

COAL AGE

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NONE of the bituminous coal companies of the United States can lay claim to producing more than 3 per cent of the country's output of soft coal. The Glen Alden Coal Co., however, during the year 1923, produced somewhat over 10 per cent of the total output of the anthracite region, thereby supplying approximately 800,000 families with domestic coal in addition to furnishing steam coal for numerous industries throughout the eastern and middle western parts of the United States. Nearly twelve miles of railroad cars are shipped daily from its various operations. It normally carries 20,000 names on its payroll.

The Glen Alden Coal Co. began operations as a successor to the Delaware, Lackawanna & Western R.R. Coal Department on Sept. 1, 1921, at which time W. W. Inglis, who prior to that time was vice-president and manager of the Delaware, Lackawanna & Western R.R. Coal Department, was made its president, and Shelby D. Dimmick, who prior to that time was assistant to the vice-president and manager, was made its vice-president and general manager.

The property of this company is situated within Lackawanna and Luzerne counties, there being seven collieries in each county. Tributary to these fourteen collieries are many mines which, in years gone by, were separate and distinct operations. By consolidating a number of local collieries into one, the Glen Alden Coal Co. has effected appreciable economies. Of these fourteen collieries, four during the past year produced over one million long tons of coal each.

At the present time, twelve separate coal beds are worked by the Glen Alden company, the number operated by the various collieries ranging from three to eleven. The number of mines tributary to the different collieries of this company, the number of beds worked at each colliery and the revenue output produced by each during the year 1923 are shown in the table.

Naturally a company of this size arouses no little interest as to its methods of operation. As little has hitherto been written, *Coal Age* in this number gives a general review of this property, elaborating on the Baker Colliery which is its most modern and important development.

To those who have been associated with the anthracite field sufficiently long to observe the

changes that have taken place in this industry' modern equipment like the Baker Colliery will be recognized readily as being as much a revolution in anthracite mining as is the modern trans-Atlantic steamer from the sailing vessel that plied the ocean lanes when the anthracite industry was at its beginning.

Much has been said by the newspapers of the country during the past ten years regarding the constantly rising price of coal. Little do the readers of these periodicals appreciate the fact that were it not for such modern equipment as is typified by the Baker Colliery, the prices of anthracite would be far beyond the figures now made necessary by constantly increasing labor costs and the growing difficulty of mining. The Glen Alden Coal Co. is a pioneer in the electrification and mechanization of coal properties. Its progressive policies have fully justified its selection of this periodical for treatment in its fourth annual model mine number.

The officers of the Glen Alden Coal Co., to whom credit for its progressive operations is largely due, are: W. W. Inglis, president; Shelby D. Dimmick, vice-president and general manager; G. N. England, secretary and treasurer; James Dodson, assistant secretary and treasurer; Bradford Samson, assistant to the vice-president and general manager; Charles R. Seem, electrical engineer; N. N. Nichols, chief mining engineer; Charles St. John, mechanical engineer; Frank Hildebrand, auditor; J. N. Shaw, purchasing agent; and J. H. Oliver, general counsel. John R. James is the colliery superintendent of the district tributary to Baker Breaker.

Glen Alden Output and Where It Comes From

County	Colliery	No. of Tributary Mines	No. of Beds Worked	Revenue Output in 1923 in Long Tons
Lackawanna	Storrs	2	11	1,040,810
Lackawanna	Diamond	2	11	605,585
Lackawanna	Hyde Park	3	4	499,900
Lackawanna	Archbald	1	5	442,623
Lackawanna	Pyne	1	5	458,749
Lackawanna	Taylor	3	6	677,043
Lackawanna	Baker	2	8	759,772
Luzerne	Bliss	1	6	601,705
Luzerne	Halstead	1	4	163,786
Luzerne	Pettebone	2	6	638,247
Luzerne	Woodward	1	7	1,259,206
Luzerne	Avondale	1	3	299,669
Luzerne	Loomis	2	4	1,255,295
Luzerne	Truesdale	2	9	1,270,759
Total				10,182,769 or 11,404,702 short tons

Do You Know or Merely Suppose?

FEW HAVE decided just how many men are needed in any one section of a mine or at any one mine to produce any given tonnage. At one plant the foremen and section foremen met and decided, with the assistance of the management, just how many men were needed in each of the major divisions of the mine. Comparisons between sections enabled a labor budget to be planned and, when it was decided, the sections were restricted to just that number of men. The number was not finally decided at a single meeting. It took two or three sessions and some discussion, but at last a labor budget was fixed, and the foremen were obliged to conform to it. The company found that it reduced operating costs immensely.

The Public Generalizes

ONLY A CLEAR case is a good case. No one can clear himself effectually who needs a lawyer, an accountant and a mathematician to do the clearing. A maze of figures scares the public. That is why wise men leave figures out of their editorials. The public does not pick up the paper usually to make complicated calculations.

Our coal case has been complicated by the troubles of the retailers. As shown in another section of this paper the wages of wharfmen and teamsters in Boston have much more than doubled. The increase in wages of those employees in 1920 and 1921 outstripped the cost of living. Since then living costs have declined, but the wages of wharfmen and teamsters have not fallen in proportion.

The domestic consumer makes no fine distinction between mines, railroad and retailer. They are all one to him. It is a folly to forget that they are all part of the coal family. The railroads stand a little apart because they are not engaged solely in the transportation of coal. But the operator and retailer are in a real sense one. They come alike under the ban of the public when the public is displeased about coal. The retailer has a right to concern himself with costs and quality at the mine and the operator with costs of distribution and quality of coal as delivered to the consumer. Both also are interested in railroad transportation.

Lower costs to the consumer by the payment of reasonable wages, by efficiency, by a reduction in the wastes of competition are matters of interest to the whole industry. The excessive increases in wage in all three industries, due largely in the case of mining and transportation to government interference, has placed a burden on the coal consumer against which he is revolting. The operator should bear that fact in mind and let the public know that coal at the mine, coal on the railroad and coal in the delivery truck are, one and all, paying excessive wage bills.

The decline in the roadbuilding and house-erecting industries will probably correct this anomaly in the wages of wharfmen and teamsters before long and may make the consumer's bill a little lower, thus relieving the anthracite operator of some of the opprobrium that accompanies high prices. It is interesting to note what generous increases the wharfmen and teamsters have received as compared with those of the men in the building trades. The public too often overlooks the fact that the mechanic or alleged mechanic in the

building trade always has received wages above the average and consequently the present wages are relatively not much out of proportion to former wages, when the cost of living is considered. Even, at that, the wages of all construction men are due for a heavy decline.

Electricity as a Simplifier

WHAT is said about the Baker breaker in regard to electricity is true not only of breakers but of the underground. The simplicity of that building is largely due to the absence of mechanical drives. In past generations the breaker was full of ropes, even today in a few breakers some still remain. They strain the structure, they shake it and they add somewhat to the hazards of operation. Furthermore they interfere with design.

Still worse would be the complication underground if the mine were operated by rope drives. We can hardly conceive of setting a hoisting engine at the top of a shaft to operate a tail-rope haulage underground. But this must be done if the mine is to be operated without electricity and all of four substitute plans are rejected, none of which are as convenient as the electrical method. A steam engine could be placed below ground at each level to operate a hoist. An air engine could be used for the same purpose, pipes being carried down the shaft. Compressed air at high pressure could be piped to a point underground and fed to a compressed-air locomotive, or animal power could be used.

In some metal mines steam engines are placed below ground. Temperatures of 130 deg. are common. What it means, even in the dry air of Arizona, to work at such a temperature can be imagined. Fortunately only at odd times does a steam engineer actually have to work, but to stay in a place having such an excessive temperature is extremely enervating.

The loss in steam pressure in such installations is immense and the dangers of fires in any but a fire-proofed shaft is extreme, for not only is the heat for combustion provided by the pipes but the draft to fan any combustion into flame is also afforded. The loss of air pressure when an air-driven hoist is set below ground is deplorable and the pipes, that lead the air to it, must be of large diameter and thus cumbrous and space filling.

The compressed-air locomotive is more feasible and is used in some mines. Animal haulage is, of course, taboo. How feebly all these expedients compare with electricity as an agent for underground service! Nothing has been said as to pumps and auxiliary fans, but with them also the argument in favor of electricity is equally strong. In fact, electricity it is that is making compressed air underground feasible. The compressor is placed in the mine and is driven electrically. Thus, what compressed air can do best in the way of percussion and shovel operation it can be permitted to do, and it will not be hampered by difficulties of transmission.

Electricity has been the great simplifier of mine operations from face to breaker or tippie. Just think what a mess of ropes we would have if we tried to cut, load, transport as well as hoist coal by ropes and to pump by similar methods. A little consideration of this fact and it will be easy to understand why electricity has made such rapid strides. The mining industry above as well as below ground could not do without it.



General View of Storrs Colliery.

Glen Alden Operates Three Longwall Faces with Conveyors in a Thirty-Inch Coal Seam

Mining Methods That Presage Company's Ability to Mine Thin Coal Whenever Big Seams Begin to Fail—Company Mines Eleven Seams but Not All at Every Property

BY FRANK H. KNEELAND

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CONVEYOR mining methods are not new in the anthracite region whatever they may be in bituminous. The region that invented and fathered the scraper had conveyors many years before the West Virginia Coal & Coke Co. tried its experiments.

Little has been said about the Glen Alden Coal Co.'s face conveyors and longwall methods. Most persons believed the company had stuck uncompromisingly to room-and-pillar workings, electric and mule gathering methods, chutes and full batteries. But the Glen Alden has been doing a little pioneering of its own in hunting for a way to mine thin coal to maintain its large output.

Just a word about the seams in the Glen Alden mines prior to a description of its mining methods. In Lackawanna County the beds worked are as follows: The 8-ft. or Olyphant No. 1, the 5-ft. or Olyphant No. 2, the 4-ft., the Diamond, the Rock, the Big or 14-ft., the New County or Marcy, the Clark, and the Dunmore Nos. 1, 2 and 3. In Luzerne County the beds worked include: The No. 5, the Snake Island, the Abbott, the Mills or Kidney, the Hillman, the Baltimore, the Forge, the Twin, the Ross and the Red Ash. In some operations some of these beds are divided forming two or more workable measures. Thus in some localities the Baltimore bed is split into an upper and a lower measure called respectively the Cooper and the Bennett beds.

The thickest coal now worked occurs in the Red Ash bed at Avondale, but the Baltimore bed at Bliss colliery is about equally thick. The thinnest coal is found in the Dunmore No. 1 and New County beds at Diamond colliery, the thickness of these measures being about 30 in. Beds of this thickness cannot, under present conditions, be worked by themselves at a profit. It is

NOTE—The reader will not fail to observe the multiplicity of buildings and other structures including reservoirs in the illustration of the Storrs Colliery, which forms the headpiece of this article. Hard coal as it comes from the mines is not salable; it must be manufactured or as it is commonly expressed "prepared for market."

only when such measures occur near thicker coals that can bear a portion of the expense of their operation that it is permissible to mine them.

In most places the coal beds worked are both overlaid and underlaid with hard rock which renders either the brushing of top or the lifting of bottom difficult and expensive. The coal pitches at all angles from horizontal to vertical. On the other hand, considering the reflex folding of the measures, it is often said that the pitch is more than 90 deg.

The methods of mining in any section of the mines vary greatly with the pitch of the measures at that point. As a rule the coal is mined by room-and-pillar methods. On pitches not exceeding 15 to 18 deg. cars are taken to the room faces by means of room hoists. On steeper pitches varying from this inclination up to about 40 deg., sheet-iron chutes are employed. On steeper slopes coal is broken down into full batteries or rooms. In low flat beds the Strange scraper serving three to five rooms is being used with much success.

At the Dodge slope of the Baker colliery an undercutter is in use in conjunction with a face conveyor. This mining machine makes an undercut 5½ ft. deep on a continuous face 220 ft. long which constitutes approximately a full shift's work in this coal. In the bottom at this point are small hummocks or knobs that the cutter bar encounters. These make cutting difficult. Machines have never been used in these mines on grades exceeding about 5 deg. Scrapers, however, have been employed on pitches up to 20 per cent.

In shooting coal it has been found best to follow the directions of the explosives' manufacturer. On the other hand the miners insist on doing about as they please. Actual practice with the use of explosives therefore varies greatly with conditions. Under ordinary circumstances the miner shoots the face of his chamber much as a contractor blows the face of a rock

tunnel except that fewer holes are used. In most cases four shots are enough to bring down a face. The coal is more or less distinctly stratified and some vertical-cleavage faults and slips are also present.

Much coal drilling is being done by hand percussive drills of the jackhammer type. These are purchased by the miners and paid for in monthly installments deducted from their wages.

Coal is mined in almost every instance by room-and-pillar methods, the rooms being normally driven from 20 to 30 ft. wide depending upon local conditions. Wherever possible all unburnable material is left in the room. Sometimes, however, it is cheaper to bring it to the surface than to stow it underground.

As a rule central compressor plants are installed on the surface, and the air is piped underground to the point of use. Small local air compressors, electrically driven, are also sometimes installed underground. Air lines from central plants are seldom over 4,000 to 5,000 ft. long. Screwed joints in such lines are re-leaded and are kept tight by frequent inspections.

In all recent mining operations ample pillars have

able intervals. When the point is reached where it is desired to start a longwall face a "doghole" 16 ft. wide is turned from the side of the entry away from the aircourse. Coal is shot from the solid until the recess is 10 ft. deep. The undercutter is then put into the place thus formed and successive cuts taken until the doghole has been advanced to a depth of 35 ft., the coal meanwhile being reshoveled to the gangway.

The head and tail sections of the conveyor are next connected up in the doghole and succeeding cuts conveyed to the gangway. At every third cut a section of conveyor is added to that already in place. This is installed next to the takeup section. That is, at every third cut the takeup section is disconnected and drawn back to the face and another length of plain conveyor put into place between it and the rest of the conveyor already in position. In this manner the face is advanced until the doghole has attained a depth equal to the length of longwall face desired.

In this mine three such faces are at present worked—one 220 ft. long, another 175 ft. and the third about 160 ft. As the operation of all is exactly similar,



FIG. 1
Conveyor
Discharge

This shows the delivery end of the coal conveyor extending from the side of the heading over a partly loaded mine car. The coal cutter also appears in the foreground in the position it occupies at the end of its face cut. The timbermen turn this machine sidewise, that is, lengthwise of the face and utilize its power in pulling the conveyor over to its new position. The undercutter thus serves two purposes.

been left to insure adequate surface support. The width of pillars is increased with the depth of bed worked.

In the second mining of flat beds, the pillars are usually drawn by men working at their inby ends. The pillars in the beds which pitch heavily are removed either by skipping or by splitting. Where the pillars are wide they are split and the pillars on either side are worked at such an angle that the coal will flow toward the center of the split. Where the pillar is not wide, skipping replaces splitting.

Reference has already been made to the mining machine and conveyor workings in the Dodge Slope. The average thickness of the coal worked at that point is 30 in. As the method employed in extracting this bed is peculiar to this mine a somewhat detailed description of it is perhaps justified.

To begin with, a 16-ft. main entry is driven in the coal. Parallel with this main entry and separated from it by a pillar 12 ft. thick a ventilation entry or aircourse is driven. This entry is made 12 ft. wide with 12-ft. crosscuts between it and the main entry at suit-

attention in this description will be confined to the 220-ft. face. The number of shovelers employed and the tonnage of coal produced will depend, of course, directly upon the length of face worked.

When the doghole has been driven to the desired depth a slabbing cut is taken by the mining machine along the entire length of its inby rib, this cut being made from the inner to the outer end. The coal is then shot down and loaded onto the conveyor which delivers it to cars on the entry.

After a slabbing cut of this kind has been loaded out the timber gang comes in. This gang consists of a chargeman or miner and four laborers. They first turn the coal cutter, which has been standing beside and parallel with the entry, into a position parallel to the new face and close to it. A hitch is then taken on the conveyor with the main or lead rope or chain of the machine. The delivery end of the conveyor is thus pulled over 5½ ft. toward the coal by means of the machine. The men, however, assist in this operation by using crowbars at various points along the conveyor.

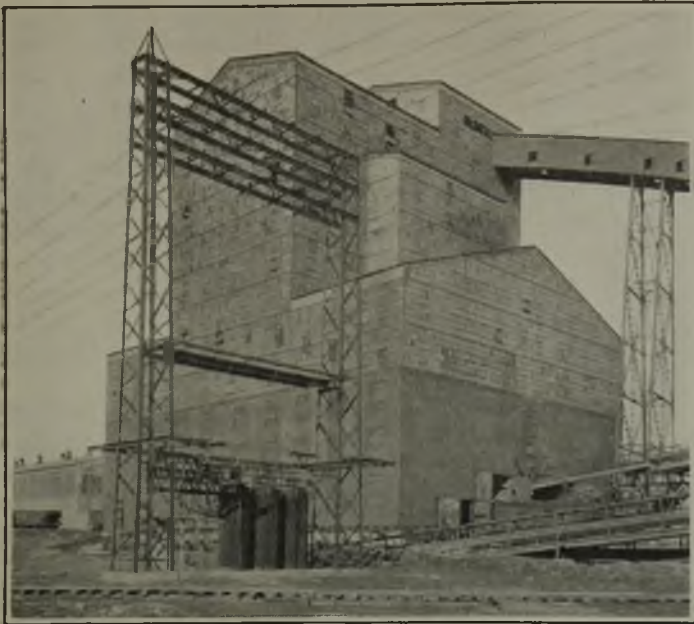


Fig. 2—Storrs Breaker, Glen Alden Coal Co.

Steel, concrete and glass are the accepted materials of breaker construction today. This is also true of most other mine buildings. Note the transformers and the transmission tower in the foreground. Electric current has practically supplanted all other means for energy distribution except for short distances, where belts are often employed.

The coal cutter is then moved (under its own power) back along the face for a distance of about 55 ft. and another hitch taken on the conveyor. This operation is repeated four times or until the coal cutter has been moved to the inner end of the coal face and the conveyor has been pulled into its new position and properly lined up about 7 ft. from the face.

The conveyor is now started but with its direction of travel reversed, that is with the upper strand moving inward or away from the entry instead of outward toward it. Round timbers in lengths of 4 ft. are next loaded into the conveyor from cars on the heading. These are removed from the conveyor at intervals along its length and laid to one side to be used in building cogs for roof support. About five mine-car loads of this cog timber and one carload of props are needed for each 5½ ft. advance of the face.

After enough timber has been spotted in this way, cogs are built, three timbers to each layer, on 8-ft. centers in a direction parallel with the face and on 5½-ft. centers in a direction at right angles to it. Props are set alternating with the cogs in the rows parallel with the face, except that no props are set immediately beside the heading. On the side of this passage, therefore, single cogs alternate with double ones. The entire arrangement is shown in Fig. 3.

After cogs and props have been put in place and securely wedged against the roof the machine runner and his "kailer" or helper, begin the new cut at the inner end of the face. This is made in a small parting that occurs in this bed about 6 in. from the bottom. A miner follows the machine setting props, usually about 6 ft. apart but closer if roof conditions require. This row of props is about 5½ ft. from the face.

Another miner and his helper follow the prop setters drilling and charging the shotholes necessary to bring down the coal. These are usually about twenty-two in number. They are made 1½ in. in diameter and 5½ ft. deep. Each is loaded with 2½ sticks of 1-in. Red Cross low-freezing dynamite. Just enough tamping is used to hold the charges in place.

On this 220-ft. face thirteen loaders are employed so that each has about 17 ft. of face to clean up. Inasmuch as the places near the far end of the conveyor are preferred to those near its discharge end (because the conveyor is loaded progressively from its rearmost end to the heading and because the man at or near the farther end, having an empty or nearly empty conveyor to shovel into, can clean up his allotted 17 ft. of face somewhat quicker than the man near the heading who must shovel to the conveyor when nearly full) the men rotate in their positions from day to day. In other words they change places exactly as did the scholars in the old-time spelling class when nobody missed a word and he who was head of the class today took position at its foot tomorrow.

In coal as low as 30 in. the men necessarily must work on their knees. As a result the shovelers as well as all others employed on these long faces wear heavy knee pads made of short sections cut from automobile tires. These are almost ideal for the purpose and afford thorough protection from the small coal and rock on the floor. In addition, however, some wear secondary or auxiliary pads of cotton sewed to their trousers legs.

The shovels used in this low coal are nearly straight, the angle between handle and blade being very small. To be exact No. 3 scoops with No. 1 lifts are used. After the loose coal brought down by the regular shots has been loaded out a "plugger" or miner straightens out the face by shooting off any projections that may remain upon it. The shotholes drilled in this work are

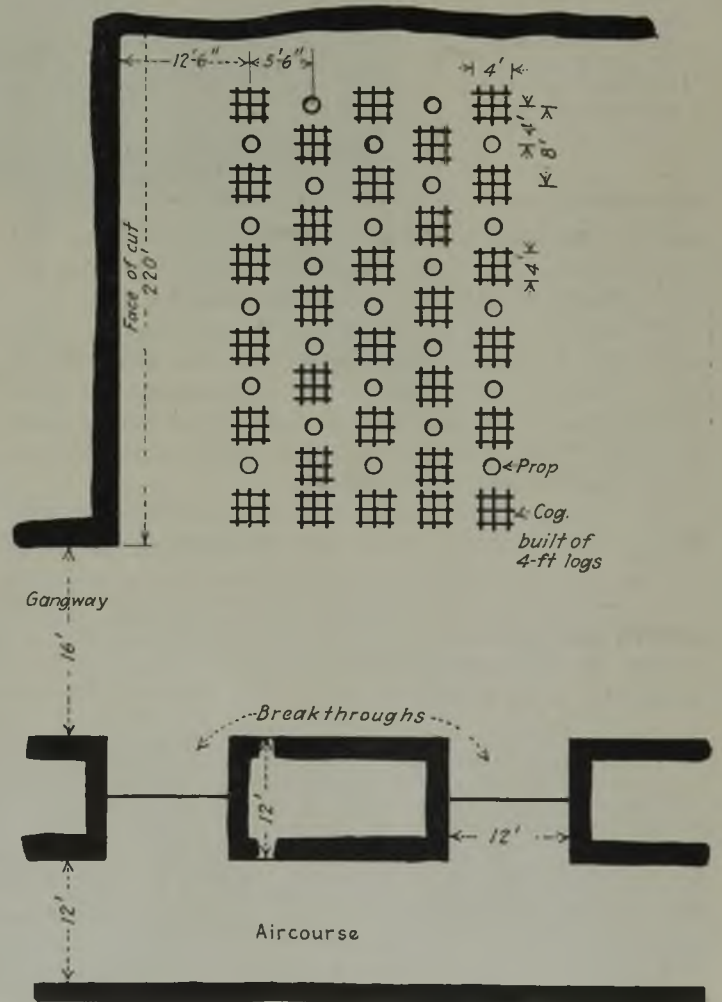


Fig. 3—Diagram of Longwall Face

This diagram, necessarily, is not drawn to scale. With a heavy brittle cover, roof support is the great problem encountered. Cogs and props are used in abundance and together control the settlement of the roof as long as necessary for the safe extraction of coal from the face.



Fig. 4—Shoveling to the Conveyor

This picture was taken from the heading. It shows one of the shovelers on his knees loading coal into the conveyor. This conveyor consists of a low, shallow, flaring trough in the bottom of which a chain with low flights or crossbars is drawn along. Being built in sections it may be readily transported over either short or long distances.

seldom more than 2 ft. deep, and the charges of explosive used are correspondingly light.

At 2 p.m. the timber gang arrives, and the cutter is ready to start his machine by 10 p.m. The cut is usually completed about 4 a.m. The chain on the mining machine carries thirty-eight bits in seven positions. Bits are changed three times in making a cut.

**FIG. 5
Truesdale**

This is one of the largest collieries in the anthracite region. Again note the many structures of varied type, yet all built of substantial materials.



Shortly after the machine has finished its cut the coal is shot down. The smoke clears away rapidly, and the work of loading out usually begins about 6 a.m.

All bone is left in the face by the loaders. The timber gang throws this material into the gob between cogs. A space 2 ft. wide is left between the conveyor and the face of the first row of cogs. Coal falling from the edge of the conveyor into this space is cleaned up by the loaders before they leave.

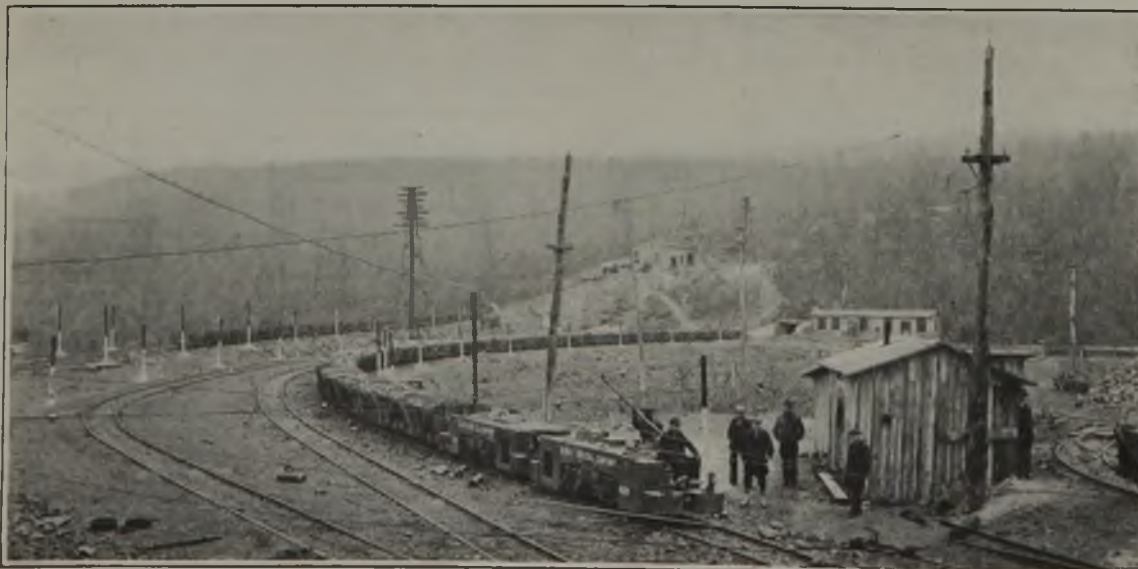
The loading crew consists of thirteen laborers who shovel to the conveyor, three men (miners) on the gang-

way and one plugger. One of the gangway men helps the plugger after the work has well started. The afternoon shift or timber gang consists of one miner and four laborers. The cutting or machine crew is composed of one machine runner, one helper or "kailer" and one miner who sets props after the machine. This crew is followed immediately by one miner and one laborer who drill, charge and blow down the coal. One foreman has general charge of all machine faces.

Every 5½-ft. cut on a 220-ft. face yields in coal of normal thickness about fifty-two mine-car loads. If the bed thins to any appreciable extent only fifty to fifty-one carloads are obtained.

