

COAL AGE

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Keep Up With Progress

ELECTRICAL failures, like mine fires, often arise from neglect or ignorance. Many times common sense dictates that certain changes be made in electrical equipment. If these are neglected disaster is likely to follow.

In the early development and application of electrical apparatus many installations were made in a way which today appear crude and unsafe. This was quite natural; it was pioneering work. Our forefathers didn't go West in aeroplanes or even automobiles and not all of them traveled in covered wagons.

Procrastination or lack of respect for the opinion of an electrical engineer nearly caused a serious mine fire recently in one of the largest anthracite mines. It appears that inside this mine, some few years ago, several circuit breakers were installed in an asbestos-lined wooden box. The engineer had lately recommended that the breakers be inclosed in separate steel cabinets but the necessary appropriation never came. One night something went wrong with one of the breakers and all were destroyed and a mine fire narrowly averted.

It is apparent that the loss of the breakers and the delay to the mine was much greater than the cost of a safe cabinet. Mine fires are indirect causes of high operating expense and increases in the price of anthracite. Mine managers should learn to appreciate the judgment of the electrical engineer and cease to look upon him as a necessary evil and a spender of profits.

Overloading Locomotives

EFFICIENCY in operation is promoted by attaching only reasonable loads to electric locomotives. The tendency is to load them down with all they can be made to haul, but certainty of operation is usually more important than maximum tractive effort. The railroads are learning this, with the result that the number of train miles has been greatly increased. A bucking locomotive holds up operation lamentably. It may come through with its trip but with what delays and what dangers. As to the latter it may be said that a trip that is too heavy is usually as greatly lacking in braking power as in tractive effort and so is liable to run away on grades.

When too much is demanded of a locomotive the motors may be burned or the locomotive may tie up machines by its excessive draft on the current strength. It may kick out the circuit breaker. Excessive use of sand may insulate its wheels from the rails and cause the current to run back along the cars. It may interpose an excessive resistance. Instead of bragging as to how much "she" can haul it is better to have a certain maximum load and not exceed it. A fine performance may be obtained at an entirely undue expense. A locomotive should be kept pulling its normal load, running according to schedule without drawing too heavily on the current and without heating.

Consistent running is what is needed. If a larger output is wanted add another locomotive, replace the present machine by one that is larger, ease the heavier grades or introduce anti-friction bearing cars, but do not overload the locomotive. That is the poorest kind of economy and may actually reduce tonnage by crippling the overloaded locomotive, so that it will not haul even a normal load.

Harrington and the Flame Safety Lamp

WE CANNOT join with Harrington in his wholesale condemnation of the flame safety lamp. He records, of course, the accidents it has caused and not the accidents it has prevented. He could do no other, if he so desired. Yet we feel that in the article that appears in this week's issue he has done the public a service.

The flame safety lamp when carried with an electric lamp is not so likely to be tampered with as when carried alone, for the man carrying it can proceed rapidly and safely to the relighting station if it should be extinguished. The readiness with which the flame lamp is put out is one of its most undesirable characteristics especially because of the natural desire of the user to relight it at the earliest possible moment. Unfortunately, an electric lamp gives such a brilliant light, that unless it is kept away from the eyes of the user he is not able with his pupils thus dilated to read the faint blue flame of the safety lamp with exactitude.

Some carry flashlights, but these lamps might cause an explosion if the bulb were broken. There are doubtless other defects. These might be corrected, but so far that has not been done at least in the United States. It would be well if the defects were removed, then the man who tested for gas could do it with precision and yet would have the flashlight to guide him into safety if the flame safety lamp failed.

However, men are constitutionally averse to labor and others are only too anxious to perform their allotted task. In either case they are apt to take a chance and to open their safety lamps in order to relight them. A safe relighting device would be a blessing, but unfortunately a lamp soon fills with an explosive mixture if in a gassy place.

When the lamp is relighted unless the device for relighting acts instantaneously and automatically, as it does in one form of mine lamp, it causes an explosion within the gauze which may be violent enough to ignite the gas surrounding the lamp. All these are reasons why the flame safety lamp is not safe but at present only the Burrell testing equipment is available, and it is said to be slower and less readily understood though far more accurate than the flame safety lamp. No wonder inventors are hard at work in Europe to produce methanometers that will be simple and continuously reliable.

Where shotfiring is done by electricity and by specially appointed men, and where miners are prevented

from smuggling powder and fuse into the mine, there is little risk that the miner will open his safety lamp to fire a fuse, though miners have been known to shoot down coal surreptitiously rather than be deprived of their day's shift when a shot has missed fire or failed to bring down the coal.

The operator should either arrange for testing by the Burrell method or should contrive in every way to prevent all contingencies that would make the opening of a safety lamp in a questionable place seem desirable to the foreman, fireboss, shotboss or other mine worker. Furthermore, he should use judgment in selecting his lampmen so that the lamps will be always in repair, safe in themselves and properly assembled. And again, he should render his mine so safe by adequate rock-dusting that any explosion would be limited closely to the area occupied by the explosive mixture of gas and air, assuming, what has not been proved, that inert dust has no power to extinguish an explosion that is solely of gas and not of coal dust and possibly a little methane.

Face the Facts

FOR YEARS we have proceeded with the notion that the mine foreman knew, or could know, enough to assure the safety of his mine. Now we are clearly convinced that unless we have an entirely new crop of foremen we cannot expect any such competence. Where such foremen are to be found no one knows. They would need to be electricians as well as mining experts, and few qualify in that direction. The mine foreman under the law is in control of the electrician. If the former is wise he leaves the electrician quite largely alone relying on him with his superior, the electrical engineer, to keep the wiring and bonding safe and insisting only that he does not violate the elementary principles of mine safety.

Unfortunately the foreman too often condones practices with regard to electrical apparatus, that do not make for safety, economy or efficiency. He does not know when machinery is properly protected. He does not condemn equipment that is in dangerous condition. He overloads motors and locomotives. He demands short and unsafe cuts. He means well but he does not understand electric current. We do not like to recommend two heads in a mine who may jangle and waste their effort in mutual incriminations. Still we believe the mine electrician should be certified and have charge of certain equipment with full responsibility for its safe keeping.

We think state mine inspectors should be trained to examine electric machinery in a competent manner. The department should have an inspector to train them and occasionally go from mine to mine with them showing them just what they should watch. Electrical hazards are real. They do not all end in electric shock. Overloading a locomotive may cause a runaway. Faulty upkeep of a fan motor may end in an explosion. The flashing of a defective rheostat may have a like effect. A short circuit may cause a mine fire. A defective battery may burn the man carrying it. A stray current from a locomotive or a stationary motor may cause a premature shot. Consequently many accidents now classified as non-electrical may have an electrical origin or at least a cause that a competent electrical engineer should of all men be the most able to remove.

Let us face the facts. The mine foreman cannot be

a competent electrician and he should relinquish to the latter all responsibility for the correct installation and manipulation of electrical equipment.

His Life for Labor

ROBERT SMILLIE, the protagonist of the mine worker, has written his book "My Life for Labor," and his story of his early life as reviewed by a New York newspaper seems centered about wrongs in mining life that all the years he has spent in labor unionism have not removed—poor lighting, dangerous roof and falling water.

As for the lighting which might have been greatly benefited and is being improved, the union has done nothing except by opposition. One of these days we shall have mines that are well illuminated, but the way will be shown by the operator. The mine worker is content. He has struck against the electric mine lamp, and when stationary lamps have been installed to light his working place he has stolen the bulbs. But lighting, somewhat satisfactory lighting, is coming. No one can blame the operators of Smillie's youth that they did not have anything but a flame lamp to light his working place.

And as for the roof that nearly ended his career while a mere stripling, it is much the same menace it ever was. Labor unions have done little but sustain the miner in doing just as Smillie did. He left the roof unpropped and it fell, fifteen-hundredweight of it on a pile of "dross" (undercuttings) he had scraped for a seat from which to extend his undercut.

The roof still drips in shallow mines and in some deep ones. Unionism has done and can do nothing for it. It is inherent in mining and cannot be avoided. Fortunately it does not seem to have proved particularly harmful to health.

But the condition of the miner, nevertheless, has improved. We cannot blame the British operator of sixty years ago because he did not give his employee all the labor-saving equipment he provides today. Most of it was not so much as known in those days. Smillie would give little credit to invention and capital and a great deal to unionism, but one can well question if the first two have not been the workingman's friend and the third an extremely doubtful supporter.

Unionism has nearly always been against labor-easing devices, the mechanisms that lay on the machine the labor and burden of the day. But when the machine is established how cheerfully and successfully does the labor agitator proceed to lay his hand on the sacred pages of history and say that it is unionism and the social struggle that has lightened the burden of the worker. Smillie's book would appear thus to distort history, twisting it ever to suit his purpose.

His life for labor, what has it effected? Much we fear that it has produced nothing but the bitter fruits of high-cost coal for the workingman, high cost of living for the laborer, discontent and social unrest, whereas the work of the inventor and of the practical industrialist has lightened toil, made possible shorter hours and put a premium on the mind rather than on the limbs of the worker. The technical man is not invited to be Minister of two Governments as Robert Smillie has been, but none the less he does more effectually than labor agitators and politicians what governments, if they are good governments, seek to accomplish, but often alas in vain.



Drilling a Sheared Face

Vertical Shearing Saves Powder But Makes Slack

Utah Fuel Co. Does Not Adopt It After Exhaustive Tests—Center Shear Cut Is Tried with Both Top and Bottom Cuts in Narrow Work and Rooms

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IS VERTICAL cutting in rooms and entries economical? A good many coal mining men have asked themselves this question. Some have tried to find out by experience. T. A. Stroup, superintendent of the Clear Creek mines of the Utah Fuel Co., after exhaustive tests has concluded that, so far as the brittle Clear Creek coal is concerned, vertical cutting loses more money than it saves. The tests showed that vertical cutting is less expensive than horizontal and that a center shearing cut down through a face that has been top or bottom cut reduces powder cost per ton more than 50 per cent, but the percentage of slack produced in places only 12 to 14 ft. wide is more than doubled and is greatly increased even in full-width rooms. Thus the good effect is nullified. So vertical cutting is not standard practice in Clear Creek.

The 90-day tests which Mr. Stroup ran amassed a wealth of data on vertical cutting such as has been hard to find in the past in the coal industry. So it is of value. Some of the tests were run in entry work in No. 3 mine of the Clear Creek group where entries were supposed to be 12 ft. wide; there was so much overrunning of machines, however, that much of the work was fully 14 ft. in width and the results thus were somewhat comparable to those that might be gotten in room work. Other tests were in 18- and 20-ft. rooms. The studies included top cutting alone, bottom cutting alone and vertical center shearing in combination with either one or the other. Comparisons were made of the

time consumed in cutting, the quantity of explosives used and the proportions of slack produced by the cutting process alone and by both cutting and shooting. After a place had been shot it was loaded out with 1½-in. coke forks. Everything that went through the forks was weighed separately as slack.

The machines used in Mr. Stroup's tests were an Oldroyd universal cutter, a Goodman straight face machine and a Jeffrey 35-B shortwall. Comparative runs were made with these machines but the results were not intended to illustrate the relative merits of the machines but are held to apply only to the methods.

A general summary of important results showed that

Table I—Time Consumed in Cutting Places
Shearing Machine Top Cut and Center Sheared, All Places

Place	Width, Ft.	Height, Ft.	Depth, Ft.	Time Cutting, Min.	Time Shearing, Min.	Total Time, Min.	Tons per Place	Time per Ton, Min.
A	14	7	8½	27	8	35	35.625	1.14
B	13	7	8½	25	8	33	25.23	1.31
C	12	6	8½	26	8	34	21.84	1.55
D	13	6	8½	35	7	42	25.25	1.66
E	14	7	9½	24	9	33	24.28	1.36
Average.....						35.4	25.445	1.39

Straightface Machine, Top Cut, All Places

Place	Width, Ft.	Height, Ft.	Depth, Ft.	Time of Cutting, Min.	Tons per Place	Time per Ton, Min.
1	12½	7½	6	17	17.595	.97
2	12	7	6½	19	15.975	1.20
3	12	7	6½	18	15.015	1.20
4	12½	7½	6	17	16.655	1.02
Average.....				17.8	15.810	1.10

NOTE—The illustration forming the headpiece shows the arrangement of shots employed to bring down a face that has been undercut and sheared, with the fewest and lightest charges. Much big coal was produced by this method but the large amount of bugdust made by the machines offset all advantages gained.



Self Condemned

In passages 12 to 14 ft. wide center shearing nearly doubled the quantity of bugdust made by the machines as may be judged by the great pile of this material in the foreground. In wider work the proportion of cuttings was not so large but enough to render the process of vertical cutting uneconomical.

in places top cut and center sheared by the shearing machine, the cutting time per ton averaged 1.39 minutes, slack produced by cutting averaged 11.8 per cent, total slack from cutting and shooting averaged 27.3 per cent and powder cost per ton averaged 3.91c. Places merely top cut by the straightface machine gave the following results: Cutting time per ton, 1.10 minutes; slack made by cutting, 6.64 per cent; total slack made by cutting and shooting, 13.17 per cent (excluding results from one place which was badly overshot); powder cost per ton, 9.2c. Thus it is shown that powder costs per ton in places center sheared and top

Table II—Slack Produced by Cutting Operation

Shearing Machine, Top Cut and Center Sheared, All Places							
Place	Width, Ft.	Height, Ft.	Area of Top Cut, Ft.	Area of shear, Ft.	Area of face, Ft.	Area cut out, Ft.	Per Cent slack
A	14	7	7	3½	98	10½	11.8
B	13	7	6½	3½	91	10	11.0
C	12	6	6	3	72	9	12.4
D	13	6	6½	3	78	9½	12.2
E	14	7	7	3½	98	10½	11.8

Straightface Machine, Top Cut All Places					
Place	Width, Ft.	Height, Ft.	Area of top cut, Ft.	Area of face, Ft.	Per Cent slack
1	12½	7½	6½	93½	6.1
2	12½	7	6	84	7.0
3	12	7	6	84	7.0
4	12½	7½	6½	93½	6.1
5	12	7	7	84	7.0

cut were much less than half those in places merely top cut.

In places bottom cut and center sheared by the shearing machine, as compared to those merely bottom cut by a shortwall machine, the results were these: Bottom

Table III—Production of Slack by Weight After Shooting

Shearing Machine, Top Cut and Center Sheared, All Places			
Place	Total Tons	Total Slack	Per Cent of Slack
A.....	30.625	7.69	25
B.....	25.23	6.575	26
C.....	21.84	4.45	20.4
D.....	25.25	9.55	37.8

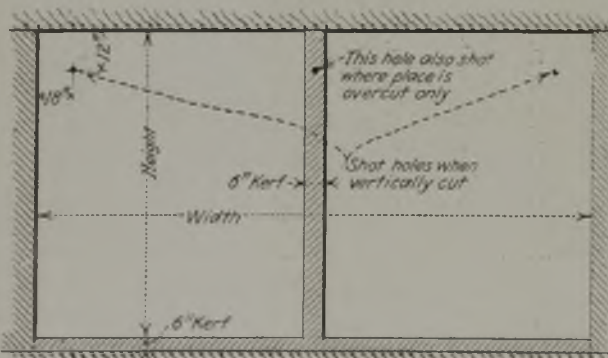
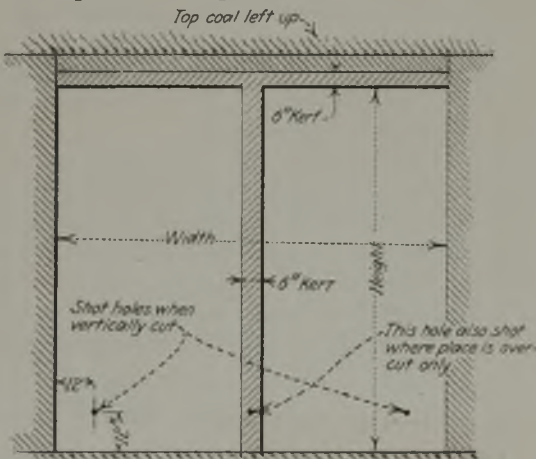
Straightface Machine, Top Cut, All Places			
Place	Total Tons	Total Slack	Per Cent of Slack
1.....	17.595	1.85	10.5
2.....	15.975	2.25	14.0
3.....	15.015	4.355	*29.0
4.....	16.555	2.50	15.0

* Overshot.

Table IV—Powder Consumption

Places Top Cut and Center Sheared by Shearing Machine					
Place	Tons of coal	Powder, Lbs.	Cost of powder	Powder used per ton of coal, Lb.	Powder cost per ton of coal
A.....	30.625	4	\$1.00	.13	\$.0327
B.....	25.23	4	1.00	.156	.039
C.....	21.84	4	1.00	.184	.146
D.....	25.25	4	1.00	.156	.039
E.....	24.28	4	1.00	.164	.041
Average.....				.158	.0391

Places Top Cut by Straightface Machine					
Place	Tons of coal	Powder, lb.	Cost of powder	Powder used per ton of coal, lb.	Powder cost per ton of coal
1.....	17.595	6	\$1.50	.340	\$0.085
2.....	15.975	6	1.50	.376	.094
3.....	15.015	6	1.50	.400	.100
4.....	16.655	6	1.50	.360	.190
Average.....				.369	.092



Arrangement of Cuts and Shot Holes

It will be observed that center shearing a place that has been either undercut or overcut eliminates the necessity for one shot hole. Because of vibration of the cutter bar when making the shear this kerf is appreciably wider than those either above or below the coal.

Table V—Time Consumed in Cutting Places

All Places Bottom Cut and Center Sheared by Shearing Machine

Room	Width, Ft.	Height, Ft.	Depth, Ft.	Time Cutting, Min.	Time Shearing, Min.	Time Total, Min.	Tons per Place	Time per Ton, Min.
A	20	6	9	30	10	40	33.29	1.2
B	20	6½	9	20	17	37	30.26	1.2
C	20	5	9	26	12	38	32.76	1.2
D	18	5	9	23	12	35	28.62	1.2
E	20	7	9	27	11	38	33.17	1.2
F	18	6	9	28	10	38	31.99	1.2

All Places Bottom Cut by Shortwall Machine

Room	Width, ft.	Height, ft.	Depth, ft.	Time cutting, Min.	Tons per place	Time per ton, min.
1	20	5½	5½	38	27.97	1.4
2	18	7	5½	35	24.67	1.4
3	18	6	5½	36	26.53	1.4

cut and center sheared places required an average of 1.2 minutes of cutting time, per ton, they produced 11.6 per cent of slack from cutting alone and a total of 25.3 per cent of slack from both cutting and shooting, the cost for powder was 2.41c. per ton of coal produced. Places merely bottom cut averaged 1.4 minutes of cutting time, per ton, produced 8 per cent slack from cutting alone and 29.83 per cent of slack from cutting and shooting, while powder costs were 5c. per ton. Thus again, the expense incurred for powder was reduced more than 50 per cent by center shearing.

One explanation for the excessive amount of slack made by the shearing machine is that vertical cuts invariably have a kerf almost half again as wide as those made horizontally. Mr. Stroup says his experi-

Table VI—Slack Produced by Cutting Operation

Places Bottom Cut and Center Sheared by Shearing Machine

Room	Width, Ft.	Height, Ft.	Area Cut, Ft.	Area Shear, Ft.	Area Face, Ft.	Total Area Cut, Ft.	Per Cent Slack	Per Cent Slack by Weight
A	20	6	10	3	120	13	10.8	
B	20	6½	10	3½	130	13½	10	11.5
C	20	5	10	2½	100	12½	12.5	
D	18	5	9	2½	90	11½	13	
E	20	7	10	3½	140	13½	9.6	11.7
F	18	6	9	3	108	12	11	11.6

Places Bottom Cut by Shortwall Machine

Room	Width, Ft.	Height, Ft.	Area Cut, Ft.	Area Face, Ft.	Per Cent Slack	Per Cent Slack by Weight
1	20	5½	10	110	9	
2	18	7	9	126	7	7
3	18	6	9	108	8.3	8.5

ence was that a vertical cut, starting from the top, could always be made quickly because of the weight of the cutterbar acting in a downward direction, but that the bar was certain to vibrate considerably, thus making a wide gash in the coal. A cutter that ordinarily would make a 6-in. horizontal kerf usually made a 9-in. kerf in a vertical cut.

"The reduction in powder consumption was outstanding in all the tests," said Mr. Stroup, in a report that was written for presentation before but which was never read at any meeting of the Rocky Mountain Coal Mining Institute. "So marked has this saving been that I venture to predict that if vertical cutting as an ad-

Table VII—Percentage of Slack by Weight

Places Bottom Cut and Center Sheared by Shearing Machine

Room	Total Tons	Total Slack	Per Cent Slack
A	33.29	8.92	27
B	30.26	7.65	25
C	32.76	9.21	28
D	28.62	6.45	22½
E	33.17	8.22	25
F	31.99	7.87	24½

Places Bottom Cut by Shortwall Machine

Room	Total Tons	Total Slack	Per Cent Slack
1	27.97	8.56	30½
2	24.67	7.85	32
3	26.53	7.30	27

Table VIII—Powder Per Ton of Coal Produced

Places Bottom Cut and Center Sheared by Shearing Machine

Room	Tons Coal	Powder, Lbs.	Cost of Powder	Powder per Ton of Coal, Lbs.	Powder Cost, Per Ton
A	33.29	3	\$.75	.09	\$.02½
B	30.26	3	.75	.10	.02½
C	32.76	3	.75	.09	.02½
D	28.62	3½	.87½	.12	.03
E	33.17	3	.75	.09	.02½
F	31.99	3	.75	.09	.02½

Places Bottom Cut by Shortwall Machine

Room	Tons Coal	Powder Lbs.	Cost of Powder	Powder per Ton of Coal, Lbs.	Powder Cost per Ton.
1	27.97	5	1.25	.18	\$.04½
2	24.67	6	1.50	.24	.06
3	26.53	5	1.25	.18	.04½

junct to horizontal cutting is ever widely adopted it will be to bring about economy in explosives.

"The use of the vertical cutting method either alone or in conjunction with horizontal cuts for the usual room and entry work being thus disposed of the question of utilizing this method for drawing pillars was considered. It was hoped to cut pillars that were too heavy for horizontal cutting by a method of crosscutting and then drawing the stump; but the great length of the shearing machine made it necessary to do much of the cutting on the curve leading into the place."



Shot Down

This shows the results of good shooting in a room that had been undercut and center sheared. As may be seen much big lump coal was produced. What cannot be seen, however, is the proportion of fine cuttings made by the machine.

Flame Safety Lamp Proves Source of Danger

Several Explosions Caused by Safety Lamps Briefly Reviewed —
Such Lamps Cannot Be Trusted Even in Hands of Certified
Officials—They Should Never Be Used When a Shift Is at Work

BY D. HARRINGTON
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"FAMILIARITY breeds contempt" is a saying which certainly should not apply to anything so dangerous as explosive gas in coal mines, yet actual occurrences seem to prove that either contempt or carelessness is all too frequently found in present-day practices with respect to methane in mines, and particularly is this true as to the use of safety lamps. In three of our western states, ignition of methane from modern flame safety lamps in the hands of fireboss or safety man has resulted in six disasters, the death of practically 500 men and financial loss of considerably over \$2,000,000. In each instance the careless person causing the ignition lost his life. Four of these explosions with a total death toll of 412 took place within the past seven years.

In each of these disasters caused by gas ignition from flame safety lamps, the user of the lamp held a certificate of competency as a fireboss, a gas examiner or a mine foreman, and in at least three of the six cases, had a certificate of competency and experience in Great Britain as well as in the United States.

In two cases resulting in 220 deaths, the flame safety lamp was taken apart by the fireboss in the mine, and the gas ignition was caused when an ordinary match was being used to relight it. The burnt match in both cases was found near the disassembled lamp.

In at least two cases the safety lamps were modern and up-to-date and although provided with safety igniters or relighters and although these relighters were in place, they were not in condition to use. In one of these two cases the lamp was of the key-locked type; in the other it was magnetically locked. In both instances the mines were operated with closed lights, the miners using electric safety lamps, and the inspectors or safety men carrying flame safety lamps.

