COAL AGE

McGRAW-HILL COMPANY, INC.
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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

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The Old, Old Question

THE DIFFICULTY and perhaps injustice of curing overdevelopment of coal by arbitrarily prohibiting the sinking of new mines is illustrated by the case of North Carolina. That state needs more power. The demand already has reached a point that justifies the development of home deposits of coal, in spite of factors which have limited their exploitation up to this year, according to the state's geological survey. The Deep River field with a present potential output of only 100,000 tons annually is especially at the fore. Should this field be encouraged to increase its output during the next few years to the million-ton mark which seems, to the state survey, to be "a reasonable vision"? Who is there to say North Carolina nay, especially if she embarks broadly and intelligently upon a program of byproduct coking? It is the old, old question which has no answer.

Yes, It Can Be Done, Mr. Lewis

THERE really is such a thing as fearless, righteous control of a labor union. The International Pressmen's Union of North America proves it. So we respectfully invite the attention of John Lewis, "the most powerful labor leader," to the fact that President Berry of the pressmen, who whipped back into line the New York locals after a strike in violation of contract and who then made them pay the cost of that strike, has been upheld by the International at its Knoxville convention. Such a thing as punishing contract violators is, therefore, possible, and we don't want Mr. Lewis to overlook it.

No, we haven't forgotten that President Lewis booted Alexander Howat and the whole kit and caboodle of Howat office holders out of the union when they struck in Kansas in spite of Lewis' orders. That was considerable, of course, but we must add that defense of the sacredness of contract was not the only thing that motivated our dogged faced (the first adjective has two syllables, not one) miner chieftain. Howat was and is a radical whose policy is to destroy everything at all costs. He would gleefully destroy the miners' union if he could. In fact there was some slight danger of that very thing for radicalism just then was on the gain. So Mr. Lewis, in smacking Howat flat was defending the contract with one hand but with the other, and with every political force at his command, he was defending his own union organization.

The question that occurs to us is: Why hasn't the dogged (two syllables again) faced miner president risen as gallantly to the defense of the sacredness of other contracts that have been broken repeatedly? There were plenty of opportunities. But Mr. Lewis and his state chiefs have not made the rank and file understand that the whole force of the organization is behind signatures on contracts. Mr. Berry has made New York understand this, and his rank and file support him. What ails the rank and file of miners? Are they contract violators by nature or is it just that President Lewis is afraid of them?

Searching for the Causes

DURING recent years we have noted considerable progress being made in the more efficient and safe use of electricity in the mines. Electric drives have been applied to equipment which previously had been driven by steam engines because of fire or explosion hazards. Higher voltages have been introduced into the mines. Some companies have successfully applied electrical equipment which not long ago was considered highly dangerous.

Much of the credit for the success of this work is due to the careful and considerate engineering of some few of our leading engineers and also to the work and investigations of the Bureau of Mines. Experimental work, research, investigation and tests of the Bureau have shown the dangers of the use of certain types of apparatus when they come in contact with gaseous mixtures. Tests, recommendations and approvals markedly have reduced hazards of electrical equipment. Today we have permissible electric lamps, controllers, headlights, locomotives, fuses and portable storage battery power units; also, recommendations and suggestions which, if followed, greatly reduce liabilitiy of accident from other sources.

Others Suffer Too

COAL MINING isn't the only industry suffering the pains of overdevelopment. Consider oil. Always reckless, always prodigal, the host which produces American oil rushed men, money and machinery around the country in the boom days during and immediately after the war, sinking 25,000 wells and half a billion dollars in twelve months! The country had to have that oil and it got it. Since then the host has been busy trying to save itself from inundation by the flood it produced. The best protection the oil host could raise apparently, was a counter flood of more oil.

The results of this policy are many and disturbing. Chief among them is waste. Where the coal producer leaves an average of only a little over one-quarter of the total deposit in the ground, the oil man leaves three-quarters. And there are oil losses in handling and consumption that rival the well-advertised wastes of coal. While, of course, strenuous efforts are made to check this heavy loss of oil, the dominating idea in the head of every oil man is: "Where can I bring in more good wells?"

"It is all too evident," says George Otis Smith, director of the U. S. Geological Survey, "that the oil business is traveling 'in high' with the gear shift locked. Everything is speeded up; the urge of ever-

increasing consumption stimulates the provision of surplus capacity in wells and refineries; then a lively competition among producers leads to an artificial stimulation of demand, and the merry round goes on. It is a pace that kills—and loses money."

So the coal man with the weight of non-producing mines crushing him down is not the only fuel producer harassed by overdevelopment. His industry has much grief in common with the oil man's. Somehow the less spectacular coal industry seems to us the sounder of the two. Its wastes are probably less, its future is better assured because its resources are, and its financing has no $300,000,000 a year of fraudulent stock promotion charged against it by the Postoffice Department, as had the more alluring oil.

"Standardization" Means Something Now

ALL THIS TALK about standardization which the country has heard these last few years is not mere high-flown language. There has been much definite accomplishment, thanks largely to the energy and resources of Secretary Hoover's Department of Commerce at Washington. Already the lumber industry has reduced the number of lumber-yard items by 60 per cent, a simplification that is counted on to check to a considerable degree the waste in that industry conservatively estimated at $250,000,000 yearly. Woven wire fencing manufacturers have reduced their styles and sizes from 552 to 69. Hollow building tile types, sizes and weights have dropped from 36 to 19; forged tool varieties are down 46 per cent and so on. The list of simplifications is a long one.

Unfortunately there is not yet any extensive reduction to report in industries directly serving coal mines, nor in coal mining practice itself, although Col. Roberts' committee of the American Mining Congress is keeping the subject alive. The campaign of education is a long, uphill fight and can't be won in a day. But it can be won. Excessive stores of repair parts in mine stockrooms is one thing that is going to help the advocates of standardization. Some mining companies have already realized the cost of capital frozen up in such stocks. Others are waking up to it. Thus perhaps the propaganda has sunk deeper than we realize.

The Intangible Something

THERE MUST be co-operation in any organization. No one was ever heard to contradict the many and frequently repeated statements to this effect. But, there is something in a highly successful mine-operating organization which came before and made co-operation possible. We seem to have no single word by which it is adequately expressed. It is in reality an urgent desire on the part of the salaried employees to promote the general welfare of the business.

There must be a good reason for this desire. In some cases it seems to be prompted by nothing more than a sincere respect or high regard for superiors, coupled perhaps with a sense of obligation because of fair treatment accorded or favors received. In other cases, ownership of dividend-paying stock of the employing company is the secret. Again, we find rare instances where a personnel is made up almost entirely of men who are far above the average in guarding the employer's interest.

Careful analysis of successful organizations would perhaps disclose other secrets for promoting the interest of those who are in positions to "make or break" the average coal-mining company. There must be good management, and therefore real co-operation, but before this can be secured the management must in some way furnish an incentive for the employee to entertain at all times a desire for the general good of the firm.

Let Coal Alone; That's All

WE AGREE with President Hutchinson of the National Coal Association that the one most important thing the coal industry needs is to be let alone —just let alone. It seems such an easy boon for the country to grant, yet what is the use of expecting the country to grant it? The whole coal industry surely knows that the only way it can protect its right to mind its own business is to fight for it. Imagine having to fight for a privilege which ought to be universal! But there are worse plights. One of them is to be compelled to accept the deserts of him who will not defend his own just cause.

If there are any thinking men in the coal industry who believe that they are secure against such bitter deserts, let them take heed of the straws in the gusty wind of the present national political campaign. Government-ownership sentiment is abroad in the land. The body of propaganda to which it belongs is rolling up a vote which next month will astonish some of these coal mine owners who lunch at the club together and easily convince each other that sound conservatism is bound to prevail. They are not counting even the union coal miners, who are certainly going to poll a heavy radical vote along with other dissatisfied elements.

This is not a prophecy that the next president of the United States will be a radical. But it is a prophecy that a radical sentiment for government ownership will register heavily at the polls next month and will be persistent in the next Congress. It may not put forth an immediate demand for public ownership of coal mines. A low-price year like 1924 is a poor one in which to tell the people they can run mines better than the owners. But it is not such a bad year to talk them into running railroads and other utilities. And coal is always next after railroads. That is the point.

Mr. Hoover has some sound arguments against government ownership of such utilities. He points out that utility service is better in America than in any other country, and that the 2,700,000 employees are paid wages giving the highest standard of living and comfort on earth. He shows that our railroads under government control during the war lost $1,600,000,000 that was paid in taxes by the people and that the roads since then have not managed to bring their average earnings even up to 4 per cent. There is already commission control over rates and issuance of stock by utilities; why should we have more control than that? If the utilities were to be bought by the government, a tax revenue of $600,000,000 would be stopped and the country would have to make it up in added tax burden.

Many a sane labor unionist sees the truth of these things, yet it cannot be denied that the government ownership nostrum is "going good" right now. The coal industry should awake to this fact. Sitting back and viewing with alarm from club windows will accomplish little. A hot battle to be let alone is immediately ahead. The sooner the industry pitches into that fight the better its chance of being let alone.

Proper Handling and Storage Reduce Oil Losses

Higgledy-Piggledy Oil Storage Is Wasteful—At Some Plants One Fourth of the Lubricant Purchased Is Lost—Storage Underground in Tanks with Metering Pumps Conserves Lubricants

By Alphonse F. Brosky
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IT WOULD not be far from the truth to say that at least 25 per cent of the oil purchased by the coal industry is wasted. Although unquestionably the major portion of this loss results from too-generous an application of oils and greases to the moving parts of machines, the fundamental cause of waste lies in the methods employed in storing, issuing and otherwise handling the lubricants before they are actually applied.

The primary requisite for preventing much of this known waste is adequate facility for storing lubricants. System in the management of mines today is being extended to include this important item of production cost. Ten years or more ago it was a common sight at the mines to see barrels of oil scattered about with no pretense at orderliness. Spigots were not always closed tightly; sometimes they were not used at all.

Results of Careless Storage at Mines

The direct result of all this carelessness, chaos and confusion was that the ground on which the barrels stood fairly seeped oil. Men were allowed to help themselves to as much lubricant as they wanted as often as they desired. And when only a gallon or two that required coaxing to pour out remained in a barrel, this container was abandoned as empty and a full barrel tapped. This word picture of carelessness and waste is true to life and may yet be seen at many mines.

The accompanying illustrations show several methods used for storing oil at the mines. Each has its place though as far as possible they have been arranged in an ascending scale of merit, Fig. 1 exhibiting the most wasteful method and Fig. 4 the one most satisfactory and economical.

Enough already has been said concerning the slovenly methods depicted in Fig. 1. If a company feels that it cannot afford to erect an oil house furnished with reservoirs and pumps, it at least can provide a rack constructed of rails resting on piers as shown in Fig. 2. By so doing a noticeable improvement over conditions existing in Fig. 1 is effected.

Oil Stored in Tanks According to Grade

A still better method of storing oil is shown in Fig. 3. Here oil is emptied from the barrels in which it is received into tanks resting upon or raised slightly above the floor of the oil house. Three grades of oil are kept in a like number of tanks. In this particular instance one grade is for engines, another for pit cars and a third for conveyors.

The methods illustrated in Fig. 4 are those used at the Lewis Mine of the Hudson Coal Co., near Clarksburg, W. Va. They are recommended as facilitating not only the storage but also the handling and issuing of lubricating oils. A better arrangement would be difficult to conceive.

The oil house at the Lewis mine is 15-ft. square inside and is constructed of concrete blocks. It is provided with a cellar in which three steel oil drums are installed 5 ft. below the frost line. The floor of this building is of concrete reinforced with 40-lb. rails.

Each of the three tanks has a capacity of 283 gal.

FIG. 1

Slovenly Storage

Everything should have its place at a mine, in such a location that the worker will not be unnecessarily exposed to danger in reaching it. Placing these oil barrels between a main line and a mine track renders the oiler's job unnecessarily hazardous. They were probably placed here for the sole reason that this was a convenient dumping point from the freight car.

Fig. 2—Orderly Open-Air Oil Storage

If an under-cover storage cannot be afforded this picture shows the next best alternative. Here not only has order supplanted chaos but the barrels are supported at convenient height above the ground where their spigots are readily accessible.

and holds a particular kind of oil or that intended for some specific purpose. The pumps are so arranged that they may be adjusted to measure out a given quantity of oil, and float gages indicate the quantity remaining in the tanks at all times. As little space is occupied by the pumps there is sufficient accommodation inside the house for storing barrels of oil and grease.

Good Location of Oil House Saves Labor

Mines producing large tonnages of coal are big consumers of oil. At such plants provision should be made for eliminating all needless labor entailed in handling barrels between the railroad car and the oil house. One excellent plan for this purpose was adopted by the Jamison Coal Co. at its No. 7 mine at Barrackville, W. Va., now owned by the Bethlehem Mines Corporation. At this particular plant the oil house was located on the same spur as, and about 60 ft. from the supply building. The floor of the structure was at an elevation slightly lower than the floor of a railroad car, so that a bridge plank could be laid between the two levels.

All in all the layout was one which greatly lightened the labor of transferring barrels from the cars to the oil house. One end of the building was occupied by tanks and pumps, somewhat similar to those shown in Fig. 3, while the remaining space was used for the storage of barrels which were rolled onto four slightly elevated tracks constructed of ordinary mine rails.

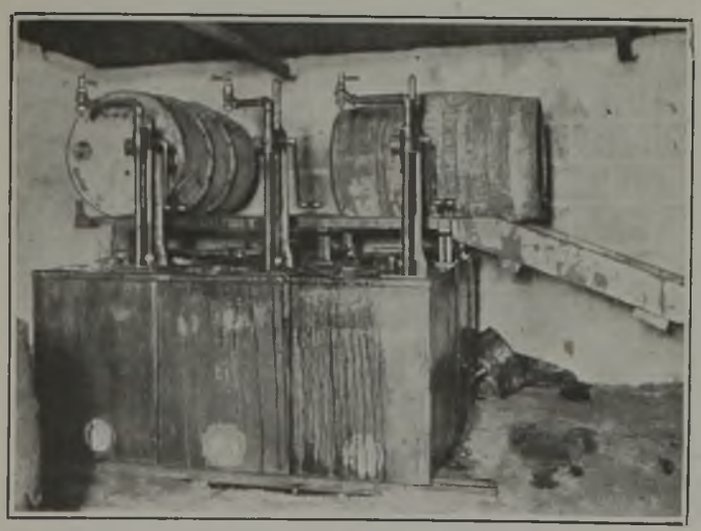

Fig. 3—Inexpensive Yet Efficient Storage

A small fire-proof building and three storage tanks fitted with a pump is about all that is necessary for this kind of a storage. Its chief shortcoming lies in the fact that the oil is unprotected from cold and in winter may become decidedly sluggish. A wooden incline facilitates raising full barrels to the rack above the tanks.

A few recommendations for the better handling of oils as suggested by the best practices now in general use may be enumerated as follows:

(1) Oil should be kept under lock and key and issued by the man in charge of supplies only upon presentation of a properly signed requisition.

(2) As a precaution against the spread of fire, oil should not be stored in the regular supply house or in any other building which, if burned, would result in a heavy loss; it is wise to construct a fireproof building for storing oil. This should be placed at a distance of at least 60 to 100 ft. from any adjacent structure.

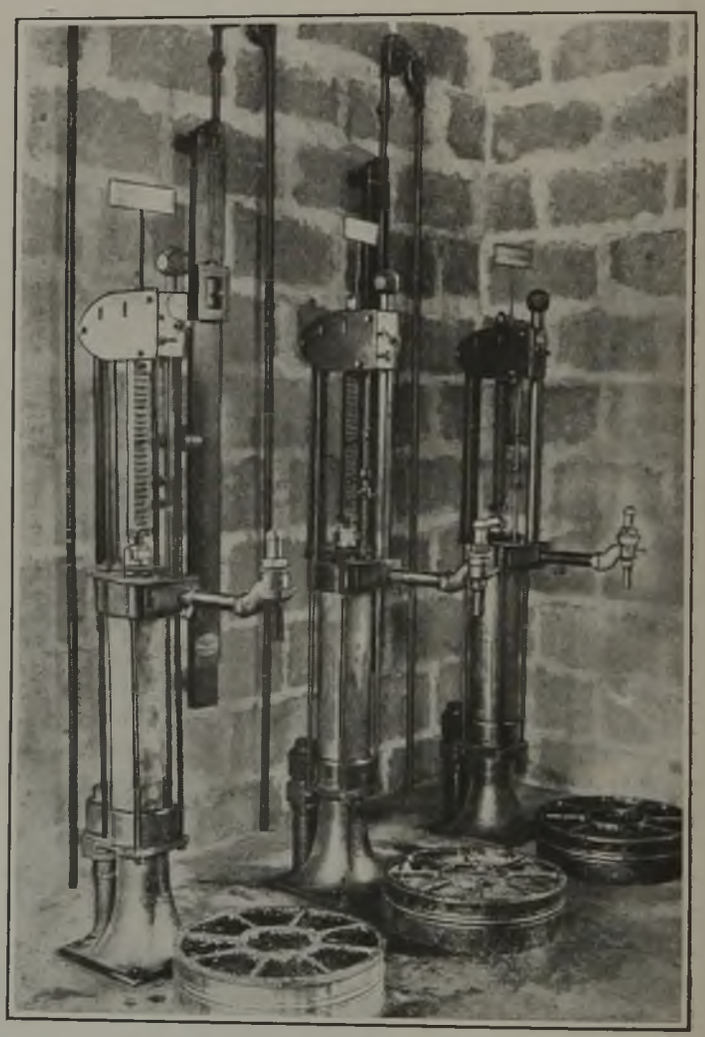

Fig. 4—Modern Oil-Handling Equipment

Means here employed for storing and issuing oil strongly resemble those used in an up-to-date gasoline filling station. The storage tanks are located in a cellar below the frost line. The pumps are provided with meters and the tanks with indicating floats so that an accurate check can be kept on the quantity drawn from the tanks and that remaining on hand.

(3) The arrangement inside the oil house should insure sufficient warmth in the winter months to maintain the fluidity of a medium or heavy oil at or near the consistency attained in summer.

(4) Oil should be emptied from the barrels in which it is received into storage tanks from which it should be removed by pumping.

If these recommendations are adopted either wholly or in part, an appreciable saving will be realized. Furthermore, the potentiality of the fire hazard will be lowered. This is a consideration that cannot be disregarded as the danger of fire is ever present.

Details of Actual Mining in Alabama Coal Beds

Thickness of Bed and Its Pitch Determine the Plan of Mining — On Moderate Inclinations Cars Are Taken to the Face — In Steep Beds Chutes or Conveyors are Used

By Milton H. Fies
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JUST as a thin seam was treated in detail, as an example of a flat Alabama bed, a measure of medium thickness will be considered as being typical of the medium pitching class. Deposits of this type in Alabama are found principally in the Cahaba field. Conditions here encountered are extremely variable. All the beds pitch; in seams now being worked the dip varies from 5 to 49 deg., the roof over the coal varies from fairly good to bad; in some instances, entries and roadways in rooms are cross-collared. The rooms are timbered closely with heavy capboards over the props. The bottom varies from hard to soft. With these extremes in mind, it is manifest that the systems of mining and timbering followed differ from mine to mine, or even from section to section in the same working.

Coal beds in this field are opened on slopes that follow the coal from the outcrop (see Fig. 14). At intervals of from 200 to 300 ft., depending on the thickness of the measure, entries or lifts are turned right and left from the slope on the strike. The slopes have one or two air courses paralleling them, with a pillar 25 to 50 ft. thick between. When two air courses are driven, one is brushed, if the thickness of the coal makes it necessary, to a height of 6 ft. so that it may serve as a manway. This passage is usually 10 ft. wide. The other air course is from 6 to 13 ft. wide and is driven to the height of the coal. Air courses parallel the cross entries, generally on the dip side. The entries are driven "water level"; that is, following the undulations of the seams on slightly rising grades, to facilitate transportation and drainage. Rooms are turned off the lifts to the rise on 35- to 60-ft. centers. The coal is won, where the pitch is not too steep and the thickness of the bed permits, by delivering the car at the face with mules or by the gravity method.

On Moderate Pitches Cars are Jigged to Face

The general practice is to use the gravity method in beds of this class, where the pitch varies from 5 to 20 deg. Rooms are driven to the rise and double tracked, the track being placed close to ribs and extended to within about 10 ft. of the room face. Pulleys, from 8 to 12 in. in diameter, are clevised to posts set about 5 ft. in advance of the room tracks. A rope of ample length to provide for room advancement and encircling the pulleys, is attached to the loaded and empty cars. An improvised braking device (see Fig. 15), situated midway between and in line with the pulleys, enables the miner to regulate the speed of the outgoing car, as it pulls the incoming empty to the face. Such a method requires great care in the laying of room tracks, in the setting of pulley timbers and in the use of the rope.

In advancing rooms three lengths of rope are used; these ropes are 150, 250, and 350 ft. long. There are two links in each rope, which are fastened to it by clamps, the surplus rope being thrown on the mine cars; these links are moved along the rope as the room advances. When the room has progressed beyond the point where one length of rope can be used, this length is moved to some other room and a longer one substituted. The ropes are $\frac{3}{8}$ to $\frac{1}{2}$ in. in diameter, depending on the pitch.

It has been found that patent brake pulleys are not

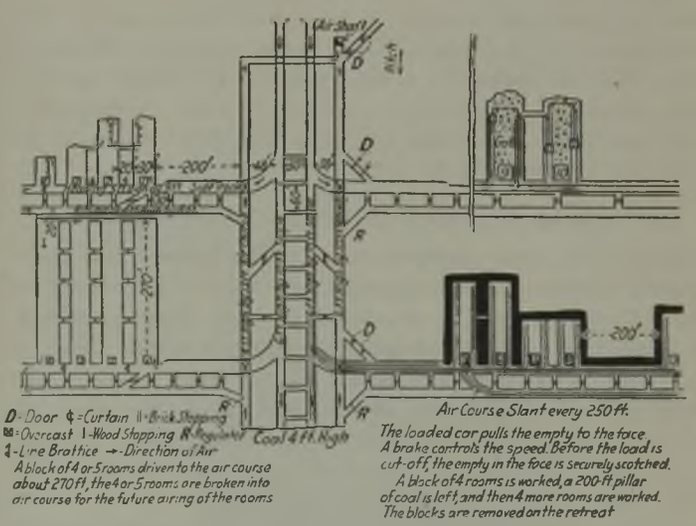


Fig. 14—A Mine in a Bed of Medium Pitch

A slope is driven from the outcrop directly down the pitch. From this levels are turned to either side and double-tracked, double-necked rooms turned up the pitch. Air courses are driven below the levels. Cars are jigged to and from the face.

successful. Sprags are used in the wheels of loaded cars where the pitch is 12 deg. or over. On this pitch wooden room rails are generally used as the damp steel rail does not give enough friction, even though the wheels are spragged.

A modified plan of mining a bed of medium pitch is shown in Fig. 16. The mine is developed through a slope, together with an air course and a manway. Level or strike headings driven double, spaced 700 to 800 ft. apart and averaging about 10 ft. wide, are turned right and left off the slope. Auxiliary slopes, or "dips," are turned off the headings about every 600 ft. The system of mining employed is the room-and-pillar panel plan with all wide work paralleling headings and auxiliary slopes paralleling the main slope. Hoist headings are driven to the rise a distance of 100 to 120 ft. off the headings for the purpose of handling coal from dip panels. Rooms, averaging 24 ft. wide with intervening 20-ft. pillars, are turned right and left off dip slopes and a barrier pillar approximately 40 ft. thick is maintained between the strike entry and the first room turned off dip slopes.

Coal is hauled, by rope, out of dip slopes by an elec-

Note—Third part of article entitled "Alabama Coal-Mining Practices," presented at the Birmingham meeting of the American Institute of Mining and Metallurgical Engineers.

Fig. 15—Gravity System or Jig in Operation

Braking is applied to the rope by the extremely simple yet efficient means here shown. The speed of the incoming and outgoing cars may thus be controlled. Sprags in the wheels are also employed if the pitch is sufficiently steep to warrant their use.

tric hoist placed directly in line with them but to the rise from the heading. From main partings in headings, coal is hauled to a side track, and thence up the main hoisting slope to the surface. Coal is undercut with machines in rooms off dips, but solid shooting is used for breaking down coal in all narrow work.

Longwall Mining Practiced to Some Extent

There are some modifications of this system, but they consist chiefly of semi-longwall operation. The application of this system is the same as that later described as applying to thick seams steeply pitching. Where thin and thick beds are mined on medium pitches, the method used is the same as that described for measures of medium thickness except as to the handling of rock in the thin seams and the depth of rooms in the thin and thick coals.

At one mine in the Cahaba field, a longwall system of mining has been practiced since 1906. This is employed in the Montevallo seam, a typical section of which was shown in Fig. 1, *Coal Age*, Oct. 9, page 474. (This seam is of medium thickness and medium pitch.) This particular mine, Fig. 17, was first developed through a slope on a room-and-pillar system, the rooms being cut together after they were necked and driven up the pitch. This system was continued until the slope had advanced about 2,400 ft. when the mine was changed to the longwall system. After the slope was driven through the basin, which was only 200 ft. wide, the bed began to slope upward on about a 12 deg. pitch, and the walls were advanced on the rise. Electric hoists are used to pull the cars up the pitch. One main hoist raises the empties to a common point of distribution, from which hoists located along the entries leading to the walls pull the cars to the face and drop back the loads. These hoists are equipped with 27½-hp. motors and have a rope speed of 400 ft. per minute.

The walls are 300 ft. in length and have been mined advancing. Experience has proved that if they are kept within 30 to 50 ft. of each other, when the weight comes on it is equalized between them. It has also been found that if the walls are kept 250 ft. part, the falls may be handled on each wall independently. Thus, when the wall farthest advanced gets a fall, it does not affect the coal through which the adjoining wall must be driven. The system of advancing the walls and the location of the hoists for handling the empties are shown in Fig. 17.

When the walls are driven to the rise, a break occurs every 100 to 150 ft. unless a slip or cleavage line appears in the roof. This naturally brings on a break more quickly. Cover over this mine averages 600 ft.

Cribs are built along roadways and timbers are placed as indicated in Fig. 18. Timbers are set on 4-ft. centers staggered, with 2½ by 4-in. straps. These timbers are 1¼ in. in diameter for each linear foot of length and are left in place. If the gob is inadequate, soft-wood cribs (usually of old timber or soft pine) are built behind in staggered position and left in place to serve as a cushion. The performance and condition of the roof determines whether or not the cribs must be built; where slips or cleavages occur, more cribs are required. If the roof has a tendency to fall more quickly than is normally the case, additional cribs must be built to counteract this feature.

Double Rows of Cribbing Protect Roadways

Headings are advanced 100 ft. under the coal in the bottom, the measure consisting of alternate coal, rash, and slate. The coal over the heading is then removed as the wall advances. The roadways are protected by cribs set in double rows. The conveyor used along these faces is of the shaker type. This is an English machine, known as the Mavor & Coulson shaker, or the reciprocal longwall conveyor. It is made in sections, each 9 ft. long, which are connected by eyelets and bolts. The motor driving the conveyor is placed be-

Fig. 16—Modification of Mining Used on Medium Pitches

A slope, an aircourse and a manway are driven down the pitch. Double levels are turned from the slope at intervals of from 700 to 800 ft. Room-and-pillar panel mining with all wide work paralleling the headings and auxiliary slopes paralleling the main slope, is the system followed.

