

COAL AGE

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Bad Work Never Pays

DOES the isolated plant pay? Only if it is well conducted and rightly equipped. That, in normal times, is true of almost any establishment. No one can persistently do the work wrongly and "get away with it." So perversely was the isolated plant slighted by its owner, starved, spurned, forgotten, that we wonder it so long endured. It was a marvel that purchased power did not come to the coal fields sooner. But today, the isolated plant at the coal mines is looking up. The Nason plant to which reference is made in last week's issue is a case in point and there are many others. Rightly planned, well executed, and properly operated, the isolated plant burning mine refuse survives and deserves to survive.

Making One Prosper Where Two Died Before

MOST of the mining companies are over extended. A few mines well worked and better equipped are better than many mines working slow time and inefficiently. A well-pruned tree grows more greenly than one that is limby. Some of the companies are doing a pruning job this spring and shutting down certain of their mines, and the evidence is that it is not being done any too drastically. One mine with conveyors, machine loaders and careful supervision will produce as much as three without these assisting factors and make a big profit into the bargain. A great man is he who makes two blades grow where one grew before, but greater is he who makes one mine bring in big dividends where before were two headed for a knockout blow by the auctioneer's hammer. The years 1924 to 1927 may set many operators into a way of thinking more clearly. The motto of these years will be "Better rather than more mines."

Talk Mines, Not Politics

FOR many years executives have been prone to talk politics rather than mines. A new era seems in prospect. We shall talk mines rather than politics. We seem likely to interest ourselves for a decade at least in new methods and new machinery rather than in log-rolling and lobbying. Conditions forced the latter on us whether we would or not. We were attacked and threatened. We were bullied and cajoled, and we could not mind our proper business even if we would. But that is over now, thank goodness. Even the U. S. Coal Commission is gone, and the politics of industry is over. We can leave the cracker barrel, the soap box and the picket fence and go back to the mines.

As a symbol of the new spirit, the operators, their engineers and executives are going to meet at Cincinnati—under the auspices of the American Mining Congress, mind you—to talk lower costs per ton, not the

Capitol, nor the President, the Fuel Administration, the Attorney General or the Governor of Pennsylvania, but, what is more important for all mining men, just plain and everyday mining and how it can be bettered. It takes almost a wrench to get back to business, and away from Washington. But it's worth while. We never mined much coal or did it cheaply, so long as it was being mined at Washington and Indianapolis. The Washington miners are little better than those at Moscow.

Selling Coal in Kilowatts

STUDIES by the experts under the Department of Commerce show that after 1930 there probably will be no growth in the use of northeastern hydro-electric power. This may be regarded by mine owners as a hopeful sign, and indeed it will make for increased prosperity, probably for commercial-mine owners and certainly for the industry. One must distinguish between the two because they are not necessarily the same. Indications tend to show that the power plants are rapidly acquiring mines and when they do they turn all the coal to their own properties and cease to absorb the byproduct of coal mining—slack.

What will be the fate of the commercial-mine owner if he can sell only domestic coal and has no market for steam sizes? Will it be to the advantage of the country and the custom-mine owner if the slack must be wasted or be a drug on the market? The metallurgical plants are already almost completely supplied with mines. The power plants and gas companies are coming into the same class, and little place is left for slack when these three are completely satisfied. When this tendency has become a universal condition, the coal operator will be back in the same place where he lay before the mechanical stoker was introduced.

Consequently, it would seem desirable that coal companies organize their own power-manufacturing companies or manufacture power themselves—running their stations, not with their entire product, but with their fine coal only, sending the coarse coal to the domestic market. In this way they will put each product to the purpose for which it is best adapted, and they will prevent the power, metal and gas companies from closing out their market for slack.

The field is not yet so completely filled that there is no room for starting this enterprise. Probably the mining companies will not need to merchandise power. They can put it on the busbars and leave to others its transmission and marketing.

The right place to manufacture is at the mines except where the distances are great. Mr. Hoover's survey shows that it is cheaper for Cleveland, which is 125 miles from the coal field, to get electricity from the mines than to generate it with coal transported to the city. The cost of delivered energy per kilowatt-hour is 6.7 mills, whereas the cost of energy on the

same basis generated by coal at Cleveland is 7.0 mills. At Baltimore, power transmitted from the mines 275 miles will cost 7.4 mills whereas power generated at that city will cost 7.45 mills.

At Philadelphia and New York, which are 350 and 425 miles distant respectively, it is cheaper apparently to generate at the city than at the mines using coal in both places as the source of power, but the difference at New York is only 0.6 of a mill, a quantity that might easily be offset by the use of inferior coal at the mine and other conditions. All this is dependent on a sufficient life being provided at the mine to keep the plant working for as many years as might be expected of the city plant without the necessity to ship in coal.

Two factors, however, militate against the conclusions given. One is that if the mine is to be used both as a source of power and as a source of domestic coal, it will either not have the necessary life or will have to be aided by railroad service. Two mines may be needed instead of one and an additional cost for transportation to the plant by railroad, mine track or conveyor will be incurred. This may be met, however, because the price of coal is estimated at \$3, which is high where the coal used is not the whole coal output but what is regarded as an inferior product. The average mine would be glad to get half that price for screenings.

A second consideration is that as the plant is at the mines, it is subject to the risk of strikes and possibly in case of a strike it might be hazardous to bring in coal from other mines to sustain operation whereas the plant in the city can use any coal that is on rails or on water, and so can weather the storm.

This difficulty is not preventing central stations from being erected at coal mines and should not prevent the mine owner from building such a station. When all the stations are tied together, hydro and steam, partial provision will have thereby been made for the exigencies of strikes. In any event much of the sale of power will be local and a strike will reduce the local demand for power greatly. Hence, failure of supply will occur at the same time as a failure of demand and no one will suffer.

Our Labor Exodus

IN METAL mines it has been customary to work the plant or some section of it at the full force or not at all. Restriction of output meant closing down units and not, as a rule, running a few days a week. In consequence, when a lull came in the market, a number of metal miners had perforce to move. Most of them went into other industries and many of them did not return. This kept the number of men in the metal industry normally below saturation. In the bituminous coal industry, the miners have worked in slack times only a few days each week, and when business became brisk there were always more men on hand than were needed to fill the tonnage requirements of the country.

Today, large concerns in the bituminous coal industry are taking a leaf out of the metal industry's book. They close down some mines and work the others intensively and at greater advantage. Fewer men are displaced, however, than in metal mines because the miners not being paid by the ton are engaged in larger numbers than actually needed and are given a place but only an inadequate supply of mine cars. They work

more nearly every day than in past years of depression, but do not get so generous an opportunity as they might to produce coal when they do work.

On the whole, however, the men are leaving the industry and the proposed car-rating plan if adopted will prevent their return, for the old mines when reopened will run less intensively than the mines that have continued working and will afford less opportunity to returning men. It is probably just as well. When all the mines are short of men, the new mines will have less chance to open, and the older mines which have the men will work more steadily. The miners also will profit by getting steadier work. That will make for greater contentment and give less time for that factional activity which breeds strikes.

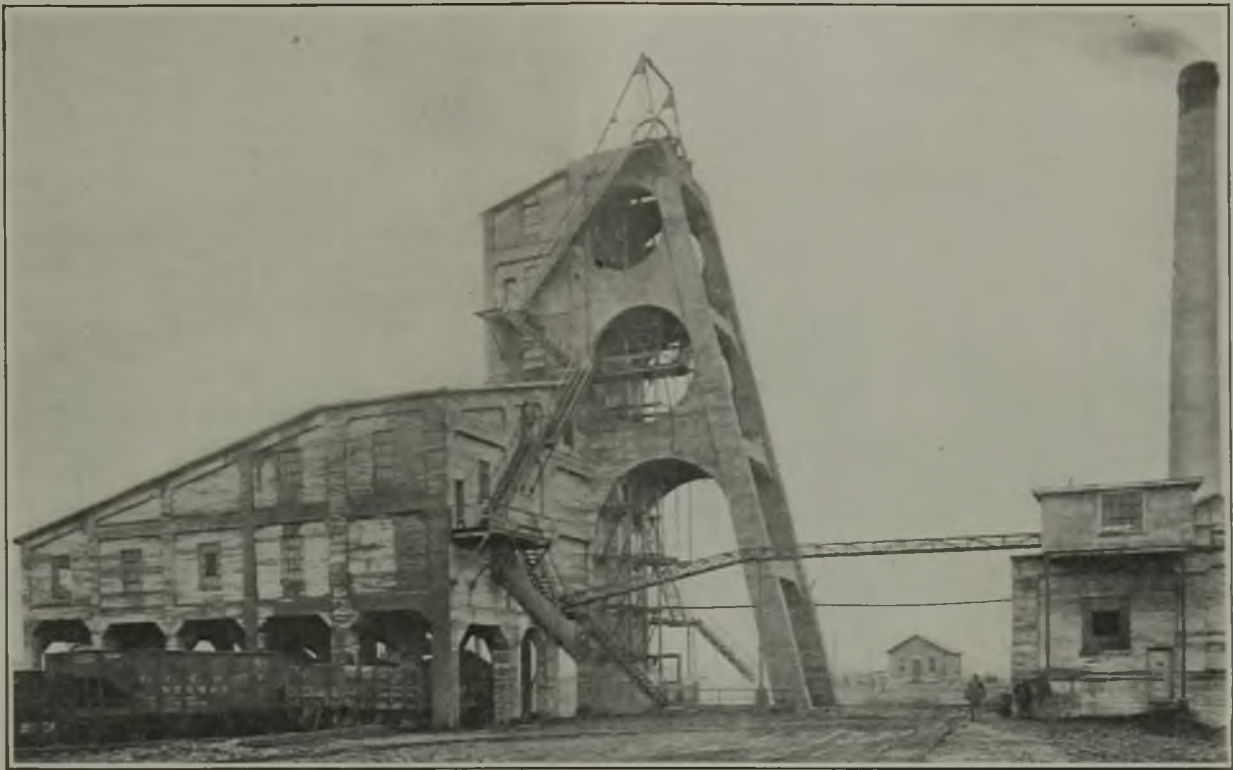
Time for Lewis to Retire?

THERE have been indications for some time that President John Lewis of the United Mine Workers was diligently seeking a new job. It has long been known that he would like to succeed to the power and prestige of Samuel Gompers, for a quarter of a century head of the American Federation of Labor. Lewis was audacious enough to make an open bid for Gompers' office at the Denver convention of the Federation—and lost. So he settled back to wait; for Mr. Gompers is full of years. Since then it has been rumored persistently around Washington that Lewis was in a receptive mood toward a government appointment of some kind, though he has never been offered one publicly.

And now comes K. C. Adams, everybody's friend and a sort of unofficial publicitor for Lewis, suggesting that at the election next autumn the international President would make a pretty good running mate with Calvin Coolidge on the Republican ticket. In two interesting pages on the subject in a recent issue of his magazine published in the shadow of United Mine Worker headquarters at Indianapolis, Mr. Adams sets out a full trip load of reasons why Lewis would make a good candidate and wants to know "how that sounds."

It sounds to us very much like a feeler by a union leader who never has taken a backward step and who fears that he is going to be compelled to take one unless he sidesteps it. Lewis has led the union miners to a high pinnacle of power through a period extremely conducive to that sort of upward progress. And now he has pitched the union camp on that pinnacle for a three years campaign at a time when the rigors of that pinnacle promise to be severe for unionism. Attempting to hold out is going to be so costly in blood and treasure that the position may prove untenable. Somebody may have to direct that union army of miners in a strategic retreat of a few steps.

Mr. Lewis has never led such a maneuver. But he is a strong man and resourceful. He has proven himself a sterling leader of miners in periods of success. Now let him prove himself that greater man—the sterling leader in times of adversity. There are many serious problems for the United Mine Workers to meet during the coming three years. They need a man like Lewis to help solve them. Their sane and proper solution will be essential to the well being of the whole coal industry. They should not be solved for the Mine Workers by some "nit wit." Lewis should stick to his army—and anyway the Republican party and the people are not demanding his services as a candidate.



Reinforced Tipple, No. 12 Mine, O'Gara Coal Co.

"Build Everything of Concrete" Is O'Gara Policy

Tipple and Rescreener Cast Monolithic and in One Unit—Concrete Also Used in Shaft Bottoms, Roof Arches, Mule Stables, etc., Underground—Concrete Haulageway Roadbed Under Test

BY RALPH D. BROWN

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A COAL mine should be considered as a wasting asset with a definite and limited life. The designing engineer planning the plant may intelligently choose his materials of construction in accordance with this idea, provided no other reasons overbalance that consideration. Other factors that may affect the decision as to what materials shall be used are: (1) Availability and adaptability of the material to the proposed design, (2) first cost, (3) cost of maintenance, and (4) statutory regulations. The geographic location of the plant and the availability of any material at a reasonable price may be the determining factors, but in Illinois, the state law fixes definitely the type of construction; that is, it must be fireproof—and consequently of either brick, concrete or steel.

After weighing all considerations in the balance, including ultimate economy, the management of the O'Gara Coal Co. operating at Harrisburg, Ill., has chosen concrete as being best suited to the conditions found in that locality. At Mine No. 12 it has constructed and put into successful use a monolithic concrete tibble and screening plant and at other operations it has built concrete shaft linings, overcasts and stoppings, haulageways, arches for roof support, mule stables, fan houses and various types of surface build-

ings. The results obtained have been entirely satisfactory. When the rebuilding of the surface plant of O'Gara Mine No. 12 was under consideration, fabricated structural steel was quoted at \$125 per ton, and deliveries could be made only in from six to nine months, whereas cement could be had for \$2.80 per barrel, with immediate delivery. In addition, the company carried a construction force trained in concrete work. Concrete was therefore chosen as the material, and the design of the various structures prepared accordingly.

CANNOT ESTIMATE STRESSES IN A HEADFRAME

Many practical builders have considered concrete ill adapted to tipples and structures of like character because of its tendency to vibrate. They feared that stresses resulting from such vibrations might eventually disintegrate this material. In the tibble designed for Mine No. 12 vibrations were reduced to a minimum, and at the same time the bond between the steel and concrete was given due consideration where it was deemed probable that vibration might be expected.

It is not possible to measure accurately or even assume the stresses existing in an up-to-date tibble structure, hence a truly economic design cannot be made. It is better to be safe even at the expense of a possible

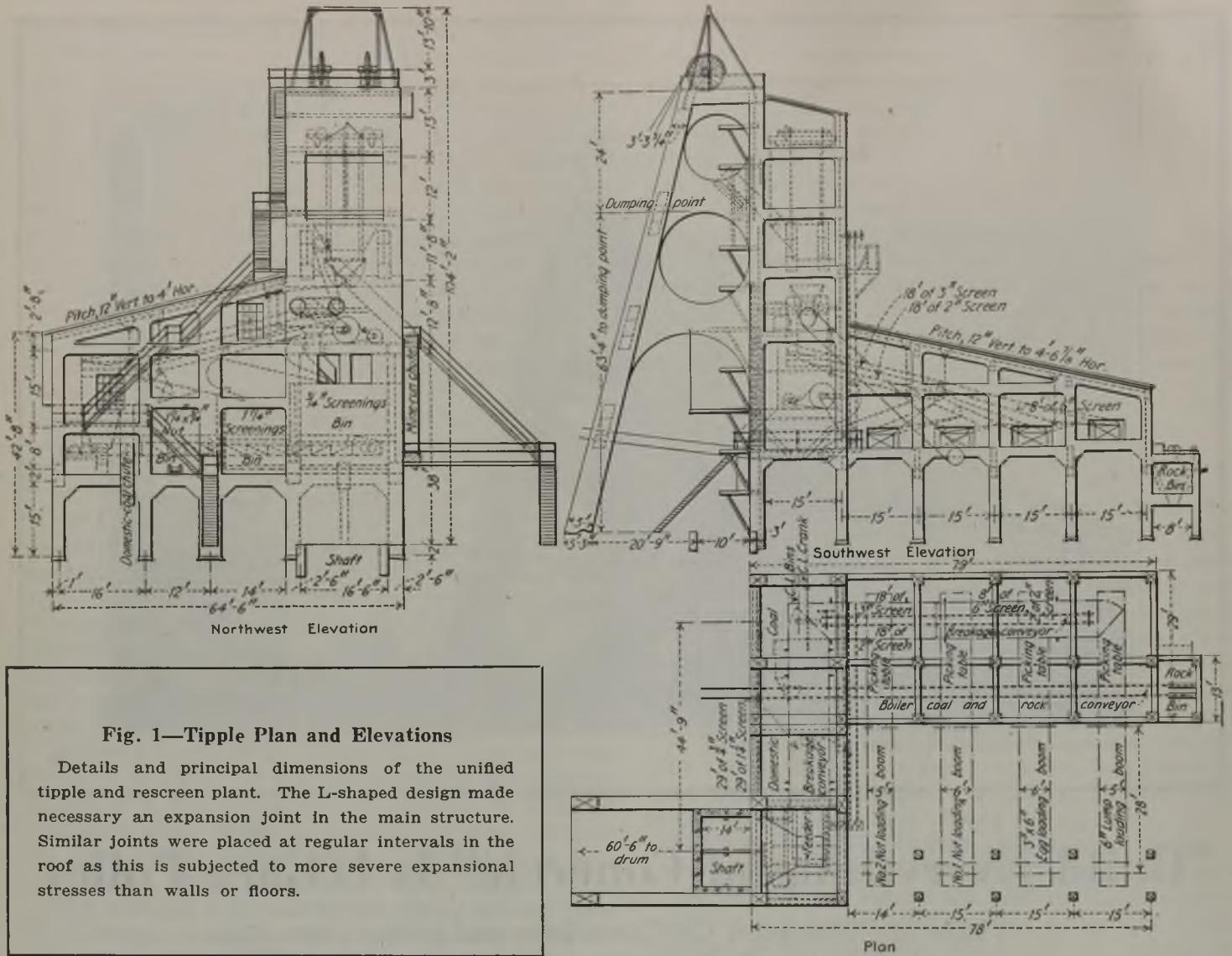


Fig. 1—Tipple Plan and Elevations

Details and principal dimensions of the unified tipple and rescreen plant. The L-shaped design made necessary an expansion joint in the main structure. Similar joints were placed at regular intervals in the roof as this is subjected to more severe expansional stresses than walls or floors.

surplus of material, for if the structure is too light the vibration will be excessive, causing eventual weakness and disintegration.