In two of these six disasters, the ignition was caused by improperly assembled safety lamps and in one case by a misuse of an apparently well-assembled lamp. In all six instances, the disaster occurred while an attempt was being made to remove gas accumulations during a working shift. In no case was the Davy lamp involved and in four out of the six instances the mine was operating with closed lights.

These six comparatively recent disasters in three states caused by methane ignition by flame safety lamps in the hands of men holding certificates of competency, leads one to doubt whether the designation flame safety lamp is not a misnomer. If they are not safe in the hands of the foreman, fireboss or safety man possessing a certificate of competency in their use, how can they be considered safe in the hands of miners not one in ten of whom has even a faint idea as to the tests to which a flame safety lamp should be subjected to determine its actual safeness and only a few of whom know the lamp's limitations or the correct methods of using it?

It seems to be anything but safe to place any kind of flame safety lamp in the hands of the miner and I am particularly opposed to the practice of relying upon the machine runner in "slightly" gaseous mines to inspect working places for gas with a flame safety lamp before operating the electrically driven coal-cutting machines.

The disasters mentioned are only a few of those that have been started by flame safety lamps, and they are instanced here only because I happen to be personally familiar with the surrounding circumstances. Doubtless there have been numerous others.

In any event there have been many cases in which the users of the flame safety lamps have been burned. Furthermore, I have had called to my attention many practices likely to result in disaster. Among the most dangerous are the various methods used with flame safety lamps to "spit" fuse or squibs. Any place that is sufficiently gaseous to require closed lights is too gaseous for the safe use of fuse or squibs in blasting. If fuse or squibs are not in themselves dangerous, the methods employed in igniting them are likely to be decidedly dangerous.

As it appears to be fairly well established that ignition of methane starts nearly three-fourths of our coal-mine explosions, it seems only sensible that in any mine where methane occurs nothing but closed lights should be used. And in view of the danger incurred from flame safety lamps and the little light they give, I am convinced of the advisability of using only permissible electric lamps in mines that give off methane. This is particularly the case as it is claimed that the

DETHRONING THE FLAME SAFETY LAMP

AFTER a long and intimate acquaintance with coal mines, especially those in the Rocky Mountain region, where he served as an engineer for the Bureau of Mines, the author of this article has come to distrust all flame safety lamps when used for any purpose other than gas testing. He states that they started the Hastings explosion in Colorado in 1917, when 121 men lost their lives, the Kemmerer explosion in Wyoming in 1923 that killed 99, and the Castle Gate disaster last March which sent 172 miners to Kingdom Come, to say nothing of the hundreds of thousands of dollars of property loss that these explosions caused the mining companies. He for one, is "not at all inclined to place the safety lamp on an altar and worship it as so many coal-mining men are inclined to do." He sounds a distinct warning concerning the danger of these lamps.

newer types of permissible electric cap lamps will give as much light as carbide lamps.

A mine that has encountered no explosive gas in many years of work may overnight become definitely gaseous. This has actually occurred in more than one instance. This situation, together with the fact that open lights have started many fires in both gaseous and non-gaseous mines and have caused dust ignition both in mines and on tipples, leads me to the belief that open lights should be excluded from non-gaseous coal mines as well as those known to make methane.

In fact, up-to-date thought tends towards exclusion of open lights from *all* mines, including metal mines. Several large metal-mining companies are now experimenting upon the use of up-to-date electric safety lamps in their operations. Furthermore, the State of Utah requires the use of closed lights in non-gaseous as well as in gaseous mines.

CLOSED LIGHTS ALONE DO NOT GUARANTEE SAFETY

However, when the mine is placed on a closed-light basis, it is absolutely essential that other precautionary measures be not neglected. It is inconsistent, to say the least, to employ closed lights yet simultaneously have in use near working faces non-permissible electric coal-cutting machines, electric pumps, booster fans or other flame-producing electrical equipment. It is certainly not safe to allow smoking in a closed-lamp mine, to fail to make frequent search for matches or to fail to severely punish anyone taking matches or smoking materials into such a mine. Similarly it seems decidedly dangerous to blast during a shift in a closed-lamp mine, particularly if the blasting is done with fuse or squibs and black powder, and more especially if the coal is shot off the solid.

Standing gas should not be moved while men are on shift. This is true even if only closed lights are in use.

As far as possible, flame safety lamps should be excluded from mines when employed for anything other than inspection purposes, and even then they should be entrusted only to qualified men. Without exception they should be of the permissible, magnetically-locked type equipped with relighters, and any person, who for any reason whatsoever, takes a flame safety lamp apart underground, except in stations designated especially for the relighting of lamps, should be given the extreme penalty of the law. And this penalty should be made as severe as for attempted wholesale murder.

FLAME SAFETY LAMP AROUSES SUSPICION

I have examined a large number of mines after explosions and in almost every one, the inquiry was made (not always by me) as to the whereabouts of mine foreman, fireboss or safety man, and particularly as to where the flame safety lamp was found and what was its condition. This indicates the widespread suspicion directed towards the flame safety lamp.

A state mine inspector informed me that upon examination of records as to mine explosions in his state, it was found that 80 per cent were started by the mine officials (superintendent, foreman, fireboss, safety inspector) and that a large part of the disasters were caused by handling gas (usually with the shift in the mine) and in several instances a flame safety lamp caused the ignition.

It seems definitely dangerous to permit firebosses to examine old workings (where it is extremely probable

explosive gas may be found) while the shift is in the mine; yet this is the common practice.

Though the magnetically locked permissible flame safety lamp is recommended for use where lamps of this general type must be employed, many old timers refuse to change over from the lamp they have used for years and even when they do change over, they are prone to "re-make" the permissible lamps in accordance with their own ideas. When the relighters become worn and cause a little trouble, they are discarded or removed and the hole plugged. In one instance the relighter was removed and the hole left open with a resultant ignition of gas.

GAUZE REMOVED TO QUICKEN LAMP ACTION

One old-time fireboss thought two gauzes made the lamp "slow"; so one gauze was removed. Gaskets have been omitted entirely or defective ones used. I recently saw a modern up-to-date flame safety lamp taken into a mine for gas testing, and the glass cylinder had a V-shaped nick extending down more than a quarter of an inch. Fortunately no gas was encountered.

Firebosses at times remove the locking devices from permissible flame safety lamps. Others drill a tiny hole in such manner that the insertion of a pin opens the lamp. Some claim to be able to open the magnetically locked permissible lamps at underground trolley frogs and others by subjecting the lamps to a certain method of jarring.

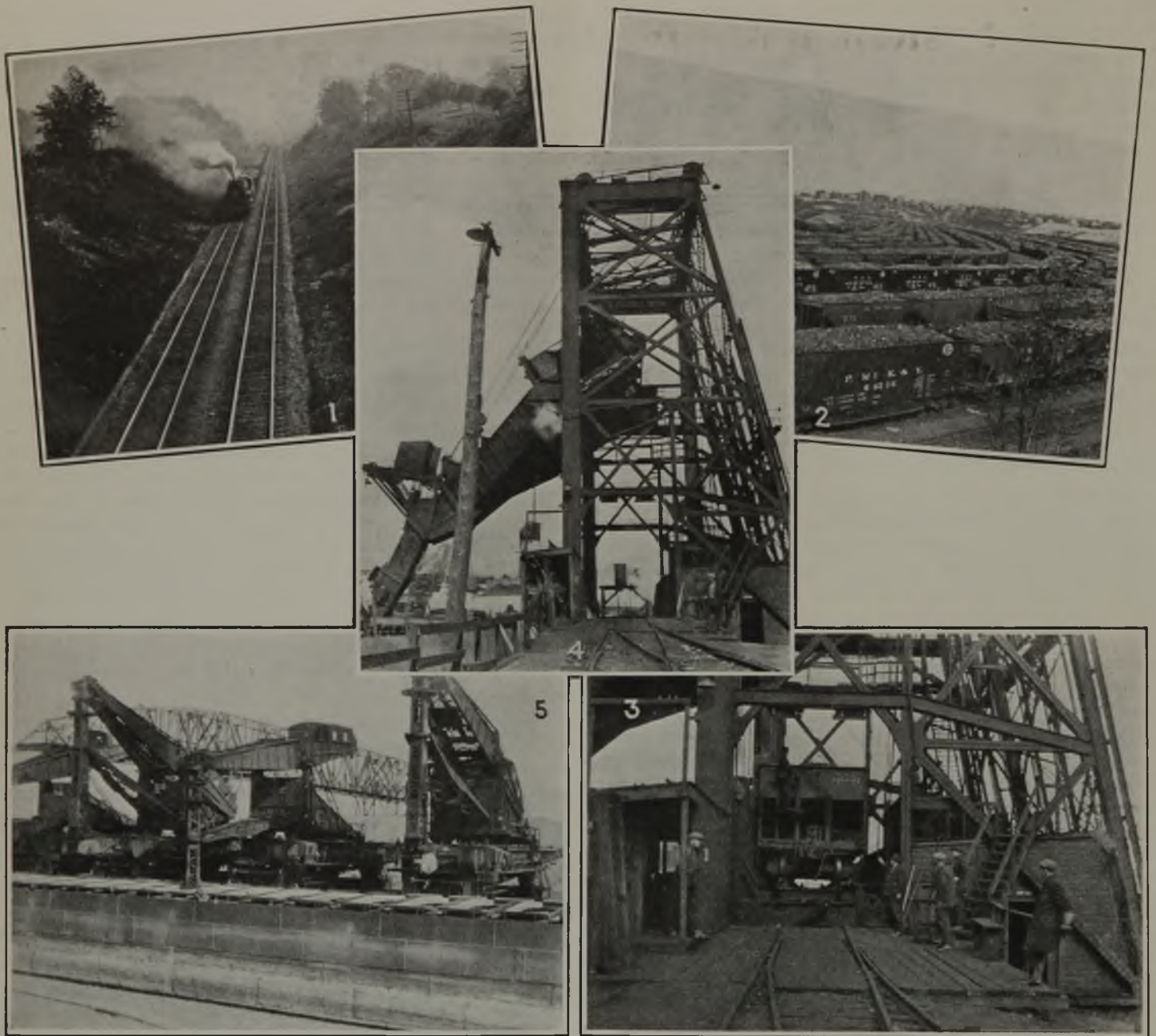
So long as this attitude toward permissible flame safety lamps is taken by officials on whom depends the safety of the mine and its workers, there doesn't appear to be any definite guarantee that the permissible lamps will be much safer than the Davy. At any rate, the fireboss, foreman, or other person taking a flame safety lamp into a mine, while a shift is in, should be compelled to test the lighted lamp before going into the workings in an explosive gas mixture by hanging it free in a gas-testing box. Furthermore, any certificated man using a flame safety lamp in a mine in which a shift is at work and having matches or smoking materials in his possession should have his certificate revoked and be prosecuted under the law, provided the statute carries any penalty for such an offence.

FLAME SAFETY LAMP IS NOT FOOLPROOF

There is decidedly too much tendency to assume that the flame safety lamp is foolproof. In recent years I have felt uncomfortable when in a gaseous mine where a number of flame safety lamps are in continuous use even when so-called certificated men are using them. It seems desirable not only that all users of flame safety lamps should be cautious and careful but it also seems advisable to exclude as far as possible, *all* flame safety lamps from closed-lamp mines, or in fact from all mines, when the shift is working.

The Burrell methane detector is much more accurate in detecting gas than is the flame safety lamp and while more time is required per test, there is absolutely no reason why this or some similar instrument should not be used for gas testing in mines when the shift is at work, reserving the flame safety lamp for the fireboss' examinations before the shift comes on.

Meanwhile, there should be a determined effort toward the invention of *some safe* efficient method of gas testing, so that the treacherous misnamed flame safety lamp may be entirely excluded from mines.



Lake Coal Runs Eventful Course from Mining Field to Northwest Ports

Every Year About Twenty-five Million Tons of It Make Summer a Busy Season on the Great Lakes for the World's Most Massive Material Handling Machines

LAKE coal may travel as far as 600 miles by rail (1) and may go through the hands of as many as 10 train and yard crews before it gets anywhere near water. Finally it arrives in a yard on the lake front (2) at one of the dumping ports on Lake Erie. From here it is pushed by a switch engine up over a hump or "high grade," each car coasting down over a pit between rails. Out of this pit rises "the pig," a squat, heavy, pusher car hauled by a steel rope. The pig moves the load up a short grade and onto the car dumper.

A car of coal, in the grip of the dumping machine (3), is hoisted about 50 ft. in the air. Then, whoosh! The whole 50 tons goes down an apron and through a flexible spout into the vessel (4); cars are dumped one a minute. An operator in a cabin mounted on the apron manipulates the steam-operated spout, swinging

it to and fro like an elephant's trunk. Thus the load is trimmed in the boat so neatly that scarcely a shovelful is spilled over the top of each hatch. The coal then travels up the lakes 800 miles or so to a Lake Superior dock, in a boat that may carry 14,000 tons, or about six 50-car trainloads.

At the Head of the Lakes the boat ties up beside a dock that may be big enough to hold a million tons of coal and the unloading is done by gigantic Hulett's (5) which gulp up 15 tons of coal at a bite, delivering each "bite" into a larry car that rides within the frame of the machine. This larry car transports the coal back from the dock edge and delivers it on the ground within easy reach of immense traveling bridge cranes, some of them 700 ft. long, which store the coal on any part of the great dock, ready for reshipment inland throughout the Northwest.

Block System of Mining Coal Has Many Advantages

It Reduces Danger, Increases Percentage of Extraction and Results in Coarser, Cleaner Output—Room-and-Pillar Mines Can Be Converted to Block Method Mainly by Widening Centers

BY H. R. BISSELL

Chief Engineer Rosedale Coal Co., Morgantown, W. Va.

CONTRARY to popular belief there is nothing complicated about the block system of mining coal. If the present room-and-pillar system is taken as a foundation and the centers of the rooms as well as those of the crosscuts are widened out to a maximum and uniform figure, the block system will result. Thus the relationship between the two methods is close.

It is surprising to find the number of operators who are still working upon the old idea of narrow centers. The mine maps of such coal producers would show that nine out of ten of them have large areas developed and standing in a semi-squeezed condition. The coal in such cases is mostly lost, or, if mined, is recovered only at an excessive cost. The fundamental idea of mining according to this method appears to be to concentrate in developing entries and rooms, spacing the latter as close together as possible so as to secure production more quickly, also to make the room breakthroughs easier to drive.

In such mines, from 50 to 60 per cent of the coal is secured in first mining. The balance is left as a necessary evil to be removed by pick and shovel at a higher labor expense, a lower production per man, a higher haulage cost, an excessive use of timber and a high cost for cleaning up falls and retimbering. The final output is a shattered dirty product which is a natural consequence of these adverse conditions. A large percentage of the coal also is entirely lost.

The block system of operation simply reduces to a minimum the coal removed in first mining. Large substantial blocks are left for pillar operations so that instead of pillar drawing being undesirable both as to cost and working conditions, the size of the blocks, and the protection they afford together with the concentration of labor rendered possible, make the work even more attractive than development from every standpoint. After a block system has been once established the major portion of the production from the mines is derived from the removal of the pillars. Development work easily takes care of itself and only 25 to 30 per cent of the coal is produced in this operation. Drawing of pillars is, of course, done by undercutting with two or more men working on each pillar.

ALL PASSAGES ARE DRIVEN ENTRY WIDTH

In the accompanying illustrations, Fig. 1 shows a block system differing from many old room-and-pillar projections in the width of the centers only. This plan shows all work driven entry width, blocks 84 ft. each way with 24 per cent of the solid coal removed in first mining. This plan is particularly adaptable to the Pittsburgh bed, although under other conditions the rooms can be widened out providing the centers are likewise extended so as to give blocks of maximum size. The plan shows all rooms driven to their limit as soon as they have been necked. It will be found, however, that after getting a long break line estab-

lished, room development can be retarded by skipping two or three rooms occasionally and driving them only when required for the break line.

In Alabama I have seen mines employing 800 men of whom 12 were employed in drawing pillars that were badly squeezed. I have seen mines in that state 45 years old still working by the original methods under which they were started, that is taking 50 per cent of the coal in first mining and working out quarter-mile squares before starting pillar drawing. This results in the mines spreading over enormous

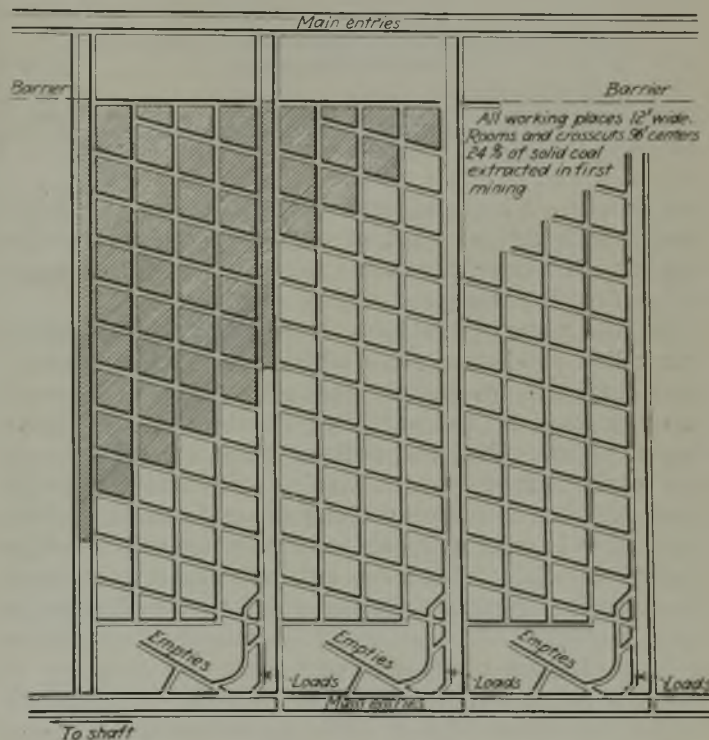


Fig. 1—A Mine Developed on the Block System

This plan differs from the ordinary room-and-pillar mine only in the width of rooms and the distance between centers. All passages are here driven entry width and the resulting blocks are 84 ft. each way. Only 24 per cent of the coal is removed in first mining, leaving the other 76 per cent for pillaring operations.

areas, four to five miles from the opening, while at the same time a large percentage of the coal is lost.

The principal objection to the block system in that region is that it is new and unfamiliar not only to the loaders, mostly negroes, but to the foremen as well.

Again in West Virginia mines may be seen that have been worked out to the extent of 70 to 75 per cent and then abandoned because it had become dangerous to draw the pillars. Such properties are sometimes purchased by a neighboring operation, in order to secure the villages that have been built on them, as well as to get the equipment installed.

An advance pillaring block system is shown in Fig. 2. This is well adapted to a comparatively flat bed and mechanical haulage because all pillar coal must be hauled parallel to the direction in which the butt entries

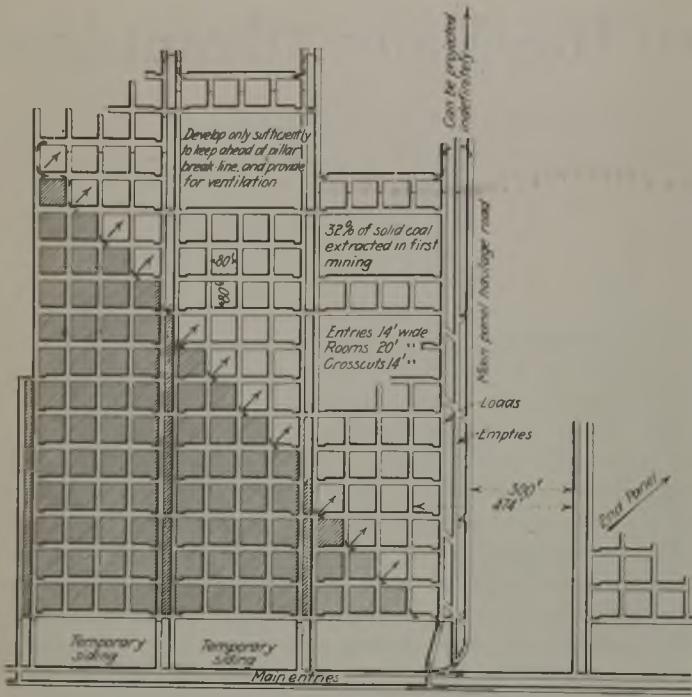


Fig. 2—Block System Particularly Adapted to Mechanical Haulage

This plan is especially adapted to comparatively flat beds. Rooms are driven 20 ft. wide on 100-ft. centers, giving blocks 80 ft. each way. First mining yields 32 per cent coal recovery. All pillar coal is hauled in a direction parallel to the butt entries.

are driven. This plan shows 20-ft. rooms and 80-ft. blocks with 32 per cent of the coal removed in first mining. However, for use in the Pittsburgh bed, entry width for all passages would be preferable.

In this plan efforts have been made to establish a break line as shown, after which development becomes secondary, the principal production from each panel being secured by concentrating on the removal of the line of pillars. Material such as track, etc., is continually moved forward as the break line advances and new sidetracks are constructed along the main panel haulage road. The barrier along this roadway not only provides protection while advancing but will furnish working places when the panel is finished and the chain pillar is ready to retreat. Some companies are projecting these panels a distance of 5,000 ft. or more.

A few of the many methods employed in removing blocks is shown in Fig. 3. The size of the blocks them-

selves makes the pillar operations secure from squeezes, safe for any reasonable method of pillar extraction and the work desirable for undercutting. These considerations form the chief arguments favoring this system.

For purposes of comparison with the block system, Fig. 4 shows the survey of a typical West Virginia "snowbird" opened during the war with a two-mile truck haulage to a private railroad siding. This mine produced 100 tons daily. The pillars will remain where they are shown.

Many of the largest companies in both West Virginia and Pennsylvania long ago changed to a block system. In Pennsylvania many mines have projections showing 100-ft. blocks, these being permitted by the mining law. The major portion of the tonnage, however, comes from smaller operations which have not altered their methods to any appreciable extent, and are hoping for

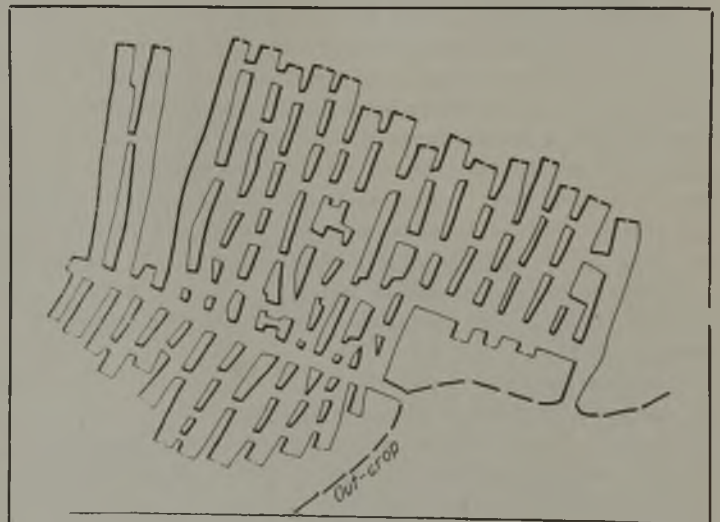


Fig. 4—A Typical "Snowbird"

Many mines such as this were opened during the war or just after its close. Inasmuch as immediate production was a paramount requisite the coal was "hogged" with no regard for the future. The pillars of this and similar mines can never be recovered.

another increase in prices which would allow them to withdraw standing pillars. When such a time arrives, however, the management may be so engrossed in retaining its labor and increasing its production that developments will be pushed still further and the next season will find the same old area of dangerous pillars.