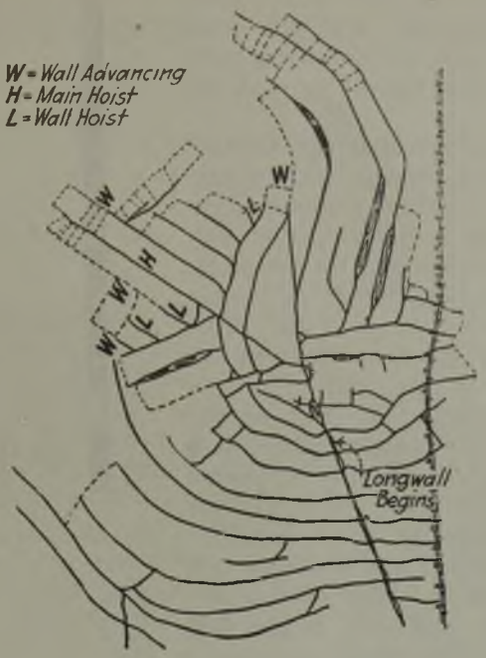


Fig. 17—Longwall Mine in the Cahaba Field

Longwall extraction has been followed in this operation for eighteen years, although the mine was at first developed on the room-and-pillar system. Electric hoists are used underground for car distribution. Operation is conducted advancing.

tween the rows of cribs and is connected to it by means of a rope.

There has been much discussion among engineers as to the proper place for connecting the driving mechanism to this type of shaker. At this mine, experiments to determine the proper location showed that it was more successful to drive the pan from the discharge end. The mining machine cuts its kerf in the rash directly over the bottom coal. Experience has demonstrated that it is most satisfactory under this system of mining to make the length of cutterbar on the machine 1 ft. for every foot of height of coal. In other words, a 4-ft. bed would require a 4-ft. cutter bar.

Coal in this mine is hard, without any butts or faces. With the system of mining described, it yields 67 per cent of lump coal over 4 in. in size, 9 per cent of 1½x4-in. egg, and 7 per cent of ½x1½-in. furnace nut, or a total of 83 per cent of domestic sizes.

A thick bed, known as the Henry Ellen or Mammoth,

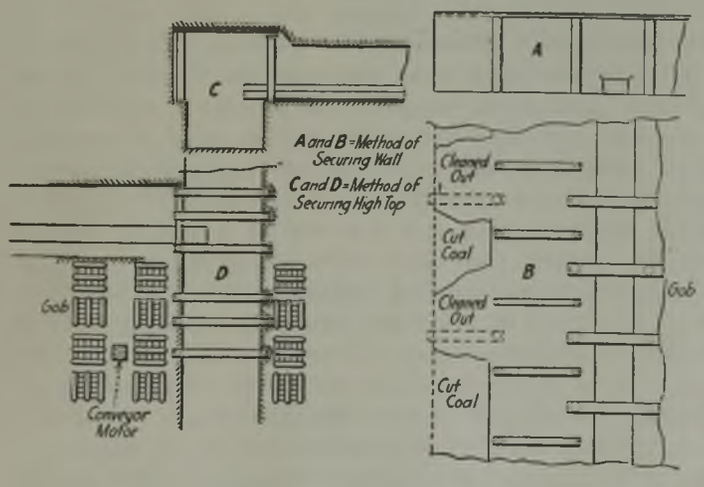


Fig. 18—Details of Longwall Timbering

Props, three-piece sets and cribs are used to support the roof. The cribs are chiefly employed however to ease the roof down. Shaking chutes are utilized to move the coal from the faces or walls to the mine cars. These are motor driven the motor being placed near the discharge end.

in the Cahaba field, is shown in Figs. 19 and 20, which illustrate the method employed in mining steeply pitching measures. This seam is 11 ft. thick with an 18-in. rash parting about the middle of the bed, and 3 to 4 in. of slate parting near the top. The pitch varies according to location along the outcrop and distance from the surface. The bed is steeper near the outcrop and flattens out somewhat as it nears the main faults, or limestone measures. The average pitch is about 26 deg. The seam is worked through a slope driven straight down the pitch with entries or headings driven at about right angles thereto. From these rooms are turned straight up the pitch, as shown. In headings and airways, the coal is loaded directly into cars. Chutes are used in the rooms and cars are loaded from them by opening the chute end gate. The cars are hauled to the sidetrack at the slope by mules and raised to the surface by electric or steam hoists.

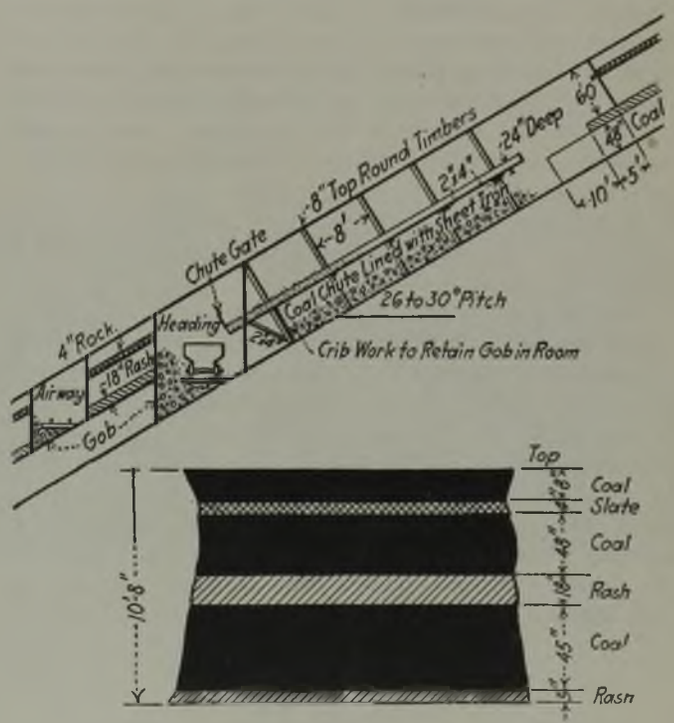


Fig. 19—Working a Thick Steep Bed

This shows a cross-section through an airway, a heading and an advancing room. The coal is here worked in benches, the slate being gobbed in the room and retained by crib work. Chutes lined with sheet iron convey the coal from the face to the heading where a car is loaded by simply raising the chute end- or discharge-gate.

The coal is shot from the solid with permissible explosives. Cutting shots are placed in the center of the working face in the top bench of coal. Slab, or dependent shots, are placed at intervals of 3 to 4 ft. each way toward the ribs. After the top coal has been shot down and loaded out, the middle parting of rock is removed with pick and shovel after which the bottom bench is drilled and shot up with a few light charges placed near the bottom of the bed. The top bench is carried 12 to 15 ft. in advance of the bottom bench in both headings and rooms. This bed gives off a large quantity of methane at the face of the coal, hence an efficient system of ventilation is required.

Ventilation is effected by means of a motor-driven exhaust fan connected to the air shaft by a duct fitted with explosion doors over the shaft. The air intake is through the slope and manway and is conducted throughout the mine on a split system, by means of overcasts, brattices and regulators, constructed of rock, concrete or wood, according to the permanency desired.

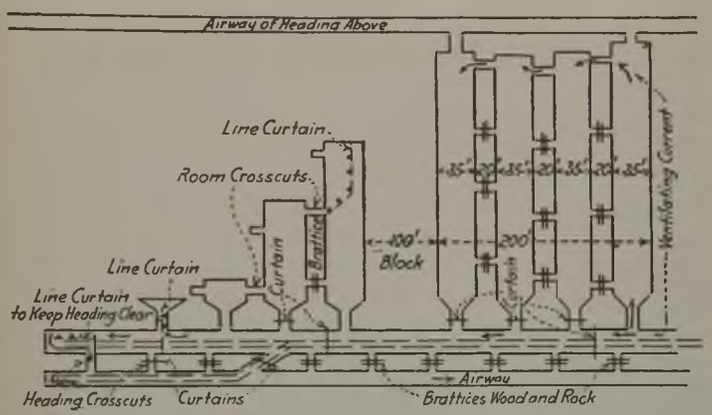


Fig. 20—Plan of Entry and Rooms in Pitching Bed

This also shows how the various working places are ventilated. As gas in fair quantity is frequently encountered it is often necessary to build line brattices or curtains in rooms or headings in order to thoroughly sweep the faces.

At times, it is necessary to use a line brattice or curtain from the last open crosscut (see Fig. 20), to the face of the working place. Electric cap lamps are used in this bed and the coal is brought down by "shot firers" after the men have left the mine. An average miner will load out from 12 to 20 tons of coal per shift.

In medium-thick beds of the third class, the difference in mining method lies in room depth and in handling rock on entries. There are no thin seams of this class mined in the state.

A semi-longwall method of mining has been applied in a few cases to thick steeply pitching beds. Fig. 21 illustrates this method. A slope was driven on the seam which pitched 35 deg. but flattened in the lower workings to about 25 deg. On the first two entries, rooms were turned up the pitch, the coal shot from the solid and loaded through chutes into 3-ton cars. This method was not a success, for the coal was almost completely shattered by the solid shooting. Accordingly, a semi-longwall system was adopted. A section of this seam is shown in Fig. 22. Entries were turned

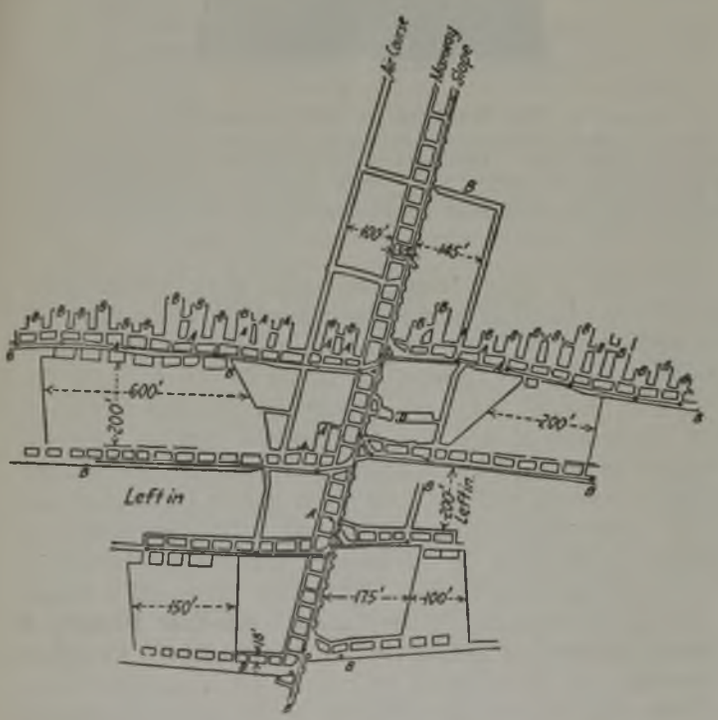


Fig. 21—Semi-Longwall in a Steep, Thick Bed

Room-and-pillar mining was first tried but was not successful. Panel longwall faces were then opened, alternate panels being left in place, the slope and manway in all cases being protected by heavy pillars. This system is more or less of an experiment and difficulty is feared when retreat on the panels left in place is attempted.

so as to provide walls 200 ft. long. Alternate panels are left solid with the idea of advancing with one panel and retreating with the other.

The walls are undercut, beneath the bottom rock, with chain machines of the longwall type fitted with a 5½-ft. cutter bar. These machines cut up the pitch. Each cuts about 100 ft. of face in approximately 2½ to 3 hr. This is about as much as the men can "rock down" in a shift.

In addition to the regular ropes on the machine, there is a safety rope by which it is lowered on the pitch after cutting. This rope is attached to a carefully placed face jack and winds around a drum on the rear of the machine; a friction mechanism attached to this drum is operated by the machine runner. When cutting on a pitch over 25 deg. this rope is kept taut, as a precaution in case the feed rope should break. On pitches of 25 deg. or less, the undercuttings in the kerf will hold the machine should the feed rope break.

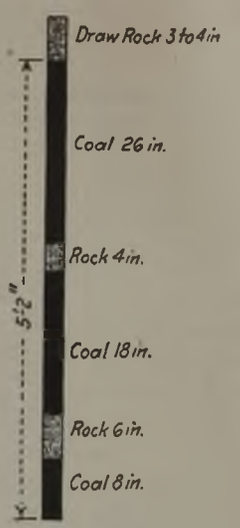


FIG. 22

Section of Coal Bed

This is a section of the coal in the mine shwon in Fig. 21. It exhibits the partings characteristic of Alabama measures.

As the wall advances, ordinary mine timbers about 6 in. in diameter are set about 4 or 5 ft. apart. These are left in place until they begin to show weight, when four rows of large breaking timbers 10 in. in diameter and larger, are set to within 3 or 3½ ft. of the face. Next all the smaller timbers are removed and a break follows. After the first break, it is necessary to timber for additional falls, each time the face advances from 50 to 100 ft. On the lower entry of each wall, pillars 18 ft. wide and 25 ft. long with 10-ft. crosscuts are left to protect the entry. When the wall advances beyond a crosscut, the chutes are curved into the last one left open. The coal is loaded into the chute by the miner and flows by gravity into mine cars.

Table VII—Output per Man per Day, Tons

Thickness of Coal, inches	Average Production per Man, Tons
28-30 (machine mined)	2.16
36 (machine mined)	3.90
44 (machine mined)	4.35
84 (solid shooting)	4.65
42 (steam shovel)	8.57

This system may, with conservatism, be said to be in an experimental stage. The operator anticipates some difficulty while retreating on the alternate panels. It is planned to drive "raises" through these panels at a distance of 1,000 ft. apart. Then, if trouble develops while retreating, a wall will be advanced from a "raise" toward the face. This system is used on medium-thickness beds of medium pitch. Where the pitch is under 18 deg., the chute is replaced with a conveyor, which consists, in most cases of a chain traveling in a trough. The movement of the chain is sufficient to bring the coal to the mine car on the entry.

As an indication of the influence of the thickness of bed on the average production per man, including company men, Table VII is submitted; these figures have been compiled by a large producing company and cover several months' operation.

Conveyor That Facilitates Concentrated Mining

Adequate Transportation Necessary to Obtain Output from Any Mine—Flexible Sectional Conveyor Makes This Possible—Ability Quickly to Lengthen or Shorten Such a Machine Is a Primary Requisite

By N. D. Levin
Columbus, Ohio

TRANSPORTATION within the mine is one process in coal production that causes much delay and loss to both mine owners and workmen. In many cases the men have to wait half or more of their time for cars in which to load, when they would far rather be working and making money. With the ordinary room-and-pillar system no more than one or at most two men can work in each room; consequently a great number of rooms are required in order to obtain the desired output. This means a correspondingly large investment if the mine covers an extensive territory.

The Jeffrey Manufacturing Co., of Columbus, Ohio, recently developed a type of conveyor that makes concentrated mining possible under many and varied conditions. One of these machines and some of its applications are described in this article. This conveyor is so constructed that it can be lengthened or shortened quickly. The standard sections are made 6 ft. long, as this is the average advance of an undercutting machine. If, for instance, the conveyor is used to take the coal away from a "shortwall loader" that makes, say, one advance per hour, the machine must be lengthened eight times in a shift.

It accordingly is evident that each extension must be accomplished quickly and easily or otherwise too much time would be lost, and the delay incurred would offset any advantage derived from the use of the machine. In designing this conveyor, therefore, aside from reliability and the lowest possible cost, the ability to attach or detach a section quickly was given first consideration.

It is evident that it will require less time to uncouple one chain than two; consequently this conveyor was made with a single strand of chain. The coupling links shown in the accompanying illustrations can be taken out or put in place in an instant.

The chain is built up of forged side straps, the same type as is employed in coal-cutting machines. The rivets take no more stress than that required to hold the chain together; the shear is taken by the lugs on the side straps. This is the strongest chain for its weight that has yet been devised.

The single chain positioned in the center of the trough is easy to get at for connecting or disconnecting. When it is desired to add a section to the conveyor the procedure is as follows: The chain is disconnected near the tail end of the conveyor, and laid out on the floor back of the conveyor, as shown in Fig. 3. The sections are held together by bolts or by pins, as shown in Fig. 4.

There is a connection on both sides at each end of every section. The pin or bolt—whichever is used—first is pulled out; then the tail section is drawn back 6 ft. In Fig. 5 two men are shown taking hold of his tail section to move it back. It is light enough so that two men can easily carry it, or, if necessary, one man can drag it.

The lower trough or pan is put in place first, after which the upper trough is added. Fig. 6 shows a man in the act of putting the upper half of the section in position. After this is done the four pins are put in place to hold the conveyor together. Next 12 ft. of chain is added and coupled to place. All parts of the conveyor are light, so that one man can do the work if necessary, but two men can perform it easily.

The bottom of the upper trough on which the coal rides is only 3 in. above the floor of the mine, so that this conveyor is extremely low. This is of great importance when working in low coal. Another feature of the conveyor is that it readily adapts itself to rolling bottom.

Fig. 7 is a shop view of one of these conveyors with 12-in. wooden blocking placed underneath a section joint. This makes more of a sudden hump than would be encountered in a mine, yet the machine will carry coal over this obstruction.

Fig. 8 is a view of the conveyor taken from the dis-

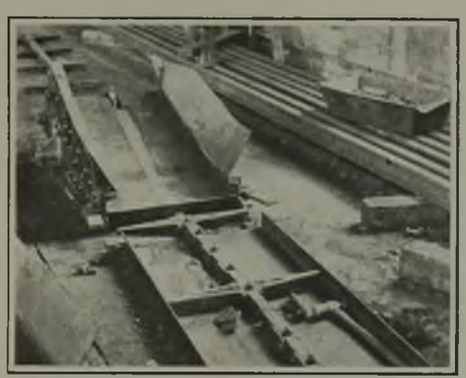


Fig. 1—Conveyor Tail Section Detached
Particular attention should be directed to the type of chain employed. Placing lugs on the side links relieves the rivet or pin from the stress of pulling the chain.

Fig. 2—Details of Chain Construction
Here the side links with their forged lugs readily can be seen as well as the grooved pins and the locking device. A hammer is used for disconnecting the chain.

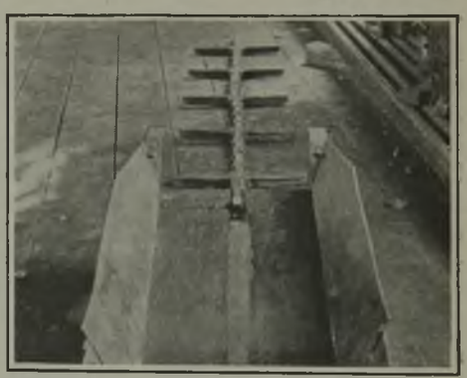


Fig. 3—Inserting a Conveyor Section
When it is desired to lengthen the conveyor the first step is the disconnection of the chain. The loose end is next straightened out in line with the conveyor.

Fig. 4—Disconnecting Tail Section

The tail or rear terminal section may be disconnected by withdrawing the pins or bolts that join it to the conveyor proper, thus completely freeing it.

Fig. 6—Inserting a Straight Section

Top and bottom pans are moved separately, the bottom pan being put in place first. Either is light enough as to be readily handled by one man. This is a decided advantage in restricted mine passages or where speed in making a change is essential.

charge end. The size of the electrical equipment shown on the left is varied to suit the length of the conveyor and the duty it will be called upon to perform. Fig. 9 is a view looking toward the discharge end, and Fig. 10 shows the tail section by itself. This is the part that ordinarily is moved back when a straight section is to be added. On the right-hand side is shown a small wheel, in the circumference of which radial holes have been drilled. These are used for slackening the chain when it is to be disconnected. A slight pull on a bar inserted in one of these holes will give sufficient slack to couple or uncouple the chain quickly.

The conveyor is reversible, this provision being necessary inasmuch as no track is laid in the entries or rooms where this machine is used, and consequently timber and other material must be handled by the conveyor.

By reference to Fig. 12 a good idea may be obtained of the way in which this conveyor is used. A "shortwall loader" is shown at *A*. The sectional conveyor carries the coal from this machine and discharges it at the point *B*, either into cars or onto a conveyor on the lateral entry as shown. At the face *C* is a "conveyor loader" which discharges into another sectional conveyor at *D*. This latter conveyor carries the coal to the point *E*. The driving units for these conveyors are located at *B* and *E* respectively. Each time the face *C* is loaded out, the conveyor is shortened at *D*. The sections removed are loaded out on the conveyor to *E*, transferred to the conveyor serving the "shortwall loader" and are used for adding on to this conveyor at the point *A*.

When the shortwall loader has driven through to the next lateral entry at the point *K*, the conveyor is not taken out, but is left in place. The head and tail ends are removed and their positions reversed. Thus the

FIG. 5

Moving Tail Section Back

Lightness is an essential characteristic of any portable conveyor. The tail section of this machine is of such small weight that two men can easily carry it or one man can drag it along the mine floor. As may be seen in this illustration, hand holds are provided to facilitate moving this section. Little time is consumed in lengthening this conveyor.

FIG. 7

Uneven Floor Is No Obstacle

Humps and hollows make little difference to this conveyor as it is sufficiently flexible to surmount them. A joint is here supported on two 6x6-in. blocks.

end that was nearest to the "shortwall loader" is placed at *B* and the driving or discharge end is put at the point *K*. When the face *C* has advanced to the point *E*, the conveyor is ready to receive the coal from this face and transport it to the point *K*. The same type

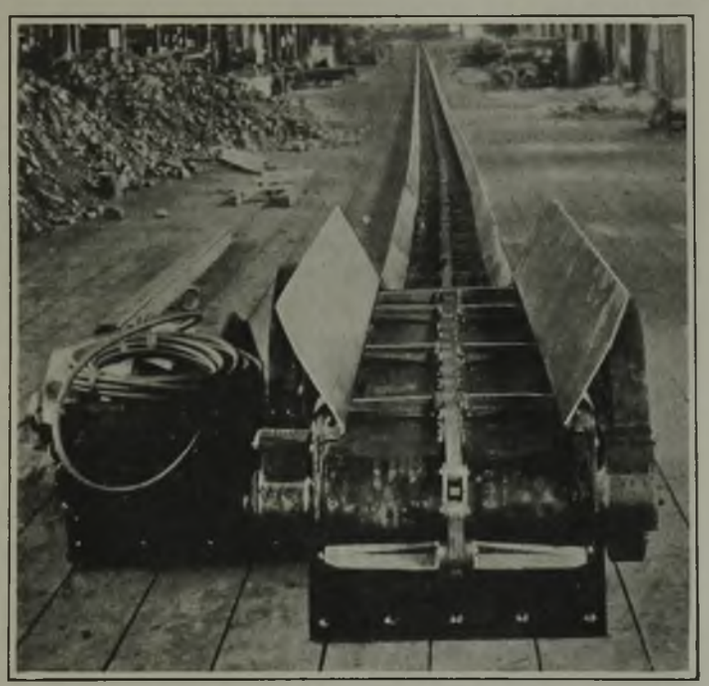


Fig. 8—View as Seen from Head End

The motor and driving machinery are well incased. The power of the motor may be varied to suit the work to be done or the weight of coal to be transported.

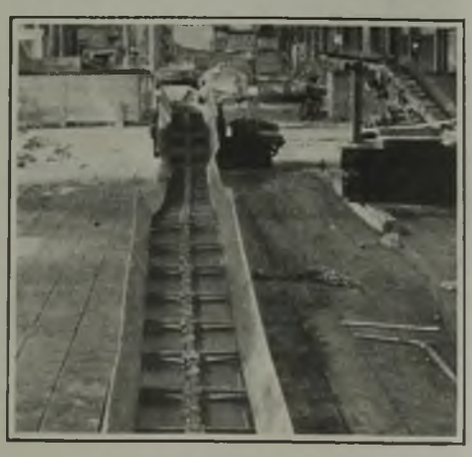
of conveyor, if desired, can be used along the face *C* instead of the "conveyor loader," the coal being loaded into it by hand. This latter method requires putting enough men along the face to load out a cut in one shift.

In mines where it is desirable to maintain the present room-and-pillar system the rooms may be driven

FIG. 9

Looking Toward the Head End

Although the bottom plate of the coal pan is only 3 in. above the floor, making the complete conveyor low, its capacity is large, as may be judged from this view.



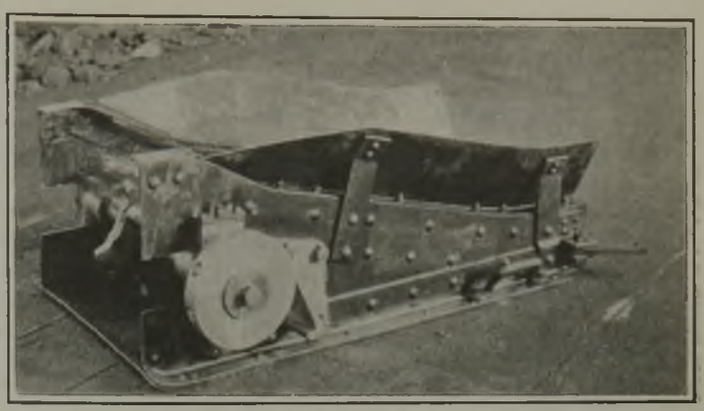


Fig. 10—Tail Section of Conveyor

The tail shaft is provided with an overhung disk with holes drilled radially in its circumference. This affords enough slack to permit of coupling or uncoupling the chain.

narrow, using a "shortwall loader" discharging to a sectional conveyor. When the rooms have been driven to their full depth slabbing cuts are made by mining machines and the coal loaded into the sectional conveyor.

In Fig. 11 is shown a room being driven 10 ft. wide with a shortwall loader, *A*. *B* is a sectional conveyor. To the right is shown a room that has been driven to its full depth. A shortwall machine is shown at *C* making a slabbing cut. *D* is the sectional conveyor that took the coal away from the shortwall loader when the narrow room was being driven and is now in position to be used for taking away coal made by the slabbing cut. *E* is a conveyor installed on the entry and em-

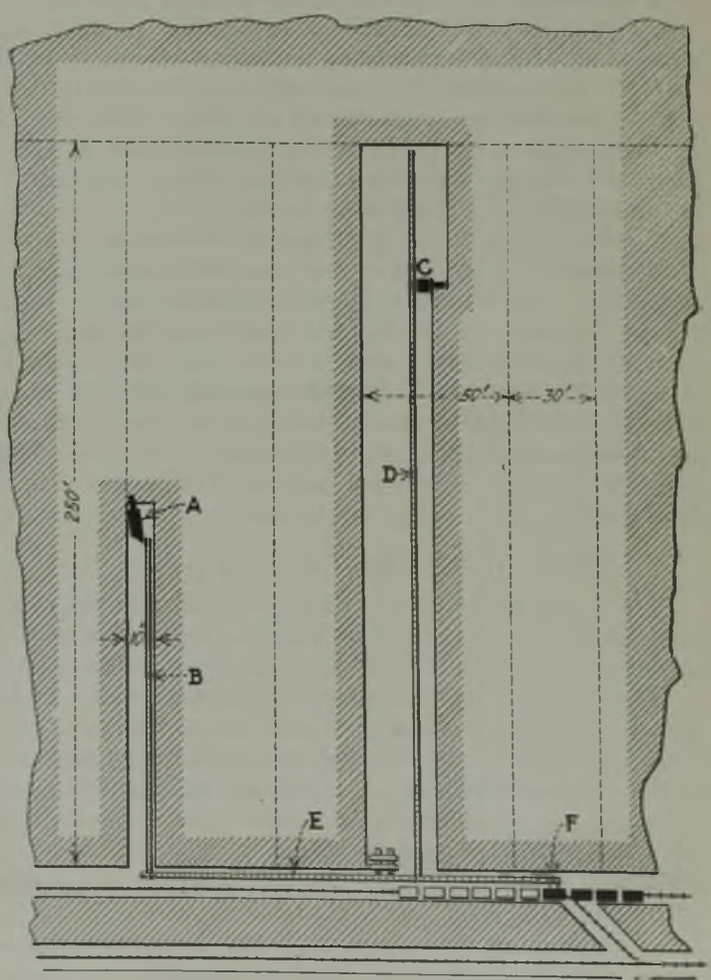


Fig. 11—Room Driving and Pillar Slabbing

The rooms are driven narrow and then widened out by slabbing cuts taken off the pillar ribs. Cars are loaded in trips on the heading, where unless grades are favorable each locomotive remains with its trip, successively spotting the cars until the entire trip is loaded.

ployed in gathering coal from several rooms and discharging it into a trip of cars at *F*. This conveyor may be extended to the nearest entry if desired.

