

COAL AGE

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Now It Can Be Told

THE WAY may be clear for coal trade statistical reports once more. At least it appears to be. Harlan Stone, United States attorney general, has shown no desire to upset the business advancement plans of the Department of Commerce as Harry M. Daugherty did before that gentleman was oiled out of the cabinet. And since the best information on the subject leads the Hardwood Manufacturers' Institute to believe that Mr. Stone is going to take the same sound position that Secretary Hoover of the Department of Commerce takes in encouraging trade statistics, it is preparing to resume the issuance of sales and stock reports. So the way appears equally open for the exchange and publication of data on closed transactions in coal.

With the coal market in its present deflated condition it is hard for some coal men to see what good it will do them to receive such data. There is so little trading in coal that everybody knows all about it without statistical reports—so they say. Nowadays the sale of one hundred tons of mine run creates almost as much furore among coal salesmen as a circus parade does in a townful of "kids." But even in such a condition, the coal market would be more stabilized and less ruled by rumor if every legitimate trader in it knew positively what every other legitimate trader did the day before. And times are bound to change. People simply must begin buying coal before long. When they do the need for straight statistics on coal markets will be keener. The time for coal trade associations to get back on their feet and organize for service is now.

Another Crime Averted

SOME of the gas journals, says G. S. Brewer in his report to the City of Buffalo on its fuel problem, want gas made at the mines. Later he proceeds to declare that the pipe should have a capacity one and two-thirds times as large as the average needs, so as to take care of the peak load.

We who have learned that our industry should be so regulated that it would have no excess capacity but always be just what the need demands or that we should regulate demand so that it would always fit capacity are surprised at this suggestion. Has Mr. Brewer no imagination or sense of leadership that he cannot find a way short of providing a pipe of excess capacity? Could not gas of a higher thermal equivalent be made in the winter? Could not the pressure of the gas pumps be increased when the cold winds blow? Could not the pipe be made to expand when the demand was greater? Could we not attempt even a revision of Boyle's law? Anything but an excess capacity!

But then if the gas were made of a high thermal value, the gas pressure were increased, the pipe ex-

panded, or Boyle's law were conveniently modified, why not use these magic powers all the year round? A smaller investment would then suffice, but there would still be that excess capacity. How prodigal! It is well the crime was averted, that G. S. Brewer nailed the sinful waste within the four narrow walls of his conclusions so tight that no one can hear its groanings, for had he not done so the coal industry, hoary with crime already, would have sinned again. No more excess capacities! An excess capacity in mines and men is enough; no excess capacity in pipes, in gas, in gas pumps should be added to the many offenses of the coal industry.

Illinois Gets a Loader Scale

MACHINE loading of coal underground is free to go forward in Illinois at last. The scale for operators of loading machines which has just been signed by the Chicago, Wilmington & Franklin Coal Co. and its employees is not state-wide but it might as well be. It is the die in which all future wage agreements for machine operation probably will be cast, as company after company installs loading machines. The most agreeable thing about it is that it puts machine loading on a per diem instead of a tonnage basis—and that in the citadel of unionism, Illinois!

There is no controverting the fact that the coal-loading machine logically should be operated at present by men paid a flat daily wage. The volume of work a certain type of machine will do in eight hours under given mine conditions largely is determined in advance. If the operators do not bring it up to that capacity, they are not giving the machine or its owners a square deal. They certainly cannot push it beyond its limit no matter what their skill or willingness. Therefore, machine loading is not piece work in the nature of it and we are glad the Chicago, Wilmington & Franklin Coal Co. has established this wholesome fact in its agreement. Such an agreement couldn't have been written with John Lewis' union a month earlier than this one was.

The job that now confronts that coal company and every other company that adopts machine loading in Illinois is the ever-present job of getting a full day's work out of men paid on that basis. It is reasonable that intelligent and industrious Illinois machine loader runners receive \$10.07 for a full day of eight hours with a loader such as those on the market now. But that is a big day's wage, judged by any sound standard of manual labor. It now remains to be seen whether such a wage will attract, as has been frequently predicted, a class of high grade, square-shooting miners who will realize this fact. If it does, then the cost of producing coal in machine loading mines will be sufficiently reduced so that those mines will get business and the miners in them will get work.

Are More Miners Needed?

DESPITE public clamor the cry still persists that coal loaders are scarce. A few years ago this cry was somewhat general. It has been only stilled, and that partly, by declarations from high authorities that there were altogether too many men for the tonnage the country could absorb and that this was true even at times when the demand for coal was greater than could be supplied from the coal fields owing to lack of transportation facilities.

No one can deny that this is true, yet the need for more men is still one of the perplexities that trouble operating officials. The reason for the paradox is the excessive number of mines in the coal fields. Almost every operator could find places for more men, and nearly every mine owner knows that if he had a larger force he could produce cheaper coal. So the hunt for men continues. Whether this is advantageous to the country as a whole is questionable, but it is natural for every owner of a coal mine to seek to hire as many men as will make operation profitable.

Certain parts of the country are more clamorous than others. The anthracite region is one of these. The law in that region requiring that every miner must have served for two years as a laborer under another miner has unduly restricted the supply of men. As anthracite is greatly needed the demand of that region is accepted as reasonable and as a problem in which the consuming public shares.

Another region is West Virginia. At first it met its demand by drawing on the farming population, which readily left its unprofitable farms on the steep hill-sides for a more profitable occupation in the mines. But West Virginia was sparsely settled. Much of it was unfitted for the plow, and the market being remote, the population had not been supplemented by immigration. In consequence of the lack of native labor, West Virginia made a heavy bid for alien immigration to support its growing production, alleging, however, that the Department of Labor favored union regions and directed the new arrivals away from non-union fields.

Consequently West Virginia has felt the lack of labor more perhaps than any other coal-producing region. Its call for labor has always been insistent. Its lack of miners has kept it from the development that its nearness to the sea coast, its low freight rates, its excellent coal, the spread of its coal fields and its lower daily wage rates otherwise would have afforded it. Some of the other coal areas have not been greatly sympathetic with this lack of labor, but it naturally has been a thorn in the flesh of West Virginians who are interested in the progress of the state.

Now the state has been further hit by the restriction of immigration, which possibly bears more heavily on mining than on other industries. Progress in West Virginia is retarded. The public, however, is so strongly convinced that there are too many miners that it will be a long time in doubt whether ameliorative action should be applied.

Those who wish to see the miners kept steadily working will not be sorry to learn that forces are at work to reduce the mining population. The miners also will rejoice. It may be only a few years before the operation of conditions such as are described in an article appearing in this issue and entitled "Coal Loaders—How Are We Going to Get Them?" may bring the number of miners down to such a level that their output

—greatly augmented by machinery—will be sufficient only when working steadily to supply the market. Then may come a condition the converse of that now existing. Meantime and thereafter West Virginia will suffer and coal-loading machines and conveyors will have a day of rapid extension.

Watching the Parade

THOUGH coal never leads the country's industrial parade, it never gets left around the corner, either. It always keeps up in the long run with the rest of the procession. Therefore, when the coal industry marks time it does the coal man good to get up on an eminence somewhere and view the rest of the parade—that is, if the result of his observation proves to him that the other paraders are still moving onward with unflinching step. He knows it will be only a short time till his own contingent is ordered forward on the "double quick." The glance he will make just now will fill him with encouragement. He can hardly pick a better place to look than at the statistics charting the course of revenue freight cars loaded with all commodities, remembering that the country ships goods only when it is busy.

These charts now show that during the first half of 1924 the railroads loaded more revenue freight than during the first half of any year since 1919 excepting last year, and that 1923 was only eight per cent ahead of 1924. The total revenue freight loaded thus far in 1924 is a trifle of twenty-three million cars, which constitutes a briskly moving procession no matter by what standard it may be measured. Naturally the two-weeks period over the Fourth of July shows a drop, as ever, but the rebound also occurs, as usual, and loadings are now on their way upward toward the inevitable fall peak. This 1924 is well on its way toward the fifty-million mark which 1923 established in revenue car loadings.

There is something wholesome about this industrial parade of freight cars up and down and back and forth across the United States. It indicates that the country's huge stock of coal is swiftly going down. In spite of the fact that coal loadings, which normally represent a third of the country's freight movement, are about 40,000 cars a week under 1923, the carriers are otherwise busy and there is no denying it. There is no confusion about their activity, however, for never in the recent history of railroads have they been in such good shape mechanically and in personnel. But they are handling a vast volume of freight. And coal loadings are moving up at about 3,000 cars a week.

The main question of interest to the coal man, as he takes this glimpse at the freight parade is: How fast will this acceleration of coal loadings proceed? When will they be up to "normal"? It is true that iron and steel production is low and has been dropping since March. It is true that production in some other lines, notably automobiles, continues low. But it also is true that average consumption of commodities generally has taken its upward turn and is now ahead of output. This naturally will soon cause a turn in production.

So, in spite of this being presidential year, there is little inflation and general economic conditions are sound. A steady upward trend in coal consumption is already starting. The country's industrial parade is headed in the right direction.

Suggestions for Concentrated Machine Mining

Coal Is Produced by Manual Labor, Every Other Commodity by Machine—Mines Laid Out to Suit Hand Methods Not Adopted to Machine Loading—Conveyors Greatly Simplify Machine Operation

BY N. D. LEVIN
Columbus, Ohio

WE LIVE in an age of machinery; almost everything by which we satisfy our daily needs is produced by mechanical means. The soil is tilled, the crops harvested and the production of food of every description in sufficient quantity and proper quality is today possible only through the aid of machines. The houses we live in, the furniture with which they are provided, our transportation systems, our telephones, in short practically everything needed, used or consumed by the human race, with one great exception, is produced by machinery. This solitary exception is coal. In many localities this fuel is still mined with pick and shovel and almost the entire output of the country is loaded underground by hand.

Many people have realized this situation and have sought to produce machinery for loading coal in the mine. During the last twenty years many hundreds of patents have been taken out, and millions of dollars have been spent on the development of coal-loading machines. And yet nearly all of the coal produced is loaded by hand. The reason for this is not in the obstacles encountered in developing loading machines, but in the difficulty met with in adapting machines already perfected to mining systems that were developed when nothing more mechanical was available for the purpose of coal production than pick and shovel.

With hand loading, the output from each working place is limited; consequently a great number of working places are needed in each mine in order to obtain the desired output. It is evident that it is not practicable to use machines if they must go into several hundred places in order to obtain the necessary production. There are too many delays of various descriptions

in attempting to load mechanically in such mines, and it is these delays that are responsible for the economic failure of coal loading by machinery.

It is necessary therefore, to change the mining system so that machines can be kept going a full shift in the same working place. Means also must be provided for removing the coal without interruption.

LOCAL CONDITIONS FIX PLAN TO BE ADOPTED

The object of this article is to suggest certain principles that should be kept in mind in laying out a mine or a part of a mine for mechanical loading. Each locality will have its own problems to solve. It is hoped that the accompanying diagrams may help to suggest some scheme that can be worked out successfully.

Fig. 1 shows the V-system that is being used by the West Virginia Coal & Coke Co. This system of mining was fully described in *Coal Age* (issue of Feb. 7, 1924, p. 197) and needs no further comment here.

Fig. 2 shows a modification of the V-system. Conveyor-loaders are used on the working faces delivering coal into sectional conveyors, which in turn deliver it to a main conveyor. The narrow work is performed by entry-driving machines and sectional conveyors. One loading point serves the entire system.

Fig. 3 shows a system embodying several faces indicated by numbers 2, 3, 4, 5, and 6. These faces may vary in length from 75 to 200 ft. or more, depending upon local conditions. A loading machine and a conveyor, or a combination conveyor-loader serves each face. The coal from face No. 2 is delivered to a conveyor on entry No. 2. That from face No. 3 is delivered to a conveyor on entry No. 3 and so on. These

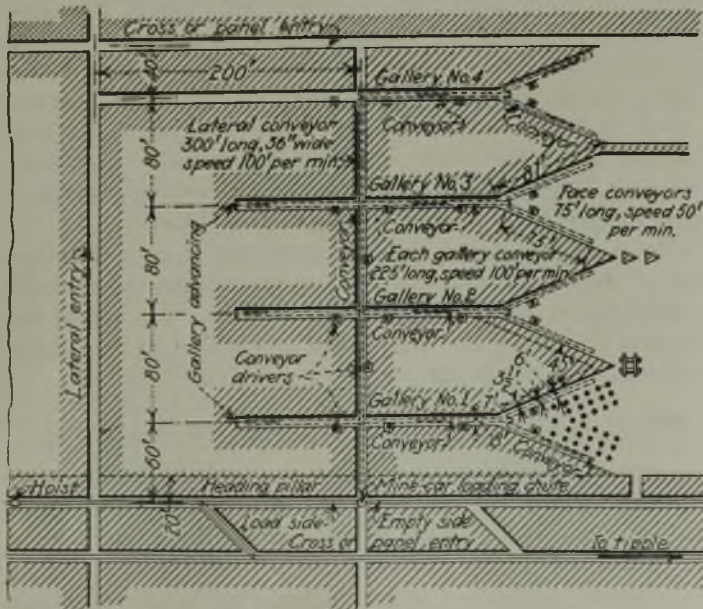


Fig. 1—V-System of Mining

By the arrangement shown each pillar furnishes two faces, each of a length approximately equal to the width of the pillar. A large tonnage is thus secured from a comparatively small area, supervision is concentrated and the advance is rapid.

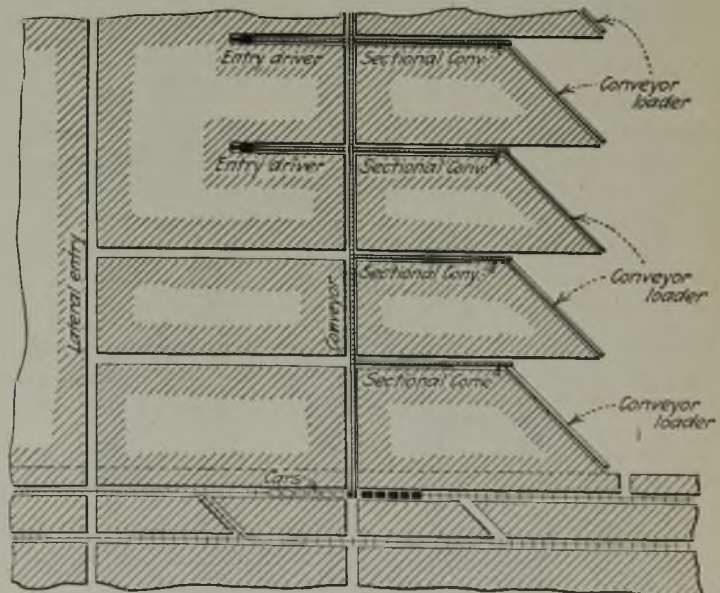


Fig. 2—V-System of Mining Modified

In the mining system depicted the pillars are worked on long slanting faces. All mining is done by machine and both development and main extraction are performed rapidly. Again, supervision is concentrated and efficient.

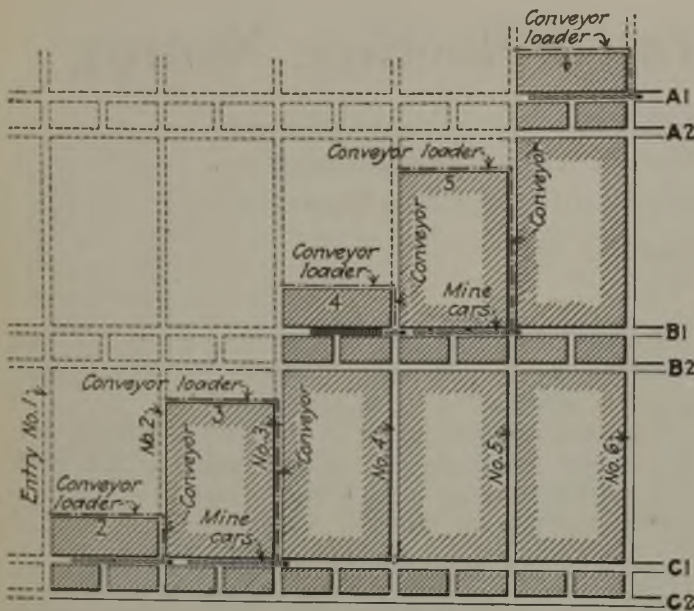


Fig. 3—Panel System, Worked by Conveyor

Five trips of cars are shown loading on three entries at the same time. The faces, which are made of a length to suit conditions, are arranged in échelon so that the line of roof break presents a saw-toothed appearance.

conveyors are made in sections so that they may be shortened as the face is brought back. The coal from faces 2 and 3 is loaded onto cars on entry C1, and that from faces 4 and 5 is loaded on entry B1. In order to obviate interference between the two loading points on each entry, as they are rather close together for handling long trips, and in order to keep an uninterrupted car supply at each loading point, a certain amount of switching will be necessary between entries B1 and B2, also entries C1 and C2.

It is believed that it would be economical and preferable to provide an additional conveyor for each pair of face entries, as shown in Fig. 4. In this case, the sectional conveyors on entries 2 and 3 deliver coal into a conveyor on entry C1, which loads cars on entry No. 4. This arrangement is duplicated throughout the mine. The empty trip may be brought in on entry C1, switched through entries Nos. 5 and B2, and then to the loading station in entry No. 4, the cars being all loaded at the intersection of entries Nos. 4 and C1. This will do away with a gathering locomotive, and one

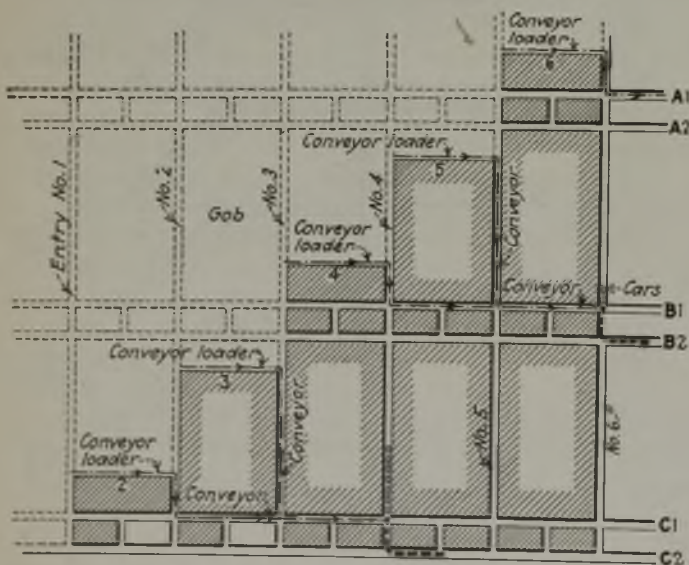


Fig. 4—Another Conveyor System of Mining

The mine layout is practically the same as in Fig. 3 but more conveyors are used so that coal from two faces instead of one feeds to each loading point. Fewer but perhaps heavier locomotives will accordingly be required.

loading point will serve for two faces. A small rope hoist should be provided near the loading point, so that one man can feed the trip past the discharge end of the conveyor, which is not stopped when shifting cars.

Fig. 5 shows a mining system worked out by the New River Co., MacDonald, W. Va. In this plan a combination conveyor-loader serves face No. 1, and another face No. 2, one machine carrying the coal in a left-handed and the other in a right-handed direction. A sectional conveyor is provided on an entry which divides the face into two parts. Each face will be about 80 ft. long; that is, faces 1 and 2 together will be about 160 ft. in length. One object in driving the extra entry in the middle of the face is to provide a safe retreat for the men in case such a retreat is needed.

Fig. 6 shows the adaptation of a room-and-pillar system to loading machines. Butt entries are shown 600 ft. apart; narrow rooms are driven clear through between these entries. The rooms may be driven 12 or 14 ft. in width by entry-driving machines. The coal is taken away from these machines by means of sectional conveyors that are lengthened as the entry drivers advance. After the rooms are driven through, slabbing cuts are made with either longwall or short-wall machines; the coal is shot down and loaded out by mechanical loaders suited to longwall work, or by combination conveyor-loaders.

If the distance between the entries is 600 ft., each conveyor-loader would serve about a 300-ft. face. The coal is carried to butt entries at each end of the room; that is, carried right and left along the face. On each butt entry is a conveyor that takes the coal away from both the slabbing machines and the entry drivers. Two slabbing machines are shown in this figure as well as two entry-driving machines discharging into a common conveyor, which in turn loads a trip of cars from the side by means of a chute. This loading point will remain at the same place for a considerable time; consequently in many cases it would be entirely practical to take down sufficient top at this point so that the conveyor can be elevated high enough for a chute to be used for loading.

Fig. 7 shows a three-entry system. This may be used where the roof is of such a character that it will not permit of slabbing the rooms entirely out to the entry. In such a case, the crosscuts in the pillar between the middle entry and the room entry act as room necks.

In this layout one conveyor takes the coal from one slabbing and two entry-driving machines. A short conveyor is provided through one of the crosscuts, and the trip of cars is loaded on the center entry.

Fig. 8 is the same as Fig. 7 except that a possible way of drawing pillars is indicated. Under some roof conditions it may be possible to use light portable conveyors to take the coal from the pillar to the slabbing-machine conveyor.

MODIFIED ROOM-AND-PILLAR SUITED TO MACHINES

It appears that in practically any mine, the present room-and-pillar system may be modified to suit mechanical loading along some such lines as those suggested. The top can be handled exactly as it is in the present system, and as rooms can be worked out in an exceedingly short time, it is believed that, with the same degree of safety, they could be driven much wider than under present mining methods.

To the left in Fig. 9 are shown two cross-sections of

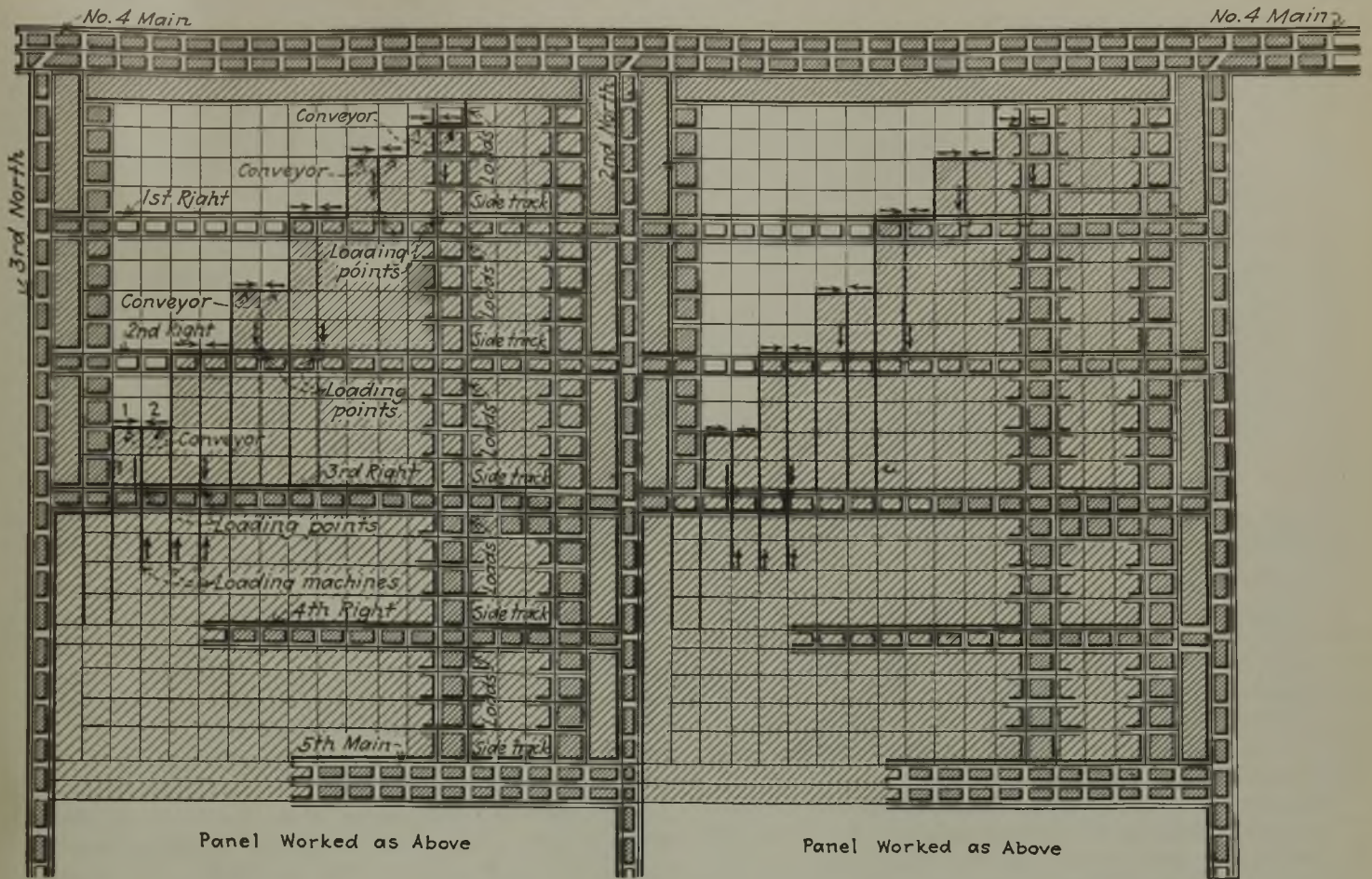


Fig. 5—How the New River Co., of West Virginia Operates the Panel system

Here again two faces are tributary to each loading point. The breakline, as before, is saw-toothed. The rapid advance of the faces obviates the excessive use of timber.

a long face such as those worked in Fig. 4. The upper cross-section shows a longwall machine making the undercut. Behind it is a combination conveyor and loading machine which reaches the entire length of the face. The space between the face and the first row of posts is 6 ft. in width. This gives ample room for both the machine and the conveyor-loader. It is possible to reduce this distance to 5 ft. in case of necessity, but 6 ft. is preferable. The lower left-hand figure shows the coal shot down.