When the longwall face on one side of the heading has been worked to its limit advancing, a second face is opened on the opposite side of the heading, and the coal on that side recovered in retreat. This second or retreating face necessarily extends across the aircourse previously mentioned. This, however, does not in any way interfere with operation.

Thus in brief has been described what is one of the most interesting mining methods in the entire anthra-



**FIG. 6
Sugar Notch**

A heavy articulated trolley locomotive taking a long trip of loads to the breaker. Glen Alden has approximately an aggregate of 500 miles of track at its mines under and above ground and an electric locomotive for each mile of track. A mining company as large as the Glen Alden Coal Co. has a trackage greater than some sizable railroads.



Major W. W. Inglis

President, Glen Alden Coal Co.

SHEER merit placed W. W. Inglis in the position of president of the Glen Alden Coal Co. In the undistinguished beginning of his career he was not a Glen Alden attaché, but an office boy for the Hillside Coal & Iron Co., an affiliation of the Erie R.R. He received the job April 1, 1884. By 1890 he was chief clerk, and in 1901 superintendent. Within a few short months, Sept. 15, 1902, he was made superintendent of the Pennsylvania Coal Co., an affiliated organization, but having more than twice as many mines and four times as many employees as the Hillside Coal & Iron Co. In 1909 he became superintendent of both companies and in 1913 he became general manager.

On Feb. 21, 1916, the Delaware, Lackawanna & Western R.R., reversing its general practice, went out of its organization to find a general manager for its coal department. Major Inglis was appointed to take complete charge of its properties. Since then he has become president and

the mines have become divorced from the railroad, the new company's name being the Glen Alden Coal Co. Major Inglis earned his title by service in the Pennsylvania National Guard and by active service in the Spanish-American War. Those who served under him recall with much pleasure the time spent under his command.

Major Inglis entered the business of coal production from the office, but let not that deceive anyone. Mr. Inglis is not deskbound in any sense. His delight is to follow out the details of mining and preparation; and the changes in methods of operation in the collieries under his control bear ample witness to the fact that he has the engineering problems of mining always before him, all the designs of the engineering department receiving his inspection and signature. He is "everlastingly at it" like the rest of his staff and finds nothing more pleasurable and inspiring than the task of making Glen Alden a profitable, economical, substantial coal property.



Panoramic View of Baker Colliery

DIN, DIRT, disorder and vibration formerly marked the anthracite breaker. The old-time coal breaker impressed and pleased the visitor by its size, but it appeared a sinister blot on the landscape and was an unpleasant place in which to work. It seemed almost a joke to describe it as a structure where coal was cleaned so grievously was it in need of that process itself. But modern methods of routing material have simplified this structure as they have the mills at the metal mines, and the modern breaker cleans and sizes coal so systematically and so simply and withal with such a little dirt and disorder that it can be entered without fear of soiling one's clothes.

The Baker breaker of the Glen Alden Coal Co. is kept as clean as a kitchen. The abundance of light makes it easy to ascertain just what results are being obtained. The old way of taking a handful of coal and carrying it to the uncertain light of a grimy window has passed with the age of darkness, and today it is easy to see the effect of each process at the point where it is performed.

ALL SIZES OF COAL CLEANED IN JIGS

In the Baker breaker the coal is crushed in a building near the ground level and then elevated to the top of the main building by means of a conveyor. Thereafter the coal passes by gravity through the various simple stages which convert it from a product of mixed size and mingled impurity to a carefully cleaned coal of eight sizes, all the grades, no matter how fine, being jigged free of impurity. The main rolls are placed on the ground level. Consequently the only vibration perceptible in the breaker is that due

NOTE—In the headpiece the foot-house with the headframe may be seen on the extreme right. Next comes the long housed-in conveyor that may be seen leading to the top of the breaker. That the movement of material is an important operation at this colliery may be judged from the number of conveyors appearing in this picture.

Baker—The Latest

Reaching the Breaker from
on the Ground Level and the
the Building—Simplicity and

to the jigs and shakers, and even this is reduced to a minimum by balancing; that is, by so arranging the equipment that the action of one machine, or part of a machine, tending to cause vibration in one direction is counteracted by another machine or another part of the same machine, which tends to cause vibration in an opposite direction. Sturdy construction and the use of separate drives for the larger units also do much to insure steadiness of the building.

Gone are the long ropes and the big driving belts that used to clutter and cumber the breaker, interfere with its rigidity and defeat any attempt to create order out of chaos. Electrical power is transferred from point to point by almost invisible conductors which can be made to follow the lines of the building and thus to perform their function without hindering the emplacement of machinery. The multiplicity of drives made possible by electric power has by the avoidance of synchronism made it possible to operate a breaker with minimum vibration. The old breaker was never a show place. The Baker breaker, on the other hand, is always in such order that it is ready for visitors. The attendant with his dust cloth and his O-Cedar mop sees to that.

Baker breaker is located on the outskirts of Scranton. It is a concrete, steel and glass structure throughout. In this breaker and adjacent buildings and structures a total of 4,773,800 lb. of structural steel and 44,666 sq.ft. of smooth wire glass were used. All machinery in the building is electrically driven, the larger units being fitted with individual drives and many of the



Glen Alden Breaker

Several Sources, Coal Is Crushed
Product Elevated to the Top of
Neatness Foster a Good Morale

smaller machines or those requiring less power, such as the jigs, are driven in groups from line shafting. Steam from the boiler plant is used for heating, as may be judged from some of the accompanying photographs showing literally miles of pipe used in the heating coils. A small electrically-driven vacuum pump sucks the air from this heating system, and all condensate from it is collected and returned to the boiler plant.



Fig. 1—Trip Haul Feeding Cars to Dump

By means of this car haul the one man shown feeds the cars one at a time to the dump. The lever that the man is holding operates a friction clutch by means of which movement of the chain is controlled. This machine is driven by a motor in the small shed at the right.

Coal reaches the Baker breaker from several separate sources, namely: From the Dodge shaft, (1 on the flow sheet, Fig. 2), from the Bellevue slope (2), and from the Bellevue shaft (5). Coal from the Dodge shaft is brought to the loaded yard in trips each of about forty cars by electric trolley locomotives. Here it is joined by coal from the Bellevue slope which has been hoisted in trips each of four cars.

When a locomotive arrives in the loaded yard with a trip from the Dodge shaft it uncouples from its trip and shifts to the loaded track whatever loads from the slope may be waiting, returning any empties from the slope that may be ready. Cars from these two sources are of slightly different design, one end-gate of the slope cars being a little higher than the corresponding end of the shaft cars, so that they easily may be distinguished and switched to different empty tracks. After properly placing these cars, both loads and empties, the locomotive is coupled to a trip of shaft empties and returns to the mine with them.

An electrically driven tripmaker (3) feeds the loaded cars to the steam dump (3a) which discharges to a chute leading to the dragline conveyor (4). The tripmaker or car feeder (3) as may be seen in Fig. 1 consists of a strand of chain provided with lugs engaging the cars on the loaded track. This chain is driven through back gears and a friction clutch by a 50-hp. induction motor operating at 600 r.p.m. By manipulating the friction-clutch lever, therefore, the dumpman may feed cars to the dump as slowly or as rapidly as he pleases. About 600 cars are passed over this dump daily.

After being discharged on the steam dump (3a) the cars pass through a kickback and gravitate to the empty yard. As previously stated cars from the Dodge shaft are switched to one track and those from the Bellevue slope pass to another. Cars hoisted from the Bellevue shaft discharge to the same chute, (4a),

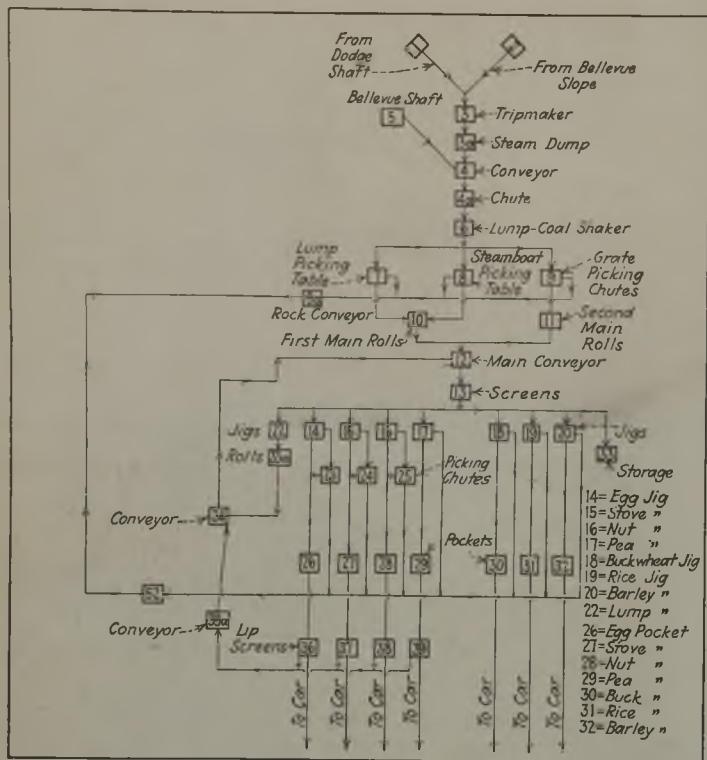


Fig. 2—Flow Sheet of Baker Breaker

This diagram is intended to show the origin and movement of the coal. It is strictly diagrammatic no attempt having been made to show anything other than the sequence of operations through which the coal passes.

that receives the coal from the conveyor (4). This chute leads to the foothouse.

Within the foothouse coal from all three sources (the Dodge shaft and the Bellevue shaft and slope) is discharged to the lump shaker (6). This machine is of somewhat unusual construction. It consists of two real and one false deck. That is the upper deck is short and unperforated and serves only as a reciprocating feeder to the other decks. This shaker separates the coal into three sizes, into lump, into steamboat and into grate and smaller.

From this shaker the lump passes to the lump picking table (7). The steamboat size likewise passes over a picking table (8), and the smaller coal is picked in the chute (9). Rock separated from the coal on the picking tables or in the chute is thrown into the rock conveyor (9a) discharging to the rock conveyor (52) leading to a conveyor (53 not shown) by which it is discharged to the dump.

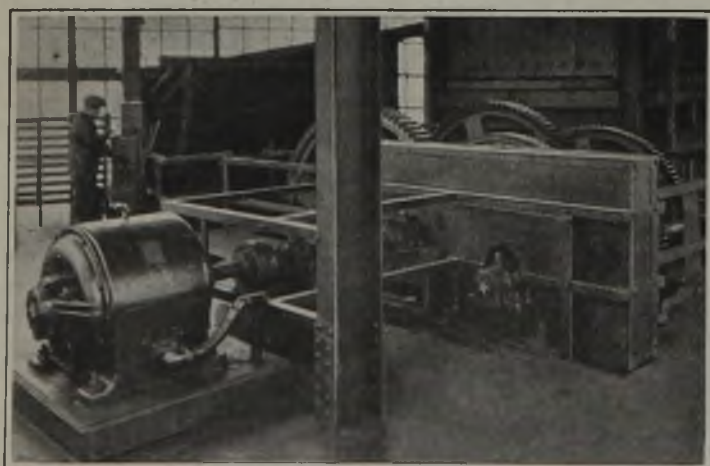


Fig. 3—Drive of Conveyor to Foothouse

The head sprocket is driven by gearing from both sides. As may be seen all dangerous moving parts are thoroughly boxed and railed in, protecting the workmen from getting caught and being injured. Glen Alden believes in safety as well as neatness.

From the picking tables (7) and (8) the coal goes to the first main rolls (10). These are the largest in the anthracite region measuring 60x60 in. They are shown in Fig. 4 and are belted and backgeared to a 75-hp. motor that also drives the picking tables. These latter are of the pan-belt type, 4 ft. wide and set on an inclination. Grate coal from the picking chute goes through the second main rolls (11).

WHEN CRUSHED ALL COAL GOES TO TOP OF BREAKER

After crushing, coal from both rolls as well as the smaller material that is bypassed around them, goes to the main conveyor (12) leading to the breaker. This conveyor is of the dragline type, 5 ft. wide. It is driven from the top by a 300-hp. motor through a silent chain and a double spur-gear reduction. This motor and driving mechanism is shown in Fig. 5.

At the top of the breaker the coal is discharged from the main conveyor onto the screens (13). Here it is separated into the various market sizes, the egg passing to the egg jig (14) the stove to the stove jig (15) and so on, the barley jig being (20). Each jig is provided with a storage hopper or reserve pocket, assuring a

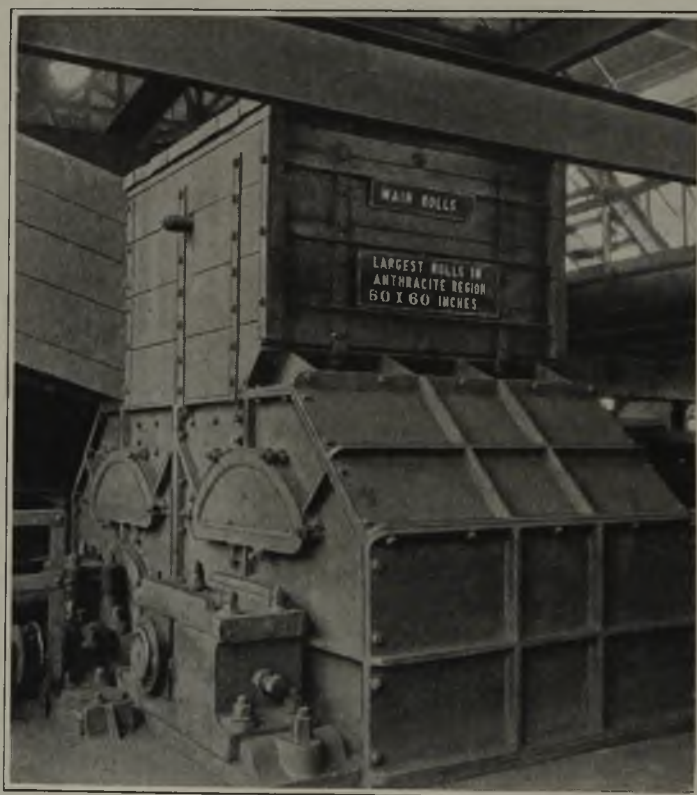


Fig. 4—Main Rolls in the Foothouse

These are the rolls that crush down the larger lumps. A smaller set of rolls located near them crushes the smaller lumps while coal of egg size and smaller is bypassed around both sets of rolls. To send coal already small enough to be marketable through rolls would result in needless degradation.

supply of coal to the jigs at all times. Buckwheat No. 4 is sent to the storage (33) and is ultimately sold for the manufacture of briquets.

Oversize coal or that larger than egg is first passed through the oversize jig (22) and then through the crusher (33a) whence it is sent back to the main conveyor (12) by way of the conveyor (34). Refuse from the egg, stove and nut jigs is hand-picked in the slate chutes (23), (24) and (25), the good coal being thrown into the chutes leading to the pockets. Refuse from all jigs passes to conveyor (52) going eventually to conveyor (53) which discharges to the rock dump.

From the jigs the coal goes to the pockets (26) to

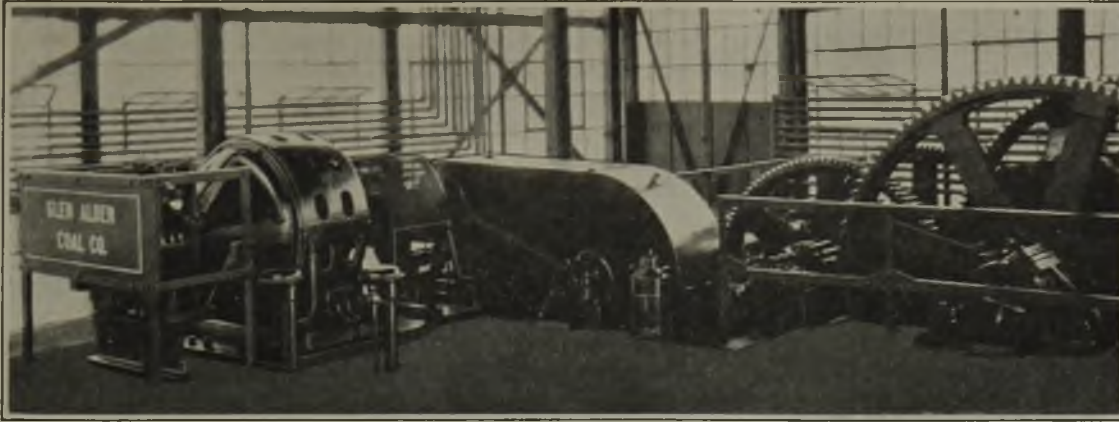


FIG. 5
Main-Conveyor Drive

This is the conveyor that brings the coal to the top of the breaker. The first speed reduction from the motor is made by means of a silent chain; succeeding reductions are by spur gears.

(32). From these it is drawn off to railroad cars, the larger sizes going over the lip screens (36), (37), (38) and (39). Lip screenings are returned to the breaker for reparation by means of the conveyors (39a) and (34).

In all twenty-one Elmore jigs are installed in this breaker. These are driven by four 75-hp. motors through line shafts. These shafts are carried on pedestals from the floor, and one of them is mounted on roller bearings. This roller-bearing installation is in a degree experimental and the results obtained from it

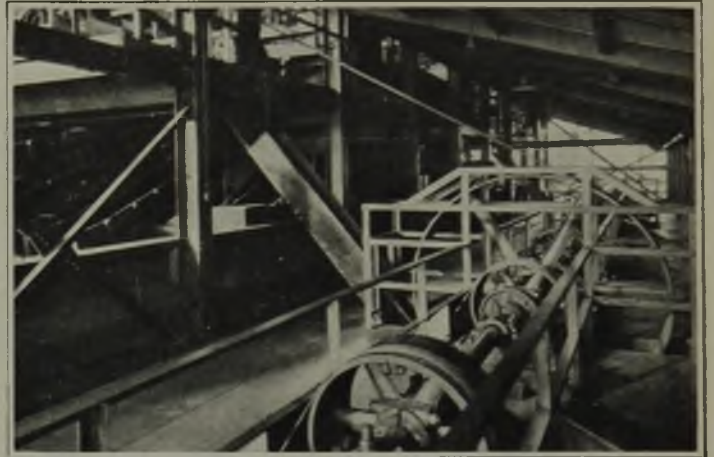


Fig. 7—Line Shaft Driving Jigs

Here again pulleys, couplings, belts and the like are carefully railed and boxed in to protect the workman. These protective devices are investments in safety that pay big dividends.

be flushed into the dip workings of the mine. A large area over old workings will thus be supported effectively.

The water used in the jigging and other preparation processes in this breaker is brought from the mine. After use it is sent to a settling tank of 500,000-gal. capacity located beside the breaker. The mine water

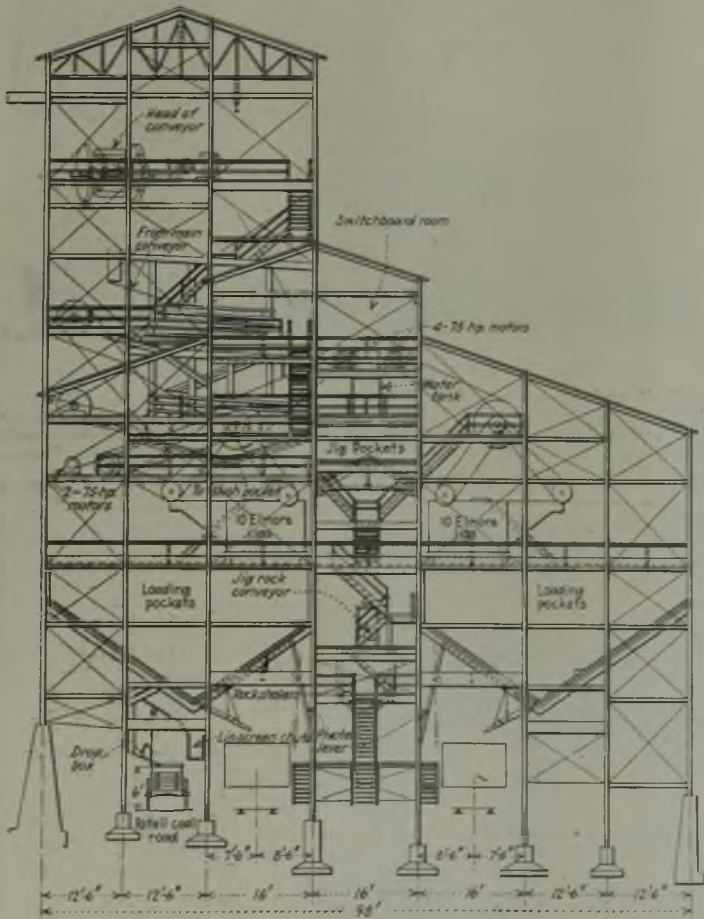


Fig. 6—Cross-Section Through the Breaker

This shows the relative positions of some of the machinery. Jigs are arranged on two sides of the building and driven in groups from line shafts. This affords a symmetrical arrangement of this machinery.

will doubtless determine the company's policy regarding similar installations in the future.

Plans have been completed for the installation of a rock crusher to which all rock separated from the coal during preparation will be delivered. This will be crushed to suitable size and transported to a borehole near the man-and-material shaft, down which it will



Fig. 8—Piping System Supplying the Jigs

Inasmuch as the water is used over and over again it becomes highly acidulous. Accordingly cast-iron pipe is used, and the valves are of acid-resisting type.

thus forms what is really the make-up of the preparation system. Settlings or sludge from this tank are cleaned out once a week.

The main supply pumps are two duplex units installed in the pump house, which is a two-story structure adjoining the breaker. Each machine consists of two single-stage centrifugals driven by a 200-hp. induction motor. These machines are under a constant suction head from the settling tank and discharge to the top of the breaker. Either machine will supply all the



Fig. 9—Loading a Car Under the Breaker

It takes only a few minutes to fill a car as the capacity of each coal pocket above is greater than that of a railroad car. There are only two loading tracks under the breaker so that no appreciable delay in loading can occur or trouble would result. Because of the ample capacity of the pockets, however, no difficulty of this kind is experienced.

water required for sprays and the like, leaving the other pump as a spare.

On the floor above are installed two 14,000-gal. per minute centrifugal pumps supplying circulating water to the jigs. These are single-stage machines either of which is of ample capacity to supply all needs, so that the other may be held as a spare. Inasmuch as the water is used over and over again all these pumps, as well as all the water lines throughout the breaker are made of cast iron so as to resist the action of acid.

In the early portion of this article mention was made of the extreme neatness and cleanliness of this plant. Most people think of coal as being something that is

dirty, something that will contaminate, something that will smudge whatever it touches. Perhaps this belief is justified. If it be true, however, the Baker breaker is verily the "exception that proves the rule," for many a painstaking and scrupulous housewife keeps her beloved parlor in no more spick-and-span, apple-pie order than that in which this breaker is habitually kept. Concrete floors, as well as all machinery, window frames and the like are carefully painted, and an attendant—he could hardly be called a janitor—makes periodic rounds with a dust cloth and an O-Cedar mop.

To one familiar with the breakers of former days, breakers, where, as Berton Braley put it,

"There is coal dust on the winders an'
there's coal dust in the air,
It's stickin' to the timbers an' it's
settlin' everywhere,



Fig. 10—Interior of Railway Scale House

Railroad scales are installed both above and below the breaker. The "weighman"—who in this instance happens to be Miss Haggerty—is here shown recording the weight of a loaded car just before it is turned over to the railroad company for transportation to market.

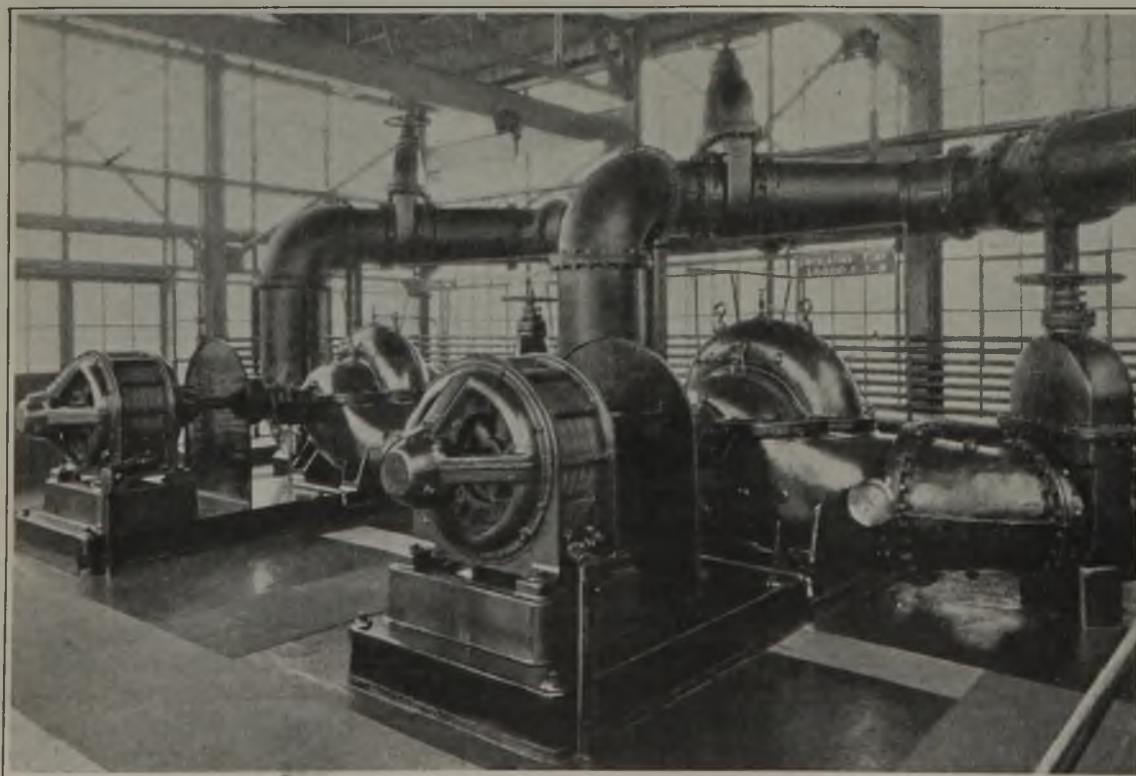


FIG. 11
Circulating
Pumps

These machines are duplicates, either being capable of supplying the jigs with water. They are installed in the pump house which is separate from, yet attached to the breaker as a kind of a wing. Here, as in the breaker itself, note the extreme cleanliness—everything is neat, spick and span.