Referring to the plans of the concrete tipple, Fig. 1, it will be evident that the coal is prepared in more sizes than is generally attempted in a single unit. For this reason the structure housing the preparation equipment is more extensive and complicated than usual.

This plant provides for the sizing, preparation and loading of seven sizes of coal in one continuous process with a minimum of labor and equipment. Concrete bins, which have a combined capacity of 450 tons, are built as a monolithic part of the tipple and not only provide storage capacity but also facilitate the loading of the three smaller sizes of coal on one track. Picking tables and booms for loading railroad cars are provided on four additional tracks. The preparation equipment is entirely modern and adequate to handle a capacity output of 3,000 tons in eight hours. The screens are arranged in two units and protected from overcharging by a grizzly feeder, which is itself a screen, removing all coal less than $\frac{3}{4}$ -in. diameter before discharging its burden onto the shakers. The primary screen is constructed as a single-section, double-deck unit. This removes all coal less than $1\frac{1}{2}$ -in. diameter and passes the remaining lump to the secondary screen which extends at right angles to the first. The primary screen sizes all the coal under $1\frac{1}{2}$ -in., discharging each size in its respective bin. The secondary screen has two sections, is double-decked, and receives all coal above

$1\frac{1}{2}$ -in. diameter, regrading it and discharging the four sizes thus made onto four picking tables where hand picking assures a clean product.

Any breakage occurring after the coal has been sized is taken by a special conveyor to the primary screen where it may be re-sized. Refuse picked from the tables is conveyed to the refuse bin, and coal containing small quantities of impurities is delivered to a conveyor and taken direct to the boiler plant for fuel.

Reference to Fig. 2 will show that the equipment prepares all the commercial sizes without a separate re-screening plant. Such an arrangement requires shaker screens of more complicated design than are commonly employed and a housing structure adequate to resist all the vibratory stresses due to this more concentrated system of operation. Apparently reinforced concrete furnishes a material well fitted to satisfy all requirements of such a structure.

A foundation capable of carrying the enormous weight of a massive concrete structure is not always available near the surface. This in itself may form a limiting circumstance that would make the use of concrete impracticable. At Mine No. 12 a hard shale rock was found at a depth of only 22 ft. All footings of the main structure were accordingly carried down to this stratum and made of sufficient size so that no bearing stress was greater than 6 tons per square foot. The excavation for the foundation footings was made in an open pit by a crawler crane operating a clamshell bucket. The pit was made of ample size to insure that

no caving would block the required section, and the concrete was poured into forms which were removed as soon as possible so that the clamshell could fill behind the foundation.

Provision was made for carrying the enormous weight concentrated at the mouth of the shaft by lining the walls of the shaft for a width of 3 ft. to a depth of 35 ft. at which elevation solid strata were reached. Here a spread footing 5½ ft. wide was notched into the rock. This ties into the concrete end walls of the shaft by reinforcements of 60-lb. relaying rails set horizontally and vertically with 1-in. steel rods placed 12 in. apart. At a depth of 40 ft. an additional spread footing was provided and tied into the footing above by steel-rail reinforcements set both horizontally and vertically on 12-in. centers.

It is not possible within the limits of this article to go into the detail of the general design of the main structure, but a general idea of it can be obtained by reference to Fig. 1. The detail plans of the reinforcing have also been omitted for lack of space. Special care was taken to provide ample ties and bonds for all reinforcement rods in the various structural members.

Another interesting feature of this installation was the method by which the steel members were anchored to the mass of concrete. For example, the steel buntions that hold the guides are built-up members riveted

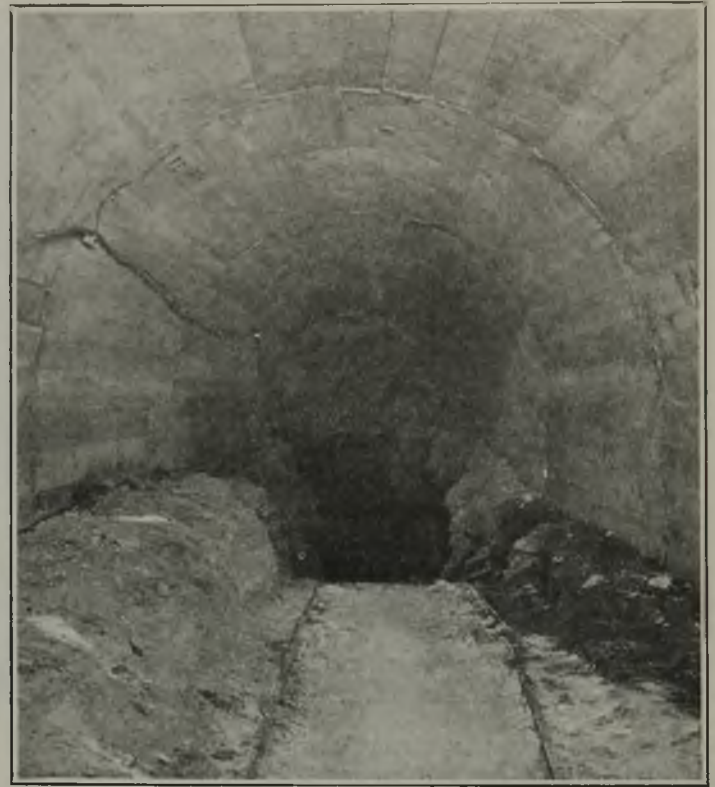


Fig. 3—Concrete Archway Through Fault

Passage through this 30-ft. downthrow was originally roofed with steel timbers. These, however, could not withstand heavy rock falls and upkeep was costly. This archway, 12 ft. wide and 75 ft. long, was built for \$27.50 per lineal foot. It has proved entirely satisfactory.

to steel channel anchors projecting from the concrete a distance sufficient to make a strong gusseted joint. This construction was used so that any serious displacement or bending of the steel bars through accident readily might be repaired without injuring the effective anchorage in the concrete.

The main structure being L-shaped an expansion joint was provided at the juncture of the two sections so that either can expand or vibrate without danger of rupture. This expansion joint is located where the planes of vibration meet at right angles. Additional expansion joints were placed in the roof at 40-ft. intervals. With these exceptions the structure is a monolith. The additional expansion joints in the roof were provided to absorb the relatively excessive expansion and contraction of this part of the structure.

BUILT TO SUSTAIN ABNORMAL LOADS

The head structure of the hoist tower was designed with special care, so as to provide for any unusual stresses that might be caused by the lodging of cages in the shaft. Four built-up, steel-plate girders 3 ft. in depth anchored to the concrete at both ends carry the sheave wheels. All other structural members (except those supporting walkways) are of reinforced concrete.

The beams supporting the shaker screens, weighing from 15 to 30 tons each, will be subjected to continuous live loads of measured intensity. Accordingly they are constructed with ample reinforcement and of such a size as to withstand the calculated stresses.

The shaker screens are driven by connecting rods from steel crank shafts set on piers cast monolithic with the floor and outside walls of the building. The entire tippie equipment is electrically driven. Remote-control equipment makes it possible for one man, conveniently located, to manipulate efficiently the entire

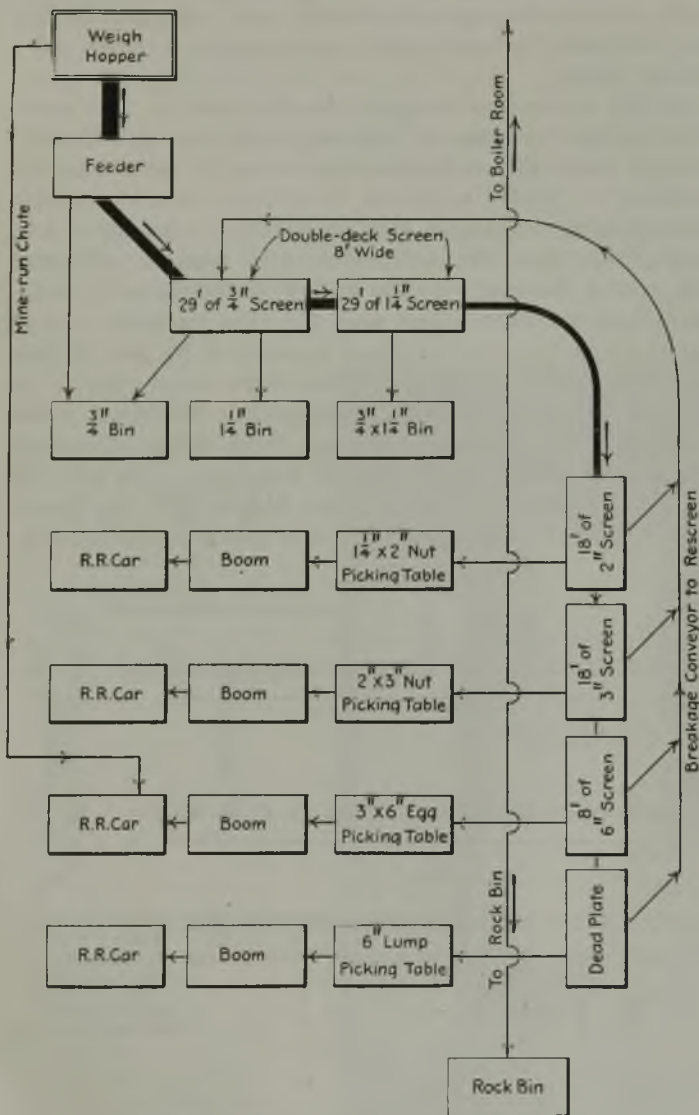


Fig. 2—Flow Sheet of No. 12 Tippie

By the use of bins the three small sizes can be loaded on a single track. The four other sizes are loaded each on its own track. The undersize goes back to the rescreen to be reprepared. The worthless material taken from the picking table goes to the rock bin. The better class of bone goes to the company's boilers.



FIG. 4

Concrete Roadbed on Main Haulageway

Tired of spending from 50c. to 75c. per lineal foot each year for maintaining haulage roads laid on wooden ties, the O'Gara company built this 300-ft. section of concrete roadbed in May, 1923, to test the possibilities of such a road. The first cost was \$2.50 per foot but thus far results have fully justified this expenditure.

system. In fact the arrangement of all machinery is correlated to the general principles of the design.

The construction plant employed in building Mine No. 12 was similar to that used on any ordinary large concrete job. The materials were unloaded and placed conveniently by a gasoline crawler crane. The concrete was mixed by an electrically driven batch mixer of 14-cu.ft. capacity located centrally at the foot of a 120-ft. hoist tower. After mixing, the concrete was discharged into a $\frac{3}{4}$ -cu.yd. bucket raised in the tower by a small steam hoist, dumped automatically and shot to place by gravity.

Concrete was made from portland cement, river sand and crushed rock in the proportions of 1:2:4. In the foundation the mixture was 1:3:6 and some large rocks 12 to 18 in. in diameter were embedded in the mass structure of the foundation. The reinforcement consisted of deformed bars and discarded mine hoisting rope. A sufficient force of carpenters was kept on the ground so that the pouring operation was practically continuous, thus preventing the formation of joints that might result in a future line of failure. Forms were not removed until the concrete had aged at least three weeks. Inasmuch as this work was done during the summer months of June, July and August, the concrete was well cured before any great stresses developed.

The mine roof in Saline County is comparatively good but a tight seal or stopping is sometimes difficult to build. The gray shale roof contains sufficient lime and other chemically unstable elements to disintegrate under the action of fresh moist air. Roof fracture is definite along certain planes, and disintegration crevices may extend well up into the strata. Consequently a seal to be tight must of necessity be made strong.

A plain concrete stopping is highly effective and satisfies the conditions when safety and fireproofness are essential, its only drawback being high first cost. In the mines of Saline County at the present time a hollow-tile stopping, plastered with stucco on one side is ordinarily employed because of its comparative cheapness and durability. When the roof is unusually bad a concrete seal is built. In closing off old workings this

seal is built double. A stopping of this character is composed of two walls from 6 to 10 ft. apart, filled in between with clay or sand. This affords a relatively tight seal having great strength and adaptability to any stresses that eventually may reach it from subsiding strata.

If the mine roof is badly faulted and at the same time subject to chemical disintegration through the action of fresh air, expensive timbering of some kind is necessary. Under ordinary conditions concrete is the best material to use in roof sustention. As there has been little need for systematic and regular artificial support of roadways in the mines of this locality, concrete has not been much used for this purpose. As a general rule the shaft bottom is secured by one of two methods, both satisfactory. The more usual plan is to erect substantial concrete walls along the entry sides and span the roadway between them with "I"-beams supporting either wood or steel laggings. The cost of such timbering will range from \$15 to \$30 per lineal foot of entry. The other plan is to use a concrete arch.

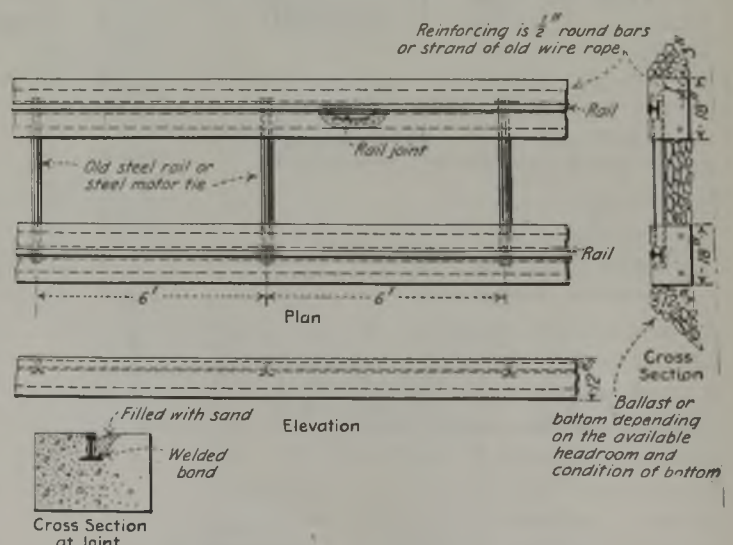


Fig. 5—Details of the Concrete Roadbed

Longitudinal rather than transverse members here afford support to the rails, the cross-members serving chiefly as ties to prevent spreading. As the bottom was fairly soft and could be cut without difficulty under the rail, trenches were excavated for the reception of the concrete. Consequently no forms were necessary for casting the supporting stringers.

This latter method affords the most permanent and serviceable of roof supports for mine bottoms, but the excessive first cost often renders this type of construction prohibitive. With the scale of wages now in force throughout the Central Competitive Field, the cost of an entry 18 ft. wide arched with concrete 12 to 18 in. in thickness will be from \$30 to \$45 per lineal foot.

In the accompanying illustrations Fig. 3 shows a vaulted airway through a 30-ft. downthrow fault. Before this arch was constructed large falls of rock, which the steel roof supports were unable to withstand, frequently had caused the steel timbering to fail. The archway shown is 75 ft. long, 12 ft. in width and cost \$27.50 per lineal foot. This cost included the filling in of all space above the arch with slate pack walls to prevent future falls of roof. No reinforcing was used in this arch and the concrete was placed in 15-ft. sections, forms being moved ahead after each section had been completed five days.

Timber available for mine use in southern Illinois is inferior in character, and its life is consequently limited. A tie placed in the motor road under ordinary conditions has an average life of two years. Such ties cost from 25 to 40c. each, f.o.b. mines. On main-haulage roads renewals are frequent but as they are necessarily made during operation of the mine their number per shift is small. The cost of such renewals will run from 75c. to \$1 each, including both labor and material, or approximately 60c. per foot of track. Adding to this the cost entailed by derailments and other incidental track expenses, we find that a motor road laid with heavy steel will cost annually from 50c. to 75c. per foot of track.