This figure indicates a 7-ft. bed and in such a case, after shooting, the space between posts and face would

be pretty well filled up with coal; consequently the conveyor-loader is covered, before the shots are fired, with short pieces of board which are removed afterward one at a time, beginning at the discharge end, the coal being carried away as the boards are withdrawn. The machine is then fed forward into the pile.

The two sections to the right in this figure show the same arrangement in a thin coal bed. As soon as the coal is loaded out at one end of the face, the setting of a new row of posts can be begun, as the conveyor-loader is flexible and is not moved up into the coal pile bodily, but with the tail end first. The rest of the conveyor is then gradually moved over so that by the

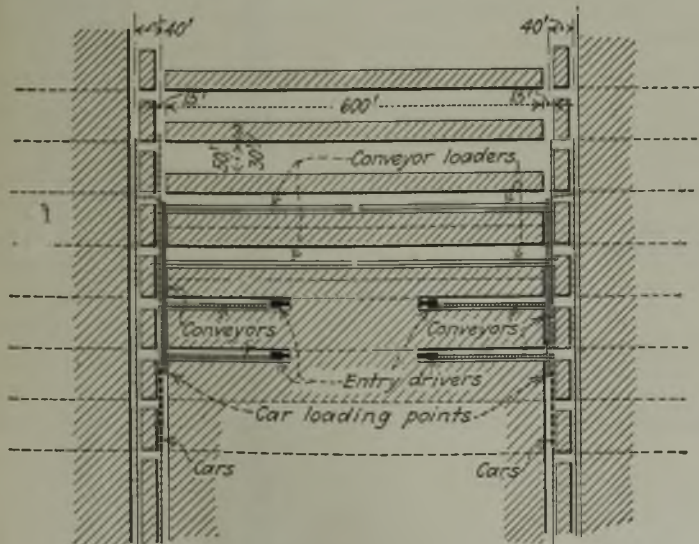


Fig. 6—Room and Pillar Worked by Conveyor

Both entry drivers and conveyor-loaders feed to heading conveyors. Slabbing cuts along the 600-ft. ribs furnish a large tonnage. Some coal, however, is lost in the pillars that cannot be entirely drawn.

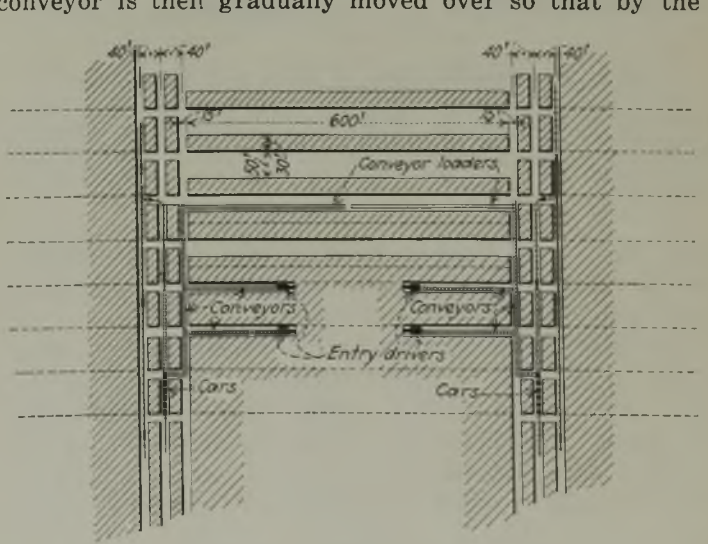


Fig. 7—Room and Pillar for Weak Roof

This is a modification of the system shown in Fig. 6, being better suited to a cover that breaks easily. By this plan cars are always protected by the pillars upon either side of the loading entry.

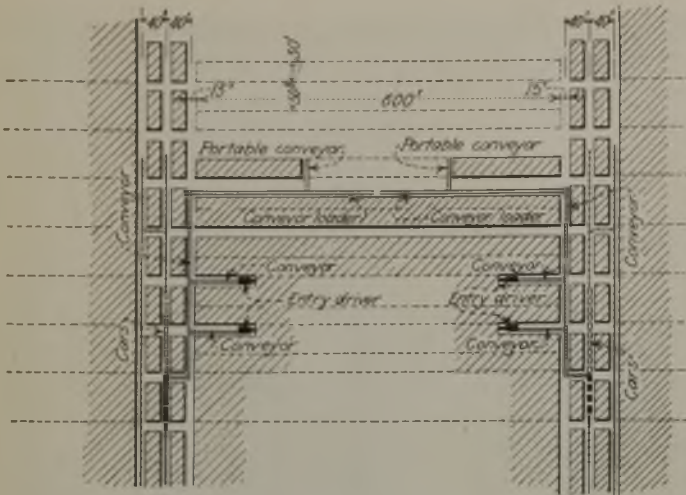


Fig. 8—Drawing the Pillars of Fig. 7

If the nature of the roof is such as to permit the removal of the room pillars, this may be done by means of short conveyors feeding to the conveyor-loaders. Although only two cross conveyors are shown it is probable that in some cases more could be used to advantage.

time the coal is all loaded out, another row of posts 6 ft. away from the new face has been put in place. The arrangement of mining indicated in Fig. 9 is recommended for any thickness of coal where the roof is bad. The conveyor-loader is only 17 in. high, and the long-wall machine is of about equal height.

Adequate ventilation in mechanically-operated mines is somewhat difficult to provide because of the lack of uniformity in state laws. At the time these various statutes were enacted they were necessary and beneficial, but as the art of mining coal advances, the laws must be altered to take cognizance of modern methods and changed conditions. It would be absurd to compel a railway company in building a tunnel through a hill, to drive two passages with cross tunnels between them, in order to convey air to the men who are working at

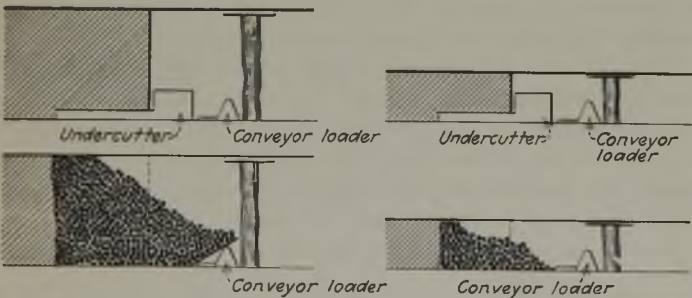


Fig. 9—Cross-Sections of Thick and Thin Beds

Thick beds naturally produce more coal than thin ones. In a thick bed as shown at the left it may be necessary to protect the conveyor-loader when shooting the face. The removal of the protecting boards allows much of the coal to roll onto the conveyor-loader by which it is removed. The machine is then fed forward into the pile.

the face. In tunnel driving positive ventilation can be maintained by mechanical means. It should be permissible likewise in coal mines.

For instance, in driving narrow rooms, such as those shown in Fig. 7, a blower should be provided on the butt entry, fitted with a canvas tube reaching up to the face. This tube can either be extended as the machine advances, or, brattice cloth can be employed. This is really a safer procedure and insures a better supply of air than is available by the use of crosscuts. Furthermore, in entry driving it saves stopping up a great number of cross passages. It also effects a considerable saving in the cost of ventilation, as it is difficult to prevent leakage through stoppings.

Why Fuss with Your Planimeter Scale?

CHANGING the planimeter vernier to suit different scales introduces possibilities of error and takes time. It is better to leave the vernier in place and multiply the result by an appropriate factor.

The accompanying table gives the factors by which planimeter readings must be multiplied when the instrument is set to the equivalent of 1 in. = 100 ft., to convert these readings to acres. This table makes it unnecessary to change the vernier on the planimeter tracer bar when working on plats or maps of different scales. This vernier may be set permanently for a scale of 1 in. = 100 ft. and the instrument operated in the usual way. The reading when multiplied by the factor shown in the table as equivalent to the scale on the map on which work is being done will then be the area in acres.

Suppose that a Coradi planimeter with the tracer bar set at 216.00, equivalent to a scale of 1 in. = 100 ft., is being used on a map the scale of which is 1 in. = 30 poles, and that after tracing a certain area the instrument reading is 0111. The factor shown on the table as being equivalent to the map scale is 0.05625. Accordingly multiplying the instrument reading by the factor we have:

$$111 \times 0.05625 = 62.4375$$

This is the number of acres in the area traced.

To obtain the proper factor for any map scale not shown (when the planimeter is set for 1 in. = 100 ft. as previously stated) the following formulas may be used:

$$F = (S^2 \div 100) \div 43,560$$

$A = F \times R$, where R = reading of instrument, S = scale of map or plat in feet, F = the factor and A = area in acres.

Planimeter Table

Table of Factors for Determining Areas in Acres When the Planimeter is Set for Equivalent of 1 in. = 100 ft.

Map Scale (Poles and Miles per Inch) (Pole equals 5 1/2 yd.)	Map Scale in Feet per Inch	Factor
	10	.060022956841
	20	.00091827364
	25	.000143480257
	30	.00020661157
	40	.00036730945
	50	.00057392103
	60	.00082644628
	70	.00112488522
	75	.00129132231
	80	.0014692378
	100	.0022956841
	125	.0035870064
	150	.0051652892
	175	.0070305326
	200	.0091827364
	250	.014348025
	300	.020661157
20 Poles.....	330	.025003000
	400	.036730945
30 Poles.....	495	.056250000
	500	.057392103
	600	.082644628
40 Poles or 1/4 mile (St.).....	660	.100000000
50 Poles.....	825	.156250000
60 Poles.....	990	.225000000
	1,000	.22956841
	1,200	.33057851
	1,250	.35870064
1/2 U.S.G.S. mile.....	1,302	.38916529
1/2 Statute mile.....	1,320	.40000000
	1,500	.51652892
100 Poles.....	1,650	.62500000
	1,750	.70305326
	2,000	.91827364
	2,500	1.4348025
1/2 U.S.G.S. mile.....	2,604	1.5566611
1/2 Statute mile.....	2,640	1.6000000
	3,000	2.0661157
3/4 U.S.G.S. mile.....	3,906	3.5024876
3/4 Statute mile.....	3,960	3.6000000
	4,000	3.6730945
	5,000	5.7392103
1 U.S.G.S. mile.....	5,208	6.2266446
1 Statute mile (320 poles).....	5,280	6.4000000
	10,000	22.956841
2 U.S.G.S. miles.....	10,416	24.906579
3 U.S.G.S. miles.....	15,624	56.039802
4 U.S.G.S. miles.....	20,832	99.626313
5 U.S.G.S. miles.....	26,040	155.66611
7 U.S.G.S. miles.....	36,456	305.1558
8 U.S.G.S. miles.....	41,664	398.50525
9 U.S.G.S. miles.....	46,872	504.35844
10 U.S.G.S. miles.....	52,080	622.66446
16 U.S.G.S. miles.....	83,328	1,594.0210

The Type of Families the Mines Are Losing—The Father Once Was a Record Coal Loader, but Today He Lives in Cleveland



The Three Older Boys Now Are in College and Two Are in High School—For These the Coal Mines Must Find Substitutes

Coal Loaders—Where Are We Going to Get Them?

Education and Non-selective Immigration Are Reducing the Number of Active Coal Loaders in the United States—These Must Be Replaced by Mechanical Loading Machines or Some Other Steps Must Be Taken

BY WILLIAM A. BUTLER
Charleston, W. Va.

MUCH effort has been expended in the education of mine employees. Let us not hope that for any reason the intensive drive for better education and more of it will slacken, no matter how forcibly we may recognize the fact that education is reducing day by day the number of coal loaders in the United States.

I have given this problem particular attention for the last few years and have studied the ideals of the best coal loaders at many mines and not a one of them have I found that expects his son to be a coal loader. He is educating him, training him and pounding into him day after day the necessity of earning his living in some occupation more desirable than coal mining. He shrinks from the very idea of his boy being a miner.

You may canvass a mining town of almost any size from end to end and question the parents of every boy in the place, and I do not believe you will find a single parent that will tell you that they want their boy to be a miner. You may find a few of the newly-arrived foreigners that do not have the higher ideals of Americanism are content to have their sons follow the employment in which they are engaged, but every foreigner who has reared his children in the United States and has placed them in our schools, is going to hope and expect his or her children to be more than coal loaders. Nevertheless, though education is making problems for the coal operator which give him much concern, he can only praise the ambition of these foreign-born citizens and lend them a hand in the elevation of the boys of the coming generation or generations.

It is the unselfish nature of every true American and a trait that I do not doubt will win in the end, for as the old-time miners are diminished, the mechanical loading machine will take their places.

No one will venture to say that the coal operator is selfish in this matter. I have yet to see the operator who

fails to encourage better education, better living and higher ideals. Never have I seen an operator who tried to teach the coming generation the best way to load coal. He may show the present-day loader the best way to perform his task, but he does not offer any such schooling to the coming generation.

In many sections of the country today, the coal operators are paying out much money to promote better schools and to provide more of them. I know of many companies that for the purpose of building good schools, paying a part of the teacher's salary, furnishing janitor service, athletic equipment, etc., are even adding their contribution to the state and country allowance for education. They are determined that the children of their employees shall have the best possible educational advantages.

BOY WITH GOOD EDUCATION WILL NOT MINE COAL

They know the boy that gets a good education is not going back in the mine to load coal; they realize that the boy that finishes high school and goes to college is not likely to remain in their organization, yet, they do all in their power to make that boy a finished product. That cannot be called selfishness. It is rather an exhibit of unadulterated Americanism. However, it is reducing the number of active miners in the United States and that fact cannot be denied.

Every year, hundreds of miners are drifting from coal loading into other industries on account of the irregularity of the business. Owing to poor market, poor car supply, strikes and other causes slack runs are, as we all know, frequent visitors in the coal-mining industry. This fact forces the miner to seek employment in other lines of work, and many of them never return to the mines.

Where are we getting the miners to replace those that are growing too old to load coal? Where are we

going to get the miners to replace those that have bought farms and have given up mining or have moved to the cities and taken up factory work in order to give their children the advantages of attending college? Where are we going to get the miners to replace those that have been absorbed by the automobile industry?

Whence are men coming to replace the miners that have made their little "roll" and left for the old country where they will be considered wealthy? We are not going to get them. We shall have to make machinery take their places. Men are not leaving the cities to go to the mines to learn the business. Few men are going to the mines from the farms. The class of immigration we are getting will not fill the vacuity, so where can we turn? Either to machinery, or to better immigration laws.

A survey of the number of miners in the United States today would show enough to supply every demand if they were active miners, but when you go into an employment office to recruit miners you will find that about 75 per cent of these men will try to obtain almost any other kind of employment before they will accept coal loading, and if they are unable to obtain any other kind, some of them then take loading as their last resort; but just as soon as they are able to locate other employment they throw down the shovel and bid the mine *adios* unless they are forced back to the mines by slack work in the factories. You can not possibly class these men as dependable miners. They cannot be relied upon to be at the mines when they are most needed.

We are getting a few miners from Mexico, and according to W. L. M. King, Premier of Canada, some are coming from the Dominion, but, all these combined will not begin to supply even a part of the leakage caused by any one of the sources just mentioned.

Within the past four months, I have interviewed approximately 10,000 men, and I think I would be safe in saying that, though at least 40 per cent of these men have been experienced miners in the past and have followed that line of work all their lives, only about 3½ per cent of them accept positions as coal loaders. In the particular section where I have been located, business has been a little slack along other lines during the past few months, and the employment agent had nothing else to offer them, so the other 96½ per cent walked away unemployed.

It could not be said that this was because the mines to which they were to be transported were undesirable; on the contrary they were among the best in the country and consisted of about forty different mines in different sections belonging to several different companies and operated under various systems. Almost all these men were willing to accept positions near some city that would only pay approximately 70 per cent as much as the mines offered and in most instances the living in the mining region was much cheaper.

It seems that since the signing of the Armistice, men have acquired the city and automobile craze, and it's not only the miners—we've all got it. I know one large coal corporation that during the past few years has had much trouble with this lust for city life.

Their men would make a little stake and go to the cities to blow it in. When their money was spent they would apply to an employment office which they knew represented the company, and the employment office would then have to wire back to the company to know if "John Doe" was a good man, and if it would be satisfactory to ship him back.

This caused so much trouble that the company started issuing what are known as "Identification Certificates" to men who are leaving to "spend their wad" and have made a good record with the company. These certificates certify that the man has been a loyal employee and that the company will be pleased to have any representative employment office advance him fare back to the mines if he applies for it. The certificate shows at which mine he was employed and the name of plants of the corporation. It must be signed by the superintendent under whom he has been employed and countersigned by the general superintendent or director of personnel. On the reverse side is a list of employment offices throughout the country which represent the company. It is an extended list, for the company has arranged to have employment representation in almost every section of the eastern part of the United States. These certificates are issued in a nice leather card-case of neat appearance.

It is not necessary to call your attention to the fact

that the whole world has gone automobile crazy, but I want to relate a little experience I witnessed recently. A certain coal company gave a newspaper an advertisement which should have read: Wanted—Five first-class trackmen. The paper in printing the advertisement made a typographical error and the advertisement read: Wanted—Five first-class truckmen.

This one little *u* instead of *a* in the word "trackmen" brought in 150 applications within 24 hours. Some of the applicants were experienced, some partly experienced and many of them wanted to know if it would be possible for an inexperienced man to get on that job. The "ad" was promptly corrected and ran for three days and one trackman was employed.

This was not a case of there being lots of "truck" drivers and no trackman, for many of the men that applied for the truck job professed to be first-class trackmen, but did not want the position, but would take the truck driving in preference, about which in most cases they knew little. Truck drivers in that section were getting \$4 a day and the trackmen were offered \$6.80. This is only one of many similar instances I have witnessed in the past year or two.

WILL MECHANICAL LOADERS BE PERFECTED?

I know one mining district, where even though the roads have been almost impassable most of the year, recent statistics show more cars per capita than in any other place in the United States.

I believe, as I previously stated, that some day the mechanical loader will supplant the present man power, but the supply of experienced coal miners is diminishing faster than the coal-loading machine is progressing, keeping in mind the practicability of the mechanical loader in all kinds of coal beds.

CANADA will take only such immigrants as she wants. We take whatever offers. In Warsaw applications were filed by twice as many women as men. Only 3 per cent paid their own steamship passage. Dressmakers, tailors, seamstresses, shoemakers and clerks formed 87 per cent of the skilled applicants.

It seems as though something will have to be done to tide us over the period until such machines have been developed. The perfecting of this equipment will take many years, but the time is coming when the mechanical loader will be considered just as essential as the cutting machine and locomotive of today.

Several loading machines are already on the market that have proved to be fairly successful in seams of coal where conditions are good, but these ideal mines are being worked out day after day, and a machine must be designed that will be adaptable to mines having less favorable conditions.

SEVERAL MACHINES ON THE MARKET NOW

The Joy digger and loading machine, the Myers-Whaley Holmstead loading machine, the Dillig T loader, the Jeffrey Heading Machine and several others have given fair results under favorable conditions. But when we say they are not adopted to all operating conditions, we must remember that the first cutting machines were satisfactory only where conditions were favorable, but now can be used in any kind of coal from a 2-ft. seam up. Today, they can cut the coal on the bottom, in the middle or the top.

In summing up the problem I have only one way out and that is through proper immigration laws. In thus speaking, I don't mean for a minute that we should open up a flow of immigration that would flood our country with unskilled people, for we are having too much of that now and to do anything that would bring more unskilled labor to the United States at this time, and skilled labor that is not needed, would be one of the worst things that could happen to the country from a labor standpoint.

Neither do I think it necessary to increase the present quota of 2 per cent, but I do mean that we should have immigration laws that will regulate this 2 per cent to a restrictive and selective process, permitting only the classes of immigration that are actually needed for the good of our own nation, instead of admitting men that happen to be able to speak forty words in English and can pass the physical examination.

CANADA'S RESTRICTIVE AND SELECTIVE SYSTEM

For some time Canada has had restrictive and selective immigration laws in operation, and Canadians are well pleased with results obtainable. Their system is not based on a quota. It excludes the classes of immigration that are not needed, and until the demand is filled places no limit on the number of any one class admitted.

Section 38 of Canada's Immigration Law almost completely covers this part of their immigration system and gives a good idea of the manner in which it is handled. I quote this section in its entirety. It reads:

The Governor in Council may by proclamation or order, whenever he deems it necessary or expedient: A—Prohibit the landing in Canada or at any specified port of entry in Canada otherwise than by continuous journey from the country of which he is a native or naturalized citizen, and upon a through ticket purchased in that country, or prepaid in Canada. B—Prohibit the landing in Canada of passengers brought to Canada by any transportation company which neglects to comply with the provisions of this act. C—Prohibit or limit in number for a stated period or permanently the landing at any specified port or ports of entry in Canada, or immigration of any specified class or occupation by reason of any economic, industrial or other condition temporarily existing in Canada, or because such immigrants are deemed unsuitable having regard to the climatic, industrial, social, educational, labor or other conditions or requirements of Canada, or because such immigrants are deemed undesirable owing to their peculiar customs, habits, modes of life and methods of holding property, and because of their probable inability to become readily assimilated or to assume the duties and responsibilities of Canadian citizenship within a reasonable time after their entry.

Summed up, Canada's arguments on immigration law stand like this, according to an article recently published on the subject: "Canada's policy on immigration is conditioned by her own needs. At the present these are the development of her vast agricultural resources, for her prosperity along other lines is contingent upon agriculture. In consequence she wants immigrants of the settler type, nation builders. She actively seeks and goes after settlers of this sturdy nation-building type. She reserves to herself the right of a sovereign government to restrict immigration and to exclude those whom she cannot absorb or who do not fit into her needs."

