydes or acids."—See U. S. Bureau of Mines Bulletin 1: The Volatile Matter of Coal (previously mentioned).

"All kinds of coal consist of cellulosic degradation products more or less altered by the process of aging, together with derivatives of resinous substances in different proportions and closely graded into one another in their nature and composition. These substances are also more or less altered by age. They all undergo decomposition on moderate heating. Some, however, decompose more readily than others at the lower temperatures.

"The less altered cellulosic derivatives decompose more easily than those which are more altered and also more easily than the resinous derivatives. The cellulosic derivatives, on moderate heating, decompose so as to yield water, carbon dioxide, carbon monoxide and hydrocarbons, giving less of the first three products the more mature and altered they are. The resinous derivatives, on the other hand, decompose on moderate heating so as to yield principally methane and ethane hydrocarbons with probably hydrogen as a direct decomposition product."—See U. S. Bureau of Mines Technical Paper 140: The Primary Volatile Products of the Carbonization of Coal (previously mentioned).

From what precedes it will be seen that, in the case of coals geologically old, roof subsidence may cause the irruption into the mine of gases composed principally of methane. In the case of geologically young coals there might be so much carbon dioxide in the gases produced by the squeeze that the visitation might properly be one of carbon dioxide even though both gases were present.

Between the two, in what I will call the "middle-aged" coals, mixtures may be produced of methane and carbon

dioxide differing so little in volume from each other that the irruption of the mixture into the workings could not well be considered as being one of either methane or carbon dioxide. A visitation of this kind, however, might bring disaster to any mine.

In the Gard (France) coalfield the seams of which, so far as geological age is concerned, bear the same relation to those of Northern France and Belgium as do the western coals to those of the East in the United States, miners fear carbon dioxide much more than methane. In some Gard districts the latter gas may be found in greater abundance than in others, but never abundantly enough for the gaseous mixture of which it is a part to be dangerous so far as explosibility is concerned.

For geological reasons, which have never ceased to be a subject of discussion for scientists, and which it would be too long to explain here, squeezes are of quite frequent occurrence in the mines of the Gard region. These squeezes may be light or they may be heavy, but they nearly always take place with great suddenness, causing a liberation of carbon dioxide in excess of that taking place under normal conditions, the importance of which is proportionate to the degree of severity of the squeeze.

A gaseous liberation, such as a squeeze may cause, is dangerous in any kind of mine, but experience tends to show that it presents less danger in mines recognizedly gaseous than in those having the opposite reputation. The reason for this is known. In mines of the first kind, a wise operator is at all times on the lookout for gas and prepared to deal with it, should it appear from any quarter, old workings included. Not so in reputedly non-gaseous mines, where the officials generally fear the possible presence of gas too little to take precautions against it.

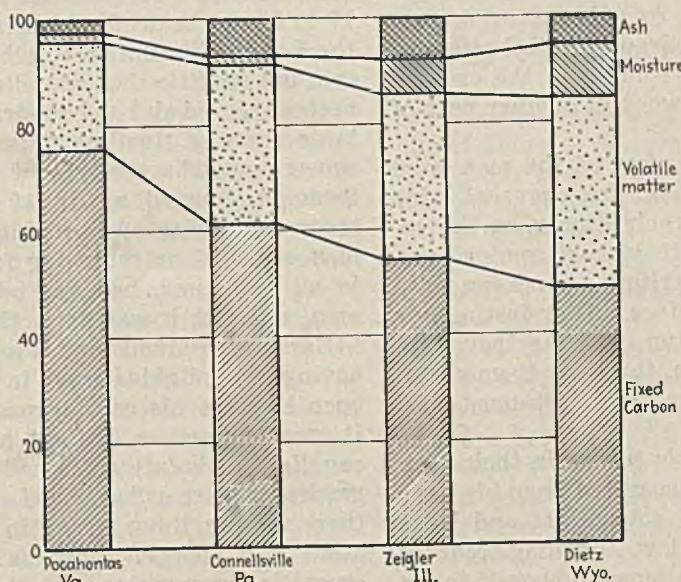
Explosions have occurred in mines that had been operated for a long time, sometimes during many years, without any sign of gas. We are all familiar with the pocket-and-crevice theory serving to explain explosions of this kind, gas-filled pockets and crevices that no one ever saw and which some have believed to exist even at depths where no place dug by man can be kept open more than a short time except at the cost of continuous brushing.

The theory that a naturally non-gaseous or little gaseous seam may

suddenly be made to yield gas abundantly, in spots, by a heat-creating crush seems to me quite feasible, especially because of two occurrences that came under my

Table II—Analyses of Coal, the Gas Emission of Which Was Tested.

	Source of Coal Tested			
	Pocahontas, Per Cent	Connellsville, Per Cent	Zeigler, Per Cent	Dietz, Per Cent
Moisture.....	0.39	1.09	7.53	11.05
Volatile matter.....	20.90	30.67	30.38	35.74
Fixed carbon.....	75.51	60.35	54.32	47.74
Ash.....	3.21	7.88	7.63	5.47
Total.....	100.01	99.99	99.86	100.00



Proximate Analysis of the Same Coals

This chart shows only the moisture eliminated at and below the boiling point of water. The Pocahontas and Connellsville coal have less moisture and volatile matter than the coals from Zeigler and Dietz.



direct attention many years ago in the Upper Potomac Region of West Virginia and Maryland.

A mine worked during the Civil War in the bed locally known as the Big Vein, was reopened after thirty-one years of idleness, the purpose being to recover valuable pillars abandoned by former operators. The coal bed was from 7 to 9 ft. thick and contained 16 to 18 per cent of volatile matter. If ever a bed deserved the reputation of being non-gaseous, the Big Vein did. Moreover, during three decades, the workings had remained almost uncaved, wide open, ventilated naturally in quite an effective way. If any gas had lurked in those old pillars, none of which was wider than 50 ft. at any place, it is hard to imagine how any of it could have remained imprisoned in the coal for thirty years.

Pillaring went on for the better part of two years, at the rate of about 2,500 tons a month, without the slightest trace of gas ever being detected. It cannot be said that the extraction of pillars was complete. The men, including the boss, had had little previous experience in pillaring. For this reason a part of every pillar was lost. The stumps thus left behind varied in area from about 100 to perhaps 2,000 sq.ft.

A time came when signs of a squeeze began to appear in a part of the workings where the roof was supported by a hundred or more of such stumps. As the squeeze seemed, at first, to be a gradual and a slow one, it was thought that it would continue so. Hence, no precautions were taken, except to withdraw the steel rails and put a barrier across all places leading to the crushed zone. The miners were put to work in another part of the old mine.

One day, when, fortunately, most of the men were absent at a big Polish celebration, those present, nine of them all told, were eating their dinner on the so-called main heading. Suddenly, they heard coming from the direction of the forbidden territory a rumbling noise such as they had never heard before. They instinctively tried to get to their feet and run out. As they were rising a blast of air caught them, throwing them about, back and forth, and finally to the ground, stunned. All lights were put out.

Two of the men were soon able to regain their feet. One of them, who had not been separated from his lamp and had matches in his pocket, got a light and in so doing happened to hold his lamp low. Nothing occurred just then, but when he lifted his lamp to hook it to his cap, an explosion occurred which burned both the standing men in the upper part of their bodies. The seven miners who had remained stunned on the ground had among them a dozen broken bones but they were not burned.

After everybody had been taken out and cared for, that is, perhaps two or three hours after the accident,

a group of investigators, three men, who were as much farmers as miners, led by a young transitman, got into the mine and into the squeezed territory, whence it was plain the blast had come. The leader, lamp in cap and unsuspecting of danger, caused another explosion that did more damage than the first one, all the amateur investigators being more or less severely burned, one of them, a farmer, dying later.

The next day, after safety lamps had been procured, a thorough inspection was made. No trace of gas was found. No better atmosphere had ever ruled in any mine. It was plain to all that the blast had been caused by the roof subsiding suddenly over the whole of the squeezed area. The subsidence averaged about 30 in. The bottom had not heaved. That the explosion was one of methane, nobody doubted. Again, the pocket-and-crevice theory served to explain the presence of the deadly gas in the mine.

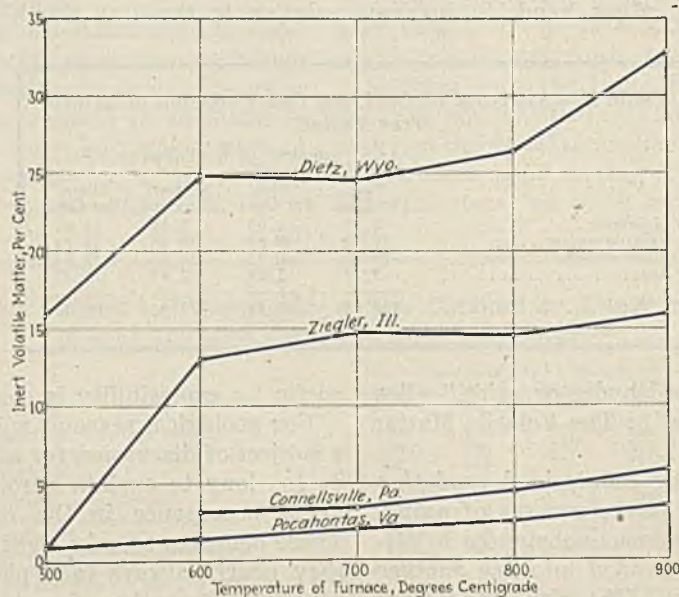
Some, who did not accept this explanation, said nothing, perhaps because they were unprepared to advance any other theory, perhaps because it was not deemed

advisable to talk much about the unfortunate affair. Since then, I have become convinced that the gas which exploded so many years ago in that old Big Vein mine came from partial distillation of the coal crushed by the sudden squeeze.

The other occurrence, before mentioned, took place in a shaft mine where a seam 5 to 7 ft. thick, containing 17 to 20 per cent of volatile matter and supposed to be the Lower Kittanning, was being worked. It liberated gas, but so little that open lights were permitted. The fireboss served also as boss-driver. Although there were large areas of standing pillars, there was no sign of a squeeze anywhere. One of these areas, called "The Swamp," covered nearly 10 acres. The swamp was crossed morning and evening for eleven years by 150 men going to, or returning from, their places. Never, in all that time, had gas been detected in this large area, although it was not actively ventilated.

Early, on a Monday morning, the fireboss went down, having his unlighted Davy in his hand and an ordinary open light in his cap, as was his customary practice. It was his custom to light his Davy and put out his cap light only after he had crossed the swamp and reached a place called "the Lay-Off." He did not think there was anything wrong in traveling so far into the mine with an open light, as he had never found gas except in the working places which were all beyond the Lay-Off.

This morning, however, a strange sight awaited the fireboss when he stepped out of the cage. The landing, a wide, two-track place, was covered with dust and strewn with shreds of rotten canvas, old powder cans, pieces of decayed wood and other things that, usually, are found with the gob in out-of-the-way places. Across the



#### Inert Volatile Constituents, Including Moisture in Coal

This graph gives the noncombustible volatile matter given off by coal at temperatures ranging from 500 to 900 deg. C. Young coals tend to give off moisture and carbon dioxide; and older coals, or those having experienced a more strenuous life, deliver mostly methane. In the Gard, France, are found young coals which have exceedingly menacing outbursts or outpourings of carbon dioxide.



tracks, near the shaft, was a large tool box which had been moved 70 ft. from its usual location.

All this looked suspicious to the fireboss who, lighting his safety lamp and leaving his open light on the landing, started toward the swamp, testing for gas as he went. He found none so long as he traveled on the main haulage road which was also the principal return airway. But after leaving this road a short distance, he began to find gas. He found more and more of it as he progressed. Before he had traveled 50 ft. into the swamp, he bumped his head against the roof at a place where he knew the height had always before been more than 7 ft. This was evidence enough to him that he would do well to go out and report, which he did in a hurry.

It took several days to clear the swamp of gas. It was then found that all the pillars in the 10-acre area had been crushed. Some had been squeezed down 4 ft. or more, some 2 ft. or less. The bottom had heaved everywhere, more where it was wet than where it was dry. The top bench of the seam, which was much softer than the lower ones, had suffered much more than the latter from the crush. In some of the thinner pillars, the top coal seemed to have been squeezed out entirely.

#### LUCK PREVENTS POSSIBLE FATALITIES

It was lucky the squeeze occurred when the workings were entirely deserted. Otherwise, there might have been great loss of life, as the commotion must have driven large volumes of gas out of the swamp and into the main return airway where drivers carrying open lights passed continuously on their way to and from the shaft. It is also easy to imagine that, if the mine had been one considered as non-gaseous, no fireboss being employed, the outcome might have been tragic.

The pocket-and-crevice theory was again invoked by its partisans in an effort to explain how it all happened. But studying the occurrence closely, I am now firmly convinced that the gas came in this case, as in that of the Big Vein previously mentioned from partial distillation of the coal crushed by the squeeze.

As to the manner in which the latter could have occurred after eleven years of complete quiescence, the following explanation is offered: There was a drift mine in a seam supposed to be the Upper Freeport, 210 ft. above the Lower Kittanning. Mining in the upper seam was conducted without any thought of what influence it could have on the workings below. It was decided to leave untouched a 9-acre block of Freeport coal because it could not be mined at a sufficient profit. This block, which happened to be almost vertically above the swamp, soon became separated from the rest of the Freeport seam by a belt of worked-out territory. As this belt widened it increased the pressure exerted by the covering strata on the 9-acre block and the swamp pillars. In the course of time the pressure on the latter became more than they could withstand, and they collapsed.

The squeeze continued for many months after the gaseous manifestation it had caused, but its progress, thereafter, was so gradual and slow that no more gas was found to come out of the swamp until the mine, finally worked out, was abandoned some 20 years afterward.

European practice affords countless examples of long-wall faces becoming temporarily gaseous, or more

gaseous than usual, when the equilibrium of the covering strata is disturbed as a result of mining operations and the pressure on the coal is suddenly increased. In the mines of Europe which are deep and overlaid by rigid rocks that are hard to break, bumps generally warn the miners that the gaseous condition of the seam may be on the point of undergoing a change. Danger from this source is further lessened by the fact that, in Europe, where mining men know from long experience that no coal mine is safe from gas, open-flame lights are not used underground.

### Little Time Lost in Sealing Underground Fires

As a general proposition, mines in the Middle West have been more successful than those in the East in fighting mine fires, particularly in the presence of gas. In the West underground fires are usually fought with a fair degree of precision and speed. An attempt is made first to extinguish the flame by direct methods if those in charge conclude that this procedure is likely



An Emergency Job Quickly Done

In gassy mines no time should be lost in sealing up a fire once the decision to follow this strategy is made. A wooden stopping can be erected in much less time than can one made of brick. When covered with wood-fiber plaster it is quite effective in keeping air from a fire. Although the particular stopping here shown is not a fire seal, its construction is exactly similar with the exception that a pressure escape valve is not here provided.

to succeed. However, while this is being done a second line of defense—the erection of seals—is arranged for, in order to avoid all unnecessary loss of time in adopting this alternative should direct methods fail.

The mine map is studied and the most logical locations for seals are determined. Additional working crews are organized and materials and tools are taken to the sites proposed. All this is done while the direct attack is in progress. Seals are then erected with all possible speed. In many instances such seals are made of wood covered with wood-fiber plaster. The materials used are light of weight, easily transported and quickly shaped.

Mining men in the East would do well to consider the use of these light-weight materials for the construction of fire seals. This form of construction, it is true, is flimsy and inflammable; but these properties are not as objectionable as they appear. Flame is not likely to reach a seal as it is usually erected some distance from the fire. If the uprights to which the boards are nailed are not sufficient to prevent a fall directly over the seal, a line of props can be placed upon either side of it.



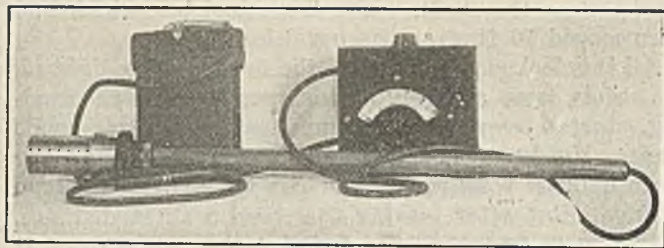
## Detects Firedamp Unerringly

As is well known firedamp or methane is the gas that is responsible for most mine explosions. Heretofore the flame safety lamp has been the usually accepted means employed for detecting the presence of this arch enemy to safety under ground. Although this device possesses many advantages it has the decided shortcoming of not indicating the percentage or proportion in which the gas is present. Taking a sample of the mine air and analyzing it will, of course, give the desired result but this process is too long and complicated for most practical purposes. What is wanted is a quick and fairly accurate, rather than an exact indication.

As the result of co-operative research work instigated by coal mine operators and legislators of the State of Utah and participated in by certain commercial organizations, an electrical firedamp or methane detector has been developed that bids fair to put an end to much of the loss of life that heretofore has been sustained because of coal-mine explosions. So enthusiastic have some of the friends of this device become that they have styled it "the most important forward step of the 20th Century."

Among the firms that embarked in this co-operative work was the Union Carbide & Carbon Corp. In this company's Long Island City laboratories a group of investigators, led by E. K. Judd, has been working for two years on the idea that an accurate, rugged, automatic detector of combustible gas would constitute the best means of avoiding disastrous mine explosions.

The primary element of the device finally evolved consists of a coil of fine platinum wire about an inch long and 0.005 in. in diameter. This filament is heated to a constant temperature by the passage of an electric current through it. When in this condition this coil comes in contact with methane it becomes slightly hotter. The greater the proportion of combustible gas in the atmosphere the more pronounced is the heating effect on this wire. In the detector this filament is mounted at the end of a stick of suitable length and is heated by current from a portable storage battery such



### Quick, Simple and Accurate

This shows the equipment assembled. The indicator and battery may be carried on the belt and the testing handle may be made of such length—telescoping if necessary—that the tester can be poked into the highest recesses of the roof.

as is normally used for energizing cap lamps. A constant flow of current is maintained by means of a simple automatic control. Thus any variation in the temperature of the coil is the result of combustion of methane at the surface of the wire.

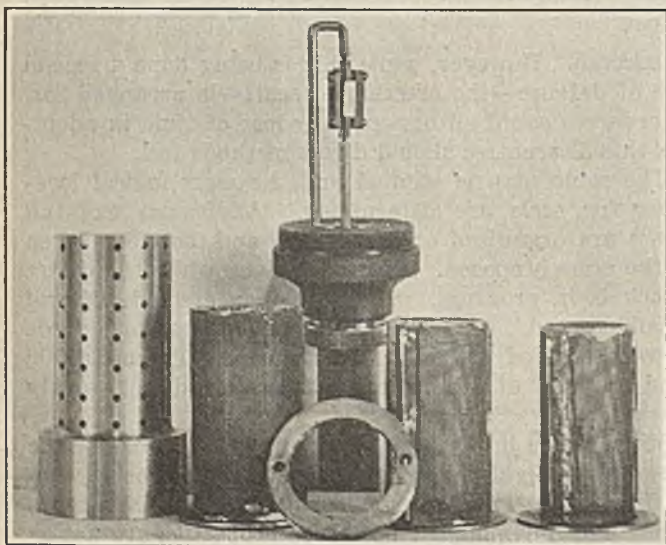
Coil temperatures are shown on a dial indicator. This is so calibrated as to show the percentage of methane in the mine atmosphere surrounding the coil. In order to prevent ignition of this inflammable gas this filament is protected by the same type of gauze bonnets that were developed by Sir Humphrey Davy nearly a century ago and which have been in use for purposes of this kind ever since.

### ATTACHABLE TO TELESCOPIC HANDLE

Inasmuch as it can be attached to a telescopic handle of any desired length the sensitive element of this instrument can be poked into the highest crevices and falls of the roof. The wires connecting it to the battery and indicator, which are carried on the fire boss's belt, can naturally be made of any necessary length. On the other hand indicators of this kind can be permanently located in various places throughout the workings and wired to indicating or recording devices in the mine office. In such cases these latter instruments can be made to ring warning signals whenever the gas content of the mine atmosphere rises above a safe proportion.

Although the indicator normally employed immediately registers the presence of methane by a progressive movement of the needle, if as much as 5 per cent is present in the air this index swings back and forth rapidly. This movement of the needle thus constitutes a danger signal.

This detector has met with much success in both its laboratory and field tests. Mr. Judd recently spent some time in trying it out in the anthracite region of Pennsylvania. Here it demonstrated its accuracy and quick action to mine operators and others interested. Further satisfactory demonstrations were conducted in Utah during the early part of February.



### Test Element Disassembled

The sensitive portion of this device is a filament of fine platinum wire. This is heated by an electric current of constant volume but when it comes into contact with methane this gas is ignited at the wire surface with the result that its temperature is raised. To prevent this ignition from being communicated to the mine atmosphere the filament is protected by gauze bonnets as is the flame of an ordinary safety lamp.

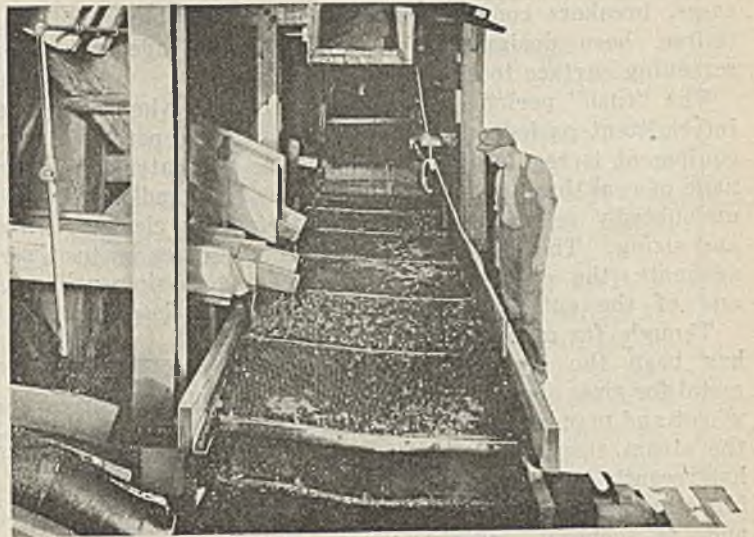
LOOSE FRAGMENTS of rock falling in a bore hole while explosive charges are being loaded are a source of danger, warns the Bureau of Mines. Besides the danger due to the impact of the falling rock on the charge, there is the possibility that in tamping the charges the rubbing of broken cartridges or small particles of explosive between two pieces of loose rock, or between a loose fragment and the side of the bore hole, may cause a premature explosion. In addition, the frictional impact of the tamping bar against a thin layer of explosive adhering to the side of the bore hole might also cause premature detonation.



# Trends in Screening Of Anthracite

Most Changes Have Been in Material of Which Screens Are Composed—Longest Lived Screens Not Most Desirable if Cost Is Greater than Life

By Frank J. G. Duck  
Assistant Editor, *Coal Age*



**B**ROADLY SPEAKING, only one change of importance has been made in the sizes of anthracite for several years, and but comparatively little change in the method of screening. A great improvement has been made, particularly within the past few years, in screen materials, screen metals of the more acid- and abrasion-resistant type having been introduced.

In order to establish and maintain a more uniform sizing standard, the anthracite operators adopted, in March, 1925, the round-screen mesh for various sizes given in Table I.\* In this table is also included the allowable percentages of slate, bone and undersize for the different grades, with other permissible variations in size and purity. The question of variation in commercial anthracite sizes had long been a source of friction and worry to the operators, the retail dealers and the consuming public.

At the request of representatives of the retail dealers, and after careful tests which showed that there would be no lowering in the quality of domestic fuel, the standards given in Table I, which have met with the general approval of the dealers, were adopted.

Although the principal thought in adopting these standards was to establish an exact uniformity of sizing of pea coal and larger, screens having the meshes given in Table I are used principally in making sizing tests on delivery to the retailer—the screens actually used in the breakers varying slightly from these standards in different localities because it is necessary to provide for the differing disintegration of the coals from the various seams and fields during their transportation to the retailers' yards. Mention has been made in Table I regarding the absence of any firmly established sizing standards for the sizes under pea coal, the additional 5 per cent of undersize permitted in chestnut and pea

being necessary to allow for unavoidable breakage in these sizes.