In an effort to reduce this maintenance expense, a 300-ft. concrete section of locomotive road was designed and built at Mine No. 10 during May of 1923. This piece of road was laid as a test to determine the use-

fulness of this type of construction for mine service. The conditions where this strip of road was constructed were ideal, as no water was present and the bottom was soft enough to be trenched for the laying of the concrete stringers underneath the rails. If it had not been possible to trench the bottom, the necessary forms for the concrete would have slightly increased the expense. This road as completed cost \$2.50 per foot.

Since the construction of this track the traffic over it has consisted of a 10-ton locomotive drawing from twenty-five to thirty cars, the gross weight of each being slightly over three tons. The locomotives average two trips per hour. To date, the results secured have been entirely satisfactory. No disintegration of the roadbed can be detected, nor has any disadvantageous condition developed that can interfere with future operation. A concrete roadway can only be constructed profitably on main-line or permanent haulage where no revisions of alignment or level are ever likely to be needed, for it is obvious that such a roadway once constructed is extremely difficult to alter or renew. However, given such conditions of permanency the use of concrete is well justified, for such a roadway if properly constructed will last as long as the mine.

The management of the O'Gara Coal Co. has found it necessary to construct several mule stables underground, and, taking into consideration the provisions of the mining law, it decided to build them of concrete. The stables so constructed are absolutely fireproof, safe, and easily maintained. All individual mangers, water troughs, partition posts and floors are cast monolithic and reinforced with small steel rods. Roof supports are also of concrete, as are also the side walls which seal off all coal or inflammable material.

Fig. 7 shows the design of one of these stables. Its arrangement is convenient and ample space is provided for each animal to rest in comfort without crowding.

FIG. 6

Concrete Stable

Three underground stables like this erected in 1917 have not cost one cent for repairs and have been comfortable enough to increase appreciably the efficiency of the mules. Sidewalls are 36 in. high surmounted by heavy wire netting allowing ample circulation of air. Mangers and feedboxes are also of concrete. Note the complacent expression on the face of Mr. Longears! This alone speaks volumes for the excellent sanitation of this underground stable. The law requires that all underground stables be made fireproof. The walls being of coal are lined with concrete.

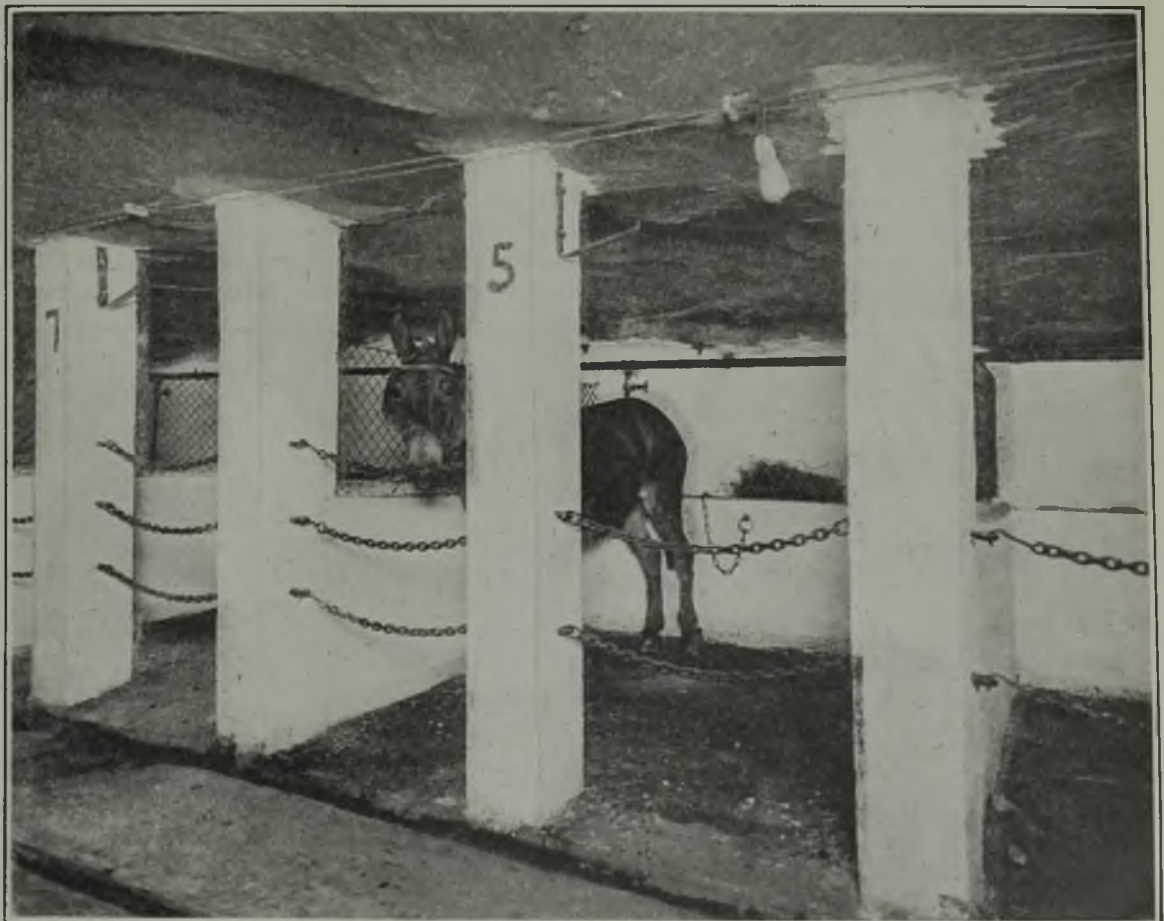
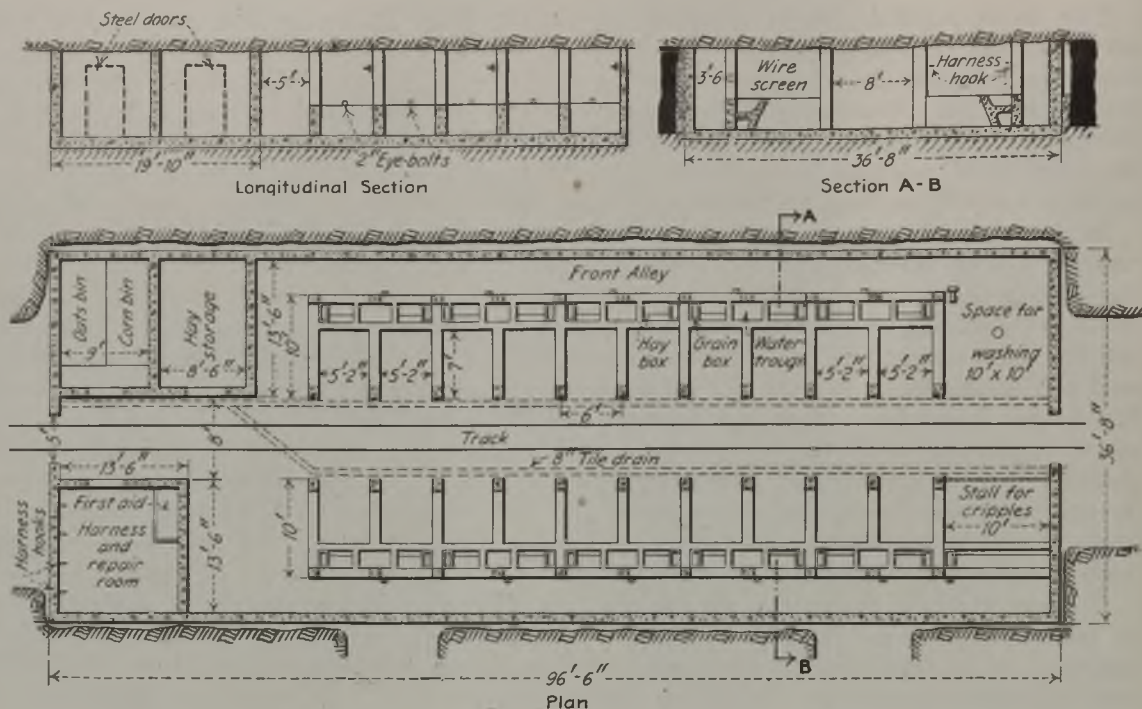


FIG. 7

Underground Stable

This shows the chief details of construction. These of course may be altered in any installation to suit any local conditions peculiar to the particular locality in which it is built. The chief essentials in addition to good drainage are ample room for each animal and adequate ventilation.



With a stable thus arranged it has been found possible to reduce the expense of keeping mules and at the same time greatly increase their efficiency.

Again referring to the design, it will be noticed that the partition walls of concrete between the stalls are not over 36 in. high and that the space from the top of the concrete to the roof is partitioned by heavy wire screen. This allows ample fresh air to circulate throughout the stable, affording the animals that adequate ventilation which is requisite for good health. Three of these concrete stables which were constructed in 1917 have not cost a cent for repairs in seven years.

Within the past four years the O'Gara company has recased with concrete six shafts that originally were timber-lined. Some of these shafts had been retimbered in the preceding six years and yet were found to be unsafe because the timber had decayed. The lining accordingly was replaced with concrete. In addition the company has sunk a 12 x 8-ft. air shaft, 400 ft. deep, lining it with concrete throughout.

There has been some discussion and more or less question as to the advisability of lining downcast shafts with concrete as in some cases the lining has disintegrated, its usefulness being practically destroyed in a

short time. All the concrete-lined downcast shafts in the vicinity of Harrisburg have proved entirely satisfactory with practically no signs of disintegration although large quantities of alkaline water and frequent freezing and thawing during the winter months make conditions severe. Experience with concrete in this field therefore has demonstrated its usefulness as a material for shaft lining and practically all shafts in southern Illinois are so constructed.

The loss of any unit of the mine plant by fire or by disintegration shuts down the entire operation at least temporarily with a consequent commercial loss. This is especially true of the more important units, such as the fan, engine and boiler houses and the preparation plant. For this reason concrete has been adopted by the O'Gara company as the best material of construction for buildings of this character. It has been demonstrated that with concrete such buildings may be constructed at an equal or lower cost than with any other fireproof material. By this means also insurance premiums may be reduced to a minimum if not practically eliminated and the general overhead decreased.

Furthermore it has been found profitable to construct concrete smokestacks, as may be seen in the headpiece.

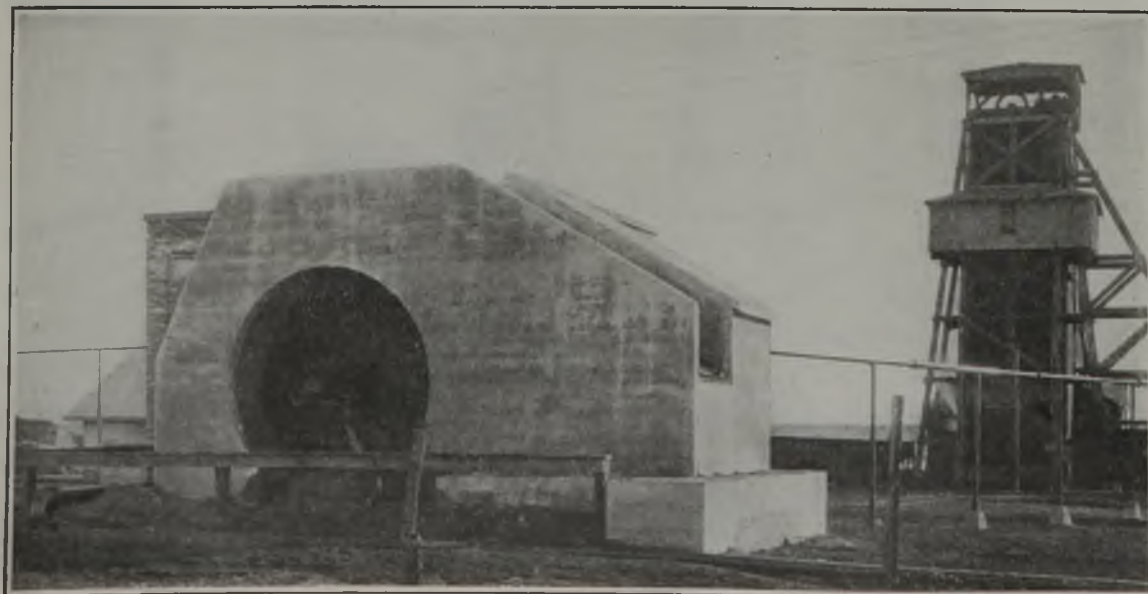


FIG. 8

Concrete Fan House

It was found that, considering the cost of labor, no other fireproof material could be used as economically as concrete for the construction of buildings as vital to operation as fan-houses. Incidentally concrete construction of top works appreciably cuts down insurance costs. If one important unit of a plant is destroyed by fire or accident the whole operation is closed down till it is repaired. Consequently it pays to build every part substantially.

Quantity of Timber Used in Soft-Coal Mines and How Much Will Be Needed in Future*

About 0.3 Cu.Ft. for Each Ton Produced—As Other Fuels Fail Bituminous Coal Must Gain—Stable Per Capita Consumption Probably Will Be Reached About 1960

BY NEWELL G. ALFORD
Pittsburgh, Pa.

ONLY with difficulty can forecasts be made of the future consumption of timber in bituminous coal mines, for no records are available of sufficient scope to enable us to determine the present timber requirements of the industry. The data on which this

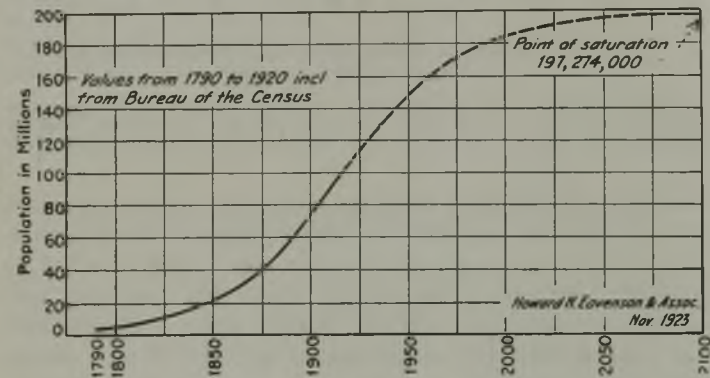


Fig. 1—Past and Estimated Future U. S. Population

From this curve it would appear that the saturation point will be nearly reached by the close of the present century but will not be fully attained until the year 2100 A.D.

survey is based was obtained from plants where records are being kept and from some operators who collected the information for this survey. To these have been added composite figures for the continental area of the United States collected in 1905 and 1919† and for central and western Pennsylvania and for Illinois in

*Paper presented before the meeting of the American Institute of Mining and Metallurgical Engineers held in New York City in February, 1924.

†Forest Service Circular 49, U. S. Dept. of Agriculture (Timber used).



1922.‡ The result, representing slightly over 928,000,000 net tons, is shown in Table I. Some of the companies furnishing data were unable to segregate the timber

into the various purposes for which it was used but for those who did, Table II shows the board feet of posts and cross-bars used per ton of coal mined and what percentage of the total timber consumed was employed in roof support. The wide variation in quantities of timber consumed per ton of coal mined is due to differing mining conditions and to the variation in the quality and strength of the timber.

Fig. 1 shows the past and estimated future population of the continental area of the United States to its

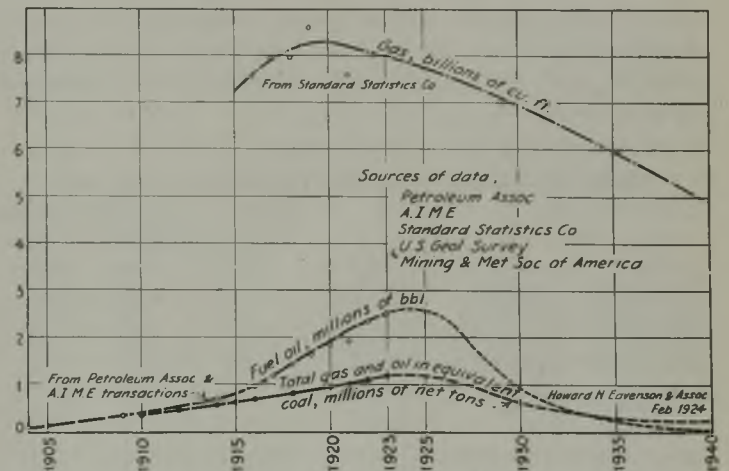


Fig. 2—Past and Future Gas and Oil Production

These curves show not only the past production of gas and oil but their estimated future production as well. Both of these fuels have been reduced to their coal equivalent.

‡Reports of Investigations, U. S. Bureau of Mines, Serials Nos. 2465 and 2546, April and November, 1923.