At the time she was in need of settlers only, only settlers were permitted to enter her ports of entry, and this class of immigration the government actually sought. It advertised in over 4,000 magazines in an effort to attract this class of immigrants. However, the true character of this restrictive system of immigration was not apprehended by everyone interested, for after the fiscal year 1920-1921, when the system was put into effect, 30 per cent of the immigrants arriving at Canadian ports of entry were rejected and in the year 1921-22, 39 per cent were rejected.

This, of course, had a tendency to frighten away the class of immigrants the Dominion really wanted. Besides that, it caused much inconvenience to the would-be immigrant, and it was necessary for Canada to take steps to prevent the rejection of immigrants after they had reached the Canadian borders. So, agents with discretionary powers were placed at Antwerp, Paris, Riga and Poland, and more will be placed at other ports soon, to check and sign all passports, and the Canadian companies were instructed to transport only those that had their passports signed by these agents.

WE GET WHAT THE OTHERS DON'T WANT

It is far from my desire to take you into a long list of statistics but I do want you to take a glance at what we are getting through our ports of entry. From July 1, 1922, to June 30 of the following year, 522,919 immigrant aliens were admitted to the United States. In the past two years I do not believe many industries could reasonably claim a shortage of common labor and yet out of the above number 275,137 were registered as common laborers and people with no trades, whereas only 5,423 miners were in the total and during that period 803 miners left this country.

Statistics show we have had a scarcity of masons but out of this half million people only 3,276 were masons and 181 masons left. From July to September, 1923, a short period, that being the last date of which figures are available, as the current year's compilations have not been completed, there were 263,259 immigrant aliens admitted to the United States and 136,683 of these were common laborers and people without trades thrown on to our labor market and only 3,035 of this quarter million were miners.

When the American consulate in Warsaw was filling the quota for 1923-24 it requested applicants for visas to fill out questionnaires; from which the following information was obtained: From more than 18,000 applicants for American visas in Poland, nearly 12,000 were women and a little more than 6,000 were men. Only 519 paid their own steamship passages, so that the passages of 17,500 were paid by relatives and friends in America. About 14,000 were unmarried. I have not heard of any distress signal being broad-

casted for barbers, tailors, shoemakers, etc., but we quote in Table I the occupation of most of these applicants:

Table I—Classes of Would-Be Immigrants to United States

UNSKILLED		SKILLED	
No occupations given.....	9,500	Dressmakers.....	810
Domestics.....	2,500	Tailors.....	573
Farm labor, merchants, etc....	2,208	Seamstresses.....	408
		Shoemakers.....	316
		Clerks.....	184
		Bakers.....	154
		Barbers.....	131
		Engineers.....	13
		Masons.....	17
		Miners.....	6
		Paperhangers.....	4
		Plasterers.....	5
		Plumbers.....	5

These figures reveal facts that are worthy of serious consideration. They show what a small percentage of the immigrant aliens being admitted to the United States are really needed and the large number that are not needed, but must be cared for once they are admitted. Industrial reports show that we have a scarcity of engineers, masons, plasterers and plumbers. Sum up these and see how much relief was obtained along this line from over 18,000 immigrants. Look over this list and I believe anyone will agree that such unrestricted immigration is more of a burden than relief.

James B. Howard, President of the National Transportation Institute, said at the recent convention of the American Farm Bureau Federation at Chicago:

“Unless something is done about the immigration laws to bring more farmers into this country, other countries will soon have all of America’s farm products’ export trade as the immigration laws are restricting the development of farming to such an extent that other countries are offering better asylums for the crowded-out Europeans, and big colonies are developing large areas in South America as well as in Canada, Australia, Africa and Mexico.”

We should find out what we really need, then go after it. We should fill our quota with the class of immigrants that will mean prosperity to the United States, instead of bringing in a class of workmen that will be a source of difficulty to our government in trying to care for them.

A report just made public by the Department of Immigration and Colonization of the Dominion of Canada says that since 1901 Canada has received 3,739,749 settlers, most of whom settled on farms in Western Canada. Of these 1,417,860 migrated from the United States, 1,396,609 from the United Kingdom and 925,278 from other countries of the world.

Are we going to continue to take the riff-raff and rabble of the world to raise, educate and elevate at the expense of our nation’s industrial efficiency, or are we going to select and restrict until we have succeeded in placing and organizing those less desirable immigrants who already are within our domain?

The Miner’s Torch

Questionnaire for the Hasty

SUPPOSE you were a company superintendent hooked up to a wife who felt competent to pass on your camp’s requirements in welfare and social-service work and furthermore this same wife happened to be the kind of a wife who was not satisfied with simply knowing what ought to be done.

Now suppose that without warning and without request on your part comes a trained social-service worker from the general office of the company who looks over the situation and within a day or two informs you that all of your efforts have been wasted and suggests furthermore a complete change of activities and requests modestly a free hand to proceed without interference. And to back up the notion certain notices are suggested for display so that everyone may be properly informed as to the newcomer’s position and authority.

What would you do about it?

Suppose you were a company engineer and unexpectedly a man should walk into your office bringing a letter of introduction from the general manager of your company stating that the company had given an option on its property to another concern represented by the bearer (a mining engineer instructed to make a complete inspection of the company’s property) his findings and recommendations to be taken as final. And suppose further that you knew that if you gave this man, sent to inspect the property, all of the facts in your possession, explaining the whys and wherefores of all of the funny looking crooked entries on the mine maps and the

blank spaces also, the deal would be sure to fall through.

What would you do about it?

Suppose you were a mining town preacher with a large family dependent on you for support and this support came to you through the route of monthly collections received by the treasurer of your church in payment of pledges made by the members at an annual meeting of the church fathers. The source of these subscriptions would probably be divided about as follows: One-third from bosses, office men, superintendent, etc., while the other two-thirds would come from miners and day men. Suppose further that the church treasurer happened to be the chief clerk in the superintendent’s office. (In passing I might state that this last supposition does not require any wild stretch of the imagination). And continuing the supposition, suppose that one fine day out of a clear sky you should discover that the company officials were not giving their employees exactly a square deal; and yet the employees were not aware of the attitude of the officials toward them and their interests.

What would you do about it?

Or reverse the above and suppose that you discovered that the men were not giving their officials whole-hearted support on a matter that had been agreed between them, which fact had not yet been discovered by the employers. (I might add that judging from my experience the first supposition happens seldom, while the second happens a little oftener than seldom.)

What would you do about it?

CARLISLE SPEDDING, prior to taking charge at Whitehaven, England, disguised himself as a hewer and worked in a Newcastle mine. Burned by firedamp, his identity was disclosed and he returned to Whitehaven to originate the “coursing of air” and, in 1750, the “steel mill.”



Main-Conveyor Drive and Control Panel, Baker Breaker

Baker Electric Plant Guarded Against Breakdown

Two Circuits of Over Four-Thousand Volt Current Supply Breaker—Provisions to Keep Equipment from Dust—Impellers for Twenty-Foot Lift at Jigs Designed so as to Prevent Slate in Water from Wearing Pump Parts

BY EDGAR J. GEALY

Electrical Editor, *Coal Age*, New York, N. Y.

ALMOST every possible means to provide continuity of service, safe operation and efficient use of power, were incorporated in the plans for the new Baker colliery. The coal now being prepared at this colliery comes from two other mines, the Dodge and National, which originally prepared their own coal.

Although these mines did not have completely electrified breakers their output was mined and transported by electricity. A delay to operation at the Baker colliery is therefore more serious than at other collieries which merely prepare their own output. The electrical equipment of the Baker colliery has been designed to handle the full 4,000-ton capacity of the breaker and like many other breakers will actually handle twice this amount if the flow of coal to the breaker is fast enough.

Two 4,150-volt feeder lines supply electrical energy from the Hampton power plant to the Baker colliery. One of these lines is called the Baker-Dodge-National circuit because it supplies power to each of these places. The other line runs over a different route from the power plant directly and therefore provides a duplicate circuit. Either of these circuits will carry the total load in an emergency.

The Baker-Dodge-National line runs direct to a point in the old Dodge colliery yard, there it divides and a branch turns off to the National mines. The other circuit runs through the Dodge yard where a tap is taken off to the operations in that vicinity. The main line continues to the Baker colliery where it connects with the other circuit from the power plant.

FOUR CIRCUITS AT THE NATIONAL MINES

The circuit to the National mines ends at a distributing point consisting of four distributing circuits. One branch supplies a 150-hp. fan motor through three 100-kva. transformers, another goes to three 200-kva. 4,150/440-volt transformers which in turn supply energy to three centrifugal pumps. Two of these pumps

are rated at 1,500 gal. per minute and are driven by 150-hp. motors; the other has a capacity of 3,800 gal. per minute and is driven by a 250-hp. motor. Another circuit enters the mines to supply a 112-hp. hoist motor in the Clark bed.

Outside in a brick building are two rotary converters, one is a 200-kw. unit and the other a 300-kw. machine. Both rotaries supply 275-volt energy to the mine trolley system which is directly connected with the inside trolley system of the Baker, Dodge, Taylor and Holden workings, the last two places being mines adjoining the National and Dodge operations.

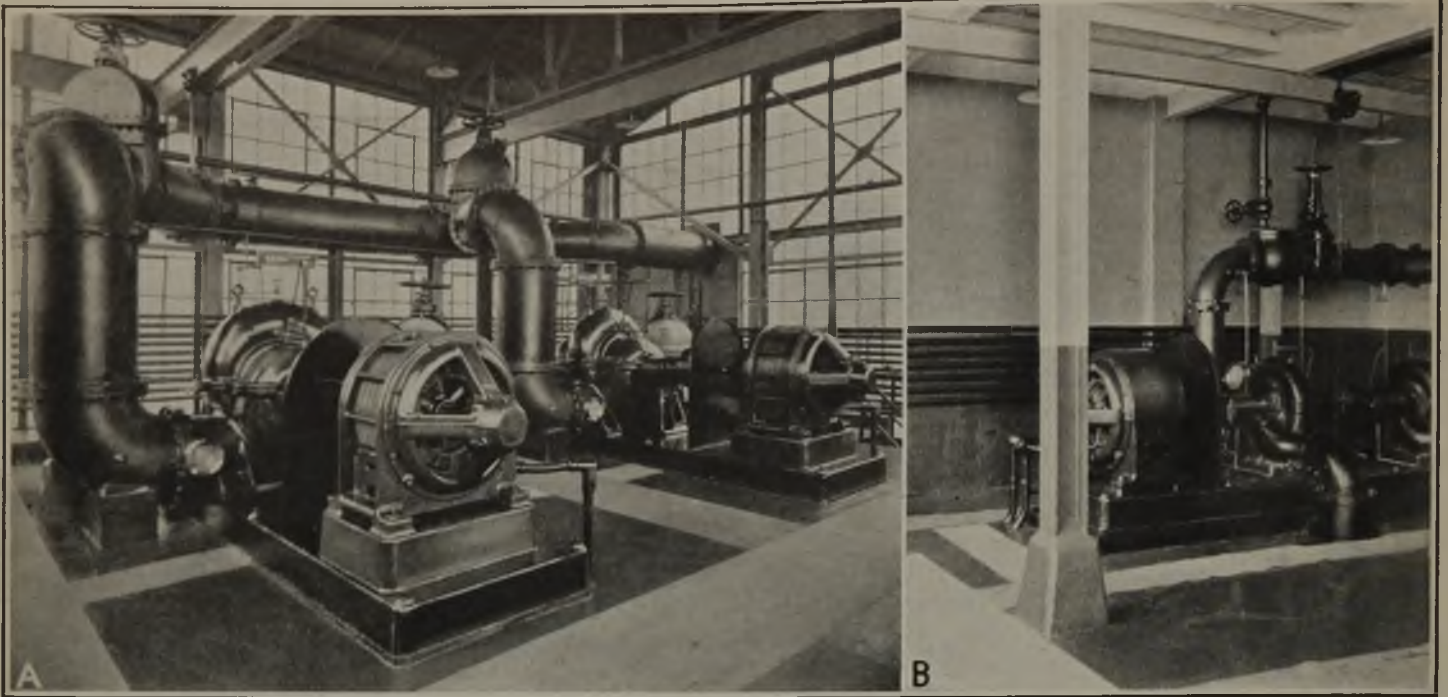
The high-voltage system at the old Dodge colliery divides into two branches, one supplies a bank of three 200-kva. transformers which furnishes 440-volt energy to the outside shop. Two 75-hp. outside fan motors, and a circuit to the inside of the mines which feeds one 100-hp. synchronous pump motor, one 100-hp. induction-type pump motor and a 30-hp. hoist motor.

A 500-kw. rotary supplies the direct-current equipment, in the Dodge mines and also feeds into a super-power network supplying 275-volt direct-current energy to ten other operations of the company spread over a territory nearly 5 miles in diameter. The equipment directly operated from the Dodge rotary consists primarily of seventeen trolley locomotives, eight track pumps, four 50-hp. coal cutters, one 80-hp. hoist, four conveyors and one air compressor.

The beds being mined in the Dodge section are the Four-Foot, Diamond, Rock, Big, New County and Dunmore No. 2. These are given in the order in which they occur. The Four-Foot bed is nearest the surface and outcrops at a point about half way between the Dodge shaft and Baker colliery. The coal from the Dodge workings is not raised to the surface at the shaft but instead is hoisted to the Four-Foot bed where it is taken on a level grade to the outcrop and then transported over the surface to the dumphouse at the Baker colliery.

There is still another mine associated with the Baker inside operations. This is the Oxford, more popularly known as the old People's Coal Co. mine. The electric power used here is supplied from a 4,150-volt circuit

NOTE—Fig. A in headpiece shows one of the largest single drives in the Baker breaker. By separating important machinery and having individual drives the hazards of the breaker are lessened. Fig. B shows the control panel for this drive which makes it possible to run the motor in either direction at almost any desired speed. Control equipment located near the motor and the conveyor is used whenever a quick stop is necessary or repairs are being made.



Large Water Circulating and Pressure Pumps Supply Baker Breaker

A spare pump has been provided for each service. The circulating pumps shown at A have a greater capacity than any other pumps owned by the company. These units supply water to the jigs. The pressure pumps shown at B furnish water for the screens, shakers and pressure lings in the breaker and annex.

running from the Hampton power plant to the company shops and offices in the central part of the city of Scranton. Three 667-kva. transformers supply power to a 4,500-gal. per minute centrifugal pump driven by a 1,000-hp. motor and another 100-hp. pump located inside the mines for emergency purposes. On the outside a three-phase 100-kva. transformer supplies the ventilating fan and hoist motors. A 300-kw. rotary supplies 275-volt direct-current energy to the inside feeders which connect directly with the Baker and Hyde Park mines.

At a large tower near the Baker breaker the two

power circuits from the Hampton plant are tied together. Switches have been provided so that the energy can be taken from either line and the other cut off for repairs. The principal circuits from this tower supply the breaker, a fan, boiler house, a hoist, inside equipment and the power-converting substation.

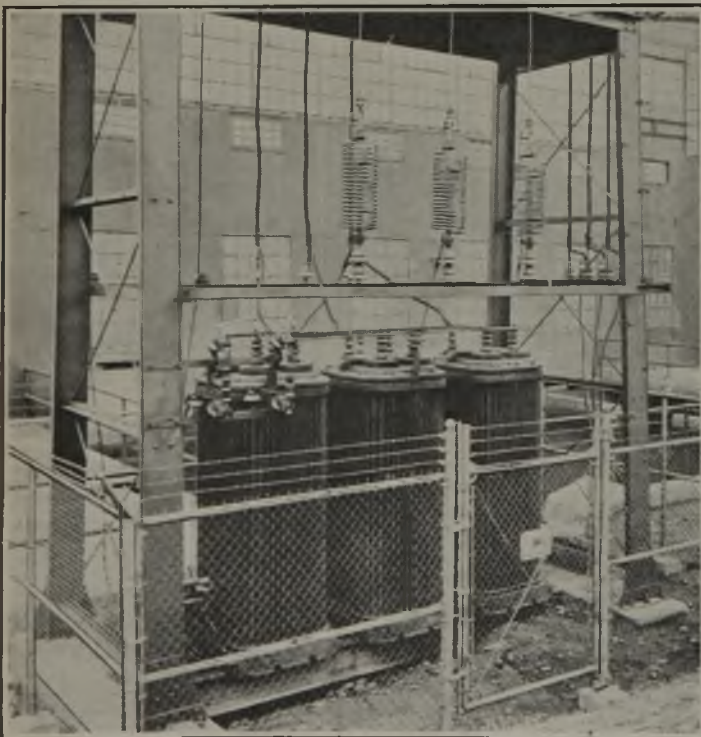
Three 400-kva. transformers step the voltage from 4,150 to 440 volts for a 200-hp. fan and the breaker motors. One 200-kva. three-phase transformer on another circuit supplies an outside slope hoist which hauls the coal from an upper bed to the surface. Another bank of three 400-kva. transformers furnishes energy to a 300-hp. supply shaft hoist and also to the inside pumps which raise the mine water from the Dunmore bed to the breaker reservoir. Two of these pumps are centrifugal units rated to deliver 2,000 gal. per minute. Each pump is driven by a 300-hp. 440-volt motor. On another alternating-current inside circuit are two 75-hp. pumps which are used to assist in gathering water for the sump of the large pumps.

The direct-current voltage used in the mines is supplied from a large brick substation located near the hoisting engine of the main shaft. In this substation there is a 750-kw. motor-generator set and a 500-kw. rotary. The larger unit runs in the day, and the smaller machine is held in reserve. At night the rotary is put in service and thus it is always kept in operating condition.

Like the other direct-current stations in this group of collieries these machines are tied into a common direct-current superpower system. Both of the machines are provided with the usual overload, reverse-current and over-speed devices, which are especially necessary on this inter-connected system.

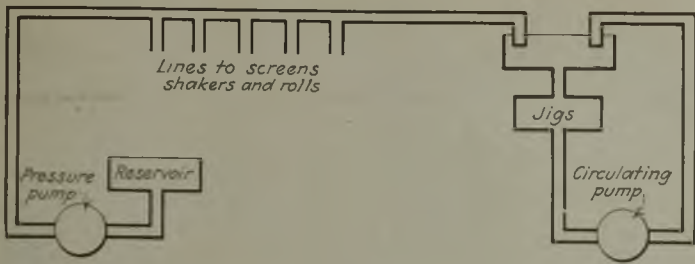
The direct-current equipment used inside the mines consists of twenty-four trolley locomotives, twenty coal cutters, fifteen track pumps, two air compressors, one car-haul hoist, one 100-hp. pump, one 160-hp. hoist and many electric lamps.

All the motors in the breaker are 440-volt, three-phase, 60-cycle units. They vary in size from a 5-hp.



Transformers Supplying Power to the Baker Colliery

Two circuits furnish power from the Hampton Plant to these transformers. Either circuit will carry the entire load. Located outside the breaker in a clean place, these units give no trouble, yet they easily can be replaced should an accident occur.



How Large Volumes of Water Are Circulated Through the Baker Breaker

The circulating pumps are placed so that the height the water must be raised is merely the slight difference in elevation between the water in the column line and that in the reservoir above the jigs. The pressure pumps are always primed because they are located below the reservoir.

motor on the vacuum heating system to a 300-hp. motor on the main conveyor. Nearly all the motors are of the inclosed type and are fitted with conduit-box connection from which a short piece of flexible conduit extends to the rigid conduit set in concrete. There are thus no exposed conductors.

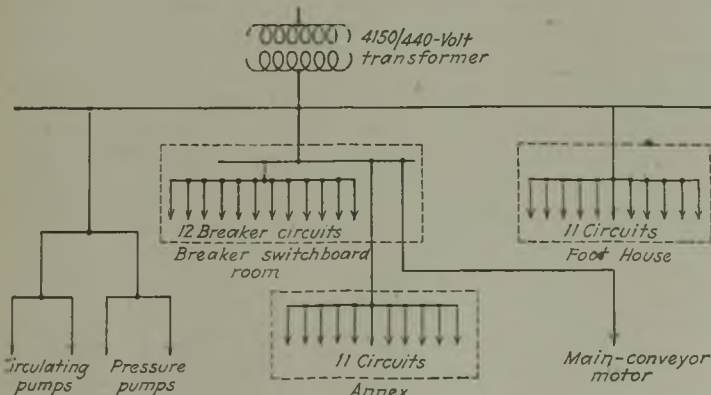
TO KEEP ELECTRICAL EQUIPMENT FREE OF DUST

So that the electrical equipment will be safe and free from dust many of the motor starters are either hand-operated auto-transformers or push-button automatic starters. The larger motors are equipped with master drum controllers so that the speed may be gradually increased under load or inching can be done while making repairs. Important apparatus driving conveyors, which might under some circumstances cause danger or serious damage, are provided with emergency stop buttons. These control points are provided where they are most convenient. The starters for nearly all the motors are provided with some means for making a quick stop in emergencies.

From a distributing point outside the breaker the 440-volt lines radiate to three different points, one to the foothouse, another to the main part of the breaker, and the other to pump rooms.

From an inclosed switchroom in the foothouse are eleven different circuits which supply an equal number of motors as follows:

- | | | |
|-----|--------|--|
| One | 25-hp. | Car haul |
| One | 50-hp. | Outside slope conveyor |
| One | 25-hp. | Main shaker |
| One | 35-hp. | Small rolls |
| One | 75-hp. | Main rolls and picking table |
| One | 25-hp. | Rock conveyor |
| One | 75-hp. | Condemned coal conveyor |
| One | 50-hp. | Lip-screen conveyor |
| One | 50-hp. | Rock conveyor from breaker to bridge |
| One | 75-hp. | Rock conveyor on bridge |
| One | 75-hp. | Coal conveyor from pulverizer and lip screen |



How the Breaker Circuits Are Divided

Each motor circuit is doubly protected by relays, switches and fuses located in separate control rooms or near the motors. These control rooms are completely enclosed fireproof compartments. Automatic doors keep these rooms closed off from all other parts of the breaker.

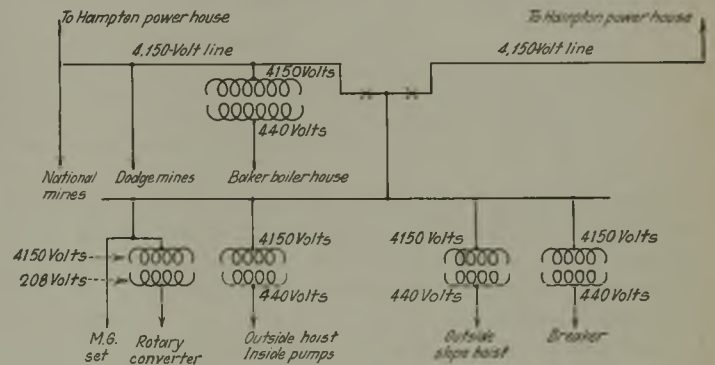
The breaker switchroom circuit is first divided into three parts. One supplies the 300-hp. motor on the main conveyor; another supplies fourteen motors in the annex as follows:

- | | | |
|-------|---------|--|
| One | 75-hp. | Main conveyor from dump |
| One | 100-hp. | Shakers and jigs |
| One | 15-hp. | Conveyor to boiler plant |
| One | 75-hp. | Rock refuse from breaker and annex |
| One | 50-hp. | Rock refuse conveyor feeding the above |
| One | 25-hp. | Annex rolls |
| One | 50-hp. | Conveyor from annex to bridge |
| Three | 75-hp. | Conveyors for fuel to boiler plant |
| One | 50-hp. | Swinging conveyor at dump |
| Two | 50-hp. | Jig pumps |
| One | 5-hp. | Vacuum heating system |

The other circuits from the breaker switchroom divide into twelve lines supplying the following motors:

- | | | |
|------|--------|------------------------------------|
| One | 25-hp. | Top middle shaker |
| Four | 75-hp. | Twenty-one jigs |
| One | 25-hp. | Settling tank conveyor |
| One | 50-hp. | Top and bottom shaker (north side) |
| One | 25-hp. | Bottom middle shaker |
| One | 50-hp. | Top and bottom shaker (south side) |
| One | 25-hp. | Rock conveyor |
| Two | 75-hp. | Pulverizer |

The third circuit entering the building from the outside distributing tower runs direct to the pump rooms. Here are two 200-hp. slip-ring induction motors driv-



Power Circuits at Baker Colliery

Normally the power supply for the Baker operations is received over two circuits from the Hampton Power Plant. Either circuit is capable of carrying the total load. It is the general practice of the company to use 440-volt motors for nearly all breaker drives.