Many different systems of mining by mechanical means are being contemplated at the present time, and it is believed that this sectional conveyor will find a place in practically all of them. A saving will be afforded by its use because of the comparatively large quantity of coal that can be taken from a territory of given size. This will result in a lower cost of mine upkeep. No track is required where the conveyor is employed, and it is not necessary to take up bottom, shoot down top or remove rock in the entries in order to make room for cars.

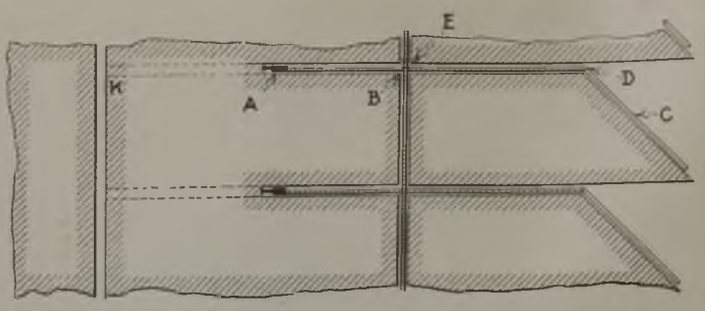


Fig. 12—Concentrated Mining by Conveyors

Both heading driving and pillar withdrawal are here shown. The method is thus rapid and the output large. Cars are loaded at a single point on a heading not shown in this drawing. Unless grades are favorable the locomotive does not uncouple from the trip.

Alberta Experiments in Making Briquets From Coal Dust Hitherto Wasted

In the fourth annual report of the Scientific and Industrial Research Council of the Province of Alberta is found a detailed account of experiments in the manufacture of briquets from the fine coal dust usually wasted in the production of coal in Alberta. This work has been carried on at the University of Alberta since December, 1922, and Prof. Edgar Stansfield, secretary of the Council, in describing it and in outlining the conclusions reached says:

"In making briquets the coal is crushed to a suitable size, if dust is not used. A batch is then weighed out, transferred to the mixer, and heated. Usually, in our test plant, 18 lb. of coal is handled in one run. The binder also is weighed out, melted and poured into the mixer, and the temperature and moisture content of the mixture regulated as required. Usually two or three minutes is found to be sufficient time to complete the mixing, but this varies with the temperature and therefore with the fluidity of the mix.

"From the mixer the batch is transferred to a fluxer, from which it is allowed to run into the feed hopper of the press. As the rear plunger is drawn back, some of the material in the hopper falls into the die box. Here it is caught, squeezed between the two plungers, and finally ejected from the die box by the rear plunger, which has a longer travel than the front one and makes only half as many strokes per minute. The briquets fall onto a moving belt, are discharged at the front, collected in a box, and tested.

Twenty-five Briquets Made Per Minute

"The press makes about twenty-five briquets per minute. Their size can be controlled by a regulation of the feed, but they usually were made to weigh about 4 oz.

"The briquets are classified by inspection, by their specific gravity, by drop test, and by rattler test. Of these, the specific-gravity and the rattler test seem to be the most satisfactory. Comparison of briquets made from the same coal with the same binder show that the quality of the briquet increases with the specific gravity.

"In the drop test, six briquets are given a 10-ft. drop onto a concrete floor, and the breakage determined. In the rattler test twenty briquets are placed in a container, which is revolved 200 times at 32 r.p.m. The material rubbed off the briquets as they revolve is then weighed, and the percentage determined.

"Tests were made to determine the best sizing of the coal, best temperature for mixing, minimum time required for mixing, best temperature for pressing, also the effect of the addition of steam to the mix, and changes of pressure in the press.

Soft Coal-Tar Pitch Used in Test Work

"Soft coal-tar pitch was used for most of these tests for the sake of uniformity and because it is in some ways the easiest binder to use for test work. Comparative tests were made with other binders. While we are not prepared at present to tabulate full results of our experiments, certain broad conclusions may be mentioned.

"The quantity of binder required varies with the type of coal. Thus, a carbonized lignite requires from two to three times as much as a coking bituminous coal.

"The higher the temperature, the less time required for mixing.

"Although blowing steam through the mix has advantages and is generally employed in commercial work a better briquet generally can be made under laboratory conditions without steam.

"Increase of temperature at the press results in increase of density of the briquet, but a limit is placed upon the temperature by the increasing tendency to stick to the plunger and by the friability of a hot briquet as it leaves the press. The tendency to stick to the plunger can be reduced by steam.

Size of Particles Affects Quality of Briquet

"Increase of pressure naturally increases the density of the product, but a large increase in pressure is required for a small increase in density.

"The effect of the size of particles in the crushed coal used on the quality of the briquet made probably is far less in a coking bituminous coal than it is with either anthracite or carbonized lignite. If the particles are too large or large particles are present in too great quantity, the briquet is coarse and friable. Finer crushing gives a smoother and more shiny briquet, but excessive dust increases the amount of binder required.

"The department does not intend to continue the manufacture of briquets this autumn," concluded Professor Stansfield, "but more attention will be paid to suitable binders for the various grades of coal. Whether our results will form a basis of a future industry for northern Alberta depends on so many factors that we can say nothing about it. We are concerned only with the scientific side of the problem and not its commercial application."

Kentucky Chief Electricians Learn How To Cut Costs

Men of Ten Related Companies Hold Round-Table Session at Williamsburg Reviewing Money Saving Methods

By J. H. Edwards
Associate Editor, *Coal Age*,
Huntington, W. Va.

METHODS that have already cut power costs and are expected to cut them deeper were discussed in round-table session by the chief electricians of the Southern Mining Co. and nine related mining organizations at Williamsburg, Ky., Sept. 25-27. The electrical men sat around a table, elbow to elbow with their superintendents, some foremen, a scattering of company officials and equipment salesman, and went vigorously at the heart of many a problem that worries coal mining men. This gathering in of men from various departments was a new plan.

They discussed differences in efficiency between new and old locomotives and how to get the best out of such motors. They developed the fact that the life of bearings can be doubled and the cost of lubrication halved by shifting from cheap black oil to good, high-viscosity lubricants. They learned that cutter chains oiled when hot deliver better service. They were convinced of the value of setting cutter bits with exactness. They described various new practices they have adopted, and produced the figures to show that the sort of study they are making in their round-table meetings pays. One of the companies, since the last meeting, reduced its electrical department costs 9 cents per ton. Many cuts in power cost per ton have been made.

There were represented at the meeting 12 properties with an aggregate output of 14,000 tons per day and operated by ten associated companies. F. A. Signer, electrical engineer for the entire group, presided at all sessions. The registered total attendance was eighty. The meeting was conducted informally where men smoked and speakers were not required to stand.

An especially interesting part of the program was the reading of reports including comparative figures of electrical department costs for this year and for the period since the first meeting at which each electrical man pledged himself to find ways to reduce costs.

In the electrical department costs of the Southern and associated companies are included: purchased power, supplies for electrical and mechanical equipment, trolley wire, line material, armature repairs, repair department labor, and the like. Table I is a summary of the results obtained. Reductions up to 9 cents per ton were made. The few cases of small increases in cost were generally due to reasons beyond the control of the chief electricians. It will be noted that the table includes power costs per ton. The average cost per kw.-hr. of purchased power for this group of mines is 2¼ cents.

Table I—Per Ton Costs Are Improving

	Electrical Dept. Costs			Power Only	
Operation	7 months of 1923	1924	Reductions	1923	1924
No. 1	.100	.071	.029	.040	.047
No. 2	.131	.123	.008	.091	.096
No. 3	.118	.123	.005	.048	.044
No. 4	.091	.070	.021	.039	.042
No. 5	.126	.131	....	.099	.105
No. 6	.104	.079	.025	.052	.050
No. 7	.254	.161	.083	.099	.096
No. 8	....	.189	....	....	.175
No. 9	.148	.139	.010	....	....
No. 10	....	.108	....	....	....
No. 11	.055	.057	....	.055	.048

This table shows the results of close studies of power problems is the Southern Mining Co., and eight related companies in Kentucky. Electrical department costs including purchased power, parts and supplies, wire and line material, repair labor, etc., have been cut as much as 9 cents per ton. Power costs per ton show some reductions also.

New Steel Tipple at Black Snake, Ky.

The first coal wast just recently loaded from this tipple at the Southern Mining Co.'s new operation. A flight conveyor moves the coal from the monitor dump to the tipple. The eight tipple motors are supplied with alternating current from the transformers in the foreground.

Many Interesting Papers Were Presented

At intervals between informal discussions, papers were read by each chief electrician. These included the following: "Economy of Automatic Substation Installation," by G. L. Birch, Southern Mining Co., Balkan, Ky.; "System Employed in Maintenance of Storage Battery Locomotives," by Jonas Jones, Southern Mining Co., Colmar, Ky.; "System Employed in Case of Haulage Locomotives and Mining Machines," by H. A. Sparks, Harlan Coal Co., Perkins, Ky.; "Performance and Repairing of CE-10 Mining Machines," by Gail Benge, Mahan-Ellison Coal Corporation; "Tipple Equipment General Remote Control," by Bryan Harkness, Southern Mining Co., Black Snake, Ky.

Mr. Birch's paper described the layout and performance of an automatic substation put into use April 23 of this year. Up to the present he has had only four trouble calls to this equipment. Twice the automatic apparatus was merely performing its duty in refusing to go on the line because of short circuits inside the mine. The other two times failure was found due to dust on control contacts. Mr. Birch suggested eliminating this trouble by inclosing the contacts.

The important subject of lubrication as influencing electrical department costs was approached, as were many other subjects, by calling on each chief electrician for a verbal report of the service he obtains and his suggestions for improvement. At one mine a 50 per cent cut in lubrication cost was reported. This was made possible by going to the carefully supervised use of good grade, high viscosity lubricants instead of the cheaper oils and greases. It was estimated that double the bearing life is now being obtained. The necessity for applying the lubricant to a mining machine cutter chain after completing a cut rather than before starting a shift was emphasized. If applied when the chain is warm the lubricant works in along the rivets where it is needed the most.

Mr. Sale explained that three-fourths of a pint of

"On Top of the Hill" at Black Snake

The two trolleys are supported by one row of heavy posts. A large bracket and a ½-in. rod support the 1½-in. galvanized pipe. The same posts support a telephone and low voltage a.c. line.

proper lubricant if applied properly is sufficient for the cutter chain during an entire shift. It is preferred to apply the oil in two doses, one after the first cut and the other during the middle of the shift, however, in some cases satisfaction is obtained by only one application per shift. Mr. Sale exhibited curves of amperage, first when using black oil on the cutter chain and later when using a good lubricant. In the first case the load was 135 amperes and in the second case 100 amperes. Mr. Signer also emphasized the poor lubrication by black oil, citing tests he had made where the load on a mining machine motor was reduced from 27 hp. to 21 hp. by discontinuing the use of black oil and substituting the use of a high grade lubricant.

Black oil will not adhere to the chain. If the chain is well oiled before beginning a cut there will be an increase of about 3 hp. before the cut is finished, most of this increase being due to decreased lubrication. Joe Gider described a comparative test during the past two years on two cutter chains, one being lubricated by black oil and the other by a high grade liquid grease. A recent inspection of the chains revealed that the first is nearly worn out, but the other is still in excellent condition. The use of a special gear compound rather than heavy grease was indorsed for locomotive gears.

Next in order was a discussion of arc weld bonds. The steel terminal bond applied with a mild steel 5/32-in. diameter metallic electrode is the standard of the companies. The terminal is applied at the apex of the angle between the base and web of the rail and welded only along the top and end. The bonds are always put on the inside of the rails in which position the flanges of derailed equipment will not cut them off.

The same size and type of steel terminal is used on the cross-bonds; however, the terminal is turned upside down and its length placed at right angles to the length of the rail. It is welded along both sides to the top of the base of the rail. With the cross-bond terminal in this position a 90-deg. bend in the copper cable is avoided thus saving several inches in length of bond required and there is provided the required offset of the copper below the top of the ties thus affording protection. The breaking of a few rails at the point of bond application was reported but no one present emphasized this feature as being a serious objection.

The discussion of trolley wire installations and mine circuits in general was quite spirited. The importance of applying hangers or suspensions at intervals of not over 20 ft. and of aligning the trolley wire properly with regard to the track was illustrated. A straight properly located wire means less strain and wear on the trolley wheels, harps and suspensions, also a great saving in time consumed by putting poles back on the wire. The waste of using several hangers screwed together one above the other at points of high roof was condemned. Mr. Birch exhibited graphic meter charts taken before and after a general repairing and reinforcing of bonding and feeders. These comparative charts indicated clearly the power saving achieved.

Following this came the subject of inspection of equipment in service. A point stressed is the necessity for effort in persuading the mining machine operators always to use a gage in setting machine cutter bits. A method of checking the care used by the machine operator is to gage a few of the dull bits he leaves at the shop. The bright marks indicate the last set screw position, this giving a point from which to measure.

In the discussion of substation maintenance the cases were cited of two fires being started by an accumulation of dust on top of the oil switches. One of the most important items of converter and motor-generator inspection brought out at the meeting is that brushes should never be allowed to get stuck in the holders.

In a discussion of locomotive and mining machine cables it was held that the braided type of cable lasts an average of ten months at these mines. The all-rubber cables are very much favored. The cost is about two and one-fourth times that of the braided but the life is three to five times as great.

Outside frame locomotives were favored by most of those present for use where clearance inside the mine permits. The outside frame type is inherently better than the type carried on an inside frame although, of course, it is more expensive when renewing tires. The difficulty of re-railing a wheel is overcome to a great extent in the latest locomotives by designs which afford 5 to 10-in. clearance between the bottom of the frame and the track.

One great advantage of the outside frame locomotive lies in its better journal bearings. Dirt and grit are excluded from at least one end of the bearing and the end thrust can be taken on a quickly renewed plate on the end of the shaft. The bearing is out where it can be lubricated and inspected easily. The added room between frames of the outside type is a valuable feature where narrow gages would otherwise tend to cramp the equipment and limit the cab space so necessary in low coal where the motorman must get down almost level with the top of the locomotive.

New Construction

The same standard bracket is used regardless of the length of arm. Pole extension above the bracket provides support for future wiring.

The difficulty often experienced in getting full tractive effort out of new or newly re-tired locomotives was referred to by some. It requires the wear of about 1/8 in. of metal off of the properly tapered tread before full tractive effort is exerted. The Kentuckians find this wear takes place in

Trolley Supports in Perfect Alignment

This is one of the many photographs used at the meeting in connection with the discussion of trolley wire installation.

a few days or weeks depending on the service. It was suggested that possibly the tires should be furnished with a flatter tread contour when first put in place.

A report was made on the performance of a 13-ton locomotive equipped with contactor control. Little or no trouble was experienced and it was agreed that the maintenance is less than with the drum control.

This meeting of chief electricians was not lacking in entertainment. One feature was a get-together dinner. Here good fellowship prevailed and serious thoughts of speakers were clothed and intermingled with wit and humor. The dinner was attended by most of the officials of the associated companies. The character of the whole gathering from start to finish was such as to make it impressive to those who attended. It is confidently expected that when the next session is held additional dollars and cents results will be reported from better electrical department methods suggested at this round table and more hearty co-operation between electrical and mining departments.

Mining Congress Discusses Coal Situation At Sacramento Convention

MOST OF THE papers presented at the American Mining Congress convention held at Sacramento from Sept. 29 to Oct. 4, dealt with metal mining. However, there developed some interesting discussions on the coal situation.

Senator Oddie of Nevada, in discussing the needs of the mining industry, advocated the encouragement of seasonal buying and did not agree with the recommendation that the problems of the coal industry should be referred to the Interstate Commerce Commission for solution.

Falcon Joslin, of Seattle, explained the Alaskan situation and told of the difficulties experienced by those who had attempted to develop coal and petroleum prospects in Alaska. He said that Alaskans wanted laws that will stabilize property rights in mineral holdings and a system of government that protects capital and investments.

The needs of the coal mining industry were briefly outlined by S. Pemberton Hutchinson, president of the National Coal Association. His address in part was as follows:

Need of Coal Industry Is to Be Let Alone

"The only need of the industry today is to be let alone to work out its own salvation. Over development, coupled with a somewhat depressed industrial situation, is usually given as the reason why there have recently been so many idle coal miners.

"Of course there is some over development for normal needs, caused by the unprecedented demands for coal during the war. This industry, as well as all other industries, cannot and should not attempt to support more men than are needed to meet the demand in normal times. Those mines that are today working the greatest percentage of full time are naturally those which can produce coal at the lowest cost. The situation in the industry is already improving and will continue to improve with a general resumption of industrial activity.

"It is often said that the stabilizing of production is the great need of the coal industry. By that is meant, I suppose, that the consumer shall buy an equal amount of coal each month. I do not believe that such a plan is practicable. There is no power to compel the consumer to buy coal when he thinks he does not need it. Lack of storage space, uncertainty as to the future of his business, and consequently of his needs, will always be governing factors in the consumer's mind.

"Some advocate regular production and storage at the source of supply, but any one who is at all familiar with bituminous coal production knows that this is utterly impracticable for physical reasons at many mines, since they are in narrow valleys where storage space is not available. Furthermore, there is the cost of rehandling with a certain loss in volume and a greater loss through degradation as well as loss in interest on the money advanced by the producer to cover the storage period.

Storage Only Adds to Congestion

"If the operator stores coal, with the consequent cost thereof, he must surely face the day when his stored and weather-beaten coal goes into competition with his freshly mined product. Those who advocate storage of coal at the mines in order to provide against a possible shortage during strikes or severe weather apparently forget that shortages have been largely caused by lack of transportation facilities. Storage wherever it involves reloading on railroad cars affords no relief from this difficulty, but rather slows down traffic and adds to congestion.

"Taking it by and large, over the long period of years since bituminous coal was first mined, the consumer has been able to secure an uninterrupted supply of coal at the pit mouth at a reasonable price. Private ownership and competition have effected this. Will government regulation do any better? I challenge the advocates of any form of paternalism to prove their case.

"The regulation of the bituminous coal industry can safely be left to economic forces. Attempts to stabilize production or buying can at best be only partially successful.

"There are certain hard facts as old as mankind which must be recognized. The bituminous coal industry is up against them and it must work out its own problems. That is the same thing as saying that the solution is economic, and other industries are faced with the same situation."

Concrete-Lined Pipes Resist Acidulous Mine Water

Lining Is Spun to Place and Requires No Puddling—Tests Prove Impermeability and Strong Adhesion to Metal

By C. H. S. Tupholme
London, England

OWING to the deleterious action of mine and other acidulous waters on metal pipes, and the incrustation and corrosion which occurs from this cause, an allowance in the size of the bore of the pipe has usually been necessary in order to secure the desired effective carrying capacity of the line. This allowance has been estimated by some engineers to be as high as 40 per cent. Various corrosion-resisting metals have been developed and used in the construction of pipes intended to carry acidulous waters. Most of these, however, have proved impracticable chiefly on account of their high cost.

The recent introduction, into Britain by the Stanton Ironworks Co., of a centrifugal method for making both iron and concrete pipes, is claimed by some disinterested parties to have provided a solution to this problem. By this method also it is possible to line a metal pipe with concrete, thus forming on its inner surface a corrosion-resistant coating.

In this process special runners are fitted to the external surface of the metal pipe that is to be lined. This pipe is then placed on the Stanton-Hume concrete machine and a concrete lining run to place on the inner surface in a manner similar to that employed in the manufacture of concrete pipes.

Concrete Pipe Spun to Shape Within Mold

The machine employed in making concrete pipes consists of a cylindrical mold, cut longitudinally, the edges being rejoined by keys. At the ends of the mold, the internal diameter of which equals the external diameter of the pipe to be made, flanges are fixed. The difference between the internal diameter of these flanges and the inner diameter of the mold determines the thickness of the wall of the pipe to be made. Incidentally these flanges serve as wheels upon which the mold is rotated when placed horizontally upon the machine with the flanges bearing against friction rollers. While the mold is revolving at low speed the necessary amount of concrete is inserted, and spreads itself over the inner surface. The speed of rotation is then increased. After a few minutes the mold is brought to rest and the water, which by action of centrifugal force, has been squeezed out of the concrete, is allowed to run off. About 7 per cent of water is left behind in the body of the pipe.

The machine is again started and the pipe once more rotated for a few minutes. During this final spin the inner surface of the pipe is polished by passing a steel bar over it.

Pipes thus formed are lifted from the machines hydraulically after which they are passed successively through chambers containing a saturated atmosphere. They are next placed in the curing yard, kept well watered while in the early stages of setting, and the conditions for curing maintained as nearly as possible to ideal for several weeks.

Lining a metal pipe is performed in exactly the same manner as above described except that the pipe itself takes the place of the split mold. Either cast or wrought pipes may be lined with equal facility in this manner.

In testing the adhesion of the concrete to the metal a 27-in. cast-iron pipe with a ½-in. lining was used. A hole was drilled through the iron only, just touching the outer surface of the concrete lining. This was then tapped and connected to a pump. Pressure was gradually applied until it reached 560 lb. per square inch. This pressure was maintained constant for a period of 10 min. during which time the pipe was kept under continuous observation. At the end of this interval moisture was seen coming through the concrete lining at a point opposite that at which the pressure was applied. The pressure was then increased to 1,120 lb. per square inch, when moisture appeared on parallel circumferential arcs 2 ft. long and 12½ and 15 in. respectively from the point of pressure application. This concluded the test.

This trial clearly demonstrated the impermeability of the lining. The layer of dense concrete on the inside of the lining is the portion that is impervious to water at reasonable working pressures. By a "reasonable working pressure" is meant one at least 50 to 75 per cent above the working pressure that the pipe is designed to withstand.

Temperature Changes Have Little Effect

Atmospheric temperatures have no apparent effect on concrete-lined pipes. The coefficient of expansion of cast iron is only slightly higher than that of concrete (0.000011 as against 0.0000106), and although the conductivity of the metal is much higher than that of the concrete, the rate of change of temperature is so slow that no separation of the metal and concrete can take place. To demonstrate this fact the following experiment was performed:

Four concrete-lined iron pipes were successively subjected to temperatures of 80, 90, 100 and 200 deg. F., with no separation between metal and lining occurring. In order to make this test as severe as possible the pipes were rolled direct from the heating chamber into the cold air and vice versa. The pipes were left for 7 hr. at each of the higher temperatures and intermittently for 5 hr. at atmospheric temperatures ranging from 48 to 62 deg. F. In order to ascertain if any separation between lining and metal had taken place in the body of the pipe, sections were cut off from time to time and inspected.

In a freezing test a 12-in. ring cut from a 27-in. cast-iron pipe lined with ½ in. of concrete was sent to a refrigeration plant and left in a freezing chamber at 1 deg. F. for 24 hr. This also had no effect on the lining.

In another test two concrete-lined iron pipes were joined and calked, after which the following loads were applied:

Load, tons	Deflection, inches
0.5	0.011
1.0	0.019
1.25	0.025
1.50	0.030
1.75	0.040
2.00	0.101
2.25	0.161
2.50	0.214
2.75	0.272
3.00	0.315
6.5	1½ approx.

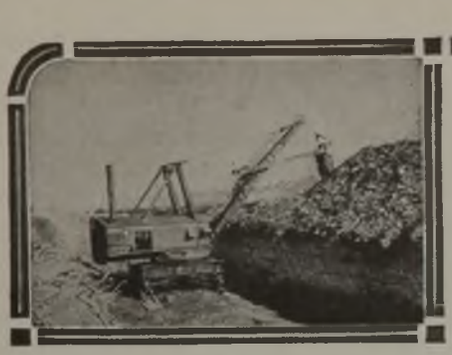
The sections joined were finally deflected 17 deg. from a straight line yet no sign of damage appeared in the concrete lining.

It is possible to cut a concrete-lined metal pipe with a diamond chisel. Such pipes also may be drilled and and tapped in the ordinary way. Aside from the protection it affords, the concrete lining imparts a material increase in the pipes resistance to external pressures. Deflection tests have shown that the concrete lining does not add to the pipes rigidity. A 4-in. pipe placed on supports 10 ft. apart gives exactly the same deflection lined as unlined. The interesting feature of this test, however, is the fact that the concrete bends with the iron without cracking. If the pipe is fractured the break in the concrete lining follows the lines of break in the metal and shows no splintering. Even the pieces flying off when lined pipe is shattered still retain the concrete lining.

THE EXECUTIVE COMMITTEE of the National Safety Council elected at the meeting at Louisville, Oct. 2, to serve until annual meeting of members, 1925, included the following fourteen members at large: C. B. Auel, Westinghouse Electric and Manufacturing Co.; Charles B. Scott, Bureau of Safety, Chicago; Walter G. King, American Optical Co., New York City; George T. Fonda, Fonda-Tolsted, Inc.; C. E. Pettibone, American Mutual Liability Insurance Co.; L. R. Palmer, Equitable Life Assurance Society; H. A. Reninger, Lehigh Portland Cement Co.; Homer E. Niesz, Commonwealth Edison Co., Chicago; Harry E. Webber, Illinois Bell Telephone Co., Chicago; A. L. Watson, Hooker Electro-Chemical Co.; E. W. Beck, United States Rubber Co., New York City; Harry A. Adams, Union Pacific Raiload Co., Omaha, Neb.; James P. Barnes, Louisville Street Railway Co.; Dr. Otto P. Geier, Cincinnati Milling Machine Co., Cincinnati.

Double Tipple No. 32 of the Red Jacket Consolidated Coal & Coke Co., Red Jacket, W. Va.

Where coal beds lie flat and occur close together, as in the case here shown, it is often advantageous to place two dump houses tributary to one conveyor leading to the tipple. By this means the first cost of the entire installation is kept to a minimum.