No changes or improvements of importance in the design of shaker screens have been made in the past few years. They are now, as they were in the past, generally of the standard eccentric-driven type usually mounted in pairs of two decks, and equipped with flexible arms such as those of the Parrish type. Practically all such "shakers" are board hung. A few modifications—such as the Miller\* and Marcus† that embody a differential reciprocating motion; the Master‡ which gives both a reciprocating and a rotary motion to the

coal and several types of vibrating screens\*\* — have been developed, but, so far as can be learned, none of them has been used to any extent in the anthracite field. The standard types of shakers employed in the sizing of anthracite are made with four to seven (with an average of five)

Table I—Standard Anthracite Sizes and Allowable Impurities

Sizes	Round Mesh, In.		—Allowable Per Cent—			Remarks
	Through	Over	Slate	Bone	Under-size	
Grate.....	4 1/4	3 1/4	2	2	15	
Egg.....	3 1/4	2 1/4	3	3	15	
Stove.....	2 1/4	1 1/4	4	4	15	Carrying large nut
Chestnut.....	1 1/4	1/4	5	5	20	Carrying large pea
Pea.....	1/4	1/4	5	5	20	Carrying No. 1 buckwheat
No. 1 buckwheat.....	1/4	1/4				} 10 per cent, slate or rock
No. 2 buckwheat.....	1/4	1/4				
No. 3 buckwheat.....	1/4	1/4				
No. 4 buckwheat.....	1/4	1/4				
Slush.....		1/4 and under				

On all sizes, for each 1-per cent reduction in slate, an increase of 2 per cent in bone is allowed.  
\* Because of the difference in the nature of coal and in the degradation during transportation to the receiving yards, every company provides such screens that the coal may arrive in such condition as to be in accordance with these sizing standards.

screen jackets to a deck, these jackets averaging 3 ft. in length and 5 ft. in width. Depending upon the coal being sized, shakers are driven at a speed of from 150 to 160 movements per minute. This speed is somewhat higher than in earlier times, largely because, though the width of the screens has remained the same, the tonnage fed to the shakers has been greatly increased, most of the old breakers having been reconstructed so as to afford a greater capacity. The screens are, therefore, forced in many instances to handle more coal per square foot of screening area than in former years. Though this is true in most

\**Coal Age*, Vol. 21, No. 8, Feb. 23, 1922, p. 324.

†*Coal Age*, Vol. 23, No. 14, April 5, 1923, p. 564.

‡*Coal Age*, Vol. 26, No. 1, July 3, 1924, p. 34.

\*\**Coal Age*, Pittsburgh, Vol. 29, No. 24, June 17, 1926, p. 898; *Universal*, Vol. 29, No. 14, April 8, 1926, p. 523; *Link-Belt*, Vol. 25, No. 18, May 1, 1924, p. 660; *Cottrell*, Vol. 24, No. 25, Dec. 20, 1923, p. 944; *Leahy*, Vol. 24, No. 22, Nov. 29, 1923, p. 819; *Arms*, Vol. 29, No. 23, June 10, 1926, p. 833; *Tyler "Hummer," Robbins "Vibrex," Mitchell. Rotex, and many others.*

\*See *Coal Age*, Vol. 27, No. 12, March 19, 1925, p. 436.



cases, breakers constructed in recent years have, of course, been designed and provided with adequate screening surface to size all coal properly.

The "rush" periods of breaker operation, when for intermittent periods of 10 to 15 min., the preparation equipment is required to clean and size a greater tonnage of coal than it is normally designed to handle, are undoubtedly reflected in both unsatisfactory cleaning and sizing. Therefore, if the screening surface be inadequate, the efficiency of the screening equipment, and of the entire operation, is materially lessened.

Though, for many years, steel has been the standard screen metal for sizes above No. 1 buckwheat and manganese bronze for the steam sizes, much progress has recently been made in adapting other metals to this purpose and to general colliery use, particularly to chute linings.

Although figures showing the actual screen requirements of the anthracite field are practically impossible to obtain as these vary according to the yearly average of breaker operation, a rough estimate would indicate that the annual consumption of all screen metals is about 4,250,000 lb. of which about 950,000 lb. is manganese bronze and other rustless metals, the remainder being sheet steel. Large numbers of firms several of which are located in various sections of the anthracite field, are making perforated mine screens, and these are equipped to meet promptly all screen requirements, both regular and emergency, of the many collieries.

The anthracite producers are directing much more attention than heretofore to this branch of coal preparation, for the replacement of shaker screen jackets involves a heavy expense. This is especially true of the faster-wearing buckwheat meshes, the multiplicity of perforations subjecting these screens to greater abrasive wear and rendering them more liable to disintegration from the corrosive action of acid mine waters. Of the "improved" screen jacket materials, Monel metal, the use of which was revived after the World War, is well

known for its resistance to both abrasion and corrosion. Copper or nickel-copper metals, such as Ambrac, Everdur, Mond Metal, etc., have also been introduced. Hard-rolled copper has been used to some extent, but, though highly resistant to corrosion, screens of this metal tend to a faster enlargement of the perforations than do those of the metals mentioned above. Several chromium-iron alloys, of the stainless iron group, have been tried out in recent years, and one, known as Ascology, has been successfully introduced, for it has clearly demonstrated its advantages as a screen material, being rustless and highly resistant to abrasion.

Much time is required to prove the screening merits of a new metal, for this involves carrying screens to complete destruction under operating conditions comparable to those of other metals. The real value of any such new screen metal depends, in the ultimate

analysis, upon the service rendered for the cost per screen or per operating day, and not upon the initial cost per pound or per square foot of the metal. The first cost (in most cases) of these new metals being relatively high, compared to steel, such screens, if they are to prove more economical, must necessarily outwear steel in compensating ratios, including, of course, the more frequent renewal of the steel screens and the labor costs of these renewals.

A simple and, at the same time, an accurate method of determining comparative costs of screen metals is to divide the service (in days) given by any screen into the actual cost per screen and to then add thereto the material and labor costs of renewing the screen jackets. For example, consider four screen metals A, B, C and D. Disregarding the cost per pound of these metals, and using as a

basis the method given above, it is apparent (from Table II) that material A, though giving the lowest service in point of time, has cost and wear characteristics that make it the cheapest metal to operate per day and consequently, per ton of coal screened. Some of the newer metals just mentioned have shown quite remarkable savings, but there is a tendency to brittleness in some of them which causes premature cracking or splitting of the metal when partly worn. When this occurs, the jacket has to be removed at once in order to avoid oversize losses. A metal which combines ductility, sufficient to permit it to be perforated, tensile strength and acid- and abrasion-resisting qualities more nearly approaches the ideal screen material.

In this respect, the chrome-iron alloys appear to advantage. These metals, as shown in Table III, are not

only highly resistant to all kinds of acid mine waters, but are also much more resistant to abrasion than steel or the non-ferrous metals and alloys in common screen use. The Brinell hardness of chrome-iron alloys varies from about 150 for the annealed material to over 360 when it is tempered or quenched. Although tough, they develop little

or no brittleness and, on account of this toughness, they are considerably more difficult to perforate than the ordinary screen metals, thus making it necessary to use a lighter gage for screens of any given mesh. It is obvious, too, that this toughness makes the chrome-iron alloys long wearing and, on these accounts, screen jackets of this metal are employed which are about 15 per cent lighter than steel and 20 per cent lighter than the non-ferrous metals. In addition, the tensile strength of the chrome-iron alloys is 25 per cent or more greater than that of the other screen metals, which permits of the substitution of these thinner screen jackets. It is said, also, that sizing is more efficient with thinner screens.

An improved type of screen made at Warrington, England, has recently been introduced by the American Rheolaveur Corporation.\* Made of wedge-shaped

**Table II—Screen Service Costs**

Material	Total Cost of Screen	Service Days	Cost per Day per Screen
A.....	\$18.15	165	\$0.11
B.....	23.40	180	.13
C.....	26.25	175	.15
D.....	33.60	210	.16

**Table III—Corrosive Action of Acid Mine Water\***

Metal	Original Weight, Lb.	Weight, Lb., After		
		15 Days	6 Weeks	6 Months
Sheet steel .....	1.870	1.000	0.625	0.375†
Chrome-iron alloy...	1.870	1.870	1.870	1.870

\*Data from tests made by U. S. Bureau of Mines.  
 †Had disintegrated to such an extent that it fell to pieces and was, therefore, removed from the water.

Samples Used: Sheet steel—8x12  $\frac{1}{8}$  in., 0.070 in. thick.  
 Chrome-iron alloy—8x12 in., 0.070 in. thick.

Treatment of Samples—Both samples were immersed in mine water from the Windburne field, generally considered to be the worst water of this nature met with in the central Pennsylvania district. This water has been known to destroy steel pipe in from five to ten days, and an ordinary shovel left in it will be entirely corroded in from seven to ten days.

\*Coal Age, Vol. 30, No. 23, Dec. 2, 1926, p. 775.



wires, wound at intervals by special machinery around bars of circular cross-section, the openings on the underside of this screen are large and those at the top are small. This makes for rapid clearance of the screened material and the entire area of the screen, except over the bars or rivets, is available for screening. The screen is so heavy that it is not quickly destroyed by corrosion and is so rigid that it does not sag and thereby retard the passage of the coal.

During the past few years but one improved type of corrugated "shaker" jacket has been noted. This is known as the "W-Dent" corrugation or screen indentation and is manufactured by the Remaly Manufacturing Co., of Tamaqua, Pa. It comprises a series of ingenious shallow indentations over the face of a shaker jacket in the form of broken "W's," the function of these "W's" being to provide not only a means of distributing and tumbling the coal traveling over the screen but also to reinforce the screen when in operation. It is extensively used in the lower anthracite field and will, no doubt, have a wide application elsewhere as its advantages become more widely known and better appreciated.

#### YET MUCH ROOM FOR IMPROVEMENT

This brief review makes it apparent that there is yet room for improvement both in the method of screening, and in the materials for screening, anthracite. However, because of the greater attention given at the present time to other phases of preparation, further advance in the science of screening will, in all probability, be rather slow. On the other hand, the necessity for building new breakers or, at least, for reconstructing old ones will doubtless cause the anthracite companies to look around the coal fields to see if their screening practice can be improved. When making extensive changes in the cleaning equipment, it is natural to suppose that the screening facilities will be revised also. The screens used to be placed in the highest part of the breaker. Vibration at such a place had to be avoided. Many modern devices clean unscreened coal. In such cases the screens will be relatively near the ground where their vibration will be less important.

### Water Pipe Eliminates Firebrick In New York Edison Plant

Arthur Williams, vice president in charge of commercial relations of the New York Edison Co., announced in a recent address over the radio, station WRNY, that a revolutionary development in steam generation had been accomplished in the company's new electrical plants through the elimination of the use of firebrick in the inner walls of steam boiler settings.

Mr. Williams said that Thomas E. Murray, senior vice president of the company, has replaced firebrick by substituting a wall of water pipes. This serves the double purpose of absorbing a large portion of the energy of coal and eliminates the frequent necessity of repairing boiler furnaces lined with firebrick. He stated that this invention would be applied in the company's new \$50,000,000 generating station now under construction at Fourteenth Street and East River, New York. This station, which will have a capacity of 1,000,000 kw., will be the largest electrical generating station in the world.

### Ten Years Ago in Coal Age— Feb. 17, 1917

"Coal Stripping with an Electric Shovel," by Wilbur G. Burroughs, describes stripping 60 ft. of overburden from 6 ft. of coal at the Piney Fork Coal Co.'s mine near Steubenville, Ohio. Shovel has 90-ft. boom and a 6-cu.yd. dipper.

"Safe and Efficient Mine Ventilation," by D. D. Dodge, Joseph Smith and Henry King, briefly reviews principles involved in mine ventilation.

A. B. Kelley, supt., Bessemer Coke Co., Greensburg, Pa., states that organization is the most important factor in the management of a mine and should not be overlooked.

#### LABOR SITUATION

Series of petty strikes in anthracite region. One thousand employees of the No. 14 colliery of the Lehigh Coal & Navigation Co. are on strike. The men want "consideration pay"—42c. an hour for all work that they contend comes under that head. The rate for company miners is \$2.75 and the men assert that the company pays this rate to men who should receive the higher scale. On Feb. 7, collieries 4, 5 and 6 of the same company went on strike—3,500 men and boys are idle. The breaker boys want 20c. an hour instead of 12 cents, the present scale.

A determined effort is being made to unionize Hopkins, Webster and Union counties, Kentucky.

Much friction and resultant idleness in the Kansas field. Alex Howat orders men not to work where shots are fired by electricity from surface. Men favor this method and miners at only two mines obey Howat. Increasing cost of powder and fuses also occasions trouble between employers and miners.

#### MARKETS

*Anthracite.*—The severe weather of the past week not only stimulated consumption to a maximum but seriously interfered with mine operations and transportation. Available supplies at distribution centers probably at lowest point since strike of 1902. Many public utilities running on narrowest of margins. In some instances fuel allotment to domestic consumers was in quarter and half-ton lots. Egg, stove and nut quoted at \$8.25@8.50 per gross ton, f.o.b. New York tide-water; pea, \$7.25@7.50; buckwheat, \$6.25@6.50; rice, \$4.50@5; barley, \$3.50@3.75.

*Bituminous.*—Trade continues to mark time pending developments in the international situation. Recent cold spell has increased consumption and car shortage, in some cases amounting to 70 per cent, has reduced coal supply in many instances so low that only most urgent demands can be met. Uncertainty in foreign situation has brought contracting to a standstill. Average price of 12 representative bituminous coals for week ending Feb. 17, is \$4.67@5.04 per net ton f.o.b. mines. Prices vary from \$6.75@7 for Pocahontas and New River, to \$3@3.50 for Williamson and Franklin Co., Ill., mine-run and screenings.



# Binding Compound Makes Satisfactory Briquets

Phosphoric Acid, Mixed With Carbohydrate Adhesives, Permits of Lower Carbonizing Temperatures of Product, Which Is Hard and Water Insoluble—Briquets Hold Shape Until All Coal is Burned

By Theodore Nagel

American Cyanamid Co., New York City

**I**N EUROPE, where bituminous and brown coal briquets are a fairly common fuel, their annual production at times exceeds twenty million tons. Many of the European coals are extremely fragile and usually slack into small particles when exposed to the air. Large losses result from handling and shipping this slack material, but briquetting it eliminates this waste and produces clean lumps or blocks. Such blocks are easily stacked to prevent theft and form neat, uniform, clean piles. Most European briquets are used industrially and the economies they effect over slack coal have led to their wide use as locomotive fuel.

Since the inception of briquetting, coal tar pitch has been the almost universal binder because it is a natural adhesive and increases the heating value of the coal. As practically no anthracite is used in Europe, smoke is accepted as a matter of course. Due primarily to the necessity for economy, Europeans are extremely frugal in their consumption of domestic fuel. Nor are they as prodigal in the use of heat as is customary in this country where, in general, houses are heated in their entirety. The smoke nuisance in London is intolerable and there is much agitation on the subject. Welsh anthracite is too expensive for general use and the prepared smokeless fuels are limited in quantity, not entirely successful, and are costly when compared with bituminous coal.

The domestic fuel requirements of the United States, particularly in the northeastern section, are radically different from those of Europe. Because of the large supplies of anthracite, the domestic consumers of New England have become accustomed to burning a smokeless fuel. Within reasonable limits they also are willing to pay a premium to be relieved of the smoke and dirt incident to the use of higher volatile bituminous coals. In recent years, the cost of anthracite to the householder has approached the "luxury" class of commodities included in his budget of expenditures. In fact, it has reached such a point that many people are obliged to purchase lower-priced fuel and submit to the discomforts of dirt and smoke—a condition with which many have become acquainted during the protracted strike periods in the anthracite field.

The production of coal briquets in the United States and Canada approximates only a million tons annually. Although the larger portion of these briquets is made of anthracite they have not been altogether satisfactory as a domestic fuel. In the majority of instances the briquetting methods used in Europe have been employed

in this country without taking into consideration the difference in our domestic requirements. As a household fuel, the briquets that have been heretofore made from anthracite with a pitch binder, except for their uniformity in size and cleanliness in handling, are but little better than lump bituminous coal. This same criticism applies with more or less force to anthracite briquets made with a binder composed of sulphite liquor and an oil emulsion (for waterproofing) that are baked after pressing. In both cases, because of the hydrocarbons present, the binder burns more rapidly than the

coal of which the briquet is made and this permits partially burned particles of coal to drop into the ashes. A domestic fuel to be a commercial success in competition with anthracite must have at least all the good qualities of raw coal.

Much expensive development work has been done to produce a fuel from bituminous coal that will compete with anthracite and many of the attempts made have been financial failures. There is much available literature pertinent to this subject for those interested but no references will here be made to it. The breakage of coal during mining produces a large tonnage of "fines," much of which is a total loss while the remainder is marketed at prices lower than the actual cost of production. This particularly applies to the smaller steam sizes of an-

Although briquetting offers the cheapest, easiest and quickest method of converting what is now generally considered waste coal into a satisfactory domestic fuel, briquets have not generally been accepted as a substitute for anthracite. This condition largely arises from the fact that many of the briquets heretofore produced were smoky and fragile and did not hold their shape until all the coal was consumed. The binding compound described in the accompanying article appears to eliminate these objections.

thrachite and also to the slack and screenings produced in the low-volatile bituminous fields. It is generally conceded that these materials, properly briquetted, will produce a domestic fuel at least the equal of the domestic sizes of anthracite and will yield a profit sufficiently attractive to justify establishing a new industry. Such an industry apparently had been awaiting the development of a binding compound that would produce clean, hard, water-insoluble briquets, the binder of which would not smoke or soften when burning and which would hold the particles of coal together until they are completely consumed. Another consideration of primary importance to a permanent briquet industry is the assurance of an adequate supply of this binding material at a reasonable cost. It has been difficult to meet such rigid requirements but once met they will eventually form the basis of an entirely new and important industry.

An investigation made of fuel briquetting, the results of which have been here briefly summarized, inspired a research program with a view to producing a binding compound, the specifications of which are:

1. The ingredients that go to make up the binding



compound must be obtainable in commercial quantities at a reasonable cost.

2. The binder must not raise the ash content of the briquets much above that of the coal from which they are made.

3. The finished briquets must resist to an extent at least equal to that of prepared anthracite, the degradation incident to storage, shipping and distribution.

4. The briquets must not deteriorate when stored out of doors. This requires that they be impervious to moisture and unaffected by freezing and thawing. They must not soften, flatten or crush under pressure of the stockpile and the heat of summer.

5. The binder used must produce no smoke or odor.

6. The binder must not soften in the heat of the fire nor burn faster than the particles of coal, which latter it must hold together until they are consumed.

The research chemists of the American Cyanamid Co. devoted two years of study to the production of such a binding compound. During this period actual briquetting tests were made of the various binders that were compounded. The briquets made with these binders were tested for hardness, resistance to disintegration by water, heat, freezing, tumbling and weathering, as well as for burning qualities.

The investigation soon demonstrated that hydrocarbons such as tar, pitch, asphaltum and heavy oil residues, made unsatisfactory binding agents. Hydrocarbon emulsions used primarily for waterproofing also proved to be undesirable. Natural and compounded adhesives made from carbohydrates eventually proved to be the most effective, cheapest and most abundant binding materials. However, this series of water-soluble binding compounds requires sufficient drying and heating to convert them, by carbonization, into water-insoluble binders. Baking of the briquets made with carbohydrate binders proved to be commercially impracticable because of the narrow temperature limits required. When baked below this limit the briquets were hard but the binder remained water-soluble. When baked above this temperature range the briquets, though water-insoluble, were too fragile for domestic or industrial use.

A study of the chemical reactions involved eventually led to the solution of the problem. Phosphoric acid acts both as a dehydrating and a fireproofing agent. When phosphoric acid is mixed in proper proportions with various carbohydrate adhesives, it is found that a lower baking temperature with a much wider heat range can be used to carbonize the binding compound. The finished briquets are water-insoluble, of increased hardness and entirely free from acid. Depending upon the quantity of acid used, the oxidation temperature of the ultimate binder is equal to or slightly higher than that of the coal briquetted. As a result of the chemical and physical properties imparted by phosphoric acid, satisfactory binding compounds have been developed from natural adhesives such as concentrated sulphite liquor and evaporated molasses residue. Compounded carbohydrate adhesives of dextrinized starch paste can be produced from low grade, spoiled or waste flour, cheap starches and spoiled grain.

Briquets made from the binding compounds just described can be thoroughly "cured" at temperatures not exceeding 500 deg. F. The baking process can be effectively accomplished in continuous ovens. Single ovens having capacities of 25 tons per hour are now in commercial use. An installation of this kind with

an hourly capacity of 50 tons and having no interior mechanical moving parts, has been developed. This can be constructed at less than half the cost of the present types.

The developments in binding compounds herein briefly described have been fully patented in the coal-producing countries of the world. These patents cover the chemicals and their compounding; the use of the compounds for briquetting and the finished briquets resulting from the use of such binders.

## Improvements in Making of Wire Rope Increase Safety Factor

BY WALTER VOIGTLANDER  
American Cable Co., Chicago, Ill.

Every coal mining engineer will agree to any reasonable policy or method that will reduce operating expenses at no sacrifice to efficiency. Naturally the interest in such a method will be greatly increased if it can be shown that the departure from ordinary practices will not only decrease expenses but also increase efficiency.

It would, perhaps, be improper to say that one part of a machine was more important than another, since all elements are so interdependent that to give efficient service every machine must act as a unit. That wire rope is a major operating element in hoists and other mining machines is self evident. Nevertheless any improvement or correction in either its construction or application will both decrease operating expense and increase general efficiency.

For nearly 100 years this product has remained nearly the same in its general fabrication with the result that to the great majority of mine superintendents wire rope was just wire rope, with little or no semblance of individuality or distinguishing characteristics. Such an impression was more or less justified up to three or four years ago when a practical means was found whereby the wires and strands that enter into the construction of such rope could be preformed or preshaped. This discovery permitted the development of a decided change in wire-rope manufacture.

Instead of merely twisting a number of wires into a strand, then twisting several strands into a complete rope, which process will naturally result in great internal strain thus reducing the resiliency and over-all efficiency of the completed product, the preformed wires and strands were laid in place without force or twisting. The obvious result is a rope which approximates mechanical perfection. The applied loads are more evenly distributed throughout the component wires and strands thus reducing unbalanced wire stresses. This yields an actual higher safety factor.

The fact that preformed rope will not unravel when untied at the ends proves the absence of torsional stress that exists in ordinary rope. Thus internal torsional stresses are known to have been reduced in this product to practically nothing. These two features yield a greater useful allowable stress in the wires for actual operating services.

When the separate wires in a rope break they invariably stick out from the surface, frequently bending back and breaking off, leaving a gap in the strands. This causes less bearing surface on both the remaining wires and the sheave. With the wires and strands preformed, however, broken wires still lie in place, thus protecting both the remaining wires and the sheaves.





# Practical Pointers For Electrical And Mechanical Men



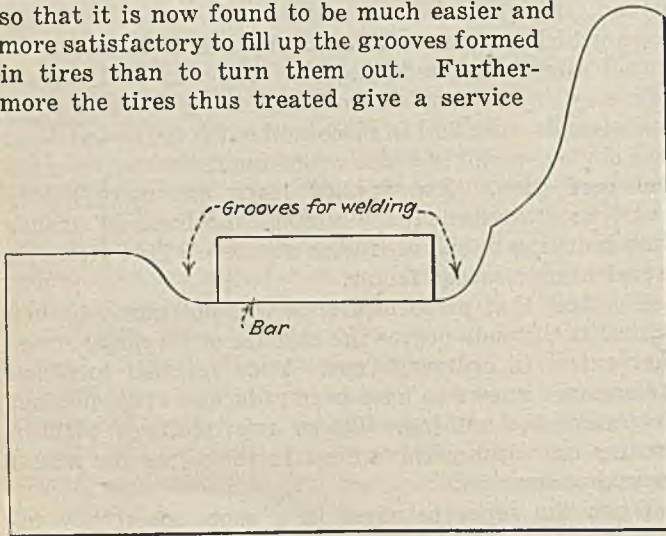
## Reclaimed Tires Give Good Service

Concerns using electric mine locomotives are well aware of the fact that the repair of tires and wheels constitutes a large item of the annual upkeep expense. The total amount thus expended may range anywhere from a few hundred to several thousand dollars depending upon the number of locomotives employed, the severity of the service and like factors.

In a comparatively short time under severe conditions a groove is worn in the wheel tread. Such grooves soon reach a depth that entails much unnecessary friction and wear on tracks and switches. The usual remedy is to dismantle the locomotive and turn down the tread. This operation is repeated as often as the need for it arises until the tire becomes too thin for further turning down or until the gear housing or other parts begin to drag on the ground.

This continued resurfacing naturally entails an expense both in labor and in time lost while the equipment is out of service, in addition to the first cost of the tires or wheels. In the end also the tires must be discarded and new ones procured. With modern methods in the shop, however, this bill can be cut to less than half as the original tires and wheels will last almost indefinitely.