Table I—Timber Used in Bituminous-Coal Mining

State	District	Seam	Net Tons Mined	Bd. Ft. Timber Used	Bd. Ft. Timber Used per Net Ton Coal Mined	Remarks
Pennsylvania	Connellsville	Pittsburgh Upper & Lower	17,064,513	74,415,347	4.36	One year's figures (1923)
Pennsylvania	Somerset Co.	Kittanning	977,814	5,998,919	6.13	One year's figures
Maryland	Frostburg	Georges Creek	237,709	929,232	3.91	One year's figures
West Virginia	Fairmont	Pittsburgh	55,375	191,332	3.45	Figures for one representative month
West Virginia	Fairmont	Pittsburgh	81,481	129,932	1.59	Figures for two representative months
West Virginia	Paint Creek	Eagle	162,512	847,904	5.22	Figures for 10 months
West Virginia	Tug River	Pocahontas	25,205,829	81,871,705	3.25	Figures for 7 years
West Virginia	Thacker	Winifrede	517,013	850,623	1.64	Figures for 2 years
Kentucky	Big Sandy	Millers Creek	137,769	897,342	6.51	Figures for 1 year
Kentucky	Big Sandy	Elkhorn	1,469,566	9,420,422	5.67	Figures for 1 year
Kentucky	Western	No. 9	132,000	227,040	1.72	Figures for 3 months
Illinois 1922	All	All	22,000,000	60,720,000	2.76	Figures for 1 year from 30 operators
Colorado (a)		Nine seams	3,175,000		6.35	Serial 2465 U. S. Bureau of Mines
New Mexico	Raton	Three seams	609,176	4,041,321	6.63	Figures for 1 year
Illinois		No. 6	2,319,000	3,826,350	1.65	Figures for 9 months
Penna. 1922	Cent. & West.	All	37,000,000	133,200,000	3.60	Figures for 1 year (1921)
U. S. 1919	All	All	465,860,058	1,813,680,000	3.89	Serial 2546, U. S. Bureau of Mines 1923 Consumption in 1919
U. S. 1906	All	All	351,062,785	1,236,506,400	3.52	R. R. Hornor, U. S. Bureau of Mines
Total above			928,067,600	3,447,915,119	3.71	U. S. Forest Service Cir. 49 U. S. Dept. of Agriculture Weighted average per ton

(a) In Las Animas, Huerfano and Fremont Counties.

None of the figures given for total states or the U. S. duplicate those of individual companies.

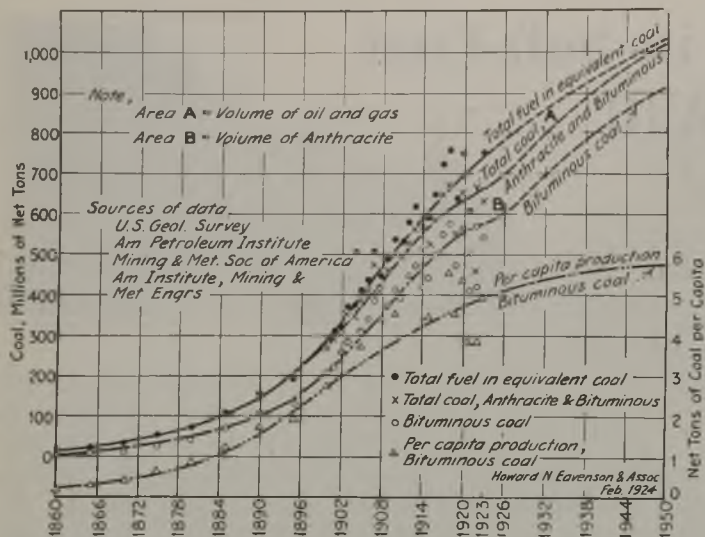


Fig. 3—Past and Estimated Future Fuel Consumption

The per capita consumption of bituminous coal or its equivalent is expected to become stabilized or approximately uniform at roughly 6 tons annually about the year 1960.

probable saturation point in 2100 A.D., this curve being copied from "The Biology of Death." Fig. 3 gives the past and estimated future total fuel consumption, including oil and gas, taken from Fig. 2. Though the latter curve largely explains why the production of bituminous coal has not increased in the past five years, it also shows that the period of peak oil production is passing and that after 1925 a progressive recession may be expected.

The curves showing the expected production of all coal and of bituminous coal, Fig. 3, take into account the future recessions in the railroad and industrial use of oil fuel as its supply is curtailed and the consequent increase in demand for coal as oil prices advance.

Concerning the oil production shown in Fig. 2, it should be stated that processes already are developed which will enable the refiner to triple the extraction of gasoline from fuel oil at a relatively small increased cost. Only the added expense prevents these methods from being used. This will decrease the quantity of fuel oil available. Furthermore, the supply of available

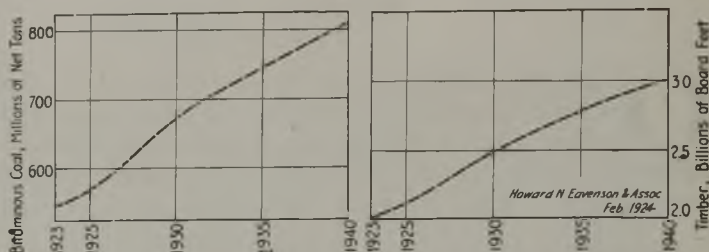


Fig. 4—Trends in Bituminous-Coal Production and Timber Consumption

These curves are practically identical except that they are drawn to different ordinates. In other words, 3.71 board feet of timber are allowed for each one ton of bituminous coal produced.

fuel oil will diminish with the certain enormous increase in the use of gasoline by automobiles. As the shallower fields approach exhaustion the costs entailed in sinking and operating deeper wells will increase, and sooner or later the United States Navy will discount its future need for conservation of fuel oil and secure legislation restricting its use to government purposes. With these factors affecting oil production and consumption, it is believed that the demand for coal and its consequent increased production because of the diminished supply and higher price of oil will rise at least as rapidly as it declined.

Increased efficiency in making electric power, and its wider and more efficient application will restrain, to an extent, the production of coal per capita, as shown in

Table II—Timber Used for Posts and Cross Bars

State	District	Seam	Board Feet per Net Ton Coal	Percentage of All Timber Used
West Virginia	Tug River	Pocahontas	2.44	75.6
West Virginia	Thacker	Winifrede	3.38	20.6
West Virginia	Paint Creek	Eagle	4.09	78.8
Maryland	Frostburg	Gorges Creek	2.68	68.6
Pennsylvania	Somerset Co.	Upper & Lower Kittanning	5.06	82.3
Kentucky	Big Sandy	Elkborn	4.56	71.1
Kentucky	Big Sandy	Millers Creek	5.60	55.4
Kentucky	Western	No. 9	0.71	41.3
New Mexico	Raton	3 Seams	6.35	90.6

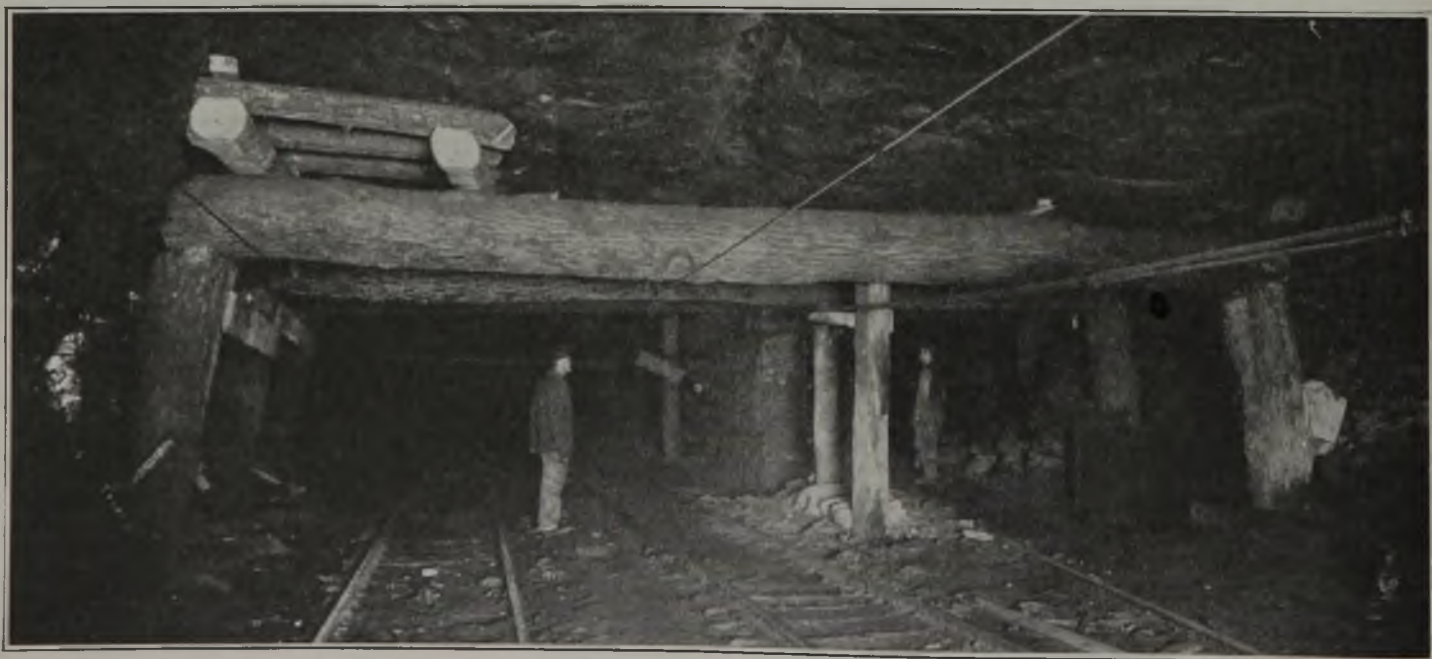


Fig. 5—Heavy Timbering on Main Haulage Road

A scene in an anthracite, not a bituminous, mine. Over twice as much timber is used in the production of a ton of hard coal as is consumed in the mining of an equal weight of bituminous coal. When it is considered that mine timbers on the average last only about 3 years, it is not surprising that the mine timber costs are high.



Fig. 6—Growing Mine Timber on a Reserve

Some of the larger coal companies have already started reforestation of cut-over areas. It requires about 15 yrs. to grow a log suitable for a mine prop. In the future many coal companies must produce the pit lumber they consume. This reserve is owned by the Kingston Coal Co.

the curve of Fig. 3, the expected stabilization of this quantity taking effect within a decade or so after 1950.

When Is Electricity Safe?

Sliding Fits and Their Dangers in Permissible Equipment—Can a Machine Perfectly Fitted Electrically for Work in Gas Cause an Explosion?

EITHER alternating or direct current at 110 volts constitutes a shock hazard; even low-voltage circuits of high amperage may ignite methane. Consequently, said L. C. Ilsley of the U. S. Bureau of Mines at a recent safety conference in Pittsburgh, Pa., care must be taken even with circuits of the voltage indicated. Many fire hazards arising from electrical causes can be eliminated by good insulation.

In discussing Mr. Ilsley's paper, Graham Bright remarked that mine equipment even if approved by the U. S. Bureau of Mines was not safe if not kept in proper condition. "At the end of several months approved equipment of the sliding fit type is no longer safe," Mr. Bright added as the result of his own observation. A bolted plate cover is permissible only so long as all bolts are in place and sufficiently tight to close all openings. Some system of inspection with proper authority given to those who make it, is needed and should apply to wiring and all electrical appurtenances. Something must be done to keep permissible equipment permissible.

Mr. Ilsley recommended that sliding fits be made of different metals and that the paths or ways be kept well lubricated. The Bureau, he added, had always insisted that permissible equipment was only safe when kept in condition, to which Mr. Bright replied, "Such equipment is not now kept safe; consequently there is only one solution to the problem, and that lies in daily inspections."

According to Henry Walker, deputy chief of the Mines Department of Great Britain, the same difficulty in keeping mining machines and other equipment in safe working order is experienced in that country where mine electricians are relied upon to inspect equipment.

Table III—Estimated Consumption of Timber in Bituminous Coal Mining

Year	Board Feet	Year	Board Feet
1923	2,021,950,000	1932	2,609,000,000
1924	2,062,760,000	1933	2,662,500,000
1925	2,114,700,000	1934	2,708,000,000
1926	2,175,000,000	1935	2,756,530,000
1927	2,226,000,000	1936	2,814,000,000
1928	2,330,000,000	1937	2,860,000,000
1929	2,415,000,000	1938	2,910,000,000
1930	2,485,700,000	1939	2,956,000,000
1931	2,547,000,000	1940	3,005,100,000

Fig. 4 shows the expected trend of bituminous coal production from 1923 to 1940 as based on data developed in Fig. 3. Using the unit of 3.71 board feet of timber per ton of bituminous coal mined, the growth in the use of timber during the same period in bituminous coal mining will be as shown in the right-hand graph of Fig. 4. It is expected, however, that the true average timber consumption per ton of coal produced will be slightly higher rather than lower than this weighted average. The values shown in the expected timber consumption curve of Fig. 4 are recorded in Table III.

The data from which the results shown were obtained are derived from thoroughly reliable sources and, so far as is known, are the most complete yet compiled.

Bolts are omitted in closed machines there just as here.

"An approved undercutting machine in permissible condition is a possible agent of ignition when cutter bits hit pyrite," said S. E. Reynolds. He related an instance in which a safe cutting machine working in a clay bed containing nodules of pyrite was believed to have caused an explosion. Because pyrite ignites at a lower temperature than coal dust, Mr. Ilsley classes its frictional ignition by the cutter bits of a mining machine as a possible source of ignition of coal dust or methane. George S. Rice remarked, however, that such a possibility is remote, considering the large number of cutting machines in use and the comparatively few explosions occurring. Mr. Allison was of the belief that frictional ignition of pyrite is possible and therefore should not be ignored. Mr. Reynolds held that cutter bits working on pyrite generate much heat and therefore might cause an explosion. As a corrective of this possibility Mr. Rice suggested that water be sprayed into the kerf while it is being cut.

Dr. R. V. Wheeler, director of the Government Experiment Station of the Mines Department of Great Britain, was one of the doubters, for he had tried experimentally, he said, to ignite methane by frictional sparks and had been unsuccessful under conditions similar to those existing in coal mines. A steel wheel was heavily weighted and made to revolve at 500 r.p.m. on a steel rail. Even the large stream of sparks thus resulting did not ignite a surrounding explosive mixture of methane with air so long as the sparks were permitted to travel freely and spend themselves in the atmosphere. Ignition, however, was obtained by setting an obstruction in the path of the sparks upon which they could impinge. These experiments led to the belief that frictional sparks must strike an obstruction and thus be enabled to have a prolonged period of contact with the gas if ignition is to be expected. A battery locomotive getting into motion on a sanded track is hardly a likely agent for the ignition of an explosive mixture of methane with air.

What Governor Pinchot's "Philanthropy" to the Anthracite Miners Means to the Public*

Wage Increase Far from Covered by Proposed Advance of 60c. per Ton—Labor Cost Now 170-180 per Cent Higher Than in 1913—Remedy to Consumer Lies in Recourse to Steam Sizes

BY E. W. PARKER

Director, Anthracite Bureau of Information
Philadelphia, Pa.

FROM the U. S. Coal Commission's preliminary report on anthracite the impression might easily be obtained that notwithstanding that business for the entire year of 1922 was "in the red," because of the losses due to the strike, it was a fairly prosperous year for the anthracite industry. In a statement showing the changes in margins from 1913 to 1923 (first quarter only) the average margins for each year are given for the years from 1913 to 1921 inclusive, while for 1922 a fair margin is given for the first quarter of the year, and a much larger margin is reported for the fourth quarter, and for the strike period covering the second and third quarters, it was simply marked "Suspension." It was, to say the least, disingenuous.

The commission evidently felt that it must respond to the public sentiment that exorbitant profits are exacted in the production and distribution of anthracite. Its tabulations of costs and profits showed that on the business done in 1921, the latest normal year, if the 60c. a ton which the Governor of Pennsylvania erroneously stated would be added to the cost by his present to the miners had been absorbed by the operators, 65 per cent of the tonnage would have been mined at a loss. However, as is well known, there are a few companies which, because of fortunate mining conditions, are highly prosperous. In order to prove this fact the commission accordingly published in detail the costs, realizations and profits of these companies from reports furnished with the understanding that they were to be held strictly confidential and which would not have been furnished had it been suspected that their confidential character would be violated.

REPORT THROWS LITTLE LIGHT ON WAGES

The report of the commission on the earnings of anthracite mine workers is one of the many academic products of that fact-finding agency, but it gives little information as to what are the actual earnings that the industry pays its employees. No attempt is made to carry one man or a number of men through the year. Consequently no allowance is made for labor turnover. A man employed during the year at three, four, five or a dozen different collieries appears as that many different men. As a result of this more than 64,000 miners appeared where only 36,500 were employed, and 76,000 miners' laborers apparently received the pay that was actually earned by 19,800. Comparison with other compilations of earnings that have been made cannot therefore be made. We may assume, how-

ever, that all employees who averaged 271 days or more were at the same job during the year, as that was the average days worked in the region in 1921. Every contract and consideration miner who worked this full time earned \$2,700 or over and 163 of them earned over \$4,000. All of the miners' laborers who worked as much as 271 days earned \$2,100, or over, but only one earned over \$3,000, and he earned between \$3,700 and \$3,800. Outside daymen who worked 271 days or more earned anywhere from \$1,200 to \$4,000, and inside daymen earned from \$1,300 up, and that is about as much as can be said on earnings.