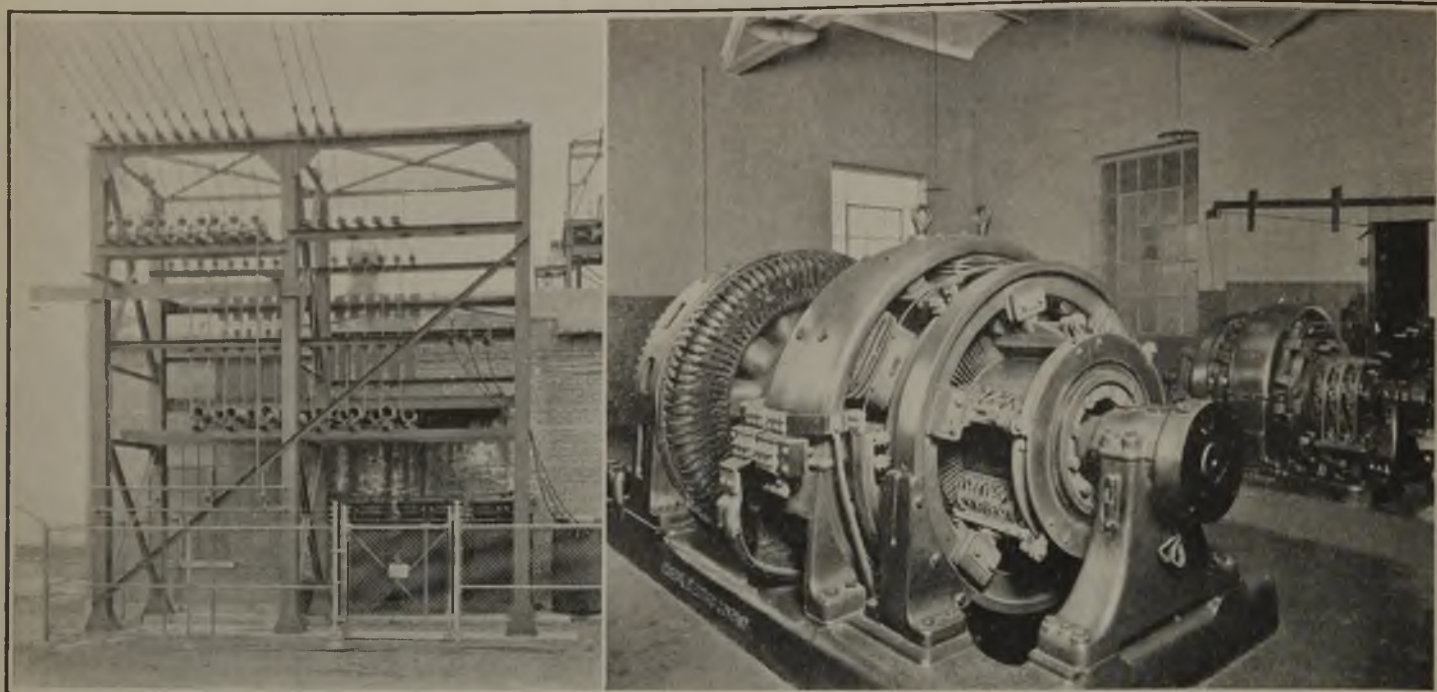
ing the pressure pumps and two 100-hp. squirrel-cage motors driving the circulating pumps.

The breaker pumping system is quite unusual, every means to prevent loss of water having been provided. The pumps have been located so that they are all self primed. Each unit has been placed where the work it must do is made as small as possible so as to effect every possible saving of labor and power.

The breaker supply or pressure pumps are duplicate units, either one being capable of handling the total requirements. These pumps have a capacity of 300 gal. per minute against a 140-ft. head. The purpose of these pumps is to supply water for the shakers, crushers, lip screens, lip chutes and make-up water for the jigs.

IMPELLERS OF CENTRIFUGALS SMALL BUT WIDE

The circulating pumps are also duplicate units, each is rated to deliver 14,000 gal. per minute against a 20-ft. head. The impellers of these pumps are of the Francis type and are extremely small diameter but very wide. They were made this way so as to minimize the wear due to the dirt and slate in the water. The low head against which these pumps operate was made possible by locating the pumps directly under the jigs, thus the pump which raises the water into the jig reservoir nowhere circulates it through pipes smaller than 24-in. diameter or to any great height.



Substation Transformers and Converting Equipment

Here again continuity of service is important and provision has been made for emergency service. During the day the motor-generator set supplies the energy; at night the rotary furnishes the direct-current voltage. Both these machines feed into a small superpower network which interconnects the many coal mines operated by the company. The overhead charges to operate a coal breaker are large; consequently, a continuous supply of energy to the mines is essential for a steady flow of coal through the breaker.

Considering the extremely dirty water handled by the circulating pumps they have given exceptionally good service. The impellers after over a year's service show little or no wear thus justifying the use of the Francis type of impeller.

With every motor clean and free from dust or moisture, all wires in metallic conduits, control apparatus housed in fireproof compartments and all motors pro-

tected against overloads and failure of voltage the work of keeping this model breaker in continuous operation is quite easy for the one electrician employed for this purpose.

Other features have contributed to making this a model breaker but the use of electric power has made it possible to co-ordinate every process entering into the mining, transportation and preparation of the coal.

Vancouver Fields Unusually Difficult To Work and of Limited Capacity

PUBLIC officials and press writers have declared the coal fields of Vancouver Island as "illimitable" and "inexhaustible," but Charles Graham in an address before the British Columbia Division of the Canadian Institute of Mining and Metallurgy shows an entirely different condition to that thus optimistically reported. The results of seventy years of surface prospecting, underground operation and extensive diamond drilling has disclosed the true status of the field.

The presence of coal on the coast of British Columbia first was made known by Dr. W. F. Tolmie in 1835, the mineral being brought to him by Indians from the northeast coast of Vancouver Island, probably from Squash. In 1850 the existence of coal at Nanaimo was announced by J. W. MacKay. Development started in 1852 and coal was shipped before the close of 1853, the first mines being operated by the Hudson's Bay Co. which they continued to work until 1861 when they sold them to the Vancouver Coal Mining and Land Co.

It is the popular belief that the coal-bearing rocks, known as the Nanaimo series, extend undisturbed from the Sannich peninsula to beyond Campbell river and under the Gulf of Georgia, but geological examination discloses the fact that the coal-bearing rocks are restricted in that area to three principal zones, and that even these zones are not always productive. Further,

throughout a great part of the area only one zone exists, and in the remainder only two of the three are found. Instead, therefore, of the probability of finding coal throughout a zone of rocks over 100 miles long, and covering a large area over the southeast coast of the Island it is now known that the area from which future production must depend is extremely limited.

In Vancouver Island many faulted and barren areas occur when the coal seam is too badly disturbed or too thin to permit of economical operation. In the Comax district, summits of the underlying pre-Cretaceous rocks project through certain parts of the seam. These knobs evidently stood above the general level when deposition was proceeding. They not only form areas of no value in themselves, but have considerable effect on the seam for some considerable distance, and interfere greatly with the general scheme of operations.

Mr. Graham shows that in one mine only 47 per cent of the coal could be recovered and in another the recovery from 365 acres has been to date less than 11 per cent of the coal supposed to be available. In the barren portions of this latter mine the roof and floor meet, completely eliminating the seam; at other points the space between the roof and floor, which naturally should be occupied by the seam is silted up by mud and fine shales. The coal seams are badly intermixed with bands of shale. Whether the coal is shot or loaded without shooting, the shale is brought down and mixes with the coal, making the finer parts of the product exceedingly difficult to clean.



News Of the Industry



Interallied Conference Seen as Key to Industrial Prosperity

American Coal Leaders Hopeful of Adjustment of European Situation—
Steel Corporation's Unfilled Orders Show Extent of General Depres-
sion—Agriculture's Comeback a Reassuring Development

By PAUL WOOTON
Washington Correspondent of *Coal Age*

Leaders in the coal industry are praying for the success of the Interallied Conference in London. There can be no return of industrial prosperity in the United States, they believe, until the European situation is composed. Stagnation in the coal industry is greater than at any other time in its history. There now is a larger percentage of idle coal-mine capacity than in the latter part of 1914 and early 1915, when the first effects of the war caused a great depression. To find any date when the unfilled orders of the United States Steel Corporation were as low as on June 30 it is necessary to go back to November, 1911. This is of more significance than the rapid drop in the production of pig iron and ingots, because the unfilled orders give no promise for the months to come.

There are two very comforting things, however, in the situation. One is that we have slid down hill with great rapidity since March without having been jolted or jarred. The other is the remarkable comeback being staged by the agricultural industry. American farmers apparently are going to have a fairly large profit on most of their products this year. It is true that much of that will have to be applied on debts contracted during the long series of lean years. With all that, however, the purchasing power of the farmer is going to be much greater from this time on.

Must Sell More Abroad

Many coal men are convinced that we cannot have sustained prosperity by taking in each other's laundry. To maintain our prosperity we must sell more abroad. When we sell abroad we must take our pay in gold, promises to pay, commodities or services. We now have most of the gold. It would threaten the continuance of the gold standard for Europe to have to part with any further considerable amount of its basic treasure. We have extended credit to Europe in excess of \$20,000,000,000. The point is being reached where we no longer can continue to accept credit documents. We cannot continue to take gold without laying ourselves open to a major catastrophe. Many believe the time

has come when we must begin to take more of our pay in commodities.

Shipping, insurance and other services, in addition to the expenditure of Americans abroad, do not go far toward meeting the situation. A generally held opinion among coal men is that not only must the Dawes plan be made effective but we must do our part by a scientific revision of our tariff. The thought is that we have drawn largely on the substance of the world. The demands which we had to supply during the period of reconstruction in Europe have resulted in a degree of prosperity here, but from this time forward our own prosperity is going to depend upon the prosperity of our neighbors.

While it may be that there are many operators of coal mines who do not see in their own situation a reflection of the European situation, representatives of the coal industry whose duties require them to mingle largely with the men engaged in production are agreed that the industry has within it an unusual percentage of men who follow through to their source the influences which affect the demand for coal and which will affect future demand. For that reason many coal operators are following the proceedings in London as closely as they watch the steel trade and other more immediate barometers. There is a feeling of confidence that the Dawes proposal will be put in operation.

The only fear is that France may demand the impossible in the way of guarantees for its protection once Germany is economically restored. Incidentally there are many coal operators who think that much of the post-war depression in Europe could have been avoided and the travail of the Ruhr escaped had the United States been willing to ratify the treaty guaranteeing France against unrighteous aggression.

The fall convention of the American Chemical Society will be held at Ithaca, N. Y., Sept. 8-11, 1924. The Gas and Fuel Section is arranging as part of the program a round-table discussion on "The Storage of Coal and Spontaneous Combustion." Prof. S. W. Parr, of the University of Illinois, will lead in the discussion.

Henry Ford Buys Dock At Last

A deal was closed July 16 by which Henry Ford acquires complete ownership of the dock of the defunct Superior Coal & Dock Co. at Superior, Wis. It was at first announced that the Ford interests had leased the property, but within a few days the outright purchase had been arranged. The Ford interests assume full responsibility for the outstanding bonds, including all back interest and overdue retirements, and will lift a mechanics' lien of \$175,000 held by the Brown Hoisting Machinery Co. and will pay off certain other accounts. The exact purchase price of the dock was not given out but it is known to be in the neighborhood of \$780,000. Mr. Ford is now in the lake coal trade. He has two large new vessels in the water and two more building. They are Diesel-engine driven.

Union "Army" Closes Mine, Threatens Another

An armed band of about 100 miners on July 18 descended on the Kali-Inla mine, at Cambria, on the Pittsburg-Latimer county line, Oklahoma, overpowered the guards at the mine and forced a non-union crew to quit work. The guards were disarmed and forced to accompany the assailants as they motored into Latimer County after the attack.

The invading party assembled at Cambria several hours in advance and cut telephone wires into the little settlement before proceeding to the mine workings. It is understood that the attack was made by miners from Texas fields, Henryetta, Okla., and other mines nearby.

The Kali-Inla mine, after a long suspension, had recently resumed operations on the basis of the 1917 wage scale, which was opposed by officials of District 21, United Mine Workers.

A threat of similar action on the following day was conveyed to employees of the Deegnan & McConnell mine, Wilburton, Okla., which also is operating on an open-shop basis. The invasion failed to take place, however, and 100 men went to work. After several hours had passed without the appearance of the invaders, Sheriff Parks said he believed that any danger was over.

Coke Output Low in June With Iron and Steel

In company with the production of iron and steel, the output of coke was reduced sharply in June. The total quantity produced was 2,958,000 net tons, of which 2,403,000 tons was from byproduct ovens, and 555,000 tons from beehive ovens. Comparison with May shows decreases of 14 per cent and 27 per cent respectively.

The present monthly rate of byproduct coke production is 23 per cent below the average for 1923 and is less than at any time since early in 1922. The average daily output in June was 80,087 tons, a decrease of nearly 11 per cent. The relation of production of capacity was 66.4 per cent. Of the 71 byproduct plants in existence, 66 were active and 5 were idle throughout the month. Ovens affiliated with iron furnaces produced 80.7 per cent of the total output.

Activity at the beehive ovens has decreased to the point where the monthly rate of output is but 38 per cent more than the weekly rate a year ago.

Monthly Output of Byproduct and Beehive Coke in the United States*

Monthly Average	(In Net Tons)		Total
	Byproduct Coke	Beehive Coke	
1917.....	1,870,000	2,764,000	4,634,000
1918.....	2,166,000	2,540,000	4,706,000
1919.....	2,095,000	1,638,000	3,733,000
1920.....	2,565,000	1,748,000	4,313,000
1921.....	1,646,000	462,000	2,108,000
1922.....	2,379,000	714,000	3,093,000
1923.....	3,127,000	1,497,000	4,624,000
April, 1924..	3,010,000	1,079,000	4,089,000
May, 1924..	2,786,000	761,000	3,547,000
June, 1924..	2,403,000	555,000	2,958,000

* Excludes screenings and breeze.

The production of coke in June required the carbonization of 4,327,000 net tons of bituminous coal, of which 3,452,000 tons was used in byproduct ovens and 875,000 tons in beehive ovens. Thus the rate of coal consumption by the coke industry has decreased 31 per cent since the beginning of the year and is now 32 per cent less than the monthly average of 1920 and 37 per cent less than that of 1923.

Estimated Monthly Consumption of Coal for Manufacture of Coke†

Monthly Average	(In Net Tons)		Total Coal Consumed
	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	
1920.....	3,684,000	2,665,000	6,349,000
1921.....	2,401,000	706,000	3,107,000
1922.....	3,421,000	1,107,000	4,528,000
1923.....	4,458,000	2,358,000	6,816,000
April, 1924..	4,324,000	1,702,000	6,026,000
May, 1924..	4,002,000	1,200,000	5,202,000
June, 1924..	3,452,000	875,000	4,327,000

† Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in byproduct ovens and 63.4 per cent in beehive ovens.

U. S. Coal Exports and Imports Decline in First Quarter

Exports of coal and coke from the United States during the first three months of 1924 were 17 per cent less than for the corresponding period of 1923, according to the Chamber of Commerce of the United States. Imports of coal and coke during the same period fell off 83 per cent as compared with the first quarter of 1923.

Lady Rhondda Still Seeks House of Lords Seat

Lady Rhondda, Great Britain's "Queen of Commerce," is said to be preparing for another battle with the House of Lords. She wishes to assume her seat in that august assembly as a peeress in her own right, the holder of a hereditary title. She is the most persistent of some dozen British peeresses in their own right who are excluded from the House of Lords on account of their sex.

The noble lords and barons of the realm have been greatly perturbed by these clamorous ladies since 1919, when women became eligible, on a basis of complete equality with men, to all English public offices. So far, the peers have successfully preserved their precincts from the threatened inroads of women.

Monongalia Mines Seek Cut In Baltimore Scale

A meeting of the joint board of the Monongahela Coal Association of West Virginia and the United Mine Workers held a few days ago brought out the fact that the operators who subscribed to the Baltimore agreement are not at all satisfied with the obligations it has imposed upon them and are sustaining losses because of the high wages they have to pay. The meeting was held to adjust local differences growing out of the agreement. There was no official statement following the meeting but it became apparent that there was dissatisfaction among both operators and miners over the present working agreement.

The miners charge that the provisions of the new agreement are not being observed in all instances, alleging that local working conditions are not conducive to pleasant work and that extra pay for working in wet places is not being allowed.

The operators on their side contend that they are losing money on every ton of coal they mine and ship and that they will lose less money by suspending operations at their plants.

Representing the operators at the joint board meeting were Samuel Purs-glove, R. M. Davis, Stephen Arkwright and W. R. Mitchell, the miners being represented by Van A. Bittner, J. K. Studdard, C. F. Davis and John X. Cochran.

Some operators have pointed out that more non-union coal is being mined in the Monongalia field than is coming from union mines and therefore they have asked the union to agree to a reduction in the scale so as to permit union mines to compete with the non-union mines.

"In the event of a failure to adjust the scale," one operator has declared, "we will be forced to close our mines or go to the non-union ranks."

Trade-Data Ruling Unlikely Before Election

The difficulty of explaining a policy on a controverted question may preclude the Department of Justice from making any announcement on trade-association statistics before the election. Any pronouncement which might be made at this time on that subject, in the opinion of politicians, would be capitalized by the opposition during the campaign. Regardless of the attitude the department might assume, it would be difficult for it to justify its position in the short time intervening before the election, the politicians think. While no comment on the matter is forthcoming at the department, it is the opinion in other well-advised quarters that nothing will be done until after the election.

There is reason to believe that the new Attorney General is in thorough sympathy with removing any uncertainty that may surround trade-association activities. He is thought to realize, however, that it is difficult to know just how a line can be drawn which would clarify the matter. It is certain that there is no disposition to allow the study now being made of the general subject to interfere in any way with the prosecution of those who are using the trade association as a cloak to defeat the purpose of the anti-trust statutes. On the other hand, there is reason to believe that trade associations that are engaged in those activities which are generally recognized as being legitimate are in no danger of prosecution.

Output of French Coal Mines Gains Steadily

Coal output from the French mines during April totaled 3,640,797 tons for 25 working days, which compares favorably with the March extraction of 3,772,734 tons for 26 working days, according to advices received by the Bankers Trust Co. of New York from its French Information Service.

The average daily output has constantly increased since the Armistice, comparative figures being:

	Average Daily Extraction
Year 1913	136,147 tons
Year 1923	121,064 tons
January, 1924	144,680 tons
April, 1924	145,632 tons

The average daily output from the mines situated within the pre-war frontiers of France is now only 7,155 tons less than in 1913, while the Lorraine mines are producing 16,640 tons a day more than in 1913.

Fuel imports into France during May were as follows: Coal, 2,594,882 tons; coke, 521,888 tons; patent fuel, 77,099 tons. The figures for April were 2,228,024 tons of coal, 703,446 tons of coke and 54,205 tons of patent fuel. May exports included 247,192 tons of coal, 34,434 tons of coke and 11,720 tons of patent fuel, compared with 178,781 tons of coal, 49,711 tons of coke and 8,157 tons of patent fuel in April.

I. C. C. Issues Warning Of Car Shortage If Coal Movement Is Long Delayed

The Interstate Commerce Commission urges increased production and purchase of coal in a warning against a car shortage in the autumn, issued July 19. The fall months are usually the peak months of transportation, the commission said, and if the carriers are called upon to handle an enormous coal traffic during those months in addition to the other commodities which they are called upon to transport, their facilities will be taxed to the utmost, the commission declared.

The necessity for increasing coal production prior to the peak movement, in the opinion of the commission, would seem apparent if the public is to avoid transportation difficulties.

In sounding its warning, the commission emphasized the following conditions which may cause a car shortage:

"The average production of bituminous coal per year for the past seven years (exclusive of the strike year 1922) has been approximately 520,000,000 tons. The average production in the last six months of such years was 6.8 per cent greater than the average for the first six months. For the first half of this year production has been about 227,639,000 tons. If in the last half of this year production is 6.8 per cent greater than in the first half, the total for the last six months will be 243,118,000 tons, or an average of 9,500,000 tons weekly for weeks of six working days each. Since April 1, 1924, the bituminous coal produced has been less than 7,500,000 tons per week in each instance.

Emphasizes Danger of Delay

"It can readily be seen, therefore, that if shipments of bituminous coal for winter consumption are deferred for any considerable length of time, the railroads will be called upon to handle a very large quantity of coal during the peak movement in the fall.

"The aggregate of bituminous coal shipped via lake to the Northwest during the 1924 season of Lake navigation to June 30, plus bituminous coal stocks at the head of the lakes April 1 of this year, is 12 per cent less than the corresponding figure for 1923 and 16 per cent less than the corresponding total for 1921, although larger than in 1920 and 1922. However, during the fall months of 1920 and 1922 there were severe car shortages and in the latter year a miners' strike.

"The coal stocks on docks at Duluth, Superior, Ashland and Washburn on June 15, 1924, aggregated 3,125,663 tons as compared with 2,179,999 tons on June 15, 1923, or an increase of 944,664 tons, indicating that considerably less coal has been distributed from the head of the lakes than at this period last year.

"Roads in the Northwest will soon be taxed to their utmost with the heavy demand on transportation in the fall months, during which period we will undoubtedly have a very heavy movement of agricultural products. It is therefore urgently suggested to the people of the Northwest that they pur-



E. J. McVann

Again secretary of the Smokeless Coal Operators' Association, having assumed the duties of the office July 1. Since relinquishing this post several years ago Mr. McVann has represented the smokeless operators in a legal capacity before the Interstate Commerce Commission and other tribunals.

chase their coal early, in order to avoid a curtailment in the transportation necessary for the heavy movement of agricultural products.

"There are no definite records available respecting present coal stocks. The stocks as of Jan. 1, 1924, aggregated 62,000,000 tons. At that time railroad coal stocks totaled 19,367,956 tons, as compared with 15,530,327 tons June 1, which is a decrease of 20 per cent. If the same percentage of decrease is applied to the aggregate coal stocks, the figure as of Jan. 1 would be reduced to 49,600,000 tons; which may not be a fair approximation of the coal stocks as of June 1, 1924.

"It is thought advisable to call the attention of the public at this time to the foregoing situation. The fall months usually are the peak months of transportation, and if the carriers are called upon to handle an enormous coal traffic during those months in addition to the other commodities which they are called upon to transport, their facilities will be taxed to the utmost.

"The necessity for increasing coal production prior to the peak movement would seem apparent if we are to avoid transportation shortages."

Coal Consumption and Power Output by Utilities Wane

Electric public-utility plants consumed 2,834,266 net tons of coal during May, according to a report by the Geological Survey. This compares with 2,900,864 tons consumed in April, according to the corrected figures. Fuel oil consumed by utility plants in May totaled 1,166,315 barrels, compared with 1,215,111 barrels in April.

The average daily production of electricity by public-utility power plants during May was 154,700,000 kw.-hr., about 2 per cent less than the daily output in April.

Davis Not To Be Judged By His Legal Service

The legal service of John W. Davis, candidate for President on the Democratic ticket, is no index of his views, according to the New York *Evening Post*. "When one comes to placing a portrait of John W. Davis alongside those of Mr. Coolidge and Senator La Follette to suggest what kind of a man the Democrats have put up for President," says Clinton W. Gilbert in his column, the *Daily Mirror* of Washington, "one has to wrestle with difficult questions whether he is a conservative or a progressive.