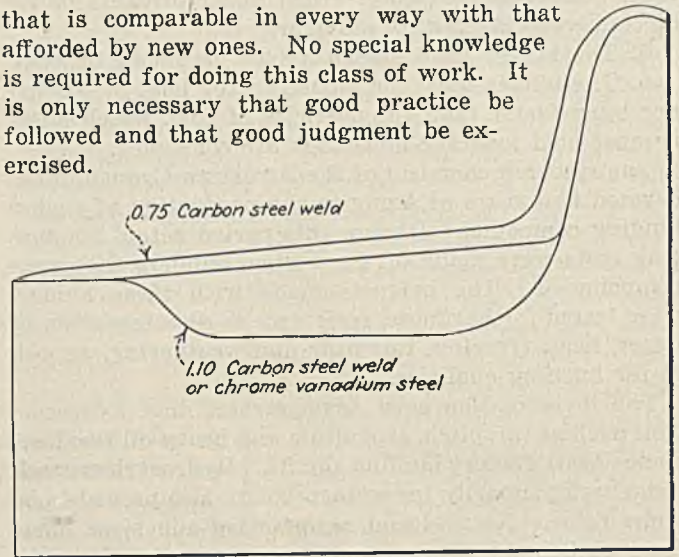
Progressive mining companies today are equipped with either oxy-acetylene or arc welding outfits or both. In the majority of cases, however, maximum use is not made of this equipment and consequently maximum benefit is not derived from it. This type of equipment has been so developed within the past year or so that it is now found to be much easier and more satisfactory to fill up the grooves formed in tires than to turn them out. Furthermore the tires thus treated give a service



**Fig. 1—Cross-Section of Tire and Filling Bar**

The filling bar should be of such shape and size as to leave a space at least an inch wide at the top between its upper corner and the side of the groove to be filled. The weld is then made in these openings, for best results both sides progressing about equally. As the work progresses it should be peened or hammered down, high places being thus leveled out and rendered comparatively smooth.

that is comparable in every way with that afforded by new ones. No special knowledge is required for doing this class of work. It is only necessary that good practice be followed and that good judgment be exercised.



**Fig. 2—Dressing Up a Tire with Hard Steel**

Cutter bits, high-carbon steel or chrome-vanadium steel may be used to fill the groove worn in the tire tread. After this material has been welded in place the whole tread and flange may be given a thin layer of ordinary mild steel. This latter coating may then be trued up in a lathe and the tire is ready for reinstallation and use. Extreme tread life is obtained by this means.

If the flanges are in good shape it is not necessary to remove the wheels from the locomotive. The machine, however, should be jacked up and blocked in position so that the wheels may be turned as desired. In making a repair of this kind a high grade mild steel bar of a thickness equal to or slightly more than the depth of the groove but at least an inch narrower than its rim or mouth is used. This bar should be a few inches longer than the circumference of the tire or wheel. It is laid into the groove and the weld started at one end.

Either the oxy-acetylene torch or the arc can be used in making the weld but the operator should be careful that the metal is fused from the bottom to the top. A steel welding rod containing 0.75 per cent of carbon or a nickel steel rod should be used and both sides of the weld should progress about equally. The bar is heated by the welding and as the process proceeds it may be bent around the wheel as desired. Meanwhile the wheel is turned so as to keep the work in a horizontal plane.

After a stretch of two or three inches has been welded it is advisable to hammer or peen the work done as its quality is much improved thereby. Simultaneously high spots are more or less effaced by this treatment. If the carbon steel rod is used with the oxy-acetylene torch it is preferable that the flame be slightly carbonizing. When the work is finished any high spots yet remaining may be removed with the aid of a portable grinder, after which the wheel is ready to go back into service. In use it will be found that a job of this kind if carefully executed will wear longer than if the bar is left out and the groove entirely filled by welding.



If the flanges are badly worn they also may be built up by welding. Inasmuch as they would have to be machined, however, it is better in such a case to remove the wheels for this operation. Welding rod containing much over 0.75 per cent carbon should not be used as the work in such a case would be so hard as to be difficult to machine.

#### USES OLD MACHINE BITS

One large coal producer whose grades are not particularly heavy does not use the bar method here described but in its stead utilizes old mining machine bits. These are laid in place and welded securely in position, the welding rod containing 1.10 per cent of carbon. Chrome vanadium steel is also sometimes used for this purpose. The groove is filled full in this manner but in no case is the work allowed to project above the original surface, as steels of this character cannot be machined in the ordinary manner. The flanges and entire wearing surface is next given a layer of 0.75 carbon steel which is machined smooth. This company is getting from eight to twelve months' service from wheels treated in this manner.

Rebuilding in this way has given such satisfactory results that the master mechanic of another company has gone over the scrap pile selecting the thickest of the tires rejected in past years. The cuts made for removing the tires are welded shut and the grooves and flanges rebuilt. All of these tires that have gone into service so far have given excellent satisfaction and have more than repaid the cost of reclamation.

### Special Alloys to Resist Mine Waters Cut Corrosion Loss

Mining engineers in America and elsewhere, says *Colliery Guardian*, are faced with the increasing problem of corrosion, due to the fact that more extensive areas and deeper mines have made mine waters more acidulous. In many cases it is necessary to use mine water for coal washing and steam condensing, so that the range over which the acid water can do damage is being enlarged. As far as chutes and pipe lines are concerned, the problem is not difficult owing to the fact that materials can be employed which are not as susceptible as metal to corrosion.

In the case of machine parts, such as pumps, metals must be used, and it is in this connection that the corrosive effects of mine water are most noticeable. Not only is the water itself corrosive, but the hard impurities in the waters handled by pumps serve to scour the metal surfaces and so aid the acid water in its destructive work.

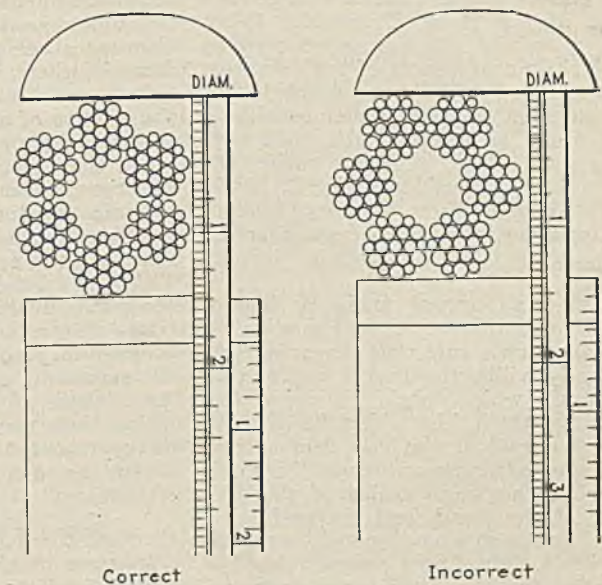
#### PROMISING RESULTS OBTAINED

Promising results have been obtained in America by constructing pump parts of high chromium steel and high silicon cast iron. An instance of the use of this metal (high silicon steel) is given in the case of a mine near Wilkes-Barre, Pa. The water in this mine is unusually bad as regards acid and silt, and it was found necessary to replace the bronze casing rings of the centrifugal pumps about every three months or so. These parts were eventually replaced by rings made of high silicon steel which are still in service after over a year's operation. The impellers of the pumps are now made of the same metal.

Similar cases are reported in several other American mines. In one case the pumps were equipped with the best grade of lead-bronze valve stems and the average life of these stems was only 150 hr. Chrome iron valve stems were substituted, and an examination after 2,200 hr. service showed a reduction in diameter of only 0.0005 in. Similar results were obtained in the case of centrifugal pump impellers. In many cases the mines themselves made the parts for their pumps, so the new alloy has been taken up by the manufacturers of these machines and the making of this alloy has been improved to such a degree that it can be both cast and rolled without difficulty, thereby extending its availability for mine machine use.

### How to Measure Wire Rope Correctly Is Shown Graphically

According to Walter Voigtlander, rope engineer of the American Cable Co., there is only one way to correctly measure wire rope and this is shown in contrast to the incorrect method in the accompanying illustration. It is important that the proper size of rope be employed for any particular job since an undersized



The Proper and Improper Ways

There is but one correct method of measuring wire rope and that is the one shown at the right in the above illustration.

rope will not give the degree of service that can reasonably be expected. On the other hand, an oversized rope represents needless investment and will not properly operate over sheaves grooved for a smaller size. It is highly important that the rope and the sheaves be properly fitted to each other. Wire rope should not be allowed to travel over a sheave wherein the groove is too small. A pinching sheave will do more damage to a wire rope in one hour than a properly grooved sheave can do in an entire week or more. Sheaves grooved  $\frac{1}{8}$  in. larger than the diameter of the rope will lengthen the life of the rope several times as compared with pinching sheaves. Since sheaves are cheaper than good wire rope, there is small economy in continuing the operation of improperly grooved pulleys or drums. Also the tread diameter of the sheave or drum greatly affects rope life. Large diameter sheaves should be used wherever possible.





## News Of the Industry



### Operators Urge "Competitive Scale" Drawn Up at Toledo; Lewis Charges Some Producers Don't Want to Agree

By Sydney A. Hale  
Associate Editor, *Coal Age*  
(By Wire from Miami)

Miami, Fla., Feb. 15.—"The continuously competitive wage scale" as a solution for the problems of the unionized bituminous fields was thrust into the center of discussion at the joint interstate conference of operators and miners of the Central Competitive Field at the Hotel Everglades today. Action on the proposal, sponsored by the Toledo conferences of the operators last month, however, was withheld and the question was still under consideration when the meeting adjourned until tomorrow. The miners, under the leadership of President John L. Lewis, of the United Mine Workers, injected the question into the discussion before the operators had a chance to first introduce it.

Taking an appeal made by one of the Ohio companies to their men as his cue, Mr. Lewis said that the union was perfectly willing to discuss any and all proposals which might be submitted. "I do not think," he added, "that there is any operator who can demonstrate that any arrangement could be made to bring the wage scales of the free labor of the North and the serf labor of the South on a continuously competitive basis. Mr. Lewis charged that the situation in the bituminous industry, except for the war years and the years immediately following, was no different from that which had prevailed for generations past. There were, he said, the same intermittent operations, impoverished markets, poorly financed companies, cut-throat competition, unsatisfactory conditions of employment and neglect of safety precautions by companies too poor to make the necessary provisions.

"I know," he continued, opening a drive on the lack of organization among the operators, "of no industry more disorganized and less organized. I don't make that statement from the standpoint of employee organization. The employees are fairly well organized and they would be better organized if Southern operators would permit their men to exercise their normal American rights. But the operators are not organized financially, commercially or as producers. We meet here after three years and find the producers more disorganized than ever before. There are

almost as many opinions as to what should be done at this conference as there are operators present."

The National Coal Association, asserted Mr. Lewis, had been aided by the funds of the union operators, but that organization had been captured by the non-union producers and was used by them as a vehicle to attack the United Mine Workers. Upon what ground, he asked, could union operators criticize the failure of the union to more completely organize the non-union fields when they themselves were so lacking in organization? Because of lack of organization the operators were selling one-third to one-half of their output at less than the actual cost of production. This was possible because the railroads, the public utilities and the large industrial plants were organized against them. As proof of this he mentioned the statement put out by the National Association of Purchasing Agents advising their members to bring pressure on operators to reduce wages. This action he denounced as "an unholy conspiracy."

#### Scores Producers' Inaction

In view of the fact that the union had been on record for twelve years in favor of a liberalization of the Sherman Act, and during that time no operating group had come forward to join with the union in an appeal to Congress, Mr. Lewis refused to give much weight to pleas that better prices were not obtainable by concerted action. He also charged the Northern fields with failure to make a vigorous fight in the matter of obtaining rate reductions and in supporting the nomination of Cyrus Woods for the Interstate Commerce Commission. This latter appointment, he pointed, out had been vigorously and successfully opposed by the non-union interests.

"So we are back again facing the A B C's of industry which existed before the war," said Mr. Lewis. "Low wages never brought the millennium to this industry when the operators possessed the power to arbitrarily fix wages. The solution of the problem of the industry depends upon internal co-operation and organization. I say frankly I don't know whether you can

#### Railroads Show Increase In Income Over 1925

Net railway operating income of \$1,231,494,000, representing a return of 5.13 per cent on property investment, was reported for 1926 by the Class 1 railroads, according to the Bureau of Railway Economics. This compares with a net in 1925 of \$1,133,696,000, or a return of 4.85 per cent. The compilation is based on reports of 186 Class 1 roads.

Gross operating revenues of the roads in 1926 aggregated \$6,451,148,000, against \$6,189,268,000 in 1925, an increase of 4.2 per cent. Operating expenses were \$4,717,590,000, against \$4,584,600,000, a gain of 2.9 per cent. Taxes totaled \$394,370,000, compared with \$363,590,000, an increase of 8.5 per cent. Out of the 186 reporting roads only 16 operated at a loss in 1926, of which six were in the Eastern district, one in the Southern district, and nine in the Western district.

place your house in order, but, if you can't, don't think the mine workers can lightly accept a wage reduction and a lowering of the standards of living merely because of your own shortcomings."

At the outset of the conference this morning, H. E. Baker, speaking on behalf of the western Pennsylvania producers, stated that the individual companies represented were ready to negotiate a contract at Miami or elsewhere. They could not, however, see any possible way to agree to a scale that does not permit them to sell in competition with the Pittsburgh Coal Co. and with operators south of the Ohio River.

Mr. Lewis, who next took the floor, outlined the wage program framed by the union at the Indianapolis convention. This program, he maintained, was conservative, although the union hoped to bring up questions of day and tonnage rates, internal and local conditions and hours of labor. The organization did not come breathing ultimatums. It was bound to oppose any reduction in wages, but beyond that had no hard and fast program.

Both Mr. Lewis and Philip Murray, international vice-president of the union, scored the operators who had repudiated the Jacksonville agreement. Many of them, they said, had executed contracts in bad faith and they insisted that the failure to try to give



that agreement a fair trial could not be used as an argument against the wages therein named.

Resentment on the part of W. H. Haskins and Herman Perry to the charge of bad faith led to specific disclaimers that the union had Mr. Haskins or Illinois in mind.

"I can name the operators, if the operators here desire me to do so," said Mr. Murray. His challenge was not accepted.

"I don't know how successful this conference will be," remarked Mr. Lewis. "I don't know how many operators are here in good faith, but I am constrained to take cognizance that certain operators do not want to make an agreement at this conference. The union wants to make an agreement at this meeting. It wants to relieve the country of any fear of a suspension on April 1 and has no sympathy with any movement to frighten consumers into laying in abnormal stocks."

Phil Penna suggested that it would be a good move, in view of this delaration, to accept the Toledo resolution which provided for a joint wage board representing the miners, the operators and the public. Mr. Lewis countered that he was sorry that Mr. Penna should suggest delegating this authority to an outside agency before the parties directly concerned had endeavored to reach an agreement.

#### Would Stick to Union, if Possible

Mr. Haskins made the issue a formal one by offering the Toledo resolution to the conference. This, he said, was not a panacea but a suggestion. Defending the good faith of the Ohio operators in offering it, he declared that they had dealt with the union for thirty years and wanted to continue union relations "if possible." If the resolution is adopted," he continued, "it means industrial war."

From that point on the discussion was largely a running cross-fire of argument and questions between Messrs. Lewis and Murray on the one side and Messrs. Haskins and Perry on the other. Mr. Lewis tried in vain to pin Mr. Haskins down to a statement of what actual wages would be under such a proposal. The spokesman for the operators argued that, once the non-union producers understood that the union fields would meet every wage reduction when and as soon as a cut was made, the non-union operators would be at a disadvantage. Men, they said, would rather work under union conditions than non-union at equal wages. The adoption of the policy proposed would mean a reduction at the start, but in less than a year, predicted Mr. Perry, wages would be back to the present basis and there would be more employment in the union fields.

The union representatives declined to accept these conclusions. Every reduction in union scales would be met by reductions in the non-union fields. Meeting the implied threat in the demand, Mr. Lewis admitted that the Ohio operators might starve men into accepting their scheme—though that was unlikely. "But when you do that thing, you'll be right back where you started years ago and will have done nothing toward solving the problems of stabilizing the industry."

### High Ash!

Thinking that a clinker had jammed the grate of her coal stove one cold day when the temperature dropped to 10 deg. Fahr. and the stove was not functioning properly, Mrs. Edgar A. Nottingham, of Cape Charles, Va., drew the fire and, much to her amazement, found a lump of melted shiny metal fast in the stove which turned out to be a piece of 20-carat gold.

Mrs. Nottingham took the gold to a jeweler in Norfolk where it was tested and found to weigh about 9 pennyweight, which was worth about \$7.20. Mr. Nottingham paid \$7.50 for the half ton of coal and, after getting the money for the gold, the coal only cost him 30c. The family ashpile was carefully sifted in search of more of the shiny metal, but none was found.

According to Mr. Murray the proposal meant following "the mad philosophy" of the British coal owners. They, too, he said, had cried out against competition and in 1921 had compelled the men to accept the theory of competitive wages, which would enable Great Britain to recover markets lost to Continental European producers. Since then there had been three other general reductions and the owners were in worse state and unemployment had not been lessened.

Seeking to minimize the claims of lost markets, Mr. Murray declared that Central Competitive Field production last year approximated 148,000,000 tons and that that total exceeded any pre-war record. It was true, he conceded, that Southern output was far ahead of pre-war tonnages; nevertheless 45,000,000 out of the 147,000,000 tons produced in West Virginia last year was non-competitive and 30,000,000 had been mined at the Jacksonville scale. There also was considerable captive tonnage in Kentucky and Pennsylvania which paid rates fairly comparable with the union scale.

Lee Hall, president of the Ohio district union, closing the discussion for the day, reiterated that wage reductions were not the solution of the ills of the industry. To substantiate this he recited his version of the situation in the Pomeroy Bend field. He said that the mines that had cut wages to the 1917 basis were averaging only 3,197 tons per day against 8,900 tons when union men were employed and that the running time at those mines had not been much, if any, better than that enjoyed by the operations still paying the Jacksonville scale. He admitted that about 218 men had deserted the union to accept employment at the lower rates.

The question was still under discussion when the conference adjourned this afternoon to meet tomorrow morning.

A short opening session Monday was devoted to the organization of the machinery of the joint conference. Rice Miller, president, Illinois Coal Oper-

ators' Association, was elected chairman; Thomas Kennedy, international secretary-treasurer of the United Mine Workers, was made secretary, and George K. Smith, secretary of the Sunday Creek Coal Co., assistant secretary of the conference. Mr. Miller appointed the following committee on rules and order for the operators: W. W. Keefer and H. E. Baker, western Pennsylvania; S. H. Robbins and John S. Jones, Ohio; Phil Penna and Hugh Shirkie, Indiana; E. C. Searls and L. H. Smith, Illinois. For the miners, Patrick T. Fagan and William Hargest, western Pennsylvania; George W. Savage and David Watkins, Ohio; T. G. Lawton and William Mitch, Indiana; Harry Fishwick and Walter Nesbitt, Illinois.

Over the protests of Ohio and Pennsylvania operators, the conference, which had been in session about an hour, then adjourned until Tuesday morning. During the argument over the recess the miners sat silent. The union representatives also refrained from voting on the motion to adjourn, which was first offered by Mr. Penna. Prior to the joint meeting, the operators held a caucus at which they named a steering committee to act as their floor leaders during debate. This committee is composed of Messrs. Baker and Penna, W. H. Haskins of Ohio and Herman Perry of Illinois.

Unless the arguments are prolonged, tomorrow will give the first test of the determination of the operators. It has been repeatedly rumored that Ohio and western Pennsylvania producers will withdraw from the conference if the meeting votes down their proposal. Under the rules of the conference, which requires affirmative action by both operators and miners, it seems certain that the conference will reject the Toledo resolution. Both sides, however, have left loopholes. The union has said it will consider any plan which can be justified. The operators have declared their willingness to listen to any alternative proposal which promises relief.

### More Coal, Less Oil, Used by Utilities; Power Output Up

Public utility power plants in the United States consumed 3,835,569 net tons of coal during December, 1926, according to a report by the U. S. Geological Survey. This compares with 3,595,662 tons in the preceding month, revised figures show. Fuel-oil consumption by these plants in December totaled 791,956 barrels, against 961,629 barrels in November.

The average daily production of electricity by public-utility power plants in December established a new record, with an average output of 218,300,000 kw.-hr. per day, surpassing the previous record established in November by about 1½ per cent. The total output for 1926 was 73,347,000,000 kw.-hr., an increase of about 11 per cent over the total output for 1925. The output by the use of water power increased 16 per cent and the output by the use of fuels increased about 9 per cent. The proportion of the total output produced by the use of water power was 35 per cent, 1 per cent larger than in 1925.



# Consumers' Stocks of Soft Coal Jan. 1 Total 55,000,000 Tons; Average Supply For 37 Days; Reserves Still Mounting

Stocks of bituminous coal in the hands of consumers on Jan. 1, according to a survey by the U. S. Bureau of Mines, were about 55,000,000 net tons. In addition there were 5,567,000 tons on the upper Lake docks and an unknown quantity, amounting to many millions of tons, loaded on cars in transit. Only once since the war have stocks on New Year's Day exceeded these figures. The exception was Jan. 1, 1924, when consumers had reserves of 62,000,000 tons. On Jan. 1, 1922, the stocks were 48,000,000 tons.

Since Oct. 1, 1926, the date of the preceding survey, 12,000,000 tons have been added to stocks. The addition has been accomplished in spite of heavy exports caused by the British miners' strike and in spite of unusually heavy consumption at home. In the last quarter of 1926 the exports averaged 1,116,000 net tons a week, or three times the normal rate. In the same period the consumption of bituminous coal averaged 11,200,000 tons a week, a figure that has rarely been exceeded.

At the rate of consumption prevailing last November and December the stocks of consumers on Jan. 1 were sufficient to last 37 days. The stocks on Jan. 1, 1922, were sufficient to last 41 days and those on Jan. 1, 1924, about 48 days at the lower rates of consumption then prevailing.

From what is known of production and exports, it seems likely that since Jan. 1 further additions to stocks have been made. With the settlement of the British strike sea-borne exports have dropped from a weekly average of 713,000 net tons in December to 181,000 tons in January. Production has averaged 13,440,000 tons a week, and although the exports to Canada and the home consumption are not yet known, this large production appears sufficient to yield a surplus available for storage.

Reports from representative anthracite dealers show that stocks of hard coal in retail yards on Jan. 1 were larger than usual at this season.

The total stocks in the hands of commercial consumers, including coal in the yards of retail coal dealers, but excluding steamship fuel and coal in the cellars of householders for all dates on which statistics are available are shown in Fig. 1. Coal on the upper Lake docks is not included, being considered as in transit.

Sales of retailers to hotels, apartment houses, offices, public buildings, and small factories as well as householders is at least 70,000,000 per year. In the last quarter of 1926 retailers were delivering more bituminous coal than in the corresponding seasons when there was no shortage of anthracite, though less than during the anthracite strike of last year. In comparison with the same period of 1923, for example, the representative retailers reporting to the Bureau showed an increase of over 25 per cent in their deliveries of bituminous coal.

Though total stocks of consumers on Jan. 1, if evenly divided, were sufficient to last 37 days, coal-gas plants had average reserves of 69 days; electric utilities, 47 days; railroads, 33 days. How these reserves in terms of days' supply compare with those on Jan. 1, 1922, is shown in Fig. 2.

The increase in stocks in the three months preceding Jan. 1 was very generally distributed over the country. In the North particularly, the reports

## Average Weekly Soft-Coal Exports and U. S. Consumption\*

Period	(In Thousands of Net Tons)		Total Consumption and Exports
	Net U. S. Consumption†	Exports	
1918—Nov. 11 to Dec. 31.	10,600	344	10,944
1921—Nov. 1 to Dec. 31.	8,400	238	8,638
1922—Nov. 1 to Dec. 31.	9,960	397	10,357
1923—January.....	11,370	276	11,646
1923—February.....	11,550	226	11,776
1923—Oct. 1 to Dec. 31....	10,080	326	10,406
1925—Nov. 1 to Dec. 31....	11,680	369	12,049
1926—January.....	12,700	251	12,951
1926—May 1 to July 1.....	8,030	470	8,500
1926—Aug. 1 to Oct. 18....	9,440	936	10,376
1926—Oct. 1 to Dec. 31**	11,200	1,116	12,316

\*Allowing for changes in stocks.  
†Production plus imports and minus exports plus or minus changes in stocks. Allowance is made for stocks at the mines; coal in transit including unbilled loads, coal in cars en route to destination, and coal on the Lake docks; and stocks of commercial consumers.  
‡Bituminous coal required to meet shortage of anthracite.  
§Revised.  
\*\*Subject to revision.

from practically every state show a larger tonnage on hand. How the reserve on Jan. 1 varied from state to state is pictured in Fig. 3, which shows the days' supply held by general industrial consumers other than coke and steel works. As usual, localities remote from the mines in general carried heavier stocks than those close to the mines. The average supply for all consumers in this class was 41 days, but New England had reserves enough for 58 days.

Complete returns from the byproduct coke plants show a total of 5,452,826 tons of coking coal in stock on Jan. 1, of which 1,288,356 tons was low volatile and 4,164,470 tons high volatile. The 202 steel works reporting had 1,894,338 tons of steam coal and 1,117,370 of gas coal, a total of 3,011,708 tons. In days' supply the present stocks have seldom been exceeded.