10 PER CENT INCREASE RESULT OF ORGANIZATION

How the mine workers have benefited through the power of their organization—through the exercise of force in the settlement of wage agreements—had its latest exhibition in the increase of 10 per cent presented to them by the action of Governor Pinchot last September. When he forced this unexpected and totally unnecessary advance in wages to the miners, the Governor said that it would increase the labor cost 60c. a ton and he suggested with a charming naïveté that the operators might absorb 10c. of this amount and that the transportation companies and the retail dealers should absorb the other 50c., though through what sort of machinery this could legally be brought about he has not yet advised us. He was informed by the experts of the U. S. Coal Commission whom he had invited to advise him on the matter, that 60c. a ton would not cover the increased cost which would result from his proposed 10 per cent advance in wage rates, but that the cost would be 75c. or more per ton. He ignored their advice, however, and assumed responsibility for an incorrect statement which he has repeated upon several occasions since.

The Governor was, or should have been, familiar with some of the facts brought out by the report of the U. S. Coal Commission, and he should have known that if the anthracite operators had absorbed even the 60c. a ton that he erroneously stated would be added to the cost, 65 per cent of the anthracite tonnage would be produced at a loss.

The anthracite operators did not see things in the way the Governor would have had them do. They promptly added to their prices, "each to his kind," the cost which the Governor had by his action forced upon them, and firmly declined to enter into any agreement with him or among themselves to boycott any dealers who advanced their prices to their customers, although they were warned by the Governor that if they did not enter into this conspiracy he would attack the industry. And he has lost no opportunity to carry out this threat.

*Final installment of address entitled "A Few Comments on the Work and Reports of the U. S. Coal Commission," delivered at February meeting of American Institute of Mining and Metallurgical Engineers, coal and coke committee, held at New York City. The first part appeared in *Coal Age*, April 3, 1924.

The reaction that he got from adding to the already too high prices of domestic anthracite was not to his liking and he demanded that the operators rescue him from the pit which he had dug for himself and into which he had fallen, under the penalty of incurring his displeasure and the consequences thereof. He would use this "hard-boiled monopoly," as he calls it, to accomplish his own ends and having failed to obtain their consent to enter into an agreement, which Mr. Warriner, in a letter to the Governor, stated would offend the criminal laws of the United States, he has upon every occasion carried out his threat to attack the industry.

The Attorney-General of Pennsylvania, in an opinion to the Governor, said:

The operators can agree with each other to control prices for the benefit of the public without infringing the common law.

Legally, the operators might be in danger of prosecution under the Sherman law, if they agreed to hold prices below a maximum; but, practically, it is hard to find how they could be attacked unless the federal Department of Justice were hostile to action in favor of the public interest.

The Governor was perfectly willing to enter into an illegal alliance with the anthracite operators in order to serve his own purposes, and they (the operators) could have bought immunity (I use the term advisedly) from his attack had they been willing to run the risk of prosecution under the federal statutes. The Governor ran no such risk. Because they would not, they have become the objects of his vigorous vituperation and denunciation, culminating in the preparation by him and his Attorney-General of a bill which on Jan. 24 was introduced by Senator Borah into the Congress of the United States, and which calls for the regulation by bureaucratic Washington of one of the great industries of his state—a monopolistic industry, yes, but monopolistic only in the fact that it is confined entirely within the State of Pennsylvania, a monopoly created by Nature, not by men, and because of that condition brings revenue into the state amounting annually to approximately three-quarters of a billion dollars, of which about 70 per cent is expended for labor.

I do not know where the Governor got the idea that the anthracite industry is hard boiled in its "monopoly," unless it is because it is kept continually in hot water by the almost uninterrupted investigations of a more or less political character to which it is subjected. One is hardly terminated before another is begun. Here is a list of some of the investigations of the anthracite industry during the last ten years:

- 1914—Interstate Commerce Commission
- 1916—Gawthorp Commission
- 1917—Federal Trade Commission
- 1917—Department of Justice
- 1917-1919—Vardaman Committee, U. S. Senate
- 1918—Federal Trade Commission
- 1919—Governor Sproul
- 1919—U. S. Senate, Frelinghuysen
- 1920—U. S. Anthracite Commission
- 1920—U. S. Senate, Calder
- 1921—U. S. Senate, La Follette
- 1922-1923—U. S. Coal Commission
- 1923—Federal Trade Commission

The 10-per cent advance in wages obtained by the miners through the Pinchot settlement was something like superimposing Pelion on Ossa, as is evidenced by the fact that in 1913 the total commercial production of anthracite was a little over 71,000,000 gross tons, and the payroll was \$113,320,000; in 1921 the commercial production was 70,190,000 tons—a decrease of more than 800,000 tons from 1913—and the payroll increased to \$284,000,000. It is estimated that for 1924 the beneficial action of Governor Pinchot will, for the same tonnage as was produced in 1921, increase the payroll to approximately \$325,000,000.

The labor cost of producing a ton of anthracite in 1913 was \$1.595; in 1921 it was \$4.046. In 1913 the average wage for every man—from miner to laborer—amounted to \$644.80; in 1921 it was \$1,760.38.

The increase in labor cost in 1921 over 1913 was 154 per cent; the boost given by Governor Pinchot will make the increase from 170 to 180 per cent. The daily earnings per man increased 162 per cent from 1913 to 1921, and the annual earnings increased 176 per cent, the

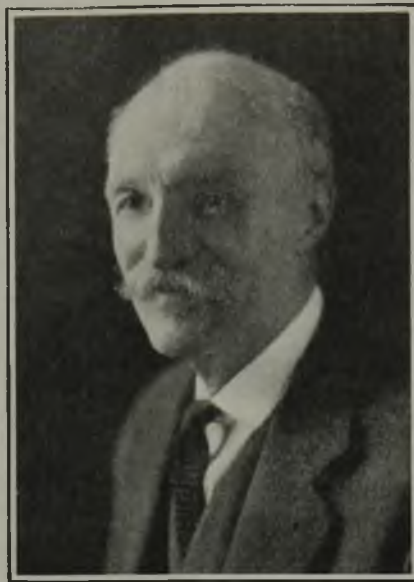
larger percentage in the annual earnings being due to the fact that the men worked an average of 271 days in 1921, as against 257 days in 1913—and, by the way, 271 days is about as much as any wage earner works. The anthracite mine workers have averaged that number or better for the last six or seven years. The industry offers practically 100 per cent employment to its workers. No other basic industry does as well.

The advances to common labor—the lowest paid adult labor—have been at a much higher rate than to other classes of employment. In June, 1914, for instance, according to Research Report No. 47 of the National Industrial Conference Board, the average actual earnings for outside common labor were 18.3c. per hour; in 1921 they were 52.8c., an increase of 189 per cent, and this percentage increase in the pay of common labor in the anthracite region is to be compared with an increase of 117 per cent for common labor in the manufacturing industries and 138 per cent in the wages paid to common labor on the railroads. In the same time the cost of living had increased 64 per cent, so that the purchasing power of the anthracite mine workers' labor has shown a very substantial improvement.

WAGES IN ALL BUT COAL INDUSTRY LOWERED

The wage rates in effect in 1921, and up to September last, were fixed at the post-wartime peak of wages and living cost. Wage rates in nearly every other basic industry have since receded. The increase in the cost of living at the post-wartime peak was 105 per cent over 1914, and it has receded to 64 per cent. Not so anthracite wage scales. Mr. Lewis and his lieutenants have declared that there shall be no backward step, and the step taken in September, 1923, was certainly not to the rear.

The result of all of the foregoing is that the anthracite industry finds itself today in a position that may truly be stated as economically unsound. No one realizes this fact more than the anthracite operators. The



©Underwood & Underwood
Governor Gifford Pinchot

The Pennsylvania executive's settlement of the anthracite strike, granting the miners a 10 per cent wage increase, boosted the labor cost to nearly 180 per cent above the 1913 level.

prices of the domestic sizes are too high, and the prices of the small, or steam, sizes, as we have become accustomed to styling them, are too low. The spread between these grades of the same commodity, having practically the same heat-producing quality and differing only in size and in the methods required for their efficient utilization, is absurd. The high prices of the domestic sizes of anthracite unquestionably encourage the use of substitutes, such as bituminous coal, coke, oil and (particularly for coking purposes) gas, all of which, strange to say, this "hard-boiled monopoly" is powerless to prevent.

It is impossible, however, in the face of such high producing costs, to effect any substantial reduction in the prices of the domestic sizes unless a more remunerative market can be obtained for the smaller sizes, which are now by far the larger part sold in competition with bituminous coal. There is no immediate prospect of obtaining any reduction in producing costs.

The anthracite operators cannot depend for long upon what S. D. Warriner has designated as the anthracite-consuming habit, and which, as he says, is the chief asset of the anthracite industry, but it is realized that consumers of anthracite—or at least the large majority of them, who are the people of moderate means—will not continue to indulge that habit when what they have always considered as a commodity, or certainly a comfort, is elevated to a superluxury class of fuel.

REMEDY IS ELEVATION OF SMALL ANTHRACITE

The remedy for the present situation is in elevating the smaller sizes of anthracite from their present degraded position of competing with bituminous coal for power raising—a use for which they are admittedly not so well adapted as is good bituminous coal—and placing them with their larger brothers in the domestic trade. It is entirely practicable; and it is not only practicable, it is economical, as has been demonstrated by elaborate tests carried on not only by fuel engineers employed by the anthracite operators but in university engineering departments, particularly Yale and the University of Pennsylvania.

However, there are now on the market appliances in which the small sizes of anthracite can be used with entirely satisfactory results for domestic heating. Among these may be mentioned the Spencer, the Molby and the Newport heaters, all of which burn buckwheat coal with automatic feed, and, if desired, with thermostatic control, also automatic, and with natural draft. A new device appropriately styled "The Electric Furnace Man," recently put on the market, uses rice and barley or even smaller sizes, automatically feeds the coal and removes the ashes, and can be operated under thermostatic control. It is operated with a blower attachment.

There are other devices which may be applied to the ordinary heating apparatus, which consist chiefly of using a forced draft either with or without automatic regulation by thermostat and with entirely satisfactory results. The people of Harrisburg, Pa., who are not responsible for the conduct of the occupant of the Governor's mansion, have for a number of years been using small sizes of anthracite, recovered from the bed of the Susquehanna River, in ordinary furnaces with a simple blower attachment. I am informed that there are more than 3,000 installations of this kind in Harrisburg and vicinity.

The steam sizes can be used with economy not only in the price of the coal but in the use of the fuel itself

by mixing these sizes with the customary fuels. For banking the fires at night the small sizes are much to be preferred to the ordinary fuel, as they make a more compact covering to the fuel bed and materially quicken the regeneration of the fire in the morning. The mixing of these fuels should never be done in the coal bin. Separate bins should be maintained for the small sizes and the regular fuel. One of the chief objections, it has been found, to the use of these small sizes in this way has been the necessity for an extra bin in the cellar, and in small houses the building of another bin sometimes proves a real inconvenience.

PREJUDICE AGAINST SMALL SIZES UNFOUNDED

There has existed an unreasonable prejudice against the use of the steam sizes for domestic purposes, one reason probably being the fact that they are sold at prices much below the domestic sizes, and it is considered, therefore, that they must necessarily be of an inferior quality. Where they have been given an intelligent trial, however, they have proved their value, and it is gratifying to state that the prejudice is gradually disappearing. The use of the steam sizes will be found more satisfactory than the use of either retort, beehive or gas-house coke. These are safe and smokeless fuels, but they are porous, consequently bulky, occupy a much larger space than the same quantity of anthracite, are difficult to handle, and unless great care is taken in the draft control they burn out much more rapidly than does anthracite. There is no other solid fuel that will maintain the uniform temperature for the length of time that anthracite will.

The anthracite operators are now taking active steps to educate the public in the use of these small sizes, and in co-operation with the manufacturers of the equipment I have mentioned and of others have established "Coal Economy Shows" in several cities where, in addition to the heating appliances shown, there are educational exhibits worthy of attention and moving-picture entertainments are given in which the story of anthracite from the original forest growth to the finished product loaded on the cars for market, is interestingly told.

Testing Coarse-Size Coal

A float-and-sink method and apparatus for testing coarse-size coal, developed by the U. S. Bureau of Mines in co-operation with the College of Mines, University of Washington, at the Northwest Experiment Station of the Bureau, is described in Serial 2570.

Two separate methods and apparatus have been developed for the float-and-sink testing of coal, one for coarse sizes and the other for use with the fine sizes of coal. The practical division between coarse and fine coal for such tests is about 20-mesh. The apparatus and methods described are confined to sizes coarser than 20-mesh for any except rough work.

A float-and-sink test of a coal sample is a means of separating in a heavy liquid the free particles of coal from associated impurities according to differences in their respective specific gravities. When the sample is placed in the liquid, the particles of specific gravity lower than that of the liquid float; those of higher specific gravity sink. This method of separating coal from its impurities is so positive and exact that it is much to be regretted that the cost of suitable solutions now prohibits its use in actual coal beneficiation.



Track, Diamond Mine, Imperial Coal Co.

Making the Application of Electricity Safe Against Hazards to Person and Property

Every 110-Volt Current with Proper Contact May Cause Death and Gas May Be Ignited by 2-Volt 1-Amp. Electric Bulb—Operation of Wireless Mines May Be Not Only Safe But Advantageous

BY L. C. ILSLEY

Electrical Engineer, U. S. Bureau of Mines

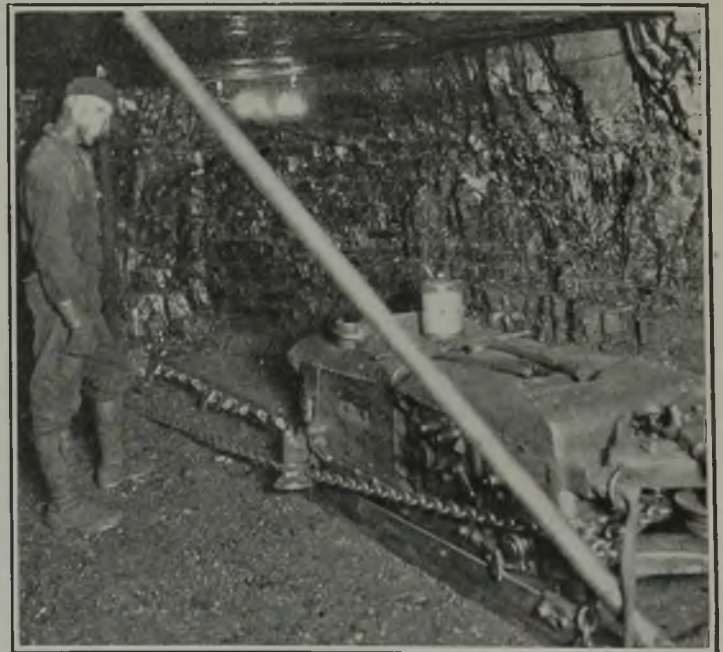
BACK of every safety program stands the industry itself with its precedents, prejudices and traditions. Coal mining, being an old established industry, naturally had many fixed traditions long before electricity and electrical equipment, comparatively new forces, made their appearance.

The electrical engineer, in spite of these traditions, thrust himself and his equipment into this field and insisted, often without invitation, upon taking a prominent part in the future development of coal mines. Therefore, it naturally follows that certain readjustments must be made from time to time to take care of the new problems introduced by electricity. Further, these adjustments will never be permanently or satisfactorily made until the electrical engineer, the mining engineer and the safety engineer thoroughly understand each other's problems and jointly work out a practical solution based upon the needs of industry and the limitations of electrical design.

The safety movement in coal mining had made considerable advance before the advent of electricity. As early as 1869 we find a safety code, covering one county in the anthracite field of Pennsylvania, and by 1888 there were at least 12 states having safety regulations for bituminous coal mines. These early safety codes, made previous to the introduction of electricity, naturally had no reference to it or to the installation and operation of electrical apparatus, and in some states, even after successive revisions of the safety code, there are still no adequate rules covering electrical equipment. For instance, a chief mine inspector or his deputy, is not, as a rule, legally required to have a

knowledge of electricity or an understanding of safety measures concerning the installation of electrical equipment.

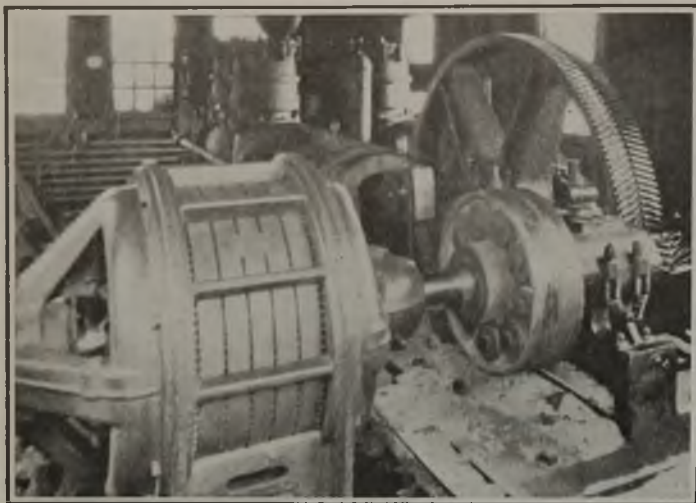
The growth of the coal industry in the United States has been remarkable. Yearly tonnage statistics, published by the Geological Survey for both anthracite and bituminous mines since 1822, not only show the rapid growth of this industry, but also indicate the part



Electric Lights at the Mine Face

Taking a leaf from the practice of other industries which have long ago learned that adequate lighting pays, the mines are now beginning to improve the illumination of their underground workings. Here is an application of electricity which will reduce mining hazards far more than the use of electricity for machinery has increased them.