"While the convention was going on I lunched in a Wall Street luncheon club. Everybody there wanted to see him nominated for President. They thought they recognized him as one of their own kind. On the other hand, all the campaign literature describes him as a progressive. Is he a liberal because he once appeared for 'Mother' Jones and Eugene V. Debs in an injunction case and because he recently acted as attorney for a labor union, the National Window Glass Workers? Or is he a conservative because he is counsel for J. P. Morgan & Co. and for a telephone company?

"Here is the story of the defense of 'Mother' Jones and Debs as told by Colonel J. C. Johnson of Clarksburg:

"Do you see that hill?" he asked.

"Well, on top of it, more than twenty-five years ago, John W. Davis saved 'Mother' Jones and Eugene V. Debs from a lynching.' Now, the old man was referring to the events that led up to Mr. Davis' first case as a lawyer. It was at a mine strike in 1898 and 1899. 'Mother' Jones, grizzled warrior for the labor cause, and Mr. Debs had come here to lead the union miners. The mine owners obtained an injunction against the strikers, and when Mr. Debs and the venerable woman refused to abide by it they were surrounded out on 'T. K.' hill by angry townspeople and non-union miners. They were in the midst of a dangerous swarm. The angry mass moved forward apparently to wreak summary treatment. It was at this juncture that Mr. Davis, recently out of Washington and Lee University and flushed with his first undertaking, mounted a shabby wagon and delivered an impassioned plea. He denounced the injunction as high-handed and against all the institutions of this country and pleaded that reason take the place of mob spirit. He was successful in getting the endangered strike leaders to safety, and subsequently went into court and defended them. He won. It was his first legal victory.

"It is only fair to brush aside all of Mr. Davis' legal employment in trying to make up our minds what his views are. He isn't a progressive because he has appeared for 'Mother' Jones nor a conservative because he has appeared for Mr. Morgan. He is only a lawyer taking cases as they come to him. He defines his own attitude thus: 'I conceive it to be the duty of a lawyer, just as it is the duty of a priest or surgeon, to serve those who call on him, unless, indeed, there is some insuperable obstacle in the way.'

Ohio Miners and Operators Agree to Modify Scale

An agreement was signed at Logan, Ohio, July 18 by the joint conference of operators and miners in the southern Ohio field which virtually puts into effect the agreement in the No. 8 field of eastern Ohio. The joint conference held sessions for about ten days and every important point in the scale and working conditions was gone over thoroughly. The operators asked for a number of concessions, which were granted, and as a result it is hoped that production in the southern Ohio field will be stimulated when market conditions improve. Dead work and the removal of slate will not be so expensive and the cost of producing coal will be lowered as a result. Another provision imposes heavier penalties for the loading of dirty coal and it is proposed to enforce them.

Corbin Amalgam Plant Nearly Ready

The Corbin Coals, Ltd., formerly the Corbin Coal & Coke Co., is installing at Spokane, Wash., an amalgam plant costing about \$100,000, to prepare the smaller sizes of coal. This is a new method of treatment the product of which is said to be a fuel that is exceedingly popular with the consumer, among its virtues being almost total freedom from smoke and ash. The plant is reported to be almost ready for operation. A coal washery is being placed at Corbin to clean coal larger than $\frac{1}{2}$ in. in size and will be ready soon.

The Corbin coal lies in huge vertical seams or lenses and some 10 or 12 of these have been found on the company's property. The Mammoth Mine, which is developed to the point of producing about 250 tons a day, is opened up on a lens 450 ft. thick. The depth so far proved is 300 ft., with every evidence that it continues several hundred feet deeper. The seam has been traced over the mountainside for about a mile. Owing to the peculiarity of the formations the coal varies in grade and quality. In places it is of the nature of anthracite and in other places soft and easily broken. A number of small bands of shale make it difficult to clean and have led to the introduction by the company of the modern plant.



Forestation by Clearfield Bituminous Coal Corporation, of Clearfield, Pa.

Thirty-eight coal companies set out more forest trees than any other group of tree planters in Pennsylvania during 1923. The Clearfield corporation was the leader, planting 163,000 trees. Of the corporation's 150,000 acres of coal holdings, 24,000 are owned in fee and available for reforestation.

Museum of Engineering And Industry Asks for Nine Million Dollars

One million dollars has been assured toward the establishment of the National Museum of Engineering and Industry, Inc., with headquarters in the Engineering Societies Building, New York City. A campaign to raise an additional \$9,000,000 started July 5. The president of the new organization is Dr. Elihu Thomson, who received the Kelvin Gold Medal from the Royal Society at the Kelvin centenary in London on that same day. The vice-presidents are Dr. Edward G. Acheson, one of the creators of the modern abrasive industry; Dr. Leo H. Baekeland, inventor of Velox paper and Bakelite, who is president of the American Chemical Society, and Dr. Edward Weston, creator of the Weston type of electrical instruments.

In co-operation with the Smithsonian Institution the new organization is planning to erect on its grounds in Washington a building to house the original models of early inventions and the records of constructive achievement of pioneers, inventors and engineers in the development of transportation and industry. In this way the United States will be given the kind of institution which all the great European nations have possessed for years, and in the layout of the proposed museum use will be made of the data collected by an expert who has recently returned from a year's survey of museum practice abroad.

To Make Special Collections

An important departure in the American scheme is proposed, however; made necessary by the vastness of the country. In addition to the central collection at Washington special collections such as replicas of the historical exhibits will be carried to the people, also live machinery of modern processes will be placed in affiliated museums in industrial centers of every state.

Already old models and records long forgotten have been located and resurrected and this winter will be exhibited at the headquarters as a demonstration of how the ultimate collection will appear.

Illinois Rate Boost Deferred; May Reopen Whole Case

New Northwest rates raising Illinois coal 28c. to the Twin Cities will take effect Sept. 10 instead of Aug. 21, according to the latest decision of the Interstate Commerce Commission, announced to Western carriers July 21. This puts one more kink into the tangled skein of Northwest coal rates. The new schedules were postponed to give railroads time to publish them. Incidentally it gives time for one more petition to the commission to reopen the whole Northwest rate case.

Illinois coal operators are the latest to file, following in the wake of six other protesting groups. Illinois claims there is no justification for advancing that state, that the commission erred in its findings of undue discrimination, that the commission erred in not taking the whole origin territory into consideration, that the order compels violation of the fourth section of the Transportation Act by failing to find illegality in existing rates to the Twin Cities, at the same time ordering increases to intermediate points. Illinois also claims the I. C. C. examiner excluded proper testimony that justifies reopening the case.

Cutting-Machine Runners Strike at Orient Mine

The new machine-loading scale signed July 15 by the miners' union and the Chicago, Wilmington & Franklin Coal Co., Chicago, produced a strike at the mine. On the morning of the 16th, when the scale took effect, all the cutting-machine runners at the Orient No. 2 mine declined to go below. They could not make a satisfactory agreement with the mine superintendent for their tonnage payments. The new agreement signed by union officials provided that until the company gets weighing equipment installed, the cutting machine men's pay would be fixed by agreement. The company refused to discuss the case until the men went back to work under the general working agreement. This they had not done up to Saturday, so the mine stood idle.

Reeves Dock at Superior To Be Rebuilt at Once

Announcement has been made of the plans of the reconstruction of the Reeves dock at Duluth-Superior, Wis., which was reported under demolition several weeks ago. The Reeves Coal & Dock Co. has been formed under the laws of the State of Delaware, and will construct a 500,000-ton dock on the present site as soon as plans are finished. The dock will cost \$750,000. Plans are being drawn by the Fegles Engineering Co. Contracts will be let as soon as these plans are completed. The dock property is located on the highway between Duluth and Superior and is considered the best dock property in the harbor.

The Reeves company has announced a "coal-at-cost" policy which will mean that 500 dealers throughout the Northwest will save 25c. a ton.



Practical Pointers For Electrical And Mechanical Men



Various Forms of Gears and Their Uses

Spur Gears with Shafts Parallel—Bevel Gears with Shafts at Angles but in One Plane—Worm Gears with Shafts at Right Angles but in Different Planes

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THE gears used on mine machinery are made from wrought steel, cast iron, bronze, brass, malleable iron, rawhide, fiber and steel castings. In general practice, malleable iron gears are made by casting the metal in molds of appropriate shape. Sometimes steel gears are made in the same way. Cast iron is used both for cast and machine-cut gears. The gears made from mild, tool and alloyed steels, bronze, and brass generally carry machine-cut teeth.

Gear cutting is an extremely delicate job, requiring special machines which are designed to space the teeth properly and give them the required contour. This is why machine-cut gears cost so much more than cast gears and are of superior quality. The teeth on the cast gear are not formed by a machine, but are merely cast in the sand and consequently do not have as perfect a shape as those which are machine-cut.

CUT GEARS FOR TRANSMISSION

Cast gears are used extensively on certain kinds of mine machinery, and they serve their purpose admirably. For power transmission the cut gear is generally used. Several styles of gears are used for transmitting power. When using gears, power is transmitted without slippage or lost motion so long as the teeth retain their shape.

The most familiar gear is that having spur, or radial, teeth. The small gear, shown in Fig. 8 meshing with the spur gear, Fig. 9, is called the pinion. This type of gear can be machine-cut or cast. The sizes of the gears are determined by the size of the teeth. The most common sizes are the 16, 12, 10, 8, 6 and 4 pitch. By a No. 4 pitch gear is meant one having four teeth for every inch of its diameter—hence, the pitch is equal to the number of teeth per inch of diameter. For example, if a gear has 60 teeth and the diameter of the pitch circle is 10 in. its diametral pitch is 60/10 or 6, and the gear is therefore called one of No. 6 pitch.

It is not difficult actually to determine the pitch of a gear, but if in doubt as to the procedure, and it is necessary to secure this information for a replacement order, a simple plan is to mark out the shape of six or eight teeth on a piece of paper and with this

drawing give the number of teeth and the outside diameter. It is then a simple matter for the supply house to figure the correct pitch of the gear. In order to obtain a gear of the proper dimensions to fit the requirements, the bore of the hole, the size of the key seat and the width, length and diameter of the hub should be given also. The spur gear, as can be seen from Figs. 8 and 9, is used for transmitting power from one shaft to another parallel to it.

Bevel gears, Fig. 13, which may be either cut or cast, are designed to transmit power to shafts which are not parallel but lie at some angle to each other in the same plane. They may be arranged to work at any one of many given angles. Bevel gears and bevel pinions are shown in cross section in Figs. 14, 15 and 20. The pair in Fig. 14 has the two shafts at an angle less than 90 deg. The one below has an angle greater than a right angle. In the lower left hand corner of the illustration the angle is still greater, and the larger wheel is known as an inside bevel gear. These three drawings illustrate the wide range of usefulness of this device for transmitting power through various angles.

RAWHIDE GEAR ALMOST SILENT

The miter gear, Fig. 18, is a bevel gear in which the shafts are at right angles, the gears have the same number of teeth and the pitch or contact cones are of the same size. Rawhide gears, Fig. 16, are used to advantage on high-speed work. One member of a pair or train of the spur and bevel gears are often made from rawhide, fiber or some similar material. One reason for using gears of this kind is that they run almost noiselessly. The rawhide is supported on each side with steel or brass plates held in position by rivets passing through the gear body.

Racks, Fig. 19, are used frequently on mine machinery. The size of the rack is determined as in the spur gear. One of the most common difficulties with the rack, especially those made from cast iron, is the fact that they are liable to break in two. Ordinarily this is caused by not having the rack firmly and evenly fastened in position. Severe stresses are also placed on the rack when quantities of dirt and grit

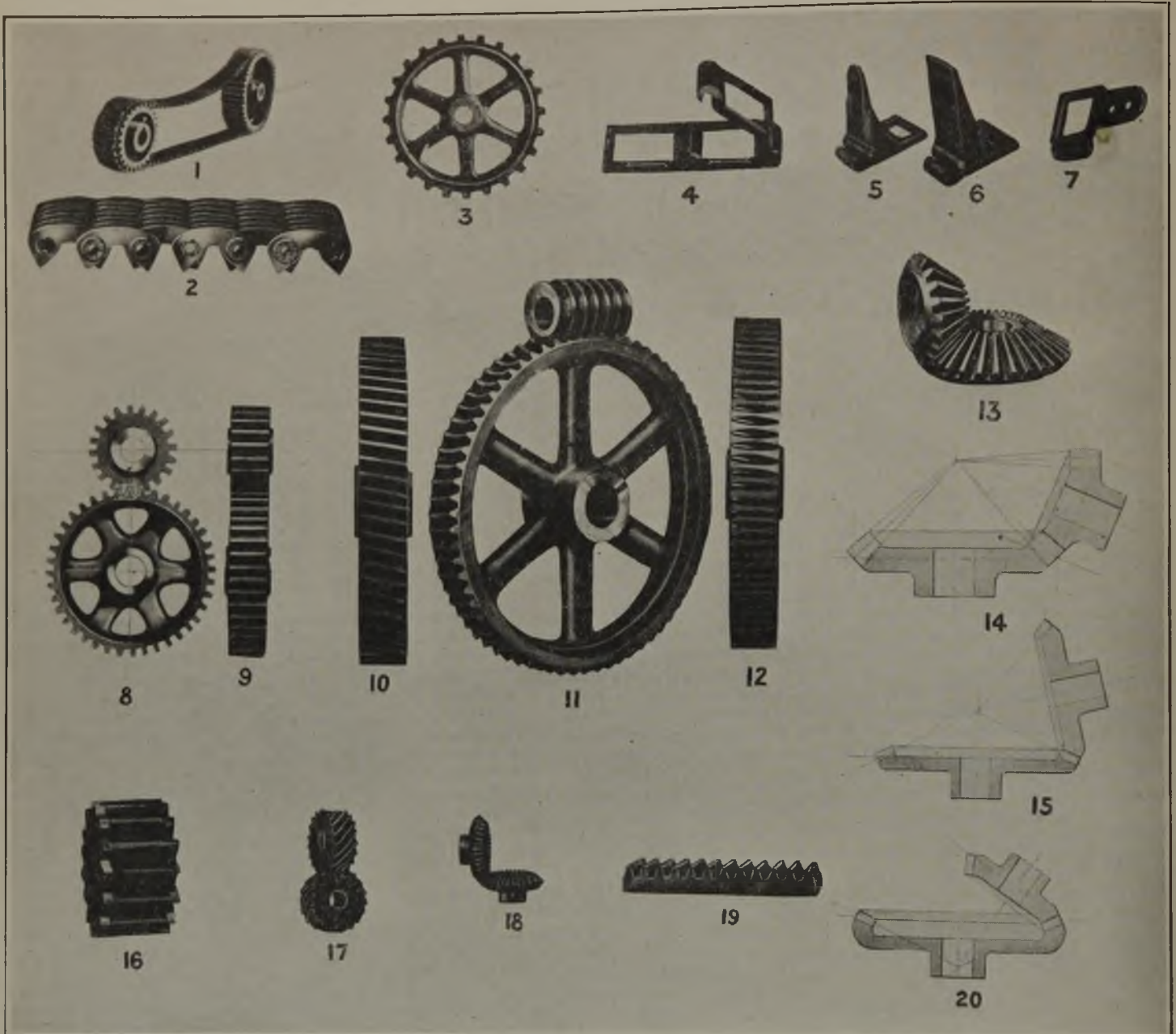
are allowed to collect between the teeth.

The worm and worm wheel, as shown in Fig. 11, are a combination of a screw and a gear and are used for transmitting motions from one shaft to another at right angles to it, the shafts not being in the same plane. This type of gearing is used when it is desired to change small torque at high speed to high torque at low speed. The most common use of the worm and worm wheel is in steering gear construction and small electric motor drives. The worm, as a reference to Fig. 11 will show, is simply a screw whose threads fit the teeth of the worm wheel. The worm wheel may be a plain spur gear with the teeth cut at an angle or curved to fit the worm. These wheels are of two types, the hobbed-work wheel Fig. 10 or the gashed-tooth worm wheel, Fig. 12. The shapes of these wheels are clearly defined in the plate.

MUST KEEP CHAIN GRIT FREE

The link belt or silent chain as shown in Figs. 1-7, is used on drives in the power plant of the truck, gasoline locomotive and automobile. To get the best service from this type of drive it is essential that the chain be kept properly lubricated and free from grit and dirt. When a chain becomes stiff and dirty from the accumulation of foreign material, free it from the drive by removing a pin and bushing. Then clean it well in a bath of gasoline. Cleaning the chain in a hot bath of water and salsoda is also considered good practice. After the chain is thoroughly cleaned, using either method, it then should be immersed in a good quality of hot lubricating oil and permitted to soak in this hot bath for a half hour.

The sprocket wheel is usually made from cast iron, although some of the small sizes are made from malleable iron. If these sprocket wheels break and it is impossible to get a replacement from the factory when needed, the broken wheel can be used as a pattern from which a new wheel may be cast at a near-by foundry. When fitting a new sprocket wheel on a job always test the wheel with the chain. This is done by testing the fit of the chain around the entire circumference of the sprocket wheel. Remember the chain is the standard and that the wheel must be fitted to it. Some of the chains used on sprocket wheels wear out quickly and when this happens the shape of the chain is possibly at fault and not the material. Inspect the sprocket wheel, and a large or uneven tooth may be discovered which is causing the damage.



Some of the Gears and Link Equipment Used for Transmission of Power

Figs. 1 and 2—Silent link chains; Fig. 3—Sprocket wheel; Fig. 4—Ewart link belt; Figs. 5, 6 and 7—Attachments used with Ewart link belts for conveying purposes; Figs. 8 and 9—Two views of spur gearing; Fig. 10—Helical gear; Figs. 11 and 12—Worm and worm wheels. The thread of the worm is left-handed. On the left hand is a hobbed-work wheel and on the right

hand a wheel with gashed tooth; Fig. 13—Bevel gear; Fig. 14—Bevel gear with angle of axes less than 90 deg.; Fig. 15—Bevel gear with angle of axes more than 90 deg.; Fig. 16—Rawhide pinion; Fig. 17—Spiral gear; Fig. 18—Miter gear; both gears same size and angle between them a right angle; Fig. 19—Steel rack; Fig. 20—Inside bevel gear and pinion.

A large number of special attachment links for sprocket chains are made. These are most commonly used to hold conveyor flights and the like. Three of these links are shown in the plate. In this type of chain the links are made from malleable iron. Chains,

after they have been in service for a long time become loose in the joints, causing the chain to unhook. This may be overcome by closing the hooks at the ends of the links so that they will fit the bar of the adjacent link more closely.

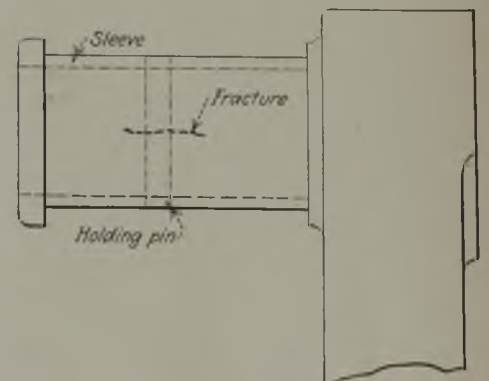
the ends of this pin had been filed down the crankpin was again put in place and no further difficulty experienced.

Repair of a Steam Engine Crankpin

The crankpin on a 200-kw. engine-driven generating unit had been heating and giving much trouble for quite some time. Often it had been necessary for the engineer to spend nearly all of his time oiling the bearing and in many other ways taking care of the crankpin. A thorough investigation revealed nothing wrong with the pin; it was in the proper alignment and of proper diameter.

The mechanical engineer of the plant finally ordered a new pin, but the attendant was not entirely satisfied that

a new one was needed and therefore made a close examination and found a small crack from which the oil would run out when he clamped the sides of the pin together. The crack was so thin that it was almost impossible to see it with the naked eye. It was large enough, however, to explain the difficulty. The pin while running would expand and cause the fracture to open up and bind in the bearing box, cutting the box out. As shown in the illustration a thin bushing in the shape of a sleeve was shrunk on the crankpin and a hole drilled through the crankpin and bushing to accommodate a pin for holding the sleeve in position. After



Quick Repair to Crankpin

A sleeve was pressed over the whole surface of the crankpin and a pin driven through to hold it in position. In this way the crankpin was given a new smooth surface and heating of the bearings permanently stopped.



Problems In Underground Management



Rock-Dusting Machine with Three Fixed Outlets Treats Roof and Ribs

Is Mounted on a Single Truck and Does
Not Need Services of a Nozzleman
— Dust Does Not Pass Through Fan

NOW that the coal-mining industry is convinced of the utility of rock-dusting as a safety measure the chief problem confronting the coal producers is that of finding the best method or machine wherewith to apply the dust. Various portable blowers are now in process of construction. Among them is the Miller mine-dusting machine designed by James B. Miller of St. Louis, Mo., and shown in the accompanying illustrations. The first of these machines has just been put to work experimentally in the mine of the Valier Coal Co., Valier, Ill., near the properties of the Old Ben Coal Corporation

bottom of which extends a screw conveyor transporting dust to one end and delivering it at a point directly beneath a multiple outlet through which a fan is driving a blast of air. The dust is picked up by this current and is discharged through three rectangular outlets, two of which are directed toward the ribs at a slight elevation above the horizontal while the third is aimed directly at the roof. None of the dust passes through the fan itself. The dust is drawn from the conveyor pipe beneath the fan and swept upward through the outlets, the inlet apertures being below the fan casing.

The fan is 12 in. long and revolves in a drum housing of light sheet steel. The three discharge pipes, all the air and dust inlets of which are at the bottom of the drum, curve upward and around the circumference of the casing delivering the dust streams at three angles so as to effect complete coverage of ribs and roof. The traveling speed of the truck can be varied somewhat without changing the volume of dust delivered per lineal foot of entry. This is done by altering the speed of the motor which drives the screw conveyor. This change of speed modifies the quantity of dust drawn from the bin, the speed of the totally-enclosed dust-proof motor driving the fan being similarly changed.

After much experimentation Mr. Miller determined upon what he thinks is a proper ratio of dust delivery as between outlets. This is partly governed by the sizes of the discharge pipes. The cross section of the two outlets delivering dust to the ribs is in each case 5x8 in., the perpendicular pipe directed at the roof being only 2 in. wide. Were there no other controlling factor, the sizes of the pipes thus would divide the dust discharge so that five parts would strike each wall and two parts would be distributed on the roof.

But there is a further control of this proportion. It is effected by the adjustment of sleeves fitted around the feed pipe by means of which the screw delivers dust to the fan. The feed pipe bears a wide slot along its top for the full 12 in. under the fan chamber. This aperture can be widened or narrowed under each discharge pipe by revolving the sleeve of that section of the

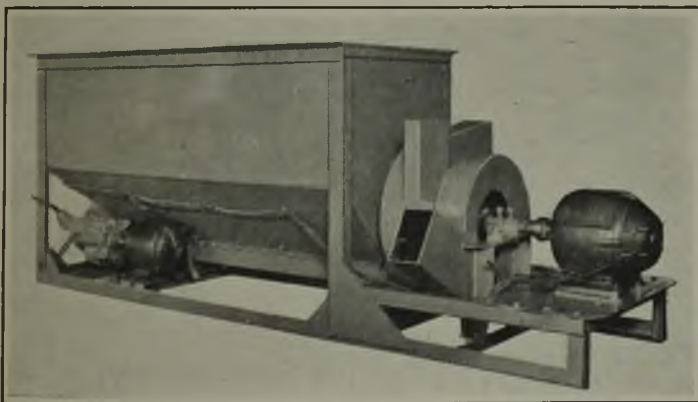


FIG. 1
**Side View of
Rock-Dusting
Machine**

This shows both motors, one totally inclosed driving the fan with its three outlets and the other driving the dust conveyor through back gearing and chain. Note that both dust bin and fan casing are of welded construction.

where much of the work of adapting rock-dusting to the mines of this country was done by J. E. Jones, safety engineer for Old Ben.