The total quantity of bituminous railroad fuel coal on Jan. 1, according to the American Railway Association, was 13,499,000 tons, an increase of two and a quarter million tons since Oct. 1. Present stocks are about the same as on Jan. 1, 1919; slightly less than on Jan. 1, 1922, and much less than the record stocks built up in early 1924. The figures for other dates are: Jan. 1, 1919, 13,200,000 tons; Jan. 1, 1921,

### Byproduct Coke Plants

	Days' Supply	
	Nov. 1	Jan. 1
Low volatile.....	27	34
High volatile.....	29	34
Average.....	29	34

### Steel Works

	Days' Supply	
	Nov. 1	Jan. 1
Gas coal.....	38	57
Steam coal.....	37	47
Average.....	37	50

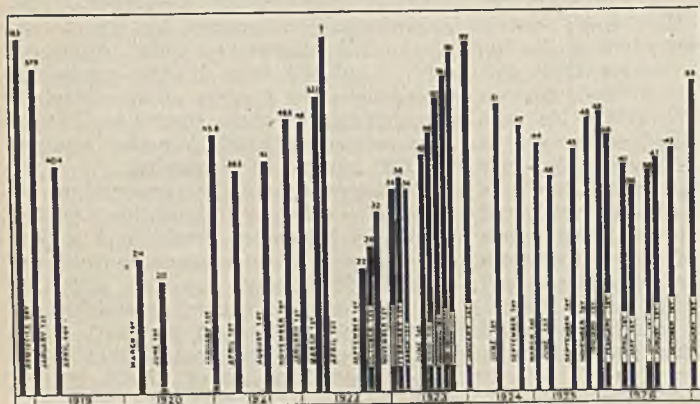


Fig. 1—Total Commercial Stocks of Bituminous Coal, Nov. 11, 1918, to Jan. 1, 1927

Figures represent million net tons and include coal in the hands of railroads, industrial consumers, public utilities, and retail dealers. Coal for steamship fuel, on Lake docks, in transit, and in the bins of householders is not included. From Oct. 1, 1926, to Jan. 1, stocks increased about twelve million tons.

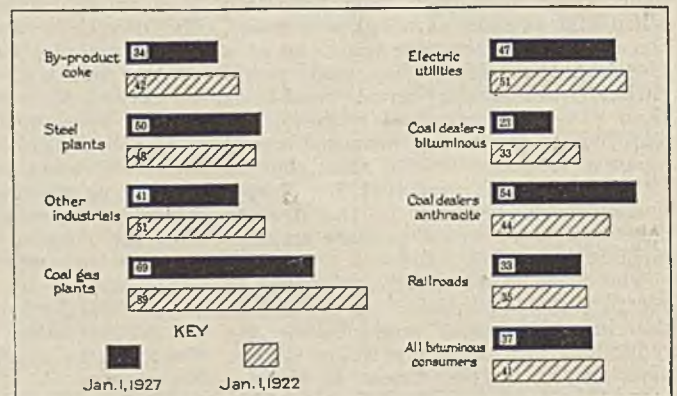


Fig. 2—Days' Supply Held by Different Classes of Consumers Jan. 1, 1927, Compared with Jan. 1, 1922

In terms of days' supply at the current rate of consumption present stocks of bituminous coal are somewhat less than those on Jan. 1, 1922. The greater tonnage on hand at present is more than counterbalanced by a considerably higher rate of consumption.



9,650,000 tons; Jan. 1, 1922, 14,111,000 tons; March 1, 1922, 16,676,000 tons; Jan. 1, 1923, 6,802,000 tons; Jan. 1, 1924, 19,368,000 tons; Jan. 1, 1925, 12,156,000 tons; Jan. 1, 1926, 11,066,000 tons; Oct. 1, 1926, 11,214,000 tons.

From the current reports of coal loadings it is evident that the quantity on wheels en route to destination on Jan. 1 was unusually great.

From a list of 43 companies who have at some time in the past stored in quantity at the mines or at some intermediate point the Bureau has received reports of 144,000 tons in stock on Jan. 1, practically the same figure as on Oct. 1, the date of the last stock report.

The total quantity of bituminous coal unbilled in cars at the mines, according to information furnished by the American Railway Association, declined from 554,000 tons on Oct. 1 to 461,000 on Nov. 1, and rose again to 553,000 tons as of Jan. 1, 1927.

Stocks on the Upper Lake docks on Jan. 1 totaled 5,567,250 tons. This compares with previous dates as follows: Jan. 1, 1919, 5,570,000 tons; Jan. 1, 1922, 7,150,654 tons; Jan. 1, 1923,

### Days' Supply of Bituminous Coal in Hand of Various Classes of Consumers in the United States, Jan. 1, 1919, to Jan. 1, 1927

(Figures represent number of days that supply would last at rate of consumption at time of stock taking)

	Jan. 1, 1919	Jan. 1, 1921	Jan. 1, 1922	Jan. 1, 1922	Jan. 1, 1923	Jan. 1, 1924	Mar. 1, 1925	Nov. 1, 1925	Jan. 1, 1926	Oct. 1, 1926	Jan. 1, 1927a
Byproduct coke plants.....	32	29	42	39	19	35	25	26	26	26	34
Steel plants.....	42	42	48	48	27	43	30	32	28	37	50
Other industrials.....	65	64	51	56	40	55	40	44	39	37	41
Coal-gas plants.....	81	55	89	82	60	91	78	78	72	70	69
Electric utilities.....	49	44	51	54	33	51	51	46	48	45	47
Coal dealers (bitum.).....	39	30	33	23	18	33	33	30	20	32	23
Railroads.....	32	23	35	42	16	44	35	30	27	33	33
Total bituminous.....	42	39	41	43	26	46	37	35	30	35	37

aCalculated at average rate of consumption during November and December, 1926.

3,129,206 tons; Jan. 1, 1926, 6,551,000 tons.

Retail dealers' stocks of bituminous coal on Jan. 1 were about the same as on Oct. 1, but somewhat less than on Jan. 1, 1922, before the great suspension of that year. Deliveries of bituminous coal by retailers in November and December were exceptionally heavy, and the stocks on Jan. 1 were sufficient to last only 23 days against 33 days at the beginning of 1922.

Considering the season of the year, retail yards were heavily stocked with

anthracite on Jan. 1. At the rate their customers were ordering coal in November and December, the stocks of the dealers reporting were sufficient to last 54 days, a very heavy reserve. The dealers reporting from New England had a supply equivalent 78 days' deliveries.

Stocks of anthracite on the Upper Lake docks are ample to meet requirements at this season of the year. Reports to the Bureau of Mines direct from the dock operators show that on Nov. 1 there were 582,072 net tons on

### Supply of Soft Coal in Hands of Industrial Consumers, Utilities and Retailers Jan. 1, 1927, And Comparison with Stocks on Previous Dates

DAYS SUPPLY HELD BY REPRESENTATIVE INDUSTRIAL CONSUMERS, PUBLIC UTILITIES, AND RETAIL COAL DEALERS, JAN. 1, 1927

(Figures represent number of days stock would last at current rate of consumption)a

State	Industries Other Than Steel and Coke		Retail Coal Dealers, Bituminous		Electric Utilities		Coal-Gas Plants		Industries Other Than Steel and Coke				Retail Coal Dealers, Bituminous						
	Number of Plants	Days' Supply	Number of Plants	Days' Supply	Number of Plants	Days' Supply	Number of Plants	Days' Supply	Number of Plants	Days' Supply	Number of Plants	Days' Supply	Number of Plants	Days' Supply					
Total U. S.....	2,086	41	861	23	583	47	259	69	1,884	+ 18	- 3	- 22	- 4	766	- 1	- 12	- 9	- 4	
Maine.....	27	65	14	28	...	...	4	70	21	+ 10	- 30	- 26	- 27	10	+ 51	- 10	- 9	+ 29	
New Hampshire.....	31	63	14	19	2	78	4	87	30	+ 18	- 37	- 52	- 44	11	+ 71	- 36	(d)	(d)	
Vermont.....	31	57	8	14	...	...	2	28	35	+ 1	- 33	- 45	- 12	5	- 29	- 75	- 33	- 38	
Massachusetts.....	229	54	56	15	29	55	21	63	214	+ 13	- 24	- 48	- 40	52	- 18	- 48	- 40	- 12	
Connecticut.....	76	62	27	26	13	72	3	103	68	+ 6	- 19	- 42	- 19	25	+ 10	- 48	- 48	- 21	
Rhode Island.....	53	51	13	11	4	53	1	72	48	+ 28	- 32	- 44	- 43	10	- 38	- 17	- 47	+ 76	
Total New England.....	447	58	132	17	48	60	35	71	414	+ 8	- 25	- 45	- 33	113	- 11	- 44	- 38	- 3	
New York.....	164	56	32	21	31	29	19	111	146	+ 20	- 17	- 22	- 8	27	- 5	- 25	+ 64	+ 89	
New Jersey.....	94	43	20	40	15	59	4	46	79	+ 39	- 10	- 16	+ 4	18	- 9	- 32	+ 96	+ 118	
Pennsylvania.....	128	30	34	15	45	83	7	75	112	+ 17	- 13	- 23	- 9	31	+ 50	- 27	- 21	- 13	
Maryland.....	34	31	13	10	9	44	3	79	25	+ 54	+ 30	- 51	- 22	4	- 1	- 13	+ 37	- 24	
Delaware.....	20	30	6	6	2	57	...	...	19	+ 18	- 28	- 50	- 52	3	+ 144	- 23	+ 6	+ 93	
Dist. of Columbia.....	7	31	6	7	11	28	...	...	2	+ 119	- 41	- 54	- 32	4	+ 1	- 3	- 4	- 18	
West Virginia.....	33	8	6	7	11	28	...	...	7	+ 14	- 41	- 54	- 32	43	+ 10	- 17	- 27	- 48	
Ohio.....	131	34	48	13	50	69	6	31	117	+ 49	+ 25	- 5	+ 33	65	+ 5	+ 3	+ 27	+ 5	
Indiana.....	91	37	70	26	40	31	20	44	79	+ 29	+ 10	(c)	+ 18	68	+ 41	- 1	+ 14	+ 25	
Illinois.....	130	24	77	26	35	35	22	47	118	+ 111	+ 36	+ 25	+ 18	68	+ 41	- 1	+ 14	+ 25	
Michigan:																			
No. Peninsula.....	18	171	3	79	23	111	36	64	19	+ 16	+ 14	- 33	+ 10	3	- 26	- 2	+ 18	+ 8	
So. Peninsula.....	90	53	51	38	...	...	...	...	82	+ 3	- 21	- 4	+ 11	49	- 3	- 5	- 19	+ 7	
Wisconsin.....	78	41	32	48	20	19	17	88	78	+ 22	+ 17	- 7	+ 4	24	+ 12	+ 32	+ 23	+ 48	
Minnesota.....	56	162	10	26	27	106	9	16	50	+ 3	- 7	- 67	+ 56	8	+ 17	+ 26	+ 26	+ 69	
Iowa.....	28	37	60	23	35	37	6	68	25	+ 88	+ 77	+ 83	+ 109	55	+ 5	+ 9	- 4	+ 7	
North Dakota.....	4	13	6	11	10	16	2	22	5	+ 17	- 38	- 50	- 54	4	+ 1	- 25	- 10	+ 15	
South Dakota.....	2	29	5	19	7	70	...	...	2	+ 22	- 6	+ 3	- 15	3	+ 32	- 62	- 10	+ 57	
Nebraska.....	7	24	7	32	22	33	...	...	8	+ 84	+ 31	+ 93	+ 15	6	+ 31	- 20	+ 30	+ 23	
Virginia.....	26	26	12	17	14	36	5	43	22	+ 21	- 18	- 27	- 14	10	+ 4	- 1	+ 9	+ 6	
North Carolina.....	45	39	10	33	14	60	9	17	41	- 11	- 10	- 42	- 43	8	- 19	+ 37	+ 1	+ 29	
South Carolina.....	42	39	9	53	6	64	1	17	19	+ 17	+ 73	- 15	+ 8	17	- 41	+ 1	+ 6	+ 29	
Georgia.....	28	33	20	33	6	61	1	29	3	+ 3	+ 44	+ 25	+ 133	2	- 38	+ 137	- 22	+ 72	
Florida.....	3	102	2	42	1	5	7	11	20	+ 73	- 63	- 78	- 64	29	- 24	- 6	- 11	+ 45	
Kentucky.....	20	10	32	19	14	27	6	63	54	- 1	- 7	- 40	- 11	19	- 33	- 8	- 11	- 28	
Tennessee.....	63	19	19	31	7	19	3	18	17	+ 15	+ 48	+ 35	+ 23	24	- 28	+ 78	+ 30	+ 28	
Alabama.....	34	37	25	48	5	19	7	4	17	+ 10	(c)	- 29	+ 7	8	- 31	+ 5	+ 23	+ 18	
Mississippi.....	17	25	8	31	6	73	4	24	25	+ 61	+ 44	+ 33	+ 17	23	+ 32	- 3	+ 1	+ 20	
Missouri.....	73	28	23	12	26	21	5	13	65	+ 6	- 38	- 49	- 37	5	+ 36	- 19	- 36	+ 48	
Kansas.....	30	14	6	35	5	40	1	13	26	+ 5	- 24	- 1	+ 98	4	+ 8	+ 25	+ 14	+ 11	
Oklahoma.....	11	118	5	28	...	...	...	...	11	+ 8	+ 26	- 24	- 44	3	+ 7	+ 55	+ 11	+ 48	
Arkansas.....	11	28	4	21	2	11	...	...	7	- 30	+ 3	+ 44	- 12	3	+ 27	+ 118	+ 89	+ 16	
Louisiana.....	...	...	3	22	1	17	...	...	23	- 10	- 24	+ 36	+ 34	1	- 60	- 55	- 50	- 55	
Texas.....	24	11	1	27	7	17	...	...	22	- 22	- 40	- 47	- 33	8	- 30	+ 2	(f)	- 11	
Colorado.....	23	15	8	11	20	21	6	18	2	+ 87	- 11	- 8	+ 84	7	- 41	- 31	- 43	- 16	
New Mexico.....	3	32	8	10	6	46	1	14	2	+ 8	- 29	- 34	- 1	4	- 9	- 37	- 11	- 36	
Arizona.....	6	32	5	13	...	...	...	...	15	+ 44	- 13	- 9	- 25	5	+ 53	- 62	- 56	+ 54	
Utah.....	19	21	5	17	...	...	...	...	5	+ 26	- 11	+ 26	(d)	6	- 19	+ 25	+ 26	+ 3	
Nevada.....	4	24	6	34	...	...	...	...	3	+ 81	- 11	- 11	(d)	2	- 52	- 47	(d)	(d)	
Wyoming.....	3	6	4	1	6	18	1	10	3	- 37	- 16	- 65	- 67	4	+ 40	- 3	- 18	- 2	
Montana.....	13	17	4	17	3	10	3	34	13	- 37	- 28	- 5	- 31	6	- 29	- 9	- 9	- 25	
Idaho.....	11	27	6	23	...	...	...	...	11	- 42	- 28	- 42	- 48	5	- 14	- 29	- 61	- 46	
Washington.....	14	27	5	21	2	57	4	35	9	- 63	- 36	- 42	- 48	8	+ 36	- 1	- 25	+ 13	
Oregon.....	...	...	...	...	...	...	...	...	3	+ 7	- 38	- 1	- 41	6	- 7	- 3	- 8	+ 63	
California.....	3	(b)	5	63	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

(a) Period of consumption Nov. 1 to Dec. 31, 1926.

(b) Very large supply.

(c) Less than 1 per cent change.

(d) Very large increase.



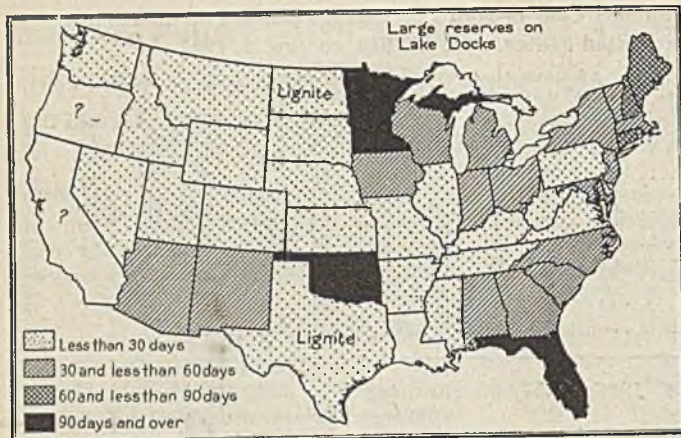


Fig. 3—Days' Supply of Soft Coal on Hand at Industrial Plants Other Than Steel and Coke Works, Jan. 1, 1927

This diagram shows state by state the days' supply of soft coal held in storage at different classes of industrial plants other than steel and byproduct coke works. The average supply for all such consumers throughout the country was 41 days, but in particular states the supply on hand showed wide variation.

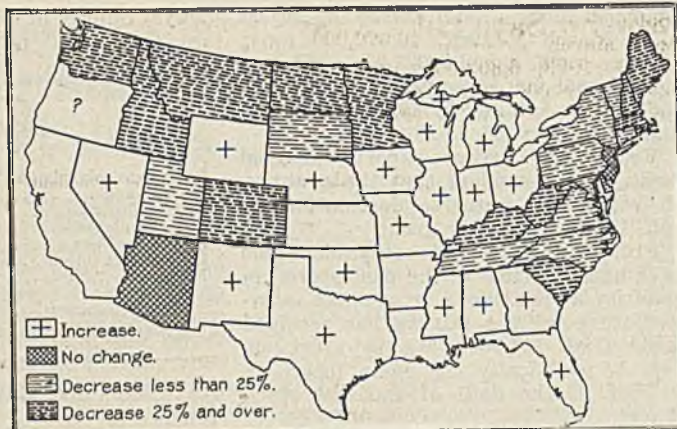


Fig. 4—How Stocks at Industrial Plants on Jan. 1, 1927, Compared with Those on Jan. 1, 1922

A group of 1,884 identical industrial plants reported 3.6 per cent smaller tonnage in stock on Jan. 1, 1927, than on the corresponding date before the suspension of 1922. The map shows that an increase in much of the Middle West and South. Along the Atlantic Coast and in the Northwest the decrease was marked.

the Lake Superior docks and 495,053 on the Lake Michigan docks, a total of 1,077,125 tons. On Jan. 1 the stocks on Lake Superior were 497,608 tons, on Lake Michigan, 495,498, and the total, 993,106. The figures for other recent years are: Jan. 1, 1922, 1,331,507 tons; Jan. 1, 1923, 177,644 tons; Jan. 1, 1924, 513,297 tons; Jan. 1, 1926, small.

A group of 21 plants supplying gas for city use and producing coke suitable for household fuel had 516,000 tons of byproduct coke on hand Jan. 1, as against 628,000 tons on Oct. 1. Figures for other years are: Jan. 1, 1922, 1,017,000 tons; Jan. 1, 1923, 212,000 tons; Jan. 1, 1924, 772,000 tons; March 1, 1925, 631,000 tons; Jan. 1, 1926, 248,000 tons; April 1, 1926, 53,000 tons; Nov. 1, 1926, 579,000 tons.

### Gas from Abandoned Areas Caused Francisco Blast

The explosion at Francisco mine No. 2, in Gibson County, Ind., on Dec. 9, last, which resulted in the death of 37 miners and the serious injury of many more, was caused by gas which came from the abandoned workings in the mine, according to K. S. Strickland, Coroner of Gibson County, who returned his verdict on Feb. 10. The finding was concurred in by Albert C. Dally, chief mine inspector of Indiana.

Following the filing of the verdict of Coroner Strickland, which held that there was no evidence of inspection of the four old mine rooms from which the gas that caused the explosion originated, a resolution of the Indiana state mine board asking a grand jury investigation of the causes of the explosion was placed in the hands of A. Dale Eby, prosecuting attorney of Gibson County at Princeton, Ind., by the state mine inspection department.

It is understood the resolution was presented to the board by Tyler G. Lawton, of Bicknell, president of District No. 11, United Mine Workers, who is a member of the board. Failure to inspect old workings of mines, it is charged, has been a practice in many parts of the Indiana mine field for twenty years or more.

### Progress Being Made In Washing Soft Coal In Eastern U. S. Fields

Advocating that more study should be given to the cleaning of coal and that coal should receive better preparation before being sent to market, F. R. Wadleigh, consulting engineer, New York City, described "Coal Preparation Practices in Eastern Bituminous Fields" at a meeting of the Metropolitan Section of the American Society of Mechanical Engineers at the Engineering Societies' Building, Feb. 11. Mr. Wadleigh traced the progress of coal washing from the first coal washer in the United States, which was erected in Illinois in 1884. He said that 62 per cent of the coal in Alabama was washed and that coal of the Connellsville and Latrobe (Pa.) regions probably had less preparation than any other. Edwin Lundgren presided.

S. W. Balch, mechanical engineer, briefly described the Rheolaveur system of washing as installed at the Loomis colliery, West Nanticoke, Pa. G. V. Woody called attention to the Cokedale plant, in Colorado, in replying to the declaration of Mr. Wadleigh that no application of the Rheolaveur principle had been made in bituminous mines. He said that in Europe of 166 plants working 160 were engaged in washing soft coal. In reply to Mr. Wood, Mr. Woody said that a 3,000-ton bituminous coal plant now being planned expected to wash coal at a cost of 6½c. per ton. That price would include everything but drying the coal. The best plan, if the finest of the slack was reasonably clean, was to screen this fine material out before washing. Then the larger size of coal would part readily with its moisture.

Frank J. G. Duck said that the Car-

penter centrifugal drier would remove the water from coal for about 2½c. per ton. John Griffen quoted experiments at the Hudson & Manhattan R.R. power station which showed that with buckwheat anthracite 1 per cent increase in ash decreased the heat efficiency 3½ to 4½ per cent. Another speaker declared that when coal was to be pulverized the main problem was to grind the ash. It was a big advantage therefore to have the ash reduced to the lowest convenient percentage. In this way the costs of repair, always considerable, would be greatly reduced.

Prof. E. H. Lockwood, Yale University, discussed in a lengthy paper the "Economics of Domestic Heating," presenting a table showing the relative costs of the several fuels now competing for consideration. He said there was no trend toward bituminous coal for domestic heating and that the present radiators heated more by radiation than by convection, thus heating the walls more than the air.

In reply to a suggestion that the life of equipment for oil furnaces might be short due to deterioration and obsolescence, and that, due to frequent retirements from business of firms making oil equipment, it might be impossible to get spare parts, Professor Lockwood admitted that these difficulties were inherent in oil equipment, but that he had not considered them in preparing his figures, which were perhaps tinged with a degree of optimism. He said that when the electric current failed in an oil furnace the flow of oil ceased but that when an electrically operated stoker was left without power 8 or 9 hr. there was still fire enough left to start again the next morning.

In discussion it appeared that fuel values alone were considered. Costs of pilot lights, electricity for oil pumps and depreciation, interest on investment and obsolescence are not considered.

#### Relative Costs of Fuels for Domestic Heating

Fuel	Assumed Price	Assumed Thermal Values	Assumed Over-all Efficiency Per Cent
Bituminous coal.....	\$9 per ton.....	14,000 B.t.u. per lb.....	50
Buckwheat anthracite.....	\$9 per ton.....	12,500 B.t.u. per lb.....	60
Stove anthracite.....	\$15 per ton.....	13,500 B.t.u. per lb.....	65
Oil.....	10c. per gal.....	19,000 B.t.u. per lb.....	70
Gas.....	80c. per m.....	550 B.t.u. per cu.ft.....	70
Electricity.....	4c. per Kw.-hr.	3,415 B.t.u. per kw.-hr.....	100



## Gutheim Says Lake Rate From Pittsburgh Should Be \$1.06; South Demurs

Arguments were concluded in Washington Feb. 10 before the Interstate Commerce Commission in the reopened hearing on lake cargo coal rates. Nothing had been brought forward in the whole proceeding to challenge seriously the contention of the Ohio and Pennsylvania producers that their rates to the lakes are unreasonable, Walker D. Hines, former Director General of Railroads, asserted in closing the case for the Pittsburgh operators, complainants.

Brief arguments were made in behalf of other interveners in the case, including the Pennsylvania and Ohio Utilities Commission, advocating a revision of the rate structure in favor of producers in their states.

A. G. Gutheim of counsel for the complainants argued on Feb. 9, on the basis of statistics, that the lake cargo coal rate from Pittsburgh of \$1.66 per ton was too high and should be reduced to \$1.06 per ton. E. S. Ballard contended that \$1.26 should be the limit. They based their request for such reductions in the rate upon elaborate cost studies submitted by accountants.

Mr. Ballard said that the Commission, in dismissing the complaint on the theory that the lake cargo coal rates were not unreasonable because they were much lower than the local rates to the transshipment points, fell into an error of both law and fact. The error, he asserted, consisted of comparing a rate intended to apply to coal to be stopped at the ports for local consumption with one intended to be applied to coal going beyond by vessel. He said it was a well established rule of law that unlike rates could not be compared for any such purpose.

### Charges Economic Waste

Harold Evans, representing the Public Service Commission of Pennsylvania, contended that there is economic waste in allowing coal to be transported 372 miles from the Kanawha district of West Virginia when coal is available from the Pittsburgh district, only 170 miles from the lakes.

George N. Brown, speaking for the southern Ohio coal operators, and A. M. Calland, of the Ohio Public Service Commission, also argued in support of a reduction in the rates from Ohio fields to the lakes, declaring that under the present adjustment Ohio has completely lost its lake cargo coal business, while that traffic from more distant fields passes through the state.