News Of the Industry

Consumers' Reserves of Soft Coal Shrink To 47,000,000 Tons on Sept. 1

Decrease of 15,000,000 Tons Since Jan. 1—Present Supply Would Last 45 Days at Current Rate of Consumption—Retailers' Stocks of Anthracite Sufficient for 58 Days

Commercial stocks of soft coal on Sept. 1, 1924, according to the government's inventory of coal stocks, taken recently, totaled 47,000,000 net tons, a decrease of 4,000,000 tons from stocks on June 1, and 15,000,000 tons from the record of Jan. 1, 1924. The course of stocks has been constantly downward since the early weeks of the year; stocks on Sept. 1, 1924, were 9,000,000 less than on the same date a year ago, and were more than double those on Sept. 1, 1922, at the close of the miners' five months' strike; compared with Aug. 1, 1921, there was an increase of 6,000,000 tons.

Measured in terms of tons, stocks decreased 24 per cent during the first 8 months of 1924. Measured in terms of days' supply the decrease was but little over 2 per cent. These percentages are based on averages which assume that the supply was evenly distributed.

In addition to the estimated quantity in storage piles of actual consumers, the following quantities are known to have been in transit on Sept. 1: On the commercial docks of Lakes Superior and Michigan, 6,600,000 tons; in storage at the mines or at intermediate points, at least 300,000 tons.

Anthracite.—Retail dealers' stocks of anthracite were 71 per cent larger on Sept. 1, 1924, than they were on the corresponding date of 1923, and they were but 7 per cent less than on Nov. 1, 1921, two months later in the season. As a result of the steady movement of anthracite up the Lakes the stocks, which stood at 450,000 tons on June 1, had increased to 1,400,000 tons by September 1.

The estimate of soft coal in the hands of commercial consumers on Sept. 1—about 47,000,000 tons—which is based on reports from a selected list of about 5,000 consumers, does not take into account the coal in the bins of householders, concerning which no data are available, nor steamship fuel, nor the tonnage on the Lake docks, which is considered coal in transit.

It will be seen from Fig. 1 that the period of accumulation of reserves that began with the termination of the miners' strike of 1922 and that resulted in stocks of 62,000,000 tons on Jan. 1, 1924, came to an end during the early months of this year. By June 1 stocks had dropped to 51,000,000 tons, and a further decline during the following three months carried them down to 47,000,000 tons.

The reports from consumers, supplemented by information from other sources, indicate that the total consumption of soft coal during the first eight months of 1924, including coal that entered into the foreign trade, was approximately 310,000.000 tons, or at a daily rate of about 1.270,000 tons. For the five months ended May 31, the average daily rate of consumption appears to have been about 1,370,000 tons, and for the three months ended Aug. 31, it was but slightly over 1,100,-000 tons.

Stocks in Days' Supply

Fig. 2 compares the days' supply held by the seven principal classes of consumers on Sept. 1, 1924, with that on the same date the year before. Here again the importance of the rate of consumption in determining the adequacy of reserve stocks is strikingly illustrated. As against a 46 days' supply on Jan. 1, 1924, at the rate of consumption then prevailing, the average consumer on June 1 had a supply sufficient to last 49 days, despite a decrease of 11,000,000 tons in the actual quantity on hand. On Sept. 1, after a further reduction of 4,000,000 tons, the storage piles still held a 45 days' supply at the rate of consumption in June, July and August.

In studying these figures of average days' supply, it should be borne in mind that the reserves on Sept. 1 were based on the summer rate of consumption, whereas the weeks following Sept. 1 almost invariably witness an increase in consumption owing to the change of seasons.

In Fig. 3 the variations in stocks in the several states are graphically presented. The map shows the days' supply held at general industrial plants, excluding byproduct coke and steel works. This is the largest single group of consumers, both numerically and from the viewpoint of consumption, and the one that illustrates best the geographical distribution of reserves. This group is a sensitive business barometer, and changes in its activity are quickly reflected in the coal market, and likewise important changes in the production and prices of coal are soon manifested in the stocks held by the industrials.

Over the country as a whole the industrials had a 48 days' supply on Sept. 1, against a 53 days' supply on June 1 and a 56 days' supply on Sept. 1, 1923. In the case of the industrials, also, the days' supply appears large because of the reduced rate of consumption.

As usual, the reserves varied with the distance from the mine and the character of the coal used. Consequently the map shows that New England, Wisconsin, the Upper Peninsular of Michigan, and the northern Rocky Mountain region had a 90 days' supply, and that New York, New Jersey and the Carolinas had better than a 60-day supply.

In the belt of states extending from Maryland to California, and from Texas

Days' Supply of Bituminous Coal in Hands of Various Classes of Consumers, Nov. 11, 1918, to Sept. 1, 1924 (*a*)

(Figures represent number of days supply would last at current rate of consumption at time of stocktaking)

	Nov. 11, 1918	Jan. 1, 1919	Jan. 1, 1921	Nov. 1, 1921	Jan. 1, 1922	Mar. 1, 1922	Jan. 1, 1923	Sept. 1, 1923	Oct. 1, 1923	Jan. 1, 1924	June 1, (*b*) 1924 (*b*)	Sept. 1, (*b*) 1924 (*b*)
Byproduct coke plants	35	32	29	38	42	39	19	30	33	35	34	30
Steel plants	45	42	42	46	48	48	27	33	39	43	56	42
Other industrials	71	65	64	67	51	51	40	56	56	55	53	48
Coal-gas plants	85	81	55	87	89	89	60	110	91	91	88	90
Electric utilities	49	49	44	54	51	51	33	52	49	51	63	58
Coal dealers, bituminous	37	39	30	46	33	33	16	38	36	34	40	46
Railroads	31	32	23	31	35	35	16	44	41	44	50	42
Total bituminous	45	42	39	43	41	41	26(*c*)	46(*c*)	45(*c*)	46(*c*)	49(*c*)	45(*c*)

(*a*) The figures in this table are estimates based on incomplete data. (*b*) The rate of consumption used in calculating the days' supply on June 1, and Sept. 1, 1924, was the quantity consumed from June 1 to Aug. 31. (*c*) Subject to revision.

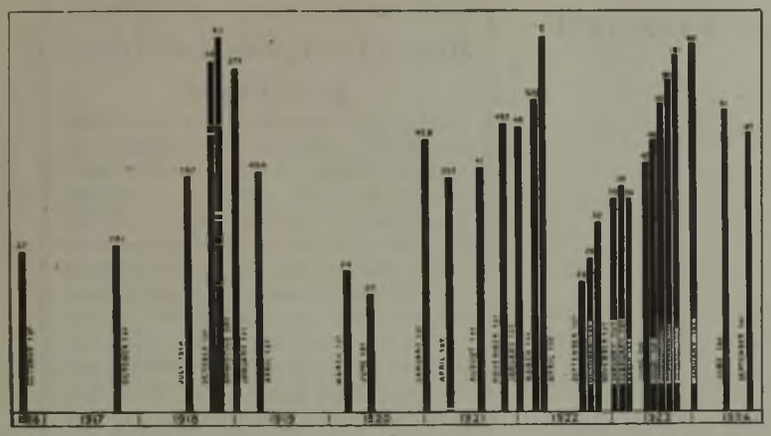


Fig. 1—Total Commercial Stocks of Bituminous Coal, Oct. 1, 1916, to Sept. 1, 1924

Figures represent millions of net tons and include coal in the hands of railroads, industrial consumers, public utilities and retail dealers. Coal for steamship fuel, on Lake docks, in transit and in the bins of householders is not included. These exceptions are important, as the coal on wheels at times has proved a greatly disturbing factor in the calculations of would-be statisticians. Figures for 1923 and 1924 are subject to revision.

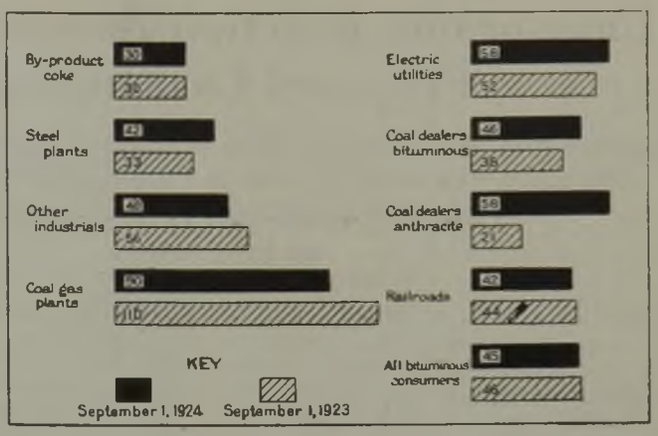


Fig. 2—Days' Supply Held By Different Classes of Consumers, Sept. 1, 1924, and Sept. 1, 1923

At the rate soft coal was burned from June 1 to Aug. 31, 1924, the total stocks on Sept. 1 were sufficient to last 45 days on the average, against a 46 days' supply on Sept. 1, 1923, at the rate of consumption then prevailing. The tonnage now in reserve, although 16 per cent less than a year ago, is nearly as adequate for the present needs as was that on hand a year ago.

to Washington none had as much as a 60-day supply, and in many stocks would have lasted less than 30 days. Some of those states, however, use mostly lignite, and in others little coal is burned owing to the availability of water power, electricity and fuel oil.

As usual, the public utilities were in a particularly strong position regarding stocks; on Sept. 1 electric power plants had a supply sufficient to last 58 days, and manufactured-gas plants had a 90-day reserve.

Complete returns from the manufacturers of byproduct coke and iron and steel showed the following reserves on Sept. 1, 1924, and Sept. 1, 1923:

Byproduct Coke Plants

	Sept. 1, 1924	Sept. 1, 1923
Low volatile	33 days	31 days
High volatile	29 days	29 days
	30 days	30 days

Steel Works

	Sept. 1, 1924	Sept. 1, 1923
Steam coal	36 days	28 days
Gas coal	56 days	42 days
	42 days	33 days

The greatly decreased activity at steel plants was reflected by a decrease of 39 per cent in the daily rate of consumption of coal from June 1 to Aug. 31, 1924, as compared with the rate in August, 1923. Consequently, although the actual tonnage held at such plants was 22 per cent less on Sept. 1 than it was the year before, it was sufficient to last 42 days, at the decreased rate of consumption, against a 33 days' supply on Sept. 1, 1923.

Through the courtesy of the American Railway Association reports have been received from the railroads that indicated a total supply of railroad fuel in excess of 13,000,000 tons, which at the summer rate of consumption would last 42 days. On Sept. 1, 1923, the railroads had stored 16,000,000 tons, sufficient for 44 days at the August (1923) rate of consumption. These figures include the coal in cars and chutes as well as that in stockpiles.

The householders' demand for soft coal was lighter than usual during the summer months, and Sept. 1 found the retail dealers with good sized stocks, which, because of the dullness of demand, appeared unusually large. Retailers' stocks on Sept. 1 were sufficient to last 46 days, at the rate of delivery during the three preceding months, an increase of 21 per cent over the supply a year ago. Compared with Nov. 1, 1921, two months later in the season, the day's supply was identical, but the actual tonnage on hand was 20 per cent less.

The total quantity of soft coal in transit has never been measured accurately, but there is sufficient evidence to indicate that the figure runs into millions of tons, and that it is subject to sudden and wide fluctuation. The available information indicates that the quantity in transit on Sept. 1 was about the same as on Jan. 1, 1924. Reports from an incomplete list of producers who store showed a total on Sept. 1, 1924, of about 300,000 tons against 385,000 tons on Jan. 1, and 440,000 tons on Sept. 1, 1923. The total quantity of unbilled coal standing in cars at the mines was about 750,000 tons.

Manufacturers of byproduct coke accumulated stocks of unsold coke during the first eight months of 1924, and on Sept. 1 a group of 21 plants had on hand a record total of 1,114,000 tons. This was an increase of nearly 45 per cent over the stocks on Jan. 1, 1924, and exceeded the previous high mark established on March 1, 1922, by more than 10 per cent.

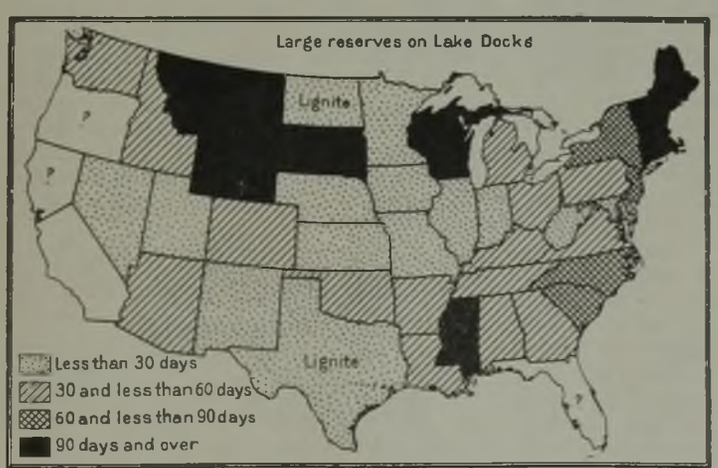


Fig. 3—Days' Supply of Soft Coal on Hand at Industrial Plants, Sept. 1, 1924

At the average rate of consumption during the summer of 1924, stocks at industrial plants, other than steel and byproduct coke, would have lasted on the average 48 days. New England, Wisconsin and the Upper Peninsula of Michigan had supplies sufficient for at least 90 days, and of the states east of the Mississippi only Illinois, Indiana, Maryland and West Virginia had less than 30 days' supply. Based on reports from 2,093 industrial plants.

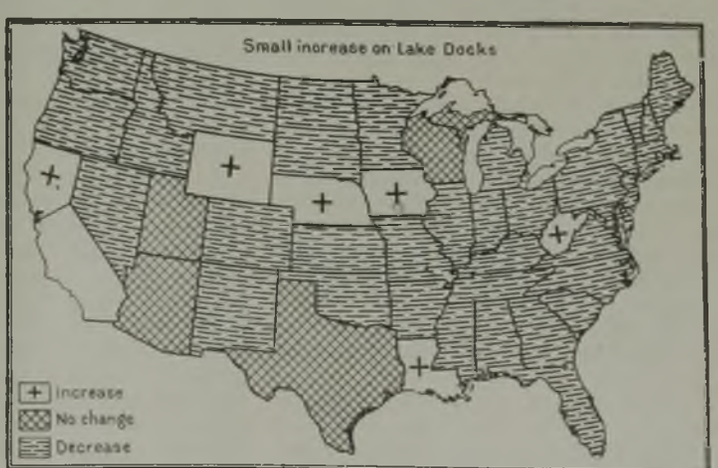


Fig. 4—How Stocks at Industrial Plants on Sept. 1, 1924, Compared With Those on Sept. 1, 1923.

The map shows, state by state, the changes in stocks at 1,839 identical industrial plants, other than steel and byproduct coke works. In only 6 states were stocks larger than they were a year ago, and in the eastern part of the country, West Virginia o ly, showed an increase. The decrease in stocks appears to have been due to a sharp decline in requirements, which led consumers to reduce their reserves.

Unfavorable Reaction Develops Toward Proposed Coal Institute

Wadleigh Plan Would Include Associations of Producers, Wholesalers and Retailers—To Interpret Coal to Public and Foster Research—Stronger Local Organizations Chief Need

By Paul Wooton
Washington Correspondent of *Coal Age*

Coal specialists in Washington do not react favorably to the coal institute which F. R. Wadleigh, former Federal Fuel Distributor, is advocating. None doubts Mr. Wadleigh's sincerity and unselfishness. The very fact that he has sponsored the idea has given big impetus to a proposal which would have been cast aside without serious attention had it come from anyone not known to be thoroughly public spirited.

The coal institute, as proposed by Mr. Wadleigh, is a sort of three-party affair to be composed of the associations representing the producers, the wholesalers and the retailers of coal. It is to be a center of information. Coal is to be interpreted to the public. The organization is so set forth in a dignified way the importance of coal in the national economy. It is to constitute a united front for a campaign to improve public relations. It is to foster research. It is to give technical advice in the art of using coal to the best advantage. It is to eliminate waste in distribution, and is to be a great center of statistical activity covering all branches of the industry.

Aims to Eliminate Waste

No one attempts to dispute the fact that the aims of Mr. Wadleigh's conception are entirely praiseworthy. At a time when the industry is suffering as never before from overproduction and the attending evils of bankruptcy and unemployment, when distribution is conducted on such slender profits as to imperil its efficiency, any proposal is welcome which will eliminate waste, improve practice and unify the industry. Even the late lamented Coal Commission would have applauded the carrying out of the aims set forth for the proposed organization. It coincides exactly with the plan of constructive trade association activities prescribed by Secretary Hoover.

Desirable as is an *entente cordiale* between the various branches of the coal industry, the majority view in Washington is that the building must be done from the bottom up rather than from the top down. Before a great superstructure can be supported by the National Coal Association, the American Wholesale Coal Association and the National Association of Retail Coal Merchants, the pillars must be strengthened.

In this matter, as in all national questions affecting coal, the views of the Washington coal specialists are entitled to consideration because they reflect not only the thought in the three branches of the bituminous industry but also the viewpoint of the public and of various types of consumers.

Convincing reasons are advanced to show that the first requisites of the coal institute plan are strong national associations functioning vigorously in their own fields. It can be said truthfully that the National Coal Association, the American Wholesale Association and the National Association of Retail Coal Merchants do not receive the support that they have the right to expect. Incidentally this situation reflects adversely on various elements within those branches of the industry.

The opinion is that the first task is to create three strong national bodies. For instance, in the matter of statistics the institute would get its figures from the national associations. These associations can furnish the facts and figures only if they in turn have the hearty co-operation of all local associations. Not only must there be hearty co-operation but there must be strong local associations before stability can be obtained by the national associations.

In studying the problems which confront our industry there is an increasing tendency to find out if there is anything in the practice of other coal mining countries which can serve as a guide to us. In this particular instance it is worth while to consider what has been done in this line in Great Britain. The association idea has advanced much further in that country than is the case here, yet there has been no federation of the associations. It is true that the British associations have carried on some of the activities suggested for the coal institute but they do not try to do things in common, although each is more ready to take up cudgels for other branches of the industry when it is under a pact, in Parliament or without, than is the case in this country.

The Lancashire and Cheshire associations for a long time have supported research on problems such as spontaneous combustion, mine explosions and permissible explosives. Other associations have been active in financing research work which the trade in this country has been willing to leave to the government. The British associations have carried statistical work to a degree not common in this country. Complete current data are available on costs, on the export trade, on employment, on wages and earnings, on the productivity of labor and on many other matters. The Mining Association of Great Britain has far more data of this character than has its counterpart in this country, the National Coal Association. It has monthly returns of cost from every field and a great mass of other data which enables that association to be the mouthpiece of the coal operator in fact as well as in name. Its board of directors is representative of all the districts. It maintains cordial relationships with other associations, but no super-organization has been created.

Howat Ineligible for Office, Says Lewis

A recent message from President Lewis to officials of District 14, United Mine Workers (Kansas), declaring Alex Howat, deposed president of the district, ineligible for office in the organization, followed the action of several locals in placing Howat in nomination for the office he once held. Lewis explained that while the application of Howat for reinstatement was accepted by one of the locals several months ago, it has not yet been approved by the International Board, and until such action Alex is not qualified to hold office.

Interesting Meet Planned by Coal Mining Institute

Deep interest is being manifested in the coming meeting of the Coal Mining Institute of America, at Pittsburgh, Pa., Dec. 3-5. Though all the details of the program have not been completed mining men far and wide urge that plans be made early to attend. The importance of this year's gathering to executives and operating men is only partly disclosed by an announcement of some of the subjects and speakers.

Men of national reputation will describe some of the advances during the last few years in operating methods. For instance, Thomas W. Dawson, chief engineer of the H. C. Frick Coke Co., will present a paper on "Underground Belt Transportation" and Graham Bright will read one on "Recent Developments in Electricity in Coal Mines." Edward Steidle, of the Carnegie Institute of Technology, will speak on "Modern Rock-Dusting Practices." The effect of certain practices such as rock dusting on the health of the miner will be treated in the language of the layman by Dr. R. R. Sayer, U. S. Bureau of Mines, in a paper entitled "Health Hazards in Coal Mining." Other subjects of no less importance will be presented.

Each year the institute invites men from all sections to present practical operating problems for solution, and the practice has been followed this year. At an early date the discussion leaders will meet and choose the best of these problems for "the Question Box."

Gaskill Reappointed to Trade Commission

Nelson B. Gaskill, of New Jersey, was reappointed a member of the Federal Trade Commission by President Coolidge last week. His term had expired but it was decided at a conference at the White House between the President and Senator Edge of New Jersey to give him a recess appointment. It has not been decided, according to Senator Edge, whether the reappointment of Mr. Gaskill will be made permanent when Congress convenes.

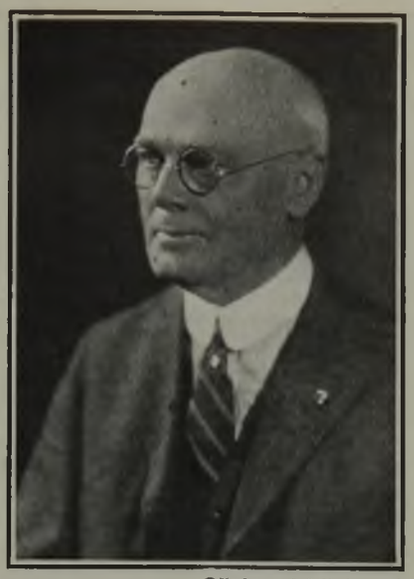
Frederick R. Low Honored at Rensselaer Centenary

Rensselaer Polytechnic Institute, at Troy, N. Y., on Oct. 2-3, celebrated the 100th anniversary of its founding in two days of fairly continuous ceremonies which were participated in by eminent educators, delegates from practically every engineering society in this country, and a number of the leading societies abroad, and by a large body of the engineering alumni of the Institute. In addition to the unveiling of several commemorative tablets at different parts of the campus and an excellent pageant in the evening outlining the history of the school, the exercises consisted mainly in addresses by prominent educators and engineers.

The principal addresses were made by Secretary of Commerce Hoover, Sir Charles L. Morgan, president of the Institution of Civil Engineers of Great Britain; Henry Abraham, past president of the Society of Electrical Engineers of France; Luigi Luiggi, president of the Society of Civil Engineers of Italy; Arthur Surveyor, president of the Engineering Institute of Canada; C. E. Grunsky, president of the American Society of Civil Engineers; Fred R. Low, president, American Society of Mechanical Engineers; William Kelly, president, American Institute of Mining and Metallurgical Engineers; Farley Osgood, president of the American Institute of Electrical Engineers; Prof. Albert A. Michelson, president of the National Academy of Sciences; and Presidents Angell of Yale, Birge of Wisconsin, and Stratton of the Massachusetts Institute of Technology.

At a banquet, at which about a thousand were present, addresses were made by President Livingston Farrand, of Cornell; H. W. Jervey, dean of the Law School of Columbia University, and J. H. Odell, of Wilmington, Del. Honorary degrees of Doctor of Engineering were conferred on the heads of the engineering societies who spoke, and of Doctor of Philosophy upon the presidents of the universities and Dr. Michelson.

Frederick Rollins Low, president of the American Society of Mechanical



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F. R. Low

Engineers, who was one of the recipients of an honorary degree, has been the editor of *Power* since 1888. He was born in Chelsea, Mass., April 3, 1860, and received his education in public schools. For a while he was a clerk with the Western Union Telegraph Co., was a court stenographer from 1874 to 1880 and then was on the staff of the *Boston Journal of Commerce* from 1880-1888. This was at a time when the steam-engine indicator was coming into use, and, being interested in this new device, he did some indicating of engines. Later he invented a compound indicator and planimeter and finally started a department of steam engineering in the paper. At about this time he also invented an arc indicator, a cleaner for vertical tubular boilers, a shaft leveling target, an elevator control and a rotary engine which were developed by the Clark & Low Machine Co.

Mr. Low is the author of "The Power Catechism," "The Compound Engine," "Condensers," and "The Steam Engine Indicator." He was a councilman in Passaic, N. J., from 1901 to 1903, president of the Council in 1905 and 1906 and Mayor of Passaic, 1908 and 1909.

Western Canadian Miners Accept Wage Cut

An agreement to settle the coal strike in District 18, United Mine Workers (Alberta, Can.) has been reached between miners' representatives and the coal operators. By the terms of the settlement the miners will accept a reduction of $1.17 a day on contract work and one-eighth reduction for day workers, which will amount to about 90c. a day for day workers. This is to be a three-year contract subject to six months' notice of cancellation by either side after March 31 next. Miners generally will vote on the proposed settlement immediately.

Negotiations on a new wage scale between the Western Fuel Corporation, of Canada, which operates mines in the Nanaimo field, Vancouver Island, and its 1,400 employees for a while proved abortive. The old wage contract ended on Sept. 30, and the company posted notices at the pitheads giving terms on which it is prepared to enter into a new wage contract.

The company took the position that there should be a readjustment on the basis of a reduction of 25c. a day. During the war what was known as a "war bonus" of $1 a day was added to the base rate, which brought it up to $5. The company felt that, the war being over and the cost of living considerably reduced, this $1 should be reduced 25c. a day. The men maintained that conditions had altered so little that no reduction was warranted. There were other differences relative to the wages of contract miners on timbering and on production, but the one cited affected all workers below and above ground and was the main issue.

Ultimately a compromise was agreed to, the men undertaking to accept a 10c. a day reduction on the war bonus, making the latter 90c. and putting the base rate in effect for the next three years at $4.90 a day. While some of the men were reluctant to adopt the recommendation of their committee the latter's advice was finally approved without dissension and a three-year agreement was signed.

Output and Value of Coal from Iowa Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at Mines for Shipment (Net Tons)	Sold to Local Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made Into Coke at Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees: Underground: Miners, a	Underground: All Others	Surface	Total	Average Number of Days Worked
Appanoose	863,671	48,737	19,259	.....	931,667	$3,464,000	$3.72	2,364	488	248	3,100	146
Boone	216,092	46,235	2,107	.....	264,434	1,222,000	4.62	402	215	51	668	178
Dallas	527,520	14,430	3,911	.....	545,861	1,915,000	3.51	646	272	90	1,008	213
Guthrie, Lucas and Wayne	696,154	9,144	19,821	.....	725,119	2,509,000	3.46	617	247	76	940	187
Jasper	81,852	15,223	6,316	.....	103,391	363,000	3.51	122	70	27	219	142
Jefferson, Keokuk, and Van Buren	6,927	7,659	.....	.....	14,586	41,000	2.81	26	3	2	31	193
Mahaska	26,702	9,720	989	.....	37,411	130,000	3.47	72	12	7	91	169
Marion	675,054	42,686	22,577	.....	740,317	2,478,000	3.35	850	337	111	1,298	203
Monroe	1,490,213	32,536	35,033	.....	1,557,782	5,510,000	3.53	1,630	601	180	2,411	198
Page and Taylor	9,954	18,685	.....	.....	28,639	136,000	4.75	57	14	6	77	219
Polk	380,606	274,802	12,423	.....	667,831	2,428,000	3.63	852	397	122	1,371	191
Wapello	150	32,267	650	.....	33,067	108,000	3.27	67	10	6	83	146
Warren	43,857	4,056	3,967	.....	51,880	187,000	3.60	92	43	16	151	174
Total, excluding wagon mines	5,018,752	556,180	127,053	.....	5,701,985	20,491,000	3.59	7,797	2,709	942	11,448	181
Wagon mines served by rail	8,750	.....	.....	.....	8,750	26,000	3.00	.....	.....	.....	.....	.....
Grand total	5,027,502	556,180	127,053	.....	5,701,735	20,517,000	3.59	.....	.....	.....	.....	.....

a Includes also loaders and shotfirers.