*Abstract of paper entitled "The Present Trend of Electrical Safety in Coal Mines," presented before American Institute of Electrical Engineers, Birmingham, Ala., April, 1924.



New Drives Replace Old

Where the equipment to be operated is still in good condition it often has been found advisable and economical to replace the old drive with an electric motor. Such changes are usually difficult to make because of the many special conditions to be met.

which electricity has played in bringing the total output of coal to the present figures.

Beginning with 58,583 tons in 1822, there is almost an unbroken yearly increase until we reach the maximum of 678,211,904 tons in 1918. An increase of 10,000 per cent in a little less than 100 years.

The increase in bituminous production during each decade for the last 50 years is shown in Table I.

Table I—Increase in U. S. Bituminous Coal Production

Decades	Average Yearly Production—Short Tons	Decades	Average Yearly Production—Short Tons
1871 to 1881	32,600,000	1901 to 1911	323,000,000
1881 to 1891	82,800,000	1911 to 1921	486,800,000
1891 to 1901	148,500,000		

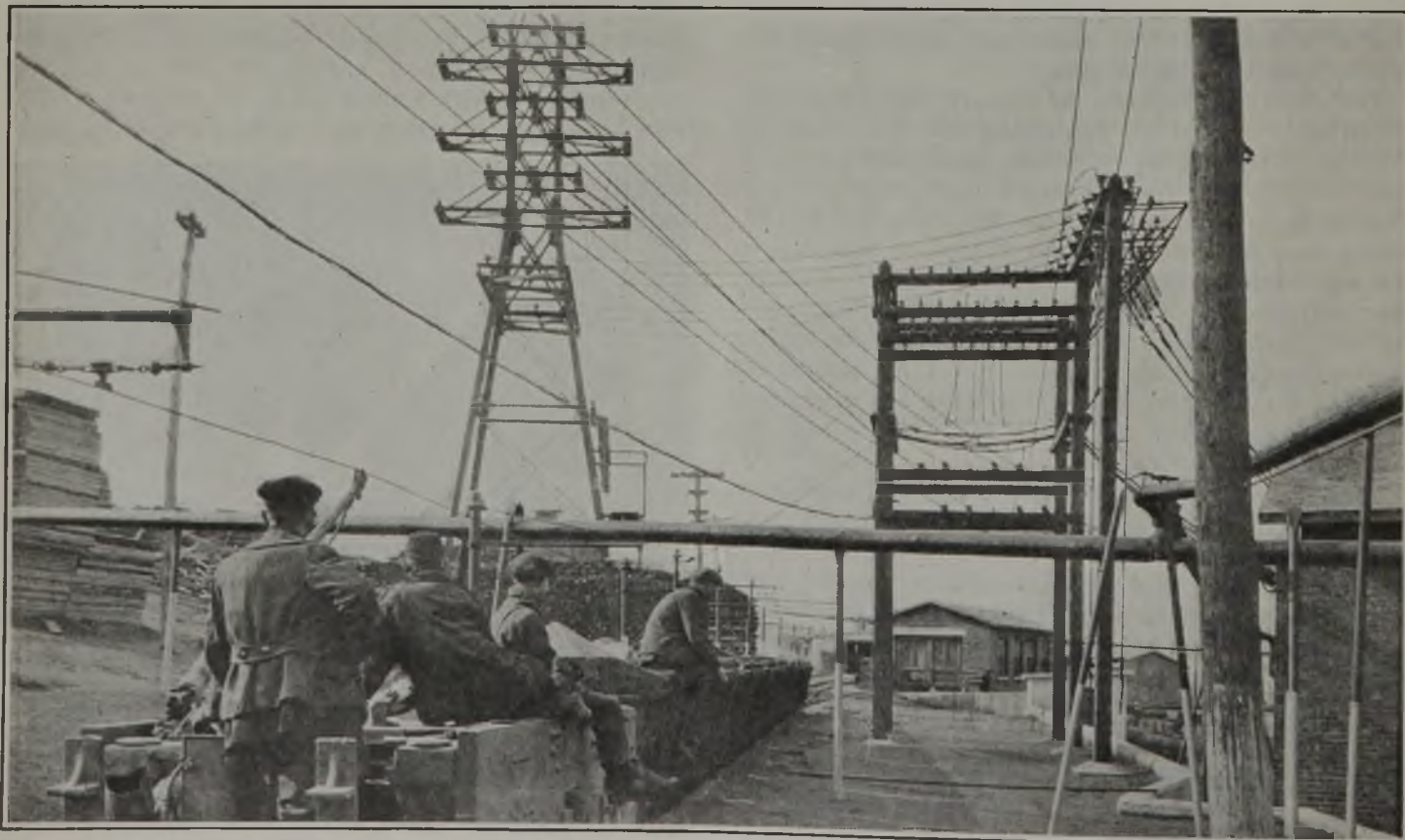
The increase in coal output during the last 25 years has been augmented by the introduction of electrical equipment which, owing to both economy of operation and flexibility, has found a real place in the industry. It was impossible to find suitable statistics showing the growth in the use of electrical equipment in coal mines. However, Table II has been compiled from such data as could be found. This table gives an indication of increases during the last two decades.

The first electric hazard is shock. No person can be sure that he will not be killed, even from a 110-volt circuit, if his body makes such contact with it that the maximum current passes through his body. As the voltage is increased to 250 volts, 500 volts, or 2,300 volts, the danger from contact with the electric circuit is increased. Alternating current of the same nominal voltage is possibly more dangerous than direct current. Experience has taught us that both will cause death, and if the fatalities from this source are to be kept low, certain precautions in the guarding of circuits must be observed.

A second hazard is in the use of explosives in conjunction with electric current. It seems unnecessary to advise against the placing of any electric wiring in a powder magazine. If a flash or arc from an electric circuit comes in contact with black powder, an explosion results. Therefore, all boxes and cars should be so constructed that current from the trolley or from the rail cannot possibly pass through the sides of boxes,

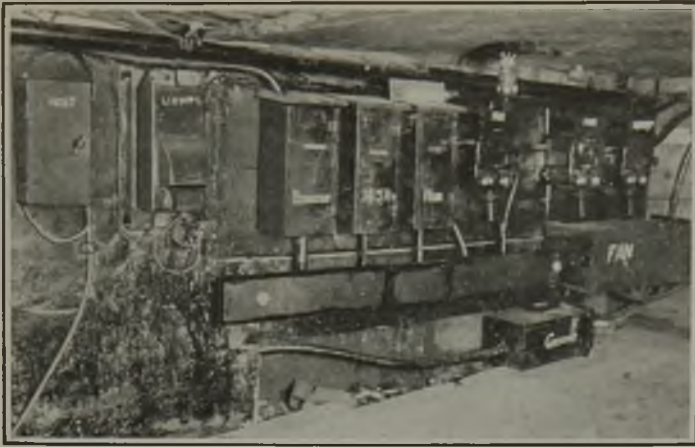
Table II—Increase in Use of Electrical Equipment in Bituminous Mines

Year	No. of Motors	Total Hp. of Motors
1902	1,322	65,927
1909	10,557	402,090
1919	42,230	1,578,474



Old and Modern Power Transmission Lines Keep Company at Coal-Mining Properties

The rapid strides made in the electrification of the mines have brought about interesting associations of old and new equipment. Original power distributing lines look much out of place when compared with the latest installations. At many mines the old must stand with the new because of the urgent demands to electrify and mechanize both obsolete and modern equipment.



Switchroom Where Circuits Are Controlled and Supervised by Definitely Appointed Workmen

To make sure that no switch may be wrongly closed or left open each enclosing cabinet is marked with wording indicating its circuit. Many such switches now used are arranged so that they may be locked open when men are working on the lines.

and so that it is impossible for the metal powder cans to form a path for the electric current.

Electric current is very useful for electric shotfiring, and undoubtedly safer than fuse and squib firing, but great care must be taken lest the shot is prematurely fired by an accidental current passing through the electric detonator. Detonators and explosives should always be kept apart until used, also great care should be taken to keep shotfiring from other electric wires, and finally, detonator leads should be prevented from contact with electrical circuits or apparatus, as less than 1 ampere of electric current will fire an electric detonator.

A third source of danger is the ignition of gas from electric flashes or heated wires. It takes but a tiny current of 250 volts to ignite gas. It has been found that the current required to operate the motor of an electric drill under no load is sufficient to ignite gas. Again, the incandescent filament of a 2-volt, 1-amp. bulb will ignite gas very readily.

A fourth hazard is the ignition of coal dust by electric arcs or flashes. Some bad coal mine disasters have undoubtedly been caused in this way. Tests made by W. Thornton in England and by H. H. Clark of the U. S. Bureau of Mines proved that ignition of clouds of coal dust by electric flashes could readily take place. The greatest danger occurs, in case of a wreck of a trip of cars, which wreck may tear down or damage an electric circuit and at the same time stir up a heavy dust cloud.

A fifth danger is from fires of electric origin. These may be caused by short-circuited cables, by grounded feeder or trolley circuits, by grounded lighting circuits, by overheated motors or starting devices, by heating from incandescent lamps improperly placed with reference to flammable material, or by short-circuited transformers or defective switches.

The operator should be given credit for what is perhaps the most forward step in regard to electrical safety in coal mines, namely, the introduction of the "wireless mine." The possible hazards of extensive electric wiring in gaseous and dusty coal mines are so great that at least two large coal mine operators, one in West Virginia and one in New Mexico, are laying their plans for an electrically operated mine without permanent electric wiring. Why does one install wires? The answer is, for transmitting energy from the power plant to the place where energy is used. If the power

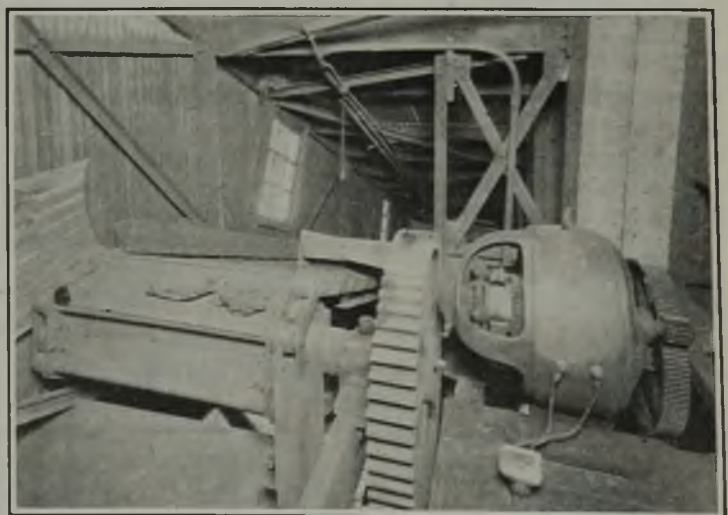
plant could be located at the coal face, no permanent wires would be needed. Then, if wires are potential danger, let us do away with them and place the power plant on wheels, taking it to the point where energy is needed. Any piece of work can be done better by energy obtained from a constant source of potential, such as would be delivered by a storage battery, provided the battery is large enough for the job. Having no wires to install, no tracks to bond, no voltage drop over long feed lines to consider, one can afford to invest heavily in a portable power plant. When the advantages from a safety standpoint are considered, the venture is certainly worth a thorough tryout.

Imagine the security the operator of a "firey" mine could feel at the end of the shift, knowing that there are no feeder or trolley circuits to become grounded over night, no switches to be left closed when they should have been left open, that when the mine stopped its work all its electrical equipment came out of the mine or at least was brought to a fresh air base to remain there until the next day's work begins.

The wireless mine has the advantage of having the equipment that carries the live electric current always under close supervision and also in that such equipment will only be in the gaseous portion of the mine during the working shift, whereas in a wired mine, the wires are there all the time, a large portion of which time they may be without close supervision.

The operator is demanding safe electrical equipment. One manufacturer of approved equipment reports 300 per cent increase in sales during 1923 as compared with the sales of any previous year. The operator is not only demanding more approved equipment, but is asking for new lines of approved equipment such as hoists, air compressors, pumps, and loading machines.

In the future, as far as is feasible, it is understood that manufacturers intend to carry only two lines of equipment, the open type for non-gaseous mines, and the permissible type approved by the U. S. Bureau of Mines for use in gaseous and dusty mines, thus eliminating the so-called "flame-proof" type, built along the same lines but not having the careful factory inspection or the additional inspection and test given by the Bureau to permissible equipment.



Drive with Exposed Commutator Is Unsafe

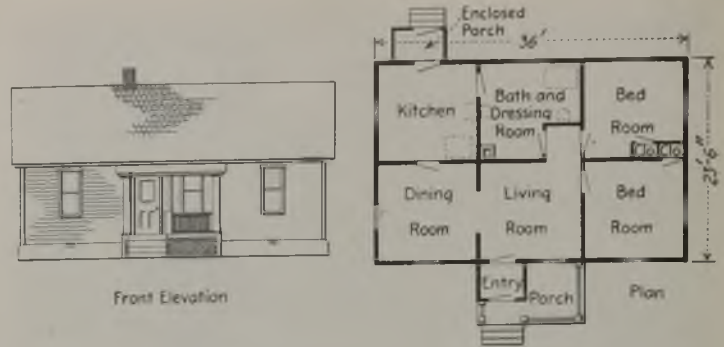
Most of the first electric drives were by means of direct-current motors. Unless carefully protected and housed they may, in the class of service shown in the illustration, give serious trouble. Note the unprotected terminals which might cause a bad fire if a piece of metal were to fall on them. The open motor with exposed commutator is liable to flash and thus fire the oil-soaked coal dust.

A Few Changes in Usual House Plans Afford Miner Comfort

Enclosed Porch and Entry Protect the Interior, and Notably the Dressing Room, from Drafts—Clothes Closets, Cellar and Bath Add Convenience

BY PHILIP A. ARNOLD
Shawmut Mining Co., St. Marys, Pa.

ENDEAVORING to view the miner's house from the point of view of the man who has to live in it, and not so much from other considerations, I have prepared some house designs in which comfort and inexpensiveness have been the paramount idea and not exterior decoration. Briefly stated, my general plan has been to adopt a square or rectangular form of house as being the most economical type to build. There are no wings or ells, which materially increase the cost of erection and involve expense for repairs and maintenance, par-



House Has Six Rooms, Two of Which Are Bedrooms

In this house are two clothes closets. The same "air locks" protect the interior from rushes of cold air through open door ways. The bathroom is a little smaller than some of the other rooms but large as a bathroom should be where it has to be used for removal of dirty clothes.

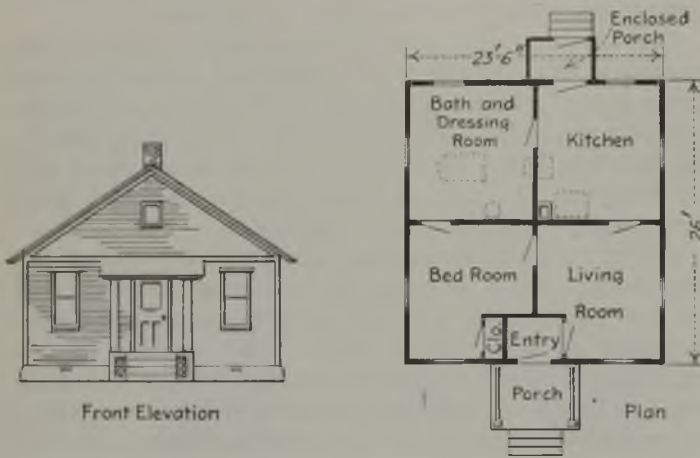
result is that often old boards, barrel staves or anything else that may come to hand have been used for the purpose. While this is better than nothing for keeping out the snow and, to some extent, the wind it is needless to say that it makes the house extremely unsightly.

EVERY HOUSE SHOULD HAVE A CELLAR

For general utility, every house should have a cellar provided with an outside entrance. It may not be necessary to excavate the entire space within the foundation of the building; but the cellar should be large enough to afford room for keeping tools, vegetables and a small supply of coal. It is far better to have the coal under cover than to have it piled against the side of the house or at the back, where it is exposed to the weather which tends to disintegrate it and render it unfit for use.

Outside coal-houses and wash-houses do not add to the comfort of the miner's home, or the attractiveness of the property and the town. These can all be avoided when the house is properly designed and a small cellar provided. Make the house a home and afford ample room for a small yard and garden surrounding the building. With a little encouragement, most of the miners' families occupying these houses can be readily induced to plant trees, bushes, vines and a garden that will make the place attractive and give it a homelike appearance.