A. C. Lewis, attorney for the miners' union of Illinois, held that a reduction from Pittsburgh and vicinity would disturb other coal-rate structures. He proposed instead that the Commission leave the Pittsburgh rate unchanged, and revise upward the rates from West Virginia, Kentucky and Tennessee.

J. F. Burke, representing the Pittsburgh Chamber of Commerce, said the coal-producing area in Pennsylvania and Ohio has been losing ground as a result of an inequitable rate adjustment.



Leaders Confer on Plans to Spread Safe Methods in Coal Mines

In order to discuss means whereby "safety first" principles might be further encouraged among bituminous coal miners, and thus the mine accident rate be reduced, a conference was held last week in the office of the National Coal Association. Left to right (seated): D. H. Morton, general manager, American Eagle Colliery Co., Charleston, W. Va.; W. A. Ellison, vice-president, Mahan-Ellison Coal Corp., Harland, Ky.; (standing) R. M. Lambie, chief, Department of Mines, West Virginia; Dr. J. W. Paul, safety engineer, U. S. Bureau of Mines; Harry L. Gandy, executive secretary, National Coal Association.

W. S. Bronson, counsel for the Chesapeake & Ohio Ry. and spokesman for other Southern roads, contended that "what the Pittsburgh producers are seeking to do is to make up by freight rates certain handicaps under which they now labor. The first of these handicaps is in the wage rate, while another is in the facts that the Pennsylvania and Ohio mines are older and more expensive to operate, while a third handicap is that the operating companies are carrying charges on expensive tracts of high cost coal lands. But the principal thing is the wage rate."

J. V. Norman, chief counsel for groups of Southern coal mine operators, who oppose any revision of the lake cargo rates, argued that "the producers of the Pennsylvania and eastern Ohio districts have every advantage in rates and conditions which could possibly be desired. Their bad situation now merely illustrates what can happen from too much coddling of an industry with high wage rates and inefficient mines.

"In 1909, when the differentials in favor of Pittsburgh were only 9 and 14c., the Northern districts did 67 per cent of the lake cargo business. In 1923, when the differentials were the same as they are today, they did 60 per cent of the lake cargo business. These facts clearly show that freight rates have not been responsible."

The Commerce Commission will make a decision later.

**Coal Bids Wanted.**—Sealed proposals will be received until noon, Feb. 28, for approximately 15,000 gross tons of semi-bituminous coal for use in the floating plant in the Philadelphia (Pa.) Engineer District, War Department, between April 1, 1927, and March 31, 1928.

## Latest Parker Bill Vote Foreshadows a Fight on McNary-Haugen Measure

By Paul Wooton

Washington Correspondent of *Coal Age*

Representative Parker's action in bringing to a vote the emergency provisions of his coal bill is seen as a move in the fight on the McNary-Haugen bill. It is current gossip in Washington that some of the representatives from coal-producing regions agreed to vote for the farm-relief bill if the friends of that measure would use their influence to persuade members of the Interstate and Foreign Commerce Committee to vote against the coal bill.

Chairman Parker is said to have felt that since the supporters of the McNary-Haugen bill were responsible for a part of the vote against his coal bill, he, in turn, would score a point if he put them in a position of defeating a measure intended only to prevent profiteering during the prospective strike and to provide a plan of distribution if the President found it to be a necessary step to protect the public.

Mr. Parker does not admit that the foregoing is a correct analysis of the situation, but he points out that in his comment on the defeat of his first bill by the Interstate and Foreign Commerce Committee he remarked that the coal industry was on trial to see if, without legislation, it could give the public continuous service at reasonable prices. He says, however, that coal operators are talking of a strike as if it were inevitable and that the United Mine Workers, in convention, have instructed their delegates to refuse any reduction of wages at all costs.

In view of the uncompromising attitude on each side Representative Parker explains that he was anxious to make one more effort to protect the public. Therefore, he struck out two of the main three features of his original bill and introduced a new bill saying nothing about fact-finding or mediation in labor disputes, but referring solely to emergency distribution and protection against profiteering. With the withdrawal of the mediation feature the objection of the United Mine Workers was met. The withdrawal of the fact-finding provisions eliminated all vestige of permanent supervision or control, which had been so offensive to the operators, and left only the features of the Federal Distribution Act of 1922, under which the coal industry functioned during the entire year without significant protest. The anti-profiteering feature based on priority and car supply and distribution would come into effect only in the event of a national emergency, says Mr. Parker.

*EDITOR'S NOTE*—The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and COAL AGE editorial policy; neither do they necessarily represent Mr. Wooton's personal views.



### Mine Accidents Kill 248 In December; Year's Rate Exceeded That for 1925

Accidents at coal mines in the United States in December, 1926, resulted in the loss of 248 lives, according to information received from state mine inspectors by the U. S. Bureau of Mines. Of this number 46 were lost in anthracite mines in Pennsylvania and 202 were in bituminous mines in various states. As the output of bituminous coal during the month was 57,671,000 tons, the fatality rate per million tons for bituminous mines was 3.50, while the anthracite rate was 6.11, based on a production of 7,528,000 tons. The combined rate for both classes of mines was 3.80.

The December fatalities brought the total number of deaths at all coal mines in the United States in 1926 to 2,510. The output of coal during the year is estimated at 663,290,000 tons; hence the fatality rate per million tons, according to present information, was 3.78 as compared with 3.84 for 1925. Final returns from producing companies showing the number of employees and amount of coal produced in 1926 will not become available for several months.

The reports for December recorded only one major disaster—that is a disaster causing the death of 5 or more men. This was an explosion on Dec. 9 at Francisco, Ind., causing the death of 37 men. There were 16 of these "major" disasters during the year and they caused 348 deaths, as compared with 14 disasters in 1925 in which 270 lives were lost. The per-million-ton death rate, based exclu-

### Coal Legislation Shelved At This Session

At a meeting Feb. 9 the House Committee on Interstate and Foreign Commerce decided, by a vote of 12 to 7, not to consider any further coal legislation at this session of Congress. This action disposes of the latest effort of Representative Parker to regulate the coal industry during emergencies through control by the federal government. The New York Congressman, who is chairman of the committee, introduced a bill styled "The Emergency Fuel Act of 1927" on Feb. 5. It was officially announced two weeks ago that President Coolidge did not look for the passage of coal control at this session.

sively on these major accidents, was 0.52 in 1926 and 0.46 in 1925.

An examination of the principal causes of accidents in 1926 shows a very slight reduction in the death rates per million tons from falls of roof and coal and for explosives, and a slight increase in the rates for haulage accidents and for gas and dust explosions. The rate for electricity remained unchanged. Comparative rates for the two years were as follows:

	Year 1925	Year 1926
All causes.....	3.839	3.784
Falls of roof and coal.....	1.856	1.829
Haulage.....	.620	.650
Gas or dust explosions.....	.593	.636
Explosives.....	.175	.142
Electricity.....	.144	.143

### Japanese Miners' Earnings Average \$46.45 a Month

Tokyo, Japan, Dec. 16.—The Japanese Government has just completed an investigation into living conditions among workers in Japanese coal mines. Study was made of 386 typical families of miners within the jurisdiction of the Sapporo, Sendai and Fukuoka mining bureaus. According to figures published, the average monthly income of these families is 92.89 yen,\* of which 83 per cent forms the monthly expenditure. It is said that colliery workers constitute 80 per cent of all Japanese mine employees, and that the total number of women working within the pits is roughly 47,000.

Absolute necessities of life—food, clothing and housing—account for 43.74 yen, or 56 per cent of the monthly expenditures. Rice and barley comprise 65 per cent of the food expense. Housing accounts for 3.35 yen, or 4 per cent of the total outlay. This is accounted for by the fact that mine owners supply housing facilities as a general rule, charging practically no house rent, the tenants being required to pay for only electric light and repairs. Clothing requires 6.32 yen.

For cultural purposes 41 sen is spent, while the expense for bringing up children is put at 2.45 yen, or 3 per cent of the total expenditure. The medical outlay is low at 1.41 yen, as mine owners generally undertake medical treatment at their own expense. The money spent on social activities is 2.91 yen.

\*The yen is worth approximately 50c. in U. S. currency, and a sen is 1/100 of a yen.

## Coal-Mine Fatalities During December, 1926, by Causes and States

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

State	Underground									Shaft				Surface					Total by States						
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal	Mine cars and locomotives	Explosions of gas or coal-dust	Explosives	Suffocation from mine gases	Electricity	Animals	Mining machines	Mine fires (burned, suffocated, etc.)	Other causes	Total	Falling down shafts or slopes	Objects falling down shafts or slopes	Cage, skip or bucket	Other causes	Total	Mine cars and mine locomotives	Electricity	Machinery	Boiler explosions or bursting steam pipes	Railway cars and locomotives	Other causes	Total	1926
Alabama.....	6	2	1									9												10	65
Alaska.....																								0	0
Arkansas.....																								2	5
Colorado.....	3	1	3									7												7	0
Illinois.....	14	2	7		1							25	3											28	8
Indiana.....	1	2	1	37	2							41												41	2
Iowa.....	1				1							2												3	2
Kansas.....																								0	1
Kentucky.....	10		2	1								14												14	11
Maryland.....																								0	1
Michigan.....																								0	1
Missouri.....																								0	1
Montana.....					1							1												1	1
New Mexico.....	1											1												0	1
North Dakota.....																								0	18
Ohio.....	4		3		2						1	10												10	3
Oklahoma.....																								35	26
Pennsylvania (bituminous).....	20	3	5	2	2							33			1									35	20
South Dakota.....																								0	0
Tennessee.....	2											2												2	0
Texas.....																								0	1
Utah.....	1											1												1	2
Virginia.....	3		1									5												5	11
Washington.....	1		3									5												5	11
West Virginia.....	18	3	8				2		3			34												35	34
Wyoming.....	1		1									2												2	1
Total (bituminous).....	86	9	36	41	9		8		3			194	3		1			4		1				202	199
Pennsylvania (anthracite).....	22	7	2		3							38		1				3	4					46	2
Total December, 1926.....	108	16	38	43	12	1	8		3			232	2	5	1	1		7	4	2		1	2	9	248
Total December, 1925.....	64	13	31	59	7		4		2			193	2					3		1		3	5		201





## News Items From Field and Trade



### ALABAMA

J. M. Powell has been appointed superintendent of the Turner mine on the New River Coal Co. property recently acquired by the Brookside-Pratt Mining Co. He was transferred from the Warrior River mine of the latter company, being succeeded as superintendent at that place by Ben Wright.

M. J. Maloney has been appointed general manager of the Central Iron & Coal Co. and associated properties in the Birmingham district, succeeding James L. Brierton, deceased. Mr. Maloney formerly was traffic manager of the company. His headquarters are at Holt.

The Alta Coal Co., a subsidiary of the Southern Cotton Oil Co., of New Orleans, La., has purchased the properties of the Summit Coal Company, at Summit, Walker County. The latter was thrown into bankruptcy some time ago and has been operated by R. T. Daniel of Birmingham as receiver. Mr. Daniel will act as agent for the new owners and will continue the operation of the Summit mine, a slope opening on the Black Creek seam.

**Improving Housing Conditions.**—The DeBardeleben Coal Corporation is rehabilitating its camp houses at Littleton in preparation for housing its employees when free labor displaces convicts in its Banner Mine. It is understood that a number of new houses will be constructed, a filter installed and other modern improvements provided for the health and convenience of employees who will work at this operation.

### INDIANA

Practically all the shaft and strip-ping mines in both Warrick and Pike Counties, Ind., are now being operated on full time and a great deal of coal is being shipped from this section. The Korff mine near Boonville, has added a number of more men recently. The shaft of the Possum Ridge Coal Company, near the Korff mine, which was shut down for several days because of a cave-in, now is running at capacity time. A great deal of the Possum Ridge coal is shipped north.

The Sherwood Coal Co., of Indianapolis, has closed options on 410 acres of coal and clay land a short distance northeast of Carbon and will open large strip-ping operations at that place at once.

**Strip-ping Planned at Cato.**—It is said to be a fairly well established fact

that Cato, a few miles southeast of Petersburg, is to be the next field of coal strip-ping operations in Pike County. Several options on land have been taken recently by representatives of E. B. Hendrix, for the Patoka Coal Co., which already has large strip interests in Pike County.

### KANSAS

**Rock-Dusting Campaign On.**—A blanket of safety is being thrown around miners of the Kansas coal field. Under the sponsorship of insurance companies patronized by the mine operators, an extensive campaign of rock-dusting, eventually to include all the larger mines of the district, is being carried out. Recently six large mines have been given the rock dust treatment, which is comparatively new in this section. All mines of the Central Coal & Coke Co., one of the largest operating concerns in the district, are to be rock-dusted, as well as many other mines.

State Senator Symms has asked the state to buy the coal rights to 5,000 acres of land in Atchison County from the Atchison Brick, Tile & Coal Co., for \$150,000. His bill provides that the state establish a branch of the penitentiary on the land and that the warden sell convict-mined coal to state institutions at cost.

### KENTUCKY

**Big Development for Lawrence County.**—A coal, clay and iron-ore mining development on 12,000 acres of land is contemplated in Lawrence County by the Kentucky Mining & Navigation Co., a firm capitalized at \$2,000,000. The tract lies between Louisa, on the Big Sandy River, and Webbville, the rail head of the Eastern Kentucky Ry. The plans of the company include a barge line on the Big Sandy River, with a river terminal at Louisa or some point below. A rail route is to be built from the river to the mining operations. The personnel of the company includes R. E. McQuay, of New York, president; H. W. Johnson, of Georgia, secretary-treasurer; a board of directors composed of Mr. McQuay, Mr. Johnson, Dr. H. M. Payne, of Washington, member of the American Mining Companies; W. A. Kitchen, of Ashland, and J. Johnson, of Tennessee. The company plans to begin field work in sixty days. By waterway shipment the company aims to market coal with a saving in freight rates.

The steamers Fleischman and Ben Franklin brought coal tows into Louis-

ville last week. The Ohio River has receded to normal level, and coal movement is back on its usual basis, after having been blocked a short time by a flood.

Edward F. Kelley has been named purchasing agent of the Louisville Railway Co., succeeding C. Edward Earley, with the company 35 years and for eight years purchasing agent, who has been assigned to other work on account of poor health. Mr. Kelley also is assistant to President James P. Barnes.

### NEW YORK

Burns Bros. and subsidiaries for nine months ended Dec. 31, 1926, shows net income of \$930,424 after depreciation, federal taxes, etc., against \$944,809 in the corresponding period of the previous year. Henceforth earnings will be reported for the calendar year instead of the fiscal year ending March 31. Adjusted to the calendar year, net income, after the above charges, for the year ended Dec. 31, 1926, was \$2,406,395. Dividends on the two preferred issues outstanding at the close of the year equaled \$232,197, leaving \$2,174,198 for common. After allowance of \$8 a share on the Class A common, both classes of common share alike, giving aggregate earnings on Class A of \$15.16 and \$7.16 on Class B.

### OHIO

A bill sponsored by Senator E. Lafever of Athens County which will compel all state institutions to buy Ohio-mined coal exclusively has been passed by the Senate and will be considered by the House of Representatives in the Ohio Legislature. The bill received the unanimous vote of the Senate and in all likelihood will be adopted by the House. Governor Donahay has signified his intention of approving the measure.

### PENNSYLVANIA

**Would Repeal Obsolete Laws.**—A series of twenty-nine repealers of obsolete laws of the state has been introduced in the Legislature by Representative Staudenmeier, of Schuylkill County. Many are unconstitutional or of no legality at present because of the subsequent passage of other laws. Three of the laws it is proposed to repeal deal with the coal industry. These are: An act approved June 29, 1881, to secure to operatives and laborers engaged in and about coal mines, manufactories of iron and steel and all other manufactories the payment of their wages at regular inter-





Portal of Main Slope, Mill Creek Coal Co.

This 350-ton mine near Carbon Hill, Ala., operates on purchased power but uses no direct current. Cutting is done with 220-volt alternating current machines, and haulage is by mule.

vals and in lawful money of the United States. An act approved May 10, 1881, to provide proper means of conveyance of persons injured in or about the mines to their homes. An act approved June 3, 1881, amending an act entitled, "An act to provide the means for securing the health and safety of persons employed in the bituminous coal mines of Pennsylvania, approved April 18, 1877."

Announcement has been made that active anthracite mining operations will begin soon by the Haddock Mining Co., of Wilkes-Barre, at a colliery half a mile from Pottsville. The virgin hard-coal basin between Pottsville and Tamaqua is to be tapped.

A dividend of \$2.50 per share has been declared on the preferred stock of the Jefferson & Clearfield Coal & Iron Co.

Shipments of bituminous coal (revenue) by the Reading Company during December, 1926, totaled 2,421,791 gross tons, compared with 2,286,666 tons in the corresponding month of the preceding year.

**Carnegie Coal Co. Reviving.**—The Carnegie Coal Co., Pittsburgh, formerly owned by John A. Bell and one of the concerns that went into bankruptcy when the affairs of the banker went to smash two years ago, is being reorganized and soon will be in a position to begin liquidating.

**P. C. & C. Doing Better.**—The preliminary report for 1926 of the Pennsylvania Coal & Coke Corp. shows a deficit of \$44,499 after depreciation, depletion and other charges, as compared with a loss of \$461,294 in 1925. For the final quarter of 1926 the company showed a net income of \$222,413 after all charges but federal taxes, as contrasted with a deficit of \$3,760 in the corresponding period of the previous year. For December, 1926, the net income totaled \$103,817, comparing with a net income of \$20 in December, 1925.

The report of the Huntingdon & Broad Top Mountain Railroad & Coal

Co. shows a deficit of \$43,762 for 1926, compared with \$96,835 a year ago. Operating revenue was \$874,883 against \$786,783 in 1925. The company's profits aggregated \$39,025 against \$13,960 12 months ago. There was a depreciation, however, of \$82,787. C. F. Zimmerman, president of the First National Bank, of Huntingdon, Pa., was appointed to fill the vacancy of Andrew S. Webb on the directorate.

One of heaviest charges of dynamite ever to be set off in mining operations in the Kulpmont section of the state was fired recently at the stripping operation of the Richards mine of the Susquehanna Collieries Co. Seventy holes containing four tons of dynamite were fired. Preparations for the blast were made three days in advance and persons in the neighborhood feared that a gas explosion had occurred near the surface of some nearby mine.

A bill introduced in the House at Harrisburg by Representative Powell, Northumberland County, provides that anthracite mine inspectors need not reside in the district for which they are appointed.

**Pittsburgh Terminal Net Higher.**—The Pittsburgh Terminal Coal Corporation and subsidiaries report net earnings of \$363,266 for 1926, after all charges and taxes, compared with \$314,790 in 1925. Gross income was \$10,151,292, against \$8,819,001.

**Electrification Scheme Completed.**—Installation in the Morea mine of a set of pumps with 19,000 gallons capacity a minute completes the huge electrification project which has been in progress for several years since Madeira, Hill & Co. took over the Morea and Boston mines, near Hazleton. At that time the two collieries were turned into one and most of the work of operation consolidated, with headquarters at Morea. Through the new pumping system the coal company will be able to increase its output of water and at the same time will be able to reduce its roster of employees. The electrification of the

pumping plant was preceded by the installation of the transformers which are handling the power from the Harwood electric plant. Under the new system the pumping devices formerly used in the Boston mine will be abandoned, the modern arrangement being able to meet all pumping requirements.

Seventy-seven men in the mine of the Gulf Coal & Coke Co., at Marion Center, Pa., have struck on account of a reduction of wages from the 1924 scale to that of 1917, made last week.

**To Reopen Maxwell Mine.**—Workmen have begun cleaning up the Maxwell mine of the H. C. Frick Coke Co., at La Belle, Fayette County, preparatory to resuming operations after an idleness of two years. Within a few days employment will be given 200 men. Coke ovens will not be fired.

**Dimmick Protects Home.**—To protect his home in Scranton, from being disturbed through the removal of coal underlying it, Shelby D. Dimmick, vice-president and general manager of the Glen Alden Coal Co., has purchased the "third estate," or mineral rights from the Scranton Trust Co. The latter, some years ago, purchased the coal reservation feature of many deeds to surface property in the central city and hill sections from the original owner, the Lackawanna Iron & Coal Co. The deed to Mr. Dimmick covers five lots.

The old officers of the United Mine Workers, district 5, have been re-elected, it was announced Jan. 19. Those returned are: President, P. T. Fagan; vice-president, William J. Patton; treasurer, William Hargest; international executive board, John O'Leary. Members of the executive board chosen follow: James Flood, subdistrict 1; Thomas Hughes, subdistrict 2; Fred Gullick, subdistrict 3; William Hynes, subdistrict 4; William Cadman, subdistrict 5, and John Brown, subdistrict 7.

**Stripping Projects Started.**—The Lehigh Valley Coal Co., which is pushing large stripping contracts at Jeanesville, Audenried and Beaver Meadow, has awarded another daylight mining project to the Rhoads Construction Co., of Ashland, Pa. This firm has made extensive stripping excavations near Mt. Carmel for the Philadelphia & Reading company and in the near future will begin operations to uncover all the Buck Mountain seam outcrop east of the Continental mine at Centralia. It is believed that two or three years will be needed to complete the work. The coal is to be prepared at Centralia breaker, which was rebuilt and enlarged several years ago to handle increased production. The Lehigh Valley company also has awarded a contract to the Diamond Excavation Co., for stripping operations between Greenwood and Moosie. Work is to start at once.

## VIRGINIA

**Long Idleness to End.**—Keokee, one of the coal mining plants of the Stonega Coke & Coal Co. in Lee County, about eight miles from Big Stone Gap, which has been closed for three years,



will resume operations at an early date, giving employment to a large number of men. A crew of railroad workers is busy preparing the tracks leading to the mines and tipples of the plant. Harry Meadows, who has been assistant superintendent of the coal mines at Roda, one of the largest operations of the Stonega company, will have charge of the mines at Keokee.

The Clinchfield Coal Corp. reports for 1926 a net income of \$391,211 after charges, federal taxes, depreciation and depletion, equal, after preferred dividends, to \$2.13 a share on 145,476 common shares, against \$445,520, or \$2.50 a common share in 1925.

The Clinchfield Coal Corporation reports for the year ended Dec. 31, 1926, net income of \$391,211 after charges, federal taxes, depreciation and depletion, equivalent after preferred dividends, to \$2.13 a share earned on 145,476 shares of common stock. This compares with \$445,520, or \$2.50 a share, in 1925.

### WASHINGTON

The Crow's Nest Pass Coal Co., British Columbia, Canada, is erecting coal bunkers at Spokane, and will make a bid for local business there. A screening plant also is being erected at the Great Northern Railway Co.'s tracks.

**New Black Diamond Mine Opens.**—The New Black Diamond mine, near Renton, is now in operation with a crew of sixty miners, who were put on late in January. Daily output, which is now from four to five carloads, will be increased rapidly as the mine is developed. Fifty carpenters are at work enlarging the bunkers, washers and yard capacity. A contract has been let for the construction of new buildings at the mine which will cost about \$25,000. A new engine house, first-aid hospital and shops are included in this contract.

### WEST VIRGINIA

**Harrison County on Low Scale.**—Virtually every independent coal company in the Harrison County field has found it necessary to readjust wages to the 1917 basis, after having paid the higher scale since early in November. While the Consolidation Coal Co. has retained the higher scale at least temporarily, comparatively few other companies have found it possible to maintain the higher scale and at the same time operate. The decrease amounts to a cut of about 25 per cent.

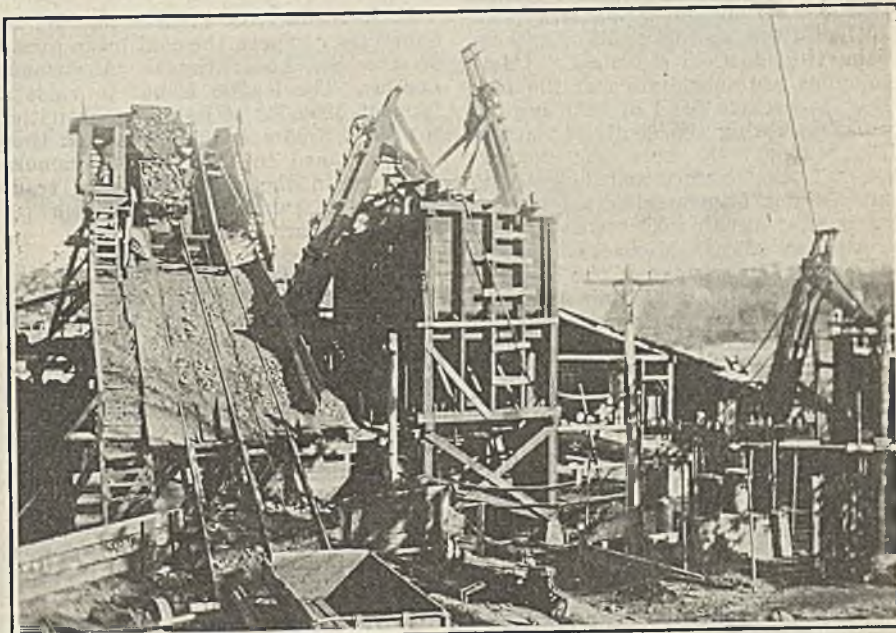
Power problems encountered by the coal-mining industry were discussed in technical papers read at a recent meeting of consulting engineers of the West Virginia Engineering Co. at Bluefield, W. Va. Engineers from the company's offices at Charleston, Williamson, Bluefield and Mullens, and the coal fields of Kentucky and Virginia served by the Norton, Va., offices took part. Among those present were H. P. Musser, J. P. Lively and T. K. Barnes, of Charleston; O. G. Crow and T. L. Elean, of Mullens; W. B. John, of Welch; M. W. Gilliam, Carl Duty, John Freese, A. A. Winter,

F. D. Jackson and Miss Margaret Mays, of Williamson; C. H. Elson, of Bluefield, and Major G. C. Thornton, of Norton, Va.

A deal has been consummated in Clarksburg under the terms of which W. H. Hatfield, well known coal man of Preston County, has acquired the E.