The Miller duster was designed after Mr. Miller had spent several weeks in the Old Ben mines studying the dusting problem in company with various engineers. It differs in two main particulars from most of the other dusting machines now in the development stages. In the first place this machine in its entirety is mounted on one truck instead of having the dust bin on one truck and the nozzle on another. The other main difference between it and other machines designed for a similar purpose is the fact that the dust is discharged through three fixed outlets instead of through one flexible pipe. This reduces the crew necessary for the operation of the machine by one man as no nozzle has to be manipulated.

The Miller duster may be briefly described as follows: The machine consists of a bin of three tons capacity along the

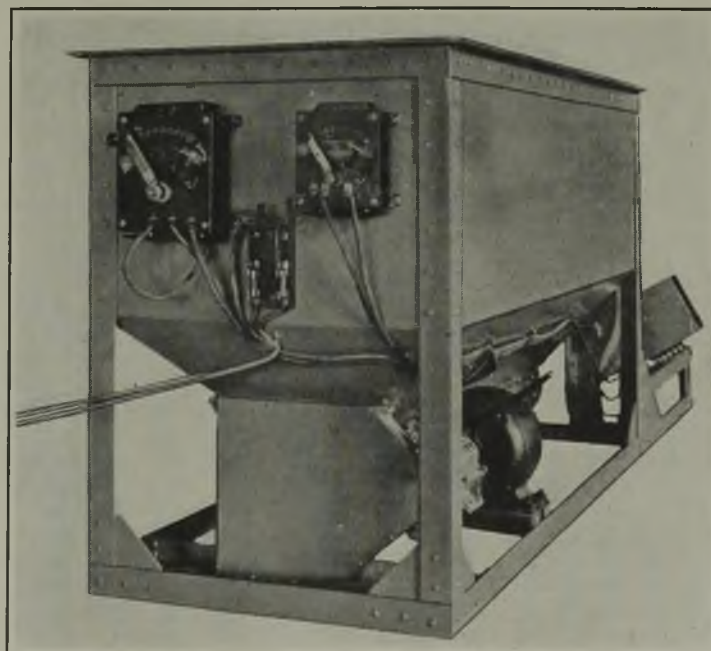


FIG. 2
**End View Show-
ing Electrical
Control**

It is, of course, intended to mount the entire mechanism shown in this illustration on a truck that may be pushed or pulled through the mine headings by a locomotive. One operator controls the entire machine and has practically nothing to do while it is in operation.

feed pipe. By a nicety of sleeve adjustment, the same volume of dust can be discharged from each outlet, or the proportions blown against the top and the two ribs can be changed to suit the needs of the place to be dusted.

One or two engineers, upon seeing the drawings and photographs of this machine for the first time, have wondered whether the three dust-laden air

streams from the machine might not set up conflicting air currents and eddies in certain parts of the cross section of an entry that would prevent dust from reaching the angles between roof and ribs. This possibility was, however, considered in building the machine and the difficulty obviated by properly adjusting the force of the air blast.

that a mine in Indiana is using Joy loaders together with the Movor conveyor in a concentrated system. The H. C. Frick Coke Co. is working the Pittsburgh seam on a longwall face at its Leckrone mine. Recovery from concentrated mine layouts should be higher than that obtained from rooms and pillars. The chief engineer of the West Virginia Coal & Coke Co. claims a recovery better than 95 per cent from the V-system of mining.

Graham Bright characterized E. C. Moore as being modest in not saying much about the V-system of mining which his firm advocates. During a visit in the Norton mine where this system is being worked, Mr. Bright noticed that the men were actively engaged in useful work practically at all times. Concentration permits factory-like illumination at the working face, eliminates many of the dangers prevalent in scattered workings and invites close supervision. He thinks that wherever the coal is clean loading machines of some type now in use can be used in conjunction with the Movor conveyor in the V-system of mining.

VENTILATING THE V-SYSTEM

"How would the V-system work in a gaseous mine?" asked T. G. Fear, general manager of the Inland Collieries Co. He is not convinced that the system is safe when used in gaseous mines. A roof break might encroach on the points obstructing the path of the current of air with which the faces must be swept. Mr. Moore advocates the use of blowers or a brattice-cloth wall up the center of a gallery for ventilation purposes. Mr. Fear said that the practice of thus using brattice cloth is unsafe. The driving of two gallery entries to each pair of faces would provide better ventilation but would at the same time occasion other difficulties. Flame-proof motors undoubtedly will be furnished with the Movor conveyor wherever the conveyor is to be installed in gaseous mines, said Mr. Moore.

Freakish Coals in Scotland

In a paper on "The Heat Due to Strata Movements and Its Effect on Certain Coal Seams," read before the North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England, by Henry Briggs, A. L. S. Owen and John Wilson, reference is made to the earliest account of what has been known as "calcareous coal" because of the presence of large quantities of calcium, magnesium and ferrous carbonates, the first forming about one-third of the altered coal and the two others together another 12 to 20 per cent of its weight. This coal is found south of Motherwell, Lanarkshire, Scotland, between that town and the Clyde.

The alteration varies in extent from point to point in the 100 acres affected. It affects several seams but in an erratic manner, but it does not appear to extend deeper than 300 ft. Apparently the occurrence has relation to heat and to certain faults, of which the three principal ones converge at low angles and finally join.

Why Exhaust Only Tenth of One per Cent Of Your Mine Development Daily?

Takes Five Years to Extract One Hundred Acres—Should Follow Automobile Industry in Planning Rapid Sequence of Operations—Ventilation Problems Vexatious in V-System of Mining

AT THE bi-monthly meeting of the mining section of the Engineers' Society of Western Pennsylvania, evening of June 24, 1924, in Pittsburgh, E. B. Moore, who is Pittsburgh manager of the Coal Service Corporation, talked on "Concentration in Coal Mining." F. A. McDonald, general superintendent of the National Mining Co., presided.

In room-and-pillar mining, according to Mr. Moore, the average output per place worked is less than 10 tons. A mine with a capacity of 1,000 tons of coal per day, therefore, requires about 150 working places, allowing for idleness of 50 per cent of the places, which is generally a safe assumption. These places are quite likely to be scattered over an area of 100 acres, from which, in a thick seam, only about one-tenth of an acre is actually extracted per day to yield 1,000 tons. The ratio of the area extracted per day to the area developed is as 1 is to 1,000. It would take about five years to work out the developed area at this rate of mining by the use of the present methods.

NEW MEANS AND NEW WAYS

Two ways to mine coal intensively are at the disposal of every operator, (1) by the use of new and modern equipment, (2) by resorting to some modification of longwall or room-and-pillar mining. The ideal system involves a combination of the two. In the mines where the room-and-pillar method is the only choice, mechanical equipment will serve to lower production costs. The day may come when three or four cuts will be taken per day from each working place. A prominent mining engineer proposes to do that very thing, by stationing three hand loaders in each of two adjoining rooms which are to be cut alternately and the coal loaded onto conveyors. "Many operators say such intensive mining can't be done profitably," remarked Mr. Moore. He is confident that it can be given due regard to mine layout and by close supervision.

In his optimism he contrasted present mining methods with the modern production methods employed in automobile factories, where a thousand and one operations are performed successively with little loss of time. He sees no reason why mining cannot be speeded up by the elimination of lost

time between the half dozen operations performed at the face.

In a few years, he is disposed to believe, the fuel requirements of this country will be met mostly by mine owners who take advantage of labor-saving equipment to reduce the cost of production. A company now using modern equipment and a concentrated system of mining reports a saving of 30 to 35 per cent over the cost of producing coal by the room-and-pillar method.

Roof control is the chief factor standing in the way of mining extensively by concentrated systems in which longwall mining is involved. Heretofore not enough attention has been given to the potentialities of long faces, which, where they can be worked successfully, lower the costs of driving headings, laying track, drainage, ventilation, etc.

HAS INDUSTRY BEEN ASLEEP?

Mr. McDonald denied Mr. Moore's statement that the reason why the mining of coal is far behind the times is because of the failure of those engaged in this pursuit to adopt labor-saving machinery, and questioned whether more intensive mining and closer supervision alone would effect savings in the cost of production. He said the labor situation in the Pittsburgh district made such advances difficult, though some progress is shown in nearby non-union districts. Different conditions in every field, mine and section of a mine prohibit the adoption of any one general method for all mining.

An objection was raised by R. H. Scheller to the concentration of working places. He maintained that the chemical content of coal varies from place to place in a mine. Coal extracted from a large area, when mixed in dumping, is fairly uniform in composition from day to day, or month to month. Uniformity of ash, sulphur, phosphorus, etc., is highly desirable in coking coal for metallurgical use. His objection had no reference to steam coals.

R. W. Powelton wanted to know if mechanical loaders are being used anywhere in a concentrated system of mining, if longwall mining is being practiced at any mine in the vicinity of Pittsburgh and what percentage of recovery may be expected from concentrated mining. Mr. Moore replied



Production And the Market



First Signs of Awakening Interest Come to Light In Bituminous-Coal Trade

A faint but none the less unmistakable awakening of activity in the Southwest is the first favorable tangible development in the soft-coal trade since the present depression set in. The increase, which is not large, is not so important in itself but is of far reaching interest as a possible portent. For some time the feeling has been strong that the beginning of a revival was at hand, but politics and various other reasons have been advanced as responsible for the delay in its appearance. Meanwhile the country's stockpiles continue to shrink to the danger point, though at a less rapid rate than many imagine, because of the slowdown in all lines of industry. Shipments by lake to the Northwest, too, are far below the seasonal average at this time. Reports of the reopening of textile plants continue to filter in, but these are offset by reduced working time at a number of others. Concurrently the trade continues to mark time as the process of readjustment develops, prices and production showing slight material change.

Commerce Commission Warns Against Delay

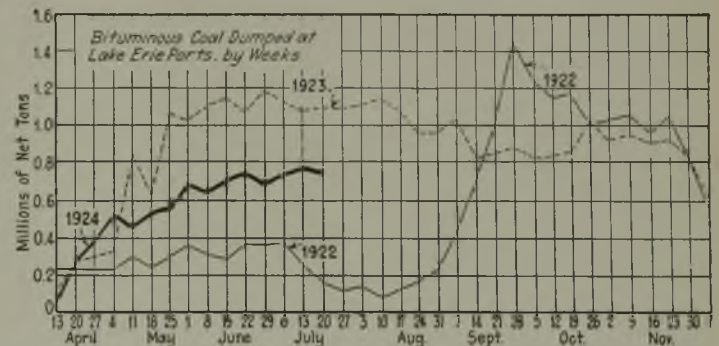
Calling attention to the danger of transportation difficulties in the event of heavy traffic on the railroads in the autumn, the Interstate Commerce Commission issued a warning last week that coal purchases should be no longer delayed. Another interesting development was an agreement by miners and operators in the southern Ohio field modifying working conditions in such a manner as to enable mines in that district to compete more successfully with the non-union fields.

Coal Age Index of spot prices of bituminous coal advanced slightly during the last week, standing on July 21 at 163, the corresponding price for which is \$1.98.

There was a marked quickening in activity at Hampton Roads after the holiday, dumpings of coal for all accounts during the week ended July 17 totaling 373,600 net tons, a gain of 137,080 tons over the pre-

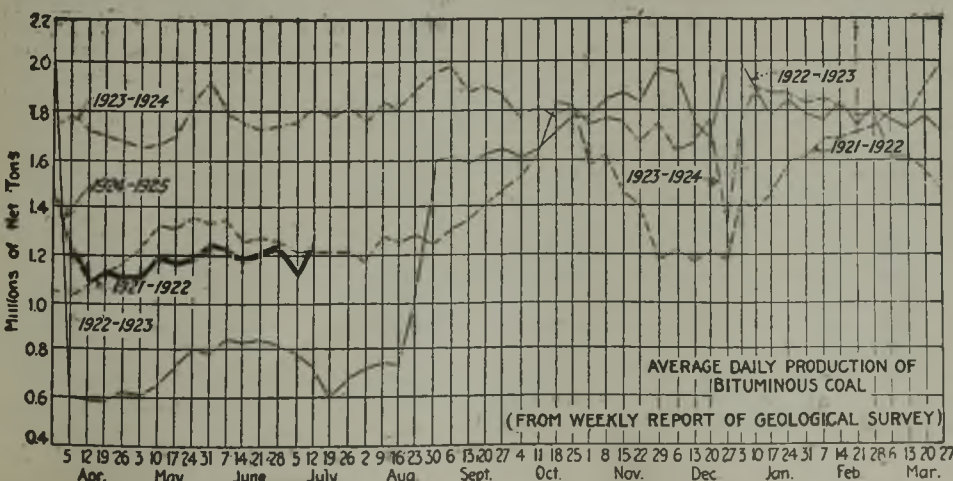
ceding week, when 236,520 net tons was dumped. Coal dumped at Lake Erie ports during the week ended July 20, according to the Ore & Coal Exchange, was as follows: Cargo, 733,634 net tons; fuel, 41,667 tons. The totals for the previous week were 731,438 net tons of cargo coal and 48,062 tons of fuel coal.

Production of bituminous coal recovered sharply from the slump caused by the holiday, output during the week ended July 12, according to the Geological Survey, totaling 7,455,000 net tons, which is the highest level attained since the week ended March 29. Anthracite output likewise registered a rebound to 1,871,000



net tons during the week ended July 12, compared with 1,296,000 for the preceding week.

Demand is far from brisk in the anthracite market, though the larger companies do not find it difficult to move domestic sizes other than pea, which is piling up on both companies and independents. Independent prices are weak, stove when taken alone bringing about 25c. more than when sold with another size. Egg also in some instances commands a little higher price than chestnut, being not quite so superabundant. Steam sizes are sluggish in the extreme, only the better grades of independent product being able to command anything like company schedules.



Estimates of Production

(Net Tons)		
BITUMINOUS		
	1923	1924
June 28.....	10,458,000	7,371,000
July 5 (a).....	8,742,000	5,738,000
July 12 (b).....	10,925,000	7,455,000
Daily average.....	1,821,000	1,243,000
Cal. yr. to date (c).....	290,478,000	239,409,000
Daily average to date.....	1,772,000	1,461,000
ANTHRACITE		
June 28.....	2,105,000	1,918,000
July 5.....	1,580,000	1,296,000
July 12.....	2,051,000	1,871,000
Cal. yr. to date.....	54,800,000	48,792,000
COKE		
July 5 (a).....	376,000	94,000
July 12 (b).....	366,000	105,000
Cal. yr. to date (c).....	10,744,000	6,282,000

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

Midwest Gains a Little Confidence

A slight indication of the pick-up to come in domestic coal has been felt in the Middle Western states during the past week. Country orders from dealers for certain prepared sizes have begun to trickle in slowly. This does not awaken the dealer trade in the cities, however, so there is little enough as yet to bolster up the flat condition of the market. Illinois operators are letting it be known that they intend hoisting the price of lump and egg 15 or 25c. Aug. 1. The general lifelessness of things has shut down three or four mines that have been trying to operate, and a couple of operators who had announced their intention of opening up July 15 changed their minds. Steam coal is draggy although many stocks are getting down toward the vanishing point.

Field conditions in Illinois continue discouraging. The railroads are about the only consumers that are taking anything from commercial mines and these shipments are not enough to provide much running time. More than half of southern Illinois continues shut down cold. The Jackson County and DuQuoin field is in even worse condition. Mt. Olive production is almost at a standstill, except at railroad mines, and the Standard district is absolutely flat.

Business conditions at St. Louis are quiet. There are few domestic orders although this trade is beginning to pick up in spots. Local wagonload steam has practically ceased and carload steam is so easy that it can hardly be found. Country steam also is hard to find, but here and there in the country there are indications that buying ought to be pretty good by Aug. 1, as there is some activity now to indicate that.

Kentucky Feels Better

At least a few of the Louisville coal men have obtained some business over the week, and are feeling better. There have been some good state contracts placed, 646 cars of screening selling at from \$1.10 to \$1.25 a ton, and while these prices are low—around 75c. a ton under prices of last year—it has lent some encouragement.

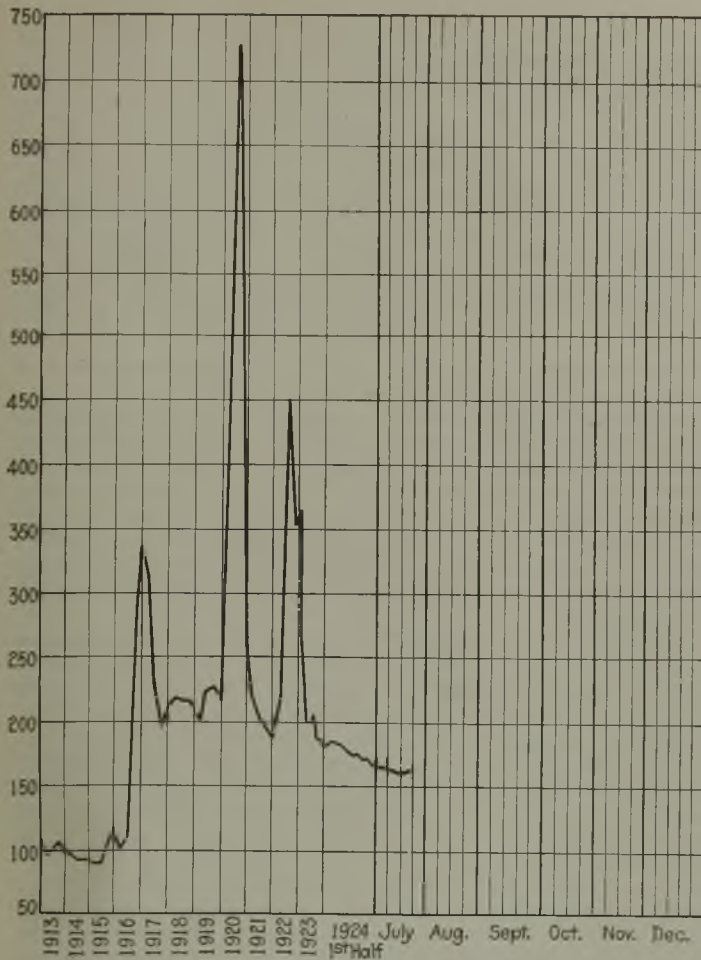
It is also said that domestic consumers are stocking more freely and that retailers are buying more coal, including some yard stock. General industrial business is in small lots, and the utility, steel and other big consuming interests are not buying in sufficiently large quantities to make things interesting, according to coal men. Nevertheless, the market is being well maintained on screenings, in spite of fairly large production of prepared coal in eastern Kentucky.

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

Table with multiple columns for Market Quoted, dates (July 23, 24, 21), and prices for various coal types (Low-Volatile, High-Volatile, Midwest, South and Southwest) across different markets (Columbus, Chicago, St. Louis, etc.).

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

Table with columns for Market Quoted, Freight Rates, and prices for anthracite coal (Broken, Egg, Stove, Chestnut, Range, Pea, Buckwheat, Rice, Barley, Birdseye) across different markets (New York, Philadelphia, Chicago, etc.).



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924		1923	
	July 21	July 14	July 7	July 23
Index	163	162	164	197
Weighted average price	\$1.98	\$1.96	\$1.99	\$2.38

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.

Western Kentucky operators deprecate reports that the field is busy. It is true that tonnage has been picking up a little, but a large number of mines are closed down by strike, many small mines have not been operating, and the total capacity of operating mines is not much over 50 per cent of field capacity. But production is increasing and some of the operators and jobbers are looking forward to a much better market in August.

Although a little more interest is being manifested by foreign buyers in smokeless coal and although the price is a little higher at tidewater, nevertheless there is not as strong a demand for low-volatile fuel in Eastern or tide-water markets as there is in the West. There is hardly a sufficient supply of prepared grades to fully meet Western demand, as it does not pay producers to prepare too much tonnage because of the low prices prevailing on nut and slack.

Northwest Is Waking

Bituminous prices are the same at Duluth as last reported, but the market is considerably stronger in tone. An independent mining company has purchased 2,000 tons of Youghiogheny screenings on the market, and several other companies are in the field with a buying light in their eyes. A month ago none of the independent mining companies was even remotely interested in the coal business and the mines were shut tighter than a safe. Several large industrial concerns have begun to show signs of life.

While no indication of Mr. Ford's plans has been given since he acquired the Superior Coal & Dock Co.'s dock, it is rumored that he will bring coal here from his mines in

his own ships, of which he has two in water and two building, and will go into the coal business.

Inquiry comes from Winnipeg for hard coal and much is being shipped there, much to the joy of Duluth docks, as only the wealthy are filling their bins there. Prices are firm, with another 10c. advance sure on Aug. 1. The docks hold now about 3,300,000 tons, of which 2,400,000 is free. Thirty-five cargoes arrived last week, of which six were hard coal, and ten are reported on the way, of which one is hard. Shipments are keeping up.

The Milwaukee coal market continues quiet. Jobbers are scouring the country for business, but with little success. A change is not looked for much before September. Nobody seems to want coal just at present. Prices hold steady. The City of Milwaukee has let contracts for about 60,000 tons of coal for delivery to various municipal institutions during the coming winter. The prices, which vary according to length of haul, averaged \$1 per ton less than prices paid last year.

Receipts of coal by lake continue fairly liberal thus far, 339,038 tons of anthracite and 779,343 tons of soft coal having been received.

West Is Buying at Last

Mail orders from dealers for Arkansas semi-anthracite lump indicate that domestic storage is under way throughout the Southwestern district. Immediately before the advance of 50c. in the retail price early this month the heaviest business since last winter was reported. Wholesale prices still are quoted at \$5.50@\$6 for lump, \$3.50@\$4 for mine run and \$2 for screenings. Kansas strip-mine coal is quoted at \$3.75 for lump and \$3.50 for nut. There has been no change in Kansas shaft coal or the Henryetta (Okla.) product.

Conditions in the Colorado market are not much stimulated yet but a few storage orders have been received and operators expect conditions to be almost normal before long. Prices remain unchanged. The transportation and car supply has been very good throughout the state.

In Utah the recent increase in coal prices by operators and retailers has had the effect of stimulating storage business. Mines are working in excess of two days a week now and the output should grow steadily. Lump, which was a drug on the market a few weeks ago, is moving again. In fact, there is a little demand for every grade of coal now. Business is generally conceded to be better now than it was a year ago. Smaller manufacturing plants are buying coal again, as are big industrials such as sugar companies.

Ohio Markets Sluggish

Total lack of interest in the domestic situation marks the Cincinnati market. Retailers have quit buying and the shortening of the supply of residue has stiffened the slack market just a little in bituminous. Many Kanawha mines have suspended operation and some shutdowns are reported from southern Kentucky. Lake buyers still stand off; the tonnage taken is far behind that of last year. Smokeless business is sluggish with screenings the weakest point on the list. Retail deliveries are at the lowest ebb of the year and prices unchanged.

The trade at Columbus is in a slump. Up to recently there was a fair volume of domestic business, but it has dropped off, and orders are far apart and hard to get. This condition is expected to be temporary only, as the general reduction in stocks will soon force some of the larger users into the market. Retail prices are fairly steady at recent levels, but this is due largely to small retail stocks. Pocahontas, smokeless grades and splints are the most popular. Steam business is rather quiet as there is little contracting. While demurrage coal is not as plentiful as formerly, still a considerable amount can be picked up in the local market. School coal is moving in considerable quantities.

While the Cleveland market continues dull and steam demand is quiet, there have been reports of additional mines opening up in the field, and if this is not indicative of actual betterment in trade conditions it at least augurs well for impending improvement. Spot prices have softened slightly during the past week. Activity in the retail trade has not yet appeared, but schools, colleges, greenhouses and certain public institutions are putting in some coal now, but without discernible effect upon the market.