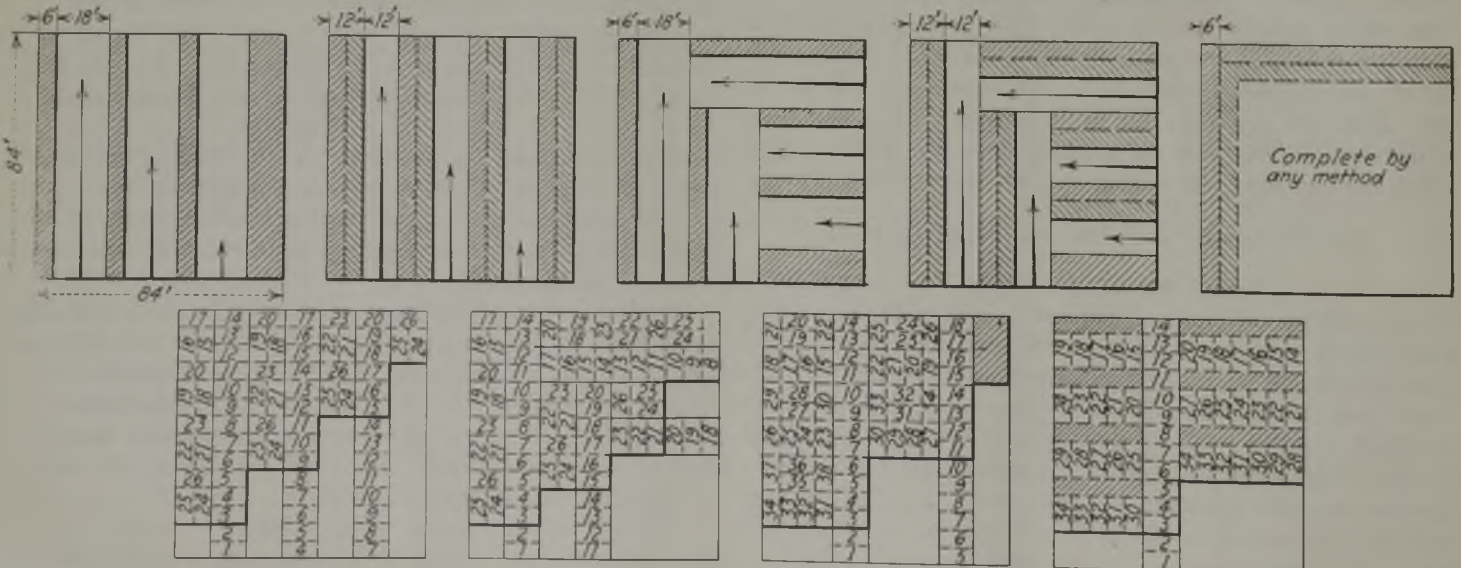


Fig. 3—One Method of Drawing Block Pillars

These pillars because of their size render the mine secure from squeeze, and any ordinary method of extraction can be followed with safety. Undercutters may be employed in pillar drawing to advantage.

British Experiment with Bituloid as Dust Layer

Limited Trials Indicate Possibilities of Allaying Mine Dust with Colloidal Oil—Cannon Shots Into a Coal-Dust Cloud Fail to Ignite Dust Thus Treated—Further Experiments Appear Warranted

COAL DUST has long been recognized as a potent factor in mine explosions and one which contributes largely to their violence. Much effort has therefore been directed toward preventing coal dust from propagating an explosion. In general two means have been adopted to this end namely, (1) neutralizing combustible coal dust by mixing with it an incombustible stone dust and (2) wetting down accumulations of fine coal particles with various liquids the most common of which is water.

Unfortunately, probably because of the high surface tension of water and the somewhat greasy nature of coal, especially when in a finely divided state, water will not readily permeate a mass of coal dust. Furthermore water will in time dry out of dust leaving it free to be raised in the air almost if not quite as readily as if it had never been treated or wet down. In order to overcome this difficulty various other substances have been added to or mixed with water to decrease its surface tension and increase its dust-penetrating ability. Soap, water glass, carbolic acid and various other substances have been tried for this purpose. All in varying degree reduce the surface tension and permit a more rapid infiltration of water into dust accumulations. Many of these substances also, upon drying, leave the coal dust so caked that it cannot be thrown into a cloud upon the initiation of a gas explosion.

Anyone who has observed the effectiveness of oil in laying the dust of a country road can readily appreciate that when applied to the coal dust of a mine it acts in a manner quite different from either water or stone dust. Strangely enough certain oils penetrate coal dust more readily than does gasoline and do not dry out for a long time. Such an oil possesses the highly desirable quality of seeping through the dust to the surface where it tends to catch and hold any other fine particles that may be floating in the air. Thus air in traversing a mine passage that has been treated with, say, a bituloid solution is purified rather than contaminated as it would be in traversing a passage that has been rock dusted.

Prof. Henry Briggs and Norman H. Wales recently presented a paper on the subject of "Colloidal Oil (Bituloid) as a Medium for Laying Coal Dust," before the South Wales Institute of Engineers. Some of the "high lights" of this paper are as follows:

The dominant factors governing the ability of a

liquid to wet down coal dust are the size of the dust particles, the surface tension of the liquid and some relationship not yet determined existing between the constituents of the liquid and of the dust. Of these the most important is surface tension.

Prof. W. M. Thornton in 1911 advocated the use of a liquid that served as a cement-like binder, but it is now believed that greater effectiveness can be attained

by employing a liquid that does not cake or cement the dust together but which dries with difficulty keeping the surface of the dust in a sticky or "tacky" condition. Bituloid, which is a heavy road oil intended originally for use on the surface, possesses the quality of remaining plastic for a long time. It readily seeps through dust deposits and keeps the surface moist thus quickly catching and holding any additional dust that may come in contact with it.

Bituloid is a milk-like substances consisting of:

Mexican bitumen, 15 to 20 per cent; green tar oil, 30 to 35 per cent; oleic acid and caustic soda, 1 to 2 per cent and water, 48 to 49 per cent. The ingredients of this mixture are so minutely divided and thoroughly mixed that they form a true emulsion the particles of oil and bitumen remaining in permanent suspension. In treating roads on the surface it is customary to add 19 parts of water to each part of bituloid, the resulting mixture thus containing about 2½ per cent of oil and bitumen. A stronger solution appears desirable for use on coal dust, and in most of the experiments performed with this substance a 10 per cent solution of oil and bitumen was employed.

Experiments thus far conducted with this material would seem to indicate that in application a coarse spray is preferable to a fine one. Furthermore the liquid should, if possible, be projected against the mine surfaces with appreciable force if best results are to be expected. If the mine passages are already well covered with coal dust two or three applications of bituloid in rapid succession may be necessary in order to bring the surfaces of the passage to the proper condition. Cleaning the surfaces and removing the dust present will facilitate the bituloid treatment and make more than two applications unnecessary as an initial treatment.

Once adequately treated most mine passages can be kept in proper condition by comparatively infrequent applications. The interval between treatments will, of course, depend on the rate of dust deposition and the drying power of the air current traveling. It is

estimated that one application in six weeks will be ample in most cases. The expense of laying dust by this means, of course is confined to the outlay for the material itself and the labor entailed in its application. The investment in equipment is small and there is no fixed charge for a preparation plant as with rock dust.

Several tests have been made with this material at various places. At the Eskmeals experiment station the floor of the experimental gallery, which is 200 ft. long and 7½ ft. in diameter was thickly strewn with coal dust. One half this length was then treated with a bituloid solution containing 5 per cent of oil and bitumen. The ends of the gallery were then boarded up and allowed to stand for three weeks. At the expiration of this time the boarding was removed, and it was found that the liquid had thoroughly wetted the dust, the surface still displaying an appreciable degree of adhesiveness. Dust readily was raised by the feet of the observers when traversing the portion of the tube where the material was untreated, but none was raised where the dust was bituloided.

EFFECT OF SPRAYING LASTED THREE WEEKS

At the Annesley colliery in Nottingham, England, two lengths of steel-timbered heading, 308 and 105 ft. long respectively and located near the downcast shaft bottom were treated on Oct. 6, 1922, with a bituloid solution containing 5 per cent of oil and bitumen. The volume of air traversing the heading where these applications were made was 32,544 cu.ft. per minute, the average saturation of this air being 74 per cent.

The longer section received a second dressing on Oct. 28. An inspection was made on Nov. 3, and it was found that the floor dust was damp and could be squeezed into a cake in the hand. The dust on the sides of the heading formed a plastic layer that required a knife for its removal. Under these conditions the effect of double spraying lasted three weeks after which freshly deposited dust was no longer retained, and another application of bituloid was necessary. In untimbered roadways carrying a high velocity of comparatively dry air the results obtained were not as satisfactory, the effects of an application disappearing in a few days, rendering retreatment necessary.

Tests of this method of laying dust were also conducted about the same time at the Bestwood colliery, in Nottinghamshire, England. These likewise indicated that a close connection existed between the drying power of the air current and the length of time that might logically elapse between applications of bituloid. In one haulage road 11 ft. wide and 6 ft. high carrying 33,000 to 35,000 cu.ft. of air per minute at 73 deg. F. and 90 per cent saturation, surfaces covered with stone dust that had been previously applied, when sprayed with 2 gal. of 5 per cent mixture per linear yard of heading, remained in good condition for a month, the floor being the first surface to show need for retreatment. During this time about 800 tons of coal was transported through this passage daily.

Early in December, 1922, a trial of bituloid was made in the Llanbradach colliery. This test was conducted on an intake haulage road. The velocity of air in this passage was 300 ft. per minute, the temperature 53½ deg. F. and the humidity about 80 per cent. The section selected was 240 ft. long. A part

of this distance was arched, part timbered and the remainder supported by "horse-shoe girders" backed by wood lagging. A large quantity of dust had collected on the roof and sides. That on the floor was kept wetted down by means of water sprays installed at intervals.

Without cleaning this passage and while the floor was wet an application of 20 per cent bituloid was made with a pressure pump. Under the circumstances no great success was anticipated. On examination fifteen days later, however, the treatment appeared to have been effective on the roof and sides but not on the floor.

Tests at the Newbattle Colliery, Midlothian, Scotland, conducted during November and December, 1922, gave the following results: (1) Bituloid caught and bound coal dust into a mass of such a character that it could hardly be expected that it would be thrown into a cloud in the air by any explosion wave however forceful. (2) It reduced the quantity of dust floating in the air. (3) A 10-per cent mixture of bituloid appeared to be most suitable. (4) A single application on dusty surfaces appeared to be of little value; at least two preliminary dressings were needed to afford the desired adhesiveness. (5) An effective cleaning should precede bituloid application. (6) Surfaces to which dust most readily adheres such as wood, are those to which bituloid also most readily adheres. (7) On the intake haulage road, where the tests were conducted, the surfaces retained their stickiness for over a month.

One objection advanced to the use of any material such as soap or bituloid for laying dust in mines is that such material unquestionably adds to the combustible content of the dust. As a matter of fact, however, a mixture of bituloid and coal dust no matter how thoroughly it may be dried out never attains such a condition that the dust could be raised in a cloud. It is believed therefore that an explosion of the mixture is thus rendered impossible.

BITULOID PREVENTS COAL-DUST IGNITION

In order to ascertain definitely by trial whether an application of bituloid solution would prevent the ignition of coal dust a series of experiments were made in a short narrow drift of the Straiton limestone mine, of the Shotts Iron Co., in Midlothian, Scotland. Obviously such tests could not be prosecuted in an operating coal mine. It was of course necessary to make such arrangements that ordinary untreated coal dust could be exploded without fail before trials were begun on treated dust.

Impressions made upon the eye were not reliable indications of the intensity of the explosion produced. The force of the blast of air created was more trustworthy, but the impression made on a photographic plate was more satisfactory still. A camera accordingly was used in recording results.

In order to ignite the dust a cannon with a 1½-in. bore loaded with 1 lb. of 2 oz. pellets of black powder and stemmed with 2 oz. of coal dust was fired electrically into the cloud of dust created by a "cloud raiser" placed in front of it and fired about one second previously. This cloud raiser was a lump of clay with a small vertical hole in its top and loaded with a 2-oz. pellet of black powder stemmed with 2 oz. of coal dust. The cloud raiser was placed 3 ft. in front of the cannon. With this arrangement 7 to 8 lb. of coal dust

distributed on shelving along the sides of the drift could be ignited time after time.

In order to simulate as nearly as possible the condition of maximum risk, the dust raiser and cannon were not fired until after bituloided surfaces of the drift had been sprinkled with a greater quantity of coal dust per unit area than would normally be deposited upon them between treatments and a certain time interval had been allowed to elapse. As no means could be found for distributing the dust evenly and uniformly hour after hour, it was all distributed at one application. At least a full day (24 hr.) was then allowed to pass before the cannon was fired.

The results of this procedure were as follows: On the first day the drift was cleaned and the surfaces strewn with 8 lb. of coal dust after which 6 gal. of a 10-per cent bituloid solution was applied. On the third and seventh days the dust was again sprayed with a bituloid solution of the same quality after which an additional 4 lb. of coal dust (making a total of 12 lb.) was distributed. This treatment was intended to simulate that administered to a dusty road where three applications of bituloid would be employed.

On the eighth day the surfaces were examined and it was found that the bituloid solution had absorbed the dust, with the exception of a little here and there. The surfaces were "tacky." The cloud raiser and cannon were then fired in the usual manner, but the photographic plate showed that no dust ignition took place.

On the sixteenth day the surfaces were again examined and found to be still adhesive. More coal dust, 4 lb. of it, making 16 lb. in all, was distributed. On the seventeenth day it was found that the bituloid had absorbed the additional dust. The cloud raiser and cannon were again fired, but the photographic plate once more showed no dust ignition. Four more pounds of coal dust then were distributed, making a total of 20 lb.

Again on the twentieth day the surfaces were examined and found to be adhesive. Once more the cannon was fired, but the photographic plate showed no dust ignition.

This series of experiments was terminated by a collapse of the wall along the side of the drift. This wall was eventually rebuilt, and the drift again rendered accessible. The surfaces that remained undisturbed were inspected on the seventy-eighth and ninety-eighth days after the first application of bituloid. Sluggish ventilation and high humidity were favorable to the slow drying of the bituloid. The dust remained closely bound in a soft matrix even fourteen weeks after the first treatment.

FURTHER EXPERIMENTATION APPEARS WARRANTED

These experiments, of course, were not conclusive, nor were they intended to be. Thorough demonstration can only be made by a long series of tests under widely varying circumstances. The results thus far obtained, however, would appear to warrant the initiation of such experiments.

This general method of allaying mine dust, although nothing positive concerning it may yet be said, would appear to possess certain more or less definite advantages and disadvantages. These might be briefly enumerated as follows: Rockdusting is the most efficient method of preventing dust explosions that has

yet been thoroughly demonstrated. This practice, however, particularly on roads that are seldom cleaned tends toward a pollution of the mine air rather than toward its purification. Working or walking in places encumbered with dry dust of any kind is unpleasant and may expose the men to dust diseases. Bituloid, repeatedly applied to dusty mine passages that are not systematically cleaned, in time will render such places almost impassable. Though a bulk sample from the floor, ribs, roof and timbers of a place that has been rockdusted may show 50 per cent of incombustible matter, inasmuch as the coal dust is deposited on top of the stone dust, the outermost layer or that first affected by an explosive wave will undoubtedly contain a higher percentage of combustible material. Bituloid impairs mine illumination instead of improving it. On the other hand its use would check, if it did not entirely prevent, the growth of fungi on mine timbers.

BITULOID OPENS WIDE FIELD OF POSSIBILITIES

Three other questions involved in the use of bituloid can only be determined from experiment or from experience. These include the effect, if any, of a current of air of high drying power; the effect of bituloid on the weathering of shaly rock, and the effect of spraying this material on the insulating cover of power cables. At the Annesley colliery some samples of shale were dipped in water and others were dipped in bituloid solution, after which they were all allowed to dry. Those dipped in water crumbled in a short time, but the others did not disintegrate.

As bituloid or some similar oil product appears to open a wide field of possibilities it would seem that some careful experiments as to the effects of its application would be fully justified. It is only through careful test that the possibilities and limitations of any process or material may be determined with accuracy.



This Big Chunk "Just Happened"

They didn't try to mine this 2 ft. 6 in. x 2 ft. 9 in. x 4 ft. chunk weighing approximately 2,200 lb. It just happened. The Pittsburgh coal bed (this piece came from the Pittsburgh Coal Co. Montour No. 9 mine, on the Montour R.R.) is noted for its well defined cleavage faces and butts at right angles thereto. This lump came down in a room face just as it is shown in the picture and this particular chunk has within itself no cleavages at all, although the surrounding coal is characterized by the usual rectangular faces. The man on the right in the picture is James Davidson, superintendent of Montour No. 9.



Thew Shovel in Hanna Mine

They Are Solving Coal-Loader Problems at Hanna

Wyoming Thick-Seam Conditions Seem Ideal for Loading Machines Yet Heavy Time Losses Cannot Be Avoided—Small Units Save Money Even at 104 Tons a Day—Single Track with Switch Proves Best for Rooms

EVERY mine offers its own peculiar obstacles to mechanical underground loading. And in every one, when these problems are worked out, machine loading pays. In the No. 4 mine of the Union Pacific Coal Co., for instance, where coal is 32 ft. thick, where roof conditions are good and there is no forest of timber to contend with, T. H. Butler, mine superintendent, once thought conditions were ideal for loading machines. Loading machines are having their opportunity—Joys and big Thews working in conjunction—yet the “ideal” conditions managed to yield a large crop of adverse circumstances which Mr. Butler described in a recent discussion before the Rocky Mountain Coal Mining Institute.

But in spite of the adversities the machines “earned their keep” during the first six months of this year, as Eugene McAuliffe, president of the company, revealed. He said the Thews loaded coal for 52.4c. per ton, a saving of nearly 28c. a ton over hand loading, and the Joys saved 11c. a ton. Together the saving averaged 25.2c. a ton; but it was Mr. McAuliffe’s opinion that neither type of machine could have done it alone. The Joys made it possible for the Thews to do their work so well.

The system at Hanna is for the Joy machines to take out the lower 8 ft. of the 32-ft. seam, in rooms 32 ft. wide and sometimes 800 to 1,000 ft. long. The Thews then load out the next 18 ft. above, the aim being to leave 6 ft. of top coal to hold the soft sandstone roof. This scheme looks admirable on paper, but the seam pitches from 14 to 17 deg. which introduces complica-

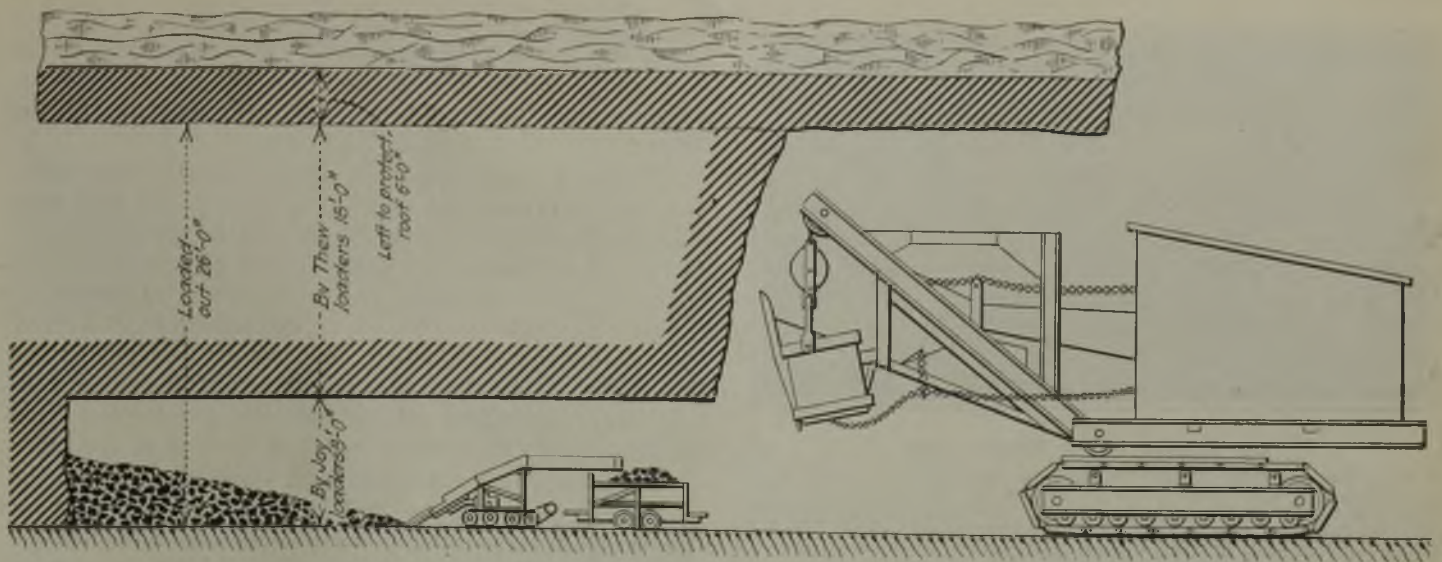
tions, for it takes a long time and a lot of effort to move the Thews from room to room. The rooms are driven on the strike and planes are used on the pitch. When faults are encountered, the planes are driven between the faults.

The Joys averaged during that six months only 104 tons a day per machine and the Thews but 140 because they could not be kept running steadily. Mr. Butler said the machines undoubtedly would load the coal if it were possible to keep them in coal all the time, but there are always many seemingly unnecessary delays to be overcome. Changing cars, breaking lumps, pulling coal loose from the face that a machine will not dig, repairing machines and the heavy time losses due to moving the machine on the heavy pitch have been the main difficulties.

In January, 1916, the company installed a Type 1 Thew shovel, equipped with a 1½-yd. dipper, and in July, 1917, it installed a Type 0 Thew, equipped with a 1-yd. dipper. In 1918 two additional Type 0 Thew shovels equipped with 1-yd. dippers were added, making a total of four Thew shovels for this mine.

“The introduction of these shovels,” said Mr. Butler, “caused the employees much concern, and, like all departures from the old methods of mining, met with the indifference of some and the open antagonism of others, so that for some time the results obtained were not satisfactory.

“However, in consequence of constant supervision and changes in the method of haulage the results obtained at present, though not entirely satisfactory,



The Loading System at Hanna No. 4 Mine of Union Pacific Coal Co.

In order to make room for shooting down a great pile of coal in front of Thew shovels, the bottom 8 ft. is taken out by Joys in rooms 32 ft. wide and of various lengths up to 1,000 ft., depending on local conditions. The next 18 ft. is loaded by the Thews and 6 ft. at the top is left to hold the roof.

are much better, and the production and costs are reasonably good. The Thew shovels in use are mounted on traction wheels with swivel axle and move in all directions by their own power. Though the weight of each is approximately 20 tons, they are not as cumbersome as one would think and they are easily operated.

"The method used in working these Thew shovels is to shoot the coal down ahead of them and maintain two tracks, two cars being used on each track, so that a shovel is loading on one track while the driver is changing cars on the other. When the place is finished the shovel is run back to the first crosscut by its own power, and lowered to the next room with block and tackle, the roof coal in the crosscut being shot down to a height of 16 ft. to allow the boom to pass.

"With better results from the Thew shovels the officials of the company soon realized that it was necessary to find some means by which rooms would be developed faster than mere human power could drive them, for otherwise the Thew shovels would soon exhaust the working places available. So in November, 1923, the company purchased two Type 4 B U Joy loaders. These machines met with the same indiffer-

ence and antagonism from the employees as had the Thew shovels. For a time the results were discouraging, but for the past six months they have been better, and at present, though production and costs are not entirely satisfactory, they are, in my opinion," says Mr. Butler, "reasonably good.

"As I see it, the big problem of successful mechanical loading is transportation, and that means working out a system of haulage so that empty cars are at all times available at the loader, or, better still, the development of a system of sectional conveyors to take the coal from the loader at the face to cars or to a conveyor on the plane.

"The blasting of the coal also is a matter of importance in the successful operation of mechanical loading, for the coal must be loose and of a suitable size to be readily handled. In this respect we are somewhat handicapped, as the coal is of a woody nature, with no cleavage or fractures, and has no roof parting to shoot to in the advancing places, all of which makes it difficult to provide coal so loose and of such size as to be handled readily by the loaders.

"How to lay the tracks in the advancing places so as to keep the cars as close to the loaders as possible also is a problem. It seems to us that the fewer tracks

Seven-Month Record of Thew Mechanical Loader

Month	Tons Loaded	Delays Hours	Days Worked	Average Daily Tonnage	Number Loaders Working	Number of Men in Crews	Number Tons per Man	Tons per Man, Hand Loading	Remarks
Jan.....	12,904	124	23	561	4	12	46.7	14.0	
Feb.....	11,659	70	21	555	4	12	46.2	13.6	
March.....	7,907	79	13	608	4	12	50.0	15.6	
April.....	4,677	18	11	425	2	6	70.0	16.3	
May.....	3,914	30	8	489	3	9	54.3	14.8	
June.....	5,656	54	9	628	4	12	52.3	13.3	
July.....	8,224	91	13	632	4	12	52.6	13.0	
Totals...	54,941	466	98	3,898					Two shovels idle on account of repairs One shovel idle on account of repairs

Average daily tonnage per loader, 140 tons.