### CANADA

The Smith & Travers Co., which has taken up coal claims near Long Rapids on the Mattagami River of northern Ontario, is obtaining equipment for diamond drilling on the property, which will be thoroughly explored to ascertain if the deposit has commercial value.



Tipple and Washer of Mill Creek Coal Co., Carbon Hill, Ala.

The comparatively small acreage available for this mine precluded a large investment in equipment, yet 350 tons per day of picked lump and washed sizes are shipped. A two-car trip is being dumped on the open-air tipple which is equipped with a shaker screen, picking table and belt loading boom. There is a troughed-table washer for the 1 to 3-in., and a flat table washer for the under-8-in. size. Purchased electric power is used, and an electric hoist pulls the cars up the mine slope and onto the tipple dump.

B. Stone coal properties near Independence. The entire equipment, including machinery, railroad sidings, mine cars, power plant, etc., is included in the purchase. The plant is said to be one of the best equipped in Preston County and the understanding is that Mr. Hatfield and those associated with him will begin operations at once.

The Island Creek Coal Co. produced 550,000 tons of coal during January, which compares with 453,000 tons in the same month a year ago, or an increase of 97,000 tons. Production in December totaled 589,822 tons.

The Cardiff mine of the Clark Coal Co., at Tunnellton, in the Preston County field, has been reopened after having been closed down for some time. This is one of the larger Freeport mines and gives employment to more than a hundred men.

### WYOMING

The first shipment of coal from the new No. 4 mine of the Kemmerer Coal Co., at Susie—four carloads—was made late in January. This is the new mine that takes the place of Frontier No. 1, and which is expected to become the largest mine in the Kemmerer district. The coal was hand-mined, but it is likely that eventually the mine will be mechanized. The shaft was started early last year, a 15-ft. bore being made through 1,500 ft. of solid rock.

Speaking in Calgary, Alta, recently, C. C. Ross, Dominion Supervising Engineer, Calgary, denied statements which had been made to the effect that there was no coal in western Canada suitable for coking purposes. He stated that all the big mines in the Crow's Nest Pass, lying both in Alberta and British Columbia, could produce coking coal and that a coal company in Coleman, Alta., was now manufacturing coke. He added that Sheep Creek and the Highwood River districts had plenty of coking coal awaiting development.

At the McCarthy claims on the Mattagami River in northern Ontario active exploration for coal is being carried on by diamond drilling. A seam was encountered at the depth of 175 ft., but owing to an accident to the drill its width could not be ascertained. Another hole is now being put down. The Hecla Coal, Oil, Mining & Exploration Co., operating in the same vicinity, will soon start diamond drilling.

Final figures for coal output in British Columbia for 1926, according to J. Dickson, chief inspector of mines, are 2,399,146 gross tons, as compared with 2,437,103 tons in 1925. The coke output was 112,186 tons, as compared with 75,186 tons in the previous year. The coal output represents 30 per cent of the value of the mineral production of the province and forms 25 per cent of the freight carried on the railways. The large increase in coke output was due to activity in the smelting industry.



## Among the Coal Men

C. S. Goldsborough resigned on Feb. 8 as president of the Pennsylvania Coal Co., Dunmore, Pa., which has extensive operations throughout that district. He also has given up his position as head of the Hillside Coal & Iron Co. Both companies are subsidiaries of the Erie R.R. He became head of both organizations following the death of Captain W. A. May, several years ago. No successor has been named and his resignation will not become effective until a new man is appointed, it was said at the company offices. Michael Gallagher, recently made chairman of the board of directors of the Pennsylvania Coal Co. and subsidiary companies, probably will be elected to succeed Mr. Goldsborough, it was indicated at the company's offices last week. Officials would not discuss any reason for the resignation of Mr. Goldsborough.

A. Spates Brady, of the Brady Coal Co., Elkins, W. Va., has been elected a director of the Inter-Mountain Coal & Lumber Co., with operations at Putney, Ky.



W. W. Inglis

William W. Inglis was re-elected president of the Glen Alden Coal Co., Scranton, Pa., last week. Other officers re-elected by the big anthracite company were S. D. Dimmick, vice-president and general manager; George N. England, secretary and treasurer; J. L. Dodson, assistant secretary and assistant treasurer. Directors elected were John H. Brooks, Shelby D. Dimmick, Frank H. Hemelright, Mr. Inglis, J. Hayden Oliver and Frederick J. Platt.

Major L. Ropner, of Durham, England, visited Birmingham, Ala., Feb. 2 and conferred with officials of the Alabama Mining Institute. Major Ropner is investigating coal-mining conditions in this country and was furnished data concerning Alabama coal mines by Assistant Secretary Mills of the Institute. He is a member of the English Parliament, representing a district where coal mining is one of the principal industries,

and is seeking data on the subject to better serve his constituency.

E. J. Wallace, C. V. Beck and W. H. Schroeter compose the coal trade group of the St. Louis Smoke Abatement League. The league is out to raise a fund of \$250,000 to cover its activities for 1927, 1928 and 1929, in which time it is planned to eliminate the smoke nuisance in the city. The coal trade group is to raise \$20,000 per year for the three years.

John S. Jones, chairman of the board of directors of the Sunday Creek Co., left Columbus, Ohio, last week to spend the remainder of the winter at Naples, Fla., a town which he founded and built a dozen years ago. Mr. Jones will attend the wage scale conference at Miami, Fla., this week.

S. Pemberton Hutchinson, president of the Westmoreland Coal Co., Philadelphia, Pa., and former president of the National Coal Association, sailed Feb. 5 on the French Liner LaFayette for a cruise of the West Indies.

W. D. Tyler, for more than 20 years identified with the Clinchfield Coal Corp. in the capacity of land agent, has been elected to the newly-created office of vice-president in charge of real estate. This action was taken recently by the board of directors in New York City. He will continue to have his offices at Dante, Va. Going to the Clinchfield organization in 1906 from Bramwell, W. Va., where he was prominently connected with the Pocahontas Coal & Coke Co., Mr. Tyler has seen the Clinchfield holdings develop, until today they aggregate 300,000 acres of coal land in southwestern Virginia. Mr. Tyler was graduated from Lafayette College, Easton, Pa.

Oscar N. Cox, of Roanoke, Va., has been promoted from general coal freight agent of the Norfolk & Western Ry. to general freight agent, according to announcement just made by officials of the railroad. The promotion became effective Feb. 1. Other promotions by the Norfolk & Western include: G. C. Van Zandt, from assistant general freight agent at Columbus, Ohio, to general coal freight agent at Roanoke. F. S. Baird, of Roanoke, from coal freight agent to assistant general freight agent. F. E. Willman, of Roanoke, from chief clerk to general coal freight agent.

Arthur Woods, former Police Commissioner of New York City, has been elected a director of the Consolidation Coal Co., succeeding A. W. Calloway, deceased.

The Wakenva Coal Co., operating mines at eleven points in the DeBusk field, Virginia, made some changes in the management at the Trammel plant Feb. 1. Charles E. Wilson was transferred from Trammel to be superintendent at the Wakenva plant and Vice-President Higgenbottom assumed ac-

tive management of the DeBusk division.

L. E. Scholl, formerly superintendent of the Standard Island Creek mines at Taplin, W. Va., became superintendent of the Burgess Branch mine of the West Virginia Southern Coal Co. on Feb. 1. This mine is located near Kistler, W. Va., and is the only mine of the recent consolidation that is in the Logan field.

David K. Smith has been appointed safety director for mines of the Panhandle district of West Virginia and has established headquarters in Wheeling. Mr. Smith is one of five safety directors in the state, and will train mine-rescue teams and settlement welfare workers. In the past it has been necessary at times to send 30 miles for a rescue team in case of emergency.

## Obituary

Robert Grant, president of a number of companies, including large coal interests, controlled by the Massachusetts Gas Cos., died in Boston, Mass., Feb. 8, after an illness of about ten days. Born 54 years ago in Glasgow, Scotland, where he was educated, he came to the United States when a young man and entered the employ of the New England Gas & Coke Co.



Robert Grant

When this company was taken over by the Massachusetts Gas Cos. his ability for organization brought steady recognition and increasing responsibility. In 1915 he became president of the "commercial companies" of the parent company, which included the New England Coal & Coke Co., New England Fuel & Transportation Co., Mystic Steamship Co., etc., and was elected vice-president of the holding company in 1918. He supervised the formation of the subsidiary companies acquired in recent years, becoming president of the E. E. White Coal Co., East Gulf Coal Co., Pemberton Fuel Co., Prince-Wick Coal Co., Long Branch Coal Co. and the Glencoe Coal Co. of West Virginia, as well as of the well known selling organization Castner, Curran & Bullitt, having offices in New York, Boston, Chicago, Cincinnati and other cities.





# Production And the Market



## Listless Tone Permeates Bituminous Coal Market; Hard Coal Trade Hurt by Mild Weather

To all outward appearances precedent, experience and even logic have but a remote bearing on recent developments in the bituminous coal markets of the country. April 1 is only six weeks off, the United Mine Workers is publicly committed to a stand against lower wages, with John Lewis' leadership less disputed than ever, but the coal-consuming public in general shows no signs of perturbation. Railroads and public utilities it is true continue to build up storage reserves against untoward eventualities at the close of next month, but other industrial interests up to the close of last week were showing nothing like the market activity expected. Closing of a few lake contracts is reported, but in general this type of business is backward.

In this connection more than ordinary interest attaches at this time to the Bureau of Mines report of coal stocks in the bins of consumers. The total as of Jan. 1 was approximately 55,000,000 tons, or sufficient for about 37 days at the present rate of consumption. This is considerably short of the total on hand Jan. 1, 1924, when the figure was 62,000,000 tons.

### Retail Trade Backward

Retail distributors and consumers as a rule are serious offenders. Only sufficient tonnage is moving for the most part to take care of the current needs of consumers, who are closely limiting purchases to immediate requirements.

In the circumstances this end of the trade is a weather proposition to a large extent. In the face of such flimsy support to the market, prices on prepared sizes are lacking in any appreciable degree of strength.

News from the conference at Miami, where actual wage negotiations between representatives of the operators and miners in the union fields are now on, may put a different complexion on the situation. It is certain at any rate that reports of developments there will be scanned with the utmost care, and it is equally sure that the attitude of the contending factions will have a far-reaching effect on the trend of the market between now and the date of the expiration of the Jacksonville agreement.

### Prices Tumble Further

Coal Age Index of spot bituminous prices on Feb. 14 was 174 and the corresponding weighted average price was \$2.11. Compared with the figures for Feb. 7 this was a decline of 5 points and 5c. Further recessions in central Pennsylvania prices on New England shipments, dips in domestic sizes from central Illinois and Indiana and a backward tendency in West Virginia low-volatile lump were largely responsible for the losses.

Bituminous production continues to exceed 13,000,000 tons per week. The U. S. Bureau of Mines estimates the total for the week ended Feb. 5 at

13,600,000 net tons, an increase of 64,000 tons over the total for the preceding week. Preliminary returns for the first two days of last week indicate further gains.

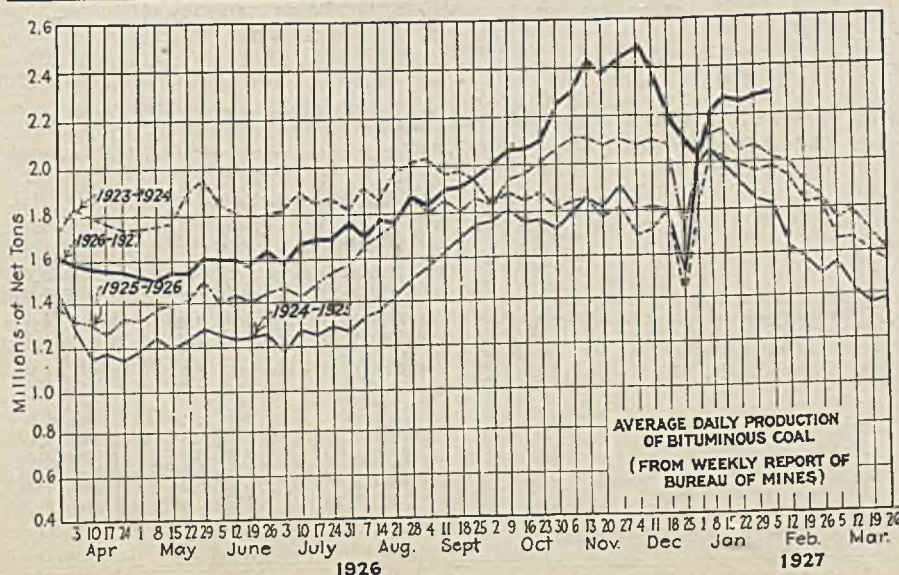
### Hard-Coal Line-Up Scrambled

Conditions in the anthracite market continue to be contrary to precedent—No. 1 buckwheat still is in the vanguard in demand, commanding a good price and with shipments hard put to keep up with the call. Rice and barley also are in good position. On the domestic side pea is enjoying the most popularity; egg, too, is moderately active, but stove and chestnut are lagging in favor. The elements have been furthering the stand-offish attitude of consumers and retailers, for the latter are holding off in anticipation of a spring reduction in company circulars. Independent quotations softened appreciably during the last week. Curtailed operating schedules still are the rule at the collieries.

A slightly firmer tone prevades the Connellsville coke market. In the furnace-coke side this is due to limited offerings, whereas for foundry coke there has been a slight increase in demand based on possible developments April 1.

### Meet Franklin Reductions

As predicted in the preceding issue, other Illinois and Indiana producers lost no time last week in meeting the



Estimates of Production			
(Net Tons)			
BITUMINOUS			
	1926	1927	
Jan. 22.....	12,431,000	13,474,000	
Jan. 29 (a).....	12,563,000	13,536,000	
Feb. 5 (b).....	12,167,000	13,600,000	
Daily average.....	2,028,000	2,267,000	
Coal yr. to date (c).....	456,696,000	499,984,000	
Daily average.....	1,747,000	1,911,000	
ANTHRACITE			
Jan. 22.....	47,000	1,488,000	
Jan. 29.....	34,000	1,670,000	
Feb. 5 (b).....	27,000	1,401,000	
Coal yr. to date (c).....	40,600,000	81,737,000	
BEEHIVE COKE			
Jan. 22.....	343,000	186,000	
Jan. 29 (a).....	339,000	190,000	
Feb. 5 (b).....	366,000	187,000	
Cal. yr. to date (c).....	1,698,000	943,000	

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



reductions made by Franklin County operators on domestic sizes. Indiana Fourth Vein 6-in. lump was cut to the Franklin County level, \$3.15, but egg is \$2.85 and nut \$2.60, representing dips of 30c. and 40c., respectively, from the Franklin County circular. Better running time has resulted from the paring of prices.

Demand for steam tonnage has improved and prices on screenings are firmer. Some shippers have advanced prices on screenings 25c., and further increases are likely as April 1 approaches.

Eastern coals are very quiet in the Chicago market, with a slightly softer tendency in prices. High-volatiles also are inactive though firm and anthracite is sluggish. The coke situation is fairly good.

Colder weather and price cuts brought about an improvement in the southern Illinois mining fields. The pick-up was principally in screenings and the smaller nut sizes, the tracks at

most mines being blocked with "no bills" of the larger sizes. In the Duquoin-Jackson County section general inaction prevails save for a slight increase in strip-pit output.

**Railroad Tonnage Moves Freely**

Railroad buying is good in the Mt. Olive field; steam demand is active and domestic trade is holding its own. In the Standard district railroad tonnage is moving with notable freedom, industrial demand for steam grades has been active and storage buying of small sizes has been good. Unbilled loads of lump and egg, however, are an annoying feature. Running time varies from three to five days a week, depending upon storage orders.

A belated fall in temperature helped domestic demand in St. Louis last week. In the circumstances it is likely that expected price cuts will not be made until high-priced coal in transit has been unloaded. Illinois middle grades are mostly in demand; smokeless, an-

thracite and coke are quiet. Local wagon steam is fairly active and car-load buying of industrial coal is fairly satisfactory. The country domestic trade is disappointing, even the reduced demand being for the cheaper grades.

**Kentucky Trade Notably Steady**

Mild weather has taken the edge off both steam and domestic consumption in Kentucky, though prices show a steady tendency. Some eastern Kentucky operators have cut the price on block 25c. to encourage domestic business and enable them to fill screenings contracts. Lump and egg also have been shaded 25c. in some instances, but there have been no changes in screenings or mine-run. Western Kentucky is commanding relatively better prices than the eastern field. Mine-run is a dime higher, at \$1.35@1.65, and the other sizes are unchanged. Shipments are held close to demand, so that there is no plague of distress coal.

Several spells of cold weather have

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

Low-Volatile, Eastern					Midwest					South and Southwest								
	Market Quoted	Feb. 15, 1926	Jan. 31, 1927	Feb. 7, 1927	Feb. 14, 1927†		Market Quoted	Feb. 15, 1926	Jan. 31, 1927	Feb. 7, 1927	Feb. 14, 1927†		Market Quoted	Feb. 15, 1926	Jan. 31, 1927	Feb. 7, 1927	Feb. 14, 1927†	
Smokeless lump.....	Columbus....	\$4.60	\$3.60	\$3.35	\$3.25@3.50	Franklin, Ill. lump.....	Chicago.....	\$3.00	\$4.00	\$3.15	\$3.15	Big Seam lump.....	Birmingham..	2.75	2.60	2.60	2.50@ 2.75	
Smokeless mine run.....	Columbus....	2.55	2.35	2.35	2.25@ 2.50	Franklin, Ill. mine run....	Chicago.....	2.50	2.60	2.60	2.50@ 2.75	Big Seam m'ne run.....	Birmingham..	1.85	1.85	1.75	1.50@ 2.00	
Smokeless screenings.....	Columbus....	1.85	1.65	1.65	1.55@ 1.70	Franklin, Ill. screenings...	Chicago.....	1.55	1.85	1.85	1.85@ 2.25	Big Seam (washed).....	Birmingham..	2.10	2.00	2.00	1.75@ 2.25	
Smokeless lump.....	Chicago.....	4.50	3.50	3.50	3.25@ 3.50	Central, Ill. lump.....	Chicago.....	2.60	2.35	2.35	2.25@ 2.50	S. E. Ky. block.....	Chicago.....	2.60	2.60	2.60	2.25@ 3.00	
Smokeless mine run.....	Chicago.....	2.10	2.60	2.60	2.25@ 2.75	Central, Ill. mine run....	Chicago.....	2.10	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Chicago.....	1.85	1.80	1.80	1.40@ 1.85	
Smokeless lump.....	Cincinnati..	4.25	3.60	3.50	3.00@ 3.50	Central, Ill. screenings...	Chicago.....	1.10	1.40	1.40	1.75@ 2.00	S. E. Ky. block.....	Louisville...	2.75	2.60	2.60	2.25@ 2.75	
Smokeless mine run.....	Cincinnati..	2.35	2.50	2.50	2.25@ 2.75	Ind. 4th Vein lump.....	Chicago.....	2.85	3.35	3.35	3.00@ 3.16	S. E. Ky. mine run.....	Louisville...	1.55	1.80	1.80	1.60@ 2.00	
Smokeless lump.....	Cincinnati..	1.25	2.00	2.10	1.75@ 2.00	Ind. 4th Vein mine run...	Chicago.....	2.30	2.35	2.35	2.25@ 2.50	S. E. Ky. block.....	Louisville...	1.75	1.35	1.35	1.20@ 1.50	
Smokeless mine run.....	Cincinnati..	5.00	5.05	4.95	4.75@ 4.90	Ind. 5th Vein lump.....	Chicago.....	1.70	2.00	2.00	2.25@ 2.40	S. E. Ky. screenings...	Louisville...	2.00	2.60	2.60	2.50@ 2.75	
Clearfield mine run.....	Boston.....	2.15	2.35	2.20	1.85@ 2.10	Ind. 5th Vein mine run...	Chicago.....	2.35	2.50	2.50	2.40@ 2.65	St. Louis.....	St. Louis.....	1.80	1.80	1.80	1.75@ 1.90	
Cambria mine run.....	Boston.....	2.45	2.70	2.40	2.25@ 2.50	Ind. 5th Vein mine run...	Chicago.....	1.95	2.10	2.10	2.00@ 2.25	St. Louis.....	St. Louis.....	1.80	1.00	1.20	1.15@ 1.25	
Somerset mine run.....	Boston.....	2.30	2.50	2.30	2.00@ 2.25	Mt. Olive lump.....	St. Louis.....	2.75	2.85	2.85	2.75	St. Louis.....	St. Louis.....	1.80	1.00	1.20	1.15@ 1.25	
Pool 1 (Navy Standard)...	New York....	3.05	3.10	3.10	3.00@ 3.25	Mt. Olive mine run.....	St. Louis.....	2.15	2.50	2.50	2.50	St. Louis.....	St. Louis.....	1.80	1.00	1.20	1.15@ 1.25	
Pool 1 (Navy Standard)...	Philadelphia..	3.20	3.10	3.10	3.00@ 3.25	Standard lump.....	St. Louis.....	1.40	1.50	1.65	1.60@ 1.75	St. Louis.....	St. Louis.....	2.50	2.45	2.45	2.40@ 2.50	
Pool 1 (Navy Standard)...	Baltimore....	2.30	2.60	2.60	2.50@ 2.75	Standard mine run.....	St. Louis.....	2.50	2.45	2.45	2.40@ 2.50	St. Louis.....	St. Louis.....	1.80	1.80	1.80	1.75@ 1.90	
Pool 9 (Super. Low Vol.)...	New York....	2.60	2.45	2.45	2.25@ 2.50	Standard screenings.....	St. Louis.....	1.80	1.80	1.80	1.75@ 1.90	St. Louis.....	St. Louis.....	1.80	1.00	1.20	1.15@ 1.25	
Pool 9 (Super. Low Vol.)...	Philadelphia..	2.70	2.55	2.55	2.45@ 2.65	West Ky. block.....	Louisville...	2.00	2.60	2.60	2.50@ 2.75	St. Louis.....	Louisville...	2.00	2.60	2.60	2.50@ 2.75	
Pool 9 (Super. Low Vol.)...	Baltimore....	2.15	2.15	2.15	2.05@ 2.25	West Ky. mine run.....	Louisville...	1.25	1.40	1.40	1.35@ 1.65	Louisville...	Louisville...	1.25	1.40	1.40	1.35@ 1.65	
Pool 10 (H.Gr. Low Vol.)...	New York....	2.30	2.15	2.00	1.80@ 2.25	West Ky. screenings.....	Louisville...	0.75	1.35	1.35	1.20@ 1.50	Louisville...	Louisville...	0.75	1.35	1.35	1.20@ 1.50	
Pool 10 (H.Gr. Low Vol.)...	Philadelphia..	2.40	2.35	2.35	2.25@ 2.45	West Ky. block.....	Chicago.....	2.35	2.35	2.35	2.00@ 2.60	Chicago.....	Chicago.....	2.35	2.35	2.35	2.00@ 2.60	
Pool 10 (H.Gr. Low Vol.)...	Baltimore....	1.95	1.90	1.90	1.85@ 2.00	West Ky. mine run.....	Chicago.....	1.50	1.85	1.85	1.75@ 2.00	Chicago.....	Chicago.....	1.50	1.85	1.85	1.75@ 2.00	
Pool 11 (Low Vol.).....	New York....	2.10	1.80	1.75	1.50@ 2.00													
Pool 11 (Low Vol.).....	Philadelphia..	2.25	2.10	2.10	2.00@ 2.20													
Pool 11 (Low Vol.).....	Baltimore....	1.70	1.75	1.75	1.75@ 1.80													

\* Gross tons, f.o.b. vessel, Hampton Roads. † Advances over previous week shown in heavy type; declines in italics.