N. C. A. Directors Start Movement to Increase Use of Bituminous Coal

Despite the long period of depression through which the coal industry has been passing, the board of directors of the National Coal Association, at its meeting in Washington, Oct. 10, voted unanimously to continue the assessment of one mill a ton for the support of national association work. It emphasized a full determination to maintain an active and virile association.

Full sympathy was expressed by the board with the purposes of the proposed coal institute, but in a resolution offered by J. T. Bradley, the board registered its conviction that these purposes could be achieved more effectively and more economically by the existing organizations without the creation of a new one.

S. Pemberton Hutchinson, president of the association, reviewed the arguments presented for and against a Department of Mines, at the Sacramento meeting of the American Mining Congress. which he had attended. The board then voted its formal disapproval of the proposed department.

The board approved the action of the research committee in urging that immediate contacts be established with architects and builders looking to the construction of houses in such a way as to make most convenient their heating with bituminous coal. Steps also were taken looking to co-operation with other associations and with the manufacturers of coal-burning equipment for the opening of exhibits at which proper methods of fuel utilization might be explained to the public.

The board of directors and the research committee are much impressed with the possibilities of "keeping cool with coal," as was suggested editorially in a recent issue of *Coal Age*. Orders were issued to leave no stone unturned to ascertain the feasibility of such a development and to encourage research to that end.

Consideration is to be given co-operation with the Stoker Manufacturers Association with the idea of disseminating information as to how bituminous coal can be used with greater satisfaction.

Announcement was made at the meeting of the promotion of Thomas F. Edmunds to be editor of *Coal Review* and of the employment of C. V. Huntress as associate editor, who also will devote a considerable portion of his time to general publicity work.

Mr. Gandy reviewed the Canadian situation before the foreign trade committee. He admitted that the efforts being made by the Canadian Government to stimulate the use of Nova Scotian and British coals are causing some concern, but that everything possible is being done to safeguard the interests of American producers. The board of directors instructed the secretary to acquaint members of the association as far in advance as possible with forthcoming exhibitions in other countries where displays of American coal might be made to advantage.

French Chemists Test Gasoline Substitute

The search of French chemists for a substitute for gasoline apparently is nearing success, two methods having been described at a conference of scientists on synthetic carburants held in Paris early this month. The first test was made with a fixed motor. Then the empty tank of an automobile was filled with the new substitute by one of the spectators. In both cases as good results were obtained as with ordinary gasoline. For its composition this new carburant needs only lignite coke and water, though charcoal dust has been used with equal success.

The second substitute was described by Professor Maihle, of Toulouse. During a study of ether salts he discovered the existence of an excess of hydrocarbon, which led him to pursue his examination and in his own words "discover a gasoline absolutely analogous to that of Pennsylvania." The new product's calorific power —between 10,800 and 10,960 calories—equals the force of the natural product, he says. His raw materials are animal and vegetable fats heated with chloride of magnesium or sodium, and only a simple apparatus is necessary.

The problem of commercial manufacture he admits, however, presents difficulties, for to produce $85 worth of the synthetic oil it cost him more than $150.

Boston Shippers May Drop Pool Classification

One of the big developments in the tidewater bituminous market at Boston the past week was the suggestion by a committee of the New England Wholesale Association appointed for the purpose of devising some means of bringing about greater uniformity in offerings, that the offering by pool classifications be discontinued. This committee discussed the problem from all angles and came to the conclusion that both sellers and buyers would be best served if West Virginia coal were offered under a trade name and the analysis.

The committee submitted its plan to the board of directors of the association, and while that body has reserved opinion it is generally believed that the plan will be recommended to the members and its use urged.

Maynard Case Postponed

The Court of Appeals of the District of Columbia has granted an indefinite postponment of argument in the Maynard Coal Co. case pending the action of the U. S. Supreme Court in the Claire Furnace case. The same principle is involved in the two cases. Each action grew out of the effort of the Federal Trade Commission to exact full information as to costs of production.

Five Glen Alden Collieries Tied Up by Outlaw Strike

(Special to Coal Age)

Scranton, Pa., Oct. 14.—Five Glen Alden collieries were closed down and as many more worked with reduced forces on Monday as the result of an outlaw strike called by members of the general grievance committee at a meeting in Wilkes-Barre a few days before. Today showed an improvement in the strike condition with every colliery in the Lackawanna County group operating with practically full forces. The unauthorized strike went into effect despite a warning against such action by John L. Lewis, international president of the miners' union, who was informed of the general grievance committee's move. Mr. Lewis telegraphed to Rinaldo Cappellini, president of District 1, United Mine Workers, and ordered him to do all in his power to counteract the strike move.

The organizers and other district officials with President Cappellini succeeded in bringing several local unions to meetings and in rescinding the strike vote. The attitude of several of the locals who were led into the strike by the radical element and were outvoted on the motion was expressed in a resolution adopted by the Truesdale Colliery Local against obeying the strike order "first, because it is unlawful and only tends to disrupt the union; second, because the so-called general grievance committee has no legal standing in the constitution of the United Mine Workers, and third, because the only committee which is expected to be recognized by the operators is the colliery grievance committee."

Two Fires at Anthracite Mine Within Few Days

A section of the No. 1 Ebervale slope of the Jeddo-Highland Coal Co., near Hazleton, was idle last week on account of a fire which broke out in the big vein. The fire is thought to have originated from a broken feed cable. A slight cave, caused by the high water, handicapped the working forces in reaching the flames. The obstacle was finally surmounted and the fire extinguished.

Several days later coal was found burning in the western section of the mine. Since then a large force of men has been fighting the flames.

Zeigler No. 1 Mine Again Breaks Output Record

Zeigler Mine No. 1 of the Bell & Zoller Coal Co., at Zeigler, Ill., has again beaten the world's record of 1922. In September, a short month, Zeigler Mine No. 1 hoisted to the surface 171,907 tons.

This is the fourth record credited to the Zeigler mines. In 1917 these mines established the world's record. In March, 1922, Mine No. 1 alone established a record of 164,085 tons hoisted to the surface. In January, 1924, a record was established for the combined production of the two Zeigler mines with a total of 310,053 tons shipped during the month.

Practical Pointers For Electrical And Mechanical Men

Insulating Rubber Cable Ends to Reduce Leakage to a Minimum

THERE are few points on an electrical system so vulnerable to dampness, and where leakage in consequence is so common as the ends of cables where the conductors are exposed. While rubber insulated cables are among the most robust that may be used about the mines, yet inattention to details, especially where cables are used in damp places may give rise to serious current leaks. The ideal method of insulating cable ends where they are connected to motors or other apparatus, is to vulcanize them; but this entails considerable expense which in most cases is unwarranted. Consequently in these notes reference is made only to the well-known method of finishing off with rubber and adhesive tape. It is safe to say that in the majority of cases, the ends of rubber cables are improperly prepared before taping, and are seldom completed in a manner likely to reduce leakage to a minimum.

Principle of Insulation

The principle on which the end of a conductor should be insulated and finished off, is that there shall be a sufficient break between the conductor itself and any moisture-conducting material, which may form a part of the insulating and protective coverings. These in the case of rubber-insulated cables consist first of a thin sheath of pure para rubber next to the conductor. Over this and vulcanized to it is a layer of rubberized tape which is covered by a very thin double layer of cotton fabric. Over this is placed the protective covering of braid or whipcord, the stoutness of which depends upon the conditions under which the cable has to work.

In Fig. 1 are shown the various stages in the preparation and finishing of a cable end that is being fitted with a terminal lug. The first part of the process is to bare the conductor as shown at *A*, care being taken to prevent the knife from cutting into and weakening the outside strands of wire.

The outer braid should then be cut back a short distance, depending upon the size of the conductor, but not less than about ¾ in. This will expose the thin cotton fabric which surrounds the vulcanized rubber insulation as shown at *B*. This thin cotton fabric should not be disturbed until after the lug has been sweated on to the conductor, as the fabric prevents the heat from expanding the rubber unduly when this is being done. After the lug has been sweated on and the thin cotton fabric has been removed, the cable end appears as at *C*, and in practice there should be at least ¾ in. between the outer braid and the conductor. Thus, in the event of the outer braid being exposed to moisture this cannot work itself along to the conductor as the short length of rubber insulation intervenes. If the fine cotton fabric is not removed, moisture, after reaching the point at which the outer braid is cut off, continues along this fabric, at the end of which only the radial thickness of the rubber insulation is interposed between the moisture-conducting material and the conductor itself.

The cable end is now ready to be insulated. This should be done with pure para rubber strip. It should be wrapped tightly in order to eliminate air spaces, extended well onto the body of the lug and well past the point where the outer braid has been cut off. The cable end should then appear as at *D*, the rubber taping being applied until it is slightly larger in diameter than the cable itself. The end of the rubber strip should be fastened down with solution. Adhesive tape should then be applied, starting on the outer braid of the cable covering and brought to within ¾ in. of the end of the rubber taping on the lug, thus still preserving the break between all moisture-conducting material and the cable lug. The finished end is shown at *E*. A coating of varnish extending from the body of the lug to just where the adhesive tape ends, completes the work and makes an efficiently insulated terminal attachment. The foregoing is applicable to cables of almost any sectional area.

ELECTRICIAN.

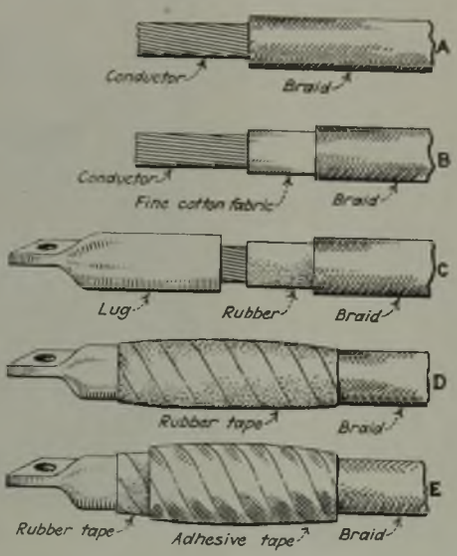


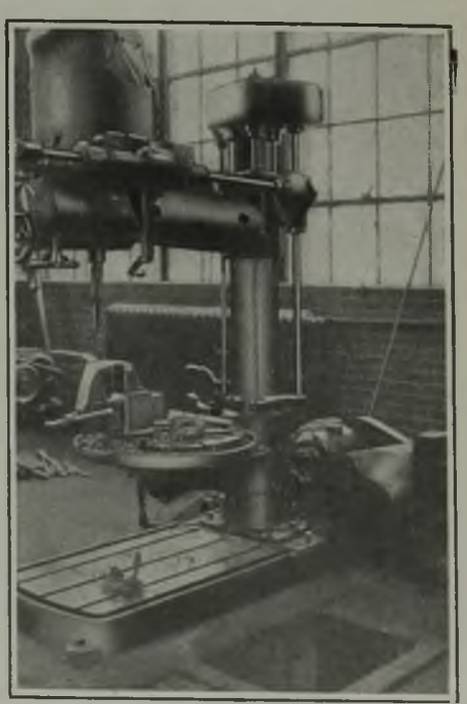
Fig. 1—Cable Ends Made Like This Will Not Leak

A. The first step in the preparation of a cable end consists of cutting back the insulation without injuring the wire. *B*. Shows the outer braid cut still farther back so that it cannot act as a wick and cause moisture to get at the wire. *C*. The terminal is now in position and a sufficient section of the wire is still exposed to permit the proper wrapping of tape. *D*. Rubber tape is wrapped partly over the terminal so as to form a long leakage path between the exposed surface of the terminal and the wire. *E*. After the adhesive tape has been put in place a coating of insulating varnish should be applied to the joint; this will effectively seal the layers of tape together.

Drill Press Conveniences

The machine shop in the central shops building of the Island Creek Coal Co., Holden, W. Va., is equipped with two drill presses; one of these is shown in the accompanying illustration. The drill press itself is not different from the usual type, but an attachment to the drilling table in the form of a vise and a pit in the floor to one side of the base impart greater utility to the machine and facilitate its operation.

The vise is held by bolts in the retaining slots of the drilling table and is attached or detached with little effort. It serves for holding strap-iron and other objects of such shape that they cannot be conveniently held on the



Two Conveniences for a Drill Press

A vise on the drilling table and a pit on one side of the base facilitate the drilling of holes in many objects.

platen. The pit in the floor enables the drill operator to work with long angle-shaped objects by allowing one end to project into the pit.

Hinged Track Enables Incline To Cross Railroad

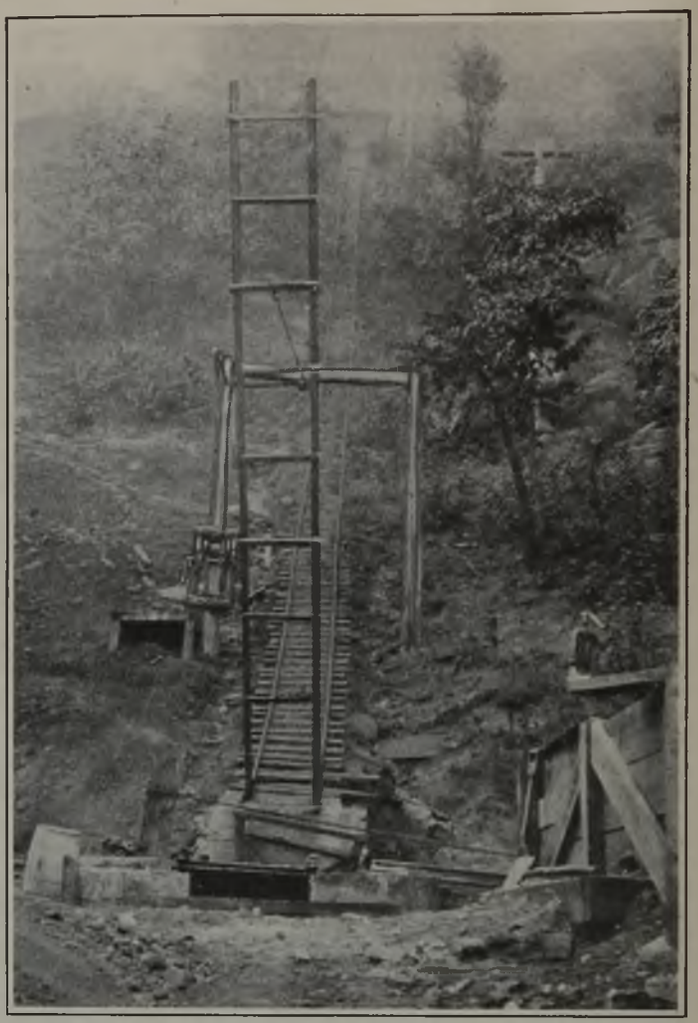
Where a mine in a mountainous district lies at an elevation considerably higher than that of the tipple, it often is necessary to crowd the tipple against the hillside. Usually there is little or no level ground between the hillside and the railroad track for laying out a supply yard, in which case the incline leading to the mine must be provided with some sort of crossing over the railroad to connect it with a mine track leading to the supply yard.

Bridge Swings Vertically

Such a condition prevails at the Gay mine of the Gay Coal & Coke Co., Mt. Gay, Logan County, West Virginia. The crossing of the mine track over the railroad is effected by a bridge track which swings vertically over the railway. One end of the bridge track is hinged at the foot of an incline supply tramway and the other end, when lowered across the railroad, connects with a turntable which can be revolved through 90 deg. to butt with the mine track leading to the supply ward. When not in use the bridge track is swung upward into the clear by a rope that passes from one of the steel ties on the bridge track, around a sheave on a timber set to a windlass.

A Successful "Bridge Track"

Because the railroad at the tipple lies between the incline and the supply yard at the Gay mine, a swinging bridge track that is hinged to the lower end of the incline, and connects with a turntable in the foreground, was constructed. This bridge track is raised and lowered by a windlass.



Gas-Driven Generator For Emergency Power Service

Our company, like others, has often found itself in difficulties due to power interruptions. We take power from a public-utility line which serves many coal mines and other industrial plants in our region. We have been delayed frequently because some one on the line would have an excessive overload and trip out the main circuit breaker. No doubt power-plant overloads line troubles, grounds and short circuits are contributing causes to our delays.

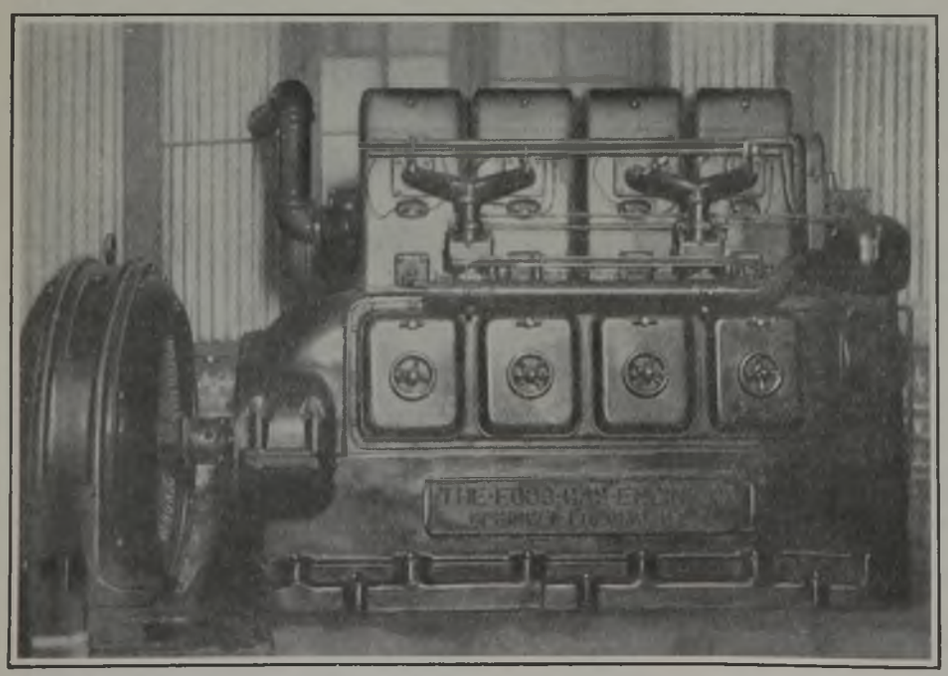
Whenever the power fails the fan stops and this necessitates much running around to call the men from the working places and at the same time trying to determine how long it will be before service is restored. All operations stop when no power is available but over-head charges mount up unproductively.

If the power is off for an hour or more and then restored it is frequently a difficult task to get the workmen back to their places. Some already have left the mine because they have an idea that service will not be restored for a few hours and have consequently gone home.

To overcome these conditions we recently purchased a four-cylinder, 100-hp. gas engine. To this unit is connected a 68-kw., 440-volt generator which is connected to a double-throw switch. The power lines from the utility company are connected to one side of the switch and the wires leading from our generator are connected to the other side. Now, when the power company service fails the double-throw switch, normally connected to the power company's lines, is thrown over. This arrangement gives us ample power to drive our fan, of course, other machines are taken off the lines or they would overload our engine.

The ease and quickness with which our stand-by outfit can be started, eliminates the necessity for calling the workmen from their working places, in fact, in about three minutes after a power failure the fan is again started and running with energy supplied from our generating outfit.

John Routledge,
Engineer.
Majestic Coal Co.,
Majestic, Ala.



Gas Engine Drives Stand-by Generator for Emergency Purposes

Whenever the public-utility power fails this unit is started and supplies 440 volt energy for driving the mine fan. Now the workmen may continue with their work, until power is again restored. In this way each man is afforded every opportunity to do a full day's work.

Problems In Underground Management

Subsidence, How Far It Extends, Its Depth And Rapidity of Movement

Stretches Furthest Beyond Coal Face When Workings Advance to Dip—The Greater the Profundity of the Seam, the Less Pronounced the Sag

IN HIS testimony before the Royal Commission on Mining Subsidence, of Great Britain, T. A. O'Donahue, declared that subsidence theories were conceived and then facts were sought to fit the theories. He believed that the observations should be made first and then a theory be formed to accord with them. Mr. O'Donahue said that though he had experience in many fields, he had more intimate knowledge of conditions in Lancashire. He had commenced taking levels in March, 1901, and had continued at intervals of from three to six months from that date to the present time.

During that period, the effect on the surface of workings had been observed over an area extending several miles, the depths of the seams worked varying from 500 to 3,400 ft. In fact as ordnance (government) bench marks were generally available over the area evidence of the settlement was obtained by the first levelings. The surface is covered with a drift of extremely irregular depth, the thickness of which, where proved, ran from 40 to 60 ft.

Break to Surface Slopes Backward

In the Upper Seam, which has workings from 500 to 2,500 ft. deep, a line drawn from the edge of the excavated face to the point where subsidence begins to occur at the surface would bear back over the coal face about 5 deg., where the inclination of the seam is about 16½ deg. With another working face in the same seam, however, subsidence did not extend beyond a vertical line. The difference may be ascribed partly to the steepness of the inclination of the measure (20 deg.).

In the Deeper Seam, which has workings from 1900 to 3,400 ft. deep, the subsidence also extends beyond the edge of the workings to the rise. The maximum angle of the point of "draw"* beyond the vertical line is 8 deg. The greater angle in this case no doubt is partly due to the lower inclination of the strata. With workings to the dip the subsidence in all cases is found to extend not merely beyond the edge of the workings but also beyond a line drawn from the edge of the workings at right angles to the plane of stratification.

In the Upper Seam, where the strata are inclined 18 deg., with workings at 1,940 ft. depth, the draw beyond the vertical was 23 deg., or 5 deg. beyond the right-angle line. In the Deeper Seam, with workings 3,000 ft. deep, the draw beyond the right-angle line extended 8 deg., but the inclination of the strata was 12 deg. only, so the total draw beyond the vertical line was 20 deg.

Surface Subsidence Is Small

The maximum subsidence produced by the Upper Seam was 1 ft. 9 in., where the seam was about 850 ft. deep. The seam at this point was 3 ft. 4 in. thick, and about 6 in. of warrant (worthless material) was excavated with the seam. As roads had to be ripped, the total thickness, in place, of the rock packed into the waste (exclusive of falls of roof) may be taken to average 10 in. over the whole area. The subsidence recorded in this area is exceptionally low compared with all other cases.

At a depth of 1,900 ft. the total subsidence was 1 ft. 6 in. The thickness of the seam at this point was 2 ft. 10 in. and the thickness, in place, of the packing material may be taken to average 10 in. over the whole area. In the Deeper Seam, with workings nearly 3,000 ft. deep, 1 ft. 5 in. of subsidence was recorded. The coal was 4 ft. thick and 1 ft. of fireclay was mined with the coal. As 2 ft. of ripping was taken down, the total waste packing may be taken as being equal to an average thickness of 1 ft. 5 in. over the whole area.

In no case does the full subsidence occur beyond the edges of the workings. In the Upper Seam this maximum is found nearly 900 ft. behind the face of the workings, which are on the rise side. With workings to the dip the full subsidence in one case is 600 ft. behind the edge of the workings. In the Deeper Seam, with the workings to the dip, the full subsidence is 550 ft. behind the edge of the workings. The regularity of the subsidence throughout the entire area and the comparative rarity of distinct breaks has been due, no doubt, to the thickness of the alluvial drift at the surface. In consequence, extensive buildings over the area to which reference is made have suffered little damage.

Subsidence did not commence until two years after the date of working where the workings were 1,000 ft. deep and advanced to the rise at the rate of 160 ft. per annum. The subsidence then continued for ten years, when it reached the maximum of 1.31 ft. In the Deeper Seam, with workings 3.000 ft. deep, advancing to the dip at the rate of 200 ft. per annum, subsidence occurred 500 ft. in advance of the face and it required twelve years to give the maximum subsidence of 1.44 ft.

*Mr. O'Donahue apparently uses the word "draw" as meaning the point of remotest discoverable subsidence. As a matter of fact that would not necessarily be the point of remotest rupture.

Mine-Haulage Accidents Far Too Frequent

Complaint frequently is made that the haulage-accident rates in mines are inexcusably high. It is true that next to falls of rock and roof come accidents incident to underground transportation, but sight frequently is lost of the fact that half of the tonnage carried by the railroads of the United States first must be transported underground, in the dark and for the most part over temporary roadbeds. Underground hauls of 5 miles are not uncommon. To obtain the economies of quantity production, this haulage must be done at high speeds.

Many underground haulage accidents are due to poor roadbed. Though better roadbeds probably could be provided in many instances, account must be taken of the economic factor and the fact that only the main haulageway will be used long enough to justify thoroughly substantial construction.

One of the difficulties in the study of these accidents arises from the absence of statistics. Despite the fact that more than $600,000 annually is made available by the government for the study of safety in connection with rail transportation on the surface, no money has been appropriated for studies of rail transportation underground, which handles half as much tonnage. The Bureau of Mines has made some study of the matter, but the work has been limited by such small sums as could be diverted from the sums assigned to other branches of mine-safety work. The increasing rate of haulage accidents in mines is giving rise to a demand that the government give more attention to studies looking to their reduction or entire prevention.

Rock-Dusting Car for Use At Springdale Mine

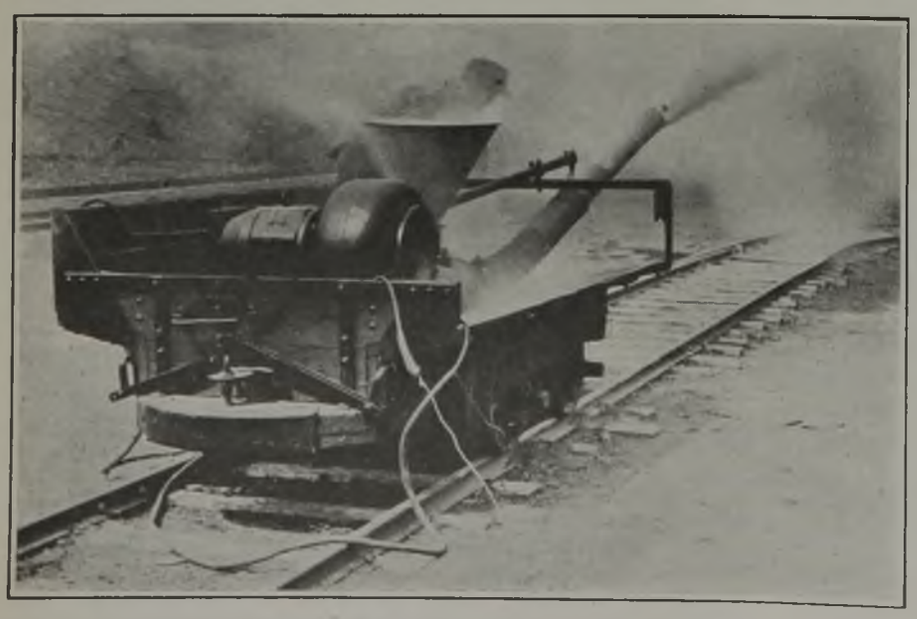
So conclusive has been the proof of the effectiveness of rock dusting to check coal-dust explosions that many bituminous mines are accepting it as standard practice. The use of rock-dusting prior to the time its feasibility was generally recognized was so limited that the problems of distributing it most expeditiously are only beginning to be solved. Nowadays a rock-dusting car in its early stages of construction, or completely built, is not an uncommon sight in mine shops.