The Pittsburgh market is as dull as ever. Production is light, and much of it by consumers or by strip mines. There is a little trade in high-grade gas coal, but not much even of that. Local consumption is absorbing only a small percentage of the district's producing capacity. The Connellsville region, with its lower wages, has been making strenuous efforts to get coal business, but without much success.

A general feeling among operators in the central Pennsylvania bituminous field is that the bottom of production and prices has been reached, although not much improvement is expected before August. Production for the week ending July 12 was 10,930 carloads, against 8,291 for the previous week, which included the Fourth of July holiday.

The coal situation at Buffalo does not show much change. Increased orders for steel manufactures are reported but no general business revival is in sight. In some quarters it is asserted that the depression has been overstated and that it will not go any further.

The Toronto market is very quiet, with but little demand for anthracite and less for soft coal. The yards are well stocked in anticipation of fall requirements, but few consumers are laying in stocks and business is less active than at this season last year.

New England Market Nearly Lifeless

In New England the market for steam coal is almost lifeless. Mills are closing down for weeks at a time, often with no date set for opening, and the trade generally is able to do little more than mark time. The few venturesome shippers who still try to force coal on this reluctant market learn to their cost that it is nearly to the saturation point.

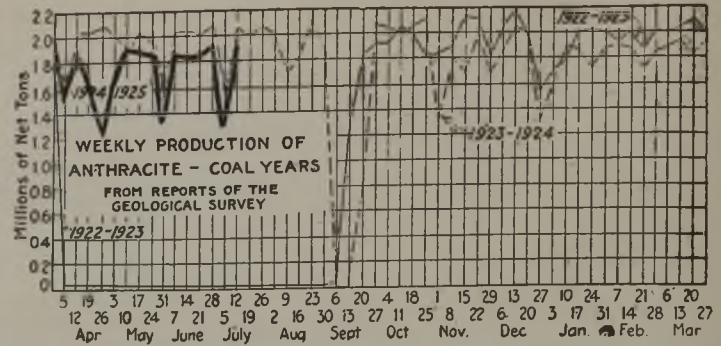
At Hampton Roads the accumulations are moderate, due to a conservative policy on the part of most of the agencies, but quotations are in no wise improved. There is a fair movement off-shore, and this together with coast-wise contracts is furnishing outlet for perhaps about a third of what would normally be considered light output.

At Providence, Boston and Portland, for inland delivery, \$5.65@5.75 is still quoted per gross ton on cars, but it is acknowledged that \$5.50 is about the top figure that can be realized on anything exceeding one or two-car lots. This situation effectually shuts out rail coal from territory at all accessible from tidewater, and aside from the few specialties there is practically nothing doing on Pennsylvania coals except in the area around the Connecticut River.

Via the New York and Philadelphia piers there is only a light tonnage moving from the central Pennsylvania districts. Here, too, the bulk of the coal placed is for special uses and is hardly an indication that for ordinary grades there would be any demand except at sacrifice prices.

Buyers Scarce in Atlantic Seaboard Markets

The New York market drags. Except when bargains may be picked up, buyers are keeping under cover unless it is absolutely necessary for them to get coal. Contracting by public institutions and large consumers has been practically completed save possibly for small lots. An instance of the latter occurred last week when bids were opened for furnishing and delivering alongside for the U. S. Appraiser's Warehouse in New York of 500 gross tons of low-volatile high-grade soft coal. The low bid received was \$4.29 per ton f.a.s., or on a basis of about \$1.16 net ton, f.o.b. mine. Local houses reported a slightly



increased demand for slack and a consequent bettering of quotations. Demand for coke continue quiet.

Outside of an increase in inquiries, there is nothing to indicate that the real buying movement is under way in Philadelphia. Big power plants are adding to their reserves, but are striving to get even lower than current market quotations. The railroads continue to stay out of the market and prospects are not bright yet as to when they will be ready for extra tonnage. Things are a bit better at tide, but bunkering is about as usual. Spot prices are unchanged.

Baltimore notes a strengthening line of inquiry for future deliveries. This is not so marked as to cause any excitement in the trade, but it does give promise of a slow but sure betterment over the midsummer period. There is a general impression here that industrial depression, and with it the slow-down in demand for coal, has about hit bottom, and that from now on a flood tide will begin. The export coal situation in Baltimore shows a decided improvement for the first fifteen days of July as compared to the same period of June.

The Birmingham market remains painfully dull and quiet, but hopeful, though there is no evidence on which to base an early improvement. Industrial conditions are anything but satisfactory, and the coal consumption from this source has been scaled down to a very low point. Spot business is negligible, and deliveries against contracts are on a minimum basis.

Summer Lull Settles Over Hard-Coal Trade

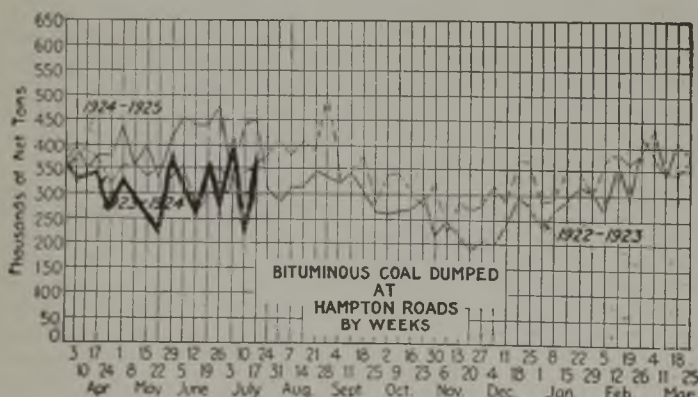
Demand for domestic hard coals is far from active in the New York market. Straight lots of independent stove coal continue to bring about 25c. more than when taken with any other size, but the activity of the market ends there. Egg coal is not as long as chestnut and for that reason is quoted by some shippers at slightly higher figures than the latter size. Recent cuts in production have had no apparent effect on the local situation. Retail dealers seem to be in good shape to meet all immediate requirements. The larger companies do not have any trouble moving their domestic coals, with the exception of pea, which is accumulating with both "regulars" and "independents." Some of the latter, it is reported, are insisting upon buyers taking a proportionate share of pea with the larger coals. Trouble is experienced in moving the steam coals. Demand is dull and only the better grades of independent product are bringing anything like company schedules.

Retail yards at Philadelphia are quite full of coal of all sizes, including stove. Nut has become particularly sluggish, a few of the smaller independent shippers offering it off price. Pea coal is becoming much easier and egg also has eased off. Steam sizes are doing the most to unsettle the market, for inability to move this coal is clogging the tracks at the collieries.

The hard-coal situation at Baltimore is exceptionally dull. The raise in retail prices probably halted some ordering, and there may be delay over August, as the public is figuring that there will be no further advance Sept. 1. More coal is now being released to Baltimore by mine connections.

Car Loadings, Surpluses and Shortages

	Cars Loaded		Surplus Cars		Car Shortage	
	All Cars	Coal Cars	All Cars	Coal Cars		
Week ended July 5, 1924	759,942	111,458				
Previous week	908,355	144,759				
Week ended July 5, 1923	850,080	155,286				
July 7, 1924	359,191	169,607				
Previous week	356,389	162,343				
July 7, 1923	64,067	4,620				



Foreign Market And Export News

British Market Quiet and Irregular; Output Drops to 4,988,000 Tons

The Welsh coal market is quiet and irregular, the tone being not quite so healthy as it was last week. Stocks all round are heavy and prices are weak. Foreign buyers have filled their immediate needs and are withholding orders for future delivery until exchange settles a bit. There also is difficulty in obtaining shipping because the combination of freights on a pre-war basis and expenses about double means that ship owners cannot operate their vessels and make a profit at the same time. In consequence many ships are laid up, and several coaling berths in the South Wales ports are empty on that account. The cheaper prices of the North of England coal also are a handicap in obtaining new business.

The Newcastle market is very depressed and nothing has occurred to brighten the future. Most of the collieries are working hand to mouth.

The Naples gas works has contracted for 36,000 tons of Newcastle gas coal for delivery from July to December, and the Palermo gas works for 10,000 tons of the best Durham coal for delivery in August and September on the basis of current quotations.

A special cable to *Coal Age* states that the production of coal by British mines during the week ended July 5 totaled 4,988,000 tons, according to the official reports. This compares with an output of 5,170,000 tons during the week ended June 28.

Hampton Roads Looking Up; Foreign Movement Slow

Slight improvement is noted in the movement at Hampton Roads, the volume of business at the piers showing an increase and the vessels reported due for cargo also being on the upward trend. Coastwise business is holding its own, bunkers are fair, but foreign movement appears to have slumped.

The tone of the market is not distinctly firmer, though it has not weakened from a week ago. Prices remain about the same, and supplies are on the increase. The trade, generally, is sitting tight, awaiting whatever the natural channels of business may bring.

French Market Shows Notable Stability and Firmness

Stability and firmness are outstanding features of the French coal market. With a good but not extraordinary demand, the current of orders is sufficient to absorb the output of industrial coals and the household fuel situation is satisfactory.

The Nord and Pas-de-Calais collieries have agreed to extend until Sept. 30—and possibly until Dec. 31—the wage increases recently granted. Prices therefore remain unaltered, save for the 0.20 fr. per ton extra charge consequent on the application of the supplementary taxes voted by Parliament.

In order to increase the marketing of ovoids and briquets, which are rather neglected at this time of the year, the northern coal fields are giving summer rebates of 8 fr. on the price of these fuels; these reduced prices will remain effective probably until Sept. 15.—The Belgian collieries have decided to take similar steps.

There is little activity in British coals at the present time, the orders for anthracites having practically completely disappeared.

At its meeting on June 24, the Coal Consultative Committee approved the abrogation of export restrictions and the decree will be published shortly.

During the month of June the O. R. C. A. was supplied with 417,806 tons of coke, or a daily average of 13,900 tons. The price of coke remains at 150.75 fr. for July.

The new Dusseldorf accord as of

July 1 includes the clauses of the agreement signed April 15 but with the following modifications: Reduction of the coal tax to 0.75 mark per ton; reduction of the licenses and allowances taxes to half of their former rate; tax on the circulation of byproducts reduced to 1 per cent; delivery of byproducts limited to 10 per cent benzol, 8 per cent sulphate of ammonia, 6 per cent pitch, 8 per cent other byproducts. The first three reductions are retroactive to June 16. The deliveries corresponding to the period of the strike (May 1 to June 7 inclusive) will be reduced to 27 per cent of the effective production during the same period of time.

Export Clearances, Week Ended July 19, 1924

FROM PHILADELPHIA		Tons
For Brazil:		
Jap. Str. Denmark Maru for Rio de Janeiro or Santos.....		—
For Cuba:		
Nor. Str. John Bakke for Gibara..		—
For West Indies:		
Nor. Str. Ravenfjell for Kingston.		—
FROM BALTIMORE		
For Algeria:		
Ital. Str. Vodice.....		6,391
Jap. Str. Kiefuka Maru.....		7,977
For France:		
Belg. Str. Caledonier		7,453
For Italy:		
Ital. Str. M. T. Cicerone.....		9,452
For Nova Scotia:		
Dan. Str. Kirsten Jensen.....		5,120
FROM HAMPTON ROADS		
For Brazil:		
Br. Str. Teesbridge for Rio de Janeiro		5,102
Br. Str. Ethelfreda for Rio de Janeiro		6,425
For Italy:		
Ital. Str. Laura for Trieste.....		4,678
For West Indies:		
Nor. Str. Dagali for Kingston....		2,003

Hampton Roads Pier Situation

	July 10	July 17
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,377	1,228
Tons on hand.....	97,819	75,026
Tons dumped for week.....	85,300	139,975
Tonnage waiting.....	12,000	20,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,701	1,429
Tons on hand.....	122,850	92,450
Tons dumped for week.....	65,031	109,560
Tonnage waiting.....	15,515	7,086
C. & O. Piers, Newport News:		
Cars on hand.....	1,865	2,164
Tons on hand.....	96,160	105,830
Tons dumped for week.....	59,856	84,037
Tonnage waiting.....	2,200	4,260

Pier and Bunker Prices, Gross Tons

	PIERS	
	July 12	July 19†
Pool 9, New York.....	\$4.60@5.00	\$4.75@5.00
Pool 10, New York.....	4.50@4.75	4.50@4.75
Pool 11, New York.....	4.25@4.50	4.25@4.50
Pool 9, Philadelphia.....	4.70@5.00	4.70@5.00
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.....	4.25	4.20
Pool 2, Hamp. Roads.....	4.10	4.10
Pools 5-6-7, Hamp. Rds..	4.00	4.00

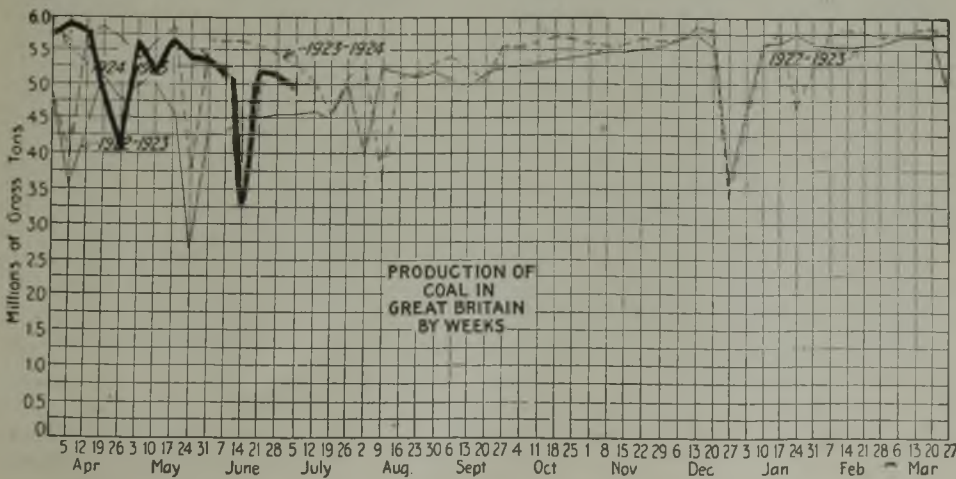
BUNKERS

Pool 9, New York.....	4.85@5.25	5.00@5.25
Pool 10, New York.....	4.75@5.00	4.75@5.00
Pool 11, New York.....	4.50@4.75	4.50@4.75
Pool 9, Philadelphia.....	5.00@5.30	5.00@5.30
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.....	4.30	4.25
Pool 2, Hamp. Roads.....	4.15	4.10
Pools 5-6-7, Hamp. Rds..	4.00	4.00

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

	Quotations by Cable to <i>Coal Age</i>	
	July 12	July 19†
Admiralty, large.....	28s.@29s.	28s.@28s.6d.
Steam smalls.....	18s.	18s.
Newcastle:		
Best steams.....	20s.@24s.	19s.@19s.6d.
Best gas.....	23s.@23s.6d.	23s.@23s.6d.
Best bunkers.....	22s.	19s.@21s.

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





News Items From Field and Trade



ALABAMA

A new mine is being opened by Olin Goodwin near Dora, Walker County, a good force now being employed in the development work.

J. S. Chalmers has been appointed superintendent of the Nauvoo operations of the Monro-Warrior Coal & Coke Co., succeeding Chas. Blanchard.

The Alabama Company is constructing a 2,400-ton Montgomery coal washer at its new opening at Lewisburg, and work of sinking the slope is progressing satisfactorily.

The Ensley-Southern Ry., formerly operated under the management of the Southern Ry. system, has been placed in the hands of a receiver by the federal courts on application of the latter road. The Ensley Southern, which operates a short mileage serving coal mines in the Walker County field and Birmingham, on the Warrior River, has been in financial straits for some time. A. B. Aldridge, president of the Stith Coal Co., was appointed receiver by the court, with instructions to continue the operation of the line for the present.

The 10 per cent reduction of wages announced July 10 by the Woodward Iron Co., Birmingham, affected all employees except common labor, including coal miners. Although no official announcements have been made, one or more other companies have made or will make wage reductions, it is reported. The Woodward company produces little or no coal for the commercial market and none for the domestic trade, the output being coked for its own furnace use. The reduction was due to the selling price of iron dropping below cost.

ILLINOIS

The McLean County Coal Co., of Bloomington, has sold its office building, at the southwest corner of Main and Market Street, in that city, to W. J. Moran, of Peoria.

John Hayes has resigned as mine manager of the Kathleen mine of the Union Colliery Co. at Dowell, and has been succeeded by Edw. Leming, formerly assistant at the same mine. John Meyers is now connected with the company as an assistant mine manager.

During the first six months of 1924 the 81 mines in the Fifth and Ninth districts of Illinois—the region immediately east of St. Louis, Mo.—mined 1,482,192 tons of coal less than during the same period the year before. The total production for the 1924 period was 5,312,592 tons. The total working

time was but 25,072 hours, as compared with 37,586 hours in the 1923 period. This represents a net average of only 52 working hours a month for each mine during 1924. In June 49 mines were idle and the other 32 averaged only 37 per cent running time.

INDIANA

The mule barn at the Interstate mine, near Clinton, was burned recently and only two of twenty-two mules were saved. The origin of the fire is not known. The mine had been working about four days a week and had expected to start on a more extensive scale.

Edwin D. Logsdon, president of the Knox Consolidated Coal Co., of Indianapolis, has been elected a member of the board of directors of the Fletcher American National Bank, one of the strongest financial institutions in Indiana. He succeeds the late Crawford Fairbanks, of Terre Haute, well known to the coal trade.

A crowd estimated at 10,000 attended the recent eighth annual state first-aid meet at Princeton. Twenty-one teams competed. First place was won by the Peerless mine of the Templeton Coal Co., from Sullivan, and second by the Clinton Coal Co., of Clinton. A banquet was held in the evening. John L. Lewis, International president of the United Mine Workers, and other union officials spoke. The meet was under the direction, as usual, of the Joseph A. Holmes Mine Safety Association.

KANSAS

August Dorchy, deposed vice-president of District 14 of the United Mine Workers, will appeal to the U. S. Supreme Court from the Kansas Supreme Court's decision that he must complete a six-months' jail sentence in Cherokee County and pay a \$500 fine. Dorchy along with Alex. Howat was convicted and sentenced for calling a mine strike in violation of the Industrial Court law. The U. S. Supreme Court decided the wage-fixing sections of the law were unconstitutional. The Kansas court held that the anti-strike section is valid and that therefore Dorchy is still a prisoner.

KENTUCKY

Attorneys for the Harlan Coal Co., Louisville, probably will make a motion for a new trial in a case lost a few days ago against the Wheeler Coal Co., in Judge Gordon's court at Louisville.

The Harlan company filed suit in 1920, alleging that under a contract made in 1919 the company was to acquire the entire output of the Wheeler company mines, and that the Harlan company was damaged to the extent of \$75,000 by failure of defendants to abide by its contract.

The Elkhorn Coal Corporation, Fleming, is recalling its old employees following a resumption of its mines at Fleming, Haymond and Hemphill on a full-time basis.

The largest contracts announced for some time were reported from Frankfort, July 15, when the State Board of Charities and Corrections placed contracts on nut and slack, or steam coal for use in the various state institutions. These contracts call for 646 cars, or approximately 32,300 tons, based on cars of 50 tons capacity, and prices average about 75c. a ton under prices paid last year, or a saving of about \$24,225 to the state. Prices of \$1.10 a ton were paid on eastern Kentucky coal at the mines, and from \$1 to \$1.25 for western Kentucky on short hauls from western Kentucky mines.

NEW YORK

The Harbor Coaling Corporation of New York City, a Delaware corporation, has been granted permission to increase its capital from \$5,000 to \$25,000.

R. M. Bryan, who for more than 17 years was the eastern manager for *The Black Diamond*, has resigned to assume charge of veterans' tours to France inaugurated by the United States Lines of government-owned steamships.

The Harbor Coaling Corporation, 10 Bridge Street, New York, has leased from the Lehigh Valley R.R. the latter's rebuilt National dock, on the west shore of the Hudson River at Communipaw, N. J., for ten years with privilege of renewal.

NORTH DAKOTA

Fire of unknown origin destroyed the tippie and hoisting shaft of the Archibald mine, near Foxholm, July 10, causing damage estimated at \$10,000. Only one man was in the mine at the time the fire was discovered, and he was hoisted to safety by another employee.

OHIO

Although coal mines in the eastern and north central region of Ohio operated 65 per cent of the full-time capacity during the month of June,

only two fatal accidents were reported, it was announced recently. Inspections were made of 130 mines, or 55 more than during the month of May.

OKLAHOMA

Chas. N. Gould was appointed director of the Oklahoma Geological Survey at Norman, beginning July 1. Dr. Gould organized the Survey and was its first director in 1908. He formulated its earlier policies and resigned in 1911 to enter consulting work. Dr. D. W. Ohern was appointed his successor. Three years later, when he resigned, C. W. Shannon was placed in charge. The Survey appropriations were vetoed a year ago by the then Governor Walton. In the interim Prof. Chas. E. Decker, of the State University, has been acting custodian. The special session of the Legislature made a small appropriation for the maintenance of the Survey and placed it under the control of the Board of Regents of the university. Dr. Gould announces as his policy the development of Oklahoma's natural resources and solicits the co-operation of every citizen interested in the development of these dormant resources.

PENNSYLVANIA

The U. S. Bureau of Mines has opened a branch station devoted to coal-mining research at 801 Coal Exchange Building, Wilkes-Barre. D. C. Ashmead is in charge.

Walter Thayer has been appointed coal traffic manager of the Eastern region of the Pennsylvania R.R. system, according to an announcement by Geo. D. Ogden, traffic manager. Mr. Thayer's headquarters will be at Philadelphia.

C. Larry Marlatt, of North Scranton, has been named as general superintendent of the Mount Jessup & Bald Mountain Coal Co., according to an announcement made in New York by William H. Grady, general manager

for Whitney & Kemmerer, who own the mine. Mr. Marlatt had for the past eighteen years been with the Hudson Coal Co., starting on the surveying corps in 1906, and working up through the engineering department and production department.

At Paxinos, eight miles north of Shamokin, a large creek washery breaker owned by W. A. Sees, of Wilkes-Barre, was blown over and collapsed on the state highway on June 25 during a severe wind storm.

The Pittsburgh & Eastern Coal Co., of Cleveland, is erecting a new and larger tippie at its Cherry Valley mine, in Washington County.

With a program of \$20,000,000 in improvements being outlined for the Johnstown plant of the Bethlehem Steel Corporation, extra power will be needed and work has been started on clearing the ground for the erection of a large power plant in Franklin. Five new mills will be added to the Gautier plant and work on clearing old buildings and dwelling houses from the land they will occupy has been started.

Coal companies in the Gallitzin fire district, which takes in large portions of Cambria County, planted 900,000 forest trees this year. Many of the coal companies are buying idle farm land and planting forest trees. The foresters in this district have set the goal at five million trees, in order to reforest the denuded lands in the coal fields. Assistant District Forester T. I. Shirley, of Johnstown, is giving all possible assistance to companies and individuals reforesting vacant land.

The H. C. Frick Coke Co. is now using the five-mile belt conveyor system recently installed to convey the coal underground from the Colonial Nos. 2, 3 and 4 mines at Grindstone, Rows Run and Smock to the Monongahela River near Fayette City through the old Alice mine main entry, acquired from the Pittsburgh Coal Co. for that purpose. The coal is fed on to the belt at the inner end by a 35-car revolving

dump furnished by the Car Dumper & Equipment Co., of Chicago, and at the outer end is loaded in barges in the river, and taken mostly to the by-product ovens of the Carnegie Steel Co. at Clairton.

Attorneys acting for David Lloyd, former Glen Alden Coal Co. superintendent, purchased the Oak Run Coal Co. at Archibald, for \$50,100, at a receiver's sale in the Lackawanna County court house, Scranton, July 18. Several interests bid for the property. The Oak Run mine, a slope operation on the mountain east of Archibald, formerly was known as the Wachna mine. Coal taken from lands owned by the John P. Farnham estate have been transported by aerial tramway down the mountain 3,300 ft. to the breaker. The company went bankrupt several months ago. David R. Humphrey, of Peckville, was president, and John J. Owens, former Assistant District Attorney of Lackawanna County, was secretary-treasurer.