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

	Market Quoted	Freight Rates	Feb. 15, 1926		Feb. 7, 1927		Feb. 14, 1927†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34			\$8.25@9.25		\$8.25@9.25	
Broken.....	Philadelphia..	2.39			8.50@ 9.15		8.50@ 9.15	
Egg.....	New York.....	2.34			8.75@ 9.25		8.75@ 9.25	
Egg.....	Philadelphia..	2.39			9.00@ 9.15		9.00@ 9.15	
Egg.....	Chicago*.....	5.06			8.13		8.13	
Stove.....	New York.....	2.34			8.75@ 9.25		8.75@ 9.00	
Stove.....	Philadelphia..	2.39			9.25@ 9.50		9.25@ 9.50	
Stove.....	Chicago*.....	5.06			8.71		8.71	
Chestnut.....	New York.....	2.34			8.50@ 9.00		8.50@ 9.00	
Chestnut.....	Philadelphia..	2.39			8.75@ 9.40		8.75@ 9.40	
Chestnut.....	Chicago*.....	5.06			8.48		8.48	
Pea.....	New York.....	2.22			6.35@ 6.75		6.35@ 6.75	
Pea.....	Philadelphia..	2.14			6.00@ 6.75		6.00@ 6.75	
Pea.....	Chicago*.....	4.79			6.03		6.03	
Buckwheat No. 1.....	New York.....	2.22			4.00@ 4.50		4.00@ 4.25	
Buckwheat No. 1.....	Philadelphia..	2.14			2.75@ 4.50		2.75@ 4.50	
Rice.....	New York.....	2.22			2.00@ 2.50		2.00@ 2.25	
Rice.....	Philadelphia..	2.14			1.90@ 2.00		1.90@ 2.00	
Barley.....	New York.....	2.22			1.40@ 1.65		1.40@ 1.50	
Barley.....	Philadelphia..	2.14			1.25@ 1.50		1.25@ 1.50	
Birdseye.....	New York.....	2.22			1.60@ 2.00		1.60@ 2.00	

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type; declines in italics.

Due to suspension of mining in hard-coal fields and practical stoppage of shipments, quotations were nominal and were not printed.



speeded up the movement of coal off the docks at the Head of the Lakes. Orders for steam grades have been liberal, but current domestic demand is largely limited to immediate requirements. Aggregate movement is well ahead of a year ago and dock interests feel increased confidence that there will be no free bituminous coal on the docks by the opening of navigation. The price situation shows no change, but screenings are tighter; in fact shortages are complained of in some quarters.

Fairly steady demand, with occasional spurts in response to sub-zero temperatures, features the domestic trade in the Twin Cities; steam business, on the other hand, has been relatively quiet because of moderate industrial activity. Prices, however, remain steady. The situation in Milwaukee fluctuates with the weather, but special features are lacking.

**Storage Sales Heavier in Kansas**

A growing tendency among railroads and large industrial consumers to store coal was evident in the Southwestern coal trade last week. Demand for domestic grades was rather slow, although no serious accumulations of "no bills" were reported in any field. One railroad, however, placed an order for 45,000 tons of lump coal, 45 days' supply. Prices of domestic grades were unchanged, but Kansas screenings advanced 15c. to a flat price of \$2.50 a ton. Crushed mine-run advanced 25c. to \$2.75 a ton, and nut coal, both deep-shaft and shovel grades, sold up as much as 25c. to \$3.75@4.

Increased demand for both domestic and steam grades in the Colorado market has reduced "no bills" practically 65 per cent. The mines are operating at approximately 70 per cent of capacity. Walsenburg-Cannon City domestic lump is \$6; nut, \$5; washed chestnut, \$3; Trinidad lump, \$4; nut, \$3.75; fancy chestnut, \$3.25; Crested Butte high-grade anthracite, \$9; egg, \$8.50; base-burner, \$8; slack, \$1.25; Rock Springs-Kemmerer domestic lump, \$4.25; nut, \$3.75; slack, \$1.65@1.80.

In Utah the demand for steam coals is about normal, but there is a surplus of slack. The situation is easing up, however, as a result of curtailed production. Retailers are buying from hand to mouth, but prices remain firm.

Unseasonably warm weather slowed up interest to such an extent in the Cincinnati market that distress coal has become a serious element. Spot sales of smokeless lump and egg fell to \$3.25, with some New River going at \$3, and even screenings slipped to \$1.75. Mine-run held at \$2.25@2.75. The general situation was helped by curtailed production in Kentucky, which had a steady influence on the prices of coals from those fields. High-volatile egg is over-plentiful and soft, but the other sizes are holding up fairly well, particularly slack, which is a shade stronger.

Awakening interest in lake business brought forth the report of a large deal closed at \$1.65 for mine-run up to July 1 and \$1.75 from then to the end of the season. Another lot of 100,000 tons was said to have been signed at \$1.60.

In northern Ohio both steam domestic demand are very quiet. Surplus screenings have disappeared on account of the scarcity of lump orders. Non-union competition is cutting the demand for oil. Production in the Ohio No. 8 field during the week ended Feb. 5 was 359,000, or 51 per cent of capacity.

**Inaction Reigns in Southern Ohio**

The central Ohio market is quiet and featureless, due to the prevalence of mild weather. Domestic as well as steam demand has been adversely affected. The railroads and utilities have accumulated large reserves, but many industrial consumers apparently are little concerned about developments between now and April 1. Contracting is largely in abeyance. Southern Ohio output has fallen to between 20 and 23 per cent of capacity.

There was a big increase in movement through the Cincinnati gateway last week. The total number of coal loads interchanged was 16,186, as against 12,650 the preceding week and 12,473 a year ago. Louisville & Nashville interchange increased 3,034 cars, Chesapeake & Ohio, 481; Norfolk & Western, 12, and Southern, 9. The number of empties en route to the mines increased from 10,360 to 14,428 cars.

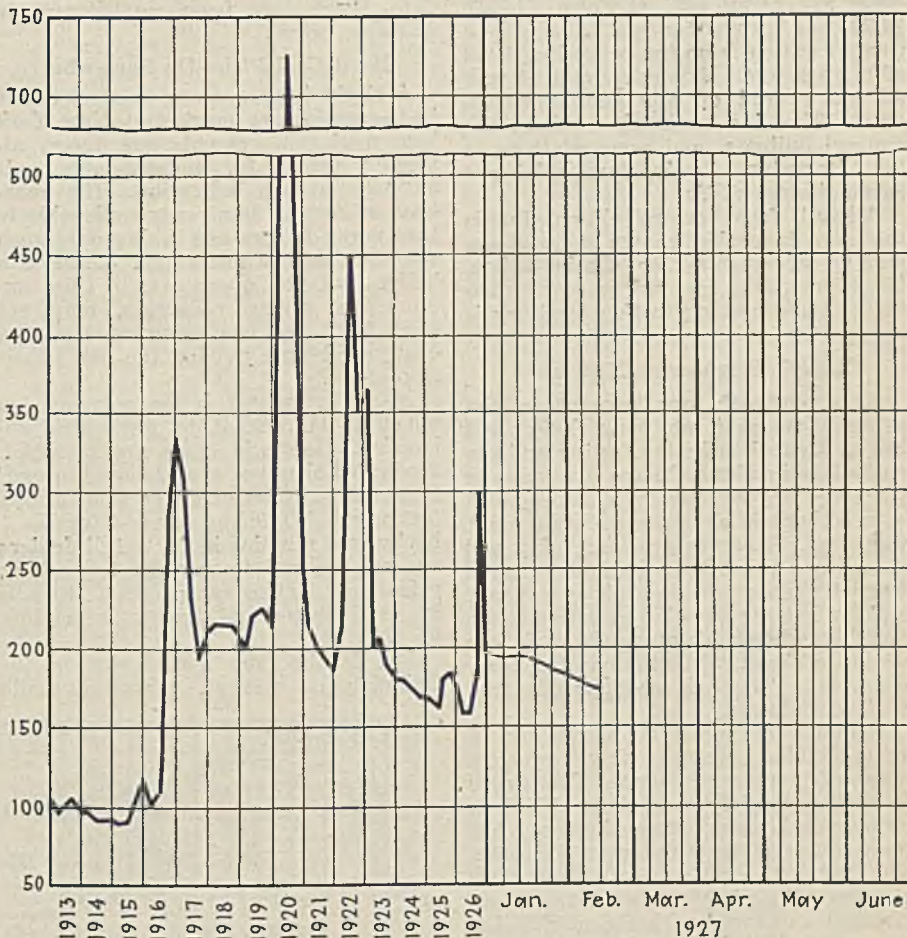
"No bills" are increasing in the Pittsburgh district, showing that the cut in production has not been sufficiently drastic. Prices, having already been thoroughly shaken out, show no further slide. Gas coals are disproportionately low in relation to steam grades, due to keen competition in the former.

Production in central Pennsylvania is holding its own, but keen competition is forcing producers to pass the benefit of lower wages on to the consumer in order to obtain business. Prices for higher grades are up a little, the latest spot quotations running as follows: Pool 1, \$2.65@2.90; pool 9, \$2.40@2.50; pool 71, \$2.45@2.50; pool 10, \$2@2.10; pool 11, \$1.85@1.90; pool 18, \$1.75.

A strictly buyers' market prevails at Buffalo. Consumers as a rule are well stocked, and the approach of April 1 is contemplated with comparative indifference. Save for a decline in gas slack to \$1.40@1.60, prices are quotably unchanged. In general there is no visible change in the situation at Toronto.

**New England Lethargic**

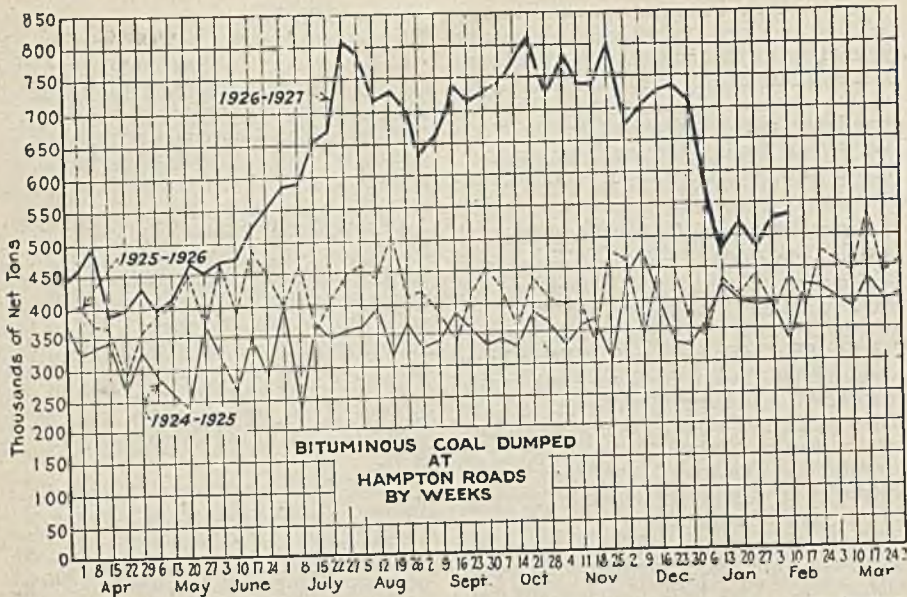
In New England the steam coal market is dull and apparently unaffected by strike prospects. Buying interest was quieted down, and this is



	1927		1926		1925	
	Feb. 14	Feb. 7	Jan. 31	Jan. 24	Feb. 15	Feb. 16
Index .....	174	179	185	188	173	168
Weighted average price.....	\$2.11	\$2.16	\$2.24	\$2.28	\$2.10	\$2.04

This diagram shows the relative, not the actual, price on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportion 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.





reflected in slightly lower prices on practically all grades both at shipping piers and at points of origin. For the moment delivered prices at this end are reasonably firm, but this is almost altogether owing to a temporary shortage of boats and higher coastwise freights in consequence.

At Hampton Roads the smokeless coals are being sold at from \$4.75@ \$4.90 per gross ton f.o.b. vessel, a further easing from the prevailing level of a week ago. Export movement was all but ceased on any comprehensive scale. The line trade also shares the general dullness, and accumulations at the Hampton Roads terminals are again characteristic.

All-rail from central Pennsylvania the more favorably known shippers are making every effort to obtain orders, but even at the low prices now ruling the tonnage moving to this territory is light.

**Outlook Brighter at New York**

More strength was present in the soft-coal market at New York last week. There is a better feeling and the outlook is brighter. Prices are low and yet some buyers look for cheaper coals before there is an advance. Movement was good. Reserves are increasing and indications point to a brisk flow until April 1. There is some talk of contract making but the question of prices is the stumbling block. High-grade coals are well sold ahead, while the cheaper coals are weak. There is considerable free coal at the piers.

Demand for coal is increasing in Philadelphia, though few outward signs of it are in evidence. Consumers show little anxiety over their ability to obtain coal, even after April 1, but much uncertainty is felt over the price. The railroads continue to add to their storage piles, but many shippers are "taking a chance" with the market between now and April 1 rather than add to contract obligations.

Light demand and keen competition prevail at Baltimore, though April 1 is just around the corner. The railroads are stocking up, but industries in general are not perturbed over the outlook. A few ups and downs in prices have resulted in no important changes.

At Birmingham shipments against

industrial contracts are satisfactory and the railroads are adding to stock-piles, but there is little coal being taken by other steam consumers. Unseasonable weather has stagnated the domestic market and there is a dearth of orders. Some operators are crushing them in on steam commitments. To date there has been no change in quotable prices.

**Hard Coal Picks Up Somewhat**

A slight improvement was noticeable in the anthracite market at New York last week. Movement was freer, although prices for independent coals showed no such indication. The nearness of April 1 is already noticeable in that many buyers are taking only such tonnages as are necessary. There is a belief that the operators, if they announce a spring reduction, may not wait until the beginning of the new coal year before putting the new prices into effect.

No. 1 buckwheat is the only size on which it is difficult to get quick deliveries. Domestic coals are plentiful. Stove and chestnut are easier than egg. Pea coal is in better shape than it was last week. While the demand for No. 1 buckwheat remains heavy retail dealers are not inclined to pay the top asking price for independent product. Rice is in good shape and barley is holding its own.

Pea is the only active size in the Philadelphia market, unusually mild

**Car Loadings and Supply**

	Cars Loaded	
	All Cars	Coal Cars
Week ended Feb. 5, 1927.....	970,892	219,113
Week ended Jan. 29, 1927.....	950,969	225,459
Week ended Feb. 6, 1926.....	914,904	175,964
Week ended Jan. 30, 1926.....	925,263	183,071

	Surplus Cars		Car Shortages	
	All Cars	Coal Cars	All Cars	Coal Cars
Jan. 31, 1927... ..	259,548	62,588	.....	.....
Jan. 23, 1927... ..	275,544	65,751	.....	.....
Jan. 30, 1926... ..	250,935	92,040	.....	.....

weather having taken all the life out of the other domestic sizes. The steam situation is somewhat easier, though premiums for No. 1 buckwheat are still in evidence. Rice and barley are a trifle easier, too, but neither is in free supply. Retailers are buying sparingly, feeling that a reduction in prices April 1 is inevitable. The larger companies report better than 50 per cent working time, but much of their output is going into their storage piles.

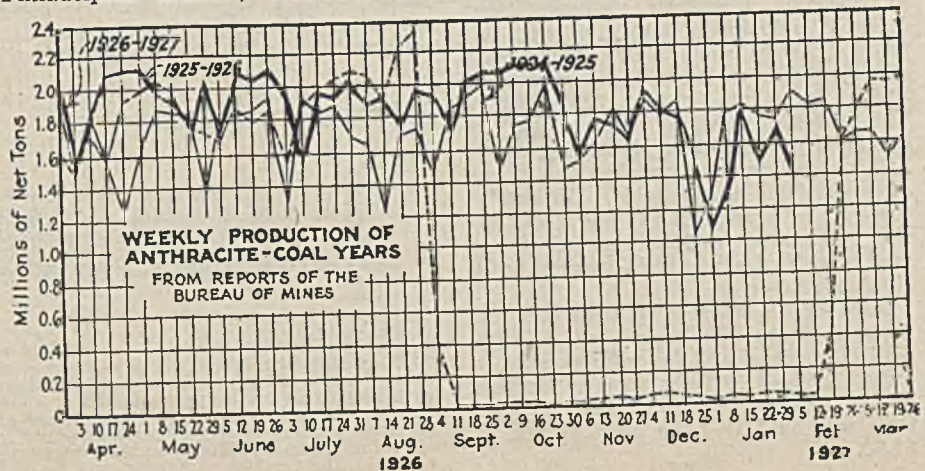
Buffalo householders are taking only small lots of anthracite when they buy at all, and there is very little activity in the trade. It is expected that lake loading will begin at almost any time and prospects are for a good deal of winter storage coal by spring.

**Connellsville Coke Market Firmer**

A slightly firmer undercurrent pervades the Connellsville spot coke market, with prices quotably unchanged. Offerings of furnace coke diminished a trifle; foundry was in slightly better demand—against contingencies April 1.

Output of beehive coke in the Connellsville and Lower Connellsville region during the week ended Feb. 5 was 136,460 tons, according to the Connellsville Courier. Furnace-oven production was 60,800 tons, an increase of 400 tons over the figures for the preceding week. Merchant-oven output was 75,660 tons, an average of 660 tons.

**Additions to Lake Fleet.**—The coal freighter "L. E. Block" of the Inland Steamship Co., which will be added to the Great Lakes fleet, was launched Feb. 2 at the Lorain yards of the American Shipbuilding Co. She is 620 ft. over all, 64 ft. beam and 33 ft. deep. The Interlake Steamship Co. will add three new freighters during the coming season and the Pittsburgh Steamship Co. two.





## Foreign Market And Export News

### Moderate Forward Buying Cheers Welsh Market

London, England, Jan. 31.—Forward contracting is now becoming a feature of the South Wales coal market. The business so far placed has not been large, but it is hoped that orders will expand now that something like an established price basis has been reached.

The situation with respect to spot movement, however, is unsatisfactory. Welsh production is not quite 10 per cent below pre-strike figures, while export demand is 30 per cent less than it was before the men went out last May. Overseas trade is slow and inland buying is not lively. Contract bids indicate that prices will work lower and this, too, is holding back orders for early shipment.

Inquiry is small and erratic owing to the instability of prices, which intensifies the difficulties arising from growing output. The progress of recovery in the steel industry remains good, however, with makers in a strong position to resist lower prices owing to the large accumulation of orders during the stoppage.

Production of coal for the week ended Jan. 29, was 5,225,100 tons against 5,197,800 tons in the preceding week. The number of miners working further increased to 996,100, against

989,700 a week ago and something over 1,000,000 a year ago.

British coal production in 1926 according to preliminary figures, was 125,500,000 tons, or practically 50 per cent of the output of the preceding year. Of this about 20,500,000 tons was exported.

The British coal trade has made huge strides toward recovering the markets lost during the strike. Exports during January were up to 4,092,879 gross tons, comparing with 1,608,769 in December and only 5,111 in November. The quantity sent out last month nearly equals the 4,148,042 tons shipped in January, 1926. A considerable quantity of American coal is still coming to Britain, however, under the long-term contracts made during the strike.

The French State Rys. have taken 100,000 gross tons of Monmouthshire coal at 22/-, f.o.b., for delivery over the year, and the Buenos Aires Great Southern Rys. have taken 50,000 tons at the same figure. The British Admiralty is in the market for 300,000 tons. Wales has bid 31/11, c.i.f., on 100,000 tons for the Egyptian State Rys. for February-April delivery.

Stocks of all grades are offered at easy prices for prompt shipment. Best Admiralty large is 24/6; best steam smalls, 15/-, and best bunkers, 18/-.

North Country coals are in better demand, but only for early delivery.

### Drive On to Force Reductions In French Coal Prices

Paris, France, Jan. 27.—A determined drive is on to force a reduction in prices at the French collieries. At first the mines refused to listen to the clamor of the industrialists, despite a known slowing up in the tonnage ordered for future shipments. Within the last few days, however, the buyers, supported by the government, have been able to induce the producers to promise a small cut on February purchases.

To date imports from Great Britain have not reached the proportions expected. But it is a matter of common knowledge that the British interests are prepared to make every possible sacrifice in immediate profits to recover their market in this country. Illustrative of that determination is the situation on Newcastle gas coals. Several days ago these coals were quoted at 25/-@26/-; it is predicted that before long these coals will be available at 20/-.

The O.H.S. has published a new price list covering the sale of coal and coke entering France through Strasburg and the Rhine ports. No change has been made in the figures on raw coal, but coke has been cut 17@20 fr.

Production of the French collieries during the first 10 months of 1926 totaled 43,184,756 metric tons, indicating an annual production of nearly 52,000,000 tons, compared with 48,000,000

in 1925 and 45,000,000 in 1924. In October, 1926, the output came to 4,568,687 tons, the largest monthly total yet reached by the French mines. In recent months the mines situated within the old frontiers have furnished an output considerably in advance of that recorded for pre-war months, and, in addition, the Lorraine coal mines have contributed to the country's total.

During 1926 France received 7,906,400 metric tons of coal and equivalent coke from Germany on reparations account. Beginning in June, however, when shipments were 649,100 tons, as compared with 847,100 tons in May, there was a steady decline in monthly receipts. This decline was due to the fact that the French treasury was unwilling to absorb the difference between German pithead prices and the figures the French consumers would pay.

With the special agreement with the Kohlsyndikat for the commercialization of deliveries, it is expected that shipments of both reparation and pre-strike fuels may be stepped up to the increasing quantities contemplated by the Dawes plan.

### Belgian Market Weakening

Brussels, Belgium, Jan. 26.—Gradual weakening in prices still characterizes the Belgian coal market. Within the past few days sales of Borinage coals have been made at prices which represent a concession of 40 fr. Patent

fuels also are losing ground; ovoids move slowly at 250 fr., and that figure probably will mark the maximum on briquets before February is over.

The official list on coke still is maintained, but demand is constantly declining and some middlemen already are offering fuel at less than the official list. Here, too, it is predicted that next month will witness a general decline. Household coals also are in less demand and some accumulation of stocks is reported.

The mainstay of the market is the long-term contracts entered into during the British strike. These contracts prevent a sharp break. Nevertheless sales are made with increasing difficulty and offers of foreign coal at lower prices are adding to the troubles of the Belgian producers.

During 1926 Belgium producer 25,319,570 metric tons of coal. This was a monthly average of 2,109,964 tons, as compared with 1,927,763 tons in 1925 and 1,903,460 tons in 1913.

### Export Clearances, Week Ended Feb. 10 FROM HAMPTON ROADS

	Tons
For United Kingdom:	
Br. Str. Great City .....	9,187
For New Brunswick:	
Dan. Str. Bornholm, for St. John...	1,189
For Argentine:	
Ital. Str. Vulcano, for Buenos Aires.	6,704
Br. Str. Baron Fairlie, for Buenos Aires .....	8,182
For Shetland Islands:	
Br. Str. Woodville, for South Shetland	3,068
For Dominican Republic:	
Nor. Str. Dago, for Santo Domingo..	1,729
For France:	
Fr. Str. P. L. M. 17, for Rouen.....	5,411
For Italy:	
Ital. Str. Ansaldo San Giorgio, for Porto Ferrajo .....	6,725
For Brazil:	
Br. Str. Vestalia, for Rio de Janeiro.	7,319

FROM BALTIMORE	
For Italy:	
Ital. Str. Alberta, for Trieste, or Venice .....	2,488
Ital. Str. Masaniello, for Civitavecchia .....	6,566
For England:	
Swed. Str. Nuolja, for Queenstown, for orders .....	9,654

FROM PHILADELPHIA	
For Cuba:	
Br. Str. Baron Herries, for Havana...	—
Br. Str. Baron Senphill, for Havana...	—

### Hampton Roads Coal Dumpings\*

	(In Gross Tons)	Feb. 3	Feb. 10
N. & W. Piers, Lamberts Pt.:			
Tons dumped for week.....		204,233	159,207
Virginian Piers, Sewalls Pt.:			
Tons dumped for week.....		109,805	133,943
C. & O. Piers, Newport News:			
Tons dumped for week.....		154,551	190,039

\* Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

### Pier and Bunker Prices, Gross Tons

PIERS		Feb. 3		Feb. 10†	
Pool 1, New York....	\$5.75@	\$6.25	\$5.75@	\$6.25	\$5.75
Pool 9, New York....	5.10@	5.50	5.10@	5.50	5.25
Pool 10, New York....	4.90@	5.00	4.90@	5.25	5.00
Pool 11, New York....	4.50@	5.00	4.50@	5.00	5.00
Pool 9, Philadelphia...	5.25@	5.45	5.25@	5.45	5.45
Pool 10, Philadelphia...	5.00@	5.20	5.00@	5.20	5.20
Pool 11, Philadelphia...	4.50@	4.90	4.50@	4.90	4.90
Pool 1, Hamp. Roads.	4.85@	5.00	4.75@	5.00	4.90
Pool 2, Hamp. Roads.	4.60@	4.75	4.60@	4.75	4.60
Pool 3, Hamp. Roads.	3.90@	4.00	3.90@	4.00	4.00
Pool 5-6-7, Hamp. Rds.	4.30@	4.50	4.00@	4.10	4.10

BUNKERS		Feb. 3		Feb. 10	
Pool 1, New York....	\$6.00@	\$6.50	\$6.00@	\$6.50	\$6.50
Pool 9, New York....	5.35@	5.75	5.35@	5.75	5.75
Pool 10, New York....	5.15@	5.50	5.15@	5.50	5.50
Pool 11, New York....	4.75@	5.25	4.75@	5.25	5.25
Pool 9, Philadelphia...	5.50@	5.70	5.50@	5.70	5.70
Pool 10, Philadelphia...	5.25@	5.45	5.25@	5.45	5.45
Pool 11, Philadelphia...	4.75@	5.15	4.75@	5.15	5.15
Pool 1, Hamp. Roads.	5.00	5.00	4.90	4.90	4.90
Pool 2, Hamp. Roads.	4.75	4.75	4.65	4.65	4.65
Pool 5-6-7, Hamp. Rds.	4.30@	4.50	4.10	4.10	4.10

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



# Current Prices of Mining Supplies

Electrical prices are to the mine by jobbers in the larger buying centers east of the Mississippi. Elsewhere the prices will be modified by increased freight charges and by local conditions.