“It’s clingin’ to our eyelids an’ our whiskers
an’ our hair

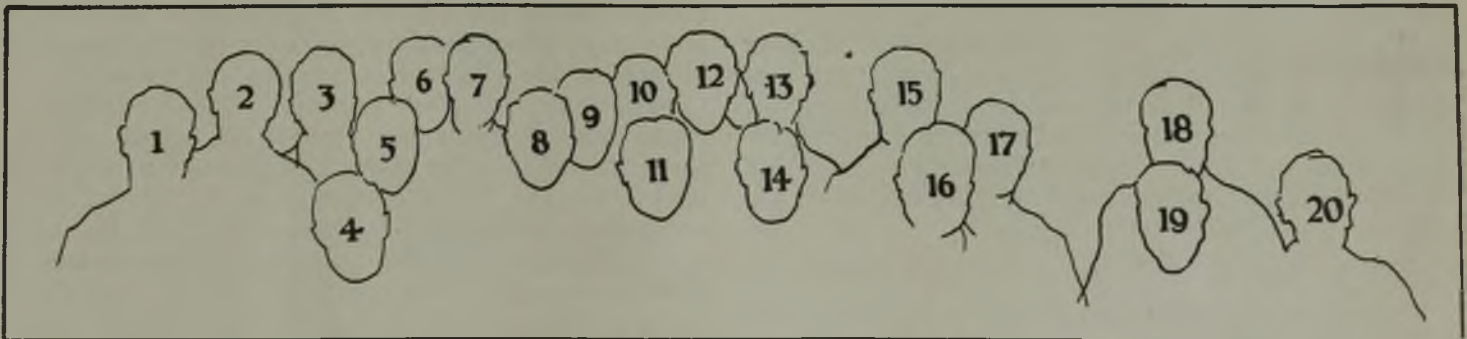
An’ we eats it in the breaker by the pound!”
this may appear like carrying neatness to an unnecessary extreme. This view, however, may be open to serious question.

THE UNCLEANLY BREAKER IS NOT PROFITABLE

As a matter of fact neither men nor machines can do their best when lungs are clogged with dust, bearings “stogged” with dirt and all movements are hampered and trammled with this material. Certainly enough squalor and filth may be found in most mining communities to satisfy anyone who believes that dirt is the running mate, the unavoidable accompaniment of coal production.

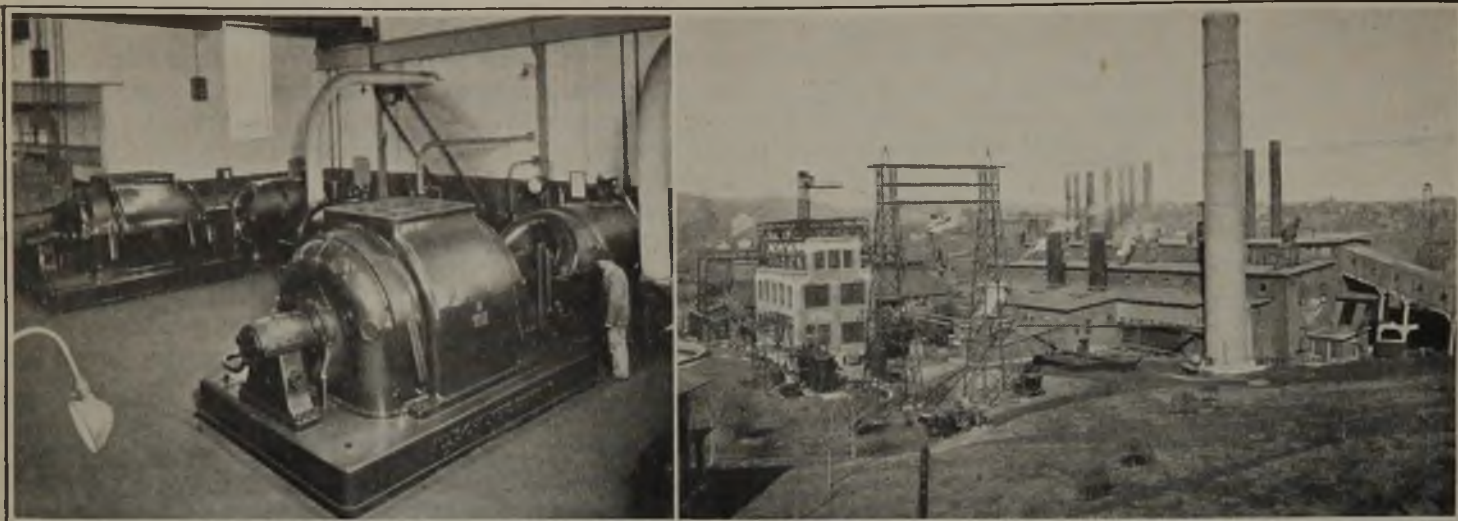
On the other hand it is well-known that no single force available to the coal operator is more potent in its influence for good or evil, more conducive to success or failure as the case may be, than the morale of the personnel. Though it may be possible to foster and maintain a good morale in the organization under surroundings less æsthetic than those existing at Baker, the chances are strong that this desirable influence may be brought to its highest degree of perfection in surroundings of which a man well may be proud and for which he may acquire a real regard.

It is the exception rather than the rule that any human being can take genuine pride in, or exhibit a real affection for, anything or anybody that is unkempt. This is quite as true of localities, places and environments as it is of personalities.



Some of the Official Heads, Glen Alden Coal Co. Taken in Front of Main Office Building

- (1) S. J. King, turbine engineer; (2) William Taylor, payroll chief; (3) E. W. O'Malley, boiler inspector; (4) Thomas Bevan, store-keeper; (5) H. M. Warren, consulting engineer; (6) W. F. Moxley, construction engineer; (7) M. J. Hoban, operator; (8) F. Hildebrand, auditor; (9) Dan F. O'Hara, steam-equipment engineer; (10) E. J. Falloon, hydraulic engineer; (11) S. D. Dimmick, vice-president and general manager; (12) C. R. Seem, electrical engineer; (13) C. E. St. John, mechanical engineer; (14) G. N. England, secretary and treasurer; (15) N. N. Nichols, chief mining engineer; (16) J. N. Shaw, purchasing agent; (17) Bradford Sampson, assistant to vice-president and general manager; (18) W. H. Williams, real estate agent; (19) M. L. Roper, general electrical foreman; (20) E. H. Adair, attorney.



Hampton Power Plant and Distributing Towers

Glen Alden Generates and Distributes More Power Than Any Utility Firm in Hard-Coal Region

With Five Hundred Miles of Electrified Track, Many Breakers and Several Times as Much Water as Coal to Lift the Glen Alden Has Line Pressures as High as 66,000 Volts

BY EDGAR J. GEALY

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

ALTHOUGH not the first anthracite mining company to use an electric mine locomotive, hoist or pump, the Glen Alden Coal Co. has for many years done most of the pioneering work in adapting electrical equipment to mine service. Today the company is recognized as having the most highly modernized and electrified coal property in the anthracite region. Present-day mining methods and many future developments in the industry will depend largely upon the past and present experiences and practices of this company's engineers.

Growing from a business which originally consisted of the purchase of a few lamps, telephones and signals the electrical purchases in this region for mine equipment have increased to about \$12,000,000 annually, to say nothing of the enormous volume of electric power-driven apparatus which always goes hand-in-hand with such development.

Economy, reliability, and safety were the impelling forces which have promoted this progress. The conditions to be met were adverse to the usual type of electrical apparatus. The liability to dangers and delays caused by acid mine water, coal dust, shock and vibration, all had to be considered. Nevertheless, the progress was consistently steady.

UTILITY PLANTS IN REGION MAKE LESS CURRENT

Today the Glen Alden Coal Co. generates, distributes and uses more electrical energy than any individual public-utility company serving the northeastern section of Pennsylvania. Its power transmission lines extend from one colliery to another over a territory 24 miles

NOTE—For years the surplus energy from the generating plant shown in the headpiece has been fed into the lines of the coal power company during emergencies. Direct connections to the large pumping station located nearby makes it possible to use a large amount of the power at low line losses. All the collieries in the Scranton district of the company receive power from this plant.

long. Line pressures as high as 66,000 volts are used. In and around Scranton the 250-volt direct-current distributing system of eight or nine different collieries forms a superpower network supplied from many scattered power-converting substations located on the surface and inside the mines.

The electrified track mileage of the fourteen collieries operated by the company totals about 500 miles. Four hundred and seventy-one trolley and storage-battery locomotives gather and haul approximately 10,000,000 long tons of coal per year.

The hoisting problems are many and varied. Some of the main hoisting shafts operate from two to eight different levels varying in depth from 20 to 1,400 ft. Inside the mines many large hoists are used on steeply pitching grades where from one- to ten-car trips are handled at speeds often greater than 1,200 ft. per minute. Room and car-haul hoists supplied either from low-voltage alternating-current lines or from the trolley system are scattered throughout the mines.

Anthracite mining companies as a whole pump about eleven tons of water per ton of coal mined, and the properties of the Glen Alden Coal Co. are no exception to this average. Most of the mines are located under or near the Lackawanna or Susquehanna Rivers, and in many places the coal beds are close to the surface or actually outcrop. These conditions require large pumping capacity.

Fortunately due to the nature of the coal beds, in the Scranton district, and also due to clever engineering and mining all the water from five and most of the water from three of the mines in this region is collected in a common sump. In this basin the company has built the largest pumping station in the coal fields. Five 5,000-gal. per minute centrifugal pumps each driven by a 1,000-hp. alternating-current motor are

located in this pump room. On the surface nearby an 800-hp. automatically operated water hoist is held in reserve.

The ventilation problems are numerous and important, principally because of the many beds of coal mined from one shaft. The haulageways in some of the mines are long and irregular. Many of the roads and air-courses connect with adjacent mines and the properties of other companies. The mines near Nanticoke are some of the most gaseous in the world; consequently great care and consideration must be given to the ventilating system. At many of these mines auxiliary reserve fans are provided, some of which are operated by electric motors and some by steam.

MORE POWER USED ABOVE THAN BELOW GROUND

Modern coal preparation methods have necessitated many changes in the design of coal breakers and washeries. The use of large volumes of circulating water to prepare the coal has required numerous pumping units. Each process of breaking, screening, jigging, elevating and conveying the coal requires large amounts of power. Consequently, the power used to prepare the coal is often much greater than that to mine and transport it to the breaker.

In the Glen Alden breakers alternating-current inclosed-type motors generally are used. To provide positive safe operation and eliminate fire hazards motor-starting contactors and switching apparatus are located in separate control rooms near the breakers or in inclosed fireproof compartments built inside the breakers. Push buttons are located wherever it may be necessary to stop the motors in an emergency and all equipment may be started from points where the operator has full view of the apparatus being started. Usually the large induction-motor load of the breaker must be corrected for poor power factor and to accomplish this end synchronous motor-generator sets equipped with oversize motors wound for the same voltage as the



One of the Large Induction-Motor Hoists

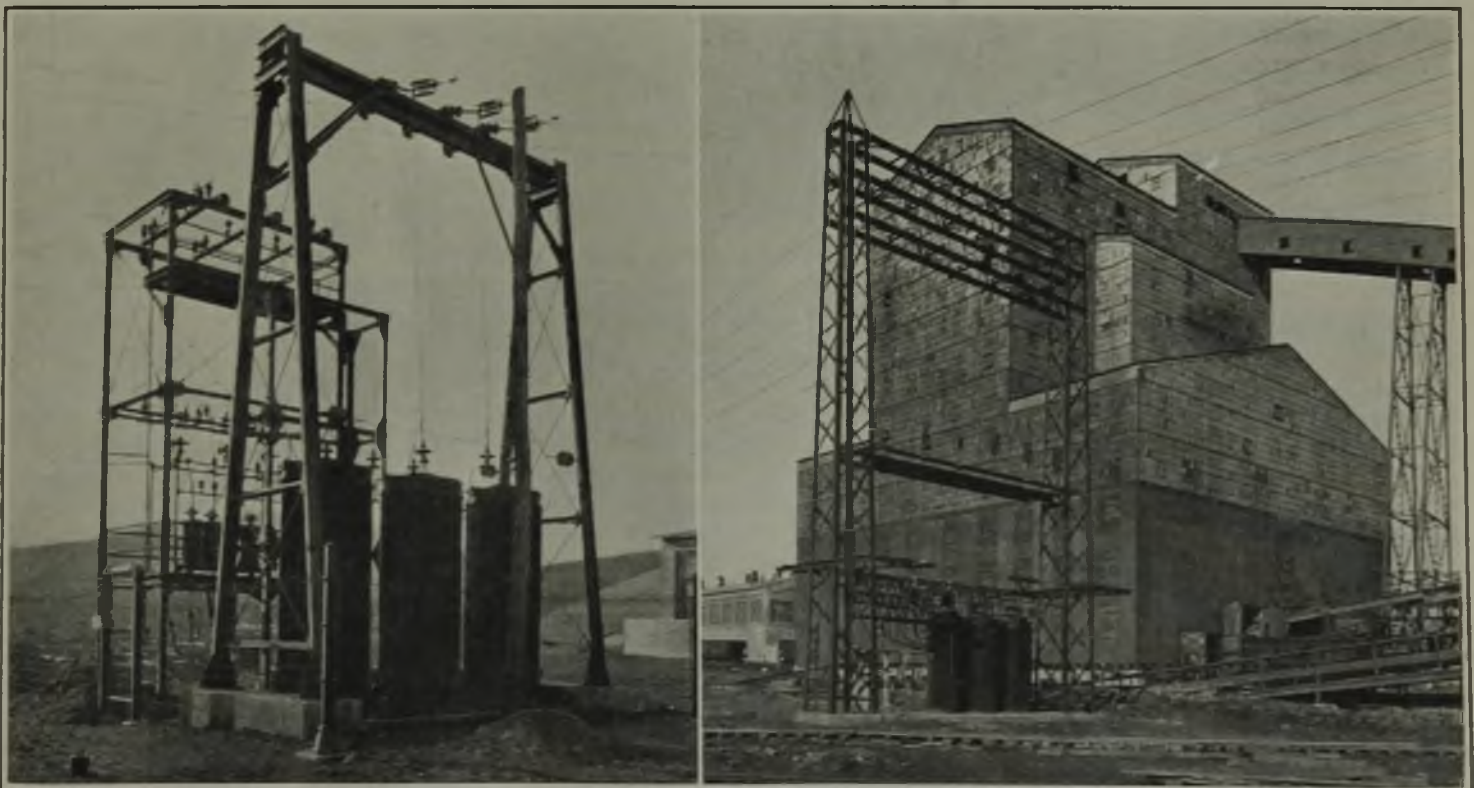
This hoist room like many others is modernly equipped with automatic safety devices. Overspeed and overhoist protective features make accidents unlikely. The lighting fixtures are arranged so as to prevent glare. Extensive changes are contemplated when the company will electrify many of the present steam-operated hoists.

breaker motors are often used and located near the main breaker transformers.

The 60-cycle, three-phase power-generating system of the company consists of four separate power plants having an aggregate capacity of 31,000 kva. These plants are advantageously located so as to be near centers of loads, utilize exhaust steam, provide economic transmission, proper line voltage and continuity of service. The largest of these plants is located near Nanticoke on the bank of the Susquehanna River.

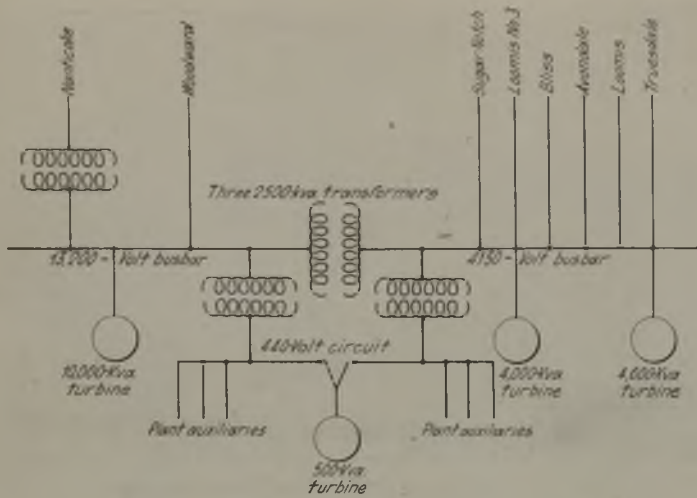
The next largest plant is known as the Hampton power house. This plant is located near the load center of the Scranton district and also near the mammoth Hampton pumping station.

The third largest power plant is located at the extreme end of the properties. This plant, located at the Storrs colliery, furnishes power for the electrical equipment in its vicinity and thus obviates the neces-



Where High Voltages Are Reduced for Distribution to the Many Drives

These towers and transformer substations represent the latest practice of the company. They are built to stand as long as the breakers will operate. The supply lines to the newest breakers are all placed in underground conduits. All the other power lines are run on steel poles and towers around the outer limits of the colliery yard.



Main Power Lines at Nanticoke Plant

Separate lines direct from the power plant to the various collieries make it easy to sectionalize troubles. Interconnecting circuits between many of the mines provide means for balancing the distribution system.

sity for transmitting large quantities of power to this point from the Hampton power plant. The smallest power-generating station is at the Woodward colliery, near Kingston. This plant effects large savings by utilizing exhaust steam from the engine-driven shaft hoists and fans used at this colliery.

NANTICOKE PLANT USES RIVER FOR COOLING

The Nanticoke power plant was located near the Susquehanna River so as to obtain readily the necessary cooling water. This plant is one of the largest in the region and may be easily expanded to an almost unlimited generating capacity. At present the plant generates about 7,500,000 kw.-hr. per month. Additions which will cost over a million dollars are now being made and a 12,500-kva. turbo-generator will be installed.

The present equipment at this plant consists of one 10,000-kva., 13,200-volt turbo-generator, two 4,000-kva., 4,150-volt turbo-generators and one 500-kva., 440-volt turbo-generator.

All these machines are interconnected through transformers so that all of them are used to supply power to the transmission and distribution lines. Six oil switches control the same number of 4,150-volt distributing lines supplying the collieries in the immediate vicinity of the plant. Another oil switch controls a 13,200-volt line which ties the plant with the Woodward

power station. Still another oil switch controls the short 13,200-volt line leading to a bank of three 4,000-kva. water-cooled transformers which boost the pressure to 66,000 volts for the tie line to the Hampton power plant which is about 21 miles away.

Leaving the power house at Nanticoke this high-tension transmission line spans the Susquehanna River by means of steel towers. The line wires consist of No. 2 soft-drawn stranded copper conductors except at long spans, where 4-0 stranded copper conductors are used. Excepting at the long spans the line is on butt-treated wood poles. Between the Nanticoke and Hampton plants this line crosses the Susquehanna River at two places and for the greater part of the distance it runs near the top of the mountains on the west side of the valley. The insulators on this line have made a wonderful record. Ever since 1919 when the line was put in service there has been no shutdown due to an insulator failure.

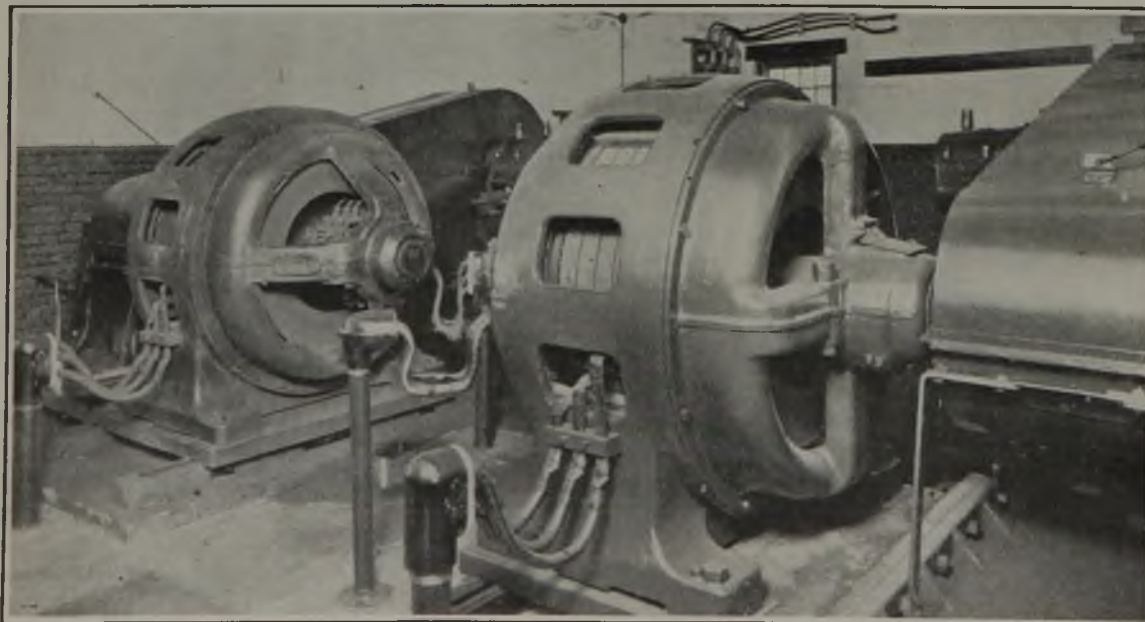
Near the Hallstead colliery at Duryea a tap is taken from the transmission line to supply equipment located at this operation. Here provision has been made should occasion arise, to open the line and furnish power to the Hallstead colliery from either the Hampton or Nanticoke plant.

The Hampton power house uses mine water for cooling purposes. The tie line with the Nanticoke plant is connected to three 4,000-kva. water-cooled transformers, duplicates of the step-up transformers at Nanticoke. However, at the Hampton plant the low-voltage windings of these transformers are connected for 4,150 volts. The present equipment in the Hampton plant consists of one 5,000-kva., 4,150-volt turbo-generator and two 2,000-kva., 4,150-volt turbo-generators.

EMERGENCY CONNECTION WITH POWER COMPANY

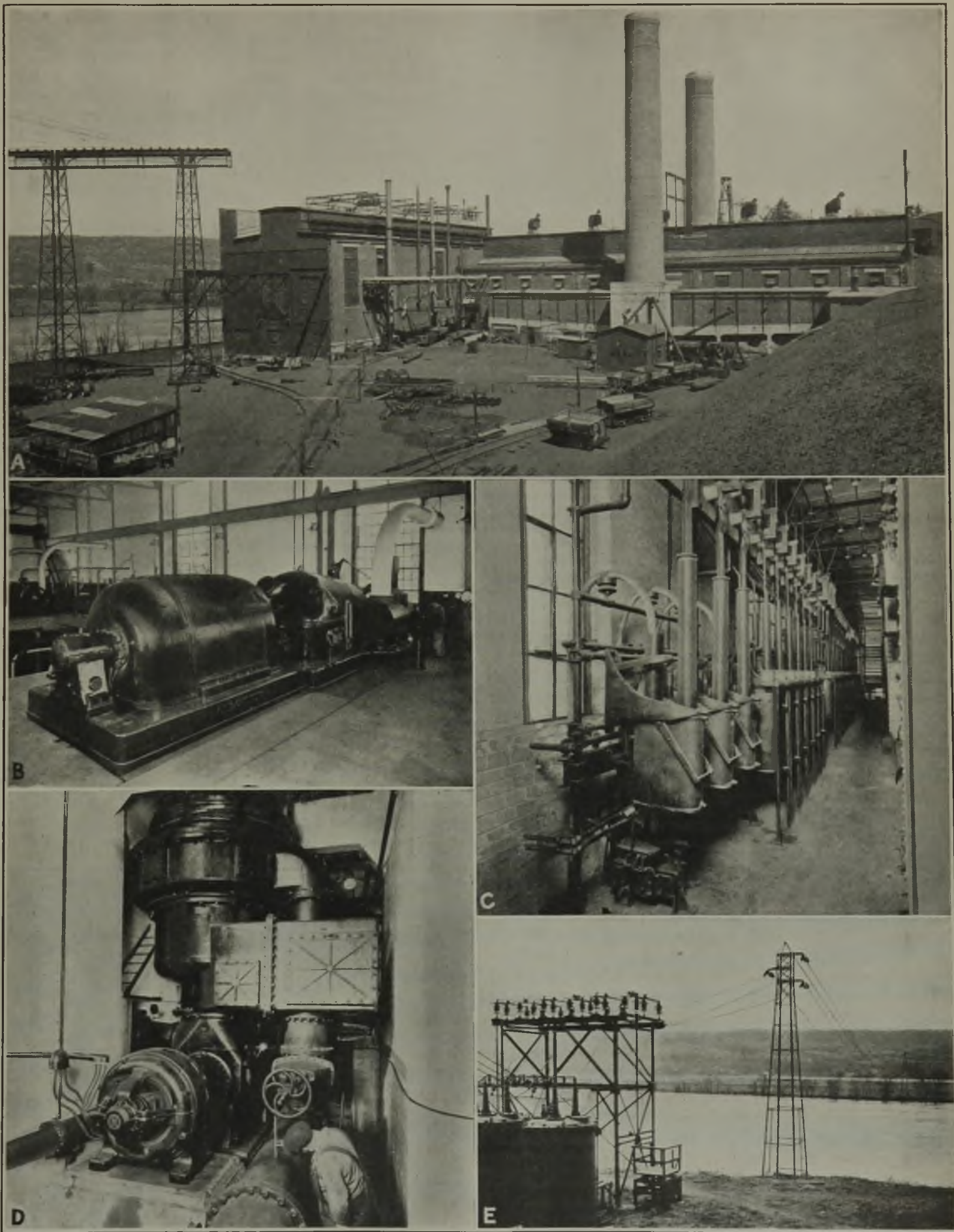
Many 4,150-volt distributing lines radiate from this power house. Two of these lines are directly connected with the Scranton Electric Co. and only used in case of emergency. The others run to the various collieries nearby. Two 16,000-volt lines also run out of this plant. One connects with the Storrs power house, and the other feeds a long line which supplies the Diamond colliery and ultimately connects with the Scranton Electric Co. and the Keyser Valley shops of the Lackawanna R.R.

One 2,500-kva., 2,300-volt turbine at the Storrs colliery supplies part of the day load at this end of the



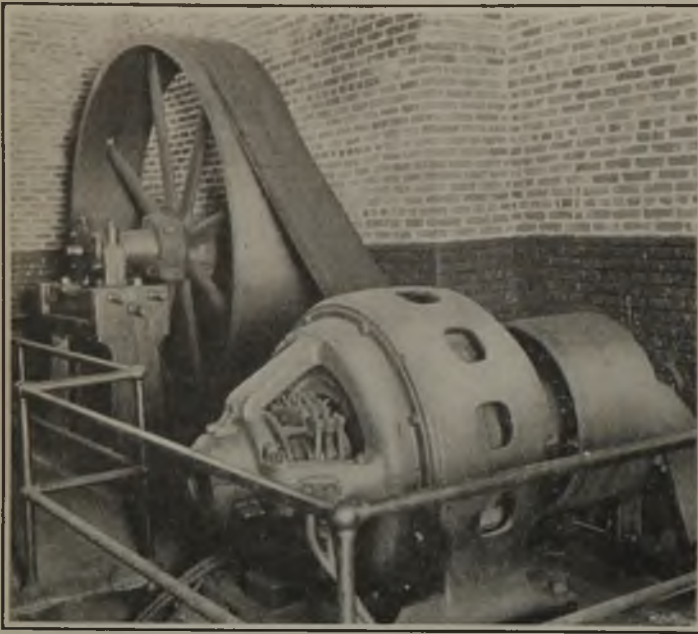
Typical Fan Drives

By installing duplicate fans like these the possibility of a shutdown at this mine is remote. Notice that the motors and drives are alike. This is another example of neat, permanent construction. The conduits and wiring fixtures are installed to last as long as any part of the machinery.