Seven-Month Record of Performance of Joy Mechanical Loader

Month	Tons Loaded	Delays Hours	Days Worked	Average Daily Tonnage	Number Loaders Working	Number of Men in Crews	Number Tons per Man	Tons per Man, Hand Loading
Jan.....	4,643	77	24	201	2	8	25	14.0
Feb.....	4,581	55	21	218	2	8	27	13.6
March.....	2,810	37	13	216	2	8	27	15.6
April.....	2,085	39	11	190	2	8	24	16.3
May.....	1,772	20	8	221	2	8	27	14.8
June.....	2,069	29	9	230	2	8	28	13.3
July.....	2,666	42	13	205	2	8	25	13.0
Totals.....	20,626	299	99	1,481				

Average daily tonnage per loader, 104 tons.



Joy Loader in the Hanna Mine

The Joy machine is used to load out the big 8-ft. undercut in the mammoth 32-ft. seam, thus preparing the way for the surface-type Thew shovel which loads out 18 ft. of the rest of the coal. The Hanna bed dips 14 to 17 deg. and the delivery of cars is thus greatly hampered, but the shovel nevertheless makes a saving.

used the better. Our experiences have taught us that by keeping a 5-car parting 25 or 30 ft. from the face

Alberta Coal Field Soon to Be Opened

PART B of the Summary Report of the Geological Survey of Canada, for 1923, just issued, contains an account of a preliminary investigation of the coal deposits along the Smokey, Hay, and Berland rivers, in northwestern Alberta, by J. MacVicar. Though this investigation is admittedly of only a preliminary nature, it gives a large amount of useful information about a region that, when opened by railway facilities, is likely to prove one of the most important coal areas in Canada. The investigation takes into consideration a strip of land 80 miles in length and 8 to 10 miles in width at the southeastern end and 25 miles wide at the northwestern end, extending in a northwesterly direction from Brulé, 180 miles east of Edmonton. In this area the thickness of the coal measures average 3,000 ft., and the individual beds range from a few inches up to 56 ft. thick. The coal varies in grade from bituminous to semi-anthracite, the lowest beds, because of the greater pressure to which they have been subjected, contain the higher carbon content.

These coal measures belong to the Kootenay formation, and where worked are noted for their evenness. Basing his calculations on this regularity and on the dimensions of the beds where they outcrop and at points at which they have been opened, Mr. MacVicar estimates that the area under consideration contains 10,000,000,000 tons of workable coal. The northwestern part of the area, which contains some of the thickest beds and is estimated to contain 7,000,000,000 tons of bituminous and 70,000,000 tons of semi-anthracite coal, has been withdrawn from location and is retained by the government as a national coal reserve.

At Brulé, in the southeastern part of the area, a considerable amount of development has been done and coal is mined for use on the Canadian National Ry. At this point the measures are 3,680 ft. thick and contain one 14-ft. and five 7-ft. beds. The top 700 ft. and the bottom 1,200 ft. of the measures contain no workable coal bed. Development in other parts of the area has been small, because there is no railway communication. The Canadian National has surveyed a route for a line to the north branch of the Hay River, which, with feeders, would give access to the first 40 miles northwest of Brulé. This road and also the Canadian Pacific

and by using a single track from parting to face we get better results than by using two tracks, the loader crew pushing the loaded car from the machine to the parting and the empty car from the parting to the loader.

"For each Thew shovel we have a crew of three men, one operator and two trimmers, one of the trimmers shifting the cars from the shovel to the plane parting. For each Joy loader we have a crew of four men, one operator, two trimmers, and one driver. I notice in the mining journals that many operations have a crew of two men on Joy loaders, but owing to large lumps that have to be broken and the half loosened coal that has to be pulled off the face, our production from loaders would decline if we reduced the size of the crew.

"Our production from the four Thew shovels and the two Joy loaders in use will average 50 per cent of the output of the mine. The attached tabulated statements show the results being obtained by the use of mechanical loaders."

are considering branches into this district, which has been demonstrated to be one of the best agricultural regions in the Dominion. There is every reason to expect therefore that a railway will be built into this district in the near future.

Salt Water to Avoid Fatigue

BY SIR JOSIAH COURT

DR. J. S. HALDANE has suggested that the cramps of mine workers in hot mines may be due to excessive loss of sodium chloride through profuse and prolonged sweating aided by the drinking of much water. In consequence experiments were made with a few miners who were given a weak solution of water when at their work. The proportion of salt was about $\frac{1}{4}$ per cent or 10 g. in 1 gal. of water. The result was satisfactory and justified its use.

It occurred to me to try the use of salt at a colliery where the air temperature at the coal face was considered high. I interviewed six miners as they left the Warsop Main pit. The four places in which they had been engaged had temperatures varying from 79 to 81 deg. F. All the men consented to take my advice and put salt in the drinking water that they brought to the mine. After a month's trial they all said they were less tired than usual after their work was over. One man not only said he was less fatigued but less anxious for his usual nap after his return home. The wives declared their husbands were more energetic when they came off shift. Another man said that attacks of cramp in his leg had ceased to trouble him since using salted water.

The boilermen at Warsop Main were working in an average air temperature of 96 deg. F. (dry). On my recommendation they added half a teaspoonful of salt to every quart of water they drank. They usually consumed four pints daily. Twelve days later I saw them again, and every man was pleased with the experiment. They all stated that when they reached home in the evening they felt less tired than they had been when drinking unsalted water.

From a paper read before the Institution of Mining Engineers, London, Oct. 2, 1924. (Eleventh Report to Committee on "The Control of Atmospheric Conditions in Deep and Hot Mines".)



News Of the Industry



Coal Stock Report Again Emphasizes Need of Distribution Data

Features Surprising to Trade Reveal Lack of Statistics Comparable with Those on Production—Demand for Figures Becoming Insistent—Interesting Light Cast on Industrial Conditions

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Correspondence reaching Washington shows that there was general surprise in the coal trade and among consumers that the country's stocks should have been 47,000,000 tons on Sept. 1, as shown by the report issued jointly by the U. S. Geological Survey and the Bureau of the Census. In some quarters there is a disposition to doubt the returns. Those who hesitate to accept the figures in the stock report base their attitude on the fact that production was low during April, May and June—lower than in those months of 1921—yet the stock report shows a reduction of only 15,000,000 tons since Jan. 1 and 4,000,000 tons since June 1.

The explanation of the apparent contradiction between the production and stock figures is that consumption of coal has been at a low ebb. In fact, it had fallen to a lower point than had been realized.

The stock report presents conclusive evidence that the country has been going through a period of dull business which almost could be characterized as a depression. In the iron and steel industry, for instance, which affects coal more than do many light industries, the depression was severe. The output of pig iron in July was the lowest in any month since February, 1922. To be specific, production of pig iron in July was 1,785,000 tons. This was barely half the rate of production in July, 1923, when it was 3,678,000 tons. Even the July, 1922, production was 2,403,000 tons.

Leaders Mum on Eve of Election

Naturally on the eve of an election business leaders are not saying much about the depressed state of industry, but the figures in the stock report tell an interesting story.

In the first quarter of the year the output of iron and steel was well up around the level of 1923, a very prosperous year, but beginning in April it began to tumble "like Niagara," to use an expression often employed by Dr. Garfield. In so far as the iron and steel industry is concerned it certainly sank to depression levels in midsummer. It is now moving upward at an encouraging rate, but has not recovered to the point where its consumption of coal is heavy.

One of the reasons why the present period of sluggishness in business has passed without much comment is that business has been spotty. Building and certain other activities have been brisk, but the heavy industries that are the large consumers of coal have been in the doldrums. They have been conspicuously absent from the coal market.

It is noticeable that the changes in coal stocks since Jan. 1 reflect closely the trend of general business. From Jan. 1 to June 1 the liquidation of stocks went on rapidly, but from June 1 to Sept. 1 it was very slow. The stock report shows clearly that the severe depression in coal was not due merely to undigested stocks held by consumers, but was due mainly to the fact that the country was passing through a period of depression. The coal market would have been dull even if there had been no stocks. The fact that there is a heavy reserve still to liquidate is discouraging to the producers of coal and some are counseling curtailment of production, which has been rising sharply for six weeks. There can be no doubt that this would be good business, from the standpoint of the coal operator, but from the consumer's point of view it is regarded apparently as good business to continue to buy coal at present prices so as to maintain the reserve.

Coal Reserves Comfortably Large

The stock report shows that the country's reserve of coal is comfortably large. There is no prospect of a shortage this winter unless something unforeseen should occur. It would not be in the public interest for consumers to be lulled into a false sense of security and allow their stocks to fall below the danger line. There is increasing evidence, however, that American consumers at last have learned that ample reserves above ground constitute their best insurance against high prices.

Consumers of anthracite, however, are not displaying the same wisdom. Anthracite stocks for the most part still are in the hands of the retail dealers. The sudden advent of severe weather would wipe out these stocks quickly. Retail storage is designed for the gradual movement of a considerable portion of the coal handled. Stocks

These Miners Know How To Cut Mine Costs

Twelve union miners who have been making \$12 to \$15 a day each by running the Crawford Coal Co. mine near Brazil, Ind., on a co-operative plan have been ordered by the district union organization to quit or be ejected from the union for 99 years. The union officials declared the men, by doubling up on jobs and otherwise reducing operating costs, were producing coal so cheaply that other operators could not compete with them.

now on hand are not sufficient to supply more than immediate needs. A run on this reserve might come over a wide area and make it impossible for the producers to supply all the coal needed on such short notice.

The appearance of the stock report, carrying with it a great surprise for the entire trade, emphasizes anew the need for distribution statistics that are comparable, at least, with those covering production. That the demand for such figures is becoming more and more insistent is indicated by the great amount of attention given the problem as applied to all commodities, at the meeting of the Eastern Division of the Chamber of Commerce of the United States in Washington.

Coal Traffic at Cincinnati Breaks Record

As a coal-handling city Cincinnati is rapidly approaching the records established by Pittsburgh, if continued increases in interchange figures as regards coal loadings may be accepted as an indication.

Following the announcement several weeks ago that the highest previous interchange record had been passed, J. A. Morris, district manager of the American Railway Association, in his weekly letter to the Car Service Division at Washington last week reported a new high mark of 13,500 carloads of coal handled during the preceding seven days in the local terminals. This was an increase of 802 cars compared with the previous week. An increase also was reported in coal bound for lake ports.

Of the 17,336 empties interchanged during the week, 12,377 were open tops going to the mines. All coal loading roads except the L. & N. have been able to supply 100 per cent car equipment for the entire week.

Coal Exporters Charged With Unfair Competition

The Federal Trade Commission charges unfair methods of competition in the marketing of coal to South America in a complaint issued against the Gano Moore Co., New York City, and the Gano Moore Coal Mining Co., Philadelphia, Pa. M. Rea Gano is named individually as a respondent in the citation, and as the president and active director of the two responsible companies.

The complaint alleges that the respondents in their conduct of their business in export trade have accepted orders and received payment from foreign customers for coal of a specified quality and quantity, to be delivered in several shipments at specified times, and wilfully or through negligence have caused to be delivered for the coal so ordered coal of a quality inferior thereto, and have failed to make deliveries in the quantities and at the times specified. On the contrary, the complaint states, deliveries of inferior coal have been made and in less quantities and at later dates than specified, the total amount being much less than the total quantity ordered, thereby engaging in unfair competition with competitors in the United States engaged in foreign commerce who bid on and furnish goods of the desired quantity and quality, and ship at the specified time. The respondents, the citation continues, bring into disrepute and injuriously affect the entire exporting trade of the United States, and unfairly injure all competitors who fulfill their agreements and undertakings.

Tried to Raise Price

According to the complaint, respondents represented that they were unable to make deliveries under existing contracts although at the same time repeated offers were made to the same purchasers to ship larger quantities of coal of the same kind and quality but at greatly increased prices, also offering to ship under the original contract provided the purchaser agreed to pay an increased price and to enter into contract for additional shipments of coal at increased prices.

Further allegation of the complaint is that the respondents in order to defeat the purposes of alleged export regulations of the United States, which restricted the export of coal to a certain percentage of the contract quantity, proposed to the Central Argentine Railway, Ltd., that they enter into a fictitious contract for 200,000 tons of coal, the railway at the same time to receive a letter from respondents to the effect that the contract was in effect for but 50,000 tons. The railway refused to accept this proposal.

The methods employed by the respondents in the conduct of their business in export trade, according to the citation, have injured and damaged generally the reputation and the business of persons of the United States lawfully competing with respondents in export trade, and have brought such competitors into disrepute with purchasers in South America.

Now the Athletic Mule

"I've been reading those 'bright mule' stories," says a mining man. "Let me tell you about an athletic mule I knew out in a thin-seam Iowa mine. I took control of a mine out there and was viewing it for the first time. I had noticed the mules all were about 14 hands high. In looking around underground I came to a place where a boulder in the roof stuck down right over the track, leaving a clearance of only 3 ft. 10 in. Not being able to figure out how a 14-hand mule could get through a place like that, I sat down to see. Pretty soon there came a little trip on the run. I'll be darned if that tall mule didn't just juke down and slip under that boulder like a dog goes under a fence, and away they went without a pause. I had to laugh. Show me any other animal 14 hands high that can do any such stunt! That's my 'bright mule' story."

What's yours?

Fewer Mine Accidents Under His Régime, Says Pinchot

In an address at Erie, Pa., on Oct. 23, Governor Pinchot attributed the reduced number of mine fatalities and accidents in Pennsylvania during the past year to the economies and efficiency of his administration. The politically useful state employee has been dropped, he said, and jobs have been awarded to the efficient.

"The results speak for themselves," he said. "In the past, for example, many thousands of miners in Pennsylvania have lost their lives in cave-ins, explosions and the hundred and one sources of danger in the underground shafts.

"We have undertaken to reduce these accidents by eliminating the sources of danger. Better inspection all along the line has resulted in the saving of the lives of many of the miners. The statistics prepared by the Mines Department at Harrisburg conclusively prove that this department has rendered a service to the families of the miners that cannot be calculated in mere dollars and cents.

"There has been a steady and gratifying decrease in the number of fatal mine accidents. In proportion to hours worked, the year 1923 showed a considerable improvement over 1922, but 1924 has far outstripped any other year of the last decade in the decreased number of mine deaths. Thus in the first eight months of 1923, 388 men lost their lives in anthracite mine accidents. During the same period of 1924, 333 men were killed in the anthracite mines, or a reduction of 55 lives. Similarly, 293 men were killed in the bituminous mine accidents in the first eight months of 1923, while but 228 died in the soft coal mines in the same period in 1924. That represents a saving of 65 lives in the bituminous mines. Better inspection certainly aided materially in reducing by 120 the number of mine fatalities in a single year."

September Soft-Coal Exports Second Highest of Year

Total exports of bituminous coal from the United States during September amounted to 1,502,829 gross tons, the second heaviest monthly shipments during the current year and an increase of almost 110,000 tons over August exports, according to a report by the Coal Division of the Department of Commerce. Exports to Canada, totaling 1,201,280 tons, increased by more than 150,000 tons over August exports and were exceeded only by July shipment to that destination.

Overseas shipments of bituminous coal during September, amounting to only 281,886 tons, compared with 335,671 tons in August, were the lowest of the year; in fact September is the only month in which overseas exports have fallen under 310,000 tons. The chief cause of the decline in these shipments is the fact that exports to Italy dropped from 89,040 tons in August to 33,590 in September. There were only two other European countries to which American bituminous coal was shipped in September, 27,067 tons going to France against 37,401 tons in August, while 1,100 tons went to Spain.

Important increases occurred in shipments to parts of Central America and the West Indies. Among these were exports of 10,278 tons to Barbados, 6,755 to Trinidad and Tobago, and 7,674 tons to the Virgin Islands, to which destinations no coal was shipped during August. Exports to Cuba, however, fell from 67,183 tons in August to 46,184 tons in September, and to the French West Indies shipments during September amounted to only 1,118 tons against 9,452 in the previous month.

Although shipments to Brazil during September amounted to 77,282 tons against 80,892 in August, total exports to South America increased, amounting to 94,223 tons against 90,389 in the preceding month. This increase was due to shipments of 15,660 tons to Argentina in September whereas there were no shipments during August. An unusual feature of the coal export trade was the shipment of 1,776 tons to Japan in September.

Exports of anthracite during September, when shipments were the second highest of 1924, were 327,322 tons against 257,090 tons in the preceding month, the increase being due to heavier exports to Canada, 321,282 tons going to that destination in September against 246,316 in August. Exports of coke from the United States during September totaled 41,804 tons against 42,308 in August.

The Illinois Coal Traffic Bureau, in a complaint filed with the Interstate Commerce Commission Oct. 27, attacks the rates on bituminous coal from southern Illinois and the Belleville groups of mines as being unduly preferential to western Kentucky, to the extent that the existing differentials are less than 50c. per ton over the southern Illinois rates and 85c. per ton over the rates from the Belleville group, on coal moving via the East St. Louis gateway.

U. S. Anthracite Operators Visit European Mines

Much first-hand information about the methods pursued in mining under various conditions in England, Wales, Scotland, Belgium and Germany was gained during a trip of 55 days recently completed by S. D. Dimmick, vice-president and general manager of the Glen Alden Coal Co., and H. M. Warren, consulting electrical engineer of the same company, both of Scranton, Pa.

The visit of the Scranton mine officials to England was made at the invitation of Harry Walker, chief inspector of mines of Great Britain, who addressed a meeting of the Engineers' Club of Northeastern Pennsylvania in Scranton last May. Mr. Walker greeted his American friends upon arrival in England and prepared an itinerary for visits to the mines of England, Scotland, and Wales under his jurisdiction. The visitors found much to interest them, especially in the anthracite region of Wales.

Welsh Mines Lined with Brick

Mr. Dimmick was impressed with the depth of the mines in Wales. He said the average shaft is from 1,600 to 2,000 ft. deep as compared with average depths of 600 to 1,400 ft. in the anthracite field of Pennsylvania. He also noted the use of bricks to line the shafts in contrast to the American practice of using timbers, and steel ropes as conductors for the cage in place of wooden guides. The absence of surface subsidences, which cause so much trouble to anthracite operators in Pennsylvania, also impressed the visitors. The depth of the veins from the surface practically obviate such disturbances. Many of the mines recover all of the timber, the visitors learned, by mining out all of the coal and dropping the roof.

In Brussels the Scranton operators visited mines at Liege and Charleroi. While in the Ruhr district the party made its headquarters at Cologne. Here they were able to inspect the Frederick Hinrichs mine, regarded by the Germans as the most modern of its kind in



Thomas Fraser

Assistant professor of mining engineering in the University of West Virginia, in succession to C. E. Lawall who has been designated acting head of the department. Mr. Fraser is a graduate of the mining department of the University of Illinois, where he studied under the late Prof. H. H. Stoeck, E. A. Holbrook and A. C. Callen. He also was employed for four years on investigative work with the U. S. Bureau of Mines, principally in coal preparation and subsidence problems.

the world. Mines in Essen, Oberhausen and Duisburg, located in the occupied territory along the Rhine River, also were visited by Mr. Dimmick and Mr. Warren.

Several operators of German mines in Essen and Duisburg informed Mr. Dimmick that during the month of March, 1925, they contemplate coming to this country to spend several months on an inspection tour in the bituminous and anthracite regions. It is expected that they will come to Scranton, where they will be the guests of Mr. Dimmick. The director of the Gutehoffnungsuitle mine, in the Ruhr, is already in this country on an educational trip. He is expected in the hard-coal region soon.

Commercial Coal Stocks Up. Say Purchasing Agents

Commercial consumers of anthracite and bituminous coal on Oct. 1 had in their bins 52,468,725 net tons, according to the monthly survey of the National Association of Purchasing Agents. This is a decrease of nearly 11,000,000 tons when compared with May 1, but an increase of 1,143,725 tons when compared with the tonnage on hand on Sept. 1 of this year. The survey shows that the estimated production in September was 48,418,000 tons and the consumption 34,217,000 tons, as compared with 33,637,000 tons in August.

In its survey the association says that business increased a little in September over the previous month if coal consumption is a fair criterion by which to judge. It is significant, however, that the majority of large corporations used about the same tonnage in September as in August while the smaller ones showed an increase. The consumption of coal for heating industrial buildings during September amounted to 528,342 net tons, or 1.5 per cent of the total production.

Assigned-Car Order Postponed Again

The effective date of the assigned-car order of the Interstate Commerce Commission, restricting and regulating the distribution to coal mines of privately owned cars and cars for railroad fuel, which was to have been Nov. 1, was postponed by the commission on Oct. 23 until Dec. 15.

The commission's decision in the case, made on June 30, 1923, held to be unjust the practice of railroads in assigning private cars and system cars for railway fuel to bituminous coal mines in excess of the ratable share distributed to bituminous coal mines upon their lines which do not receive assigned cars. After the issuance of the first order postponements have succeeded each other with monotonous regularity.

Monthly Bituminous Coal Output in the United States in 1923 by States*

(In Thousands of Net Tons)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
Alabama	1,902	1,629	1,902	1,676	1,747	1,677	1,621	1,741	1,643	1,793	1,671	1,456	20,458
Arkansas	135	101	100	86	86	97	104	116	126	126	116	104	1,297
Colorado	992	921	879	750	736	759	691	758	866	977	963	1,054	10,346
Illinois	9,256	7,938	7,576	5,983	5,666	5,386	5,284	5,973	6,424	7,014	6,416	6,394	79,310
Indiana	2,890	2,439	2,586	2,089	1,725	1,802	1,878	1,927	2,226	2,337	2,188	2,142	26,229
Iowa	613	542	551	404	391	383	365	438	474	523	523	504	5,711
Kansas	408	342	344	290	300	287	289	335	350	373	378	340	4,036
Kentucky	3,714	3,118	3,488	3,284	3,777	3,657	3,902	4,303	3,892	4,513	3,847	3,282	44,777
Maryland	239	202	235	211	207	203	176	194	164	159	144	152	2,286
Michigan	142	105	144	91	52	51	70	92	109	126	106	84	1,172
Missouri	381	316	271	240	247	238	242	268	296	316	300	288	3,403
Montana	361	317	309	172	187	163	171	219	275	370	340	264	3,148
New Mexico	317	233	239	241	253	221	218	216	229	259	253	236	2,915
North Dakota	220	147	153	63	64	60	60	90	109	163	143	114	1,386
Ohio	3,567	2,764	3,329	3,113	3,770	3,848	3,559	3,817	3,488	3,675	3,120	2,496	40,546
Oklahoma	271	245	247	200	200	208	202	241	263	273	293	242	2,885
Pennsylvania	14,911	12,300	14,620	14,356	15,685	15,656	15,332	16,370	14,517	14,170	12,222	11,741	171,880
Tennessee	585	505	532	491	529	491	470	517	483	529	481	427	6,040
Texas	112	93	87	80	94	91	99	106	104	117	117	87	1,187
Utah	478	382	306	282	323	385	363	365	417	546	458	415	4,720
Virginia	926	846	1,035	1,012	1,097	1,038	998	1,090	991	1,039	886	804	11,762
Washington	326	307	333	145	193	193	152	204	236	305	293	239	2,926
West Virginia	8,310	7,170	8,501	8,272	9,826	9,688	9,938	10,475	9,440	10,320	8,359	7,601	107,900
Wyoming	817	621	611	472	483	452	477	672	669	829	750	722	7,575
Other states and territories	30	27	33	25	22	20	17	17	14	17	20	20	262
Total bituminous production...	51,903	43,610	48,411	44,028	47,660	47,054	46,678	50,544	47,805	50,869	44,387	41,208	564,157

* According to final estimates by U.S. Geological Survey.

(a) Includes Alaska, California, Georgia, Idaho, North Carolina, Oregon and South Dakota.

Delay of Assigned-Car Order Arouses Producers

The action of the Interstate Commerce Commission in delaying until Dec. 15 the effective date of its order abolishing the use of assigned cars in the procurement of railroad fuel is being criticized widely. There is a general desire in the coal trade to have the uncertainty removed. In some quarters the commission is accused of lacking the courage to put its order into effect in the face of the violent opposition which it aroused among the carriers. It will be recalled that the carriers were so certain that the commission would not abolish assigned cars that they made only a perfunctory effort in opposition to the proposal when the matter was first brought before the commission.