The accompanying illustration shows a rock-dust distributing car throwing a cloud of dust in the open air. It was built in the machine shop at the Springdale mine of the Allegheny Pittsburgh Coal Co., Logans Ferry, Pa. The construction of the car in its present form is entirely experimental, it being the purpose of the company to determine the best principles upon which to base the design of the rock-dust distributing equipment that ultimately will be adopted.

Method of Operation

The car as shown is equipped with a Sirocco blower that develops about 1,800 cu.ft. of air per minute. It is driven by a 5-hp. direct-current motor. Rock dust is introduced into the blower through a funnel hopper with a fly-leaf valve feed control. The discharge is nothing more than a standard length of 6-in. stove pipe which is connected to the blower by a piece of flexible composition hose. The discharge pipe is moved up, down or to either side by a fulcrum bar to which it is attached by a chain-link coupling; this bar swings in a keeper after the fashion of an oar in the rowlock of a row boat.

It will be noted that the equipment is located on the rear end of the car. In all probability the blower later will be shifted to the front end of the car so as to leave room for a hopper behind it. Rock dust will be fed from the hopper to the blower by a bottom screw feed. Of course a supply wagon will accompany the distributing car. The rock-dusting outfit will be pulled by a locomotive moving against the air current so that the dust will be carried away from the work trip which will always be in the clear.



Trying Out New Rock-Dust Equipment at Springdale

As will be readily seen this outfit is frankly experimental, being placed within the body of an ordinary mine car and mounted so that the dust must be carried in another car not easy of access. It will, at least, test the equipment. The problem of adjusting the car to the outfit will come later.

Nova Scotia Man Shows What Has Been Done

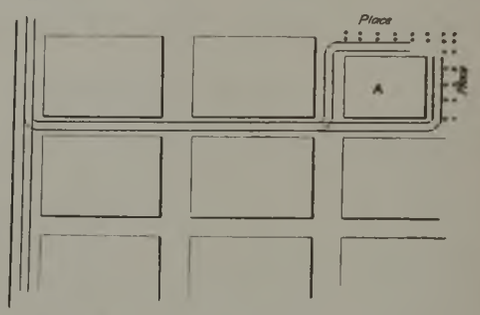
In the July 3, 1924, issue of *Coal Age* (Vol. 26, p. 22) a West Virginia Operator requests suggestions from mining men and engineers for the best method of working a somewhat peculiar coal bed. Although the operator making inquiry appears to consider the conditions difficult, I can hardly regard them as such, as I have had experience in mining a somewhat similar measure.

As several plans for working this coal bed have already been suggested I shall confine myself to describing briefly the method of operation with which I am most familiar. The coal bed to which I refer carried a 10-in. drawslate and the upper coal band was 4 ft. thick. An 8-in. rock parting occurred about 12 in. from the floor. In all there were three benches of coal and two of slaty material in addition to the drawslate.

If among these various strata a good mining ply occurs, places or rooms can be driven, say, 12 ft. wide, the mining being done with hand picks. Blocks or pillars 50 or 60 ft. square are left. This process of opening out is slower than by means of double rooms but it will prove more economical and efficient in the end, because when the pillars are being extracted the roof weight makes the use of mining machine unnecessary.

The general plan above outlined proved most advantageous for working the bed described. In some cases the pillars were brought back by longwall retreating, all the faces of a range of pillars being kept in line, while in others they were drawn in lifts. As soon as a lift is finished the roof behind it is allowed to come down. The accompanying drawing illustrates the method followed.

When a section has been opened out to, say, 400 ft. square the work of extracting pillars may be started. This may be done as at *A* in the drawing or by working a single longwall face on the rear of the pillar. In such a layout as that shown the longwall face would be preferable because the rock and refuse produced in mining could be disposed of more readily. Experience in coal mining has demonstrated that when dirt occurs in a coal bed the only satisfactory way of separating it from the coal is to pick it out. Its logical place is in the gob and not on the dump.



Plan of Mining

This is practically a block system of operation instead of a room-and-pillar system. Only a comparatively small proportion of the coal will be secured in blocking out a panel, the chief source of output being the pillars.

Hand operation—that is, pick mining—is advocated for working this bed. This may appear to some to be a somewhat antiquated practice, but it should be borne in mind that so far statistics have never proved conclusively that mining machines have lowered the cost of coal. I believe also that in most cases a far smaller proportion of the cost of producing coal is charged to transporting it from face to tipple and there loading it into the railroad car than would be justified if facts were honeestly considered. MAC.

River, Herbert, N. S.

Experience with mining machines has shown them extremely profitable both in reducing the cost per ton at the face and in increasing production and thus lowering handling charges per ton. They also have decreased the percentage of small sizes wherever hand mining had deteriorated, as in many places, to shooting off the solid. Undercutting is safer than the indiscriminate solid shooting likely to be employed where mining machines are not used. In most instances, however, union contracts have made the differentials for machine mining over extraction by hand so small that often no economy could be effected in the cost at the face by providing machines.

We are sometimes disposed to believe that mining men of British or other foreign extraction when on this continent are too ready to tackle problems like those they have faced abroad, wholly forgetting that in most parts of America there are so many clean beds that it is inadvisable to attempt the task of working less desirable beds which can be worked successfully only when operating for a market where competition is largely with coals mined under similarly unfavorable conditions. —EDITOR.

Production And the Market

Trend of Bituminous Coal Market Is Upward Though Course Is Irregular

The bituminous coal market continues to move irregularly, but the trend is unmistakably upward. Marked strength pervades the trade in New England, reflecting a pickup in the textile industry, but western Kentucky just now probably shows the greatest improvement. In Illinois and Ohio, on the other hand, "no bills" have appeared again, though Cincinnati is an outstanding exception, slack having become scarce there. Caution is in evidence throughout the trade, which means that competition is fairly keen.

Healthy Undertone Indicated

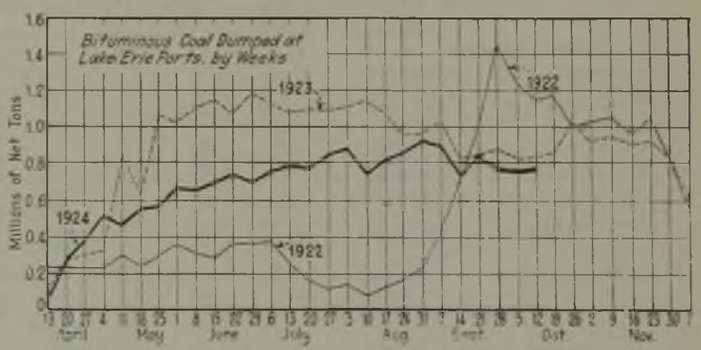
Much light is thrown upon hitherto dark places by the government's report on commercial stocks of soft coal as of Sept. 1. Though the total reserves in the hands of consumers—47,000,000 net tons—is 4,000,000 tons less than on June 1 and 15,000,000 tons less than on Jan. 1, the supply would fall only one day short of lasting as long as the surplus at the beginning of the year, the disparity being due to the greatly decreased rate of consumption. The steady though gradual increase in demand and output despite the size of the reserves is indicative of healthy underlying conditions in the market.

Coal Age Index of spot prices of bituminous coal for the sixth consecutive time registered an advance last week, standing on Oct. 13 at 174, the corresponding price for which is $2.10. This compares with 171 and $2.07 respectively on Oct. 6.

A slight increase in activity was in evidence at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Oct. 9 totaling 340,447 net tons, compared with 331,398 tons handled during the preceding week.

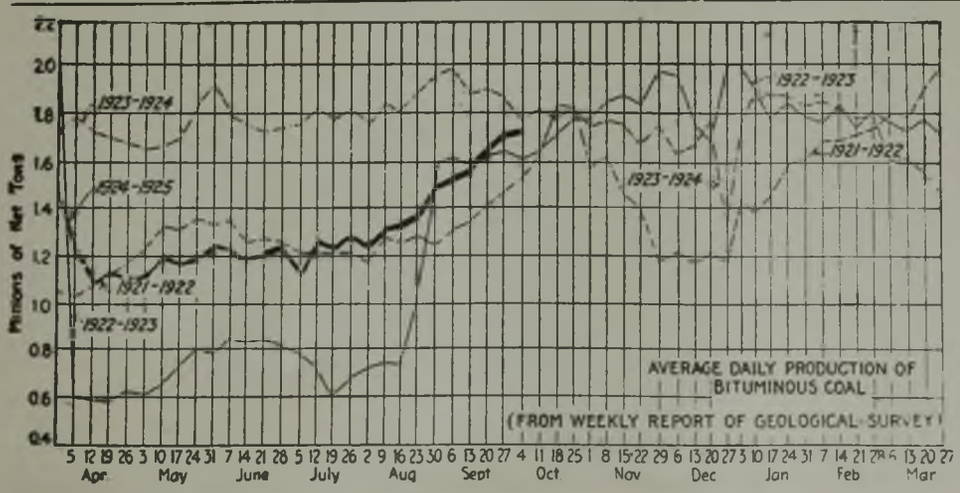
Movement of coal across the lakes continues in good volume although it had been expected to fall away markedly by this time. Dumpings at Lake Erie ports during the week ended Oct. 12, according to the Ore & Coal Exchange, were as follows: For cargo, 737,102 net tons; for fuel, 40,547 tons, compared with 731,604 and 45,145 tons during the previous week.

Anthracite is moving without much difficulty on the whole, stove being in rather strong demand, though chestnut is picking up noticeaby and egg is holding its own fairly well. Steam sizes are in fair demand, No. 1



buckwheat showing notable firmness. Independent prices have occasioned much surprise, having soared 75c. above company schedule in some instances. Output is still greatly hampered by floods at the mines, which are even more serious than was at first supposed.

Production of bituminous coal continued to show improvement during the week ended Oct. 4, when, according to the Geological Survey, the estimated output was 10,268,000 net tons, an increase of 128,000 tons over the week ended Sept. 27, when 10,140,000 tons was produced, according to revised figures. On the other hand, there was a sharp decline in the output of anthracite, the total for the week ended Oct. 4 being 1,425,000 net tons, compared with 1,942,000 tons during the preceding week. The falling off was due to the water in the mines.



Estimates of Production

(Net Tons)

	1923	1924
BITUMINOUS		
Sept. 20	11,454,000	9,830,000
Sept. 27 (*a*)	11,347,000	10,140,000
Oct. 4 (*b*)	10,699,000	10,268,000
Daily average	1,783,000	1,711,000
Cal. yr. to date	421,712,000	342,341,000
Daily av. to date	1,798,000	1,711,000
ANTHRACITE		
Sept. 20	877,000	1,851,000
Sept. 27	2,025,000	1,942,000
Oct. 4	2,015,000	1,425,000
Cal. yr. to date	73,279,000	69,276,000
COKE		
Sept. 27 (*a*)	321,000	132,000
Oct. 4 (*b*)	312,000	139,000
Cal. yr. to date (*c*)	14,76,000	7,598,000

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

Fine Coal a Drug on Midwest Markets

Continued mild weather has affected the Chicago market only in so far that off-grades of southern Illinois domestic coal are looking for orders and may be had at somewhat reduced prices to get business, but only on egg and nut. Lump is firm in every field with operators hopelessly behind in making shipments. Some of the large operators in the southern Illinois field have found it necessary to close down because of unsold screenings, hoping thereby to stimulate prices. The tracks are full of "no-bill" fine coal in every district and it is a buyers' market.

From all indications retailers in the central northwest have delivered much coal to domestic users. Eastern Kentucky is firm and Pocahontas screened coal cannot easily be had. Dealers are showing a tendency to bid the price up. Anthracite is moving fairly well and is being rapidly consumed, but no change of price is indicated.

Southern Illinois is still short of lump coal, but egg is not moving as freely as it was a week ago. This is the condition in the Carterville field although some mines are pretty well sold up on egg. Nut is still plentiful and the smaller steam sizes are heavy and are in the way. Some mines are unable to work on account of "no bills" but most of them are getting on an average four days a week. Railroad tonnage is light. In the Duquoin field conditions are similar to those of the Carterville district. In the Mt. Olive field there has been a good movement of all sizes. Most of the small sizes are going on contract and domestic sizes are moving well, as is railroad tonnage. In the Standard field it is still a guess as to whether the prices are bringing the cost. Conditions are unsatisfactory and many [illegible] are idle and will not start up and those that are wo[illegible] have "no bill" steam sizes on hand.

Warm weather caused the St. Louis market to ease [illegible] little this week. There is, however, a fairly good move[illegible] most of it coal sold during the recent cool spell. In a do[illegible] tic way, however, business is good from the country and for[illegible] the better grades of coal principally. Two-inch Standard is not taking in the country district this year. As a mat[illegible] of fact, Standard is hard to move to the country de[illegible]er. Locally steam shows activity, especially in wagon load.

Many Kentucky Mines Oversold

The Louisville local market is in excellent shape, the jobbers' principal complaint being over inability to obtain deliveries from the mines, many of which are oversold. Prices are advancing steadily until the peak quotations in both eastern and western Kentucky are $4 a ton on best grades of block, although there is not much eastern Kentucky at over $3.50@$3.75. Lump is $2.50@$3; egg, $2.25@$2.75; nut, $2@$2.25; mine run, $1.35@1.75 and screenings, 85c.@$1. Eastern Kentucky is operating on wage scales

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

Low-Volatile, Eastern	Market Quoted	Oct. 15 1923	Sept. 29 1924	Oct. 6 1924	Oct. 13 1924†
Smokeless lump	Columbus	$6.35	$4.10	$4.35	$4.25@$4.50
Smokeless mine run	Columbus	3.05	2.10	2.20	2.10@ 2.35
Smokeless screenings	Columbus	2.25	1.20	1.20	1.15@ 1.30
Smokeless lump	Chicago	6.10	3.85	3.85	3.75@ 4.00
Smokeless mine run	Chicago	2.85	1.90	1.90	1.85@ 2.00
Smokeless lump	Cincinnati	5.85	4.00	4.10	*3.75@ 4.00*
Smokeless mine run	Cincinnati	2.50	2.00	2.25	**2.25@ 2.50**
Smokeless screenings	Cincinnati	1.60	1.20	1.15	**1.25@ 1.35**
*Smokeless mine run	Boston	4.65	4.25	4.25	**4.25@ 4.35**
Clearfield mine run	Boston	2.00	1.90	1.90	1.45@ 2.35
Cambria mine run	Boston	2.60	2.35	2.25	**2.00@ 2.60**
Somerset mine run	Boston	2.35	2.10	2.05	1.75@ 2.40
Pool 1 (Navy Standard)	New York	3.10	2.75	2.75	2.50@ 3.00
Pool 1 (Navy Standard)	Philadelphia	3.15	2.70	2.70	2.50@ 2.90
Pool 1 (Navy Standard)	Baltimore		2.55	2.60	2.35@ 2.85
Pool 9 (Super. Low Vol.)	New York	2.35	2.05	2.10	2.00@ 2.25
Pool 9 (Super. Low Vol.)	Philadelphia	2.45	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.)	Baltimore	2.25	1.85	1.85	1.80@ 1.90
Pool 10 (H.Gr. Low Vol.)	New York	2.05	1.85	1.90	1.80@ 2.00
Pool 10 (H.Gr. Low Vol.)	Philadelphia	2.05	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr.Low Vol.)	Baltimore	2.15	1.65	1.65	1.60@ 1.70
Pool 11 (Low Vol.)	New York	1.85	1.60	1.60	1.50@ 1.75
Pool 11 (Low Vol.)	Philadelphia	1.75	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.)	Baltimore	1.80	1.55	1.55	1.50@ 1.60
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.65	1.50	1.55	1.50@ 1.65
Pool 54-64 (Gas and St.)	Philadelphia	1.65	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.75	1.40	1.40	1.35@ 1.50
Pittsburgh sc'd gas	Pittsburgh	2.55	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run	Pittsburgh	2.20	2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.)	Pittsburgh	1.85	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas)	Pittsburgh	1.20	1.15	1.25	1.15@ 1.35
Kanawha lump	Columbus	3.15	2.10	2.10	2.00@ 2.25
Kanawha mine run	Columbus	1.85	1.40	1.40	1.30@ 1.55
Kanawha screenings	Columbus	.95	1.15	.95	*.85@ 1.00*
W. Va. lump	Cincinnati	3.35	2.60	2.60	**2.75@ 3.75**
W. Va. gas mine run	Cincinnati	1.65	1.60	1.50	1.40@ 1.65
W. Va. steam mine run	Cincinnati	1.65	1.45	1.40	1.35@ 1.50
W. Va. screenings	Cincinnati	.80	.95	.95	**.90@ 1.10**
Hocking lump	Columbus	3.05	2.50	2.50	2.40@ 2.65
Hocking mine run	Columbus	1.85	1.60	1.60	1.50@ 1.75
Hocking screenings	Columbus	.95	1.05	.95	*.85@ 1.00*
Pitts. No. 8 lump	Cleveland	2.55	2.35	2.35	**1.95@ 2.80**
Pitts. No. 8 mine run	Cleveland	1.90	1.85	1.85	1.85@ 1.90
Pitts. No. 8 screenings	Cleveland	1.05	1.15	1.15	*1.00@ 1.15*

Midwest	Market Quoted	Oct. 15 1923	Sept. 29 1924	Oct. 6 1924	Oct. 13 1924
Franklin, Ill. lump	Chicago	$4.05	$3.35	$3.35	$3.25@$3.50
Franklin, Ill. mine run	Chicago	2.60	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings	Chicago	1.35	1.35	1.35	1.25@ 1.50
Central, Ill. lump	Chicago	3.10	2.85	2.85	2.75@ 3.00
Central, Ill. mine run	Chicago	2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings	Chicago	.80	1.15	1.15	1.10@ 1.25
Ind. 4th Vein lump	Chicago	3.35	3.10	3.10	3.00@ 3.25
Ind. 4th Vein mine run	Chicago	2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings	Chicago	1.20	1.35	1.35	1.25@ 1.50
Ind. 5th Vein lump	Chicago	2.50	2.60	2.85	2.75@ 3.00
Ind. 5th Vein mine run	Chicago	2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	.80	1.25	1.25	1.20@ 1.35
Mt. Olive lump	St. Louis	3.10	2.85	2.85	2.75@ 3.00
Mt. Olive mine run	St. Louis	2.25	2.50	2.50	2.50
Mt. Olive screenings	St. Louis	1.25	1.25	1.25	1.25
Standard lump	St. Louis	3.00	2.85	2.85	2.75@ 3.00
Standard mine run	St. Louis	2.05	1.80	1.80	1.75@ 1.85
Standard screenings	St. Louis	.55	.80	.80	.75@ .90
West Ky. lump	Louisville	2.55	2.85	3.35	**3.75@ 4.00**
West Ky. mine run	Louisville	1.75	1.65	1.70	1.50@ 1.90
West Ky. screenings	Louisville	.55	.90	.80	.75@ .90
West Ky. lump	Chicago	2.60	2.85	2.85	2.75@ 3.00
West Ky. mine run	Chicago	1.75	1.65	1.65	1.35@ 1.95
South and Southwest					
Big Seam lump	Birmingham	3.75	2.85	3.00	2.75@ 3.25
Big Seam mine run	Birmingham	1.95	1.60	1.60	1.50@ 1.75
Big Seam (washed)	Birmingham	2.35	2.00	1.85	1.75@ 2.00
S. E. Ky. lump	Chicago	3.35	2.85	3.10	3.00@ 3.25
S. E. Ky. mine run	Chicago	2.25	1.60	1.60	1.50@ 1.75
S. E. Ky. lump	Louisville	3.10	3.00	3.10	**3.25@ 4.00**
S. E. Ky. mine run	Louisville	2.00	1.55	1.60	*1.35@ 1.75*
S. E. Ky. screenings	Louisville	.85	.90	.90	.85@ 1.00
S. E. Ky. lump	Cincinnati	3.10	2.75	2.75	**3.00@ 3.75**
S. E. Ky. mine run	Cincinnati	1.55	1.55	1.55	1.35@ 1.75
S. E. Ky. screenings	Cincinnati	.80	1.00	1.00	**.90@ 1.15**
Kansas lump	Kansas City	5.00	4.50	5.00	5.00
Kansas mine run	Kansas City	3.50	3.25	3.25	3.25
Kansas screenings	Kansas City	2.25	2.35	2.35	2.35

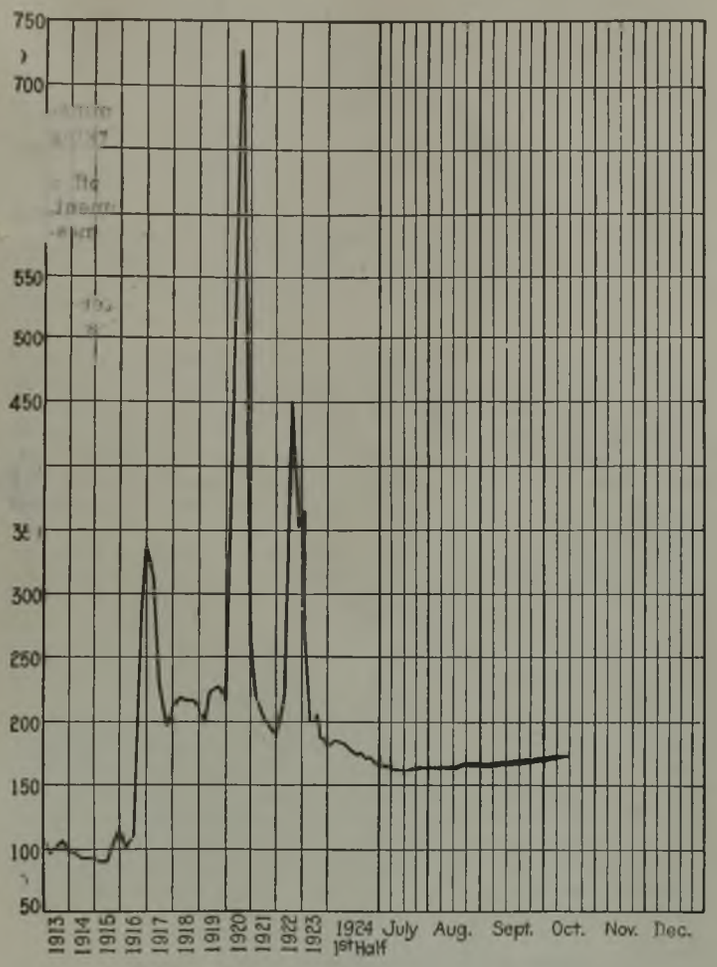
* Gross tons, f.o.b. vessel, Hampton Roads.

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

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

	Market Quoted	Freight Rates	Oct. 15, 1923 Independent	Oct. 15, 1923 Company	Oct. 6, 1924 Independent	Oct. 6, 1924 Company	Oct. 13, 1924† Independent	Oct. 13, 1924† Company
Broken	New York	$2.34	$9.60@12.25	$8.00@$9.25		$8.00@$9.25		$8.00@$9.25
Broken	Philadelphia	2.39				9.15		9.15
Egg	New York	2.34	9.85@12.25	8.75@ 9.25	$9.25@$9.75	8.75@ 9.25	$9.25@$9.75	8.75@ 9.25
Egg	Philadelphia	2.39	9.85@12.20	8.75@ 9.25	9.00@ 9.70	8.80@ 9.25	**9.25@ 9.75**	8.80@ 9.25
Egg	Chicago*	5.06	9.60@12.50	8.00@ 8.35	8.17@ 8.27	8.14@ 8.20	8.17@ 8.27	8.14@ 8.20
Stove	New York	2.34	9.85@12.25	8.75@ 9.25	9.50@10.25	8.75@ 9.50	**10.00@10.50**	8.75@ 9.50
Stove	Philadelphia	2.39	9.85@12.20	8.90@ 9.25	9.35@10.00	9.15@ 9.50	**9.85@10.25**	9.15@ 9.50
Stove	Chicago*	5.06	9.60@12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut	New York	2.34	9.85@12.25	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25	**9.50@10.00**	8.75@ 9.25
Chestnut	Philadelphia	2.39	9.85@12.20	8.90@ 9.25	8.85@ 9.80	9.15@ 9.25	**9.65@10.00**	9.15@ 9.25
Chestnut	Chicago*	5.06	9.60@12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea	New York	2.22	6.75@ 8.25	6.15@ 6.65	5.00@ 5.50	5.50@ 6.00	**5.25@ 5.50**	5.50@ 6.00
Pea	Philadelphia	2.14	6.75@ 9.00	6.35@ 6.60	5.75@ 6.25	5.75@ 6.00	**5.75@ 6.35**	5.75@ 6.00
Pea	Chicago*	4.79	6.00@ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20		
Buckwheat No. 1	New York	2.22	2.50@ 3.50	3.50	2.25@ 3.00	3.00@ 3.15	2.25@ 3.00	3.00@ 3.15
Buckwheat No. 1	Philadelphia	2.14	3.00@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice	New York	2.22	2.00@ 2.50	2.50	1.85@ 2.25	2.00@ 2.25	1.85@ 2.25	2.00@ 2.25
Rice	Philadelphia	2.14	2.00@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley	New York	2.22	1.15@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley	Philadelphia	2.14	1.25@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye	New York	2.22		1.60	1.35@ 1.60	1.60	1.35@1.60	1.60

* 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

	1924			1923
	Oct. 13	Oct. 6	Sept. 29	Oct. 15
Index	174	171	170	185
Weighted average price	$2.10	$2.07	$2.06	$2.24

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of clack, prepared and run-of-mine normally shipped, and send, 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.

equal to or below the 1917 level, for the most part, and is quoting under western Kentucky, which is asking $3.75@$4 for block and lump; $3@$3.75 for egg; $1.90@$2.75 for nut; and $1.50@$1.90 for mine run. Western Kentucky screenings are 75@90c. It has been reported that some eastern Kentucky screenings have sold as low as 75c. Movement is as full as operating conditions will permit, there being a good car supply and steady demand.

Northwest Markets Unruffled

Pocahontas lump is cutting heavily into the hard-coal business at Duluth. This is creating a serious situation in Pocahontas, as there is much of this coal on the docks in screenings form which cannot be disposed of. Prices are the same all down the line. Docks are loading out rapidly, but most of the coal goes to dealers and little is on its way to industrial concerns. The public utilities, however, are showing signs of life and may come in soon for some of the screenings. It begins to look as if there would be an oversupply of hard coal. Last week 28 cargoes arrived at this port, of which only one was hard coal. Sixteen are reported on the way from lower lake ports, and of these only two are anthracite.

In the Twin Cities no real progress seems to be made in the coal business with the advance of the season. Consumers insist that they can get fuel as they need it, and under the going market and refuse to stock to any extent. This does not seem likely, as a firm market bids fair to prevail for some time. Dock receipts are moderate, indicating that there is not likely to be any great amount received in the remaining weeks of navigation. Present totals are about the same as a year ago, but the prospective market is greater. The all-rail trade continues to be in considerable of a change, due to the increase in rates on southern Illinois rather cutting off that market in favor of the other districts of Illinois and Indiana. But as yet the demand has been small, and it is something of a question what will happen when the rush begins.