Interesting Views of the Nanticoke Power Plant

A—Outside view of boiler and generating plant. Here the small-size fuel is burned and the power transmitted over 24 miles. B—One of the large generating units. This machine has a full-load capacity of 10,000 kva. C—Where the power circuits are controlled. Continuity of service is of paramount importance; hence the rugged construction of these switches. D—Large turbine condenser and drive. The cooling water for this unit comes direct from the river where there is always an ample supply. E—How the plant is connected with other stations. The spans across the river are on steel poles. On the mountainside the line is run on butt-treated wood poles.



Fan Drive with Anti-Friction Bearings

When this installation was made, the workmen claimed that the large pulley was so well balanced and the frictional resistance was so low that a small nut placed on a spoke would cause the pulley to rotate. At the Loomis colliery near this installation mine gas accumulates rapidly. Consequently any savings in power in the fan drives are of great importance, for the fans must be run continuously at full speed.

line. The water used at this plant is mainly purchased from the water company. In spite of this drawback the demand for a power plant at this place became imperative when the new breaker was electrified and it became necessary to handle at this colliery most of the mine water of adjacent mines.

The transmission and distributing lines at the Storrs colliery are nearly all underground. Wherever it was necessary to run overhead wires they were carried on steel poles along the outside edges of the colliery yard. The underground conductors consist of lead-covered cables run in fiber duct concreted in troughs.

The Woodward power plant, installed in 1912, is an unusual installation. It consists of one 1,000-kva. low-pressure turbine. It utilizes the exhaust steam from three large steam-operated hoisting engines, three fans and one air compressor. The condensing water is circulated through a cooling tower which is assisted by a large air-circulating fan. Almost every year since it was installed this turbine has generated 1,800,000 kw.-hr.

The breaker at this colliery is completely electrified and for several years held the world's output record for anthracite, preparing over a million tons per year. At present the electrically operated Truesdale breaker of the same company holds the record, shipping about a million and a quarter tons of anthracite per year.

The boiler fuel used at the various boiler plants supplying steam to the electric generating equipment is what is known as buckwheat No. 4 or barley No. 2. This is a very fine grade of fuel which is unsalable on the market. Most of it comes from the fines on the ends of the various screens used in the breakers. Each boiler plant depends upon the collieries in its immediate vicinity for its supply of this fuel.

The present boiler equipment at the Nanticoke plant consists of twenty standard two-drum, 303-hp. boilers each equipped with a traveling chain-grate stoker. About 14,200 long tons of fuel are burned per month and 146,000,000 lb. of water evaporated in the same period. A large part of this steam is used to generate

electric power used for pumping purposes. Large pumps at the plant supply water to several of the collieries located within a radius of 3 miles from the plant.

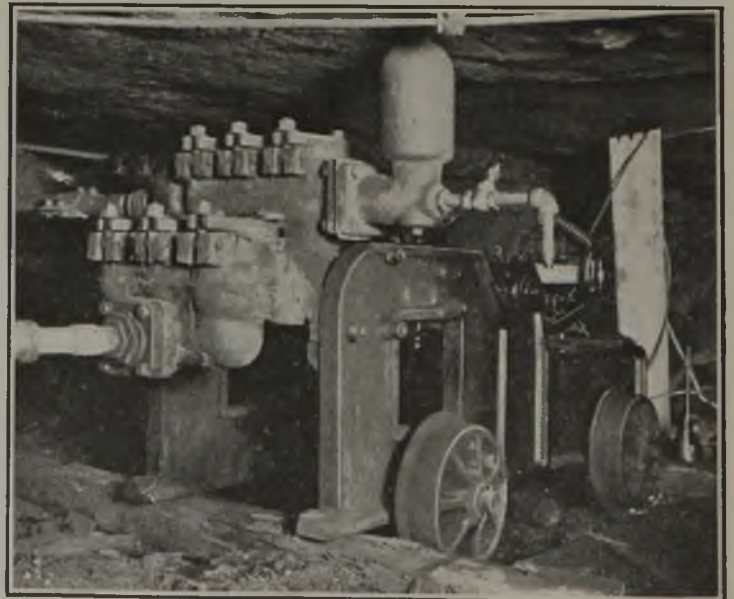
Ordinarily the boiler-feed water is raised to a temperature of from 200 to 208 deg. The volume of cooling water depending on the load carried by the plant, the vacuum maintained, and the temperature of the water as it comes from the river. The steam pressure supplied by the boilers is about 160 lb., and the vacuum at the turbines varies between 28 and 29 in.

LARGE PUMPING UNITS GIVE GOOD LOAD FACTOR

The peak load comes on the plant soon after eight o'clock in the morning. However the day load from 7 a.m. to 3 p.m. is quite steady. Because of the demand made by the big pumps provided where large quantities of water must be raised to the surface much of the pumping is done at night. This makes it possible to operate the generating plants at good load factors.

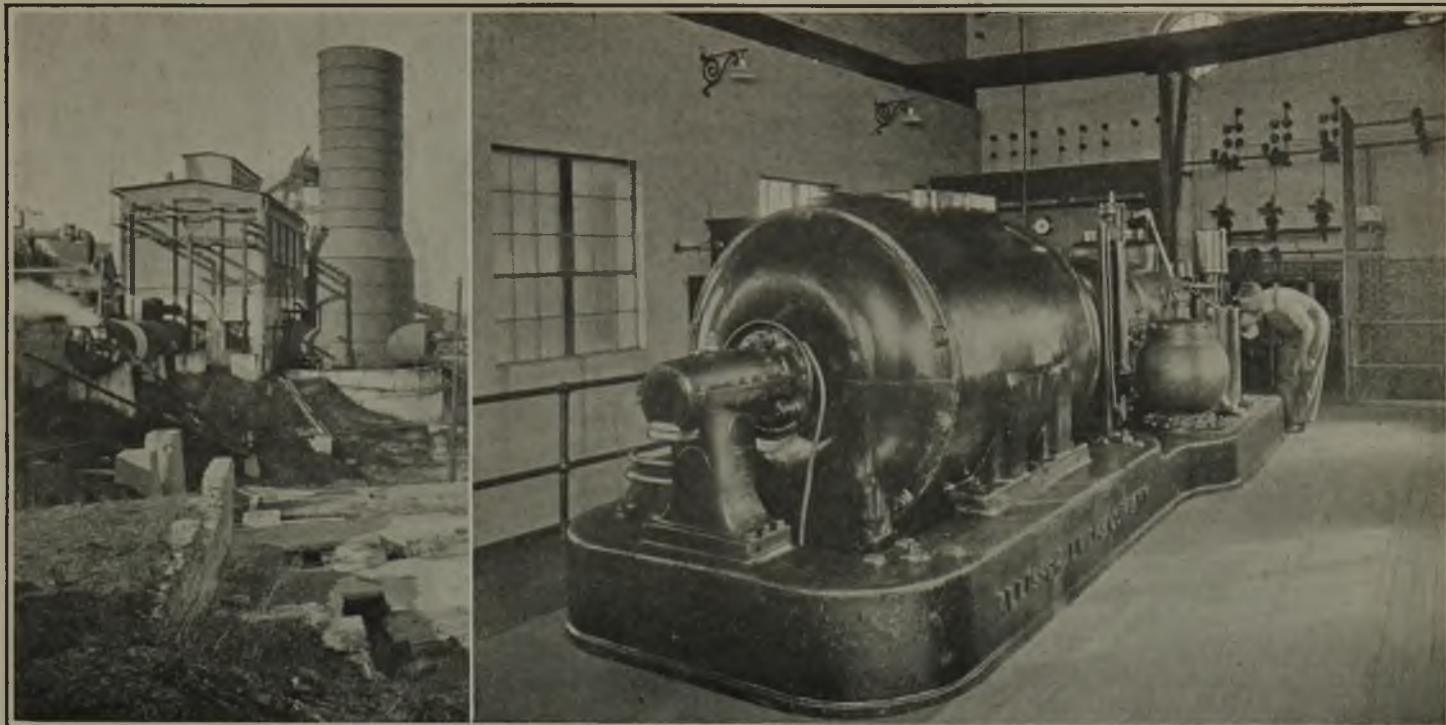
About a year and a half ago a large dam across the river below the Nanticoke power plant broke. Since that time the elevation of the water at the penstock is much lower and during the dry seasons, although there is ample water in the river, it is necessary to locate a pump on the bank of the stream close to the water. This pump is mounted on a truck and lowered down a plane. During normal operation 11,000 gal. per minute are required for the two surface condensers on the two 4,000-kva. turbines and a further 10,000 gal. per minute for a jet condenser on the 10,000-kva. turbine.

The Hampton boiler house furnishes large quantities of steam for use at the many collieries nearby, consequently the boiler capacity is much greater than that required to operate the turbines in the power house. In the boiler house there are fifteen 313-hp. boilers, five 613-hp. two-drum hand-fired boilers and three 613-hp. double-drum boilers fired by three double-compartment stokers. These boilers operate at about 148-lb. steam pressure, use 14,500 long tons of fuel per month and evaporate 151,022,000 lb. of water in the same period. The average monthly power output of the generators is about 3,420,000 kw.-hr. Because it



Portable Gathering Mine Pump

Units like this concentrate the water into large sumps where it is handled by centrifugal pumps. As the mining progresses these pumps are moved to new areas. Frequently they receive power from the trolley system. In the old workings where mining is scattered over large areas, many of these pumps are required to keep the rooms from filling up with water.



An Unusual Power-Generating Station at the Mines

Located where it can use what was formerly waste steam this plant has for many years supplied 1,000 kva. into the company's power system. This station utilizes low-pressure exhaust steam from the hoisting engines and fans at the Woodward colliery. This colliery is one of the largest producers in the anthracite field, and it is therefore important that ample power be available at all times.

is necessary to use mine water for cooling purposes all the condensers, spray plates, cones and pipes are heavily wood-lined.

Ten 300-hp. hand-fired boilers supply the steam requirements at the Storrs boiler plant. These boilers supply 140-lb. steam pressure for the turbine, fans and hoisting operations. The cooling water is circulated from the condensers to a large spray pond adjacent to the power house.

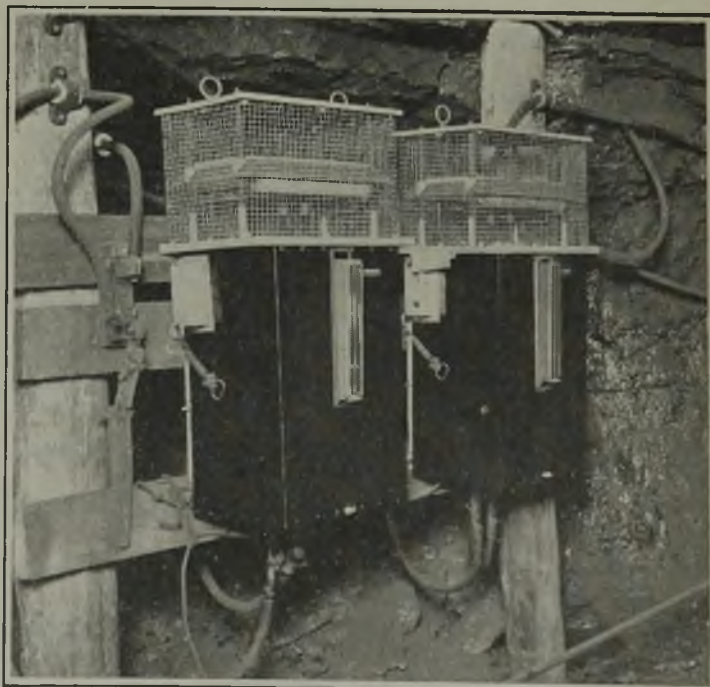
The steam used at the Woodward power house was formerly wasted. This plant uses exhaust steam at 3-lb. pressure from the colliery steam engines. The condensing water is pumped into a cooling tower and circulated back to the condenser. This method of cooling is very successful at this plant because of its relatively small capacity and low steam pressure.

MOTOR-GENERATORS REPLACE ROTARY CONVERTERS

Years ago when the only electric power load at the mines consisted of locomotives and a few direct-current pumps and hoists, most of the power-converting units were rotary converters. Now when many of the old breakers have been abandoned and new ones electrically equipped with induction motors have taken their places, there is a greater need for power-factor corrective equipment. Large pump and hoist motors have increased this need, consequently, many of the later power-converting units are motor-generator sets. Some of the motors on these units have been purposely made larger than ordinarily required so as to be able to correct the lagging power factor of the large induction-motor loads in the breakers and washeries.

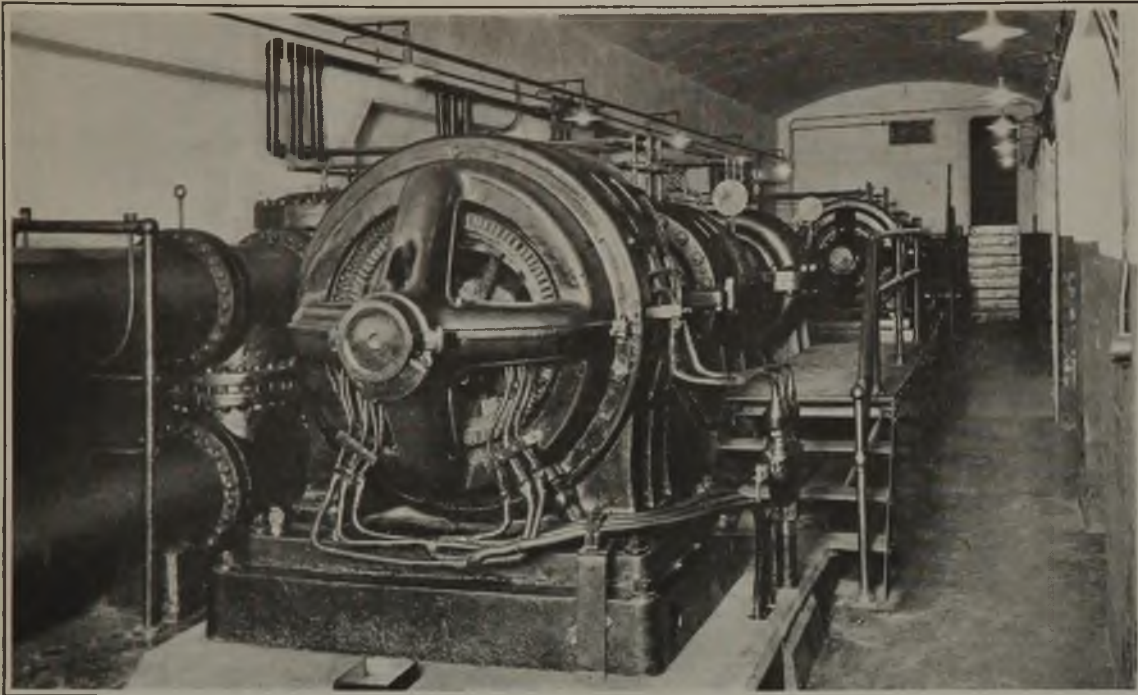
In some places the converting substation is located outside the mines near the breaker, and the synchronous motor on the motor-generator set is wound for the same voltage as the breaker motors. This permits power-factor correction on the load side of the transformers thus effecting power savings and eliminating the necessity for over-sized transformers.

Nearly all of the power converting substations are located adjacent to or near a hoist, pump or fanhouse, therefore, the company has not considered it particularly necessary as yet to provide complete automatic operation. The direct-current system of most mines is protected by means of automatic circuit breakers which in some cases are provided with the self-reclosing feature. Where the machines operate in parallel with other units or are tied into a direct-current distributing system they are protected against reverse-current and overspeed.



How the Direct-Current Feeders Are Protected

These circuit breakers not only open under overload but sectionalize faulty equipment and grounded supply circuits. In the substations slightly different breakers make the direct-current distribution system function automatically. The attendant need only oil the generating equipment and see that the alternating-current apparatus functions properly.



Storrs' Mine Pumps

The water at this colliery contains much acid, yet these pumps have given great satisfaction. Large 1,000-hp. motors, duplicates of those driving the Hampton pumps are supplied with energy direct from the local power plant. In emergencies and also at nights these pumps may also draw power over the tie line connecting the Storrs' power plant with the Hampton power house.

At most of the stations it is merely necessary for the operator to start and stop the machine and oil it occasionally, all other normal conditions are handled by the station protective equipment.

To the 471 trolley and battery locomotives now in service 26 new locomotives recently have been added. Those now in service consist of seventy-one 6½ ton, one hundred 7-ton, one hundred and ninety-three 8-ton, thirty-nine 10-ton, thirty-nine 13-ton, three 15-ton, one 20-ton, two 26-ton trolley types and twenty-three storage-battery locomotives. Seventy-two of these locomotives including the two 26-ton units are in service at the Truesdale colliery. As in the mines of many other anthracite companies the tracks in the Glen Alden mines are very irregular. Much of this is due to former methods of mining and to the large quantity of second mining being done. For these reasons the track-bonding, trolley and feeder systems in many sections of the mines are not very modern. However, main haulageways and main feeders are now being remodeled along more approved lines.

Most of the main shaft hoists are steam driven, although several large induction motor-driven hoists have

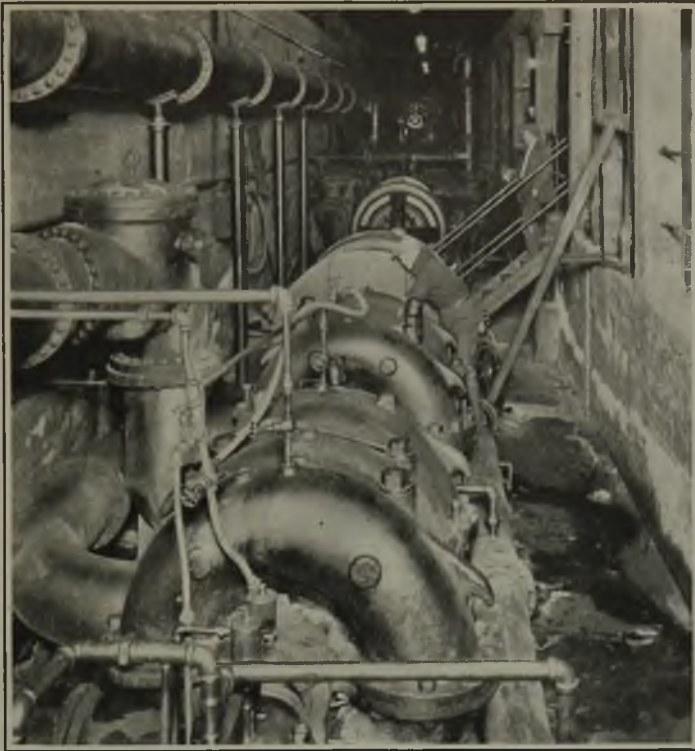
lately been installed. One of these new hoists at the Loomis colliery is driven by a 600-hp. motor and controlled by a liquid rheostat, another at the No. 3 Shaft of the same colliery is driven by a 350-hp. induction motor. Both of these hoists and several others are fully equipped with automatic safety devices including, overspeed, overwind and overload protective features.

Some of the pump installations of the company are the largest and most up-to-date in the region. By the autumn of this year none of the pumps in the mines will be operated by steam or air. At present 301 centrifugal pumps are in operation to which are connected 39,000 motor horsepower and over 2,000 steam-engine horsepower. The aggregate capacity of these pumps is approximately 500,000 gal. per minute. There are also 239 motor-driven plunger pumps driven by about 3,500 motor horsepower. These pumps have a capacity of 28,000 gal. per minute. The combined motor horsepower of these two classes of pumps is about 42,500 and the combined pumping capacity approximately 528,000 gal. per minute. The total number of pumps including hand-operated and jig pumps is approximately 998.

Tandem Unit

It seems quite natural that large tandem locomotives should be found at the Truesdale Colliery, the giant operation of the anthracite region. One of these double units hauls coal over the surface from the Sugar Notch opening to the breaker. Nearly all the trolley locomotives of this company operate from 275-volt circuits.





Hampton Pumping Station, Largest in Region

One of five 5,000-gal. per minute centrifugal pumps which raise the water 599 ft. to the surface. At this pumping plant all the water of five mines and most from three mines is gathered and pumped to a large reservoir. Each of these pumps is operated by a 1,000-hp., 2,200-volt, wound-rotor type induction motor.

Each of the five 5,000 gal. per minute pumps located at the Hampton pumping station, previously mentioned, pump against a 500-ft. head. During dry seasons 8,000,000 gal. of water are pumped in 24 hours and in the wet season 20,000,000 gal. are raised to the surface in the same length of time. The weight of bronze alone in each of these pumps is approximately 17,000 lb. The pumps are primed by air ejectors or vacuum pumps. Five 300,000-cm. three-conductor, varnished-cambric, lead-covered, armored cables, suspended in two lined boreholes, deliver 2,300-volt energy to the 1,000-hp. motors connected to each pump. Two of the pumps are controlled by automatic starters and three by non-automatic control panels.

At the Cayuga mines is an automatic pumping station. Originally a manually operated 1,500-gal. 630-ft.

head centrifugal pump replaced a large steam-driven reciprocating unit. In September, 1923, additional control equipment was added to the new centrifugal pump, so that now it is automatically primed, started, stopped, controlled and protected. When the water in the sump rises to a predetermined level the pump is automatically primed and started. While in operation it is protected against overload, loss of water, air leaks and column-line breaks. When the sump has been emptied to a predetermined level a float operates the control devices and automatically stops the pump and everything is made ready for a complete restart whenever the water again rises to the starting level. This pump is driven by a 400-hp. 440-volt induction motor.

ONLY A FEW SIZES OF CENTRIFUGAL PUMPS USED

By standardizing upon a few different sizes of centrifugal pumps many of the ordinary pumping problems have been obviated. This makes it relatively simple and inexpensive to carry in stock repair parts for nearly all the important pumps. Whenever an unusual accident occurs it is a simple matter to take an impeller, bearing or casing from one mine to another to make a hasty repair.

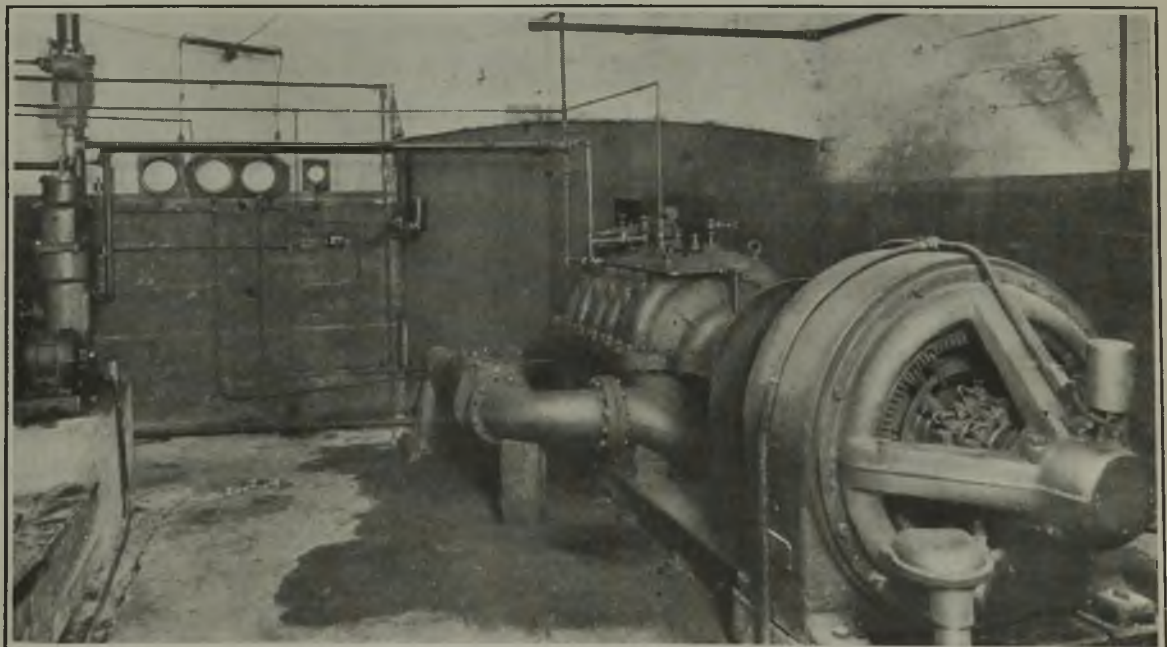
The large centrifugal pumps are standardized into three units. The first is a 12-in. three-stage unit having a nominal rating of 4,500 gal. per minute against a 300-ft. head. This pump is used between limits of 5,000 gal. per minute at 250-ft. head and 4,000 gal. per minute at 350-ft. head. The second unit is an 8-in. two-stage volute pump having a nominal rating of 2,000 gal. per minute against a 200-ft. head. This unit is used between limits of 1,400 gal. per minute at 230-ft. head and 2,400 gal. per minute against a 150-ft. head. The other large unit is a double suction single-stage volute pump nominally rated 3,500 gal. per minute against a 100-ft. head and is used between limits of 2,800 gal. per minute at 140-ft. head and 4,000 gal. per minute at 70-ft. head.

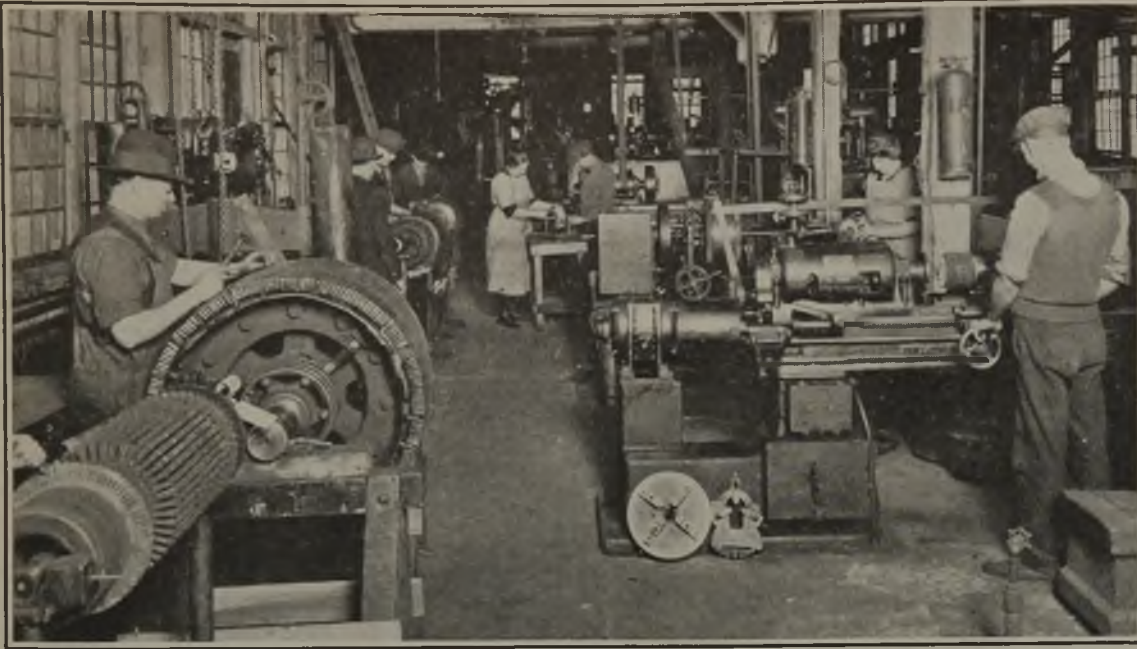
TEN-STAGE CENTRIFUGAL LIFTS WATER 920 FT.