## SINCE LAST MONTH

THE steadily declining tendencies in prices of mine supplies, noticeable on this date last month, are even more pronounced at the present time. Demand is slow in this group of materials, and the recessions reported affect mainly cast-iron pipe, steel plates, machine oil, scrap metals, copper wire and feeder cable. Not a single one of the items covered in the accompanying table advanced since January.

**STEEL RAILS**—The following quotations are per ton f.o.b. in carload or larger lots

	Pittsburgh			
	Current	Year Ago	Birmingham	Chicago
Standard Bessemer rails.....	\$43.00	\$43.00	\$43.00	\$43.00
Standard openhearth rails.....	43.99	43.00	43.00	43.00
Light rails, 25 to 45 lb.....	36.00	36@38	34@36	1.80@1.90*

\*Per 100 lb.

**TRACK SUPPLIES**—The following prices are base per 100 lb. f.o.b. Pittsburgh mill for carload lots, together with warehouse prices at the places named:

	Pittsburgh			
	Current	Year Ago	Chicago	Birmingham
Standard spikes, 1/2-in. and larger.....	\$2.80@2.90	\$2.80	\$3.55	\$3.00
Track bolts.....	3.90@4.25	3.90@4.25	4.55	3.90
Standard section angle bars, splice bars or fish plates	2.85	2.75	3.40	4.15

**WROUGHT PIPE**—The following discounts are to jobbers for carload lots at Pittsburgh mill:

Inches	Steel Black		Galv.		Inches	Iron Black		Galv.
	62	50 1/2	50 1/2	43 1/2		30	23	
1 to 3.....					1 to 1 1/2.....			12
2.....	55	43 1/2			2.....			7
<b>BUTT WELD, EXTRA STRONG, PLAIN ENDS</b>								
1 to 1 1/2.....	60	49 1/2			1 to 1 1/2.....			30
<b>LAP WELD, EXTRA STRONG, PLAIN ENDS</b>								
2.....	53	42 1/2			2.....			9

**WROUGHT STEEL PIPE**—From warehouses at the places named the following discounts hold for welded steel pipe:

1 to 3 in. butt welded.....	Black			
	New York	Chicago	Birmingham	St. Louis
2 1/2 to 6 in. lap welded.....	53%	54%	62%	49%
	48%	51%	59%	46%
Galvanized				
1 to 3 in. butt welded.....	39%	41%	50 1/2%	36%
2 1/2 to 6 in. lap welded.....	35%	38%	47 1/2%	33%

Malleable fittings, Classes B and C, banded, from New York stock sell at list plus 4% less 5%. Cast iron, standard sizes, 36—5% off.

**CAST-IRON PIPE**—The following are prices per net ton for carload lots:

	New York			
	Birmingham	Burlington, N. J.	Current	One Year Ago
4 in.....	\$41.00	\$49.00	\$51.60	\$54.60@56.60
6 in. and over.....	37.00	45.00	47.60	50.60@52.60
Pittsburgh				
4 in.....	\$49.60	\$49.20	\$47.60	\$51.00
6 in. and over.....	45.60	45.20	43.60	47.00

Gas pipe and Class "A," \$4 per ton extra.

**MACHINE BOLTS**—Size 1/2x1 1/2-in., per 100, \$1.70. Discount at New York warehouses on all sizes up to 1x30-in., 40%; 1 1/2 and 1 1/2x3-in. up to 12-in., 15%; with cold punched hex. nuts up to 1-in. dia. (plus std. extra of 10%) 30%; with hot pressed hex. nuts up to 1x30-in. (plus std. extra of 10%) 35%.

**CARRIAGE BOLTS**—Size 1/2x1 1/2-in., per 100, \$1.00. Discount on all sizes up to 1x30-in., 30%.

**NUTS**—Semi-finished, 1/2x1-in., 2c. each. Discount 70% for 1/2-in. and smaller and 65% for 1-in. and larger. Case hardened 1/2x1-in., 6c. each, less 50%.

**STEEL PLATES**—Following are base prices per 100 lb. in carload lots, f.o.b., for 1-in. thick and heavier:

Pittsburgh.....	\$1.80@1.90	Birmingham.....	\$2.00
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**STRUCTURAL RIVETS**—The following quotations are per 100 lb., in carload lots, f.o.b. mill, for 1-in.:

Pittsburgh..	\$2.30@2.60	Cleveland..	\$2.30@2.60	Chicago..	\$2.60
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**WIRE ROPE**—Discounts from list price on regular grades of bright and galvanized, in New York and territory east of Missouri River:

	Per Cent
Plow steel round strand rope.....	35
Special steel round strand rope.....	30
Cast steel round strand rope.....	20
Round strand iron and iron tiller.....	5
Galvanized steel rigging and guy rope.....	7 1/2
Galvanized iron rigging and guy rope.....	12 1/2

**RAIL BONDS**—30-in., 0000, stranded copper, welded, expanded terminals, f.o.b. New York per 100, \$104.72

**RAILWAY TIES**—For fair-sized orders, the following prices per tie hold:

	6 In. x 8 In. by 8 Ft.	7 In. x 9 In. by 8 1/2 Ft.
	Chicago, white oak, plain.....	\$1.45
Chicago, empty cell creosoted.....	1.85	2.45
Chicago, zinc treated.....	1.65	2.15
St. Louis, white oak, plain.....	1.20	1.45
St. Louis, zinc treated.....	1.60	1.85
St. Louis, red oak, plain.....	1.10	1.35
St. Louis, sap pine-cypress.....	.95	1.20
Birmingham, white oak.....	1.25	1.45

**STEEL MINE TIES**—Prices range from \$0.38 to \$0.60 per tie, f-o-b. Pennsylvania and West Virginia-Districts, depending upon gauge of track and weight of rail.

**CALCIUM CARBIDE**—In drums, f.o.b. producing point, per lb., \$0.05 1/4 @ \$0.06.

**BRATTICE CLOTH**—Jute, per sq.yd., \$0.14 to \$0.20, in Charleston, W. Va., St. Louis, Mo. and Pittsburgh, Pa., districts.

**COTTON WASTE**—The following prices are in cents per lb.:

	New York	Cleveland	Chicago
White.....	13.00@17.50	16.00	15.00@20.00
Colored.....	9.00@13.00	13.00	12.00@17.00

**DRILL ROD**—Discounts from list:

New York.....	60%	Cleveland.....	55%	Chicago.....	50%
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**MACHINE OIL**—Medium bodied, in 55 gal metal barrels, per gal., as follows:

New York.....	\$0.33	Cleveland.....	\$0.35	Chicago.....	\$0.29
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**SCRAP IRON AND STEEL**—The prices following are f.o.b. per net ton paid by dealers:

	New York*	Chicago	Birmingham
No. 1 railroad wrought.....	\$13.00@14.00	\$12.75@13.25	\$12.00@13.00
Stove plate.....	9.25@11.00	14.00@14.50	14.00@14.50
No. 1 machinery cast.....	15.00@16.00	16.00@16.50	17.00@17.50
Machine shop turnings.....	8.75@9.25	6.00@6.50	8.00@8.50
Cast borings.....	8.75@9.25	9.25@9.75	8.00@9.00
Railroad malleable.....	14.50@15.00	14.25@14.75	16.00@17.00
Re-rolling rails.....	12.25@12.75	14.50@15.00	15.00@16.00
Re-laying rails.....	23.00@24.00		21.00@22.00
Heavy melting steel.....	9.00@12.25	12.00@12.50	13.00@14.00

\* Gross ton.

**SCRAP COPPER AND BRASS**—Dealers' purchasing prices in cents per lb.:

	New York	Cleveland	Chicago
Crucible heavy copper.....	11.25 @ 11.50	10.25	10.25@10.75
Copper, heavy, and wire...	10.62@11.12 1/2	10.50	9.50@10.00
Copper, light, and bottoms...	9.25 @ 9.50	9.00	8.50@9.00
Brass, heavy, yellow.....	6.75 @ 7.12 1/2	7.00	6.50@7.00
Brass, heavy, red.....	8.75 @ 9.25	9.25	8.50@9.00
Brass, light.....	5.25 @ 5.50	5.50	5.75@6.25
No. 1 yellow rod turnings..	7.25 @ 7.50	7.25	7.00@7.50

**COPPER WIRE**—Prices of bare wire, base, at warehouse, in cents per lb. are as follows:

New York.....	18.50	Cleveland.....	18.50	Chicago.....	15.37 1/2
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**FRICITION TAPE**—Size 1/2-in. in 100 lb. lots in Eastern territory, per lb., \$0.31.

**TROLLEY WIRE**—In carload lots, f.o.b., producing point, all sizes, round, 15 1/2c. per lb.; grooved, 15 1/2c.; Fig. 8, 16 1/2c.

**TROLLEY WHEELS**—F.o.b. Jersey City, N. J., 4-in., 95c. each; 6-in., \$1.50 each.

**MINING MACHINE CABLE**—F.o.b. producing point, rope lay patterns, single conductor, per M. ft.:

Size	Braided		All Rubber Covered	
	Price	Price	Price	Price
Size 2.....	\$105.80		\$208.00	
Size 3.....	74.50		188.70	
Size 4.....	65.70		174.00	

**LOCOMOTIVE CABLE**—F.o.b. producing point, braided, Size 3, \$83.00 per M. ft.; Size 4, \$71.00 per M. ft.

**FEEDER CABLE**—Price per M. ft. in larger buying centers east of the Mississippi

B. & S. Size	Two Conductor		Three Conductor	
	Price	Price	Price	Price
No. 14 solid.....	\$31.00 (net)		\$50.00 (net)	
No. 12 solid.....	136.00		180.00	
No. 10 solid.....	185.00		235.00	
No. 8 stranded.....	305.00		375.00	
No. 6 stranded.....	440.00		530.00	

From the above lists discounts are: Less than coil lots, 50%; Coils to 1,000 ft., 60% 1,000 to 5,000 ft., 62%; 5,000 ft. and over, 65%.

**EXPLOSIVES**—F.o.b. in carload lots:

Black Powder,	Districts		
	West Virginia	Pennsylvania	Missouri
FF, NaNO <sub>3</sub> base, 800 kegs per car, per 25 lb. keg.....	\$1.70@1.80	\$1.70	\$1.75
Ammonium permissible, 1 1/2 x 8 in. sticks, 20,000 lb. per car, per 100 lb.....	14.50@15.50	14.25	14.50



## Coming Meetings

Fifth Annual Midwest Safety Conference, under the auspices of the American Society of Safety Engineers, Engineering Section of the National Safety Council and the Chicago Safety Council, Feb. 21, at Hotel La Salle, Chicago, Ill.

Rocky Mountain Coal Mining Institute. Winter meeting Feb. 23 to 25, at the Cosmopolitan Hotel, Denver, Colo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

## Association Activities

The Hazard Coal Operators' Association, at its annual meeting held at the Lafayette Hotel, Lexington, Ky., Jan. 14, announced an annual scholarship of \$1,000, for worthy students in the Department of Mines, University of Kentucky. Presentation of the fund was made by Frank D. Rash, president of the Kentucky Mine Owners' Association. Judge R. C. Stoll, of the Fayette Circuit Court, presided over the banquet, as toastmaster. There were about forty guests other than coal men, including city, county, state and federal officials, and prominent business men, representatives of clubs, etc. Henry Pfening, Jr., of Seco, Ky., was elected president; W. W. Miller, Cincinnati, vice-president; J. E. Johnson, Lexington, re-elected secretary; and Harry E. Bullock, Lexington, re-elected treasurer.

The board of directors of the Central Pennsylvania Coal Producers' Association and the executive committee of the Association of Bituminous Coal Operators of Central Pennsylvania met at the headquarters in Altoona on Feb. 7 to consider problems confronting the operators. Reviewing the demands that will be made by the United Mine Workers at the general conference in session in Miami, Fla., it was decided to move slowly pending the outcome of deliberations there. It is the general opinion of operators in central Pennsylvania that there will be a suspension of union operations on April 1. Though the miners have gone on record as opposed to any wage reduction it is definitely known that the operators will take a stand for a reduction.

## New Companies

The Walton Coal Co., Inc., of Richmond, Va., with capital stock of from \$5,000 to \$50,000, has been granted a charter to mine and deal in coal. The incorporators are Robert B. Walton, Jr., president; T. V. Chick, secretary, and J. T. Serrey, all of Richmond.

The Universal Coal Co., Cincinnati, Ohio, has been incorporated with a capital of 100 shares of stock, no par value designated, to own, deal in and operate coal properties and to sell coal and coke at wholesale. Incorporators are Julius R. Samuels, Delia J. Martin, Clara W. Meyer, William H. Cobb and David F. Naylor.

## New Equipment

### Unique Controller Designed For Fine Speed Adjusting

A 31-point drum switch designed by the General Electric Co., Schenectady, N. Y., has resulted from a demand by central power station operators for finer speed adjustment of slip-ring motors applied to forced and induced-draft fans. To burn fuel efficiently requires that the proper proportion of fuel and air be maintained at all times and that the draft fans be capable

size, only the 150-amp. size is designed for manual operation.

For cases where the 50 per cent speed reduction obtainable with one slip-ring motor is not sufficient, a double-motor drive using two motors of different speeds is commonly applied. One of these switches can be adapted for use with the two machines.

### Perfected Air-Cooled Arc Welder Being Made

Another step in the progress of electric-arc welding is marked by the perfecting of an air-cooled alternating-current welding machine, designed to weld steel and cast iron and built for both light and heavy duty. This machine, now being manufactured by the Monarch Electric Welder Co., Des Moines, Iowa, was invented after seven years of experiment by Ralph and Earl Brummett of Des Moines.

It is claimed that this welder is self-cooling and cannot be overheated by constant operation. Another feature, it is stated, is the economy of maintenance as its operation costs only 15c. per hour. The maximum current capacity of the Monarch welder is 1½ kw., operating on 110- or 220-volt power circuits. The adjustable amperage is between 20 and 170 amp.

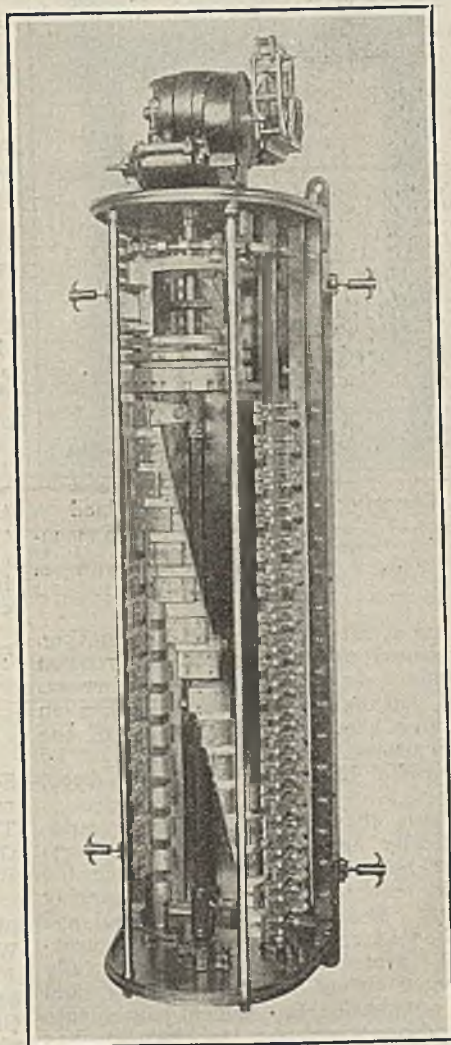
This welder is a heavy-duty machine but is also adapted to lighter types of work due to the fact that its amperage may be increased or diminished at the operator's will.

### Test New Type Pulverizers

New types of coal pulverizers are being tested by the fuel conservation committee of the U. S. Fleet Corporation at the League Island Navy Yard, Philadelphia, in conjunction with the tests now being made of pulverized coal for raising steam in Scotch marine boilers. One type of pulverizer has been discovered which powders the coal so fine that it may be passed through a 300-mesh screen.

### An Automatic Sump Pump

The new automatic sump pump manufactured by the Buffalo Steam Pump Co., Buffalo, N. Y., and used for draining pits, cellars, and excavations, is said to offer five particular advantages: (1) It is easily installed, being a self-contained unit which upon arrival needs only to be uncrated and connected to the electric current supply; (2) the motor shaft and pump are entirely inclosed and positively protected from action of sump water; (3) all parts are easily accessible; (4) ball-bearing thrust is used to carry the weight of the moving parts, and is adjustable to conditions of alignment; (5) oil in place of grease is used to lubricate the thrust, since it is claimed to be far superior for the intermittent use to which the bearings are subjected.



For Delicate Speed Control

This controller will handle wide variations of speed to meet the most exacting demands, as in draft control in central power stations.

of accurate adjustment to changes in fuel feed. The value of this is evident when it is realized that the cost of fuel represents more than half the cost of electricity as generated by the modern steam plant. The new switch is made in both 150- and 300-amp. sizes with either alternating-current or direct-current pilot motor for remote control. Because of the large physical dimensions of the 300-amp.



### Filter Increases Dielectric Strength of Oils

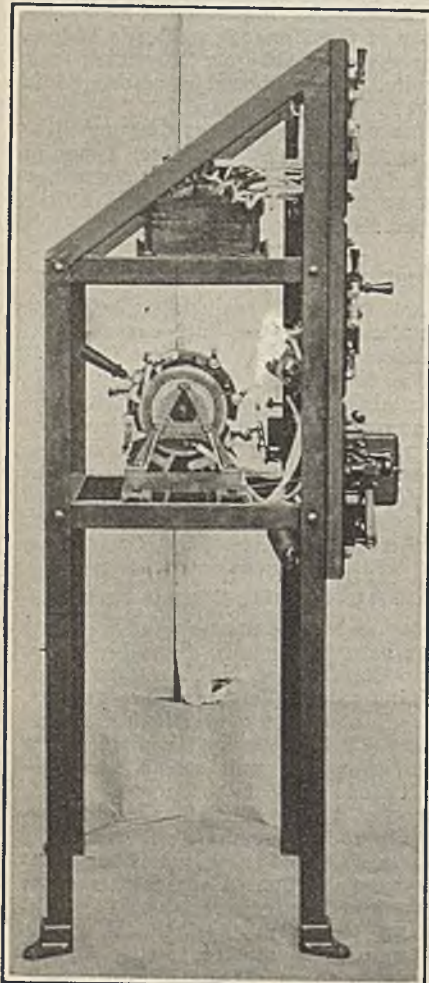
To increase the dielectric strength of oils is the purpose of the Diskelectro Oil Filter now being manufactured by the S. F. Bowser Co., Fort Wayne, Ind. This device uses the principle of "edge" filtration between thin discs of metal. The distance is infinitesimal. Uniformity of spacing has been achieved by electro-depositing metal projections on the discs.

The low surface tension of oil permits of its passage between discs but the high surface tension of the water globules prevents their passage through the same space.

The Diskelectro transformer and switch oil filter is made in three sizes; No. 1 has a capacity of from 75 to 100 gal. per hr., No. 2, 175 to 200 gal. per hr., and No. 3, 350 to 400 gal. per hr.

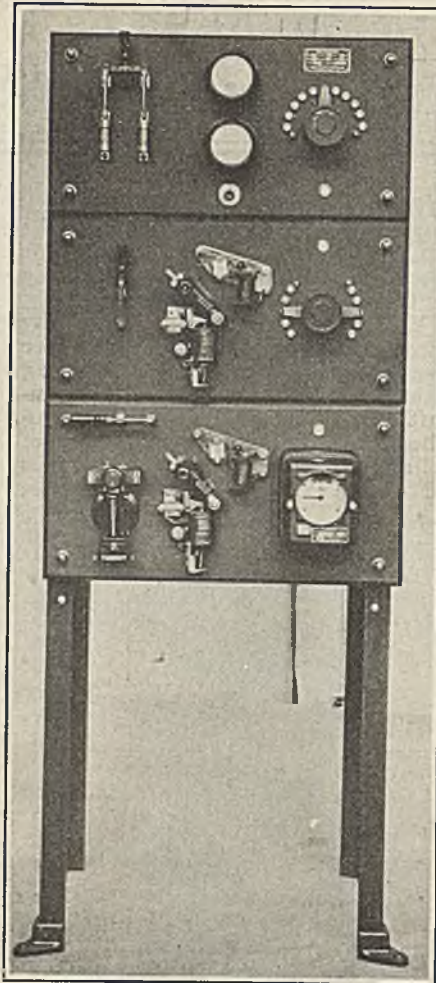
### Battery Charging Device Is Self Contained

Marking a change in the design of units for charging storage batteries the Liberty Electric Co., Stamford, Conn., announces the Syncroverter. This device is a commutating rectifier, the commutator being driven by a patented synchronous motor that has been developed and which, it is claimed, is in



#### Capacity Is Flexible

This charging unit is of 75 amp. capacity. These devices are made in sizes up to 200 amp. To get higher amperages the units are multiplied.



#### Charging Unit Is Self-Contained

The Syncroverter shown above, the manufacturer states is fully automatic. It is also claimed that it requires no more room than the ordinary charging panel.

phase at all times and is non-hunting.

Commutators are of the construction standard to this class of equipment. The alternating current is taken through slip rings on the side of the commutator, rectified and taken off by the radial brushes as pulsating direct current.

These charging units may be automatically operated using an ampere-hour meter, which may be mounted either on the locomotive or the charging panel. The Syncroverter is equipped with reverse-current protection, overload protection, independent fully charged cut-off for each battery, and an automatic stop which comes into operation when the last battery has been fully charged.

### Industrial Notes

The Rome Wire Co. has opened a new warehouse to serve the Detroit territory. The warehouse is located at 199 Minnie Street, Detroit, Mich., and is in charge of Herman C. Joos, district manager.

International Combustion Engineering Corporation has purchased the capital stock of the Heine Boiler Co., one of the oldest water-tube boiler manufacturers in the United States.

This acquisition gives the International Combustion Engineering Corporation large boiler shop facilities at St. Louis, Mo., and Phoenixville, Pa. C. R. D. Meier will remain as president of the Heine company.

The Worthington Pump & Machinery Corporation has purchased the Harris Air Pump Co., of Indianapolis, for some years one of the foremost manufacturers of air lift systems and air lift pumps. The purchase was outright and includes patents, drawings, patterns and good will.

Considerable additional floor space has been obtained by the Trico Fuse Mfg. Co., Milwaukee, Wis., manufacturers of Trico renewable fuses, to provide for increased production. In this space, adjoining the present plant, new machinery and special equipment is rapidly being installed to cope with increasing market demands.

Pittsburgh offices of the Hyatt Roller Bearing Co.—recently made headquarters for the central sales division—are now located at 806 Fulton Building. The new location amply provides for the increased sales and engineering forces of the central division, functioning under the direction of B. H. Lytle. H. R. London, a new member of the Pittsburgh force, is now operating in the industrial field.

H. J. Forsythe, president of Hyatt Roller Bearing Co., Newark, N. J., announces the appointments of H. O. K. Meister as general sales manager and A. W. Scarratt as chief engineer. Mr. Meister joined the Hyatt forces more than fourteen years ago. Mr. Scarratt, who has had extensive experience in the design and construction of automotive, tractor, railroad and industrial equipment, joined the Hyatt engineering staff a few months ago as assistant chief engineer.

### Publications Received

A Plan of a Co-operative Sliding Scale of Wages as Applied to Bituminous Coal Mining, by F. A. Ray. The Engineering Experiment Station, Ohio State University, Columbus, Ohio. Bulletin No. 33. Pp. 20; 6x9 in.

Employment Statistics for the United States, edited by Ralph G. Hurlin and William A. Berridge. Russell Sage Foundation, New York City. Price \$2.50. Pp. 215, 6x9 in.; diagrams. Gives the results of the work on employment statistics by the committee on governmental labor statistics of the American Statistical Association.

Suggestions for the Design of Electrical Accessories for Permissible Mining Equipment, by L. C. Hsley and E. J. Gleim. Bureau of Mines, Washington, D. C. Bulletin 258. Pp. 47; 6x9 in.; illustrated. A discussion of the design of accessories used in permissible mining outfits.

Oil-Field Emulsions, by T. B. Dow. Bureau of Mines, Washington, D. C. Bulletin 250. Price, 25c. Pp. 112; 6x9 in.; illustrated. Covers the cause and removal of water emulsified in crude petroleum and the colloidal theories involved.