Coal movement has fallen off at Milwaukee during the past week owing to weather conditions. Dealers report a freer movement by rail, but continued difficulty in getting West Virginia splint, Pocahontas and Kentucky coal. Pocahontas advanced at the mines to the extent of a dollar during September. All of this advance has not been reflected by the retail market, but Pocahontas is now selling in Milwaukee at $11.25 for egg and lump spouted, and $12 for the same grades carried in. Movement by lake continues free and steady. Receipts thus far in October total 108,019 tons—12,900 tons of anthracite and 95,119 tons of bituminous coal.

Western Domestic Demand Gains Momentum

Demand for domestic grades through the Southwest continues to grow stronger and the mines are working full time. But, as there has been no corresponding improvement in the industrial market, the surplus of screenings, noticeable the last two weeks, is mounting. No changes in prices have been announced.

Colorado coal seems to be moving at a fairly good pace now and with the advent of colder weather operators look for a busy and more lucrative season. Colorado mines worked on an average of 31 hours last week with 21 per cent of the working time lost attributed to "no market." Prices remain unchanged as of Sept. 1 and the supply of labor is sufficient. Transportation and car supply have been very good except in Routt County and the Trinidad district, where shipping of other commodities has caused a slight delay in the movement of coal.

Utah mines are increasing output, but operations still are far below 100 per cent of the full-time capacity; 55 per cent would be the outside. There is a shortage of slack coal, which some believe may become acute. Intermediate sizes are a drug on the market. Both retail and wholesale prices are unchanged.

Domestic Strong, Steam Draggy in Ohio

Many of the largest Cincinnati shippers and wholesalers are "sold up" either to the extent that they have practically nothing to offer or only enough free coal to care for the day to day turn of the market. Nut and slack residue and screenings are holding firm and in most cases show 5c. to 10c. advance in price. Domestic coals, however, have the center of the stage. Central Michigan, northern Indiana and the West were slow in getting into action but have come crashing in with orders. Steam coals are lagging, the range continuing between $1.35 and $1.65 for run of mine and 90c. and $1.10 for screenings. The smokeless market has gone skyrocketing with the rest of the list. Under heavier buying orders practically all of the screenings that were held have disappeared.

Columbus trade is considerably one-sided. There is still a strong demand for domestic sizes, but steam business is slow and draggy. This has resulted in an accumulation of screenings, which have been selling extremely low, and causes the operator to hesitate before taking any further domestic business until he can find a place for the resultant sizes. On the whole the steam trade is not as strong as a week ago, but many producers are still booked up on orders and are running full blast, or at least as much as the labor situation will permit. Retail prices have advanced in sympathy with the higher domestic prices at the mines. Pocahontas and other smokeless grades are strong and little free coal is to be had. Lake shippers are closing up contracts after a rather good season.

Except for a continued strong domestic demand, the Cleveland market has experienced a slight reaction. Spot prices on No. 8 slack and nut and slack are off 5 to 10c. per ton. slack being quoted at $1@$1.05, and nut and slack at $1.10@$1.15, with softening tendencies. Retailers are active. Spot prices on Pocahontas lump have advanced during the past two weeks from $3.50@$3.75 to $5@$5.25 f.o.b. mines, and on West Virginia Panhandle splint lump from $2 to $2.50@$2.75 f.o.b. mines. The steam trade, however, is quiet and "distress" coal has appeared.

The Buffalo market hears much of the return of business activity all over the country, but does not see much of it,

as business is still dull. But for the increased output there is no doubt that the coal trade would be doing better now. The difficulty is that the operators anticipated this and have already killed the goose before she began to lay.

There is no noticeable improvement in the industrial demand at Toronto and movement is quite limited. Wholesale quotations are as follows: Steam lump, $6.25@$6.50, slack, $5@$5.25; Pennsylvania smokeless, $5.75@$6.25.

Pittsburgh Feels Stimulus of Cool Snap

Movement of domestic coal has increased rather sharply at Pittsburgh due to a cool snap. Offerings have been plentiful, however, so that prices have not advanced, although they are regarded as far too low, considering the value of domestic coal in the ground. They are much lower than last year. Current quotations are $2.50@$2.65 for 1¼-in. lump and $2.65@$2.80 for 2-in. lump. Considering the low prices of resultant slack and nut the realization is poor. Steam slack continues soft but is still quotable at $1@$1.10. Gas slack remains at $1.15@$1.35, but there is little going at over $1.25. A few buyers, particular as to quality, are willing to pay $1.35.

Production continues to increase in the central Pennsylvania field, 14,043 cars having been loaded during the first week in October, as compared with 13,973 in the last week in September. At Windber, where the Berwind-White operations are located, there is an upward tendency in operations. From three days a week, the company's mines are now operating four and some weeks five days.

New England Market Still Forging Ahead

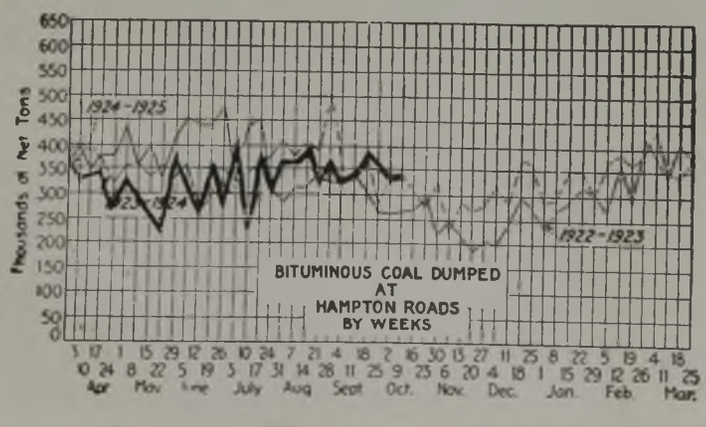
The New England tidewater bituminous market has advanced further with prices higher at the southern loading piers. The lowest at which strictly high grade run of mine New River and Pocahontas is now offered is $5.40 gross ton on cars Boston, but $5.50 is generally asked with shadings of more than 5c. infrequent. For late October shipments $5.60 on cars Boston is named. After an early week softness, when some tonnage of New River was sold at less than $5.35 on cars Providence, there has been a strengthening there too and $5.40 is the minimum, with $5.50 asked.

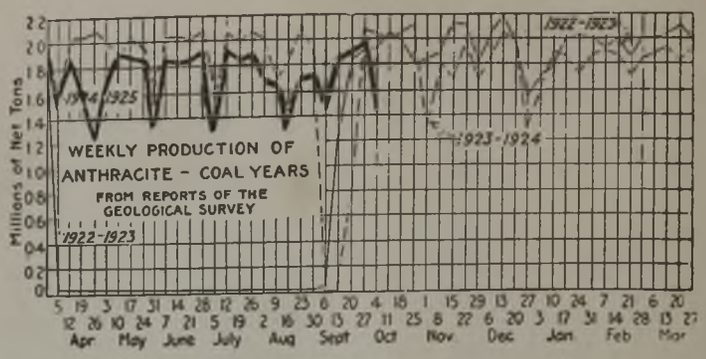
Local shippers have been unable to pick up really high grade mine run at less than $4.25 gross ton f.o.b. Hampton Roads the past week and $4.35 has been paid for a fair tonnage by one large local factor. With consumer demand expanding the market has assumed the greatest activity for months, a worth-while increase in textile operations having taken place.

There is little new in the all-rail situation. Sales are being made here and there, in one instance $2.75 net ton mines having been obtained for a medium volatile extra lumpy coal. It is only in cases where extra lumpy coal is desired that Pennsylvania coal will interest buyers because even at the advanced prices at tidewater the landed cost of tide coal is under that of rail coal at most New England points.

Demand Firmer in Atlantic Markets

The market at New York continues to go along without much change. Demand is a little stronger, but this has been met by heavier output, with the result that prices remain about stationary. There is a stronger tendency at tidewater and along the line. Consumers are more inclined to place orders and not so much disposed to question the price if they know they are getting good coal.





Fall business is well under way at Philadelphia and each day brings reports of industrial improvement, especially textiles, and these concerns are taking more interest in coal and are buying somewhat better. That all hands expect better market prices is shown in the care with which commitments are made, as there is an increased tendency not to take on big orders at current prices over an extended period.

The Baltimore market is ascending. Demand has increased from both large and small industrial groups and movement of coal from the mines is now running far ahead of that for October, 1923. Prices have not stiffened, however. The export situation is not as healthy as it should be for this season, the first ten days of October having dropped behind the same period of September.

Little change is reported in the Birmingham steam trade over a week ago. A good sprinkling of orders for spot coal continues—possibly a small gain over last week—but individual orders for substantial tonnages are rather scarce, even the railroads taking minimum allotments. The return of unseasonable weather quickly brought about a retrenchment in domestic buying. Quotations on steam and domestic coal f.o.b. mines are firm. Coal is moving better, production being higher than at any time in the last four months.

Anthracite Plentiful Despite Flood

Considerable activity in the anthracite market at New York centers around stove coal, with a heavy call for chestnut. Buyers want stove almost exclusively but are asked to take either egg or chestnut with it and sometimes pea or buckwheat No. 1 is added. Consumption has not reached the point where retail dealers are hard pressed for supplies. Dealers' yards are filled to overflowing and they have large reserve stocks of egg and chestnut. Pea moves with some difficulty. Of the steam coals buckwheat No. 1 is the easiest, though rice and barley are in better shape.

Shipments to Philadelphia have been meager during the past week, as production has been greatly hampered by floods at the mines, which are even more serious than was at first reported. Since the cool spell retail trade has slumped. There was surprise when independents advanced prices 75c. above company schedule. Stove is the only size in strong demand, but even this is losing strength. Nut is becoming more popular.

Baltimore dealers report a fairly active demand. While some dealers are having trouble in getting all of the popular sizes they desire as ordered, the majority are able to meet the situation promptly. Most of the yards have fair supplies on hand, with coal running, and are keeping well abreast of their trade.

More coal is moving at Buffalo, but the demand is not large, as the days continue to be sunny and mild. There is all possible promise of a good supply of natural and by-product gas, but beyond that the consumer seems likely to be dependent on the regular anthracite supply for the winter. A few are using coke and finding it good, but sales are light.

Car Loadings, Surplusages and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Sept. 27, 1924	1,087,447	193,422
Previous week	1,076,553	183,315
Week ended Sept. 29, 1923	1,097,493	200,955

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Sept. 30, 1924	116,689	58,375	.....	.....
Sept. 22, 1924	143,345	72,279	.....	.....
Sept. 30, 1923	41,745	5,651	15,331	5,439

Foreign Market And Export News

Inland Demand Active in British Market; Export Trade Depressed

Conditions are still far from satisfactory in the Welsh steam coal trade, though anthracite and dry steam coals are active and firm. The inland trade is showing the usual activity at this season of the year, but this is not enough to make much difference to the trade as a whole in the face of the acute depression in the export field. Demand from the Continent is particularly quiet. Shipments to France and Italy are low on account of the supplies of German reparation coal going to those countries. Welsh steam coal is quite unable to compete, and it is only in respect of contract deliveries and in cases where the highest quality coal is essential that the Welsh exporters are able to hold their own.

In a number of cases collieries are working only about half time and in several instances large collieries have been closed for a week at a time. The Bedlinog Collieries, employing 2,000 men, have stopped. Notices have been given at two collieries owned by Crayshaw Brothers, which will throw 2,300 men out of work at the end of a fortnight. Notices are expiring also in regard to some 3,000 or 4,000 other miners. Thirty-eight thousand miners are reported to be unemployed. Despite the fact that working costs are so much in excess of market prices, colliery owners have been compelled to make further reductions in quotations.

The general position of the Newcastle market is unchanged, with slight improvements in certain sections. Best steams are fairly steady, but the rates are weak compared with normal times. Small steams have been temporarily scarce, and for a time improved a little, but the firmness is due rather to the refusal of owners to make concessions than to any expansion of business.

Output by British collieries during the week ended Sept. 27, a cable to *Coal Age* states, was 5,210,000 tons, according to the official reports. This compares with 5,135,000 tons produced during the week ended Sept. 20.

Coastal Trade at Hampton Roads Heavier; Prices Stiffen

Little change is perceptible in the activity at Hampton Roads. The market continues firm, with a slight increase in coastwise movement and bunker trade. Foreign movement is unchanged, with scattered cargoes for Italy, Brazil and other countries. Prices show a tendency to stiffen, indicating higher levels in the immediate future. Supplies at tidewater are dwindling to some extent in the face of heavier rail movements to the West and elsewhere.

General movement over the piers is on the increase and many good orders were reported in the trade for movement within the next ten days or two weeks.

French Industrial Inquiry Slow: Household Shipments Lower

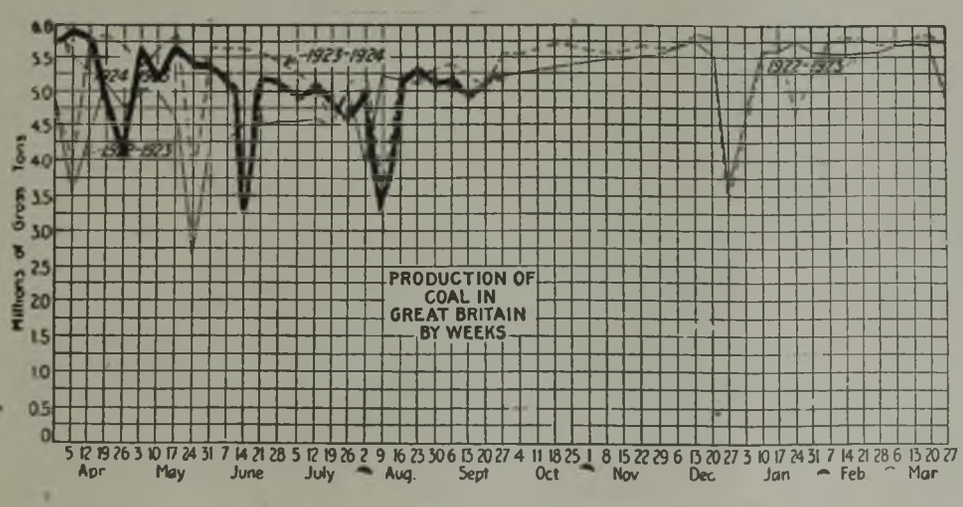
Inquiry for industrial coals continues slow in the French market and wholesale prices hold to the level on Oct. 1, with the exception of industrial briquets, which have been reduced from 142.20 to 135.20f. The spread between British and French prices has been increased by the further rise of sterling.

Shipments of house coals from the mines are lower, as the merchants' autumn supply is now sufficient to meet consumer demand. Retail prices in the Paris market have been raised an average of 5 to 10f. per ton on September; anthracite nuts have been increased by 15f.

French imports of British coals are now nearer normal, but the quantities received for open sale from Germany are still weak. Shipments of sized coals from Belgium are delayed through the rolling stock position there.

Deliveries of indemnity fuels from Germany to France and Luxemburg during the first twenty days of September were 610,700 tons, including 295,200 tons of coal, 297,500 tons of coke and 18,000 tons of lignite briquets, a daily average of 30,000 tons. Since Oct. 1, deliveries have been made under the Dawes plan.

During September the O.R.C.A. received 275,896 tons of coke, a daily average of 9,200 tons, as against 280,938 tons in August.



Export Clearances, Week Ended Oct. 6, 1924

FROM HAMPTON ROADS

	Tons
For Argentina:	
Ital Str. Piave for Buenos Aires	7,206
For Canada:	
Ital. Str. Ignazio Florio, for Montreal	6,296
Ital. Str. Valpenga, for Montreal	7,332
For Cuba:	
Br. Str. Berwindmoor, for Havana	9,520
Br. Str. Silverway, for Havana	3,291
Amer. Schr. Dewitt Brown, for Cienfuegos	1,720
For France:	
Fr. Str. P. L. M. 21, for Marseilles	8,103
For Italy:	
Ital. Str. Golden Gate, for Genoa	3,524
For West Indies:	
Nor. Str. Bur, for Fort de France	6,084

FROM PHILADELPHIA

For Cuba:	
Br. Str. Portmore, for Havana	——
Newfoundland:	
Nor. Str. Recto, for St. Johns	——

FROM BALTIMORE

For Porto Rico:	
Am. Str. Delfina, for Guanica	592
Am. Str. Delfina, for San Juan (coke)	180
For Italy:	
Ital. Str. Astor, for Genoa	9,027

Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Oct. 2	Oct. 9
Cars on hand	1,505	1,128
Tons on hand	98,085	71,373
Tons dumped for week	99,331	115,089
Tonnage waiting	10,000	6,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,347	1,210
Tons on hand	93,650	83,650
Tons dumped for week	81,410	106,433
Tonnage waiting	7,315	6,666
C. & O. Piers, Newport News:		
Cars on hand	1,132	1,176
Tons on hand	57,265	59,725
Tons dumped for week	115,151	82,449
Tonnage waiting	350	510

Pier and Bunker Prices, Gross Tons

PIERS

	Oct. 4	Oct. 11†
Pool 9, New York	$4.75@$5.05	$4.75@$5.05
Pool 10, New York	4.60@ 4.75	4.60@ 4.75
Pool 11, New York	4.35@ 4.50	4.35@ 4.50
Pool 9, Philadelphia	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.15	**4.25**
Pool 2, Hamp. Roads	4.05	**4.10@ 4.15**
Pools 5-6-7 Hamp. Rds.	3.90	**4.00@ 4.10**

BUNKERS

Pool 9, New York	$5.00@$5.30	$5.00@$5.30
Pool 10, New York	4.85@ 5.00	4.85@ 5.00
Pool 11, New York	4.60@ 4.75	4.60@ 4.75
Pool 9, Philadelphia	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.25	4.25
Pool 2, Hamp. Roads	4.15	4.10@ 4.15
Pools 5-6-7 Hamp. Rds.	4.00	**4.00@ 4.10**

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

Quotations by Cable to *Coal Age*

Cardiff:	Oct. 4	Oct. 11†
Admiralty, large	27s.	**27s.@27s.6d.**
Steam smalls	14s.6d.@15s.	——
Newcastle:		
Best steams	23s.@24s.	*17s.9d.@18s.6d*
Best gas	21s.@22s.	**21s.@22s.6d.**
Best bunkers	18s.6d.@19s.	*17s.6d.@18s.6d*

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

News Items From Field and Trade

ALABAMA

Work has begun on the addition of 25 Koppers byproduct ovens at the plant of the Alabama Byproducts Corporation, Boyles, for which the contract was recently awarded.

The Pratt Fuel Co., Birmingham, of which Walter Moore, 715 American Trust Bldg., is president, is reported to have acquired the coal lands, mines and leases of the Nelson Coal Corp., of which Frank Nelson, Jr., is president. This purchase includes 1,200 acres in Walker County and the Red Star mines and equipment.

The Moss-McCormick Coal Co. is opening new coal mines near Jasper. They will have five openings, the coal from which will be handled over one centrally located tipple. C. E. Crandall, superintendent, says that the total tonnage of this company will approximate from 2,000 to 3,000 daily when the property is fully developed. This company will build a railroad from the mines connecting with a spur of the Frisco Railroad. Employment will be given to 600 miners.

At the sixth annual Alabama first-aid meet, held at Rickwood Field, Birmingham, Oct. 7, three interesting events in first-aid work were staged and participated in by forty-nine teams. First prize was won by the white men's team of the DeBardeleben Coal Corporation, Empire (J. L. Shores, captain), which made a score of 99⅓ per cent, second prize going to the white men's team of the Woodward Iron Co., Bessemer, (W. E. Street, captain), with a score of 97 per cent. The ladies' teams from the Majestic Mines of the Majestic Coal Co., (Mrs. Geo. Rudd, captain) and a team from the Empire mines of the DeBardeleben Coal Corporation (Mrs. J. D. Sumners, captain) tied for the ladies' prize, the former winning in the run-off with a score of 97⅓ per cent. The winning colored teams were: First prize, Woodward Iron Co., Dolomite (Henry Dean, captain); second prize, Woodward Iron Co., Mulga (Chester Fuller, captain). These teams tied, the former being winner in the second trial, making a score of 96 per cent.

A new washery will be constructed and extensive changes and improvements will be made to the tipple at the Empire Mines of the DeBardeleben Coal Corporation, located on the Frisco Railroad, Walker County, involving an expenditure of approximately $100,000, according to official announcement. The old washery is located some distance from the coal tipple, involving a switching cost at present, which the location of the new washery will eliminate. Coal is mined at Empire from two openings, Nos. 1 and 2, on the Black Creek seam and is dumped at the same tipple, motor and tail-rope haulage being employed.

According to reports from the Walker County field the Galloway Coal Co. is considering the development of its Mill Creek properties, near Carbon Hill.

Coal mines are being opened at Altoona, Etowah County, on the Underwood seam by W. L. Smith and associates of Gadsden. A production of 400 or 500 tons daily is planned. A spur track and tipple structure are in course of construction.

The Birmingham agency of the Westinghouse Electric & Manufacturing Co. has been moved from the Brown-Marx Building to Rooms 1407-11, Age-Herald Building and advanced to a branch office with John Gelzer, Jr., as manager. The new quarters are much larger than the offices formerly occupied.

Contract has been awarded by Moss-McCormack Co. for the construction of a spur to its new developments near Carbon Hill, Walker County, on lands acquired from the federal government about two years ago. The track will be an extension of the Frisco Ry. spur to No. 11 Mine of the Galloway Coal Co., which connects with the main line at Carbon Hill. Stanley & Singer, of LaFayette, will construct the new line.

ILLINOIS

The Lovington mine, near Paris, resumed work Oct. 1, after approximately a year of idleness. The mine is one of the largest in central Illinois. It was closed last fall because of lack of orders.

INDIANA

A conference of mine workers' officials with representatives of the Knox Consolidated Coal Co. held Oct. 1 at the office of Phil Penna, secretary of the Indiana Bituminous Coal Operators' Association, failed to bring any solution regarding the division of work in the Bicknell field. The Knox company owns five mines in that field, only three of which have been operating. Those who had been employed at the idle mines asked that the company divide the work so the idle mines would operate part of the time. In the contracts the operators have agreed to a fair division of the work whenever business conditions permit. They explained to the committee that business conditions are not such that the company can operate the two idle mines and that further division of the work is impossible.

IOWA

Coal has been found on the August Witt farm, near Merrill, Iowa, a 15-in. vein having been struck by drillers at a depth of 415 ft. Another test will be made east of Merrill and if a satisfactory amount of coal is located, active mining will be begun.

KANSAS

The campaign for complete unionization of District 14, United Mine Workers, recommended recently by two representatives of the International board, is under way. Osa Gasaway, International board member from District 8, and D. F. Frampton, of Moberly, Mo., an International organizer, are at work among the non-union miners of the district.

MARYLAND

The Eastern Fuel Co., has opened an office at 638 Equitable Building, Baltimore, in charge of Hall Hammond.

MINNESOTA

Bids for fuel for the county home and the Ancker City and County Hospital, St. Paul, were rejected a few weeks ago and new ones taken on a B.t.u. basis. Buying the old way resulted in a loss of nearly $13,000, according to estimates by the City Chemist.

The County Board of Control in St. Paul has awarded contracts to the Northern Coal & Dock Co. for furnishing West Virginia splint for the county home at $5.40 on track, and for the Ancker City Hospital at $6.25 delivered. Both are on the B.t.u. basis of 14,100. Previous bids on a straight basis were rejected.

MISSOURI

James Duncan, of Alton, Ill., was named permanent receiver for the St. Louis Coke & Iron Co. by Federal Judge Fitzhenry at Springfield, Ill., Oct. 6. Mr. Duncan, who is president of the Litchfield & Madison R.R., has been acting as temporary receiver for the company since Sept. 8, when a friendly receivership suit was instituted by the Iron Mountain Co., a creditor.

NEW YORK

Will A. Brown, who is well known to the coal trade, having been engaged in the New York market for many years, has removed his office from 25 Beaver Street to No. 1 Broadway.

The request for offers to furnish slack coal to the Buffalo waterworks in 300- and 500-car lots brought out 17 bids, which were opened Oct. 6. Prices offered ran from $3.47 to $3.89 including mostly a $2.24 freight rate. It will be some days before the lowest regular bid is fixed upon.

The New York Stock Exchange has stricken from the trading list, at the request of the Consolidation Coal Co. $40,205,448 of its capital stock as a result of correspondence between the company and the listing committee regarding the issuance last spring of $10,000,000 preferred stock, following which the stock previously outstanding became common stock. An amendment to the company's charter by the Maryland Legislature, required to make the change, was obtained after some delay.

When the war broke out the government took over the Donner-Hanna Coke Corporation's plant at Buffalo, then nearly finished and ran it as long as was desirable, then turning it back to the company, but never entirely relinquishing ownership. For this reason the private corporation has refused to pay taxes on it. On Oct. 6 Supreme Court Justice George E. Pierce decided that on account of the failure of the company to bring a certiorari proceeding in time, it will be obliged to pay $130,000 in taxes and interest to the city and county.

OHIO

Tom Dew, formerly vice-president of the Western Coal Co., has been appointed to represent the R. R. Smith Coal Co., of Huntington, W. Va., on the Cincinnati market. He will continue to retain his interest with the Humphrey Coal Co.

William S. Ranson and Delvin Orr, formerly identified with the Matthew Addy interests, have opened a wholesaling and jobbing concern in coal, coke, charcoal, pig iron and alloys in the Dixie Terminal Building, Cincinnati, under the name of the Ranson & Orr Co.

A petition has been filed in the Columbus courts, asking for the appointment of a receiver for the Consolidated Mining Co., a corporation, which formerly had offices at No. 8 E. Broad St. and which has since ceased to function as an active business. The petition was filed by the Central West Coal & Lumber Co., which holds an unsatisfied judgment of $9,462 against the defendant company. In the suit Henry Watkins and Albert Goff, president and vice-president, respectively, of the Consolidated Mining Co., were made co-defendants.

Coal men generally extended their condolences to Fred Legg, president of the Logan & Kanawha Coal Co., Cincinnati, whose father died at Montgomery, W. Va., on Sept. 26. His father, Richard Legg, had long been identified with the coal and railroad interests of the Mountain State.

J. T. Dunnigan, who for several years has been identified with the Harlan Kileoka Coal Co., at Harlan, passed through Cincinnati on Sept. 30 to take charge of the Coal River Collieries, owned by the Brotherhood of Locomotive Engineers. He will have general charge and supervision of these properties.

It was announced by officials of the Ohio Collieries Co., New Lexington, recently that Mine No. 256, at Glouster, and Mine No. 281, at Modoc, would reopen soon giving employment to about 600 men. The two mines have a daily capacity of 4,200 tons of coal and are the largest in the Hocking field.

Operations were resumed Oct. 9 at the Blue Rock Mine, located in Muskingum County, near the river bearing that name, for the first time since the disastrous flood of 1913. Following the flooding of the workings the mine was sealed and only recently Jerome Watson, head of the Ohio Mines Department, and a number of deputies explored the mine and has put it in shape for working. The mine is one of the oldest on the Muskingum River, having been opened in 1845, when the product was shipped by river exclusively. A squeeze occured in 1854, when four miners were entombed and a new opening was made at that time. The gas formed to such an extent in the mine before it was opened by the mine department that it burst through the hill a few months ago.