The dilatory tactics of the commission have so aroused some of the producing interests that inquiry has been made as to possible legal steps to require the body to express itself. While there is no statutory way of requiring the commission to take action, it is thought that just as effective results can be obtained by a Senate resolution inquiring into the causes of recurring postponements.

A probable explanation of the delay is thought to be that the commission is closely divided on the questions involved in the matter of assigned cars and mine ratings. The postponements, some think, are being ordered in the hope that some of the differences may be smoothed out.

The coal consumption of various industries as shown by the returns of the 1923 census of manufactures, now being issued, include the following: Rubber products, 544,105 tons; manufacture of steam and electric railroad cars, 44,630 tons; stoves, 94,783 tons; pianos, 102,108 tons; haircloth, 3,291 tons; manufacture of gas machines, gas and water meters, 24,120 tons; watches, 38,929 tons; grindstones and pulp stones, 10,884.

Six Hard-Coal Firms To Be Consolidated in \$20,000,000 Company

Special to Coal Age

Scranton, Pa., Oct. 27.—A twenty million dollar merger of coal properties in Luzerne and Lackawanna counties will be consummated here within the next few days, according to information from Frank W. Childs, of New York, who is back of the biggest consolidation plan yet attempted in the anthracite region. A syndicate of bankers of New York City are understood to be part of the combine seeking control of the collieries. The following companies, according to Mr. Childs, are included in the merger: Kingston Coal Co., Grand Tunnel Coal Co., at West Nanticoke; Jermyn Coal Co., Old Forge; Midland City Coal Co., of this city, and the West Ridge Coal Co., of this city with the Carbondale Coal Mining Company of Carbondale.

The Kingston company and Jermyn company properties are the largest listed in the combine. The former company with coal titles will sell for \$6,000,000, according to the option, it is said, and the latter company will be bought for \$8,000,000 if the option is taken up. The Grand Tunnel Coal Co. is another large corporation in the lower section of the hard-coal field. The Midcity and West Ridge collieries are known in mining circles here as excellent properties. Figures on the estimated coal acreage involved in the transaction were not made available, as detailed information regarding the collieries is not being given out for publication.

It is understood that Mr. Childs has handled virtually all of the details and obtained a majority of options held by the syndicate. For some months back experts have looked over the properties included in the list, together with a number of companies not in the combination. Most of the options expire this week and a definite announcement of whether or not the merger will be put through will be made before the end of the week. Originally, it is said, the

Coal Mining Institute Balloting On

Official mail ballots have been sent out for the election of officers for 1925 of the Coal Mining Institute of America. The candidates are as follows: President, A. C. Callen, Urbana, Ill., and Nicholas Evans, Johnstown, Pa.; vice-presidents (three to be elected), J. M. Armstrong, Pittsburgh, Pa.; A. C. Fieldner, Pittsburgh, Pa.; J. B. Hanford, Morgantown, W. Va.; W. C. Hood, Uniontown, Pa.; Eugene McAuliffe, Omaha, Neb., and J. J. Rutledge, Baltimore, Md.; secretary-treasurer, T. P. McTigue, Pittsburgh, Pa., and H. D. Mason, Jr., Ebensburg, Pa.; managing directors (ten to be elected), Ralph Beerbower, Pittsburgh, Pa.; Denis Boyle, Johnstown, Pa.; D. R. Blower, California, Pa.; F. W. Cunningham, Somerset, Pa.; M. D. Cooper, Pittsburgh, Pa.; Charles Enzian, Windber, Pa.; J. H. Evans, Mather, Pa.; W. G. Fear, Indianola, Pa.; W. E. Fohl, Pittsburgh, Pa.; William Hart, Parkers Landing, Pa.; A. E. Holbrook, State College, Pa.; A. B. Kelley, Greensburg, Pa.; R. M. Lambie, Charleston, W. Va.; Lee Long, Dante, Va.; Richard Maize, Uniontown, Pa.; J. W. Paul, Pittsburgh, Pa.; William Rigg, Pittsburgh, Pa.; Edward Stridle, Pittsburgh, Pa.; S. A. Scott, MacDonald, W. Va., and Fred Vinton, Indiana, Pa.

deal contemplated the merger of some fourteen companies in Lackawanna and Luzerne counties, but a recent turn of events has reduced the number to six. As first contemplated, the consolidation included the von Storch, Legitts Creek, the Spencer and Nayaug companies. Mr. Childs said that the name of the proposed company would be the Consolidated Mining Co. The company will have its main offices in this city.

Plans for financing the deal have been worked out, according to those who have been in close touch with the progress of negotiations. The latest merger, if it is completed, will make the fourth and most important in the anthracite field in the space of a few months.

Output and Value of Coal from Indiana Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at Mines for Shipment (Net Tons)	Sold to Local Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made Into Coke at Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees				Average Number of Days Worked
								Underground		Surface		
								Miners, a	Others	Total		
Clay	580,068	56,706	8,619		645,393	\$1,394,000	\$2.16	585	208	297	1,090	100
Daviess	142,253	21,589	8,089		171,931	364,000	2.11	197	81	39	317	105
Dubois and Perry		7,351	104		7,455	22,000	2.95	11	4	2	17	191
Fountain and Warren		2,514			2,514	10,000	3.98	9			9	189
Gibson	506,235	15,495	20,470		542,200	1,272,000	2.34	707	263	86	1,056	100
Greene	2,309,237	55,690	28,395		2,393,322	5,767,000	2.41	1,731	633	548	2,912	121
Knox	3,404,670	44,501	61,671		3,510,842	8,276,000	2.36	2,840	960	330	4,130	134
Owen	90,714	1,162	2,110		93,986	241,000	2.56	16	3	77	96	118
Parke	82,644	23,642	3,977		110,263	259,000	2.35	148	42	27	217	129
Pike	1,749,939	29,264	39,121		1,818,324	4,092,000	2.25	1,089	393	498	1,980	136
Spencer	4,467	2,270	140		6,877	14,000	2.04	27	7	4	38	65
Sullivan	5,372,203	54,411	83,896		5,510,510	13,601,000	2.47	4,244	1,947	814	7,005	150
Vanderburg	120,507	178,772	9,305		308,584	810,000	2.62	256	93	37	386	167
Vermilion	3,101,624	34,760	110,914		3,247,298	8,019,000	2.47	3,422	1,095	471	4,988	145
Vigo	6,458,083	144,357	179,295		6,781,735	18,470,000	2.72	6,691	2,200	770	9,661	134
Warrick	937,801	25,348	23,512		986,661	2,152,000	2.18	804	299	403	1,506	127
Total, excluding wagon mines	24,860,445	697,832	579,618		26,137,895	64,763,000	2.48	22,777	8,228	4,403	35,408	136
Wagon mines served by rail	91,204				91,204	283,000	3.10					
Grand total	24,951,649	697,832	579,618		26,229,099	65,046,000	2.48					

a Includes also loaders and shotfirers.

Commerce Department Indispensable Force in American Business

Under Hoover's Direction It Has Become Powerful Factor in Promoting Self-Government in Industry—Helped Bring About Three-Year Miners' Wage Agreement

From an agency with a reputation of being engaged largely in statistical and other stereotyped tasks the Department of Commerce within the last three years gradually has taken on vitality and momentum until now it is roaring along like a great motor and has become a vivid, powerful and indispensable force in American business.

Unquestionably Mr. Hoover's greatest accomplishment as the Secretary of Commerce, and the one which promises greatest return to the public, is his promotion of constructive self-government in industry. He has shown conclusively how these voluntary forces can bring American industry to a new high plane of efficiency. Codes of ethics have been established in many lines of business. Many others are in the making. Practices that are unfair to the public and to others in the same line of endeavor are being specifically listed and condemned. The way has been pointed out for industry and it is lifting its own standards and taking steps to see that they are maintained.

Despite all the ultra-conservatism that characterize the captains of industry Secretary Hoover broke through the crust of their reticence and has them co-operating with the government and with each other in an effort to put our economic life on a higher plane and to instill in all a new appreciation of the rights of others.

In the matter of trade promotion, leadership also is vested in those engaged in the businesses concerned. No step is taken until it is established that the trade wants it and needs it. That this policy is bearing fruit is shown strikingly by the fact that new business secured during the last fiscal year, as a result of suggestion or help from the Bureau of Foreign and Domestic Commerce, totaled \$529,000,000.

Additional Funds Needed

If American business continues to increase its use of the Bureau at the rate maintained during the last three years, the point soon will be reached where more appropriations must be forthcoming. In fact, the handicap of inadequate financial support has made itself apparent in recent months.

Much more is done in the Bureau of Foreign and Domestic Commerce than trade promotion. There is a protective service which is of inestimable value.

One of the main reasons for the remarkable expansion in the use of this bureau unquestionably was the reorganization under which commodity divisions were set up. This form of organization is essential if leadership is to come from industry. The commodity divisions are under the immediate direction of specialists who have wide acquaintance in the industries with which they are familiar. They maintain the closest possible contact with

the individuals and with the associations in a particular industry, an advantage which is lost when organization is on a regional basis.

A notable series of studies is being made by this Bureau of those raw materials which are subject to arbitrary control abroad to the detriment of American consumers. The steps which can be taken to protect American consumers from unfair practices in other countries have been set forth in such a way as to promote production in other areas, to stimulate research and to encourage search for substitutes.

The new Division of Domestic Commerce is carrying into practice the ideas of business men in the effort to reduce the wastes and costs of distribution.

In the effort to insure lowest possible prices to the consumers and to increase the returns to the producers, the division of Simplified Practice, set up by Secretary Hoover, has been doing result-getting work in eliminating excess variety. It is taking many other steps to eliminate waste in industry.

Defends Legitimate Trade Bodies

With a display of courage rather common on the part of one holding political office, Secretary Hoover early in his term came to the defense of legitimate trade associations just at the time that these organizations most needed an outstanding champion.

Recognizing the far-reaching benefits of bringing ocean-going bottoms to the ports of the Great Lakes, thereby reducing the transportation charge against the products resulting from the labor of forty million people, Secretary Hoover proposed the creation of the St. Lawrence Commission. President Coolidge approved the recommendation and appointed Mr. Hoover as the commission's chairman. Under his auspices essential economic studies now are being made which will have an important bearing on the project, which, in addition to the waterway, involves the harnessing of 2,000,000 hp. of water power in an area where industrial development cannot expand much further until this power is made available.

Much has been done under Mr. Hoover's direction to call attention to the fact that electrical interconnection in the Northeast, the principal industrial section of the country, is not keeping pace with the best practice elsewhere. Studies have been made and maps prepared which emphasize again the need for interconnection, the construction of large steam central stations at strategic points, and the development of more water power. As a result of these studies the conclusion was reached that it would be possible to reduce coal consumption in the area by more than 50,000,000 tons annually,

power could be made available at lower rates, the factor of reliability could be improved, electrification of railroads could be made feasible, and power could be made available on farms so that much manual labor could be replaced by mechanical devices.

One of the great assets of the American business man is the statistical service furnished by the Bureau of the Census. Since the advent of Mr. Hoover there has been rapid expansion in the production of current figures which make available to all interested an accurate picture of the conditions under which operations are being conducted. Facts gathered by 116 trade associations, 55 government organizations and a large number of trade periodicals are compiled in highly serviceable form in the monthly publication *Survey of Current Business*. Nearly 1,500 business movements are portrayed through statistical tables, graphic charts and text material. It has popularized the use of index numbers. All industries are put on a comparable basis. General trends of production, stocks on hand and unfilled orders are available at a glance.

Industrial Efficiency Increased

Under Mr. Hoover's direction the Bureau of Standards, the greatest physical laboratory in the world, has taken on new life. It has made a large number of technical studies which are of great value in making possible improved methods of production. Better utilization of raw materials has resulted from its researches.

Secretary Hoover played no inconspicuous part in bringing about the three-year wage agreement in the coal industry. He has consistently urged "peace and transportation" as the two most important steps which could be taken toward the stabilization of that industry. He made an effort just prior to the strike of 1921-1922 to effect an agreement providing for arbitration of the renewal of the wage agreement. The mine workers refused to agree to the proposal, but subsequent events revealed the lack of wisdom of such a course. After the strike was called Secretary Hoover effected a voluntary agreement whereby 85 per cent of the output was held down to the Garfield scale of prices. He has used the full weight of his influence to induce public utilities and other large consumers of coal to put in large stocks during the seasonal lull in coal production.

One of Mr. Hoover's first major accomplishments came early in his term and grew out of the conference on unemployment. He was able to enlist organizations of employers and employees, state officials, municipal officials and a large number of public-spirited individuals. A large program of public works was launched and other steps taken which gave employment to two million persons.

Out of this conference grew the study of business cycles. The report issued in the course of this study carried conclusive evidence that periods of depression are the natural outcome of a period of speculation and waste. It is believed that this report has made a sufficiently wide impression to arouse general interest in curbing inflation and booms.

Big Sandy Coal Association Combats Discrimination

A coal tax at so much per bushel, like the present gasoline tax of 2c. per gallon, is being advocated in Kentucky. The Northeast Kentucky Coal Association met at the Ventura Hotel, Ashland, Ky., Oct. 23, to discuss the situation and to attend to other business. The coal men desire that the tax be placed on tobacco instead of on coal, seeing that the money has to be raised and that competition in coal is so severe that the tax would reduce output.

Instead of trying to make coal pay for good schools and good roads the coal association is in favor of the \$75,000,000 bond issue which has been proposed. The coal men present voted to indorse the issue. The Associated Insurance Companies are asking for an increase in rates, though they were raised a year ago. The operators' association has filed a demurrer, attacking the right of the State Compensation Bureau to fix rates, contending that they have only powers of approval.

The association will compile exact facts on taxes and insurance premiums paid and on the compensation paid to employees. This will be used in combatting unfavorable legislation. Previously it has sent out inquiries and not more than 40 per cent of the companies addressed made reply. On this occasion the association will make a search of court-house records and thus will obtain information as to the taxes paid by coal companies.

The association has lost many members during the recent slump in prices, companies withdrawing to avoid payment of dues, which are now 7 mills per ton, yet in the last six months the association has obtained new freight rates saving operators 27c. per ton, opening new markets to the west for lump coal and affording the operators of the Big Sandy an opportunity to enter the tidewater market.

Delbert H. Pape, assistant to the executive secretary of the National Coal Association, said that the dues in most other local associations run from 1 to 3c. per ton with other special assessments. Harry L. Gandy, executive secretary of the National Coal Association, said that a barrel of cement costs roughly as much as a ton of coal, yet the members of the cement manufacturers' association pay dues of approximately 7c. per barrel.

Coal to the extent of 146,716 tons was used in connection with the manufacture of chocolate and cocoa products during 1923, the Bureau of the Census reports. Similar figures covering other industries are as follows: Steam and other packing, pipe and boiler covering, and gaskets, 145,596 tons; pulp goods, 131,421 tons; needles, pins, hooks and eyes, and snap fasteners, 24,216 tons; music, printing and publishing, 2,192 tons; excelsior, 5,163 tons; peanut grading, roasting, cleaning and shelling, 9,848 tons; linseed oil, cake and meal, 73,608 tons; toys and games, 32,041 tons; refrigerators, 70,894 tons; flavoring syrups and bitters, 95,177 tons; iron and steel forgings, 610,191 tons; pumps, 84,789 tons.

Call Outlaw Strike of 10,000 Hard-Coal Miners Despite Order by Lewis

Special to *Coal Age*

Scranton, Pa., Oct. 25—For the second time in as many weeks a general grievance committee has overridden the expressed orders of John L. Lewis, international president of the United Mine Workers, and has called a general strike in the anthracite field.

The latest general walkout, ordered for yesterday morning by the general grievance committee of the Pennsylvania & Hillside Coal & Iron Co., took effect in the face of contrary orders by the district union officials and the international president. As a result 10,000 men are idle, and all collieries of the Pennsylvania & Hillside company in the Pittston district are closed.

District union officials are keeping silence in anticipation of advice from the international president. The situation to them is the same as that when the Glen Alden grievance committee called a strike.

The action of the Pittston union men in defying their leaders has precipitated one of the most serious situations in the history of the union in view of the specific orders of President Lewis that the men remain at work as provided in the wage agreement. Only yesterday President Cappellini transmitted recent orders from President Lewis to the executive committee of District No. 1, which were said to contain the admonition, that continued insubordination on the part of the grievance committees might result in suspension or expulsion of members from the union.

This threat, however, falls on deaf ears in the Pittsburgh region, where at least 90 per cent of the unauthorized or "outlaw" strikes go into effect. Several groups of alleged radicals, who are said to have been prominent in the election of Rinaldo Cappellini as president of the district, are going their ways without any particular fear of being excommunicated from the union. Cappellini has several times been placed in embarrassing positions as a result of the actions of his supporters in the Pittston section. On one occasion the union local in which he holds a card called a strike without consulting the district officers. The local was on strike for several weeks and its grievance with several others, which the men charge are not being given attention, has resulted in the present outlaw strike.

In dismissing for want of jurisdiction the appeal of W. L. Stickel from decisions of lower courts adverse to him in his suit against the Big Laurel Coal Co. for title to coal lands in West Virginia, the U. S. Supreme Court on Oct. 13 declined to question the authority of the West Virginia Legislature to enact laws by which the state assumes title to lands on which taxes have not been paid for a period of years. No written opinion was handed down, the court acting upon authorities cited by attorneys for the coal company. Stickel claimed title because of inheritance from an old land grant. The coal company acquired the lands after they had been taken by the state because of not being entered on the tax books.

Three Miners Die in Blast In West Kentucky

Three miners were killed by an explosion the night of Oct. 22 in the Hart Coal Corporation's mine near Madisonville, Ky. Fourteen others were in the mine at the time but came out almost unscathed. The cause of the blast had not been finally determined when this was written but unofficially it was believed to be due to a windy shot fired by Paul Wheeler, 22, one of the three victims. He had been married but four days. The other two men who died were Thomas Chinn, assistant mine electrician, and Gilland Joyce, machinist. Brent Hart, president of the company, estimated the property loss at about \$20,000 and said the mine would be partly closed down for about sixty days for repairs.

N. C. A. Cost Accounting and Tax Committee Named

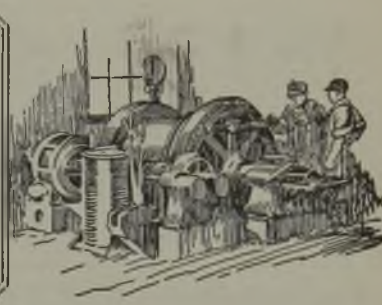
S. Pemberton Hutchinson, president of the National Coal Association, has appointed a special tax and cost accounting committee, with especial reference to a recent decision of the Solicitor of the Bureau of Internal Revenue on the subject of allowable expense deductions and replacements in coal-mine operations after normal output has been reached, as authorized at the recent meeting of the Board of Directors of the association. Following is the personnel: M. L. Gould (chairman), president, Linton Coal Co., Indianapolis, Ind.; J. D. Francis, vice-president, Island Creek Coal Co., Huntington, W. Va.; Michael Gallagher, general manager, M. A. Hanna Co., Cleveland, Ohio; C. F. Richardson, president, West Kentucky Coal Co., Sturgis, Ky.; Geo. B. Harrington, president, Chicago, Wilmington & Franklin Coal Co., Chicago, Ill.; W. D. Ord, president, Empire Coal & Coke Co., Landgraaf, W. Va.; Frank S. Love, president, Union Collieries Co.; Pittsburgh, Pa.

The committee has been called to meet at Washington, on Nov. 12, at which time the subject will be thoroughly discussed and the attitude of and the action to be taken by the National Coal Association determined. The change of interpretation of the Internal Revenue law as to what constitutes allowable deductions, according to an opinion by the Solicitor of Internal Revenue, presents a serious situation to the great majority of the bituminous coal producing companies, especially on account of unadjudicated returns in prior years. The committee includes men of broad experience in the industry who have intimate personal knowledge of the line of demarcation that should be drawn between ordinary industries and what may be termed to be a "westing industry," such as the mining of bituminous coal.

President Hutchinson had intended a committee of eight members, but inasmuch as one acceptance of the appointment has not yet been received, the announcement of the eighth member will be deferred for the time being. Prior to the committee meeting another prominent operator will be added.



Practical Pointers For Electrical And Mechanical Men



Cutting Down Old Brushes for New Use Is True Motor Maintenance Economy

REDUCING maintenance costs is one effective method of promoting economy in any industry. This article is to describe a method which has effected worth-while savings in motor maintenance merely by making use of old brushes that are too often thrown away.

Any industry that employs a great number of direct-current motors and other direct-current apparatus, finds at the end of a year that the expenditure for carbon brushes alone amounts to a considerable sum. It is generally known among electrical maintenance men that when one-half, or more frequently one-third of a carbon brush is worn away, it is seldom dependable for further service in the type and size of holder for which it was originally intended. As a result the worn brush is scrapped and a new one put in its place.

It seems never to have been a common practice in electrical repair shops to refit the worn brushes of large sizes to the brush holders of motors employing brushes of smaller dimensions. This is probably due to the fact that the alteration of the brush destroys the copper coating that originally was placed on it in order to effect a maximum contact with its mounting, and that considerable time frequently may be required to fit the brush to the holder in which it is to be used.

However, this operation of refitting old brushes to new mountings of smaller dimensions may be shortened and made more accurate by sawing, grinding or filing the brushes to approximately the right size and then by forcing them, with an arbor-press or other suitable apparatus, through a gage as shown in the accompanying illustration.

This gage may be made of cold-rolled steel with openings shaped to the various dimensions of the smaller brushes that are to be made. Care must be taken to leave the edges of the openings accurate and sharp and they should be case-hardened to insure a maximum life to the edges, which trim the brush. One strip of steel long enough to accommodate gages of several sizes may be employed, and the various sizes should be stamped at the openings prior to the hardening of the

steel. Such a gage can be stored more conveniently and found more easily when needed than would several gages each made of a separate piece of steel.

One feature worth special mention, is that a carbon brush may be a carbon brush but all grades of carbon brushes are not adapted to any one service any more than one grade of brush is applicable to all services. Therefore, when resizing brushes, care should be taken that the various grades of the larger brushes are made only into the smaller sizes required by motors employing the same or a similar grade of carbon. If this practice is not carefully followed, considerable trouble may be experienced with the commutation of motors equipped with brushes of an unsuitable grade.

After the brushes are sized, they should next be drilled or recessed for the attachment of shunts. Detachable shunts may be attached after the brush

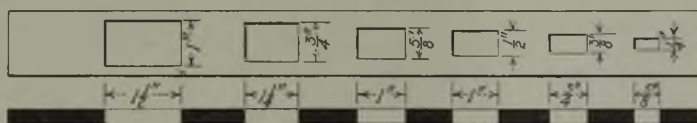


Fig. 1—Sizing Gage Makes Work Easier and More Exact

After the brush has been cut nearly to size and filed it can be pressed through a gage and made to fit the brush holder so that it will not chatter.

is copper coated, while shunts that are not detachable should be secured to the brush prior to the coating. Permanent shunts may be attached by placing them in the vertical hole as shown in Fig. 2, and filling the horizontal hole with molten solder, taking care that sufficient heat is applied to the carbon as well as the solder.

After the shunt is attached the brush is coated to effect a metallic contact in the mountings. This process is of a more specific nature than those just described but it is often essential. Several methods are employed. However, I will mention only two which are in most common use.

One consists of impregnating the carbons with wax so as to prevent the blue vitriol solution from penetrating. The carbons are then brushed with quicklime and without further preparation are placed in a copper sulphate solution and the copper deposited electrolytically. This solution can be prepared in the proportion of 1 lb. sulphate of copper and 1 lb. of sulphuric acid to each gallon of water. First dissolve the sulphate of copper in the minimum amount of hot water that will

take it into solution and then add the remainder of the water cold. After this add the required amount of sulphuric acid. When the solution is cooled it is ready for use.