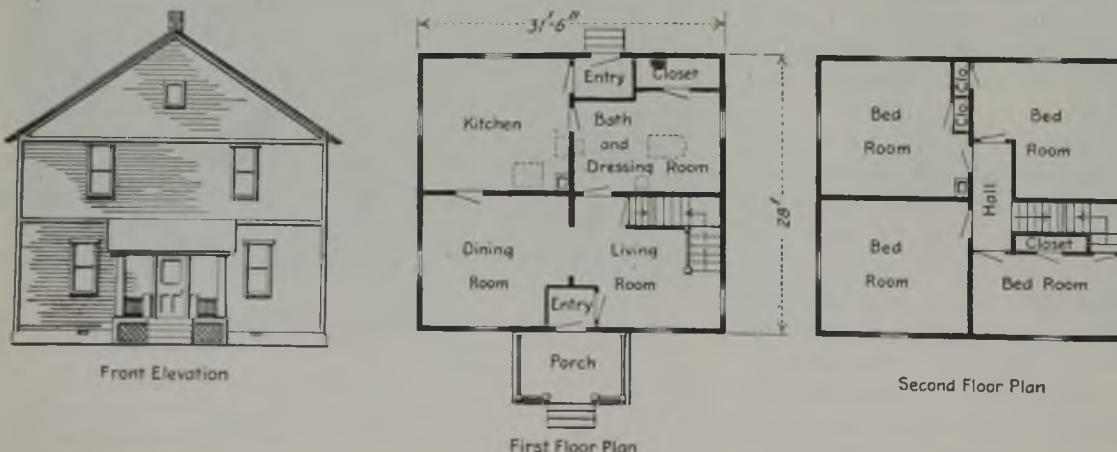
The main feature in these houses is a bath and dressing room opening out of the kitchen. This is a prime necessity in most miners' homes. With a bath on the first floor there will be no tracking through the house when the miner comes home from his work. The bath or washroom should be so arranged that the man can wash and dress with ease and comfort, on his return from work. Place should be provided where he can



Four-Room House for Man and Wife

House is almost square thus saving on cost of construction. Note how the dressing room is protected from drafts by both doors of the enclosed porch and the kitchen door.

ticularly in the roof construction. I am giving, here, three plans of eight-, six- and four-room houses designed for practical low-cost building, as well as desirability from the tenant's point of view. The dimensions given on these plans are only suggestive and can be changed to suit local conditions. A foundation of concrete, tile or brick is absolutely necessary, in most coal regions, if the house is to be kept warm and comfortable. Observation shows that a too common practice has been to set these miners' houses on posts, elevating them a foot or more above the ground and leaving it to the option of the tenant to inclose this space if he cares to do so. The



Two-Story House

The stairway cuts into the living room but the ground plan is larger than with the four-room house making all the rooms of adequate size.

hang his working clothes to dry in readiness for the following day.

Many may prefer a washroom in an outside shed, because when that is provided the dirt and coal dust incident to mining is not brought into the house. In any event, it would seem that, with an outlay that is not prohibitive, each house could be provided with running water that would relieve the occupants from the steady grind of carrying water from the nearest street hydrant. In mining towns this is not an infrequent living condition.

One feature that is worthy of mention is the provision made in two of the plans, here presented, for an inclosed entry. This is always desirable and will be

appreciated by most tenants where the front door of the house opens directly into the living room. A third plan shows an inclosed entry built out on the porch, which is often done in case the house is small or the size of the rooms limited. In the eight-room house, it will be observed that a space for a stairway leading to the attic above the second floor has been provided. In this plan and also in the six-room house some closet room is also arranged. One never realizes how useful closets are until one lives in a house built without them.

It is not to be supposed that these plans will meet the needs and requirements in all cases. Everyone has his likes and dislikes and what is suitable for one family may not meet the needs of another.

The Miner's Torch

Things Are Not Always as They Seem

A MAJORITY of the companies that own and operate coal mines own and operate commissaries in connection therewith; the average coal-mine manager and likewise the average coal-mine superintendent although not responsible for the operation of the commissary at his operation has been in such close contact with the institution all through his mining career that he assumes as a matter of course that he could add the management of a commissary to his other duties without any trouble whatsoever. Fortunately the average manager and the average superintendent is not called upon to take over the actual management of a commissary, so no harm comes to the superintendent or his company from the assumption.

Some years ago (at the time I considered myself an average mine manager) I was offered a lease on a complete coal-mining property, and included in the deal was a well-stocked commissary. By the terms of my lease I was required to take over the commissary stock and pay the inventory price for same. Before agreeing to the purchase of the merchandise I decided to have the stock passed upon by men who were posted in the various lines and only after discussing the matter with them did I sign the papers that put me in possession. The stock judged by inventory value was about equally divided between groceries, dry goods and shoes.

The man who passed on the shoes for me was an employee of a shoe jobbing house and he reported that the stock was in good condition and there was a fair assortment of sizes, except that most of the larger sizes were missing. There was the joker but he didn't know it and I didn't know it.

I owned that stock of goods exactly one year and in that length of time the commissary manager that I employed was only able to dispose of two or three pairs of the shoes that I had acquired in the original purchase. All of the miners in that camp had large feet and they had purchased all of the shoes from the stock that were salable in that community before my ownership. Do miners everywhere have large feet? Not having been everywhere I hesitate to answer.

The commissary manager who had originally purchased the stock had had no previous experience in mining camps and in buying the shoes he simply

ordered a complete assortment of sizes. That was before the days of questionnaires; I suppose the procedure today would be to send out a blank to each male citizen and get full details relative to sizes and preferences before stocking up the commissary shelves.

Where did I fall down as a commissary manager?

First: I showed bad judgment in my choice of appraisers.

Second: I showed bad judgment in my choice of commissary manager. A little advertising in near-by communities would have allowed me to realize on the shoes that we could not move, but I did not realize that until my successor's commissary manager turned the trick.

There was probably a third, fourth and fifth but there is a limit to the information one can acquire in one year.

HYDROGEN AS A CAUSE OF EXPLOSION IN COAL DUST.—T. G. Fear, general superintendent, Inland Collieries Co., in discussing J. W. Paul's paper on "The Explosion Hazard Investigations of the U. S. Bureau of Mines," at a recent safety conference said he had been disposed to believe that the hydrogen content of the coal affected its degree of explosibility, for in the Southern states most of the explosions occur in mines working coals containing much hydrogen. This suggestion met with no support, Mr. Paul stating that the higher the ratio of volatile to combustible matter the greater the explosibility of the dust. For Pittsburgh coal the ratio is 0.4 but for coals further east the ratio is less. Mr. Fear said that coals high in hydrogen contain more waxey material and it is this material which, when in the form of dust, tends readily to explode. Mr. Allison, of the U. S. Bureau of Mines, said that the ratio of volatile to combustible matter was a more important indication than the hydrogen content.

BULLETIN 84 OF THE STATE TOPOGRAPHIC and Geologic Survey, on "Coal Reserves in Clarion County," by James D. Sisler, has been published by the Pennsylvania Department of Forests and Waters. According to the bulletin, 1,262,000,000 tons are recoverable. There are twelve coal beds in the county, the bulletin shows, four of which are now being mined for shipping coal, five others being mined for local fuel and the remainder having little commercial importance at present. The Lower Kittanning coal is the most persistent and largest producing bed in Clarion County. The Clarion Lower coal contains the largest quantity of recoverable coal but is variable in thickness everywhere except in the southwestern part of the county.



News Of the Industry



Utah Adopts "100-per Cent" Safety Code Following Castlegate Blast

Requires Permissible Explosives, Electric Cap Lamps, Careful Rock Dusting, Thorough Wetting of Working Faces and All Dusty Places and Most Careful Reporting and Handling of Gas Pockets

Utah is going to make its coal mines as safe as men know how to make them. A new and drastic safety code and a fresh determination to stop mine accidents have risen out of the public shock caused by the March 8 explosion at Castlegate No. 2 mine of the Utah Fuel Co. in which 171 men were killed. The new code, adopted by the State Industrial Commission after it had been written in a conference between state mine inspectors and operating men, requires the use of permissible explosives only, the use of nothing but approved electric cap lamps, calls for all shots to be fired electrically when men are out of the mines, and lays down some strict requirements for wetting every mine. It is said to be the most rigid safety mining code in America.

Investigators of the Castlegate explosion finally concluded that without doubt the blast was started by the attempt of a fireboss to relight his flame safety lamp. A pocket of gas was ignited and coal dust throughout the mine that was improperly sprinkled did the rest. Laxity in reporting gas accumulations and failure to sprinkle abandoned workings were condemned in the report of B. W. Dyer, chief mine inspector; John Crawford, state coal-mine inspector, and H. E. Munn, coal-mine engineer for the Industrial Commission.

Recommendations Now in Effect

This report was considered in a long conference between the three state mining men and a committee representing the operating interests of the state. It was approved almost in entirety and the new code of safety came out of the conference. Not only is the Castlegate report accepted as correct by the Utah Fuel Co. but Frank N. Cameron, vice-president of the company, said most of the recommendations of the investigators have already been put into effect by that company.

The company men who helped frame the new safety code were L. F. Rains, Columbia Steel Corporation; A. C. Watts, William Littlejohn, Utah Fuel Co.; R. M. Magraw, J. B. Forrester, U. S. Fuel Co.; P. H. Burnell, Lion Coal Co.; Charles Ledger, Royal Coal Co.; J. R. Loaf, Independent Coal & Coke Co.; Thomas R. Stockett, Spring Canyon Coal Co.; William Money, Kin-

HERE'S THE GIST OF IT

Utah's new "100-per cent" safety code, more drastic than that of any other state in many particulars, requires:

- 1—Permissible explosives only.
- 2—Shotfiring by electricity.
- 3—Approved electric head lamps.
- 4—Rock dusting in all mines.
- 5—Use of water for cutting and loading machines to reduce dust.
- 6—Sprinkling at every face.
- 7—Daily reports on sprinkling.
- 8—Sprinkling to be done by men employed for no other duty.
- 9—Shutdowns during removal of gas accumulations.
- 10—Cleaning up of all abandoned workings.

ney Coal Co.; B. P. Manley, Carbon Fuel Co.; R. W. Van Derck, American Fuel Co.; George A. Schultz, Liberty Fuel Co.; Robert Howard, Peerless Coal Co.; B. Newren, Scofield Coal Co., Union Pacific mine; A. Shaw, Mutual Coal Co.; H. E. Lewis, Standard Coal Co.; H. Tomlinson, MacLean Coal Co.; J. H. Roberts, Weber Coal Co. and Grass Creek Fuel Co.; William Littlejohn, Blue Seal Coal Co.

The safety code, by which Utah leads all other states in the requirements laid down in the first seven sections, follows:

"(1) Permissible Explosives.—Only 'permissible explosives' shall be used for blasting coal in any mine, and the amount of such explosive used in any one hole shall not exceed the permissible limit of 1½ lb. A permissible explosive shall be considered as one which has been classed as permissible by the U. S. Bureau of Mines, and then only used in such quantities and under such conditions as have been approved by the U. S. Bureau of Mines.

"(2) Shotfiring.—In all coal mines in Utah in which three or more men are employed on any one shift, all shots shall be fired electrically by authorized shotfirers, when all men, except the shotfirers, are out of the mine.

"(3) Lighting.—All men entering coal mines in Utah in which more than five men are employed on any one shift shall be equipped with electric lamps approved by the U. S. Bureau of Mines and no flame lamps shall be permitted in the mine, except for testing purposes. All lamps used for testing purposes shall bear the approval of the U. S. Bureau of Mines and shall be magnetically locked and the igniters shall be maintained in a serviceable condition. Mines employing five men or less on any one shift may be required to comply with the above regulation at the discretion of the Industrial Commission of Utah.

"(4) Rock Dusting.—All main entries and slopes of coal mines in Utah shall be rock dusted from the mine opening into a point designated by the state mine inspector. Intake air courses shall be rock dusted at least into the most distant points where freezing takes place in the coldest weather. Whenever, by analysis, the rock dust material in any part of a mine so treated shows a total incombustible content lower than that determined as necessary to render the coal dust inert, the section in question shall be fenced off, or the mine closed until sufficient inert material has been added to allow of safe operation.

To Prevent Spread of Blasts

"(5) At every opening from each working panel or level connecting to any other level or panel, entry or slope, there shall be installed rock-dust barriers so placed that an explosion originating in that level or panel cannot extend to other parts of the mine. These rock-dust barriers shall be of a type which has been tested and approved by the U. S. Bureau of Mines, and shall be correctly installed.

"(6) Water on Mining Machines and Mechanical Loaders.—Coal-cutting machines and mechanical loading machines shall not be operated in coal mines in Utah unless equipped with a supply of water applied in a manner to wet down and prevent the raising of fine coal dust into suspension in the air.

"(7) Sprinkling.—Every owner, agent, manager or lessee of coal mines within the State of Utah shall provide and maintain water lines in all working places of sufficient size and pressure to furnish water in sufficient quantities for sprinkling purposes to wet down all coal dust that may arise and accumulate in and around the working face. And each worker shall be kept supplied with a sufficient quantity of

West Kentucky Parley Off; Miners Refuse Wage Cut

Special Dispatch to Coal Age

Louisville, Ky., April 14.—Negotiations were broken off between the Western Kentucky Coal Operators Association and District No. 23, United Mine Workers, this morning when on reopening the conference on a new wage agreement, the miners issued an ultimatum to the effect that they would accept nothing other than the so-called Jacksonville agreement, or a three-year contract at the 1919 scale as adopted by the Central Competitive Field, of which western Kentucky is not a part. The operators wanted a return to the 1917 scale, due to non-union competition and disadvantage in freight rates in competing with the Central Competitive Field. The ultimatum stated that the miners could not accept any reduction, not having the authority to do so. This is taken to mean that John L. Lewis, International president, is responsible for the refusal, as the men had previously shown a disposition to accept a reduction agreement. The operators issued a statement and the conference was abandoned, the men returning to their homes.

It is predicted that some of the mines will soon open on a non-union basis, while others will make no attempt to operate for the time being. The original expiration date of the contract was April 1, but this was extended to April 15, in order to give the miners time for conference with Lewis. The operators will now offer the reduced scale, and operate if enough miners report.

President Lewis at Indianapolis definitely refused, several days ago, to sanction any sort of wage reduction in western Kentucky. He is reported to have hurled some strong language at District President Jackson and the committee of union men from Kentucky. Thus it was left for Jackson to go back and do the best he could. The impression got abroad that if Jackson agreed to the 25 per cent cut the operators demanded, Lewis would promptly make an example of him in an effort to hold the other wobbling outlying districts in line.

These negotiations cover only the east half of the western Kentucky field, comprising Muhlenberg County mainly. There is a union contract called the Madisonville agreement outstanding another year in the western half of the field, but few indeed are the companies operating under it, for there is little union strength left there.

Freeport Vein Operators Sign

A wage agreement has been signed by the wage scale committee of district No. 5, United Mine Workers, and officers of the Freeport Thick Vein Steam Coal Operators' Association, P. T. Fagan, president of the district mine workers, announces. The pact affects about 10,000 mine workers in the Pittsburgh district.

The agreement is based on the Jacksonville settlement and will run for three years.

Rescue Team at Castlegate

But the word "rescue" is a misnomer, for all the men in the mine perished.



water hose to enable all parts of the face region to be thoroughly sprinkled, this to be used by the workers in each working place.

"(8) Men employed for sprinkling shall make a signed daily report, in a book kept for that purpose, of the sprinkling work done, condition of working places, pipe lines, and any difficulty arising from the lack of pressure, pipeline shortage, breakage, lack of hose, etc., this report to be countersigned by the mine foreman.

"(9) Men employed for sprinkling shall not be used on work other than sprinkling without first having the permission of the superintendent for such transfer, it being understood that in case of such a transfer the vacancy shall be filled by a man qualified to do that work.

"(10) Ventilation.—Moving of gas (methane) accumulations while the shift is in the mine is absolutely prohibited even when all miners are on a closed-light basis, and the entry in which the accumulated gas is found, together with all workings on the return side of the same split in which the accumulated gas is found, shall be closed down until the gas is removed by approved methods of ventilation.

"(11) General Orderliness.—Before the track is pulled out of the air courses, abandoned rooms and other places, all coal and coal dust must be cleaned up and loaded out. This, however, does not apply to rock and bone gobs in rooms and other places that have been adequately rock dusted.

"That the orders herein made (except order No. 4, relating to rock dusting, and order No. 6, relating to water on mining machines and mechanical

loaders, these orders to be effective as provided hereafter) shall and they are hereby made effective on and after July 1, 1924; provided that in the case of order No. 4, relating to rock dusting, additional time may be granted by the Industrial Commission to any operator who, by written application, applies to the commission for an extension of time, provided in the opinion of the chief mine inspector said operator has exercised due diligence in an effort to comply with said order; said additional time, however, to not extend beyond Sept. 30, 1924; and be it further provided that in case of order No. 6, same shall be effective on and after June 1, 1924; and,

"That all orders and parts of orders contained in the general coal-mine safety orders of the Industrial Commission effective Sept. 1, 1920, which are in conflict with the orders herein made are hereby rescinded, vacated and set aside."

F. L. Burns Named President Of Burns Coal Co.

The resignation of Michael F. Burns as president of Burns Bros., New York City, was accepted at a meeting of the directors April 8, and F. L. Burns, his son, was elected president of the company. Michael F. Burns was elected chairman of the newly created advisory committee, the other members of which have not been chosen.