OKLAHOMA

After only a few days of quiet, hostilities were reopened in Oklahoma on the night of Oct. 6, when gateways to Mine No. 12, of the Rock Island Coal & Mining Co., near Hartshorne, were dynamited, and an attempt was made to burn two railroad trestles leading to the mine. The mine, which employs 350 men, has been operating part time. The company has been paying the 1924 wage scale approved by the union at its No. 12 mine, but had announced its intention to reopen other mines on an open-shop basis paying the 1917 scale.

Wardell Court.

A Square in Front of Union Pacific Coal Co.'s Club, Rock Springs, Wyo.

PENNSYLVANIA

The mine and other coal property of the Hess Coal Co., near Punxsutawney, was sold at auction on Oct. 1, being bid in by Scott Calderwool, one of the creditors and a stockholder in the company, for $27,000.

The Somerset Realty Co. has purchased the Koontz farm, near Somerset, Somerset County, and has opened a coal mine. The company will be known as the Somerset Springs Coal Co. and the product will be known as "Coffee Springs Coal." The officers of the new concern are David Goodstein and W. Curtis Truxal.

A new service for members of the United Mine Workers in District No. 2, which includes fourteen counties in central Pennsylvania, was inaugurated recently when a compensation department was opened in Johnstown. Attorney Peter Jurchak has been named superintendent, with offices in the United States National Bank Building. This department has been under consideration for eight years and was finally authorized at the convention in Altoona early this year. The department will serve members of the union of all fourteen counties in District No. 2, which are included in the jurisdictions of these compensation referees, as follows: Jacob Snyder, of Altoona; W. W. Champion, of Williamsport, and G. Scott Smith, of Kane. The district includes these counties: Cambria, Somerset, Bedford, Blair, Clearfield, Huntingdon, Centre, Indiana, Armstrong, Jefferson, Clarion, Elk, Cameron and Tioga.

After pumping out the water in the old No. 5 anthracite slope at Silver Brook, the John C. Haddock Coal Co., which is reclaiming the operations after an idleness of over thirty years, expects soon to increase its tonnage from the local breaker. Free access now is afforded to sections of the mine which were submerged. A large force of men is working and additional employees will be taken on soon, it was announced. Silver Brook, formerly operated by J. S. Wentz & Co., was closed and abandoned when a disagreement arose over the terms of a new lease. The lessees are erecting homes for their men who desire to live near the mines.

UTAH

J. A. Stallings, sales-manager for the Spring Canyon Coal Co., Salt Lake City, who had been ill for some months and returned to his desk recently has had to lay off again.

H. F. Fernstron, manager of the Western Fuel Co. and president of the Utah-Idaho Retail Coal Dealers' Association, has been selected chairman of the advertising and publicity committee of the Salt Lake City Chamber of Commerce.

B. W. Dyer, district engineer of the U. S. Bureau of Mines in Utah; State Coal Mining Inspector John Crawford and other officials will soon begin an investigation of the explosion at the Rains mine of the Carbon Fuel Co., this

city, which resulted in the loss of five lives and wrecked the mine. Mr. Dyer said that the investigation had not been commenced yet because the ventilation had not been restored. He hoped, he said, to be able to issue a report about Oct. 11. Mr. Crawford completed an inspection of the mine about one week prior to the disaster and pronounced it safe. A. H. Jenkinson, secretary-treasurer of the company, declared that all of the new mine safety regulations of the Industrial Commission had been complied with.

WEST VIRGINIA

The Buffalo Thacker Coal Co. has disposed of three of its mines at Ottawa, on the Chesapeake & Ohio Ry, and one mine at Chattaroy, on the Norfolk & Western Ry. It is understood the Eastern Coal & Export Co. was the purchaser.

James L. Crawford, of Page, and Joseph A. Graft, of Beckley, civil and mining engineers, have opened offices in Oak Hill. Mr. Crawford, who will be the chief engineer at the Oak Hill offices, formerly was chief engineer for the Loup Creek Collieries Co. at Page, and has had 12 years' practical experience in addition to his courses in civil and mining engineering.

The Diamond Fuel Co., in the Scotts Run field, has posted notices at its Liberty plant that hereafter the 1917 wage scale will be paid. Fifteen families were evicted during the first ten days of October. Although a number of men and women have congregated around the plant since the company first posted notices, there had been no outbreak of any kind at last reports. Six companies in this field either have resumed operations on an open-shop basis or are preparing to do so. They are the Diamond Fuel Co., the Continental Coal Co., Bunker Coal Co., Shriver Coal Co., Brady-Warner Coal Corporation and the Chaplin Collieries Co.

CANADA

Nanaimo, B. C., is this year's winner of the Montizambert Cup, emblematic of the Canadian first-aid championship. Second, third and fourth positions were taken by Coleman, Alta.; Montreal, and Ottawa, Ont., respectively. In the Coderre Cup competition, open only to miners' teams, Nanaimo took second place, first honors having been won by Canmore, Alta. Another notable victory for Nanaimo was in the Wallace Nesbitt provincial junior competition. Fernie, Trail, Vancouver and Victoria followed in the order named. For the Lady Drummond Challenge Cup the Nanaimo ladies' first-aid team carried off second honors, being outpointed by representatives of the City of Montreal. The Ottawa ladies were third. The prizes were presented by Lieutenant Governor W. C. Nicholl.

Coal production in British Columbia, while not as heavy as in previous summer seasons because of the strike in the Crows Nest Pass, has been maintained at a fairly high level in the Vancouver Island and the Nicola-Princeton fields. In June it was 135,872 tons; in July 146,217 tons and in August 131,284 tons. That the output should have advanced in July and dropped in August is a little out of the ordinary and is hard to account for. Statistics for the months of July and August show that the production of the Canadian Collieries (D), Ltd., and of the Western Fuel Corporation, Ltd., the two largest collieries of the island, has fallen to the extent of some thousands of tons. Other island collieries, however, have been advancing their output slightly, chief among these being the Granby Collieries and the Nanoose Collieries. The July output in the Nicola-Princeton District was 18,788 tons while that of August was 17,565 tons.

The mine managers of the Dominion Coal Co., Ltd., of Glace Bay, N. S., that are to make an educational trip through the principal coal-mining districts of Pennsylvania, West Virginia and Illinois are Daniel J. McCuish, manager of Dominion No. 1B mine; Billy S McDonald, manager of Dominion No. 2; J. R. Dinn, manager of No. 4, and Tom J. Casey, manager of No. 11 mine. They will start on the trip within the next two weeks. The proposal of J. E. McLurg, vice-president of the British Empire Steel Corporation, Ltd., with the co-operation of Harry J. McCann, general manager of coal mines of the Dominion Coal Co., Ltd., to inaugurate a series of educational trips for representative men of the various departments of the steel company and the coal company, and associated companies, was well received by the general personnel of the corporation.

Total output of coal from Canadian mines during 1923 was 16,990,571 net tons, as compared with 15,157,431 tons in 1922, or an increase of 12 per cent, according to the official government report just issued. The previous high record, 16,946,764 tons was made in 1920. The value of the coal output in 1923 was $72,058,986, or an average of $4.24 per ton. Higher values were recorded in 1920 and 1921. Compared with 1922, the 1923 total value was an increase of $6,540,489. Alberta had an output of 6,854,397 tons; Nova Scotia followed with 6,597,838 tons, while British Columbia produced 2,823,306 tons. The latter province and New Brunswick, which accounted for 276,617 tons, showed slight decreases from the quantities produced in 1922. Saskatchewan increased its production to 438,100 tons during 1923.

Trade Literature

Hi-Test Sucker Rods. Marion Machine Foundry & Supply Co., Marion, Ind. Folder describing the different rods manufactured by this company.

Blacker Hammers. Blacker Engineering Co., Inc., Grand Central Terminal, New York City. Pp. 8; 7½ x 10 in.; illustrated. These hammers travel over the anvil face, performing hand-forging operations and utility smithing without helpers.

Little Giant Electric Hammer Drill. Chicago Pneumatic Tool Co., 6 East 44th St., New York City. Bulletin 896. For use in drilling concrete and soft stone as well as for light chipping of metals. Equipped with a Universal motor and will operate interchangeably on direct or alternating current. Illustrations of the drill are shown in this two-page bulletin.

Walter A. Zelnicker Supply Co., St. Louis, Mo., in Bulletin 326, gives information on rails, including switch material and track accessories; cars, locomotives, shovels, cranes, etc.

"National" Pipe for Power Plants. National Tube Co., Pittsburgh, Pa. Pp. 51; 8 x 11 in.; illustrated. Among the data included are standard specifications for power piping; weights, dimensions, etc., of various classes of pipe and fittings; information on bends, pipe columns and hand railings; articles on steam, superheated steam and flow of steam; tables of various data of interest and help to those engaged in power-plant design and operation.

Automatic Station Control Equipment. General Electric Co., Schenectady, N. Y. Bulletin 47,731. Pp. 27; 8x10 in.; illustrated. Briefly describes the uses and advantages of this type of equipment. List of installations up to Jan. 1, 1924, is included, giving names of companies, stations, types of apparatus, kilowatt capacity and incoming and outgoing voltage.

Turbro Waughammer, Model 37. Denver Rock Drill Mfg. Co., Denver, Colo. Pp. 15; 6 x 9 in.; illustrated. In addition to fast drilling, ease of handling and ability to drill deep holes in any class of ground, this hand hammer, on account of its unusual rotative power, due to the drill still being rotated independently of the hammer action, eliminates the danger of "stuck steel."

The Automatic Control of Combustion. Carrick Engineering Co., Chicago, Ill. Catalog 99. Pp. 32; 8 x 11 in.; illustrated. Discusses automatic control methods and systems, bringing out the limitations of the various systems and why they fail. Analyzes the conditions to be met in coordinating supply of steam with the demand and gives some interesting charts of steam pressure.

Systems for the Automatic Control of Combustion. Carrick Engineering Co., Chicago, Ill. Bulletin M. Pp. 16; 8 x 11 in.; illustrated. Complete specifications, together with diagrams and list of equipment required for thirty-three distinct methods of automatically controlling boiler-room equipment, are given. Thirteen different methods of controlling powdered coal are included. Each method is illustrated and described and the apparatus necessary listed.

Recent Patents

Coal Spreader; 1,491,401. John W. Himmelsbach, Chicago, Ill. April 22, 1924. Filed May 31, 1923; serial No. 642,452.

Flotation Process; 1,491,863. Thomas A. Janney, Garfield, Utah. April 29, 1924. Filed Oct. 21, 1920; serial No. 418,466.

Pulsating Jig; 1,491,870. Martin J Lide, Birmingham, Ala. April 29, 1924. Filed Oct. 18, 1920; serial No. 417,783.

Conveying Apparatus; 1,492,078. Nils D. Levin, Columbus, Ohio, assignor to the Jeffrey Mfg. Co., Columbus, Ohio. April 29, 1924. Filed Dec. 1, 1922; serial No

Coal Chute; 15,839. John E. McMinn, Louisville, Ky., assignor to Peerless Mfg. Co., Louisville, Ky. May 13, 1924. Filed Oct. 5, 1923; serial No. 666,860.

Coal-Washing Apparatus; 1,493,510. George W. Wilmot and Francis H. Blatch, Hazleton, Pa., assignors to Wilmot Engineering Co., Hazleton, Pa. May 13, 1924. Filed June 14, 1922; serial No. 568,124.

Coal-Mining Machine; 1,493,701. Richard T. Quaas, New York, N. Y. May 13, 1924. Filed March 30, 1920; serial No. 369,921.

Safety Mining Needle; 1,493 823. Andrew Palsha, Ashley, Pa., assignor of one-half to Thomas Henichek, Jr., Ashley, Pa. May 13, 1924. Filed Feb. 14, 1924; serial No. 692,723.

Expansion Coal Cutter; 1.494,274. James G. Morgan, Wilkes-Barre, Pa. May 13, 1924. Filed Aug. 2, 1921; serial No. 489,169.

Mine Switch - Operating Mechanism; 1,495,283. Harry W. White and Wm. J. Galbraith, Stonington, Ill. May 27, 1924. Filed Feb. 9, 1924; serial No. 691,745.

Mine Shaft; 1,495,352. Edward O'Toole, Gary, West Va. May 27, 1924. Filed Feb 20, 1923; serial No. 620,248.

Traffic

Indiana Chamber to Fight On For Lower Rates

A second strenuous fight for lower and equalized freight rates on coal shipments is to be made by the Indiana Chamber of Commerce in behalf of Indiana manufacturers and other coal consumers. Testimony in the chamber's second eastern bituminous coal case will be heard before an examiner of the Interstate Commerce Commission at 10 a.m. Friday, Nov. 28, in the Federal Building at Indianapolis. All railways carrying coal to Indiana consumers from mines in Kentucky, Tennessee and West Virginia are named as defendants.

The State Chamber was led into taking up the fight for Indiana consumers by the action of manufacturers of the Kalamazoo and Grand Rapids (Mich.) belts, who brought action for a cut in coal rates that would assure them rates equal to those enjoyed by Toledo, Jackson and Detroit, it was said.

Indiana and Illinois coal-mine operators have intervened in the new case, which, the chamber promises, in the end will be for their better interests.

Finds Indian Creek Valley Ry. Rates Unfair

Contentions on the part of the Indian Creek Coal & Coke Co. have been upheld by Interstate Commerce Examiner Fleming, who recommends that the commission find that existing rates from points on the Indian Creek Valley Ry. to Eastern and New England destinations are unduly prejudicial. Examiner Fleming proposes that the commission issue an order that rates from mines on the Indian Creek Valley Ry. "are and for the future will be unduly prejudicial to the complainant and other coal operators on that line and unduly preferential to the competitors of these operators in the Meyersdale region [Somerset County, Pennsylvania] to the extent that they exceed or may exceed the rates on like traffic contemporaneously maintained from the Meyersdale group to the same destination."

New Companies

The Blue Banner Coal Co., of Jackson, Ohio, has been incorporated with a capital of $10,000 to mine coal and deal in coal and coke. Incorporators are David Armstrong, Allen M. Rowe, Arthur L. Rowe, John M. Martin and A. J. Welch.

A Dominion charter has been granted the **Northwest Coal & Iron Co., Ltd.**, with headquarters at Toronto. The company, which has an authorized capital of $1,000,000, will carry on business as coal and mining operators. The following are named as incorporators: J. J. Butterfield, Edmonton; A. D. McDougall and F. H. Honeywell, Ottawa; S. G. Butterfield, Riverdale, Md., and E. C. Tait, Alliance, Ohio.

R. A. Brown, in association with some well-known operators of the Harrison County field, has organized the **R. A. B. Coal Co.**, the headquarters of which are at Morgantown, with a capital stock of $50,000, with a view to operating in northern West Virginia counties. Associated with Mr. Brown in the new concern are W. S. John, of Morgantown; V. E. Gocke, Katherine Gocke, and Maud Brown, all of Clarksburg.

The Cameo Coal Co. has been incorporated in Henryetta, Okla., by R. R. Fretwell, of Henryetta, and E. R. Jones and L. W. Randolph, of Muskogee, Okla. The capital of the company is $10,000.

The Combined Coal Co., a co-operative concern has been organized at Crooksville, Ohio, by 16 miners with a capital of $42,000. The company has leased the Cres Mar mine, near Crooksville, which is a going concern. George Appleman is president; Harvey Smith, vice-president; and Fred Reed, secretary-treasurer.

The following coal companies were recently incorporated at the State Department, Harrisburg, Pa.: **Lincoln Coal Co.**, of Scranton; capital stock, $60,000; incorporators, David M. Thomas, 1134 Van Deventer Boulevard, Scranton, treasurer; David Lloyd, Scranton, and Herbert L. Williams, Scranton. **Crafton-Ingram Coal Co.**, Crafton, $25,000; incorporators, S. Harvey Fisher, 21 Hawthorn Avenue, Crafton, treasurer; William L. McCoy, Ingram, and Joseph A. Pannabaker, Ingram. **M. K. Piper Coal Co.**, Kregar, Westmoreland County; $100,000; incorporators, W. L. Piper, Lilly, treasurer; M. K. Piper, Lilly, and J. William McCauley, Lutherville. **The Bituminous Coal Co., Inc.**, Philadelphia, $25,000; incorporators, William F. Ehlers, 4372 Mahayunk Avenue, Philadelphia, treasurer; Miriam S. Cramp, Philadelphia, and W. E. McCall, Jr., Bryn Mawr. **The Clymer Moshanron Coal Mining Co.**, Clymer; capital $20,000; incorporators, Charles E. Faust, James St. Clair, Peter Harr, Clymer.

Association Activities

The Alabama Mining Institute held its annual meeting at the Hillman Hotel, Birmingham, Oct. 7. The annual reports of Frank Nelson, Jr., president, and James L. Davidson, secretary of the Institute, reviewed the work of the past year and revealed material progress in the aims and activities of the organization. The election of three directors to replace a like number whose terms expired resulted in naming Carr McCormack, of the Pratt Consolidated Coal Co.; J. L. Brierton, of the Central Iron Co., and Milton Fies, of the DeBardeleben Coal Co. Officers for the ensuing year will be named at a later meeting of the directors, the present officials probably serving for another year.

Obituary

W. A. Garrett, chief engineer for the Belick Knob Coal Co. at Meadow Bridge, W. Va., was instantly killed in an automobile accident early in October. Mr. Garrett was on his way to Charleston, where his family lived, when his car skidded on a muddy road and went over an embankment. Mr. Garrett, who was 46 years of age, is survived by a wife and eight children. Interment took place at Clendenin.

Henry Tennington, age 60, well known coal operator of Glen Campbell, Clearfield County, Pa., died in the Clearfield Hospital on Sept. 27. He was a native of Clearfield County and was interested for many years in mining in Clearfield and Cambria Counties.

Coming Meetings

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

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

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

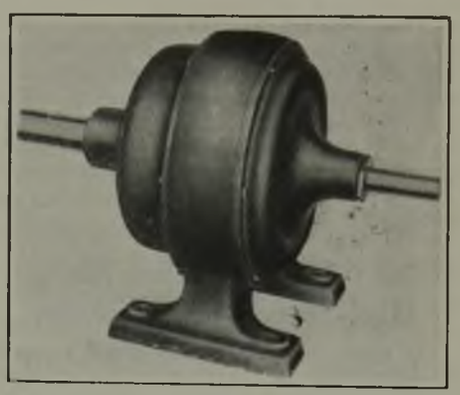
Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

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

New Equipment

Speed Reducer with Novel Features

High-speed turbines and motors, which are rapidly coming into general use because of their compactness and economy, require a speed reducing mechanism when driving low-speed machinery such as compressors, generators, refrigerating machines, pumps, conveyors, crushers, etc. The ideal speed reducer should transmit the load



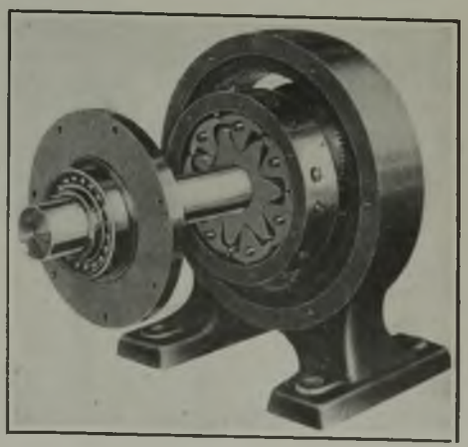
Noiseless and Safe Speed Reducer

Housed where dirt and dust cannot get into the gears, the life of the reducer is greatly prolonged.

noiselessly, without shocks or loss of power, and should be compact and require little attention.

A speed reducer recently was developed by the Meachem Gear Corporation, 122-142 Dickerson St., Syracuse, N. Y., that meets these requirements in a novel manner. The load is transmitted from the high-speed shaft through planetary gears to a slower rotating annular ring. Inside this ring are connected a number of rockers which engage with a spider keyed to the low-speed shaft.

As the driving motor or turbine starts up, each of the rockers engaging with the teeth of the spider first compress a spring plunger which brings the bottom of the rocker into positive contact with the inside of the annular ring and at the same time brings its side



Planetary Gears Transmit Power

Shocks are prevented by means of rockers which gradually pick up the load.

into positive contact with the side of the adjacent spider tooth.

During the time required to compress the spring plungers, corresponding to about one-quarter of a revolution, there is practically no load on the turbine or motor, and the load is then transmitted gradually and without starting shock. The spring plungers also serve to eliminate vibration and backlash, thereby assisting in promoting quiet operation.

Perfect Torque Assured

The low-speed shaft to which the spider is keyed is supported on both sides of the spider. The pinion on the high-speed shaft is allowed to float and adjust itself to the proper position between the planetary gears, thus preventing side strains or unequal stresses and assuring perfect torque.

The speed reducer is totally inclosed, so as to be dustproof and foolproof, and all parts run in oil with forced lubrication on units operated at speeds above 1,800 r.p.m. The reducer can be applied to either step-up or step-down speed change, and is furnished in ratios from 4:1 to 200:1 and for any load up to 500 hp.

Oil Circuit Breaker Meets High-Duty Requirements

A new line of outdoor oil circuit breakers has been placed on the market by the Condit Electrical Manufacturing Co., South Boston, Mass.

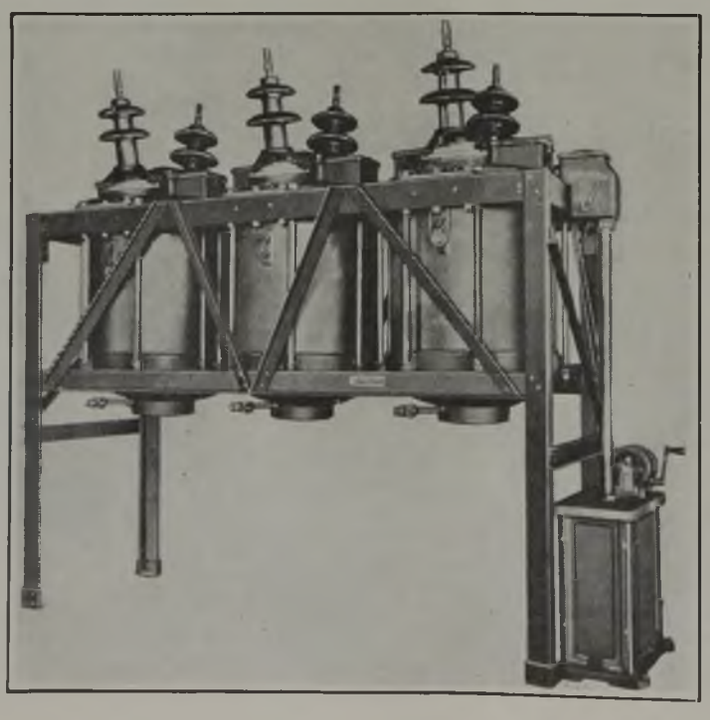
These are designed for 337,000,-50,000- and 73,000-volt service, having standard capacities of 400, 600 and 800 amperes, and suitable for interrupting capacities as high as one million kva.

This new type breaker is constructed of steel and equipped with high-grade bushings and ample sized current-carrying parts, insuring a high degree of mechanical strength and providing exceptional insulating qualities. The highly-accelerated tripping mechanism and special contact design afford high-speed circuit interruption.

All breakers can be equipped with mechanisms for operation either electrically or manually. The heavy-duty solenoid for operating the breaker electrically is inclosed in a steel housing with sufficient room for the relays generally used for overload protection. For automatic reclosing service, the automatic reclosing mechanism is furnished to operate either from direct or alternating-current circuits.

Large Oil Breaker Ruggedly Built

This switch may be equipped with suitable apparatus to make it automatically reclose. It may also be arranged for manual or electrical operation. An indicator connected with the switch mechanism shows when the switch is opened or closed.



Fan-Engine Regulator Controls Speed Automatically

The fallacy of the straight-line chart, of keeping boiler pressure constant, especially where there is a wide variation in demand, has been pointed out and generally agreed upon. The exact amount of steam required to drive the fan engine or blower is seldom known and it is seldom clear just what exact change in boiler pressure should be required before the regulator is opened fully and the fan engine brought from normal to full speed.

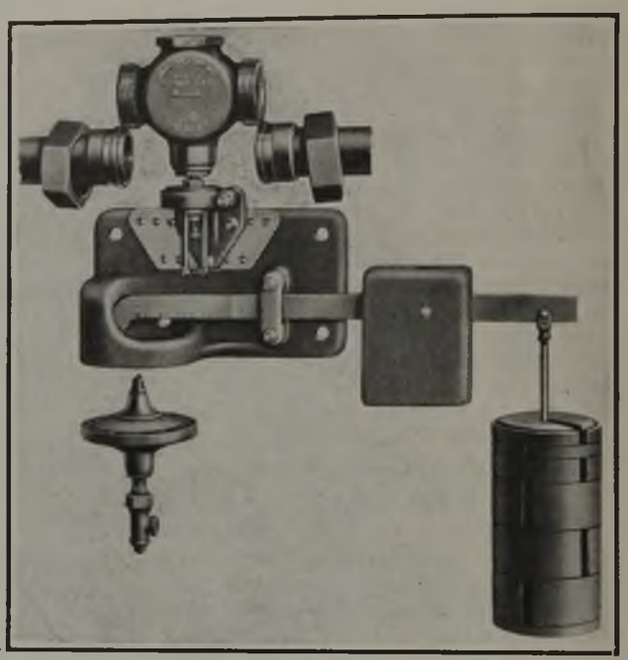
With these ideas in mind the A. W. Cash Co., Decatur, Ill., has brought out an improved fan-engine regulator that is extremely accurate and sensitive, controlled by varying boiler pressure and bringing about compensating changes in fan or blower speed smoothly and evenly.

Details of Regulator

In the illustration the boiler pressure connection and diaphragm, with a self-aligning hardened steel knife-edge bearing mounted on it, are unbolted and dropped down from their position in the device. Boiler pressure is at all times effective on the under side of the diaphragm. It is counterbalanced by the weighted beam which transmits the pressure change impulses through a link to the balanced valve which supplies steam to the fan engine.

Regulator Changes Speed Smoothly

The boiler pressure on the underside of the diaphragm transmits motion to the balanced beam, which is adjusted to the particular steam requirements. As the steam pressure changes the fan engine speed is regulated to deliver more or less air.



Any decrease in boiler pressure causes a downward movement of the beam, an increase in valve opening, and therefore a gradual, smooth pick-up in fan speed. An increase in boiler pressure decreases the valve opening and lowers the fan speed smoothly and evenly to normal fan speed when normal boiler pressure is reached. Each definite change in boiler pressure is therefore accompained by a definite change in fan speed, which will be repeated every time.

Assuming that good engineering requires an operating range of, say, 6 lb. on a certain installation, if the desired normal boiler pressure is 180 lb., the fan engine should be idling at that point and for economical reasons should be brought up to full speed only when the boiler pressure drops to 174 lb., should it fall that low. There should be a lag between the boiler-pressure curve and the fan speed curve.

With this device the amount of valve opening for a given change in pressure may be determined by the position of the valve in relation to the beam. The valve connection may be shifted along the positioning pad and the connecting link connected to the beam at the corresponding hole. In this way a definite, fixed amount of valve travel may be established in relation to a definite, fixed and scientifically desirable change in boiler pressure.