The largest capacity pumps at the Glen Alden's mines are two located in the Baker breaker for circulating water to the jigs and screens. Each of these pumps has a capacity of 14,000 gal. per minute. The highest lift of any of the centrifugal pumps on the Glen Alden property is on a 6-in. ten-stage, 800 gal. per minute

Pumproom Interior

Automatic pumping station at Cayuga. This centrifugal pump replaced a steam-driven unit. Centrifugal pumps save much pump-room space aside from their many other advantages. At this station the pump starts and stops when the water in the sump rises or is lowered to predetermined levels. At the extreme left of the picture is a part of the old pump foundation and the new vacuum pump which primes the centrifugal unit. Note the bearing thermostat on the motor.





Repair Shop

Large and small motors and other electric equipment can be repaired in this shop. Standard and special coils are made on modern coil-winding machines. Each motor armature is wound, baked and machined before being placed in service. Spare coils and commutators are always kept on hand. Even large converter rotors are quickly repaired and returned to the mines by the auto trucks of the electric department.

unit at the Truesdale mines. This unit pumps against a 920 ft. head.

All the bronze centrifugal pumps purchased by the company are bought upon standardized specifications. The important specifications for a typical two-stage pump are in general as follows: The pump is to operate at a full-load speed of 1,170 r.p.m.; it is to be of the balanced piston multi-stage centrifugal type, preferably without diffusers; consideration will be given to two-

stage back-to-back type pumps having volute casings; preference will be given to pumps which can be most readily opened for inspection or repairs; casings to be of acid-resisting bronze and sufficiently heavy to withstand a working pressure equal to twice the rated head; impellers to be of the inclosed type and to be of bronze; all parts of the pump coming in contact with water to be of bronze consisting of 75 per cent copper, 10 per cent tin and 15 per cent lead.

The Miner's Torch

The Closed Door

OCCASIONALLY we find men who are rated as conspicuous successes in their line of endeavor who are willing to talk about the things to which they give credit for their success. Whether such talks have any real value to the fellows who are trying to climb higher on the ladder of success is a fit subject for debate, but when we consider that two American monthly magazines are filled almost entirely with literature of that kind, and considering further that one of these magazines has almost the largest circulation of any monthly in America we must admit that such literature undoubtedly has wide appeal.

Recently I was thrown with one of the most successful designing engineers of America (a man who has clients in a number of states and who has accumulated a no inconsiderable fortune from his professional activities) and in the course of our conversation he grew reminiscent and told me some things about himself and his methods that were not only interesting but suggestive as well. Had a professional interviewer been present my friend would have had a difficult time keeping his picture out of the magazines. This man attributes most of his success as an engineer to assistance received from sales engineers.

Here is the way he expressed it, as near as I can repeat it: "The best posted men in America today are the sales engineers who are in the employ of the large

manufacturing companies. They not only know all about all of the things which their employers manufacture but they are just as well posted about the things manufactured and sold by their competitors. Furthermore, they are widely traveled as a rule and have seen their equipment in operation in all parts of the country under widely varying conditions and for every conceivable purpose. A machine or method may succeed in one part of the country and fail in another; if there is a reason they can tell you why. If there is no reason they can put you to thinking. And generally they are about as honest as the average humans.

"Numbers of times I have had my mind made up and was ready to recommend equipment for special jobs only to have my reputation saved at the last moment by a word of advice from a sales engineer who easily convinced me that my judgment was poor.

"And here is the strange part of the whole thing to me; the very fellows who are most in need of the kind of advice that sales engineers can give, absolutely refuse to give them an audience, even going so far as to insult them if they cannot get rid of them in any other way. Why there are some engineers who feel so strongly on the subject that they go all to pieces at the very mention of the title "Sales Engineer." If a man unfortunate enough to possess a card bearing that title following his name should use his card for purposes of introduction with engineers of that type he should count himself lucky if he escaped from the office without being offered personal violence."

HYDROGEN HAS BEEN SOLIDIFIED by Dr. C. W. Kanolt. The gas was subjected to a pressure of 3,000 lb. per square inch, cooled artificially to -425 deg. Fahr. and further cooled 14 deg. Fahr. by evaporation.



News Of the Industry



Coal Operators Rejoice at Nomination of John W. Davis for President

Industry Feels Assured Against Advocacy of Regulation—Mining Unlikely to Be Prominent in Campaign—Charge of Wall Street Domination Disproved by Defense of Glass Blowers' Union

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Regardless of party affiliation, the coal operators are rejoicing in the selection of John W. Davis as the presidential nominee of the Democratic Party. With the party's leadership in his hands the industry feels assured that no unsound foray into the regulation of the coal industry will be advocated during the campaign by the Democrats or put forward by the party if it be vested with the administration of the government.

Had one of demagogic tendencies been selected as the Democratic standard bearer the regulation of the coal industry easily could have been made one of the major talking points. There would have been the further temptation to do it because it is known that Senator La Follette will make it one of his principal issues. While the Democratic platform mentions by name only the anthracite industry, it is a fact that the original draft of the plank applied to the entire coal industry. The point was raised in the resolutions committee that there is nothing in the bituminous-coal industry which possesses a semblance of monopoly.

New England Hits at Anthracite

Since it was really anthracite at which the New England members of the committee were striking, there was no objection to confining the specific mention to that type of coal.

With Mr. Davis as the Democratic candidate, the probabilities are that little will be heard of the anthracite regulation plank. To start with, Mr. Davis comes from a coal-producing state. He is particularly familiar with the bituminous-coal industry and understands the situation in the anthracite region. He knows that it is going to take more than coal to cause the strongly Republican states of New England to abandon their favorite son. The probabilities are that under Mr. Davis' leadership no particular bid is going to be made for the New England vote. He knows that energy can be expended in other states where the prospect of carrying them is better. Moreover, Mr. Davis knows that any proposal to regulate the anthracite industry will be regarded by the bitu-

minous-coal industry as the first step toward the regulation of the latter.

Mr. Davis also knows that it is impossible to regulate profits without regulating prices, and that you cannot regulate prices without eventually regulating wages. He knows just how



©Harris & Evans

John W. Davis

Nominated for President at the Democratic convention in New York City, July 10, on the 103d ballot.

unpopular any such program would be with capital and with labor. Labor might go along on a proposal to nationalize coal mining—although it is divided on that—but it never would seriously recommend that the government undertake the regulation of this speculative and highly complicated industry.

From the standpoint of practical politics it seems improbable that a leader of Mr. Davis' understanding would give emphasis in the campaign to a recommendation which would be overwhelmingly unpopular in the coal-producing states, several of which are of doubtful political complexion. Any proposal to regulate the coal industry from a federal bureau in Washington would be overwhelmingly disapproved in such states as Illinois, Indiana, Kentucky and West Virginia.

The main weakness of Mr. Davis as a candidate, it is asserted, is that he appeals strongly to Republicans but will not get their votes. William Jennings Bryan had much to say at the New York convention about the impossibility of Mr. Davis freeing himself from his allegiance to Wall Street. Big interests have contributed so much to his income that Mr. Bryan, prior to the nomination of his brother as Mr. Davis' running mate, was certain that they would continue to be his master. In that connection, however, it is pointed out that there will be difficulty in convincing the country that Mr. Davis is a creature of Wall Street, since it was he who drafted the Clayton Act, who has more than any other one man, some claim, to establishing the principle that labor is not a commodity and who has been retained by trade unions as frequently as he has been by big business.

The last case he won before the Supreme Court of the United States was for the glass blowers' union, a case involving alleged violations of the anti-trust statutes by the union.

Mine Workers Opposed Davis

At the convention the chief opposition to Mr. Davis' candidacy appeared to come from the United Mine Workers. The United Mine Workers' only argument against him, so far as it could be learned, consisted in the fact that he had represented the Bituminous Operators' Special Committee before the Harding Coal Commission. As in the case with Mr. Bryan, there was no charge that Mr. Davis had made any misrepresentations in his service for the coal operators. The opposition seemed to be based solely on the ground that he had committed the unpardonable crime of having accepted employment at their hands. While Mr. Davis did appear before the Coal Commission in behalf of the Bituminous Operators' Special Committee, his participation was limited to legal questions with which the United Mine Workers probably would take no issue.

Ford Leases Superior Dock

William S. Harmon and Frank L. Stein, receivers for the Maynard Coal Co., of Columbus, have closed a lease with the provision of purchase for the properties of the Superior Coal & Dock Co. at Superior, Minn., to the Ford Motor Co. The deal has been pending for some time and the approval of the court was given July 12. The lease carries with it the privilege of purchase within a year at the announced price of \$650,000 and accrued taxes of \$8,500. The Ford Motor Co. will take possession of the dock at once.

No Early Change Likely in Rules for Mine Rating and Car Distribution

No changes in the rules governing the ratings of coal mines and the distribution of cars to these mines seems probable at this time. It is confidently predicted by those who oppose any change in the present rules that the Interstate Commerce Commission will give the existing rules a thorough trial before ordering any change. The questions asked by members of the commission indicate that there is little disposition to put into effect the recommendation in this regard of the Harding Coal Commission.

The National Coal Association in opposing any change, urging that present rules be continued until there has been experience with them under car shortage conditions. In fact the association took the ground that the commission does not have the authority to promulgate an order placing mines on a commercial basis until there is a finding that the present rules are in violation of the statute. The National Coal Association believes that the commercial basis would produce discrimination between seasonal and non-seasonal mines and between large and small operators, and would place in the hands of the carriers an implement which could be used most insidiously were they inclined to discriminate. Issue also is taken with the claim that the proposed rules would eliminate the economically unnecessary mine or that they would simplify railroad operations.

Gutheim Presents Case

On behalf of the Pittsburgh Coal Producers' Association, August G. Gutheim contended before the commission that "the rating of bituminous-coal mines for car-distribution purposes, based wholly or in part upon the commercial ability of such mines to sell coal the year round, would be unjust, unreasonable and would discriminate unlawfully against coal operators and against the railroads."

Some of the contentions set forth by the Bethlehem Steel Corporation follow: "Bethlehem operates seven large steel plants with a coal requirement at full

operation of about 12,000,000 tons annually. It owns 31 coal mines, operating 25 tipples, with an annual capacity of about 10,000,000 tons. Practically speaking, Bethlehem is a self-contained industry as to its fuel supply.

"When Bethlehem's steel plants are running full, they take all the coal its mines can produce. The steel business is subject to sharp fluctuations. At the present time Bethlehem's plants are operating at 40 per cent of capacity. Under these conditions, which are recurring and not unique, Bethlehem's mines have a potential production of 6,000,000 tons which its plants do not need. It is Bethlehem's established policy not to mine and ship this coal but to confine the operation of its mines to the current needs of its steel plants. Operating its mines in this way, and using its 4,000 private cars to move its own coal, as needed, Bethlehem has obtained a satisfactory supply of the special fuel it needs, without becoming a disturbing factor in either the commercial coal market or the distribution of system cars. Its private cars have been sufficient to serve fully its mines and these mines have made no call on system cars in times of car shortage.

Waste in Commercial Rating

"If Bethlehem were forced by the adoption of the proposed commercial rating rule to enter the commercial coal market with its 6,000,000 tons of unneeded production, the result would be waste and financial loss to Bethlehem and an aggravated depression to the commercial coal industry, already suffering from slack demand and overdevelopment.

"Bethlehem's study of the question of mine ratings in this proceeding has confirmed its earnest conviction that for the best interests of all concerned an industry owning its own coal mines and consuming their entire output should be permitted the use of private coal cars for that purpose. Thus and thus alone, can such in industry withdraw alike from the competition of the commercial coal market and the competition for system cars."

Besson Must Pass Test, Court Decides

Leon Besson, Governor Davis' new head of the Kansas mine inspection department, succeeding James Sherwood, must pass that qualifying examination after all. The State Supreme Court has decided it. When he was appointed and the appointment was ratified by Governor Davis' two appointees on the Kansas Industrial Court, the third member, Presiding Judge John H. Crawford, protested that he was being railroaded into office and should be required to pass the examination for "deputy mine inspectors," a phrase used in the law covering the matter. Governor Davis and Besson contended that Besson was appointed as "state mine inspector" and therefore the law did not apply.

Two days following the ouster decision Presiding Judge Crawford announced that he and Judge Martin had appointed Ernest Shaw, chief deputy, to act as inspector. Besson continued at his office. He said he would do so until he received an official order from the Industrial Court to vacate it.

K. U. Meguire to Open Big Strip Pit in West Kentucky

The Dawson Daylight Coal Co., in the Dawson Springs district of western Kentucky, which is controlled by K. U. Meguire and associates, of Louisville, is getting ready to launch what may be the largest coal stripping operation in the State of Kentucky. A branch line of the Illinois Central R.R. to this property was more than a year late in finally connecting it with the outside world, but the company, while handicapped in the matter of getting material and equipment to the property, has made headway and completed a tipple with a capacity of 5,000 tons of coal daily, or about 100 cars, before the railroad reached the property. At the present time the company is assembling a Bucyrus No. 320 revolving steam shovel with a 7-yd. bucket, which will be used for removing overburden.

This will represent the first invasion of the Meguire interests into the west Kentucky coal fields, the company having heretofore operated in eastern Kentucky exclusively, with some big plants in both the Harlan and Hazard fields.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of June

(In Net Tons)

Ports	Railroads	1924			1923			1922		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo.....	Hocking Valley.....	2,283,927	67,447	2,351,374	1,553,478	45,717	1,599,195	1,179,017	29,241	1,208,258
	N. Y. C.-Ohio Central Lines	4,505	227	4,732	642,792	19,653	662,445			
Sandusky.....	Baltimore & Ohio.....	468,692	14,834	483,526	723,174	21,577	744,751	1,433,897	31,949	1,465,846
	Pennsylvania.....	637,844	19,219	657,063	835,312	24,321	859,633	768,563	17,986	786,549
Huron.....	Wheeling & Lake Erie.....	262,486	12,726	275,212	504,478	18,071	522,549	7,612	334	7,946
Lorain.....	Baltimore & Ohio.....	454,962	42,758	497,720	968,567	58,641	1,027,208	17,820	9,491	27,311
	Pennsylvania.....	350,273	55,631	405,904	641,445	53,040	694,485	43,358	12,114	55,472
Cleveland.....	Erie.....	113,021	3,631	116,652	358,487	15,176	373,663			
	Baltimore & Ohio.....	151,589	33,491	185,080	224,947	20,860	245,807			
Fairport.....	New York Central.....	326,648	38,807	365,455	1,372,834	79,608	1,452,442	31,083	9,163	40,246
	Pennsylvania.....	321,273	27,629	348,902	640,104	26,908	667,012	28,342	6,456	34,798
Conneaut.....	Bessemer & Lake Erie.....	557,685	81,051	638,736	958,390	58,164	1,016,554	42,257	743	43,000
Erie.....	Pennsylvania.....	137,330	24,161	161,491	207,098	26,551	233,649	28,607	13,789	42,396
Totals.....		6,070,235	421,612	6,491,847	9,631,106	468,287	10,099,393	3,580,556	131,266	3,711,822
*1923 Storage Loading		182,060	4,940	187,000						

* Coal loaded into vessels in December, 1923, after close of navigation and forwarded during 1924 season of navigation. Compiled by Ore & Coal Exchange, Cleveland, Ohio.

Electric Lamps Now in Use In Oklahoma Mines

The chief mine inspector of Oklahoma is losing his fight against the use of electric cap lamps in the coal mines of that state. The District Court at Oklahoma City has restrained him from preventing the use of such lamps and about 900 men wearing them have gone back to work in the three mines of the Rock Island Coal Mining Co. at Hartshorn. Inspector Ed Boyle has appealed to the Supreme Court of the state, but the lamps are in use and the company is producing coal once more after a shutdown lasting more than six weeks, during which the whole region has been upset by the violence of the argument over lamps.

The controversy has been brewing for two years, or ever since the Rock Island company put electric cap lamps into its No. 12 mine. A year ago when a district inspector ordered them into the company's other two mines with the company's entire consent, the chief inspector objected strenuously.

After John L. Lewis, president of the United Mine Workers, had helped write an electric-lamp provision into the wage agreement for the Southwest district early in May and the Rock Island company bought lamps for its whole group of mines and started their use, Chief Inspector Boyle went on a rampage, ordering the use of nothing but carbide lamps in Oklahoma and posting notices at the Rock Island mines threatening arrest for anybody who wore them and court action against any company that tried to use them.

This produced a strike at the Rock Island mines, fostered by an Alexander Howat element which is in control of the district union. Many mass meetings and much uproar followed before the mines reopened early this month under court protection.

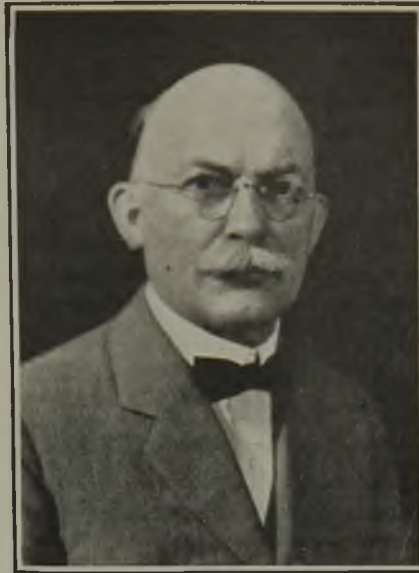
Boyle "Knocks" Electric Lamps

In spite of the claim of the company and of Bureau of Mines engineers that electric cap lamps are safest in gas, Chief Inspector Boyle contends they are dangerous. In a public statement he set forth his case thus:

"With an open-flame lamp the miner can tell by the flame the condition of the atmosphere. When conditions are dangerous, the flame is straight and does not quiver. He knows there is danger.

"The closed lamp gives less than 1 candlepower; the open flame lamp gives 5 candlepower. If you were digging coal in the bowels of the earth, which would you prefer? The Rock Island Coal Co. has used open-flame lamps down there for twenty years with the best of results. Why quit? Oh, just to save a few dollars. The lives of the men are worth saving too. That is what this department is for.

"Ninety per cent of the accidents in mines in this state are caused by other than gas explosions. L. C. Ilsley, engineer of the Bureau of Mines, Washington, D. C., testifying before the congressional committee after the Virginia mine explosion said: "The explosion was caused by an unapproved



©Underwood & Underwood

C. W. Bryan

Governor Bryan established 158 coal stations in Nebraska and claims to have saved consumers \$10,000,000 in their coal bills.

electric coal drill; that in Pennsylvania by an unapproved electric coal cutting machine; that in Utah by an unapproved flame safety lamp.

"The idea is that the closed lamp without proper electric insulation throughout the mines is very dangerous because of fire flashes."

Court of Appeals Affirms Decision Against Company In Coronado Coal Case

A decision of the Eighth Circuit Court of Appeals, filed at St. Louis, July 12, affirms the unanimous ruling against the Coronado Coal Co. made by the U. S. Supreme Court, June 5, 1922. The opinion was written by Judge William S. Kenyon and concurred in by Judges Walter H. H. Sanborn and Robert E. Lewis. This apparently brings to an end the ten years of litigation in which the Coronado company vainly sought to recover treble damages, amounting to \$600,000, from the United Mine Workers for destruction of property by striking miners at the Bache-Denman mines in Arkansas in 1914.

The case had been remanded by the Supreme Court in 1922 for a new trial after a lower court had given judgment to the Coronado company for \$200,000 damages, which would have been trebled under the Sherman anti-trust act.

On the ground that there was nothing in the evidence to show that the International union or International board of the United Mine Workers had authorized the strike or taken any part in preparation for it or in its maintenance or had ratified it by paying any of the expenses, the Supreme Court concluded that the International union and its officers should not have been held by the trial court as subject to joint liability with the district and local organizations and officers for participation in the conspiracy or for the destruction of property incident to the strike.

C. W. Bryan, Nominee for Vice-President, Sold Coal To Consumers in Nebraska

On his arrival at Atlantic City, July 11, C. W. Bryan, Democratic nominee for Vice-President, said of his administration as Governor of Nebraska and his attitude on state ownership:

"We have reduced the price of coal of all kinds from \$3 to \$5 a ton. I furnished coal to municipalities and homes at wholesale. I have been selling it, personally, to 158 towns and cities in Nebraska, buying it in carload lots from the mines. This forced the coal combination to reduce its prices. The people saved \$10,000,000 last year by our coal stand. I am not in favor of federal, state or municipal ownership of anything except natural resources, such as water, but when business combinations, particularly utilities and those supplying vitally necessary products, defy all authority and endeavor to mulct the public, then I think that the government should sternly repress them, using whatever means may be efficient."

Mr. Bryan pursued the same tactics with regard to gasoline and claims that he reduced the price in the capital from 23c. to 17c. per gallon. He proposes to do the same in all sections of the state unless the price is reduced to 15c. He claims to have reduced the cost of road building 25 per cent and the cost of gravel 33 per cent.

Mines Bureau Plans Further Co-operation with British

In addition to interchange of the results of previous research work on safety in mining by the United States and British governments a technical representative of the British government will be assigned to the Pittsburgh station of the Bureau of Mines, while a member of the bureau's technical staff will be accorded similar facilities to observe the progress of British work, said H. Foster Bain, Director of the U. S. Bureau of Mines, on his return from the Empire Mining and Metallurgical Congress in London. The bureau is to undertake tests of the British "permitted" explosives. The British have been less successful than has this country in producing explosives that will give satisfactory service in coal mines.

A. C. Fieldner, superintendent of the Pittsburgh experiment station, with a member of his technical staff, now is in England conferring with the Fuel Research Board of Great Britain relative to the processing and better use of coal. This is in anticipation of the time when it will be necessary to supplement petroleum supplies with benzol and other oils derived from the by-products of the distillation of coal. Every effort will be made to avoid duplication of effort in research work.

Mr. Bain spent much time with Mines Minister Shinwell, and it is entirely probable that co-operation between the two governments will be much broader than is outlined in the actual agreement, which is limited to matters pertaining to safety.

MacDonald, Ousted by Union And Reds, Seeks a Job

Duncan MacDonald, who for a few days was Presidential nominee of the Communist-controlled convention of the Farmer-Labor party at St. Paul, is now seeking any kind of job he can find.

For years MacDonald has been in the limelight in labor affairs in Illinois. He was secretary of the state coal miners' union and president of the Illinois Federation of Labor. But today he is out in the cold.

MacDonald's first clash in organized labor was with Frank Farrington, president of the Illinois Coal Miners' Union. As secretary of that organization MacDonald launched an attack on a series of alleged irregularities in Farrington's office. In the bitter fight that followed, MacDonald was ousted, but he was elected head of the State Federation of Labor through the votes of the coal miners. He met defeat at the next election, however.

At the recent Peoria convention of the Illinois miners' union MacDonald was mentioned as Farrington's probable successor. The miners wanted him to make the race, but advised him to follow a cautious policy. But with apparent success in sight MacDonald joined William Z. Foster and his cohorts in forming a new third party in the state, believing it afforded him the necessary weapon to continue his fight against the Farrington machine.

At the St. Paul convention MacDonald was nominated for President, but last Thursday he was supplanted on the ticket by William Z. Foster. The Muscovite label attached to the St. Paul convention didn't appeal to either the farmers or industrial workers, however, and they indorsed La Follette.

Machine Loader Scale Is Signed in Illinois; Men to Get \$10.07 a Day

Special Dispatch to Coal Age

Chicago, Ill., July 15—A scale for machine-loader operators has been signed in Illinois at last. The Chicago, Wilmington & Franklin Coal Co. has agreed to pay its loader men \$10.07 a day beginning July 16 and during the remaining life of the Jacksonville agreement, to which Illinois is committed.

This scale is not statewide because no other companies have loading machines, but now that a wage rate has finally been fixed, that rate naturally will be the one adopted by any other companies that go in for machine loading. In the agreement it is covenanted that the men are to work under the direct supervision of the company a full eight hours a day, and that in case of machine breakdown they are to perform any sort of labor that may be assigned them. It is "recommended" that they be given hand loading in such cases.

The union agreed to a day wage instead of a tonnage basis of pay because it is evident that the use of loading machines is still in an experimental stage. The scale is to apply to all loader operators, no matter what the developments of loading may be during the life of the agreement. The new scale was fixed at \$10.07 a day largely because that is the rate in Indiana, where a number of loaders are at work. Up to July 16 all the men operating the 14 Joys and the four Myers-Whaley loaders in the Orient No. 2 mine of the company were on development work and received \$8.54 a day and yardage. Under the agreement men on drilling and snubbing get \$8.04 a day. Cutting machine runners receive the union scale of 13c. a ton.

Six Kanawha Companies Now Working Under New Scale

Of the twenty-six companies which joined in posting a new wage scale in the Kanawha region of West Virginia, marking a formal severance of relations with the United Mine Workers, six companies were able to resume operations July 7, under the new scale, according to reports made to the Kanawha Operators Association. The employees were glad to go to work again after an idleness lasting since April 1. The twenty-six companies referred to operate 45 mines in the Kanawha region and up until April 1 operated in agreement with the union.

A number of other companies in the Kanawha field have been operating on a non-union basis since the strike of 1922. The group of operators who have just announced their determination to operate on a non-union basis were unable to compete with the non-union mines when the union demanded that the Jacksonville agreement be subscribed to and hence shut down their mines until such a time as their employees would indicate that they were willing to accept a reduction in order that operations might be resumed. Action taken by the group of 26 operators means that the Kanawha field, formerly a union stronghold, is now almost exclusively non-union.

Receiver Named for Egyptian And O. K. Companies

C. B. Thomas, referee in bankruptcy, East St. Louis, Ill., on July 11, was appointed by Federal Judge English as receiver for the Egyptian Coal & Mining Co. on the application of J. C. Hamilton & Co. of Marissa, Ill., and the Security National Bank of East St. Louis. The Marissa company holds the company's bonds while the bank is trustee under the bond issue.

The action was taken under a petition to foreclose the mortgage securing the bonds, which were issued in November, 1922, in the sum of \$250,000. The proceeds of the bond issue were used to improve the company's properties and to lease the O.K. Coal Co. property adjoining. J. A. Hamilton is president and W. E. Meek, vice-president of both companies.