Another method that has become very popular is to bring the carbon

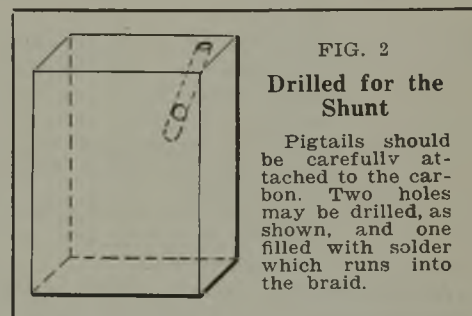


FIG. 2

Drilled for the Shunt

Pigtails should be carefully attached to the carbon. Two holes may be drilled, as shown, and one filled with solder which runs into the braid.

to almost red heat, then dip it into molten tin, afterward covering it with a layer of ammonium chloride. Then make the carbon a cathode in a copper cyanide bath and plate the carbon to about 0.2 of a mil, in thickness. After plating, the brushes must be washed, alternately dipping them in hot water and cold water and allowing them to remain in each bath from 5 to 10 minutes. Then the brushes must be carefully dried at about 110 deg. C. to remove all water from the pores.

ROYCE L. GRIMES,
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Cleveland, Ohio.

Using the Trolley Wire As a Meter Shunt

Split-type portable current transformers were developed to satisfy the urgent need for a means of measuring, with fair accuracy, the flow of current in an alternating-current line without the necessity of opening the circuit to insert the ammeter or its transformer. Many times it is likewise desirable to determine the amount of direct current flowing in a section of trolley wire or large feeder line. However, it is seldom done because of the cost and difficulty of inserting the meter or its shunt into the circuit.

This difficulty can be overcome by using the correct length of the conductor itself as a shunt. Fig. 1 shows the method of connection and Table I, which was copied from a mine electrical engineer's notebook, gives the necessary length of conductor between meter lead connections (a in Fig. 1) when using an ammeter or millivoltmeter which requires 100 millivolts at the terminals to bring the pointer to full scale reading.

This table was computed by using

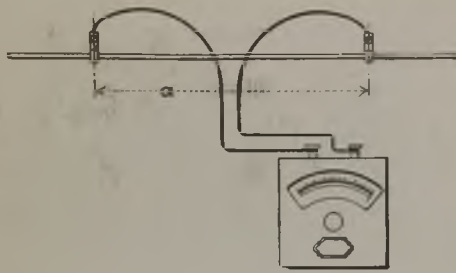


Fig. 1—Measuring Direct Current Without Opening the Circuit

Using the conductor as a shunt will give readings which are sufficiently accurate for most mine feeder tests. One of the greatest chances of error lies in misjudging the sizes of stranded conductors.

the following formula which was derived from Ohm's law:

$$L = \frac{M}{A \times R}$$

Where L = distance in feet of conductor between the points where meter leads are attached.

M = millivolts required at meter terminals to give full-scale reading.

R = resistance in ohms per 1,000 ft. of trolley wire or other conductor.

As the formula makes plain, it is necessary to know the millivolt capac-

and length of meter leads. Such errors may amount to several per cent, but nevertheless the readings obtained will generally be sufficiently accurate to give the desired information.

A very satisfactory method of connecting to a grooved or figure 8 trolley wire is shown in *a* of Fig. 2. Here a 20-amp. test clip, or battery charging clip, is used. This connection will not interfere with the passing of trolley wheels along the wires. Another easy way of making the connection is by means of ordinary trolley feeder clamps. A method of using a pipe grounding clamp for attaching the leads to a large stranded conductor is illustrated in *b* of Fig. 2.

Can You Judge the Quality of An Adhesive Tape?

There are many grades of adhesive tape. A few are of a quality suitable for the purpose for which they are intended; many others are entirely unsuitable for any service. In the former class, quality must be the sole consideration, irrespective of manufacturing cost; in the latter class, quality is ignored in favor of low production cost.

The principal function of an adhesive tape in wire and cable splicing is to provide a firmly adhering, weather resisting, mechanical protection to a splice already properly insulated. The essential characteristics, therefore, of a high-grade adhesive tape for such a purpose are toughness and durability of fabric, the greatest possible adhesive strength and the longest weathering property.

The usual off-hand method of judging the adhesive qualities of a tape is to determine if it feels sticky." There is, however, a vast difference between "adhesiveness" and "stickiness." A tape which seems extremely sticky to the touch generally has little or no adhesive strength.

A much-used specification for determining the adhesive strength of a tape is:

"The adhesion between adjacent layers of the tape shall be such that when a strip of tape 2 ft. long is taken from a roll and wound upon a mandrel one inch in diameter, under a tension of 10 lb. per inch of width at a rate of 30 in. per minute and allowed to stand for 3 min. with the weight attached, a weight of 4 lb. per inch of width shall not cause the plies to separate at a rate greater than 30 in. per minute.

The test shall be made at a room temperature not less than 21.1 deg. C. or 70 deg. F. nor more than 23.9 deg. C. or 75 deg. F., the sample having been kept within these limits for at least 30 min. immediately preceding the time of testing.

"The mandrel shall be so free in its bearings that a weight of 1 oz. will cause it to revolve freely when sus-

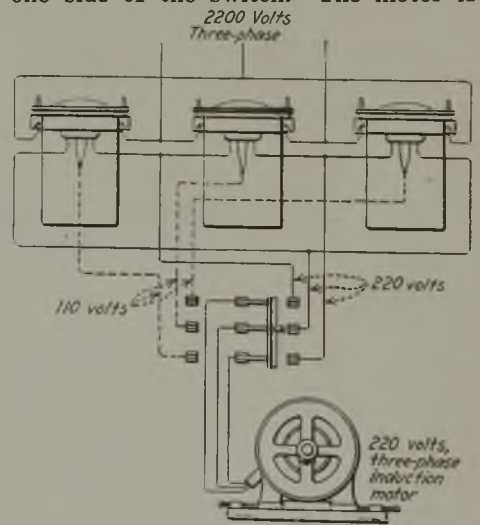
pended from a cotton string wound in a single layer on the center of the mandrel."

The conditions of such a specification must be carried out scientifically and exactly, in order to obtain reliable data on adhesiveness. A variation of any one of the conditions will entirely alter the results. This essential property of a high grade tape—adhesiveness—cannot be determined by any casual or superficial means, such as sense of touch, etc., a careful test should be made to obtain accurate comparative results.

The Starter "Hopeless," and No Spare Available

Where 220- or 440-volt three-phase motors are used to drive fans, hoists and the like, it is usual to place the transformer installation within 25 or 50 ft. of the motor. The most common arrangement is a bank of three single-phase transformers having series-multiple low-voltage windings connected to deliver the desired voltage. When such is the case it is a simple matter to fix up, a temporary starting arrangement to serve as a substitute for a damaged starter.

A few feet of wire and a three-pole double-throw switch, or two three-pole, single-thrown switches will do the trick. The three extra wires, as shown by the dotted lines in the accompanying illustration, are run from the transformers and connected to the clips on one side of the switch. The motor is



Emergency Starting Method

A standard transformer connection except for the wires shown by the dotted lines. Throwing the switch to the left delivers half voltage to the motor for starting.

started on half voltage by throwing the switch to the left, then given full voltage by throwing it to the right, which is the running side.

When making such an emergency connection it is imperative that the starting and running leads be ties to the switch with the proper regard for the phase rotation, in other words so that the motors will tend to rotate in the same direction for either position of the switch. The plan used for obtaining half voltage is sometimes employed as a permanent method of supplying small, low-voltage, three-phase motors from conveniently located transformers which were installed primarily for other duty.

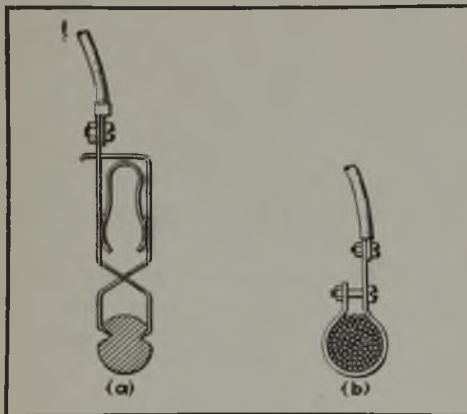


Fig. 2—Connecting Meter Leads

Connections to trolley wires are most conveniently made by using 20-amp. test clips. Special care should be exercised in getting a good connection to stranded conductors. Clean the surface, pull the clamp quite tight and have it touch as many as possible of the outside strands.

ity of the instrument used. This value is generally stated by a note on the meter scale or attached inside of the cover. The large majority of the portable ammeters for use with shunts are 100-millivolt capacity. If the millivolt value is not stated then the manufacturer should be asked to supply the information.

It will be recognized that this method of using the conductor as a shunt cannot be highly accurate. Errors are introduced by inaccurate placing of meter connections, temperature changes in the conductor and variations in the size

Table I—Conductor Length to Be Used as a Shunt

Size Copper	Full Scale Capacity of Meter				
	100 Amp.	300 Amp.	600 Amp.	900 Amp.	1,800 Amp.
No. 00 B. & S. gauge.....	12 ft. 8 in.	4 ft. 2 1/2 in.	2 ft. 1 1/2 in.	1 ft. 5 in.	0 ft. 8 3/8 in.
No. 0000 B. & S. gauge.....	20 ft. 2 in.	6 ft. 8 1/2 in.	3 ft. 4 1/2 in.	2 ft. 2 1/2 in.	1 ft. 1 3/8 in.
500,000 circ.mil.....	47 ft. 8 1/2 in.	15 ft. 10 1/2 in.	7 ft. 11 1/2 in.	5 ft. 3 1/2 in.	2 ft. 7 1/2 in.
750,000 circ.mil.....	71 ft. 6 in.	23 ft. 9 1/2 in.	11 ft. 10 1/2 in.	7 ft. 11 1/2 in.	3 ft. 11 1/2 in.
1,000,000 circ.mil.....	95 ft. 3 1/2 in.	31 ft. 8 in.	15 ft. 10 1/2 in.	10 ft. 7 in.	5 ft. 3 1/2 in.



Production And the Market



Unseasonable Weather Causes Temporary Setback In Bituminous Coal Market

An unprecedented stretch of unseasonably warm weather has taken the edge off the demand for coal in many sections of the country, with the result that the market has been hard put to hold its own. This taken in conjunction with the grumblings of those who expected more of an improvement than there was any sound basis for has caused a temporary setback to even the conservative elements in the industry. Small-lot buying, only sufficient for current requirements, is again in evidence in many quarters, and as a natural consequence prices are none too firm. The fact is that though output, sales and prices have been climbing gradually, the gains have not been sufficiently heavy to enable the producers, except those in non-union fields that have been able to reduce wages to the 1917 level, to make a decent profit.

Production Mounts in Eastern Ohio

Competition of the keenest character has to be brought to bear to get in on the business that is going. Then too the impending end of the lake shipping season looms as a menace that may release coal to compete in other fields. Nevertheless it is worthy of note that output in the eastern Ohio field has reached the highest level since early in February.

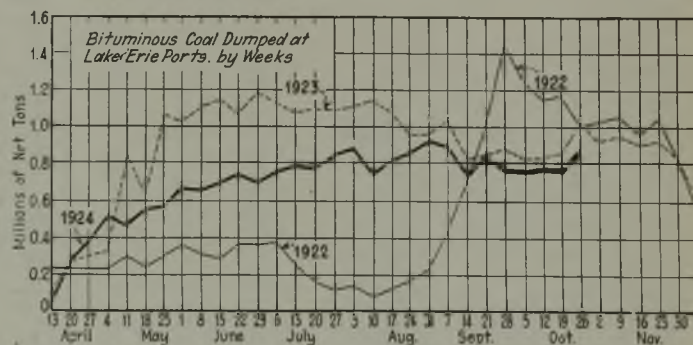
Coal Age Index of spot prices of bituminous coal halted for the time being in its upward climb, after seven consecutive weekly gains, standing on Oct. 27 at 176, the corresponding price for which is \$2.12—the same as on Oct. 20.

There was a marked increase in activity at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Oct. 23 totaling 384,268 net tons, compared with 326,124 tons handled during the previous week.

Coal movement up the lakes likewise mounted during the last week, dumpings at Lake Erie ports during the period ended Oct. 26, according to the Ore & Coal

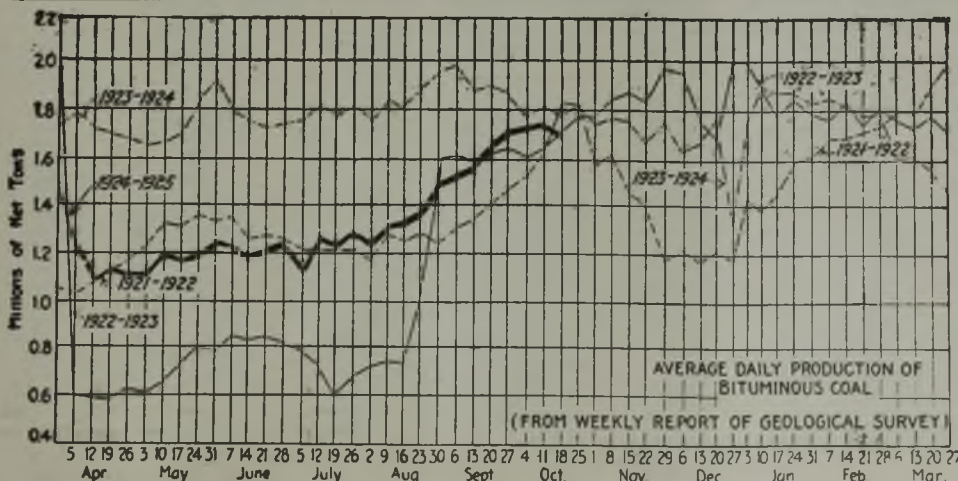
Exchange, being as follows: For cargo, 819,869 net tons; for fuel, 39,998 tons. This compares with 735,770 and 40,787 tons respectively for the previous week.

After ten weeks of steady increase, bituminous coal output reacted during the week ended Oct. 18, when, according to the Geological Survey, 10,255,000 net tons was produced. This was a decline of 298,000 tons from the week ended Oct. 11, when the output was 10,553,000 tons, according to revised figures. The falling off was due partly to the observance of Columbus Day. Anthracite production, on the other hand, registered a slight



gain during the week ended Oct. 18, 1,750,000 net tons having been produced, an increase of 13,000 tons.

Conditions have eased somewhat in the anthracite market with demand a trifle slower, though the line companies are easily moving output and independents are disposing of tonnage with comparatively little difficulty. Stove coal is the least plentiful of domestic sizes, but the demand for nut has picked up markedly. Egg is comparatively easy. Barley is moving the easiest of the steam sizes, buckwheat and rice being slow for this time of the year. Independent prices are holding fairly firm at last week's levels. Save for a few operations that have not been able to resume since the flood a few weeks ago, most of the mines are nearing maximum production.



Estimates of Production

(Net Tons)

BITUMINOUS

	1923	1924
Oct. 4.....	10,699,000	10,275,000
Oct. 11 (a).....	10,953,000	10,553,000
Oct. 18 (b).....	10,684,000	10,255,000
Daily average.....	1,782,000	1,709,000
Cal. yr. to date (c).....	443,359,000	363,156,000
Daily av. to date.....	1,799,000	1,469,000

ANTHRACITE

Oct. 4.....	1,949,000	1,425,000
Oct. 11.....	1,943,000	1,737,000
Oct. 18.....	1,978,000	1,750,000
Cal. yr. to date.....	75,492,000	72,763,000

COKE

Oct. 11.....	284,000	127,000
Oct. 18.....	286,000	146,000
Cal. yr. to date (c).....	15,332,000	7,871,000

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

Midwest Runs Slowly

Continued warm weather is doing its stuff in Illinois, Indiana and Kentucky. Demand has sunk to a point that makes nut and egg sizes extremely difficult to move, and even lump, which has been oversold in the better fields, is dragging slightly here and there with no immediate probability of a change in prices. Production is lower. However, circulars on lump are well maintained in such regions as southern Illinois, Indiana Fourth Vein and Mt. Olive, Ill. Central Illinois' attempt to increase from \$3 to \$3.25 a short while back failed so utterly that \$3 remains the absolute top for that field. Kentucky, both east and west, is having its difficulties finding a place to put most coarse sizes, so that the circulars of those fields on lump and egg in and around Chicago are pretty hard to hold.

Steam coal has firmed up for several reasons, but price levels have not risen. One or two of the big steam buyers in the Chicago district, whose storage piles have been sink holes catching large volumes of distress coal at absurdly low prices all summer and autumn, have made steam contracts for the winter, thus taking them out of the spot market. The slump in domestic production due to warm weather was another factor tending to stiffen up screenings. But to counteract these several other big steam buyers withdrew from the market entirely during the past week, thus reducing the demand. They are waiting for

colder weather and heavier production to pull steam prices down again. The general result of these counteracting forces is that steam quotations are maintained more closely than they have been for weeks.

Domestic business is easing around St. Louis. Cold weather stimulates it and the last week or two of warm weather has brought about a relaxation although prices have not changed. Coal dealers as a rule are pretty well loaded up, but there is a shortage of high grade lump. Mt. Olive lump is in fairly good demand, but Standard is slow with no call. Local wagonload steam shows considerable improvement although the tonnage is far under what it was a year ago on account of the inroads of electric power. Carload steam is hard to find. Country domestic has slipped a little while country steam demand is unusually light and is for small nut and not screenings.

Kentucky Moves Some Coal

With the exception of a little Harlan fine gas block and some of the finer grate coals of the Straight Creek and Jellico fields, \$3.25 appears to be the top for best block coal in Kentucky, a few southeastern Kentucky mines getting as high as \$3.50 on some business, while a few operators are reported as quoting \$3.75. The eastern Kentucky block market is \$3@3.50; lump, \$2.50@3; egg, \$2.25@2.50; nut, \$1.75@2; mine run, \$1.50@1.75 and screenings are 10c. a ton weaker at 75c.@1 a ton.

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

Table with multiple columns: Market Quoted, Oct. 29 1923, Oct. 13 1924, Oct. 20 1924, Oct. 27 1924†, Midwest, Market Quoted, Oct. 29 1923, Oct. 13 1924, Oct. 20 1924, Oct. 27 1924†. Includes sub-sections for Low-Volatile, Eastern; High-Volatile, Eastern; and South and Southwest.

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

Table with columns: Market Quoted, Freight Rates, Oct. 29, 1923 (Independent, Company), Oct. 20, 1924 (Independent, Company), Oct. 27, 1924† (Independent, Company). Lists various anthracite grades and their prices.

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



Index	1924		1923	
	Oct. 27	Oct. 20	Oct. 13	Oct. 29
Index	176	176	174	184
Weighted average price	\$2.12	\$2.12	\$2.10	\$2.23

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

Movement has been good and mines are operating at capacity, but haven't much business booked ahead, and can't advance prices in the face of mild weather, without bumping into competition from union fields.

In western Kentucky block coal is quoted at \$3@3.25; lump and egg, \$2.75@\$3; nut, \$1.60@\$2; mine run, \$1.50@\$1.80; and screenings, 60@75c. Screenings are in big supply in all sections, and move only at low prices.

Chilly weather is resulting in slightly better orders from retailers and domestic consumers, and rural demand is improving a shade. Utility demand is increasing with shorter days, along with fairly active industrial consumption of power.

Good car supply and fair labor conditions are making for steady production. With the exception of the Central City district of western Kentucky, which is still partly strike bound, there are not many tippie mines inactive.

Northwest Trade Not Brisk

The market at Duluth is firm in both hard and soft coals and the price is as last quoted. However, trade has been unusually poor within the past week, due to the weather and the fact that dealers are pretty well stocked up. On top of their other troubles cancellations on orders are beginning to come to the docks from such utilities as the Minnesota Power & Light Co. Water power supplied by the recent rains has reduced coal demand.

Shipments to the docks continue reasonably heavy. Thirty cargoes were received last week, of which one was hard coal, and fourteen are on the way, but none of this is anthracite. It seems that the docks are starting to cut down on their shipments of anthracite. This is natural, as

200,000 tons more will more than fill any needs, and anthracite is not in demand anyway.

The feature of the Head-of-the-Lakes market is still Pocahontas. In fact two of the docks are not taking carlot orders for lump, although they are still supplying their retail trade. Mine run Pocahontas is coming into favor because it is \$2.75 less than lump at the dock, and those who use it in their furnaces say that it is just as good.

There is no change in conditions around Milwaukee, which awaits the onset of seasonable weather. A slight improvement in the flow of orders is reported; also a continuance of equipment trouble—difficulty in obtaining gondolas, which are preferred in most cases to the hopper carriers that are available. No change in prices is noteworthy. Receipts by lake in Milwaukee during October, up to the 22d, were 87,240 tons of anthracite and 277,684 tons of bituminous coal, making the total for the season 659,894 tons of anthracite and 1,917,994 tons of bituminous coal.

Western Business Is Spotted

More mild weather has made it easy for Southwestern operators to catch up completely with long fall orders. Retailers are now somewhat overstocked and running time in Kansas is shortening. This naturally reduces the supply of screenings, the demand for which continues fair. Oklahoma has settled most of her labor troubles with consequent higher production. This hurts Arkansas, which had already begun to suffer from warm weather and from the fact that cotton-gin trade is sold up for the fall. Arkansas semi-anthracite lump has dropped 25c. to \$5.50@\$6.75. Mine run is \$3@\$3.50 and screenings \$1@\$1.50 with considerable shading. Henryetta (Okla.) lump is \$5.50; nut, \$4; mine run, \$3.25 and screenings, \$1.50.

Colorado running time has been picking up with better markets. Last week mines averaged 31 hours and only 20 per cent of lost time was checked against "no market." Production is heavy enough from most fields now so that with the first real cold spell both operators and railroads will have their hands full. Routt County got its usual bad car service from the Moffat Road last week, attributing 61 per cent of lost time to car shortage. A slight increase in price has taken effect all along the line on domestic sizes from the southern Colorado fields.

The heavy movement of crops in the mountain states is beginning to cause a shortage of cars in the Utah coal fields. If the weather continues mild, operators say the situation will not grow serious; but if winter sets in early there may be a coal shortage. Prices, both retail and wholesale, are steadier than for months. The labor situation is excellent. Industrial demand for coal is normal for the season. Retailers have a 30-day supply of coal in the yards at Salt Lake City.

Ohio Markets Feel Stimulus of Cold Snap

The seesaw season is on at Cincinnati with the end of the lake season in sight. A couple of frigid days cut down suspension orders and refusals considerably, but coal on consignment in railway yards is not a healthy sign and the glutting of the Chicago markets with coal from the smokeless fields has made the local trade cautious. Still, there has been no distinct break in prices, and perhaps best of all is the strength of mine run. Slack is about the same as last week. Interest centers upon the probable prices of smokeless for November. Screenings are none too strong with the old quotation of \$1.10@\$1.25 prevailing. River business is still held up by the dry season in the upper valleys.

Colder weather has stimulated domestic trade at Columbus. Smokeless grades and splints are in the best demand and there is a fair trade in Hocking, Jackson and Pomeroy grades and also in Kentucky varieties. Retail prices are steady at recent levels. The car shortage on certain West Virginia lines is causing some concern but is not sufficient to add much strength to the market. Weakness in steam grades is the bad feature of the trade. The worst situation is in screenings, which are very plentiful owing to the larger production of lump and egg and consequently prices on that grade are extremely low.

Lethargy has overtaken the Cleveland market. The steam trade is particularly dull, due to industrial inactivity. During the week there have been many instances of nut and slack, usually 10c. a ton over slack, selling at the same price. These grades are not in such demand at this time

as to maintain the usual spread in the prices. Spot prices on other grades remain unchanged, with no tendency to reduction. Production in the eastern Ohio field during the week ended Oct. 18 was the largest of any week since early February. The domestic trade is not quite as active as it was several weeks ago.

There is more movement at Buffalo but it is not pronounced enough yet to affect price. There is some prospect of a car shortage before the crest of the grain movement has passed, but the railroad men say that there will be no serious shortage if there is any, so the situation is not likely to change much right away.

Oversupply in Pittsburgh Market

There seems to have been too much loading of coal at Pittsburgh, but it does not appear that as yet there is any considerable accumulation of coal on track, and there are no reports of actual "distress" sales to avoid demurrage. There has been no definite price decline and this seems to be due to prices having been thoroughly shaken out six months ago. The district has been running at 50 per cent or more since the middle of September.