Five to six hundred men have been idle at Nant-y-Glo, Cambria County, since July 15, according to word received by Superintendent John W. Harrison of the Heisley Coal Co. The Heisley mines have been working steady for two months, loading more than 40,000 tons of coal during May and June. The company contemplated a shutdown in April but continued in the hope that conditions would improve. The reason confided to the superintendent by officials of the company is that the company is unable to compete with the non-union mines. It was intimated that if the men would accept the 1917 scale it might be possible to keep the operations working at least a part of the time.

School boards in a half dozen cities and boroughs of the anthracite region are giving consideration to the installation of small-sized coal burning grates in the heating plants of the school buildings under their jurisdiction. The action is believed to be a result of the campaign conducted by anthracite producers, urging the use of small size fuel. Among the school directors contemplating the change are those of Hazleton, Carbondale, Olyphant, and other places.

Judge Koch issued a decree of foreclosure recently in the case against the Schuylkill Valley Coal Co., of Port Carbon, brought by the bondholders, represented by a Pottsville bank. The decree will enable the bondholders to reopen the operation, which has been closed for months. The company has had financial difficulties for months past, and employees, unable to collect back pay, started legal proceedings. The claims, amounting to \$24,000, have now been paid and the mine has been cleared of water and is ready for operation.

There were eighty-three fewer fatal accidents in Pennsylvania during the first six months of 1924 than during the same period of 1923, according to Secretary of Mines, Joseph J. Walsh. During the first six months of this year 412 miners lost their lives in accidents while 495 miners were killed in the first six months of last year. The decrease in the number of deaths was divided about



Courtesy U. S. Distributing Corp.

Mine Cars on Way to Tippie at Acme Mine

It can be seen by the foliage on the hill in the rear that this mine is in the far West. It is located in Sheridan County, Wyoming, and is the property of the Sheridan-Wyoming Coal Co.

evenly between the anthracite and the bituminous fields. A total of 248 miners was killed in the anthracite mines during the past six months as compared with 289 in 1923, or a decrease of 41 deaths. In the bituminous field 164 men were killed in accidents during the first half of 1924 as contrasted with 206 in 1923, a drop of 42 deaths. The decrease represented 14 per cent of the former fatalities in the anthracite field and 20 per cent of the 1923 totals in the bituminous mines.

UTAH

Utah's coal output for June amounted to 261,975 tons, compared with 333,230 tons for the same month last year. In 1923 the figures were 337,629. June 1921 showed only 220,941 tons, but the previous year showed an output of 531,600 tons, or more than twice as much as June, 1924.

WASHINGTON, D. C.

A decision in the mine-rating case is not expected before autumn. Fully a month must be allowed for the delays incident to the vacation period. The rules covering car distribution are closely related with the assigned-car case. The postponement of the effective date in the latter proceeding until Nov. 1 is thought to indicate that the Interstate Commerce Commission hopes to be able to hand down that decision prior to that date. It is expected that each of these decisions will be handed down at about the same time.

WEST VIRGINIA

A state first-aid meet will be held at the State Fair Grounds at Wheeling on Sept. 4 at 9 a.m. The contests are open to teams of all coal companies in the state. The winners will be declared state champions and awarded the cup, which is at present held by the Thomas team of the Davis Coal & Coke Co.

The following coal companies have filed certificates of dissolution with the Secretary of State of West Virginia: Huntington Coal Sales Co., Acme-Eagle Coal Co., Fielder-Davis Fuel Co., Greenmount Fuel Co., Jarvis Coal Co., Rich Block Coal Co., Hutton-Beal Coal Co., New Pocahontas Coal Co., Harry's Branch Coal & Coke Co., D. K. C. Coal Co., Hendricks Coal Co., Coolidge Coal Co., and the Imperial Coal Sales Co., which was dissolved by deed of sale.

Coal companies recently dissolved and the charters of which have been surrendered include the Miami Coal & Coke Co., of Moundsville, and the Greenmount Fuel Co., of Morgantown.

The Lillybrook Coal Co., at Sullivan, near Beckley, Raleigh County, is putting the finishing touches to a modern mine and expects to start operating about Sept. 1. Two seams of coal will be worked at this mine, the Beckley seam by drift mining and one of the Pocahontas seams by shaft. An addition was made to the town. The tipple is of steel, having shaker screens and

picking tables, and a semi-automatic substation is being completed which can be set to divert most of the power to the workings in the seam yielding the coal most desired at any particular time. This arrangement will halt only one operation in case of overloading.

Scott's Run, in Monongalia County, was the scene of a recent pitched battle between different factions of the United Mine Workers over the election of a checkweighman. The trouble started in the union hall, but the miners went into the open to settle the dispute. One miner, Joe Susac, unable to obtain recognition and to gain the floor, wielded a knife to cut his way to recognition. In a minute rocks and bricks were flying through the air and members of the contending factions were flaying each other with pickhandles. When Sheriff Yost arrived Mike Rockvitch had been cut about the legs, arms and body and Joe Susac was still in action. Joe and Pete Rockvitch were arrested and put in jail. In the meantime there was no agreement on a checkweighman.

The Hudson Coal Co., of Clarksburg, recently entered into an arrangement with the Metropolitan Life Insurance Co. to insure the lives of its employees through the medium of a group policy, under the terms of which no medical examination is required, while supplementary to the provisions of the policy the workers are entitled to the services of Metropolitan nurses in case of sickness or injury. They also will receive at stated periods health pamphlets issued by the insurance company. The total insurance amounts to \$136,000, the protection for individuals ranging from \$1,000 to \$1,500. In the case of sickness or injury \$10 a week is paid for twenty-six weeks.

WISCONSIN

The Great Lakes Coal & Dock Co. has leased the docks once occupied by the Central Coal Co. on Canal Street, near the Twenty-seventh Street Viaduct, in Milwaukee, and is now storing coal upon it. About 15 cargoes have been received by the company thus far this season.

WYOMING

Clyde N. Fisher, cashier of the Gunn-Quealy Coal Co., Rock Springs, Wyo., who disappeared July 15 with the semi-monthly pay roll of the company, was shot and fatally wounded early the next day by J. Walker, mine foreman and friend of Fisher. He died a few hours later without making a statement. Search of the vicinity where the shooting occurred revealed a cache of food, water and blankets, also the entire payroll, which totaled more than \$6,000.

Wyoming may soon have a new railroad that will open up more coal lands in the southwestern quarter of the state. The Wyoming & Colorado Shortline has been incorporated by Colorado and Wyoming men and has now applied to the Interstate Commerce Commission for the right to construct a 380-mile line from Casper

southwest to the state line. Oil, timber and cattle probably will be the principal freight produced along the new road.

CANADA

The Gibson Collieries, Ltd., of Drumheller, Alberta, has been adjudged bankrupt and a receivership order issued appointing the Security Trust Co., Ltd., custodian.

Supplementary estimates passed in the House of Commons at Ottawa contain an item of \$200,000 to provide for transportation of Canadian coal from Alberta and Nova Scotia to central Canada by the Canadian railways.

In order to encourage the shipment of coal from Alberta to the provinces of Ontario and Quebec the Dominion government has appropriated \$200,000, for payments to railway companies to make up losses which may be incurred by them in granting reduced freight rates. This policy is a concession to the demands made by several cities of central Canada.

The movement for negotiation of a separate agreement between Gladstone Local of the miners union, at Fernie, B. C., and the management of the Crows Nest Pass Coal Co., which for some days promised a settlement of the strike in the eastern British Columbia section of District No. 18, U. M. W. A., has been broken. District President Sherman visited Fernie on learning of the development. Addressing a mass meeting of the miners of Fernie, Michel and Coal Creek he promised immediate additional relief to the extent of \$3,000 and that a meeting of the International Executive Board was to be held at Indianapolis to discuss the situation in District 18. Finally they resolved to stick out for the Jacksonville agreement. Then they declined the company's offer based on a 12 per cent higher rate of wages than that now in effect in the Vancouver Island Coal Mines.

Trade Literature

The Buffalo Forge Co., Buffalo, N. Y., has issued a folder designated as Form 1875 describing the operation and use of the Buffalo coal burner for burning junior grades of coal.

The Hoar Shovel. Hoar Shovel Co., Duluth, Minn. Pp. 24; 7½x10½ in.; illustrated. The use of this shovel for mucking is described and its operating costs are given. The shovel is shown working both on the surface and underground.

Heine Bent-Tube Boilers. Heine Boiler Co., St. Louis, Mo. Bulletin 54. Pp. 25; 8x11 in.; illustrated. Describes the general design, circulation, construction, supports, trimmings and accessories of the V-type boilers.

The Detroit Electric Furnace Co., Detroit, Mich., has issued a booklet on **Brass Melting**. It tells how the electric furnace is a factor of ever-increasing value in brass melting; it enumerates the economies effected by the electric furnace and then shows how complete control of analysis, color, texture and homogeneity of the alloy is secured through the electric furnace. The bulletin is known as No. 41.

Air Filters for Compressors and Internal Combustion Engines. Mid West Air Filters, Inc., 100 E. 45th St., New York City. Pp. 24; 8½x11 in.; illustrated. Among the advantages claimed for these filters are full efficiency in the operation of compressors and engines, and the equipment depending on them, less oil, longer life and fewer shutdowns. Tables and useful data are included.

Traffic News

Commerce Commission Makes Western Coal Rates Decision

The June 9 decision of the Interstate Commerce Commission on what is known as the Western coal rates case has been published. The commission reduces to 40c. its 1923 ruling which fixed a 50c. differential in favor of the Castlegate region over the Rock Springs-Kemmerer region on coal going to points west and north of McCammon, Idaho. It declined, however, to separate the Rock Springs and Kemmerer fields into two rate groups, even though Kemmerer is 85 miles west of Rock Springs. This was because very little Kemmerer coal competes with Utah coal west of McCammon.

The commission withdraws its recent order increasing from 10 and 12c. to 40c. the differential on west-bound coal enjoyed by the Segó mine of the American Fuel Co., about 95 miles east of Castlegate, Utah, over the mines of the Cameo-Palisade district of Colorado. The old rates are to prevail until the commission makes a decision in No. 13,509.

The establishment of joint rates on Castlegate coal to points in Oregon and Washington on the Northern Pacific, Great Northern, C. M. & St. P. and the Spokane, Portland & Seattle railroads such as apply on the Union Pacific was refused. However, Commissioners McManamy, Aitchison, Eastman, Campbell and Cox, comprising almost a majority of the commission, dissented.

May Take Northwest Rates To Court for Test

Hints are being given in the all-rail trade that if the recent petition for a rehearing of the case of the dock association against the all-rail carriers fails, there probably will be a move to bring the case into court for a test. The first step would be an injunction to restrain the enforcement of the new rates, which would come shortly before the time for them to become effective—Aug. 21. A temporary injunction doubtless would be issued, which would suspend the rates until the case came up in court, which might take several months. The railroads affected seem to be proceeding with the preparation of the new tariffs, and do not seem inclined to offer any objection to increased revenue rates.

Want Joint Rates to Frankfort From All Kentucky Fields

The Frankfort (Ky.) Chamber of Commerce and various coal concerns of that city have jointly petitioned the Kentucky State Railroad Commission to require the Louisville & Nashville R.R. and Frankfort & Cincinnati R.R. to establish joint rates with other roads from all coal fields of the state to Frankfort, the complaint charging that there are no joint rates on coal transported and delivered at Frankfort, and that coal handlers or consumers are compelled to take coal from mines on lines of the Louisville & Nashville.

Obituary

Business troubles led W. J. Elliott, of Princeton, W. Va., treasurer of the Wysong-McCoy Coal Co., to take his own life. His wife found him dead in his office, a pistol on the floor nearby. Mr. Elliott was formerly cashier of the Bank of Matoaka, president of the Rock District Board of Education, Sheriff of Mercer County from 1916 to 1920 and cashier of the First National Bank of Princeton.

Mrs. F. A. Reed, mother of Geo. W. Reed, vice-president of the Peabody Coal Co., in charge of sales, died suddenly at her home Wednesday, July 16, 1924. The funeral was held Friday the 18th from the home of her son, 7136 Luella Ave., Chicago.

Reese E. Evans, age 67, secretary of the Bessemer Coal, Iron & Land Co., of Bessemer, Ala., died at Biloxi, Miss., July 13 after an illness of long duration. Mr. Evans had been in the Birmingham district for the past forty years and was widely known and possessed a host of friends who will mourn his passing.

New Companies

The Gray Coal Co., of Gray, Ky., capital \$10,000, has recently been chartered by J. T. Gray, Mattie Gray and J. H. Gray.

The Pike County Collieries Co., of Danville, Ill., capitalized at \$262,500 to own, lease and operate coal mines, has been authorized to do business in Indiana as a foreign corporation, with C. F. Shannon, of Petersburg, Ind., as state agent.

The Standard Fourth Vein Coal Co. has been organized at Linton, Ind., by G. B. Taylor, A. G. Schneiderhelm, C. F. Sherrard, F. J. Schneiderhelm and Pearlle Poole to mine coal and other minerals. The company's capital is 5,000 shares of no par value.

The following bituminous coal companies have been incorporated in Pennsylvania: Windber Coal Mining Co., Johnstown, capital, \$25,000; incorporators, Irving L. Camp, Wayne Street, Westmont, Johnstown, treasurer; C. E. Schooley, Johnstown, and G. C. Trueaux, Windber. Punxiana Coal & Coke Co., Indiana; capital, \$800,000; this company was formed by the merging of the Punxiana Coal & Coke Co. and the Meco Coal Co. H. A. Snyder, Indiana, is treasurer, and the company's purpose is to mine coal and manufacture coke.

Coming Meetings

Western Canada Fuel Association. Convention Aug. 5 and 6, 1924, Brandon, Manitoba, Can. Secretary, W. H. Morrison, Winnipeg, Man., Can.

Rocky Mountain Coal Mining Institute. Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

New York State Coal Merchants Association, Inc., 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

American Chemical Society. Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

Oklahoma Coal Operators' Association. Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

Association of Iron and Steel Electrical Engineers. Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

National Safety Council. Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

American Institute of Mining and Metallurgical Engineers. Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

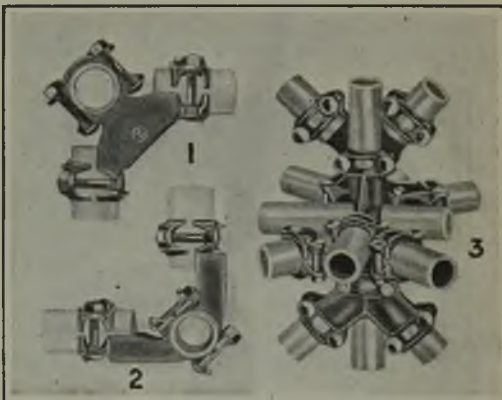
American Institute of Electrical Engineers. Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

New Equipment

Pipe Fittings for Electrical Switching Equipment

Structural interchangeable pipe fittings, designed for use with common wrought-iron or steel pipe in the erection of outdoor or indoor electrical switching equipment, recently have been put on the market by the Westinghouse Electric and Manufacturing Co. Though designed primarily for electrical installations, they are equally available for the construction of racks, railings and bench or table frames, electric sign structures, playground apparatus and dairy stable stanchions.

Pipe is a convenient material for structural work of this kind as it is light for its strength, has a symmetrical cross section which resists bending equally well in any direction, and can be cut easily and rapidly with inexpensive tools by inexperienced labor. The fittings are more adaptable



Interchangeable Fittings for all Kinds of Pipe Framing

(1) Four-way or side-outlet tee; (2) Another side-outlet tee; (3) Six-way fitting with double 45-deg. brace showing great adaptability of fittings.

than those designed for ordinary plumbing. They are made of high-grade malleable iron with a minimum tensile strength of 50,000 lb. per square inch, are light in weight, compact and neat in appearance.

The only tools necessary to erect a structure with these fittings are a pipe vise and cutter and an open-end or socket wrench for each of the two sizes of bolts used. Changes in and additions to such a structure are made with facility. The principal feature of the design of the new fitting is a ribbed yoke which clamps over the pipe and is attached with heavy carriage bolts to the other unit part. Various other units consist of two or more yokes cast in a single piece through connecting webs. As the bolt spacings are uniform, parts designed for a certain size pipe are interchangeable with all others for that size. When the fittings are bolted they yield slightly, due to the malleable characteristic of the iron, until they fit the pipe perfectly.

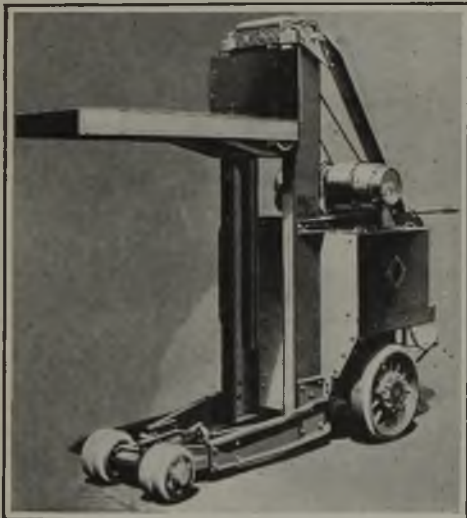
Ordinary carriage bolts galvanized

by the hot-dip process, are used, the square shank under the head fitting into the square hole in the fitting, so that assembly can be made with a single wrench. The fittings are designed for two standard pipe sizes, 1½ in. and 2 in., and for a combination of these sizes, with a few fittings of ¾, 1 and 1½ in. size for light switchboard frames and for clamping insulators to pipe frames. They have a black gloss baked finish for indoor use or are galvanized for outdoor installations. With galvanized pipe and fittings, an outdoor structure which will resist weather conditions for years without maintenance cost can be provided.

Elevates and Transports Loads

A storage-battery elevating truck and tractor by which a load can be picked from the floor or placed upon it, the loading platform requiring little clearance, is being manufactured by the Elwell-Parker Electric Co., Cleveland.

The elevator head at the forward end may be equipped with two or more forks at the floor line, 1 to 2 in. thick and of proper spacing and length to handle bales, boxes or barrels, car wheels, receptacles or the like. When fitted with a pair of arms 18 in. above the floor, barrels may be handled and when equipped with a single horizontal



Battery-Operated Elevating Truck

Equipped so as to be able to handle almost any kind of load this new machine is both an elevating truck and tractor. Automatic safety devices make it easy to operate.

shaft the machine may be used in handling coils or wheels.

The machine is made up of the company's standard tractor-type, hot-riveted tractor frame with battery compartment and hinged cover. The operator's seat is located forward to provide an unobstructed view of the movement of the elevator. The seat is arranged to actuate the electric circuit breaker connecting the battery to the controller located in a separate compartment. The circuit breaker closes only when controller drum is in off position and the controller comes to full stop when reversing. A brake pedal with heel-operated latch is located on the footboard, actuating dual contracting shoes on a 7-in. brake drum.

The drive axle is located at the ele-

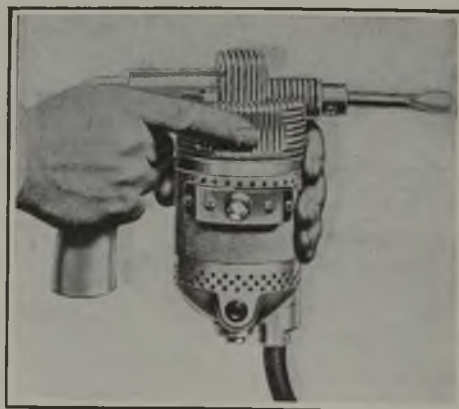
vator or front end to assure traction by under all conditions of loading. The wheel base is short, and all four wheels equipped with 7-in. double-row ball bearings and 20 x 3½ in. tires. The hoist unit, which is mounted immediately in front of the operator, consists of an inclosed motor and electric brake. The motor drives a single-grooved drum through a bevel and worm gear reduction inclosed in an oil-filled housing. This drum winds a ¾-in. plow-steel cable. The cable passes over a sheave at the top of the elevator uprights to the traveling elevator head, which is provided with special attachments to support the load. The elevator head is guided by four rollers running inside the upright channels. The hoist motor is operated through a controller at the right of the driver's seat.

Electric Screwdriver Revolves Only When Pressure Is Applied

A portable electric screwdriver and an automatic lag-screw driver, a feature of which is an automatic overload safety device which shuts off the current when the motor runs beyond its rated capacity, preventing damage to the motor, have been placed on the market by the John Steptoe Co., Cincinnati. These tools are part of the line formerly built by the Automatic Electrical Co., Cincinnati, the manufacturing and selling rights of which the Steptoe company has recently acquired.

The electric screwdriver weighs only 5 lb. and may be held in one hand while inserting or removing screws, the other hand being free to hold the work in position. It is claimed that No. 16 screws 3 in. long may be driven into hard yellow pine without first drilling a hole. By placing a bit on both sides the tool may be used for driving or withdrawing screws. The tool runs at 250 r.p.m., and is arranged so that it will not revolve until the bit is placed in the screw slot and a downward pressure applied that engages the positive driving clutch. Although the aluminum pistol grip is provided as regular equipment, it readily may be removed.

The motor, which is of special design, runs at 10,000 r.p.m., and is reduced to the spindle speed through a gear and worm drive. The motor is air-cooled



Power Screw Driver

Even the screw driver has had to be electrically driven. The tool that turns the trick weighs only 5 lb. and can be held in one hand.

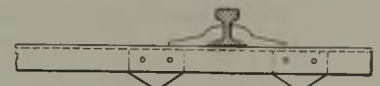
by a fan, which is machined from a heavy bronze casting. Ball bearings are employed for the armature and gear shafts. The casing is of aluminum. An automatic overload safety device is provided as part of the regular equipment. The conductor cord is reinforced at the machine with heavy rubber hose and is attached to a terminal block, to prevent strain on the motor by pull on the cord.

The machine is rated to drive any size screw that can be driven by a hand brace. The automatic lag-screw driver may be used to advantage in putting up countershafts and in lagging machines to platforms. This machine weighs 30 lb.

Mine Tie That ¹⁹¹¹Resists Creep

Inasmuch as transportation is an important part of coal production it is not strange that many improvements in track construction and materials should originate at the mines. Metallic ties have long been known and used both for mine and railroad tracks. One of the chief disadvantages of such ties, however, has been their comparatively slight hold on the roadbed and their consequent tendency to creep.

In order to obviate this difficulty, William M. Riggins, of Lynch, Ky., has devised the tie shown in the accompanying illustration and for which application for letters patent has been made. As may be seen from this drawing this tie does not differ materially from other devices of like nature except that at each side of each rail a plate or anti-creeper is secured to the sides of the tie. This plate is so formed that it forces its way downward into the roadbed and resists whatever tendency toward creep may be developed by the action of the locomotives and trips that pass over the track.



Lest the Ties Bunch

Like creepers on one's shoes are the creepers on Mr. Riggins' steel tie, only one assists and the other resists creeping.

Said to Treble the Life of Woven-Wire Fencing

A new process of galvanizing that trebles the life of woven-wire fence has been announced by the Page Steel & Wire Co., of Bridgeport, Conn. The new method is called "galvanizing after weaving." A protecting coat of zinc five times heavier than that on ordinary galvanized fence is applied to the fabricated wire. Formerly the wire of which fence was made was first galvanized and then woven into fence and, as many mechanical operations were performed, the thickness of the zinc coating was definitely limited.

In the "galvanizing after weaving" method, the mechanical operations are all performed first, and the fabric is then galvanized, thus permitting the application of a "super-heavy" coating of zinc. In service tests, wire bearing the thickness of coating that is applied by the new method has successfully withstood exposure in New England for more than seven years.