Under the terms of the mortgage the trustee was entitled to foreclose if the mines were closed down and the bonds and interest not paid. Attorneys for the company admitted this condition and agreed to the appointment of Thomas as receiver. The company has assets estimated at \$450,000.

Last week stockholders of the O.K. company filed suit for a receivership, but this action was withdrawn preliminary to the Egyptian suit.

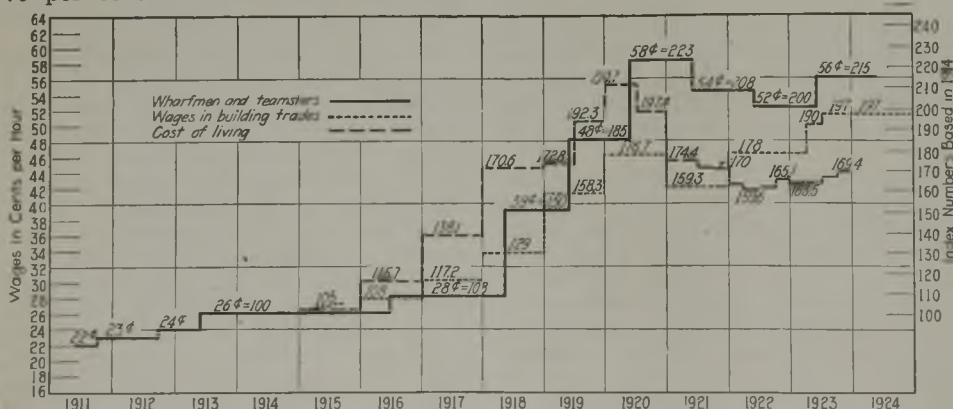
"Soo" Shipments Gaining

Shipments of bituminous coal to the Northwest via the "Soo" Canals during June, according to the U. S. Engineers' office, totaled 1,493,759 net tons, compared with 1,138,398 tons during May. Anthracite shipments during June amounted to 205,342 net tons, compared with 61,084 tons during May.

High Wage Rate of Teamsters Raises Retail Prices

In the accompanying chart is shown how the increase in the wages of wharfmen and teamsters has exceeded in Boston even the increases in the wages of the building trades. Whereas the building wage rates have risen about 70 per cent the wharfmen and team-

sters have been forced up 115 per cent. This probably is typical of the general condition. It will be noted that the wharfmen and teamsters, though their wage increases have been large, are not even now getting startingly high wages. These wage-rate increases, whether justified or not, account in a degree for the high cost of coal at retail.



Comparison of Wages to Wharfmen and Teamsters with Cost of Living and Wages Paid in Building Trades in Boston, Mass.

Above the heavy line representing the wages paid to wharfmen and teamsters is placed the hourly wage paid between 1911 and 1924. To this is appended after 1913 the comparative rate per cent that any one wage rate bears to that ruling in 1914.



Practical Pointers For Electrical And Mechanical Men



Where Combination Locomotive at Mine Meets Unusual Conditions

A mining engineer recently presented an interesting haulage problem that can be solved practically in only one way. The conditions at his mine were such that coal cars from an opening near the tippel had to be transported over a short stretch of the railroad track before they could be unloaded. It was impossible to lay a mine track parallel to the railroad because a large building was on one side and a creek on the other. It was therefore necessary to use one rail of the railroad track and place another to suit the gage of the mine cars. When this was done another problem presented itself.

The haulage locomotive selected for this service was of the trolley type and therefore it was necessary to provide a trolley circuit where the locomotive was to travel. To meet the railroad rules it was impossible to install the trolley wire near enough to the railroad track to permit the use of a trolley pole of reasonable size. Hence the ordinary trolley locomotive would not meet the conditions.

A combination trolley and battery locomotive was suggested. When the locomotive would operate over the railroad track the battery power would be used but when the locomotive would be on other sections of the track both inside and outside the mines the power supply would be furnished from the trolley circuit.

Though the combination locomotive is peculiarly suited to the needs of this peculiar condition it is well to remember that it would have a place in this mine or in other mines apart from any such unusual problem having to be solved. In what follows some advan-

tages will be discussed that have no connection with the problem stated but would be found available in other operations. These advantages are cited so as to complete the record.

Another advantage that would not apply to the problem under discussion is as follows: Combination locomotives can be, and are, used for switching loaded cars at the bottom of shafts after the main-line motor has brought the trip to the point near the shaft where it makes a flying switch to the empty track for its trip of empties. It is also used to handle the cars on and off the cage.

Combination locomotives operate efficiently from both trolley and battery. The battery can be charged while the locomotives are operating from the trolley, except in the very low types the limited height of which does not allow room for the charging equipment.

Where a main-line motor is out of commission temporarily, the combination locomotive can take its place and keep cars moving and coal coming to the dump. Where power is not kept on the line at night the combination locomotive with the battery which has been fully charged during its operation on the trolley in the daytime can be used for the night shift to deliver men or material to any point where work has to be done, the power being furnished by the battery. Such a locomotive will soon pay for itself in general utility service alone. In case of trouble or accident, the utility locomotive is always ready to run to the scene under its own power even though the power lines may be out of commission.

In many situations, combination loco-

motives save a large investment in trolley wire, bonds and feeders by doing all the gathering and entry hauling on battery power and only operating on the trolley where the work to be done justifies the installation of wires, feeders and bonds. New mines are being laid out so that the trolley wire with its necessary feeders and bonded track is confined to the main-line hauls, the work on the cross or butt entries and in the rooms being taken care of by battery power entirely.

Advantage of High-Voltage Distribution in Mines

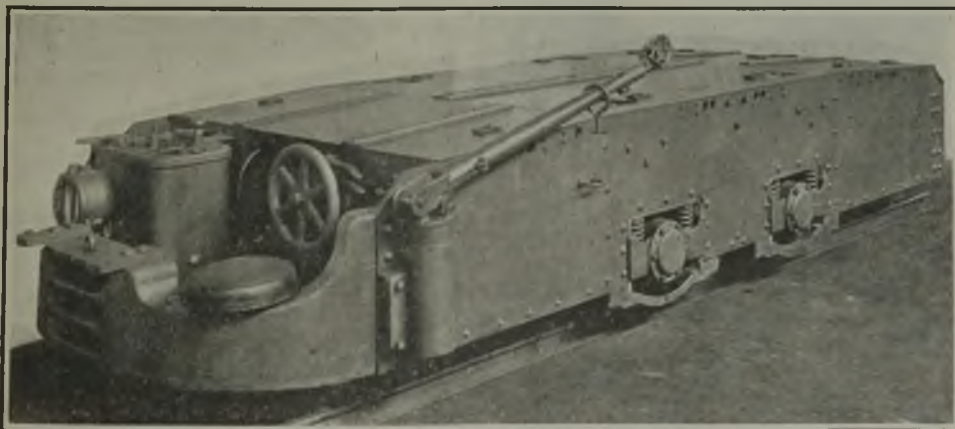
In a coal mine, an electric pump is operated at a point about a mile from the foot of the shaft. It receives its power supply from a three-phase alternating-current circuit, consisting of No. 6 copper wire. The line runs down the shaft and through the gangways to a point near the pump where it delivers 2,200-volt energy to a bank of transformers. At the transformers, the voltage is reduced to 220 volts and then supplied to the pump motor. For safety purposes it is desired to reduce the distribution voltage from 2,200 volts to 440 volts and transmit the pressure at this voltage to a bank of transformers near the pump and there reduce it to 220 volts for the motor. Is this a good idea, will the pump operate as well as at present?

A SUBSCRIBER.

The size of the motor mentioned in this problem is not stated. For this reason we will have to make several assumptions. The motor is probably an induction-type alternating-current unit and an understanding of its characteristics will no doubt help us reach some satisfactory conclusions.

Most induction motors are designed and rated with the idea that they will operate satisfactorily with 10 per cent over-voltage, or 10 per cent under-voltage. Although this is true every effort always should be made to supply induction motors with normal voltage. The torque of this type of motor decreases rapidly with even a slight reduction of voltage; for example, when the motor is supplied with a pressure 10 per cent below normal, the torque decreases to about 81 per cent.

Hence, it is important that every induction motor be connected to circuits capable of furnishing as near full normal voltage as possible. This fact is not always given due consideration, and it is not at all unusual to find coal companies investing large sums of money in bigger motors than needed, in order to get sufficient torque to



Low-Type Battery and Trolley Locomotive

One important advantage of the combination-type locomotive is that it carries its own power plant and therefore causes no voltage drop for other equipment or its own motors when operating from its batteries. Full voltage can be obtained from the battery just as long as it is not discharged unduly.

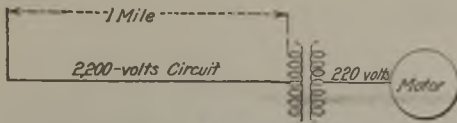


Fig. 1—High-Voltage Distribution

By transmitting the energy at 2,200 volts the low currents permit the use of small wires and the per cent voltage drop is low.

operate machinery supplied from below-voltage power circuits.

This practice of over-motoring equipment driven by electric motors introduces poor power-factors and aggravates the conditions. By decreasing the distributing voltage from 2,200 to 440 volts, the current required for a given load increases to five times its original value. The Underwriters recommendations as to wire sizes show us that a No. 6 wire is capable of carrying 50 amp. To carry five times this current, a wire slightly larger than 4-0 would be required.

Although the power to be transmitted, is not stated in our problem, it is probable that the full load current in the transmission line is about 25 amp. The same power transmitted at 440 volts would therefore require about 125 amp. It is well to note that the area of the conductor, expressed in circular mils has been increased about eight times. This is due to the greater heating capacity of the larger current.

Whether the pump motor will operate satisfactorily depends not upon the transmission voltage, but upon the voltage supplied directly to the motor. The transmission voltage may be high or low, efficient or inefficient, but if the secondary voltage of the transformers

Table Showing Voltage Drop

Volts	Amperes	Wire Size	Drop in 10,000 ft.	Per Cent Drop
2,200	25	6	100	4.5
440	125	4/0	60	13.6

is 220 volts, the motor will operate very satisfactorily. Whenever the transmission voltage is low, the transmission current is high. Unless large conductors are used for carrying heavy currents the voltage drop in the transmitting circuit will be high, and the transformers will not receive the proper primary voltage. Usually when voltages lower than normal are furnished to a transformer the secondary circuit supplying the load has a correspondingly low pressure.

Assuming a simple circuit 10,000 ft. long supplied first by 2,200-volt energy, and secondly supplied by 440-volt energy. In transmitting 25 amp. of current at 2,200 volts over a No. 6 wire, the drop is above 4.5 per cent. The same power transmitted at 440 volts over a 4-0 wire has a drop of 13.6 per cent. Consequently, trans-

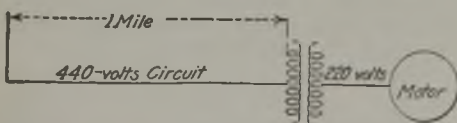


Fig. 2—An Expensive Circuit

Unless very large conductors are used the power loss in the line and the voltage drop is excessive. It is also unusual to transform from 440 to 220 volts. The cost of the transformers and the transformer power losses generally warrant buying a 440-volt motor.

formers supplied from the 440-volt line will receive less than the normal 440 volts and unless sufficient transformer taps are supplied in the transformer winding the secondary voltage supplying the motors will be abnormally low.

Using Special Wheels for Polishing Materials

If a very high polish is required on a piece of material it can be obtained by buffing. Wheels used for this work are usually made of felt. There are many kinds of felt wheels on the market, Mexican gray felt being the most popular. It is relatively cheap, yet gives good service. For best results a buffing compound should be

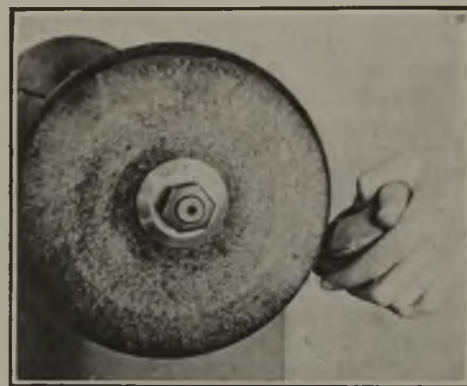


Fig. 1—Applying Buffing Compound

To secure a high polish on a piece of material a felt wheel prepared with a buffing compound, usually of crocus is used.

applied to the wheel, as in Fig. 1. Fig. 2 shows a piece of material being polished on a soft wheel in preparation for the buffing operation. The composition used on these buffing wheels for general work is usually in the form of sticks or cakes. As a rule these cakes are compressed tallow or some other heavy grease, containing a polishing material such as tripoli, crocus, rouge, flour, emery, etc. Polishing and buffing

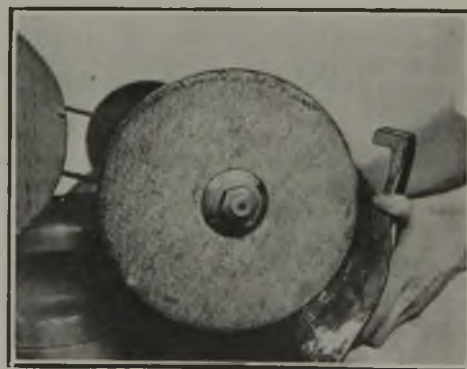


Fig. 2—Preparing Material Before Using Buffing Wheel

By first polishing the material on a canvas wheel the buffing operation can be made more satisfactory.

wheels are made in sizes ranging from 6 to 18 in. diameter and 1/2 to 2 1/2 in. thick.

A good cement for cementing emery cloth to wooden wheels consists of 4 1/2 lb. of rosin, 3 lb. or paraffin, and 9 oz. of vaseline. The ingredients are melted and mixed thoroughly. The surface of the wheel is heated and the mixture spread on the wheel. The emery cloth is then rubbed down to

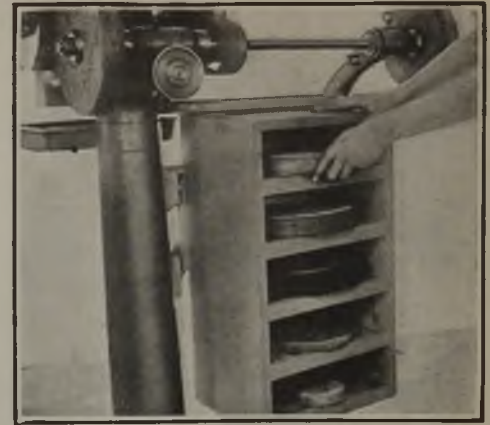


Fig. 3—Box for Grinding-Machine Parts

A cabinet provided near the stand will make it much easier for the workman to put the supplies in a safe place.

exclude all air sacs. Allow the cement an hour or two to set, and it is ready for use.

To protect wheels from severe misuse they should be stored properly when not in use. In Fig. 3 is shown an inexpensive means of storing grinding-stand supplies in a convenient but substantial box. It is much better to arrange some kind of protection for these supplies than to permit them to be abused by allowing them to lie on the floor. With the storage case near the machine there is always a better chance to have the wheels put away properly.

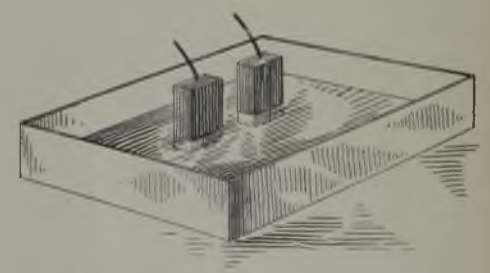
G. H. RADEBAUGH.

Prevents Burning of Brushes

The application of oil on the commutator of electric machines will often stop sparking. This is especially true of machines fitted with carbon brushes when the spring tension is too great. The oil temporarily reduces friction and heat but should be used sparingly.

A few weeks ago we were having considerable trouble with some brushes on our generator and I put about 1/2 in. of engine oil in a tray and placed it over one of the steam pipes in the engine house. The brushes were stood on end with the beveled edges in the oil. After the brushes had stood for a few hours they were wiped and again put on the machine. The sparking stopped immediately. I find that this treatment allows these brushes to absorb enough lubricant to operate satisfactorily for almost six months. The treatment must be repeated occasionally as the brushes wear down because the oil does not penetrate very deeply.

ELECTRICIAN.



Lubricating Generator Brushes

By letting the brushes stand in a pan containing about 1/2 in. of lubricating oil they soak up sufficient lubricant to keep them from causing any undue sparking at the commutator. This process has to be repeated about every six months because the oil does not penetrate very deeply into the carbon.



Production And the Market



Hesitant Tendency Holding Back Expected Revival In Bituminous-Coal Business

Clutching at any straw within reach, the coal industry rejoices that the long-drawn-out convention of the Democrats has finally come to an end and heaves a sigh of relief that the choice of a candidate fell to one not likely to indulge in rampages for regulation if his campaign for election should prove successful. Whether this is the herald of the early approach of the long hoped-for upturn in business or not it marks the passing of what in some quarters has been regarded as one of the obstacles in the path of business resumption. What the others may be, other than the usual hesitant attitude while waiting to see which way the political wind will blow, doesn't seem to be clear. At any rate, caution continues to dominate the coal business in the leading markets of the country, consumers showing a reluctance to buy except for immediate needs or when distress coal may be picked up at a sacrifice.

Kanawha Mines Working with Lower Scale

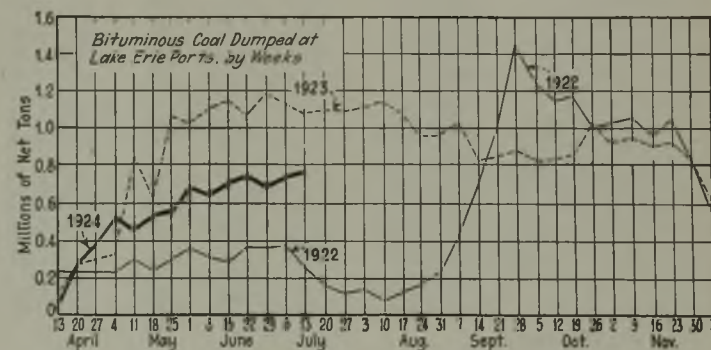
Since twenty-six operations in the Kanawha field last week posted a scale of wages cutting tonnage rates to the same level as the 1917 rate and placing day wages somewhat above the basis of that scale six companies have resumed production. One of the most encouraging developments of recent weeks is the announcement that six textile plants are about to reopen—three in Massachusetts and a like number in Connecticut.

Coal Age Index of spot prices of bituminous coal sticks uncomfortably close to the unprofitable low level of recent weeks, the figure for July 14 having receded to 162, the corresponding price for which is \$1.96.

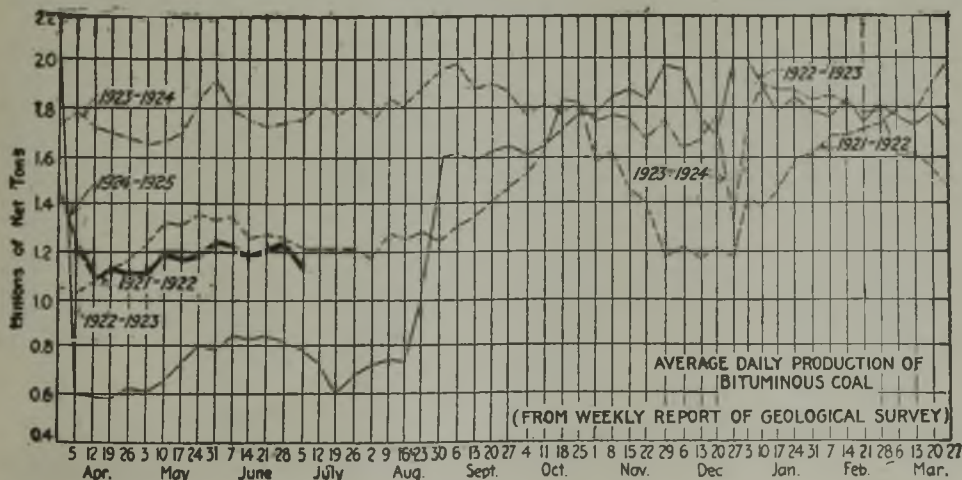
The holiday week end played havoc with traffic at Hampton Roads, dumpings of coal for all accounts during the week ended July 10 totaling 236,520 net tons, a slump of more than 165,000 tons from the previous week, when 401,935 net tons was dumped. Coal dumped at Lake Erie ports during the week ended

July 12, according to the Ore & Coal Exchange, was as follows: Cargo, 731,438 net tons; fuel, 48,062 tons. The totals for the preceding week were 712,277 net tons of cargo coal and 40,966 tons of fuel coal.

Bituminous production also received a severe setback because of the holiday, output for the week ended July 5, according to the Geological Survey, totaling only 5,755,000 net tons, compared with corrected returns of 7,371,000 tons for the previous week. Anthracite output likewise slumped, the figures being 1,296,000 net tons. This compares with 1,918,000 tons produced during the preceding week, according to revised returns.



The customary summer quiet characterizes practically all branches of the anthracite trade. Demand, as usual, is best for stove coal, being sufficient to take care of the output. Egg and chestnut also are moving well, though dependent in a degree on the call for the more popular stove. Pea, however, is causing some difficulty, many of the larger companies stocking it. Steam sizes are in weak demand. Independents' prices hold fairly firm on stove, but occasional concessions are made to move the less active sizes. A number of the smaller independent operations, it is reported, have not resumed production since the holiday because of the falling off in demand.



Estimates of Production

(Net Tons)
BITUMINOUS

	1923	1924
June 21	10,422,000	7,202,000
June 28 (a)	10,458,000	7,371,000
July 5 (b)	8,742,000	5,755,000
Daily average	1,748,000	1,151,000
Cal. yr. to date (c)	279,553,000	231,971,000
Daily average to date	1,770,000	1,469,000

ANTHRACITE

	1923	1924
June 21	2,042,000	1,823,000
June 28	2,105,000	1,918,000
July 5	1,580,000	1,296,000
Cal. yr. to date	52,749,000	46,921,000

COKE

	1923	1924
June 28 (a)	399,000	125,000
July 5 (b)	376,000	95,000
Cal. yr. to date (c)	10,378,000	6,177,000

(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 Lives on Hope

Nobody made any money out of the Midwest coal market during the past week. Trade could hardly be any deadier. Last week's slight increase in Illinois, Indiana and Kentucky production was not at all well received. A slight firming up of steam sizes was noticeable for a few days, but even that did not last. Domestic business is absolutely flat. The trade continues to count on inevitable business cropping up any day.

Smokeless business is sagging a little more. The \$2 mine price on mine run is not attracting anybody and the little coal that is moving is forced at less than that in spite of circular. Anthracite also is dead. The first real hot weather of the summer in the Chicago region and continued heat in the belt from Des Moines and St. Louis east across Iowa, Illinois and Indiana kills about all the retail yard business there is.

Southern Illinois producers are not expecting much from the new move in the Northwest to get the I.C.C. to reconsider its recent rate decision which hiked the cost of shipping by rail into Minnesota. They are counting on the increase to take effect Aug. 21, as scheduled, and expect to see some business taken away from them by the docks.

Continued quietness prevails over the entire southern

Illinois field. Everything is practically at a standstill, outside of a little railroad coal. "No bills" of all sizes are on hand and mines that a few weeks ago were getting a couple of days a week are practically idle. A little movement to the Northwest is noted occasionally on lump and egg. The same conditions prevail in Duquoin and Jackson County.

The Mt. Olive field is shipping on a few railroad contracts to the Northwest. The Standard field also is at its worst. Everything seems to have come to a dead stop. All sizes are on track and coal is sold below cost and the trade is hopeful that things will soon begin to pick up.

In St. Louis the usual midsummer vacation period has just about killed the retail coal business. There is absolutely nothing doing, except the public-school business and a little apartment storage. Country domestic begins to show signs of a little life, but country steam is pretty well shot.

Kentucky Is Whistling

Generally speaking business at Louisville is showing some signs of life, there being better inquiry and better general outlook, but there hasn't been much increase in tonnage. The steel and metal-working industries continue buying slowly along with the auto, ice and cold-storage interests, while railroad consumption appears to be a shade off and utility movement would not indicate that the utilities are

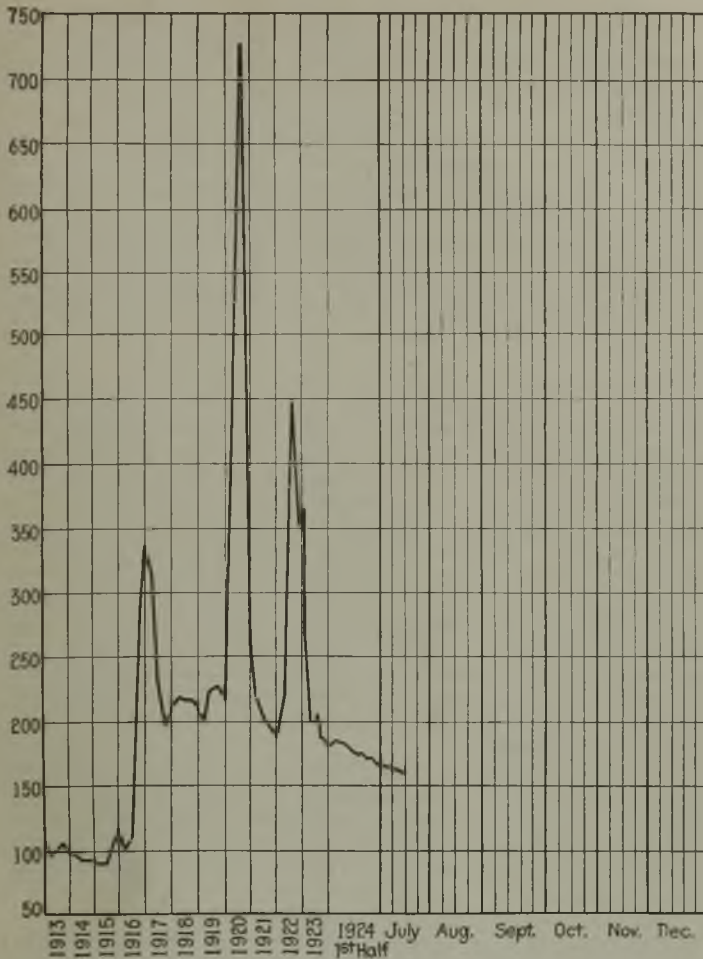
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Table with multiple columns for coal types (Low-Volatile, Eastern; High-Volatile, Eastern; Midwest; South and Southwest), market quoted prices, and spot prices for various dates (July 16, 1923; June 30, 1924; July 7, 1924; July 14, 1924).

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

Table with columns for coal types (Broken, Egg, Stove, Chestnut, Range, Pea, Buckwheat, Rice, Barley, Birdseye), market quoted prices, freight rates, and spot prices for various dates (July 16, 1923; July 7, 1924; July 14, 1924).