New England Inactive but Hopeful

Bituminous trade in New England can hardly be described as active. There are inquiries in the market, and because coal men have been starved for so long they are inclined to regard a few crumbs as a feast. Prices are less depressed, and there are those who feel they will grow steadily firmer to the end of the year. Most of the buying is confined to Southern coals.

The present range of No. 1 coals at Hampton Roads is \$4.40@4.50 per gross ton, f.o.b. mines, with \$5.65@\$5.75 approximately the level at Boston on cars. Portland factors have been able in some cases to extract \$5.90 and even \$6 from small buyers, and at Providence sales have been continued on the \$5.50 basis.

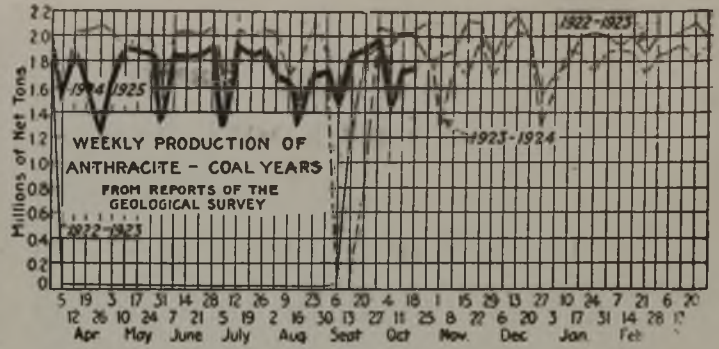
All-rail shippers have as yet hardly begun to feel any firmer tendency. What little coal is sold by this route is still coming forward in dribblets and at prices that still rest on the hard pan of irreducible cost determined several months ago. Shipments via the Philadelphia and New York piers are still light, and there is no hope of any considerable improvement during November. The highest grades that compete at all with Pocahontas and New River are close to \$5 per gross ton, f.o.b. vessel at Philadelphia.

Atlantic Markets Gain, but Slowly

Growing demand has not yet affected prices materially at New York. Business is a little slower, due in part to weather conditions. Line demand is more pronounced than buying at tidewater. Quality is playing a more prominent part in sales, prices being secondary if the prospective buyer can be assured of a suitable coal. Receipts at tidewater are averaging larger than for many weeks. Most of the coal is on contract.

A little more tonnage is being moved at Philadelphia, but as yet there have been only slight price changes. Prices seem a bit firmer at present low levels and with all indications that this is the low water mark. Stocking up seems to be general, but there has been a freer offering of gas slack the past week or so, caused, no doubt, by the increased domestic demand in the West for screened coal. The most favorable news is of a few charters for export coal.

The coal trade at Baltimore seems to be marking time till election. One of the hopeful signs is the steady increase



of inquiry on future deliveries for industrial use. So far, however, the easy supply from the mines, keeping well abreast of all demands, has prevented any increase in prices. In the face of a fall off in exports for the 24-day period of October as compared with the similar period of September, which included all activities of that month, there is a distinct feeling of encouragement in the line of foreign trading as a result of inquiries now developing from north coast Mediterranean and South American ports.

The Birmingham steam market is showing better form and there is increased activity in the domestic trade. Business being booked from industrial sources generally is assuming a healthier tone. Lumber and cotton mills and hydro-electric power companies are in the market to some extent on account of low water. Bunker business also is reported slightly better. While quotations on steam for the most part remain unchanged there is a tendency toward higher figures as basic market conditions improve. Domestic prices are firm in the face of stable current demand and the absence of adequate stocks in many sections.

Anthracite Markets Are Easier

Easier conditions prevail in the anthracite market at New York. Independent coals are not moving rapidly although so far operators and sales agents have had no difficulty in disposing of output at last week's prices. The old line companies move their tonnages easily. Weather conditions have not been conducive to heavy consumption and householders, especially in the suburbs, have delayed putting in their winter coal. Stove coal is the shortest of the domestic sizes. Demand for it continues strong. Chestnut moves without any trouble, while egg is easy but not accumulating. Buckwheat and rice are in slow call for this time of the year. Barley is the easiest to move and the better grades are bringing full company price schedule.

A couple of heavy frosts at Philadelphia brought householders out eagerly after fuel and dealers are now urging for coal. None of the snap has gone out of stove coal, but the demand for nut now outstrips all other sizes. The mines are again near maximum production, though a few are still closed down entirely. Retail prices are a trifle soft and a few dealers are selling at as much as \$1 less than the average. Wholesale prices among the smaller producers went upward a bit with the increased demand. Steam sizes are moving fairly well, but there is a tendency toward a surplus again.

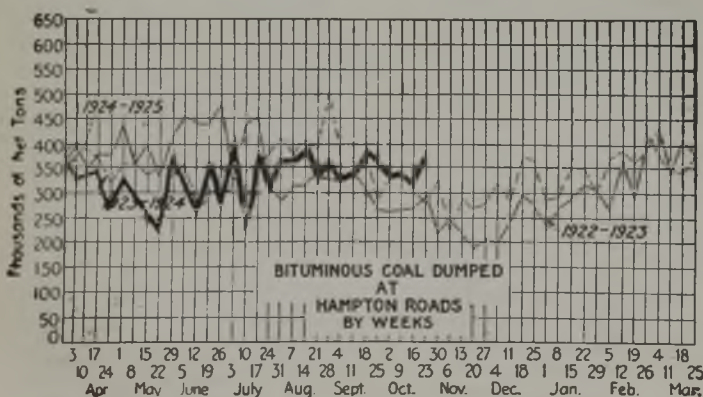
The weather at Baltimore has been so mild that consumption in homes has been negligible. Most of the yards are carrying fairly large stocks of anthracite, and there will be ample fuels to meet the first call that comes when genuine cold weather arrives.

At Buffalo the demand for anthracite is improving, but the weather is too mild for anything like a rush. Consumers look on the supply as pretty certain and if there is anything to be gained by waiting they want to be prepared to take advantage of it. The outlook does not favor much falling off in cost, but that is mostly on account of lack of enterprise. The coke trade is still quiet.

Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Oct. 11, 1924	1,088,462	198,154
Previous week	1,077,006	186,516
Week ended Oct. 13, 1923	1,084,458	194,963

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Oct. 14, 1924	99,952	50,160		
Oct. 7, 1924	103,730	52,643		
Oct. 14, 1923	27,062	5,674	15,920	4,179



Foreign Market And Export News

Foreign Contracting Provides Only Bright Spot in British Market

Conditions in the Welsh steam coal trade are no worse, which is the very best that can be said of the present market. Enormous stocks are standing, and the Welsh pits are surrounded by huge mounds of small coals for which no buyers can be found.

Some interest is being shown in contracts for 1925, however. In addition to the French Midi contracts the Central Argentine Railways have placed an order for 300,000 tons of good admiralty large at about 26s., f.o.b., and the Entre Rios Ry. has placed an order for 50,000 tons on the same basis. The market is otherwise inactive, with prices fairly steady.

The owners' plea for a return to the 8-hour day has met with no response from the miners, whose co-operation would be necessary before the Act of Parliament authorizing such a change could be obtained. The attitude of the Welsh miners is to shorten the day still further, and frequent resolutions have been passed demanding a 6-hour day. The same attitude is maintained on the question of double shifts.

The Newcastle market is dull and weak. Prices have dropped a little, though there is a slightly improved inquiry for steam coals for winter shipment. Operators are hoping that the present abnormally low prices will encourage foreign buyers to clinch orders for early delivery.

Production by British collieries during the week ended Oct. 11, a cable to *Coal Age* states, was 5,088,000 tons, according to the official reports. This compares with 5,155,000 tons produced during the previous week.

Trade Eases at Hampton Roads; Revival Expected

Business at Hampton Roads is slightly slower, with mild weather cutting down domestic trade with export movement at a minimum. New England is tak-

ing increasing quantities of coal and bunker trade is holding up well.

The market has weakened slightly, although supplies at tidewater are diminishing and dumpings at the coal piers are heavy. Retail business is good and prices are holding firm, with no prospect of reduction and a chance of increase in case forecasts of a severe winter are borne out.

The trade continues to be optimistic over the general situation and business is expectant of a general revival in activity.

Less Life in Evidence in French Coal Market

The French industrial coal market shows little animation and business in house coal also is a little quieter, due to weather conditions. Shipments of sized products from Belgium are less active for the same reason.

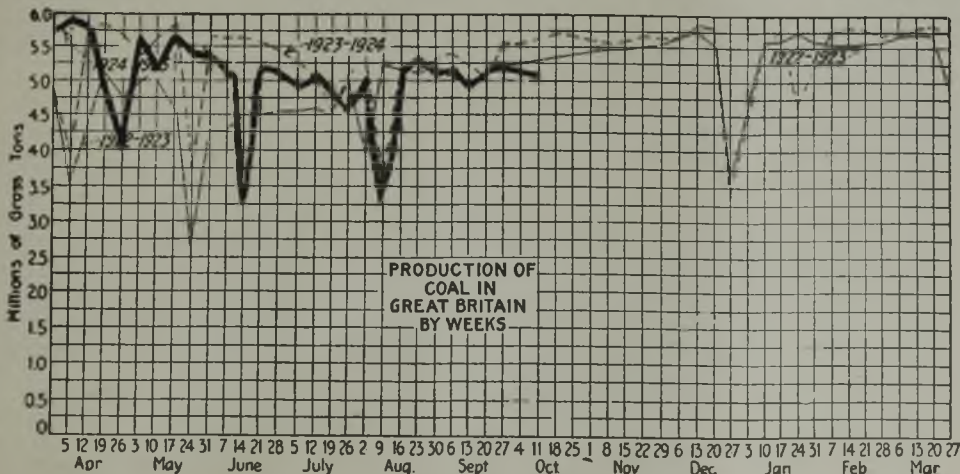
The rise of sterling has increased the price of British coals, which were tending to attract more attention at the lower levels. British house and anthracite coals are neglected.

German coal deliveries on the open market continue small. The rolling stock position remains congested.

Deliveries of indemnity fuels during September to France and Luxemburg included 471,400 tons of coal, 437,800 tons of coke and 38,400 tons of lignite briquets, a total of 947,600 tons. This compares with 429,700 tons of coal, 425,800 tons of coke and 30,700 tons of lignite briquets, or a total of 886,200 tons of fuels, during the previous month.

Between Oct. 1 and 15 the O.R.C.A. received 144,603 tons of coke, a daily average of 9,660 tons.

With active British and French competition, the inquiry for industrial coals in the Belgian market is slack. House coals are steady but patent fuel and coke are depressed.



The strike is still on in the Borinage, but, the mine owners having signified their willingness to grant concessions, work is expected to be resumed soon.

United States Domestic Coal Exports During September

	1923	1924
Anthracite, gross tons.....	175,689	327,322
Value.....	\$1,855,733	\$3,714,232
Bituminous, gross tons.....	1,768,620	1,502,829
Value.....	\$9,071,428	\$6,472,042
Coke, gross tons.....	95,479	41,804
Value.....	\$930,039	\$317,651

NINE MONTHS ENDED IN SEPTEMBER

Anthracite, gross tons.....	3,445,793	2,626,108
Value.....	\$37,298,877	\$29,119,095
Bituminous, gross tons.....	15,334,621	11,659,463
Value.....	\$85,309,428	\$54,421,087
Coke, gross tons.....	932,719	419,412
Value.....	\$10,233,991	\$3,589,047

Export Clearances, Week Ended Oct. 25, 1924

FROM HAMPTON ROADS		Tons
For Canada:		
Swed. Str. Kalmorsund XI for St. John		1,710
Ital. Str. Aquitania for Montreal...		6,600
For Italy:		
Nor. Str. Betty for Argenta		3,456
For Newfoundland:		
Noro. Str. Osterdal for Lewisporte..		3,456
For West Indies:		
Nor. Str. Fram for Fort de France..		4,013
Jap. Str. Spain Maru for Castries..		4,365

FROM PHILADELPHIA

For Cuba:		
Am. Schr. James W. Howard for Caibarien		2,200

FROM BALTIMORE

For Cuba:		
Nor. Str. Rananger, for Havana.....		4,057
For Porto Rico:		
Am. Str. Major Wheeler, for Ponce..		1,281
Am. Str. Delisle, for Yabucoa.....		481
For Chile:		
Nor. Str. S. Vindeggan, San Antonio		1,494

Hampton Roads Pier Situation

	Oct. 16	Oct. 23
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	825	897
Tons on hand.....	53,728	55,076
Tons dumped for week.....	111,860	120,512
Tonnage waiting.....	5,000	10,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,118	1,244
Tons on hand.....	80,000	85,400
Tons dumped for week.....	105,729	118,360
Tonnage waiting.....	7,800	17,487
C. & O. Piers, Newport News:		
Cars on hand.....	1,596	1,913
Tons on hand.....	84,060	101,455
Tons dumped for week.....	74,486	104,225
Tonnage waiting.....	3,760	8,815

Pier and Bunker Prices, Gross Tons

	PIERS	
	Oct. 18	Oct. 25†
Pool 9, New York...	\$4.80@5.10	\$4.80@5.10
Pool 10, New York...	4.65@ 4.80	4.60@ 4.80
Pool 11, New York...	4.35@ 4.50	4.40@ 4.55
Pool 9, Philadelphia.	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia.	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia.	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.40@ 4.50	4.35@ 4.50
Pool 2, Hamp. Roads	4.20@ 4.30	4.15
Pools 5-6-7 Hamp. Rds.	4.00@ 4.10	4.00@ 4.10

BUNKERS

Pool 9, New York...	\$5.05@5.35	\$5.05@5.35
Pool 10, New York...	4.90@ 5.05	4.90@ 5.05
Pool 11, New York...	4.60@ 4.75	4.65@ 4.80
Pool 9, Philadelphia.	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia.	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia.	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.50	4.50
Pool 2, Hamp. Roads	4.30	4.25
Pools 5-6-7 Hamp. Rds.	4.10	4.10

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

Quotations by Cable to <i>Coal Age</i>		
	Oct. 18	Oct. 25†
Cardiff:		
Admiralty, large...	27s.	27s.@27s.6d.
Steam smalls.....	11s.6d.@15s.6d.	15s.6d.@16s
Newcastle:		
Best steams.....	17s.6d.@18s.	18s.6d.
Best gas.....	22s.6d.@26s.9d.	20s.6d.@21s.
Best bunkers.....	17s.6d.@18s.6d.	17s.6d.@18s.6d.

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



News Items From Field and Trade



ALABAMA

The Pratt Fuel Corporation, of the Walter Moore Companies, Birmingham, has acquired the interests of the Grider Coal Co., including three mining operations, the Burnwell Coal Co., Yerkwood and others, \$500,000 being involved in the deal. It also is said that S. L. Yerkes will be in the Pratt Fuel Corporation. The Grider Coal Sales Agency is not affected by this deal, as it will continue as selling agency for the Pratt Fuel and the mines just taken over. The Walter Moore interests took over the Jagger and Nelson companies not long ago.

The Franklin Coal Mining Co. will begin the construction shortly of a Montgomery coal washer of large capacity to replace the old washery at its Powhatan Mine No. 2, which is not of sufficient capacity to handle the required tonnage from this operation. The improvements will cost approximately \$20,000. The Powhatan mines are located in the western section of Jefferson County in the Mary Lee seam and produced during 1923 about 250,000 tons of washed coal. The head offices of the company are in Birmingham.

COLORADO

During September 935,364 tons of coal was mined in Colorado, compared with 863,500 tons mined in September 1923, bringing the total production for the first nine months of this year up to 7,221,707 tons compared with 7,345,599 tons mined during the same period last year. So far this year the number of days worked per mine in the state is 128.1. The total decrease in the production of coal during the first nine months of this year as compared with the corresponding period in 1923 has been 123,892 tons. During September 12,133 men were employed at the mines.

ILLINOIS

Two Williamson County strip mines in the vicinity of Carterville have been reopened upon a full-time schedule. Weaver Mine No. 20 planned to resume operations about Oct. 25, after having been closed down since last November.

The Liberty Coal Co. with offices at 1206 Lehmann Building, Peoria, has installed a new coal cutter and a storage-battery locomotive. The company has ten trucks running between the mine and Peoria and is able to handle a large local business.

The Atwill Coal & Coke Co., McCormick Building, Chicago, has purchased

the entire assets and liabilities of the Atwill-Makemson Coal & Coke Co. J. L. Makemson retires from the business. F. C. Atwill remains as president of the company; H. L. Weith, vice-president, and J. B. Ullmen, secretary.

The Newcastle Coal Co., Edwardsville, has reopened its mine with twenty-five men working.

W. D. Obcamp has been elected a director of the Brewerton Coal Co. of Lincoln. James Casey, general superintendent of the mine, also has been elected to the board. Those on the board before these two names were added were: W. A. Brewerton, Roy O. West and Percy P. Eckhart. The board recently was increased from three men to seven, leaving two places to be filled, possibly by business men of Springfield and Lincoln.

William Y. Wildman, for years a traffic man for the Chicago & Northwestern R.R., has been made secretary of the Illinois Coal Traffic Bureau in Chicago, succeeding Frank H. Harwood, whose health has been precarious for some time and who must spend much of his time on his fruit farm in California.

The Kolb Coal Co. has opened its Mine No. 2, near Belleville, upon a full-time basis. This mine has been operating intermittently.

W. W. Austin, of Taylorville, has purchased the interests of J. M. Corine in the Decatur Coal Co., of Decatur, and will give his entire time to that work.

The Wenona Coal Co., Wenona, has leased its mine property to Edward L. Monser, vice-president of the company, and John Blazina, Marshall County mine inspector, who will operate it in partnership. The mine has been cleaned and is now ready for service.

The Shiloh mine of the Southern Coal & Mining Co., located near Belleville, has resumed operations after having been closed for six months. The mine employs 350 men. The Radium mine, employing 250 men, also has resumed operations.

Crescent Mine No. 1, in Marsh Creek Hollow, near Peoria, has begun operations on a half capacity basis after having been idle since March 29. This gives employment to about 250 men. With the opening of the Crescent Mine No. 1, about 40 per cent of the miners in the Peoria territory are now employed. This is an increase of 30 per cent over the total employed sixty days ago.

INDIANA

The Brazil Collieries Co., of Brazil, has filed a preliminary certificate of dissolution with the Secretary of State of Indiana.

In the Indiana bituminous district 443,016 tons was produced by 189 mines during the week ending Oct. 11 as compared with 443,345 tons by 190 mines for the week previous. The 189 mines during the week ending Oct. 11 worked a total 3,461.34 hours and lost a total of 5,072.49 hours. Car shortage caused a loss of 59.66 hours; other railroad disability, 35.5 hours; labor troubles, 71.5 hours; mine disability, 625.25 hours; lack of orders, 4,280.58 hours. During the previous week lack of orders caused a time loss of 4,197 hours, or 49.54 per cent.

IOWA

W. F. Moore, A. J. Harkins and Charles E. Moore have purchased the Liberty mine, located north of Des Moines, on the Twentieth Street road. The three men will operate the mine under the name of the Liberty Coal Co. and will do both a wholesale and retail business. They formerly owned and operated the Madison Coal Mining Co.

KANSAS

An abandoned mine on Santa Fe land near Frontenac, in the Pittsburg field, has been leased by Albert Benelli and John Knoll, who have begun preparations to reopen it. The mine has a shaft to the coal, but the vein is only partly developed.

Despite a recent announcement by John L. Lewis, International president of the United Mine Workers, that Alexander Howat is ineligible for office in the organization, locals continue to send in his name for nomination for president of District 14 (Kansas). In one day recently seven locals placed his name in nomination.

KENTUCKY

It has been reported at Madisonville that the Hart Coal Corporation, one of the big shaft mine operating companies of western Kentucky, will spend \$70,000 on a rescreening plant and in remodeling its tipples at the Victoria No. 11 mine and at the White City Mines. Improvements are to be completed within sixty days.

Two additional western Kentucky mines recently started operations on a non-union basis. One of these is the

Providence Coal Mining Co., of which Percy Berry is the head, the company starting with over 100 men on the waiting list. The Rockport Coal Co., operated by H. L. Tucker, at Centertown, also started operations, and with more men than it could use.

It is reported from Lexington, that Lexington and eastern capital is interested in a merger of coal mines and coal properties in Perry and Knott counties along Carrs Fork. J. P. Allen, of Lexington and Hazard, a large operator, is behind the movement, and slated to head the company if the merger is worked out. The Meem-Haskins Coal Co., Montgomery Creek Coal Co., Scuddy Creek Coal Co., and Carrs Fork Coal Co. are included in the merger plan.

Announcement was made at Lexington, Ky., Oct. 21, of purchase by L. W. Fields, of Lexington and Whitesburg, and the W. C. Belcher Land & Mortgage Co. of Ft. Worth, Texas, which has offices in Lexington, of a tract of several thousand acres of coal and timber land in Letcher County from the Mineral Development Co., of Philadelphia.

President Wes Ames of District No. 23, United Mine Workers, is urged in a communication sent him by County Attorney W. O. Smith, of Muhlenberg County to take immediate steps to adjust the differences between the union miners and operators of the district if he would save his organization from complete disruption. Mr. Smith formerly was president of District 23. He says three-fourths of the union miners of District 23 would go to work at a reduced wage if the union permitted it. Mr. Smith says he believes the policies of the international officers are wholly inapplicable to conditions in this section, and that they are using this territory to enrich that of the competitive field, which suffered from the same cause recently.

It was reported from Madisonville, Ky., on Oct. 22, that the West Kentucky Coal Co. had decided to abandon Mine No. 11, of the St. Bernard group, and that it would be sealed up. The mine was the first in Hopkins County, opened in 1870, and is largely responsible for development of the field and the establishment of the town of Earlington. The old mine has worked back so far in the hills that cost of transportation has become excessive.

The Court of Appeals of Kentucky, on Oct. 21, affirmed the Circuit Court dismissal of a petition of members of Union 3,348, District 19, United Mine Workers (southeastern Kentucky), to recover \$2 a day for each man, or a total of \$32,000, for an eighty-day

period in which they allege the Jellico Coal Co. arbitrarily closed down its mine and locked them out because they refused to surrender their charter. Failure to allege that notice had been given the company of fines to be assessed against the company rendered the petition invalid the court held.

OHIO

Thomas H. Settle, general manager of the Virginia-Smokeless Coal Co., of Bluefield, was in Cincinnati recently consulting with engineers and others. He let it be known that another mine was being opened by his company and that production would be well on the way within a year.

Jewett, Bigelow & Brooks, through action of the receivers, closed their offices maintained on the sixth floor of the Dixie Terminal, Cincinnati, on Oct. 20. Only a small room on the same floor will be maintained by the receivers.

With Ben F. Ford at its head the Ford-Elkhorn Coal Co. has opened offices in the First National Bank Building, Cincinnati. Mr. Ford was long the directing partner of the Matthew Addy Co. in charge of its coal department prior to receivership proceedings. He is the owner of a mine or two in the Elkhorn district and has other valuable connections in that and other Kentucky districts.

Fire has broken out afresh in several new locations between New Straitsville and Shawnee in the big coal mine fire which has been raging in this territory for the past 40 years. Residents of New Straitsville are apprehensive that their homes may be undermined by the burning coal. It is estimated that more than 6,000 acres of good coal has been consumed in the last four decades.

The William S. Harman Coal Co. is gradually acquiring a considerable acreage around Philo, on the Muskingum River, and large developments will soon be made in that section. The company has obtained the contract to furnish the immense power plant of the American Gas & Electric Co., at that place with coal and the development will be made as the coal requirements increase. The power plant is one of the largest in the Middle West and already approximately \$25,000,000 has been spent in building it. Additional units are to be added later on. One of the first developments will be a large striping operation.

A meeting of representatives of the Red Jacket Coal & Coke Co. was held recently at the general offices in Columbus with Ohio, Indiana, Michigan

and Canadian representatives in attendance. W. M. Ritter, chairman of the board of directors, and H. T. Wilson, president of the company, both gave talks. Sales manager Thomas H. Wilson had charge of the meeting. Following the conference all of the salesmen with I. D. Cooke, cashier, left to inspect the Red Jacket mines, where they were joined by W. H. Cummins, general superintendent; George Vance, superintendent, and J. F. Poindexter, who represents the company in Virginia and the Carolinas.

PENNSYLVANIA

Wagon mines in the vicinity of the larger cities in the central Pennsylvania field are pushing operations and in many places cuts in prices of from 50c. to \$1 per ton have been made in order to get business. Many of the wagon mines are running full time and some two shifts.

At a primary election held in District No. 2, United Mine Workers, last week John Brophy for president, James Mark for vice-president and John Ghizzoni for national board member won over George Bassett, Jerre Ford and Evan Thomas, respectively, and will be elected at the general election in December. Mr. Brophy's total of locals placing him in nomination was 117 against 55 for Bassett; Mark carried 110 against Ford's 63 and Ghizzoni had 110 against 35 for Thomas.

The Mid Valley breaker of the Hazle Brook Coal Co., near Hazleton, has ceased operations and will be dismantled. Hereafter the tonnage of the mine will be hauled over the Lehigh Valley R.R. to the company's new breaker at Raven Run.

James L. Cooney, president of the Scranton Coal Co., Scranton, was recently tendered a banquet by men he played with and against in football 25 years ago, when he was a Princeton gridiron star. Harry Vaughn, former Yale player, was among those who turned out to honor the Scranton coal mining official.

Operation of the Wallwork mines at Mosgrove, near Kittanning, was resumed Oct. 20, after a recent suspension. The resumption gives employment to a number of men of the district. The mine was first opened in 1917, by Samuel Wallwork, who died a few weeks ago.

Three men were killed instantly in the Pittston vein of the No. 14 colliery of the Pennsylvania Coal Co., at Inkerman, when roof supports snapped while they were loosening a pillar stump and the roof fell, burying them beneath. The bodies were recovered by rescuers in about an hour's time.

Several operations in the Lehigh field which were idle during the summer months have resumed operations during the week and an increased tonnage is looked for by the Lehigh Valley R.R. The railroad and coal company managements are working to speed production to 20,000 tons a week as soon as possible and keep this up during the fall and winter, as the demand for fuel increases.



Railroad Station,
Rock Springs,
Wyo.

In summer the only blue grass in town is grown in the station yard and soil to grow that had to be brought from a ranch twelve miles away.

UTAH

The arguments on motion of defendants to dismiss proceedings started by the federal government against the Carbon County Land Co. the Independent Coal & Coke Co. and Carbon County to recover title to 5,500 acres of alleged rich coal lands, were finished in Judge Tillman D. Johnson's court last week and the motion taken under advisement.

The Rains mine of the Carbon Fuel Co., which was wrecked by an explosion a few weeks ago, is now ready for official inspection. B. W. Dyer, chief mine inspector, and John Crawford, coal mine inspector, will be in charge. The State Industrial Commission had resolved that before the mine is opened for production it be completely rehabilitated; that all the stopings along entries where men are employed be permanent and of fireproof material; that dust in the mine be either loaded out or wet down, or rock dusted to such an extent as to render it inert and incapable of propagating an explosion and that the mine be examined by the coal mine inspection department of this state and pronounced safe.

Coal production in Utah for September amounted to 380,558 tons, a falling off of 5,634 tons compared with the previous month. In September, 1923, 408,536 tons was produced. The September production this year was the smallest in years. The heaviest output in September for the past five or six years was in 1922, when 489,220 tons was mined.

VIRGINIA

The Clinchfield Coal Corporation has resumed dividends on the common stock. It will pay \$1.50 a share on Nov. 15 to stockholders of record Nov. 10. The regular quarterly dividend of 75c. a share on the preferred also has been ordered. The last previous payment on the common was $\frac{3}{4}$ of 1 per cent, on May, 15, 1923.

The Clinchfield Coal Corporation, of Dante, has contracted with the Roberts & Schaefer Co., for the installation of R. & S. shaker loading booms to be installed at No. 2 tippie, Dante.

WEST VIRGINIA

J. W. Powell, consulting and contracting engineer, of Charleston and Welch, W. Va., who was formerly employed for many years in the development and management of heavily pitching seams in the western part of the United States and Canada, left for Siberia Oct. 22 by the Str. Esthonia. Mr. Powell is to take the position of mine superintendent for the Autonomous Industrial Colony Kuzbus, a Russian state mining trust which operates the central and southern group of mines in the Kuznetsky Basin.

The Buckhannon River Coal Co., of Uniontown, Pa., has contracted with the Roberts & Schaefer Co., Chicago, for a new tippie of wood construction at Adrian, W. Va., which will be complete with all hoisting machinery, Marcus screens, and R. & S. loading machinery.

The Nelson Fuel Co., operating in the Greenbrier smokeless field, has just completed the installation of a water system. The water is forced by air into a main and pumped into an 80,000-gallon capacity reservoir which supplies the town of Leslie. It is freestone water and 350 gallons per minute will be produced from a depth of 190 ft.

The Fordson Coal Co., of Stone, Ky., has contracted with the Roberts & Schaefer Co., for a new steel tippie to be built at Twin Branch, W. Va. This tippie will be complete with retarding conveyor, Marcus screen and R. & S. loading booms.

Governor Morgan let it be known indirectly that he would not intervene in eviction proceedings in northern West Virginia between the miners and operators as requested by T. C. Townsend, representing the United Mine Workers. The Governor declined to take any definite action other than to refer the protest to the prosecuting attorney of Monongalia County. Governor Morgan did use his good offices in halting evictions in the Kanawha County field as a result of the visit of John L. Lewis to that section. Operators there had been evicting in accordance with a decision of the Supreme Court, but called a halt to such methods and proceeded to obtain possession of their houses through the usual court routine.

The Raleigh Wyoming Coal Co., of Charleston, has been granted authority by the Secretary of State of West Virginia to increase its authorized capital stock from \$4,100,000 to \$4,700,000.

Operators from various sections of West Virginia assembled at Washington a few days ago for a conference on proposed changes in the mining laws of West Virginia. Among those present were C. H. Jenkins, vice-president of the Hutchinson Coal Co.; Frank R. Lyon, vice-president of the Consolidation Coal Co.; Everett Drennen, president of the West Virginia Coal & Coke Co., and a number of operators from southern West Virginia. It is proposed to draft a new code of mining laws in the state.

The Pocahontas Fuel Co. will soon have two large, new plants in operation developing a 30,000-acre lease obtained from the Frick coal interests in Tazewell County, Va., and in McDowell County, W. Va. One plant is being constructed on the Jacob Fork and the other on the Dry Fork of Tug River. Cutting, cleaning and loading will be done entirely by machinery. The company expects next year to be able to mine 6,000,000 tons of smokeless coal in West Virginia.

CANADA

A coal-weighing war has broken out in Hamilton, Ont., the dealers refusing to submit to city weighing and declining to pay back bills for it. They have their own scales that can be inspected at any time. The city is preparing to collect the bills by process of law.

Record coal outputs are being produced from the collieries of the British Empire Steel Corporation in the Glace

Bay area. The total quantity hoisted on Oct. 17 was 18,203 tons, the largest days production since October 15, 1915, on which day the output was 18,312 tons. No. 11 pit made a new mark with a production of 1,723 tons, breaking the previous record of 1,629 tons mined on July 22 last.

The miners of Alberta returned to work Oct. 20, ending the protracted strike, the men having ratified the agreement entered into by their representatives with the operators by a narrow majority. According to estimates of the Department of Labor the strike entailed a loss of about 775,000 working days and a coal production of approximately 1,500,000 tons. Now that the cost of production has been lowered by the wage reduction it is anticipated that the operators of Alberta can compete on more even terms with American producers and in addition to recovering their lost ground in Manitoba and the West, find a market in the neighboring states of North Dakota and Minnesota. The reduced cost of running also will further the projected shipping of Alberta coal to Ontario.

Association Activities

The Kanawha Operators' Association recently held its twentieth annual meeting in Charleston, W. Va. The sessions were marked by complete harmony, all the old officers and directors being re-elected as follows: John Laing, president; D. H. Morton, vice-president; John L. Dickinson, treasurer; Duncan C. Kennedy, secretary. Directors: Col. W. M. Wiley, Col. E. O. Dana, H. L. Warner, F. O. Harris, W. C. Mitchell, F. H. Morton and C. A. Cabell. The Chesapeake & Ohio came in for high praise for the excellent transportation service rendered during the last year. The association adopted a resolution offered by Carl Scholz, vice-president of the Raleigh-Wyoming Coal Co., opposing the proposed child labor amendment to the federal constitution.

William R. Chedsey, professor of mining at Pennsylvania State College, in an address at the first fall session of the Pennsylvania Coal Mining Institute, at Johnstown Oct. 17, said he felt inclined to favor the use of high-voltage currents, explaining that he termed anything over 500 volts as high. Professor Chedsey's subject was "High Voltage vs. Low Voltage Electric Installations in Mines." He said he had no record of a death resulting from contact with a circuit of less than 220 volts and told of a fellow teacher who had to wet his fingers to feel the current of 440 volts. Of course, he said, death might result from a much less voltage, depending on the resistance of the individual. J. W. Paul, chief engineer of the U. S. Bureau of Mines at Pittsburgh, read a paper on "Explosions and Rock Dusting." Among the interested spectators at the meeting were a number of inspectors and mine foremen. E. Kent Davis, chief engineer for Peale, Peacock & Kerr, of St. Benedict, will speak at the next session of the institute, which will be held on Nov. 21.

Industrial Notes

The Eagle Iron Works, Des Moines, Iowa, is now well established in a new and greatly enlarged manufacturing plant.

Blaw-Knox Company announces the appointment of Waldemar Dyrssen as chief engineer of the furnace equipment department and chief engineer of the forge and hammer welding department of the company. Mr. Dyrssen's experience in the steel industry has been extremely wide and comprehensive since his graduation from the Royal Technical University, Stockholm, Sweden, with the degree of Metallurgical Engineer, class of 1908.

Traffic

Defers Hearing on Proposal to Raise Switching Rate

The Coal, Coke & Iron Ore Committee, Central Freight Association territory, announces a postponement of the hearing on switching rates on coal, coal boulets and briquets, coke (except petroleum coke), coke breeze, coke dust and coke screenings, carloads, as shown in B. & O., C. & C. Series I.C.C. 2,429, from point of connection of B. & O. with P.R.R., Martins Ferry, Ohio, to private sidings on B. & O. R.R. within switching limits of Martins Ferry, Ohio. It has been proposed to cancel the switching rate of 13c. per net ton, minimum \$3.60 per car, and apply a rate of 76c. per net ton, as per Agent Davis' Tariff I.C.C., 43, and B. & O. Tariff I.C.C. 2306.

The hearing on this subject, which was set for Thursday, Oct. 30, 1924 (as per announcement of Public Hearing No. 34, dated Oct. 15), is postponed to Thursday, Nov. 13, 1924, at 10 a.m., in Room 606, Chamber of Commerce Building, Pittsburgh, Pa.

Plan Better Handling of Coal At Birmingham

A meeting of traffic officials of all the coal-carrying lines in the Birmingham district and several other roads indirectly contributing equipment for the movement of coal and coke from that section was held at Birmingham, Oct. 22 and plans were evolved whereby it is thought that the mining industry will be provided with an adequate car supply through the winter and spring, a period in which the district has suffered materially in the past from shortage of cars. The meeting was attended by several coal operators, the interests of shippers being represented by S. L. Yerkes, chairman of the coal and coke committee of the Alabama Mining Institute.

Kanawha Group Rate Sought by Winifrede Coal Co.

The Winifrede Coal Co., operating in the Kanawha district, has filed a complaint with the Interstate Commerce Commission requesting that rates from points on the Winifrede R.R. be established on the basis of rates from the Kanawha district group. It is asserted that the mines on that line are geographically, geologically and commercially and from a transportation point of view within the Kanawha group. The Chesapeake & Ohio R.R., however, has "failed, neglected or refused" to extend the group basis to the Winifrede R.R. The combination rates which must be paid, it is contended, are so excessive as to render it difficult at all times to market coal in competition with mines enjoying the group rates.

Freight rates on coke from Portsmouth, Ohio, to Wingate, Ind., which had been attacked by retailers, are reasonable, the I.C.C. has ruled.

Obituary

Harry B. Olmstead, one of the best known coal operators in the Middle West, died at the Good Samaritan Hospital, Cincinnati, Oct. 24, following a short illness from pneumonia. He was 57 years of age and leaves a wife, one son and a daughter. Mr. Olmstead started in the coal business about 20 years ago in the Equitable Coal Co., which had mines on the C. & O. R.R. in the Kanawha field. Later he organized and became president of the Middle States Coal Co., which had offices in Columbus and mines at Hugar, W. Va. This company was later taken over by the Houston Coal & Coke Co., of Cincinnati, and Mr. Olmstead went with the new owners in a responsible position in the operating end of the business. He was secretary of the Williamson Operators Association.

Edward S. Nevius, widely known coal operator, died Oct. 19 at the home of his daughter, Mrs. Samuel Ayres, in Kansas City, Mo. Mr. Nevius was president of the Adair Coal Co., which operates mines in northeast Missouri, and formerly was president of the Nevius Coal Co., operating in Southeast Kansas fields. He was 60 years old and had lived in Kansas City more than twenty years.

John William Wolfe, 50 years old, treasurer of the Marmet-Halm Coke & Coal Co. and the Otto Marmet Mining Co., died suddenly at his home in Cincinnati, Oct. 16, of cerebral hemorrhage. Mr. Wolfe, who was born in Cleveland, Ohio, went to Cincinnati more than 25 years ago, and for the last eight years had been with the Marmet company. Mr. Wolfe is survived by his wife.

Jesse Dean Stalter, secretary of the R. Stalter Coal Co., of Columbus, Ohio, and an owner of several coal mines in the Hocking Valley district, was instantly killed when his automobile crashed against the concrete side of a viaduct in Columbus. He was seen to be driving rapidly when the car skidded with the fatal results.

Charles Fergie, a prominent engineer identified with the coal-mining industry, died at Montreal, Canada, Oct. 19, in his 67th year. Mr. Fergie was born in England and came to Canada in 1887, becoming manager of the Intercolonial Coal Co., Ltd., at Westville, N. S. He was afterward appointed vice-president and general manager of the company. In 1905 he was made general superintendent of mines for the Dominion Coal Co. at Sydney, N. S., holding that position until 1908, when he went to Montreal where for some years he practised as a consulting engineer. In 1914 he became president and managing director of the Intercolonial Coal Co., Ltd.

J. J. Dobbie, general manager of the Cumberland Coal Co., with headquarters at Douglas, W. Va., died late in October of pneumonia after an illness lasting more than a year. At the time of his death Mr. Dobbie was in his 69th year. Although a native of Maryland, Mr. Dobbie had lived in West Virginia for many years, where he had been prominent in coal mining circles. He was the father of W. Clark Dobbie, general superintendent of the New England Fuel & Transportation Co., and of Gibson Dobbie, also connected with the coal industry in the Fairmont region.

Coming Meetings

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Society of Mechanical Engineers. Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

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

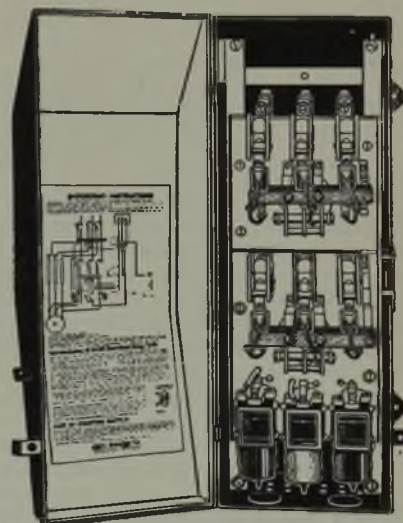
Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

New Equipment

Automatic Resistance Starter Has Push Button Control

This starter is a push button control unit for squirrel-cage motors and is superior to the automatic compensator due to the smoother acceleration and greatly reduced current inrush when switched from the starting to the running tap. The graphite compression resistors are adjustable with one screw for any starting current. There are no taps to change. The motor is started by pressing the starting button of the push button station which closes



A Push Button Starts Things

After a predetermined time interval a relay closes the main line switch and the motor receives power directly from the line.

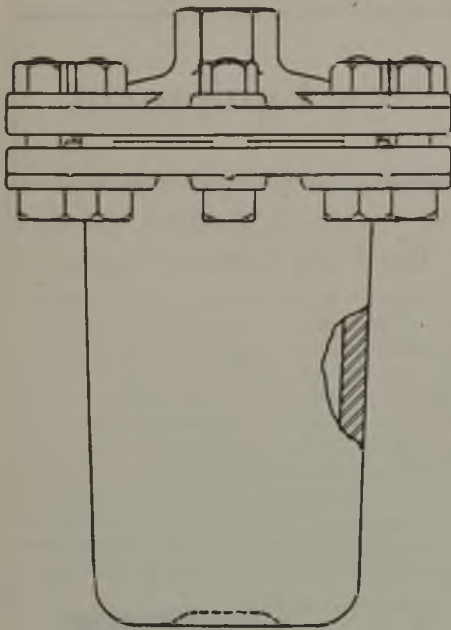
the starting clapper switch and allows the motor to accelerate with the primary resistors in the main circuit. After a fixed interval of time, the timing relay closes the main clapper switch and throws the motor on the line without opening the primary circuit and thereby short circuits the starting resistors. This switch has all the protective features of similar starters made by the Allen-Bradley Co., Milwaukee.

Such a starter as this is useful where the motor must be started and stopped from a position remote from the motor. Conveyors, belt lines and scrapers must usually be started and stopped from several different points.

Rugged Steam Trap Designed For Extreme Pressures

A new steam trap designed for extreme pressures and temperatures has just been introduced by the Armstrong Machine Works, Three Rivers, Mich. In this latest addition to the company's line the body and cap are of high grade cast steel. All strains are removed from the castings by annealing.

The steel trap embodies the same patented basic operating principle that has been so well established in the com-



Heavily-Built Steam Trap

After the trap is completed it is hydraulically tested to pressures up to 3,000 lb. to insure tight joints and suitable castings. The valve parts are non-corrosive chrome steel, machined from bar stock, then heat-treated.

pany's standard type trap. The discharge is at the top so that oil and sediment are forced out whenever the trap discharges. An air port in the closed end of the inverted submerged bucket permits any air that may enter the trap to rise to the top and be released when the trap discharges.

Realizing the fierce service conditions imposed by high pressure and superheat, the valve parts have been made particularly rugged, and throughout the trap is designed to stand up under the most severe conditions. The valve parts are non-corroding chrome steel, machined from bar stock, then heat treated. The valves are furnished with orifices suitable for pressures up to 500 and 600 lb., or higher in special cases. The cap is bolted to the body with eight to ten large bolts, depending on the size of the trap.

After the trap is completed, it is hydraulically tested to pressures up to 3,000 lb., to insure tightness of castings, joints, and valves. The steel body trap is also made for pulsating pressure service.

Simplified Diesel Engine Has Low Operating Cost

An entirely new design of two-cycle, double-acting Diesel engine was recently announced by the Worthington Pump & Machinery Corp. The new engine combines a fuel economy comparable with that of the best existing types of Diesel engine, with dimensions, weight and construction cost per horsepower approaching those of reciprocating steam machinery.

Another striking and important feature of the design is the fact that, from all indications, the horsepower per cylinder can be carried to a far higher value than any yet attained in Diesel engines, thus immensely increasing the field of possible usefulness of Diesel-type power units.

The engine which has resulted from

long research will undoubtedly be of the greatest interest to industrial and mechanical engineers everywhere, as the relation of space, weight and first cost to horsepower is of importance in power plants. The new engine is characterized by simplicity of design and construction, and its initial cost per horsepower will consequently be low.

The basic principle underlying the new engine may be briefly stated to be: in the four-cycle Diesel engine one stroke in every four is a power stroke; in the two-cycle engine one stroke in two; in the new engine every stroke is a power stroke. Its working cycle, therefore, is virtually the same as that of a reciprocating steam engine.

The principle, of course, is not a novel one, but mechanical difficulties, chiefly concerned with the complicated heat stresses in the cylinder of a double-acting engine, have hitherto interfered with its successful application. The success of the Worthington design lies in the manner in which the problems of expansion and of heat removal are solved.

Once the major problem is overcome, the many advantages of the double-acting type are evident. The balance of the moving parts, for example, is simplified to a marked degree, and the weight saving, not only from the manner in which the required power per cylinder is distributed through four strokes instead of being concentrated in one, but also from the decreased provision needed to care for the momentum of moving parts, and in other ways, is obviously a big advantage.

The cylinder of the new engine might be described as composed of two single-acting cylinders, opposed end for end and working in opposite directions, their respective pistons flanged to the same rod, the scavenging and exhaust ports, cooling water circulation and expansion provisions of

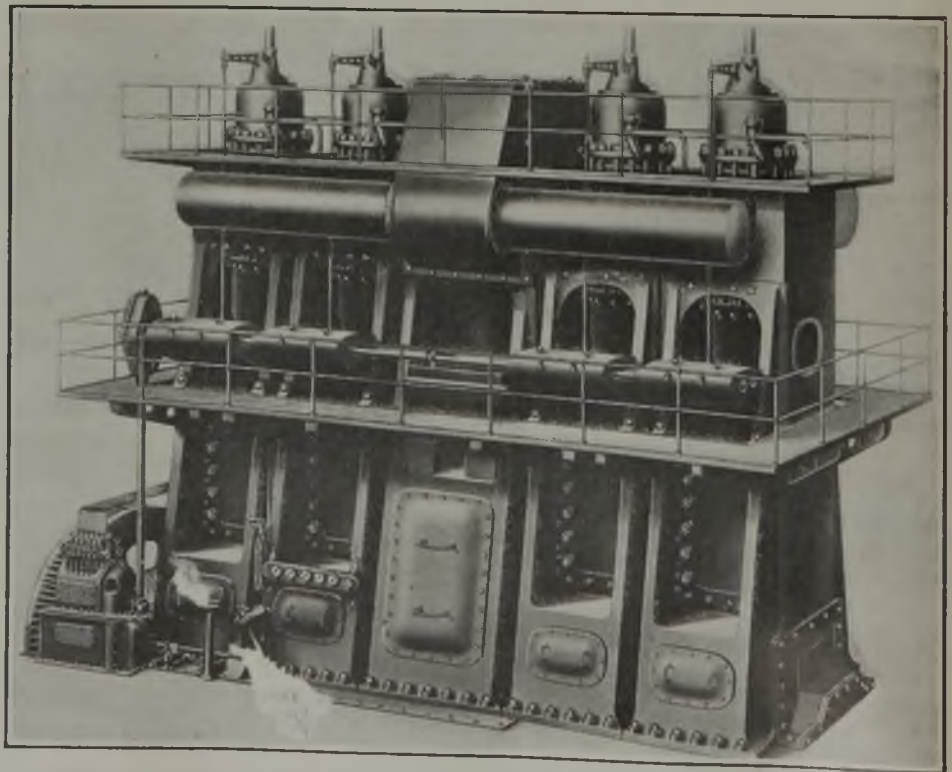
the two being virtually independent of each other.

There are three fuel spray valves, one on top of the upper end of the cylinder, and two in the bottom head on opposite sides of the piston rod, entering at an angle. One of the admirable points of the design is the ingenuity with which these two valves are proportioned so as to give a uniform and symmetrical distribution of the charge around the piston rod.

The reversing mechanism, as a point of interest, is second only to the unique cylinder design. Each of the three valves has its own cam, all three are geared to the same shaft. The cams are symmetrical, and all that is necessary to reverse the running direction is to shift all three cams simultaneously through 343 deg. on the shaft. This is accomplished by a worm shaft, which in turn is actuated by an oil-operated hydraulic mechanism controlled by a four-way cock, this in turn being operated by a single lever on the manoeuvring platform.

The engine is started and stopped by a single lever, which as it is moved forward successively opens the air starting valves, then the fuel supply valves, simultaneously closing the air starting valves; the lever being then capable of being set, by a ratchet and pawl, at any desired fuel supply. To stop, all that is necessary is to throw this lever back to the stop position.

The starting and stopping lever and the reversing lever, though independent of each other in all other respects, are interlocked so that the engine must be brought to a full stop before it can be reversed. Every effort has been made, in all the auxiliary mechanism as well as in the engine proper, to secure the utmost possible simplicity both in design and operation, that can be combined with the highest efficiency and reliability.



Two-Cycle, Double-Acting Diesel Engine

The unit is started or stopped by a single lever which opens the air starting valves, then the fuel supply valves. Every stroke is a power stroke. Its working cycle compares favorably with that of the best