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



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

Index	1924			1923
	July 14	July 7	June 30	July 16
Weighted average price....	\$1.96	\$1.99	\$2.01	\$2.40

This diagram shows the relative, not the actual, prices on four-teen 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.

rushed. General movement from eastern Kentucky has been quite fair, in spite of the fact that the movement to the Lakes doesn't show up as well as that of last year.

Retailers have been getting a better volume of business, but locally and in districts close to coal fields the retailers appear to be buying for immediate use and making no effort toward yard stocking. Movement to the Southeastern textile districts continues dull, as the textile trade is not busy. However, there has been some very fair scattered movement to Michigan and as far as Canada, moving over three and four railroads in some instances, and some movement West and Northwest. Prices show no change.

In western Kentucky the situation is not inspiring. Although four of the St. Bernard mines are trying to run non-union, the production of the field is not picking up much. The strike paralysis grips most of that end of the state. The strip mines are doing fairly well, however.

Smokeless originating in southern West Virginia occupies a relatively stronger position than high volatile. Smokeless output is about 700,000 tons a week, nearly half of which is coming from the Pocahontas region. There continues to be a strong demand for low volatile lump and egg. There is not much activity in the buying of high-volatile fuels except for the tonnage moving to lake points.

Northwest Idles Along

Trade is still dull at Duluth. Kentucky lump has dropped to \$6, splint run of pile is up to \$5 and Pocahontas mine run is off to \$5.25. These prices are not considered as indicative of anything but slight readjustment. The de-

mand from steam plants which have been compelled to operate because of the low water has fallen off and docks are feeling the loss of this trade.

Railroads are taking lots of dock coal. Shipments last month ran to 13,401 cars. In all about 90,000 cars went out the first six months of this year as compared with 66,000 in the first six months of last year.

The docks will have to hurry if they are to have enough coal to go around this year, according to comparative figures of the past few years. About 7,000,000 more tons is needed, as only about 2,000,000 tons of all sorts of coal has been brought up so far, and about 3,000,000 tons was on the docks when the season opened.

Anthracite is very dead. It does not seem possible to make the buyers start laying in their winter's coal.

The general free-for-all on prices at the Twin Cities seems to have reached the point where general blood-letting was not beneficial to any of the patients, and there is something of a stiffening. Dock prices are around \$3.75 for screenings and \$5.75 for Youghiogheny lump and \$5.25 for Hocking lump. All signs point to a reaction that will give the coming autumn a better demand than has been experienced in several seasons. Commercial and industrial conditions are fairly promising and crops generally seem to be in good shape.

The Milwaukee coal market is at a normal summer level, which means monotonous dullness. Hopes of a betterment during July have been dissipated. There have been no changes in prices. Cargo receipts of coal by lake since the opening of navigation have passed the million-ton mark, the aggregate up to date being 329,538 tons of hard coal and 699,083 tons of soft coal, or 1,028,621 tons in all. This total is about 50 per cent less than the total up to this date last year.

West Generally Quiet

Little activity is reported through the Southwest. The demand for threshing coal, as compared with that of other years, has been good, but this takes a small volume of fuel. During June there was some storing of domestic coal, principally semi-anthracite, by householders. Dealers, however, apparently were buying only to supply the current demand. This remains steady in spite of a 50c. increase in the retail price of Arkansas semi-anthracite to \$11.35. No change has occurred in wholesale quotations, which remain \$5.50@\$6 for lump, \$3.25@\$3.75 for mine run, and \$2 for screenings.

Kansas coal prices are: Lump, \$4.50; nut, \$4; mine run, \$3.50; and screenings, \$2.50. Henryetta (Okla.) coal is: Lump, \$4; nut, \$3.50; mine run, \$3; and screenings, \$2.

Very little change is noted in Colorado except for a slight pick-up in the movement of coke. Mines worked on an average of 20 hours last week and attributed 46 per cent of the working time lost to "no market." Prices remain unchanged.

Salt Lake City coal dealers have increased their prices as follows: Utah lump, \$8@\$8.75; domestic lump, \$7.50@\$8.50; nut, \$7@\$8; pea coal and slack remain \$6 and \$5 respectively. Stove coal, which has been retailing at \$7.25, will not be made hereafter. The announcement of this increase has increased the storage orders slightly.

Bottom Drops Out at Cincinnati

The bottom has dropped out of the Cincinnati market. Steam buyers are not even interested in very low spot quotations, most of them having ample unused reserves, due to suspended or considerably reduced operations. Domestic retailers, who had placed large orders for July delivery in the belief that the usual buying by the householder would be in evidence this month, are canceling most of these orders because the customary business has not shown up for them, while there is an almost complete dearth of new orders. The usual volume of thresher's coal is going out, but the farmers are not buying winter supplies.

Buying at Columbus is limited to present needs and there is little to break the monotony. Domestic demand has slumped. What coal is moving is mostly of the smokeless varieties and splints. Hocking and Pomeroy grades are exceedingly dull. Retail prices are fairly steady at former levels. Little change has taken place in the steam business. Many of the heavy users are not in the market, as consumption in many lines has been reduced owing to industrial conditions. Utilities and railroads are the best



users. Contracting is not much, as most of the buyers are picking up cheap consignments of distress coal. School coal is moving in fair quantities. Lake trade is steady, although there is a plentiful supply of bottoms.

Demand is lackadaisical at Cleveland. Despite various quantities of distress coal appearing from time to time, spot prices continue stable. Business conditions are no better; if anything, they are slightly worse, judged by the barometer of railroad traffic. The producing end of the trade is optimistic in the belief that the next change in conditions will be upward, because fuel preparations for the coming autumn and winter must shortly begin. While some more small mines have closed, there are reports of resumption by some of the larger companies, one company with two mines of 1,800 tons per day capacity starting up this week.

Further stagnation has hit the Pittsburgh market. Even local consumption has declined enough to make a difference in the total operation of the district, which has been running at but little above one-eighth of capacity, against about one-fifth in April and May. Of domestic demand there are as yet practically no signs.

Industries at Buffalo that have been losing ground considerably of late find no consolation from the coal trade. It is at the bottom and seems to be finding a new and lower bottom now and then.

New England Trade Light and Fitful

To New England buyers there seem to be no present inducements. The industries are under severe curtailment because of lack of business, and not yet is there enough prospect of better markets to warrant purchases of fuel beyond ordinary summer reserves. A few of the smaller textiles have so reduced their stocks of coal that they are making inquiry for September and October delivery, but there is no volume to this business and it will only replace the tonnage which still other plants of the same character will stop taking.

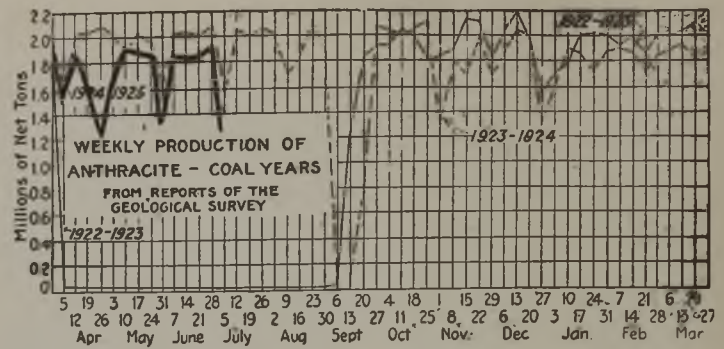
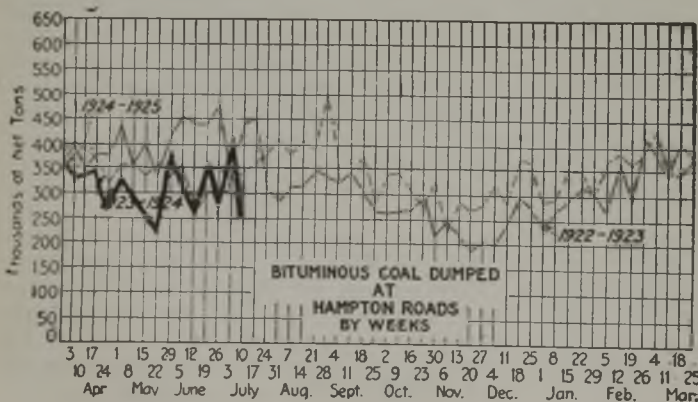
At Hampton Roads there is no special change. Accumulations are only moderate, but spot sales are by no means dependable. It is only the staple contract trade that is absorbing its share of current output, and there is still some fluctuation of prices in the effort to make sales that will move demurrage coal. No. 1 Navy standard coals can be bought at \$4.25@4.40 per gross ton f.o.b. vessel, with second grades at 15@35c. less. The larger agencies are following a very close-hauled policy in the effort to avoid being pressed to move current output.

For inland delivery at this end there is little to report. The dullness that has now spread over so many months has discouraged for the most part the practice of forcing cargoes on a reluctant trade.

All-rail from central Pennsylvania there is a little business being done by standard shippers who are both anxious to keep mines in operation at least a part of the time and are willing to meet conditions. A few of the quality grades from Cambria County are selling well down to \$2 per net ton at the mines, but the market in this territory is still restricted to points well away from tidewater.

Demand Weak in Atlantic Seaboard Markets

Lack of demand, low prices and an accumulation of coal characterize the New York tidewater market. There have been daily averages of between 1,500 and 1,600 cars of coal at the local piers, with the result that in order to save demurrage charges some shippers find it necessary to let



their holdings go at less than current quotations. Many soft spots are reported, but market quotations are about on last week's basis. Reserve stocks are dwindling and consumers continue to withstand the warnings to replenish, hurled at them from all directions. Demand along the line continues slow and uninteresting. Spot coal buyers are scarce and most of the output moves on contract.

The holiday shutdown was of scant help to the Philadelphia market. Despite the lack of buying, there are evidences of better times. Shippers report an increase of inquiries for prices lately, and have been able to develop some business from them. There has also been a stir among the utility consumers. Prices remain at last week's quotations, and seem to be a trifle firmer. The market for tide coal is unchanged; bunkering, the chief business, is only moderate in volume.

The trade at Baltimore is about on the same level as for two months past. Encouragement is taken in the gradual but sure depletion of surplus industrial stocks. The three-day holiday caused a depression in the export trade, only three ships clearing with coal cargoes up to July 10, but the month bids fair to compare favorably with June.

The Birmingham market continues sluggish. There is little demand for any grade of coal, the spot market affording an outlet for only a small tonnage of either steam or domestic sizes. Consumers are buying only immediate requirements and there is practically no stocking by any of the contract consumers.

Anthracite Feels Dull Season

The anthracite market at New York is comparatively quiet. The demand depends greatly upon the call for stove coal. Egg and chestnut move freely, but they are taken mostly in conjunction with the other large sizes. Independent broken coal is practically out of this market, many operators finding it necessary to break it in order to prevent accumulation. Independent operators are able to get about \$9.50 for straight lots of stove coal, but when taken with either egg or chestnut quotations are 2 to 50c. lower. Pea coal is causing some trouble to certain of the smaller operators and some of the larger companies are sending it to stockpiles. There is little call for steam sizes and independent product is being quoted at lower figures by those small operators who continue to produce coal.

The situation in Philadelphia has grown quieter. In another week some curtailment of mining by independents probably will be necessary. The dealers' yards are filled with all sizes, and even stove is not in such demand as it was a few weeks ago. Steam sizes are so extremely slow that some shippers are selling buckwheat below \$2.50 in order to get it out of the way, and rice is in almost the same position. Barley is a trifle better, but there is even a slowing down in the demand for this size.

The raise in hard-coal prices on July 1 seemed to have very little effect on trading at Baltimore. The usual number of July orders are being placed in the majority of cases, although some dealers complain that they are considerably behind the annual average.

Car Loadings, Surpluses and Shortages

	Cars Loaded		
	All Cars	Coal Cars	
Week ended June 28	908,355	144,759	
Previous week	903,700	140,807	
Week ended June 30, 1923	1,021,471	185,324	
	Surplus Cars		Car Shortage
	All Cars	Coal Cars	
June 30, 1924	356,389	162,343	
Pre iou week	359,644	167,315	
June 30, 1923	63,636	3,896	

Foreign Market And Export News

British Market Continues to Improve; High-Cost Operations Close

The south Wales coal market has improved only slightly during the last week, and business is still far below the capacity of the industry. European exchanges are steadier and some of the higher cost pits have been closed, so that production expenses on the whole are slightly lower. The Welsh operators are emphatic that any reduction in price is out of the question on account of the increased working costs under the new agreement. In some cases they are endeavoring to speed up production at the newer pits by the adoption of the two-shift system, but the miners are strenuously opposing any such innovation, and it is likely that sectional strikes or lockouts will result. The Miners' Federation seems to be in rather bad odor and is losing members, so that the agents are getting busy on a campaign to force every miner in Wales into the Federation. Notices soon to be given in the Rhondda district will affect about 45,000 men. Inquiries from Belgium and France have increased, and there is some more business with Italy.

Business in the Newcastle market is slow; the collieries are engaged mainly in filling old contracts. It is stated that the Paris gas works has contracted for the supply of 70,000 tons of Durham gas coals at 20s., delivery to be over the rest of the year.

Coal output by British mines during the week ended June 28, according to a cable to *Coal Age*, was 5,170,000 tons, compared with 5,173,000 tons produced during the previous week.

Trade Slows at Hampton Roads; Optimism Wanes

The situation at Hampton Roads is extremely dull, with comparatively no demand for spot coal and with the market showing a decided tendency to weaken. Some coastwise movement has been noted, but on contract, while foreign business continues in the slump

it struck two weeks ago when large orders for Brazil were completed.

General shipping appears to have struck a period of dullness which is reflected in poor bunker trade. Supplies are accumulating at the piers, the post-holiday production having begun generally in the mines serving this terminus. Shippers are not optimistic over the immediate outlook.

French Market Maintains Favorable Position

The situation of the French collieries has now been favorable for several months, although there was a slight unsettlement when the rates of sterling depreciated to 67-68 fr., thus putting British and French coals on a fairly level price. But since May 8 the pound has recovered and the price of these two fuels has shifted to the advantage of the latter. Therefore, if French coal seems to be well sold at present, this is due more to a slackening of output than to a question of price. Activity in household coal is rather good, so that few disposals are recorded outside of contracts.

There is fair inquiry for British anthracites on the Paris market, in spite of the prices being still affected by the high value of sterling.

In Belgium, house coals are well sustained while the industrial coal market is easier for the same reasons as prevail in France, and there is a disposition to take a hopeful view regarding the possible maintenance of prices in the autumn.

With the stoppage of the canals and a rather short supply of boats, freight is higher at 22 fr. Bethune-Paris.

Deliveries of indemnity fuels during May to France and Luxemburg included 243,400 tons of coal, 365,300 tons of coke and 333,900 tons of lignite briquets, a total of 642,600 tons, as compared with 1,301,100 tons in April.

The supply of indemnity coke to the

O.R.C.A. for the first twenty-four days of June was 312,278 tons, a daily average of 13,000 tons, showing an increase over the May deliveries and on the early part of June.

Export Clearances, Week Ended July 12, 1924

FROM PHILADELPHIA		Tons
For New Brunswick:		
Am. Schr. Georgia D. Jenkins for St. John		—
FROM BALTIMORE		
For Italy:		
Jap. Str. Hofuku Maru		7,998
FROM HAMPTON ROADS		
For Argentina:		
Ital. Str. Campania for Buenos Aires		6,415
For Brazil:		
Br. Str. Pilar de Larrinaga for Rio de Janeiro		8,074
Ital. Str. Valsavora for Rio de Janeiro		6,921
Ital. Str. Recca for Rio de Janeiro		7,360
Jap. Str. Glasgow Maru for Rio de Janeiro		7,792
For Canada:		
Du. Str. Spar for Montreal		5,601
Swed. Str. Innaren for Montreal		5,516
For Africa:		
Dan Str. Kina for Dakar		7,626
For Cuba:		
Br. Str. Berwindmoor for Havana		8,010
Nor. Str. Krosfond for Santiago		2,001
Br. Str. Harald Casper for Havana		3,842
For Dominican Republic:		
Br. Str. Lindenhall for Puerto Plata		5,398
For Italy:		
Ital. Ignazio Florio for Genoa		7,741
Ital. Str. Monte Nero for Porto Ferrajo		6,966
Amer. Str. Wabash for Genoa		5,699
Amer. Str. Benmore for Genoa		2,287
For Spain:		
Amer. Str. Jalapa for Gibraltar		4,975
For Straits Settlements:		
Amer. Str. Half Moon for Singapore		5,745

Hampton Roads Pier Situation

	July 3	July 10
N. & W. Piers, Lamberts Pt.:		
Cars on hand	1,238	1,377
Tons on hand	74,708	97,819
Tons dumped for week	142,164	86,300
Tonnage waiting	20,000	12,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,551	1,701
Tons on hand	115,200	122,850
Tons dumped for week	91,037	65,031
Tonnage waiting	167	15,515
C. & O. Piers, Newport News:		
Cars on hand	1,337	1,865
Tons on hand	69,036	96,160
Tons dumped for week	125,668	59,856
Tonnage waiting	14,710	2,200

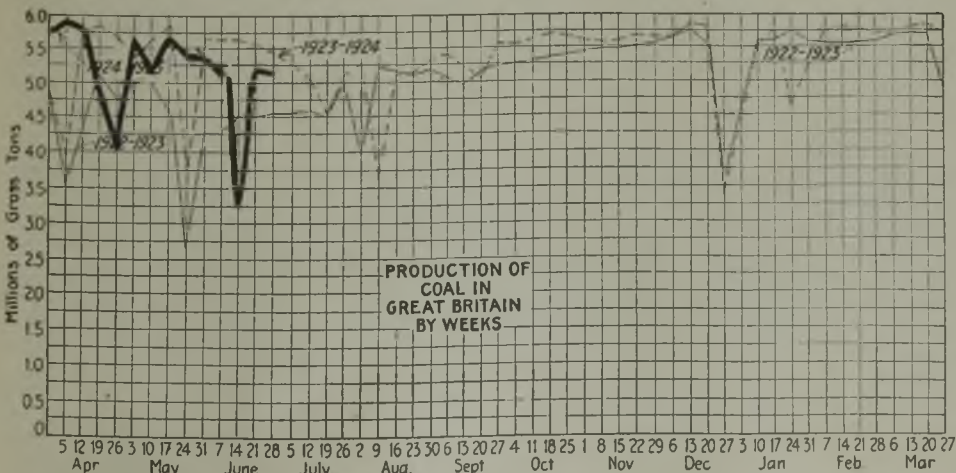
Pier and Bunker Prices, Gross Tons

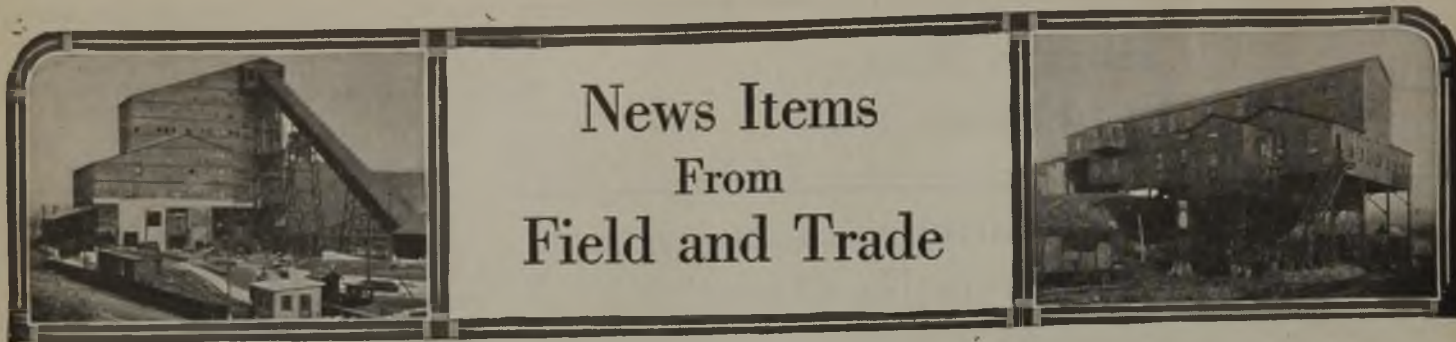
	PIERS	
	July 5†	July 12†
Pool 9, New York	\$4.60@5.00	\$4.60@5.00
Pool 10, New York	4.50@4.75	4.50@4.75
Pool 11, New York	4.25@4.50	4.25@4.50
Pool 9, Philadelphia	4.70@5.00	4.70@5.00
Pool 10, Philadelphia	4.45@4.70	4.45@4.70
Pool 11, Philadelphia	4.30@4.50	4.30@4.50
Pool 1, Hamp. Roads	4.30@4.35	4.25
Pool 2, Hamp. Roads	4.15@4.20	4.10
Pools 5-6-7, Hamp. Rds.	4.00@4.10	4.00
BUNKERS		
Pool 9, New York	4.90@5.00	4.85@5.25
Pool 10, New York	4.80@5.05	4.75@5.00
Pool 11, New York	4.55@4.80	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	4.35	4.30
Pool 2, Hamp. Roads	4.20	4.15
Pools 5-6-7, Hamp. Rds.	4.10	4.00

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

	Quotations by Cable to <i>Coal Age</i>	
	July 5	July 12†
Admiralty, large	28s. 6d.	28s. @ 29s.
Steam smalls	18s. @ 18s. 6d.	18s.
Newcastle:		
Best steams	19s. 6d. @ 20s.	20s. @ 24s.
Best gas	23s. @ 23s. 6d.	23s. @ 23s. 6d.
Best bunkers	22s.	22s.

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





News Items From Field and Trade

ALASKA

The Geological Survey has begun its 26th successive year of the investigation of the mineral resources of Alaska. During this time it has mapped the topography and geology of over one-third of Alaska's total area of 586,400 square miles. It has investigated in at least a preliminary way every producing mining district in Alaska, and has mapped many of these in detail. Since 1905 it has annually collected and published the statistics of mineral production of the territory. The results of this work are published in 380 different reports and over 400 maps, which throw much light on the resources, including water supply, as well as the topography and geology of Alaska. A detailed topographic survey is being made of the Hyder district, of southeastern Alaska, by R. M. Wilson, topographic engineer. A. F. Buddington, geologist, is continuing his investigation of the geology and mineral resources of southeastern Alaska. This year he will investigate parts of the Ketchikan, Wrangell, and Juneau districts. S. R. Capps, assisted by Kenneth Landes, is making a supplementary examination of the Matanuska coal field.

ARKANSAS

The Meard and Bevil mine near Bates is being pumped out and arrangements are now being made to operate it after a suspension of 10 months.

It is hard to believe that District No. 21 of the United Mine Workers, covering Arkansas, would violate a contract, but Webb Covington says it violated its two-year contract to employ him at \$7,500 a year as the district's chief attorney. So he is suing for a year's pay.

CALIFORNIA

With the price of oil mounting, California is taking more interest in its coal. Lloyd L. Root, state mineralogist, recently issued a statement in which he said the California coal deposits were estimated at one billion tons and that a total of 5,177,125 tons has been extracted. He calls attention to the presence of iron ore in Shasta, Madera, Placer, Riverside, San Bernardino and Mendocino Counties and says: "The lack of cheap coke makes it impossible to use these ores commercially. There is a good future in the iron and steel industry in this state when coke can be obtained economically." He says there has recently been a little prospecting for coal in the Ione field of

Amador County; at Tesla, in Contra Costa County; at Stone Canyon, in Monterey County, and at Palo Cedro, in Shasta County, but that the only development of importance has been made this year in the 14-ft. seam of sub-bituminous coal at Dos Rios, Mendocino County.

ILLINOIS

A strike of 100 miners at the Shuler Mining Co., of Alpha, has been settled and the men have returned to work. The mine will now be operated about three or four days a week.

Peabody Coal Co. mine at Marion recently broke its hoisting record with a total of 2,892 tons in one day, filling 59 railroad cars and requiring 1,394 dumps.

William Kortkamp, Sr., veteran coal operator of Montgomery County and widely known throughout that territory, was recently appointed county mine inspector by the County Board of Supervisors.

A mine may be sunk soon at Ashland, as a company of business men has been formed at that town to start the enterprise. Officers are F. C. Walbaum, president; H. J. Loman, secretary, and J. N. Blank, treasurer.

The Wittenborn & Carter Coal Co. has completed its tipple and is now handling three grades of coal. This mine is located on the Wittenborn farm, three miles south of Cutler, on the Duquoin and Chester state road.

It has been announced that the St. Louis Coke & Iron Co., now operating blast furnaces and eighty coke ovens at Granite City, will add another blast furnace to its plant at that place. This plant expansion will cost approximately \$2,500,000 and it is the intention of the company to turn the gas from the blast furnaces into electrical energy, which will be sold to public utility corporations in southern Illinois and Missouri. Southern Illinois coal is used exclusively in the plant at Granite City.

The Jefferson Southwestern Ry., built recently by the Illinois Coal Corporation to connect its new mining town of Nason with Mount Vernon, 11 miles distant, has not yet freed itself of operating limitations. It was built last year in the face of other railroad opposition. Although it obtained permission of the Illinois Public Service Commission to operate in intrastate traffic, it has been able to make joint traffic agreements only with the C. & E. I., the L. & N. and the Southern and it is still petitioning the Interstate

Commerce Commission for the right to participate in interstate traffic. This petition has been denied once, but on an appeal the commission decided to permit operation under certain specific restrictions. The railroad's second appeal to have these restrictions lifted has been in for about two months and another decision is expected.

An effort is being made to reorganize the Lovington Coal Mining Co., which is now in bankruptcy. The company has a mine and about 5,000 acres of coal rights at Lovington. It is stated that stockholders in the present company will realize very little from their claims.

KANSAS

It is still possible, under the Kansas Industrial Court law, to jail a man for calling a strike in an essential industry just as Alexander Howat was jailed. The Kansas Supreme Court reached this decision July 5 after a rehearing of the case of August Dorchy, Howat's lieutenant, who was jailed with him two years ago. Howat has been pardoned but Dorchy took an appeal. The Kansas Supreme Court decided that even though the United States Supreme Court last fall declared the wage-fixing section of the Kansas law unconstitutional, the balance of it stands alone and remains in effect.

KENTUCKY

A large commissary store operated by the Black Diamond Mining Co. at Drakesboro was one of several stores in the town to burn in a \$100,000 fire on the night of July 6. The company mines have been down for some weeks on account of the district strike.

Fred M. Sackett, prominent coal operator, retailer and jobber, of Louisville, has named the advisory committee to aid him in his race for the U. S. Senate on the Republican ticket. Denver B. Corbett, of Harlan, is one of several coal-mine operators included.

The Harlan Coal Co., Louisville, on July 7, lost a suit pending since 1920, following a five-day argument, in Judge Gordon's court, in a suit for \$75,000 damages against the Wheeler Coal Co., of eastern Kentucky, in which the Louisville company alleged violation of a contract. The petition was filed on Aug. 2, 1920.

The Hatfield-Reliance Coal Co., which succeeded the Reliance Coal & Coke Co. some weeks ago in a merger of the Reliance and Hatfield interests of Cincinnati, is reported to have been

enlarging its mining plant at Glomawr, four miles from Hazard. The company has completed sixty additional miners' homes and plans increased output through new mines already opened.

A petition for writ of error and right to appeal to the U. S. Circuit Court of Appeals of the Sixth District at Cincinnati was granted the Fordson Coal Co. in its suit against the Kentucky Coal Lands Co. and others, by Judge A. M. J. Cochran, in the U. S. District Court at Lexington, Ky., July 2. This followed Judge Cochran's denial of writ of possession and overruling motion for possession by the Fordson Coal Co. of the lands under litigation in Leslie County valued at \$100,000. In his judgment against the Fordson Coal Co. Judge Cochran ordered that the plaintiffs pay all court costs. In granting the appeal to W. K. Middleton, of Detroit, one of the lawyers in the case, Judge Cochran set the date for the Cincinnati filing for Sept. 1.

NEW YORK

Mayor Schwab, of Buffalo, has recommended the putting of automatic coal burners into the furnaces at police headquarters and the various station houses about the city, at a cost of about \$10,000. Certain sample burners used by the city are said to have effected a big saving.

OHIO

F. S. Davidson, formerly with the Gibraltar Coal & Coke Co., has taken service with the Columbus office of the Elk River Coal & Lumber Co. George A. Ramsey, formerly in the jobbing business in Columbus under the name of the George A. Ramsey Coal Co., also has joined the staff of the Elk River Coal & Coke Co., and will cover the State of Indiana.

A conference of the joint committee representing operators and miners in the Hocking Valley field was held at Logan, Ohio, last week, starting July 8. An entire new set of rules containing many radical changes from those formerly in force was presented for discussion. The matter was considered for the remainder of the week without arriving at any decision. It is believed that some conclusions may be reached which will mean the opening of a number of mines in the southern Ohio field.

Columbus coal operators were advised recently that more vessels are being offered at Toledo and Sandusky ports than are needed for the transportation of coal to the Northwest. Part of this excess tonnage of shipping is due to the fact that Ohio mines at the present time are producing very little lake coal, owing to a scarcity of orders. Heavy tonnage of lake coal continues to pass through Columbus from the non-union mines at West Virginia and Kentucky to the docks at Toledo and Sandusky.

PENNSYLVANIA

Fire of unknown origin destroyed the tippie at the Pittsburgh Coal Co.'s Partridge mine, near Allegheny, early on July 4. The mine has been idle since last autumn.

W. J. Rainey, Inc., resumed operations early last week at the Allison No. 1 plant, which was one of the plants closed down the week before because the men refused to continue at work at the 1917 scale. The men returned to work at that scale, however.

The Gulf Co. coal mine at Marion Center, Indiana County, resumed operations during the last week in June as a non-union mine. The Gulf Co. some time ago proposed to its 150 miners that they accept a reduction of wages to the scale of 1917. The proposition was rejected and the men struck.

All arrangements have been completed for the transfer of the plant of the Worthington Pump & Machinery Corporation at Hazleton to the Pennsylvania Power & Light Co. The sale of the property became effective on July 1.

The Clearfield Bituminous Coal Corporation, Indiana, Pa., has abandoned the colliery located in the Clymer-Dixonville field on the Cherry Tree & Dixonville R.R. heretofore operated under the name of Sample Run Mine. It has been replaced by a new, modern, well equipped operation to be known as Clymer No. 1.

A severe rain and windstorm on June 25 caused damages estimated at \$300,000 in the Shenandoah district of the anthracite field. The roof of the Shenandoah City colliery of the Philadelphia & Reading Coal & Iron Corporation was torn off and machinery knocked out of alignment while the Plank Ridge washery was completely

demolished. At the North Mahanoy colliery the storm did damage estimated at \$40,000. A pipe line and the stacks from the boiler house were thrown through the engine house and into the machinery of the colliery.

It was reported on June 24 from Lotts Creek that Charles Lynch, mine superintendent for the Ajax Coal Co. and Superior No. 4 Co., was shot and killed by John Vermillion, merchant at Lotts Creek, the killer claiming self-defense. Lynch was formerly from Tennessee.

The Republic Iron & Steel Co. has closed down the only mine it had been working at Russelton, in the Freeport district, which means that the only active operations of the company are one mine at Bowood and one at Martin, which are doing pretty well. The Ford Collieries Co., at Curtisville in the Freeport district, has one out of three mines working.

It is reported that the Monessen Coal & Coke Co., a subsidiary of the Pittsburgh Steel Co., is negotiating for the purchase of the Lilly Coal & Coke Co., operating a large modern mine in the Pittsburgh vein of coal, near West Brownsville, Washington County, on the Monongahela River and the Pennsylvania R.R., with facilities for either river or rail shipments. Thomas Elliott, of Brownsville, is president of the Lilly Coal & Coke Co.

Charles O'Neil, secretary of the Central Pennsylvania Coal Producers' Association, returned to his office in Altoona after a two weeks' absence. Mr. O'Neil was a delegate from the Blair-Bedford Congressional district to the Democratic National Convention in New York.

All mines of the Consolidation Coal Co. in the vicinity of Meyersdale, Somerset County, were closed for a period of two weeks beginning July 7. This is the first shutdown of the mines since work was resumed in April after a long period of idleness. At that time the miners accepted a substantial reduction in wages. No reason was given for the shutdown.

Officials of the Lehigh Valley Coal Co. have decided to resume the first-aid contests held years ago but not so prominently featured during recent years. They have made reservations for Hazle Park, Hazleton, for July 21 and 22 for the events.

Figures for the first half of the present year for the central Pennsylvania bituminous district show that the loadings were 337,271 carloads, a loss of 114,154 carloads compared with the corresponding period of 1923. It was expected that production would gain in June, but figures compiled by the Central Pennsylvania Coal Producers' Association, Altoona, show a loss of 49 carloads from May, the figures being May, 49,533, and June, 49,464 car loads. These figures indicate about 45 per cent of the maximum production and about 60 per cent of the normal production of the district.

Heilwood won first place in the tenth annual inter-plant first-aid meet of the subsidiary companies of the Bethlehem Steel Corporation, held at Johnstown June 28. Heilwood had a percentage of



Courtesy U. S. Distributing Corp.

Monarch Tipple, Sheridan-Wyoming Coal Co.

Coal from this mine finds a market in Wyoming, Iowa, Nebraska, Montana, Washington and North and South Dakota.

95.2. The Preston division team from Masontown, W. Va., was second, with a percentage of 92.6. The Ellsworth division team was third with a percentage of 92.2; Marion division had fourth place with a percentage of 91.8; Johnstown was in fifth place with 91.6, and Wehrum was sixth with 90.

UTAH

The United States Fuel Co., of Salt Lake City, has bought a herd of cows to furnish milk for the coal mining camp of Hiawatha. A modern barn and every facility for operating a successful dairy for the camp has been installed.

There is to be no increase in the rate for workmen's compensation in Utah, according to a decision just rendered by the Industrial Commission. The decision took into consideration the safety provisions adopted since the Castlegate catastrophe last March, it was stated. A formal statement was to the effect that the experience in Utah justifies continuance of the rate of \$3.90 per \$100 of payroll. Figures were compiled by the National Council on Compensation Insurance.

WASHINGTON

Mel C. Butler, of Seattle, is beginning to develop six sections of coal land south of the Wilkeson mine and east of Carbonado. He says this work is for the new Pacific Coal & Coke Co., which is said to be ready to build a blast furnace near Enumclaw if the coal land pans out.

The annual first-aid and mine-rescue meet for western Washington is scheduled for Carbonado on Aug. 9. About 25 teams from Bellingham, Black Diamond, Burnet, Carbonado, Fairfax, New Castle and Wilkeson are entered. The committee in charge of affairs is headed by David C. Botting, of the Pacific Coal Co. His principal aides are A. G. Harvey and A. E. Holden.

Activity at the marine coal bunkers of the Pacific Coast Coal Co. the week before last exceeded anything of like nature there for many months. On Sunday morning the Norwegian freighter Balto berthed for coaling. Immediately following the Balto, the Holland-America steamer Moerdyk was bunkered. Both vessels took on large supplies, as both are bound for the United Kingdom and European ports. On Monday and Tuesday two large Nippon Yusen Kaisha passenger liners, the Mishima Maru and the Kaga Maru, called to load bunker coal for the return trip to Japan.

The Morton Coal & Coke Co. mine near Morton is producing again. It has been leased to Peter Pagolious and A. Flewelling, of Centralia. The mine output may be brought up to about 100 tons a day. Pagolious, a Greek, who is managing the property, has some ideas about "foreigners" in this country. He came from Greece 16 years ago and is an American citizen. He thinks all other aliens in the United States should decide, by the time they have been here five years, whether

they want to stay or return to their native land. If they want to stay they should become American citizens at once. He gathers his own men together in the mine every once in a while and preaches this doctrine.

WEST VIRGINIA

The Raleigh-Wyoming Coal Co., of which Carl Scholz is vice-president and general manager, is sponsor for an interesting monthly paper, the *Edwight Eagle*, published with a view to establishing closer relationship and better understanding between the company and its employees.

There were 27 persons killed in the mines of West Virginia during May, according to a compilation by R. M. Lambie, chief of the State Department of Mines. Of that number, 11 were killed by falls of slate, roof and coal; seven by mine-car accidents; two in motor accidents, and three by electrical shock. Four deaths, occurring outside the mines, were the result of railroad car accidents and electrical shock.

The Fairmont-Chicago Coal Co. has begun to load coal over its new tippie at the Chesapeake mine, near Barrackville, in Marion County. The mine's capacity is 1,200 tons a day, but arrangements are being made to increase the tonnage by the beginning of the year to about 2,000 a day. The new tippie cost \$100,000, is of fireproof construction and is equipped with shaker screens, picking tables, loading booms, etc., it being possible to prepare seven different kinds of coal and to load three different sizes simultaneously. The tippie is operated through a system of electric push buttons, making it possible to stop the tippie machinery at any time from almost any point.

WYOMING

Here is a new form of mine accident. Chester Tynski, mine worker, 18 years of age, was instantly killed at Winton, Sunday, June 29, while flying a kite. The young man was using some No. 17 enameled copper wire, taken off a Ford automobile generator, as a kite string, the kite and string falling across a 33,000 volt transmission line with fatal results to Tynski, although artificial respiration was used for an extended period in an effort to resuscitate him.

CANADA

The mines of the Inverness Coal & Railway Co. at Inverness have been closed indefinitely, owing to demands of workers and market conditions. Efforts are being made to have the company reopen the mines on a part-time basis. These mines are the sole support of Inverness, an out of the way and isolated point on Cape Breton Island.

An explosion in the Allen shaft of the Acadia Coal Co., at Stellarton, N. S., on June 30, caused the death of four men and injuries to seven. These eleven men were entombed by a fall of coal in No. 3 level, about 1,200 ft. down. According to the statements of officials

of the company, there were seventy-four men in the mine when the explosion occurred, the other sixty-three making their escape. The damage to the mine was not as great as at first supposed. Company officials believe that operations will be resumed in three or four weeks.

Obituary

According to word received in Fairmont, W. V., Dan R. Lawson, formerly secretary of the Northern West Virginia Coal Operators Association and district fuel representative of the United States Fuel Administration during the World War, died at the family residence in Philadelphia, following an attack of appendicitis. Mr. Lawson had resided in Fairmont for a number of years. He was connected at various times with the John Y. Hite and the C. D. Robinson coal interests, with the J. E. Long interests of Clarksburg, and with the Cortwright Coal Co. in Philadelphia. For many years Mr. Lawson was connected with a railroad in Chicago. A few years ago he helped organize the Appalachian Fuel Co., with headquarters at Fairmont.

C. M. O'Dell, chief engineer for the Dominion Coal Co., died at Sydney, N. S., on June 24 after a long illness, at the age of 63 years. He went to Glace Bay in 1886 in connection with the construction of the International Railway.

Wright Lawford, mining engineer for the Bottom Creek Coal & Coke Co., in the Pocahontas field, was instantly killed last week by a slate fall in the mine where he was at work. He was 25 years of age, having been born at Pocahontas, educated in the public schools of Pocahontas, at the Episcopal High School in Alexandria, Va., and received his engineering degree from the Alabama Polytechnic Institute at Auburn, Ala. For a time Mr. Lawford worked for the Pocahontas Fuel Co., becoming a mining engineer for the Bottom Creek Coal & Coke Co. about two years ago.

Herbert Bertrand Wright, long and prominently identified with the mining industry of southern West Virginia and southwestern Virginia died at his home in Pocahontas on Monday, June 30. Death followed an illness of about a year's duration. Mr. Wright was born on June 18, 1863, at Bury, Quebec. He received his education in the public schools of Quebec and at Eaton Academy, Eaton, Quebec. He later became a naturalized citizen of the United States. In 1893 he became superintendent of construction and operation of a mine belonging to the Elk Ridge Coal Coke Co. in McDowell County. From 1918 until the time of his death he was chief engineer in charge of all engineering work of the Pocahontas Fuel Co. He also was a vice-president of the Excelsior Coal Co. From 1896 to 1899, Mr. Wright was the manager of the Peerless Coal & Coke Co., at Vivian. In 1902 he became chief engineer in charge of surveys, prospecting, etc., on some 20,000 acres of coal lands for the Faraday Coal & Coke Co. His wife and one brother survive.

Traffic News

Want Northwest Rate Case Reopened

Application has been filed with the Interstate Commerce Commission by the Northern States Power Co., as a large user of all-rail fuel, for a rehearing in the case of the dock companies against the carriers for an adjustment of the discrimination alleged to exist in the freight rates from the docks and from the southern Illinois mines to the Twin Cities. The Minneapolis Traffic Association and the St. Paul Association also have intervened with a request to reduce the rate from the docks on soft coal, now \$1.82 for 150 miles, to \$1.50, rather than increase the all-rail rate, now \$3.47 for 630 miles, to \$3.75.

It is something of a question as to whether the commission will grant a rehearing after the recent complete consideration of the case, but it seems possible that there may be a resort to the courts by the all-rail shippers. That would hardly come until close to the time for the proposed change, August 21, when a temporary injunction might be asked, that would throw the case back until a court hearing. The carriers are proceeding with their arrangements for instituting the new rates.

Hearing on Iowa Petitions for Lower Rates Completed

The long freight-rate hearing on various Iowa petitions for reduction of rates from many fields to Iowa have been completed. The sessions of the Interstate Commerce Commission examiner ran both in Des Moines and in St. Louis, Mo. A decision is expected by autumn.

Alton Cuts Rate from Illinois To Kansas and Missouri

To enable Illinois operators to compete with Kansas coal operators for the Kansas City and St. Joseph (Mo.) trade, the Chicago & Alton R.R. is about to reduce the freight rate on fine coal from central Illinois 9c. a ton. The old rate was \$2.07 and the new rate is \$1.98. Some weeks ago the Southwestern district operators obtained a 9c. reduction from Kansas and Oklahoma. Immediately the Alton gave notice that it would voluntarily file notice of a reduced rate to take effect Aug. 7. This rate has now been published.

Circuit Court Disallows Cut In Illinois Rates

The cut in coal rates between Springfield and Bloomington, Ill., ordered recently by the Illinois Commerce Commission was reversed by Judge E. S. Smith in Circuit Court at Springfield, July 2, and referred back to the commission for reconsideration and the taking of more evidence. The commis-

sion, upon the petition of the Bloomington Association of Commerce, reduced the rate from \$1.42 to 80c. A proportionate cut was made in the rate between Lincoln and Bloomington. The railroads objected to this as unreasonable and appealed to the Circuit Court.

Association Activities

D. F. Buckingham, general manager of the Roslyn Fuel Co. and the Independent Coal & Coke Co., 818 White Bldg., Seattle, was elected president of the **Washington Coal Producers' Association** at its annual election held June 17. He succeeds E. P. Lucas, general manager of the Bellingham Mines, who has headed the association's activities for the past year. Prescott Oakes, treasurer of the Roslyn Fuel Co. and the Independent Coal & Coke Co., was re-elected as treasurer, and W. E. Maltby was again named manager of the association.

John C. Reid of the Cameron Coal Company, McAlester, Ok., was elected president of the **Southwest Interstate Coal Operators' Association** at the annual meeting of that organization. Approximately seventy-five members of the association from Missouri, Arkansas, Kansas and Oklahoma attended the meeting. Business of a routine nature, affecting the coal industry in the Southwestern field, occupied the attention of the members present for the one-day convention, according to W. L. A. Johnson, general commissioner of the organization, who was re-elected.

Practically all of the coal operators of Colorado and New Mexico met June 18 at Denver in the sixth annual meeting of the **Colorado-New Mexico Coal Operators' Association**, reviewing the year's work and taking a look ahead. The association re-elected F. O. Sandstrom secretary-treasurer and traffic manager. The officers for the ensuing year, in addition to Mr. Sandstrom, are these: President, F. R. Wood, president of the Temple Fuel Co.; vice-president, H. F. Nash, vice-president of the Oakdale Coal Co.; directors, W. D. Brennan, of the Phelps-Dodge Corporation; Frank Bulkley, of the Baldwin Fuel Co.; L. A. Hayden, of the Hayden Bros. Coal Corp.; W. H. Huff, of the Victor-American Fuel Co.; A. M. McNeil, of the McNeil Coal Co.; S. S. Murphy, of the Huerfano Coal Co.; H. F. Nash, of the Oakdale Coal Co.; J. J. Roche, of the Rocky Mountain Fuel Co.; J. van Houten, of the St. Louis, Rocky Mountain & Pacific Co.; J. F. Welborn, of the Colorado Fuel & Iron Co., and F. R. Wood, of the Temple Fuel Co.

Coming Meetings

First International Management Congress, Prague, Czechoslovakia, July 21-24.

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.

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, 163 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

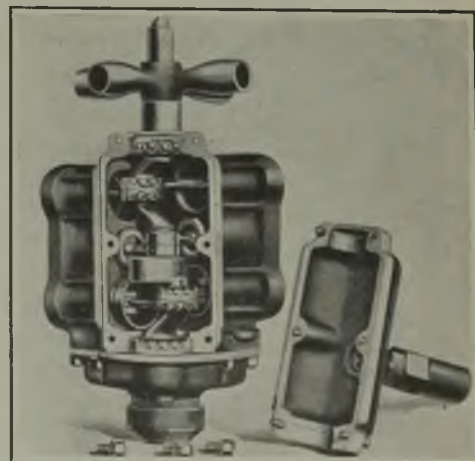
Ball Bearings a Feature of Pneumatic Grinder

A pneumatic motor for operating portable drilling and other tools and designed to meet exacting requirements, and a new portable pneumatic grinding machine have been placed on the market by the Cleveland Pneumatic Tool Co., Cleveland. The outstanding feature of both the motor and the grinding machine is that both are provided with ball bearings.

The pneumatic motor is made in plain and compound-gear types. It is a four-cylinder unit having four single-acting pistons connected to opposite wrists of a double-throw crank. These wrists are grooved, hardened and ground, forming an inner ball race. The four connecting rods are enlarged at their end into a ring of sufficient size to be hung on to the end of the crank. The inside of the ring is machined to form the outer ball race. After the connecting rods are placed in position on the crank the balls are inserted and are retained in position by a spring ring retainer.

The pistons are screwed to the piston sockets, which in turn are attached to the connecting rods by a floating wrist pin which has oil holes for lubrication. The main valves are of the solid piston type and are operated from eccentrics on the crankshaft. They are placed between each set of cylinders from which they are separated only by a thin wall in which air ports are provided. The live air is, therefore, injected almost instantly into the piston chamber, assuring, it is claimed, quick motor action and conserving air. It is stated that on account of the reduction in friction through the use of ball bearings and the added power gained through quick delivery of the air to the pistons a very high motor speed and high drilling capacity is obtained.

The bearings on the crank and connecting rods, as well as the rods and pistons, run in the lubricant and the



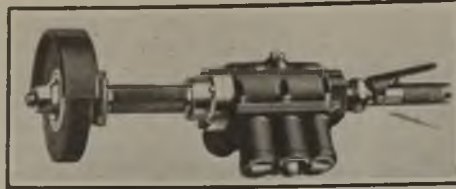
Compact Pneumatic Motor

Equipped with four single-acting pistons and ball bearings this little air motor is claimed to be highly efficient and easy to maintain.

gears are similarly lubricated. The gear chambers open directly into the crank case, which is filled with an oil and is so constructed that the lubricant is not driven out when the motor is in action.

The portable pneumatic grinding machine has an arbor or extension covered by a housing which is used as a forward handle. The arbor is connected directly to the crank as shown in the illustration, and is mounted on annular ball bearings at both ends, as is also the driving crank. The single-piece connecting rods contain ball races, which operate directly on the crank. These races as well as the annular ball bearings on the crank and arbor bearings have continuous lubrication both in the crank chamber and in the forward quill housing. All the revolving parts run in lubricant.

The body is split at the center, which permits the removal of the crank assembly without disconnecting the pistons or valves from the crank. The piston cups are screwed to the piston sockets and reinforced by a lock nut at the base of each cup. The connect-



Portable Grinding Machine

A shield protecting the emery wheel makes it safe to operate this machine in close quarters. The lubricating system is arranged to supply oil to all wearing parts regardless of the position in which the outfit may be turned.

ing rods are attached to the piston sockets by a floating wrist pin, which is perforated for lubrication. Four types of throttle handles are available, these being the inclosed type with outside or inside throttle levers, a straight handle with snap throttle lever and a straight handle with twist throttle sleeve. The machine is made in two sizes, one weighing 12 lb. having a 6-in. emery wheel and a speed of 4,600 r.p.m., and the other weighing 21 lb. having an 8- or 10-in. emery wheel and a speed of 3,600 r.p.m.

Portable Coal Loader

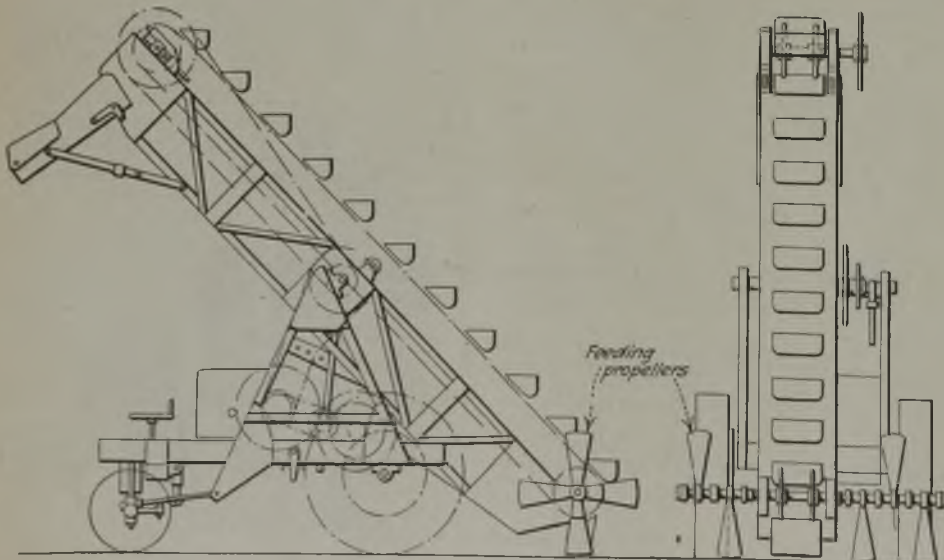
With its positive, self-feeding device the new path-digging loader recently announced by the George Haiss Manufacturing Co. will load any kind of anthracite or bituminous coal, from lumpy run-of-mine to buckwheat. The feeding propellers do all the work, and the only labor required is that of the one operator. There is no shoveling. The machine is provided with a slow-speed crowding gear which can be brought into play simultaneously with the combined loading action of the buckets and self-feeding device. This keeps the machine fed up against the pile in its most efficient working position, and, with the revolving propellers, digs a path right into the pile.

The self-feeding propellers are twelve slanting vanes, extending to each end of the shaft at the bottom end of the elevator. These rotate slowly under power and move coal gently and automatically from the out-

side one of the series, successively to the inner one, which delivers it in front of the loader. The buckets are heaped full continuously and discharge a full load into the truck.

The propelling mechanism is connected from the driving unit by a chain to a countershaft, then through a clutch to a jack-shaft, and thence to the two rear traction wheels by means of pinions and gears. The main gear shifter controls one forward and one reverse motion of the loader. The loader travels backward 60 ft. and forward 100 ft. per minute. A second, or very slow-speed gear-shifter engages a worm drive which propels the entire machine backward at a speed of only 30 in. per minute, while the feeding propellers convey the material to the buckets.

The wheels have a 10-in. face, and the driving pair are furnished with traction cleats. Heavy steel-plate propeller blades are bolted on to extra large cast-steel lugs which in turn fit rigidly on the big steel propeller shaft.



Power-Driven Self-Feeding Coal Loader

Propeller blades on the sides of the elevator buckets dig into the pile and pass the coal from the sides to the middle where the buckets are filled. A slow-speed crowding gear simultaneously keeps the loader well up against the pile so that the buckets are always full.

The revolving speed of the feeding propeller and the pitch and number of the blades, conform with the speed and the capacity of the elevator buckets. The spread of the feeding propellers across the back of the loader is more than the over-all width of the loader.

The construction is all-steel. The elevator truss frame is pivoted at the center and can be collapsed when moving the machine under overhead obstructions. The front wheels are 24 x 10 in. and have roller bearings. All other turning parts have bronze bushings. The machine bearings are provided with grease cups and the motor bearings have oil reservoirs.

The front axle is similar in design to that on an auto truck. The axle does not turn when steering the machine, but instead the two front wheels are steered by a handwheel through a worm and sector device and steering knuckles.

Hand-Fastened Trolley Clamp With Aligning Feature

A new aligning clamp so constructed that it may be installed without any strain on the insulation of the hanger is just announced by The Ohio Brass Co.

This clamp is practically identical in appearance and construction to the



Aligning Type Trolley Clamp

This device may be aligned on the hanger without being loose on the stud or disturbing the insulation. Little labor is required to install the clamp and suspend the trolley wire.

Bulldog clamp except that it has the aligning feature. It has the same self-opening jaws that are controlled by the nut both when being opened and closed.

The new clamp, like the ordinary clamp of the Ohio Brass Co. without the aligning feature, is tightened onto the hanger stud by gripping the jaws with the hand. This is unlike usual types which cannot be tightened onto the hanger stud without applying a wrench to the nut. This difference is due to the fact that the jaws are loose on the boss for only slightly over one-half turn instead of being altogether loose. One-half a turn is sufficient to back off the jaws to align with the trolley wire after the clamp is tight on the hanger stud.

Tightening of the jaws on the wire with the nut does not affect the hold on the hanger as the nut itself does not touch the hanger insulation. There is no pressure against the insulation nor any grinding or wedging action.