The directors declared the regular quarterly dividends of \$2.50 on the Class A stock and 50c. on the Class B stock, both payable May 15 to stockholders of record May 1.



Bath and Change House at Castlegate

In this house, 100 ft. from the main entrance of the mine, every window was broken. The drift mouth itself was demolished by the explosion and caved in.



P. & A. Photos.

Hugo Stinnes, Jr.

Comes into control of vast industrial enterprises through the death of his father.

Two Lives Lost in Flood of Four Glen Alden Mines

Four mines of the Glen Alden Coal Co., near Scranton, Pa., were flooded and three others seriously threatened April 7 by the swollen waters of the Lackawanna River, which broke through on the westerly side, below the National colliery, in Taylor. Company officials and employees labored tirelessly in an effort to halt the flood. Two miners employed in the Sloan mine lost their lives. The bottom workings of the Bellevue, Dodge, Hyde Park and Sloan mines were inundated and the Taylor, Pine and Archbald workings were menaced.

After thirty-six hours of work by nearly 800 miners, who dropped ten steel cars, 100 tons of steel rails, 50 tons of baled hay and several thousand bags of sand into the opening, the course of the river was diverted from the opening. It will take several weeks to clear the workings of water.

Senate to Pass Johnson Bill

Passage of the Johnson immigration bill by the U. S. Senate by an overwhelming majority is indicated as *Coal Age* goes to press, an attempt to amend its provisions to continue the "gentlemen's agreement" under which the Japanese Government is pledged to refuse permission to coolie laborers to emigrate to the United States having been defeated April 14 by a vote of 76 to 2. The House passed the bill April 12 by a vote of 326 to 71.

As the Johnson bill goes to the Senate, it provides that immigration in the future shall be based upon the census of 1910 instead of 1890.

It permits immigration from each nationalistic group to the amount of 2 per cent. of the number of such nationals resident in the United States as recorded in the census of 1910. It is estimated that under its provisions immigration would approximate 161,990 a year, as compared with an average of 357,801, under the present law, which fixes immigration on a 3 per cent quota.

Stinnes, Industrial Czar Of Germany, Dies

Hugo Stinnes, industrial and financial leader of Germany and one of the wealthiest men in Europe, died in Berlin April 10. He had been operated on twice for gallstones, after which his condition was complicated by peritonitis and pneumonia. It is believed that his fatal illness was brought on by the Ruhr occupation, chagrin, worry and overwork.

Hugo Stinnes was born in Mullheim in 1870, of Jewish parentage and belonged to a wealthy family that long had been prominent in commerce. He received a common school education in his native town and then worked as a miner and in a business office to gain practical experience. He started business for himself as a coal dealer, bought several coal mines and then branched into transportation, buying river steamers and barges and ocean-going vessels. He became a director in many corporations in Germany and Luxemburg, especially those engaged in supplying electric power and lighting.

Stinnes was the foremost profiteer of the World War; was intrusted by Ludendorff with the industrial looting of Belgium and had charge of the production of munitions. He bought many newspapers in Germany which he used for the promotion of his profiteering schemes. He was elected a member of the Reichstag in June, 1920, as a member of the German People's party, and later sought to organize a supertrust to control every industrial and commercial enterprise in his country.

Governor Fields Intervenes To End Mine Warfare

In an effort to arbitrate the differences which brought about warfare in the mining camp on Straight Creek, Governor Fields, of Kentucky, held conferences April 12 with R. R. Atkins, general manager of the Liberty Coal & Coke Co.'s mine at Straight Creek, and William Turnblazer, president of District No. 19, United Mine Workers; Sanford Snyder, International union representative, and two miners from Pineville, representing the local union involved. The Governor held separate interviews with the representatives of both sides of the controversy, but no announcement has been made as we go to press.

All last week the armed conflict between state troops and mountain snipers kept up around the plant of the Liberty Coal & Coke Co. on Straight Creek, near Pineville, Ky. A good many shots were fired from various points around the hills toward the company's property under protection of the troops, but no hits were reported. The mountaineer dead shots among the union miners who refused to work at the 1917 scale and were consequently evicted, hit nobody except the three men shot down April 3.

It is supposed that numerous unemployed union miners from other fields have come in to help in this struggle to regain the union's foothold at the Liberty property, which is in the center of a hotbed of unionism in and about Pineville.



P. & A. Photos.

Hugo Stinnes

Germany's industrial and financial leader, who died in Berlin April 10.

A. J. Cook Elected Secretary Of British Miners Union

A. J. Cook, leader of the South Wales coal miners, has been elected secretary of the Miners' Federation of Great Britain, succeeding Frank Hodges, who resigned the post upon his appointment as Civil Lord of the Admiralty in the labor government. When interviewed by the Associated Press on his appointment, Cook, who is an avowed extremist and devoted to the Marxian theories, said he interpreted the miners' choice as a desire for an aggressive policy.

"I am in favor of a real live national and international miners' organization," he said, "and am convinced that the miners cannot retain even their present bad conditions without it. I am still a Red with all that means, and I will not rest satisfied until private enterprise in the mining industry is abolished."

Upper Kanawha Wage Parley Broken Off

Negotiations between the operators to the north of the Kanawha River and on the Kanawha & Michigan R. R. in the Kanawha fields and the scale committee of District No. 17 of the United Mine Workers were broken off, April 8, at a meeting held in the Sinton Hotel, Cincinnati, after conferences lasting several weeks. Operators of about twenty mines with an annual output of 5,000,000 tons were represented.

Attempts were made to have the union recede from its demand for the Jacksonville scale of \$7.12 a day, it being pointed out that the open-shop mines to the south of the river were working on a scale calling for \$4.68 a day. It is understood that the union operators were willing to go as high as \$5.50 a day in order that an agreement might be effected, but the miners were obdurate in holding out for the scale. It was announced that this precluded getting business in competition with the surrounding mines and rather than enter into an agreement, all of the mines affected would be closed down.

Coal Destined to Play Prominent Role In Reparation Settlement

Report of Dawes Committee Fraught with Deep Significance in Eyes of Washington—British and American Coal to Meet Competition from Large Volume Produced by German Mines

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Directly, or indirectly, every individual in the world, from the naked savage in an African jungle to the richest industrialist in America, is affected by the existing reparations situation and will be benefited by the settlement which is expected to follow the reports of the committees of experts. Coal is destined to play a major part in any plan of settlement, since it is one of the few commodities that Germany can export in quantity.

The report of the Dawes committee is regarded in Washington as a decisive document. Sight should not be lost of the fact, however, that it is only a plan for settlement and not a settlement in itself.

A few think this report will mark only another weary milestone along the road from the armistice to normalcy, but the great majority believe that a plan has been devised that will be the basis for successful negotiations.

The great difficulty in the reparations tangle is to find means of payment whereby wealth from Germany may be translated into credit outside of Germany. There are some stocks of gold and silver in that country, but far less than is needed for essential reserves for its own financial structure. Liquidation of German assets in other countries has gone as far as it can. No means yet has been devised to lay hands on the much-discussed German bank credits abroad.

Germany Now Without Ships

Before the war Germany furnished a large service to other nations with its merchant marine, but it no longer is operating ships. As a result, the only way that Germany can pay is by exporting goods. The amount that can be paid must come from the difference between the value of these exports and the cost of the foodstuffs and the raw materials that Germany must import. The public, particularly the French public, has failed to appreciate that there can be no transfer of wealth to the Allies which can be made immediately available except as surpluses of goods are transferred.

There will be no great enthusiasm in the Allied countries for the throwing open of their markets to goods manufactured in Germany. It is evident, however, that if the German machine is to be set running again means must be found to absorb a large amount of German manufactured products. This means the displacing of a like amount of these goods which now are being furnished by other countries. As it would be highly unpopular to assist in the building up of German assets by that method, it is certain that a forced draft will be used in endeavoring to crowd out of Germany the maximum amount of coal and potash. Germany

has almost inexhaustible reserves of both of these commodities.

France particularly will be interested in encouraging large exports of coal. Her domestic coal industry is relatively small. The French realize that they could afford to seal up their mines and keep that resource in the ground for one hundred years, if necessary, while Germany would be building up credit abroad by the export of its excellent coal. The coal fields of the Ruhr are among the richest of the world. The seams are thick and occur, one above the other, in formation particularly easy to mine. Production in that region was growing at a very rapid rate. In all the demoralization and uncertainty of 1920 Germany, had she really wished, could have furnished to France the 2,000,000 tons per month provided for under the Spa agreement.

More Ruhr Coal Than France Needs

The Ruhr, however, is capable of furnishing much more coal for export than France can take, which will mean, it is predicted, that a great effort will be made to force this coal into other markets. This means the displacing of a large tonnage now being furnished by the British. Such export markets as the United States has retained will be subjected to double pressure as a consequence. France particularly must begin to receive reparation payments. The whole situation seems to indicate that a large volume of German coal is to be pressed upon the market, almost regardless of price.

It frequently is said facetiously in this country that the hazards of the coal business are so great, and the profits so uncertain, that no Jew is found in the trade. Evidently this is not the case in Germany, as Hugo Stinnes was the outstanding figure in its production and distribution. Being an industrialist, he opposed any great levy on German coal resources for the payment of reparations in kind. He would have burned the coal under German boilers and would have forced the world to absorb a flood of German manufactured goods. The hand of Death has swept Stinnes from the stage just at a time that plans are laid to make coal the chief factor in the transference of German wealth to the outside. Had Stinnes lived, he might not have been able to block this plan. His passing certainly will make the task an easier one.

Three-Year Pact in Wyoming

Mine workers and operators of the south and north Wyoming coal fields have ratified the Jacksonville agreement, effective for three years from April 1.

British Miners Reject Offer of Mine Owners But Will Not Strike

In a heavy ballot the British coal miners rejected by 16,258 votes the offer made by the operators in reply to the demand for better working conditions. The decision against acceptance was accompanied by a demand that the government institute an inquiry into wages in the mining industry, and it was officially announced that the Minister of Labor had agreed to appoint a court of inquiry to meet after Easter.

The agreement regulating wages and conditions in the coal fields expires April 17, but there is no question of a strike, and arrangements are to be discussed next week under which work can be carried on while the court conducts its inquiry.

Hoover Sees Key to Rate Cut In Consolidation

Testifying at Washington April 9 before the House Commerce Committee, which has been considering the Hoch resolution to direct the Interstate Commerce Commission to undertake a general rate revision, Herbert Hoover, Secretary of Commerce, said he believed an exhaustive study should be made by the commission to lay the foundation for a general readjustment of railroad freight rates.

"Simplification of the rate structure," he declared, "might be difficult under present conditions, but it probably would be shown that it could be done easily if there were consolidations of railroads. A thorough study of the rate structure undoubtedly would become one of the strong arguments for consolidation."

Mr. Hoover declared there was pressing necessity for a revision downward of rates upon such primary commodities as farm products, coal, iron and steel and lumber, but expressed the view that reductions might work a hardship on roads whose revenues come chiefly from carrying such commodities. Consolidation, he said, would tend to equalize the loss in revenue instead of making certain carriers stand the brunt of the reduction.

Before consolidation can be carried out on a wide scale, Mr. Hoover said, legislation will be needed, particularly to confine the power and attitude of the Interstate Commerce Commission toward them. If a definite policy as to grouping of roads is translated into law, the committee was told, there will be a marked tendency toward efficient consolidation.

Horizontal increases and reductions of freight rates, in the opinion of the Secretary of Commerce, have thrown the entire freight structure out of adjustment. He estimated that the cost of operating railroads and their revenues are 70 per cent above pre-war levels.

New York to Save Money on Coal This Year

Twenty-eight coal companies submitted bids on April 8 for furnishing and delivering between April 1, 1924, and March 31, 1925, more than 500,000 net tons of coal to thirteen municipal departments of the City of New York. When all bids had been tabulated Edward W. Buckley, Commissioner of Purchase, announced that the prices were from 50c. to \$1 per ton below last year's figures and that the coal bill for these departments for 1924 would be approximately \$250,000 lower.

The largest quantity called for in any one lot was for 160,760 tons of No. 1 buckwheat for barge delivery, for which there were seven bids ranging from \$4.51 to \$5.25 per ton. For delivering 43,980 tons of bituminous run of mine coal to the same points, the prices submitted ranged from \$1.29 to \$5.48. The schedules called for various tonnages to be delivered by truck in the various boroughs of Greater New York. Prices submitted for supplying No. 1 buckwheat ranged as follows: Manhattan, \$5.29 to \$6.21; Brooklyn, \$5.38 to \$6.03; Queens, \$5.21 to \$6.48; Bronx, \$5.48 to \$6.21, and Richmond, \$5.48 to \$6.24.

Tenders for furnishing and delivering soft coal, mine run, to various points in the boroughs ranged from \$5.69 to \$6.39 in Manhattan; \$5.24 to \$6.48 in Brooklyn, and \$5.22 to \$5.75 in Bronx.

For delivering 12,000 tons of bituminous coal to the Fire and Police Department boats the prices ranged from \$5.29 to \$5.97.

Stove and chestnut sizes of hard coal when delivered by truck to designated points will cost the city from \$11.49 to \$13.75 per ton and pea coal from \$8.21 to \$10.47, while barge delivery of stove coal will cost from \$10.47 to \$12.25 per ton.

For delivering coal in carload lots to the city institutions in Orange County the bids ranged from \$9.97 to \$12.09 for stove coal; \$7.38 to \$7.50 for pea coal; \$3.59 to \$3.74 for barley coal and \$4.86 to \$5.39 for bituminous mine run.

Bids received for delivering in carload lots 23,680 tons of bituminous mine run to pumping stations on Long Island ranged from \$4.86 to \$5.38, and for 15,800 tons of No. 1 buckwheat from \$4.81 to \$5.87.

May Defer Effective Date of Section 28

Chairman Hall, of the Interstate Commerce Commission, appearing before the Committee on Merchant Marine of the House of Representatives on April 11, urged that legislation be provided so as to defer until June 1, 1925, the effective date of Sec. 28 of the Merchant Marine Act. He made it clear that great confusion in transportation will result if the law is made effective May 20, next, as proposed by the Shipping Board.

Since it is practically impossible to obtain the necessary legislation prior to May 20, the prospects seem to favor the coming of the period of confusion which Chairman Hall pictures. The

Essen Miners' Band Plays At Stinnes Funeral

The famous coal miners' band of Essen took part in the funeral of Hugo Stinnes, at Berlin, Monday, playing dirges and Westphalian folksongs. When the news of his death reached the home town of the famous industrialist the leader of the band asked permission of the family to honor their dead chief by playing the miners' "taps" at the obsequies.

Some of the members of the band worked with Stinnes during his active apprenticeship in his father's mines and all learned to respect him as an employer. Stinnes was always a generous patron of the band and was especially fond of its rendition of his favorite native tunes.

Interstate Commerce Commission will not hesitate, it has been indicated, to postpone the effective date for a short period on the ground that it is physically impossible for the railroads to prepare their tariffs by that time.

The oral arguments which will begin before the Interstate Commerce Commission April 17, will be confined entirely to the extent to which the commission's authority goes in the matter of postponing the date on which Sec. 28 will become effective. It seems entirely improbable that the commission will be convinced that it has any latitude in the matter beyond a comparatively few days.

Coal has not come into the discussion before the Merchant Marine Committee. The railroads are firm in their decision to contend that low rates to tidewater are in no sense export rates. Their position is that the reduction is made primarily because of the lower cost in handling coal in wholesale quantities to dumping points at piers. The rates are held to have been made in the interest of the intracoastal movement and that the small percentage of this coal which moves to foreign countries is simply an incident.

The traffic executives of the railroads serving the Eastern territory have very carefully considered the interpretation and application of Sec. 28, and have decided that rates on coal and coke to the North Atlantic Ports, which are lower than track delivery rates on the same commodity to the same port for transshipment, are not included within the operation of Sec. 28, because such rates are not based upon contemplated exportation, but are based primarily on the incident of coastwise transportation to other ports of the United States. This will, of course, continue the present rate arrangement on traffic which moves coastwise and export from these ports and there will be no change as a result of the Shipping Board's action.

A bill has been introduced by Senator Curtis amending No. Sec. 28 of the Act so that it will not become effective until July 1, 1925. It is doubtful if this can be passed before the date set for Sec. 28 to become operative as it now stands.

Blame for Yukon Explosion Not Placed

In investigating the cause of the explosion at the No. 2 mine of the Yukon Pocahontas Coal Co., at Yukon, late in March, in which 26 men were killed, the coroner's jury did not fix the responsibility for the explosion on any particular individual or individuals. After visiting the mine and then examining fifteen or more witnesses, the jury brought in a verdict stating that it found from the evidence that the explosion started in Rooms Nos. 5 and 6 in what is known as parallel entry in No. 2 mine. In the opinion of the jury gas was ignited either by powder or an electric detonator, and an accumulation of coal dust extended the explosion.

T. J. Dawson, general superintendent of the Yukon-Pocahontas company, expresses the belief that the explosion was caused not by gas but by the explosion of powder, planted in two abandoned rooms of the mine. It has been stated by Mr. Dawson that electric detonators and fragments of a powder box were found in rooms Nos. 5 and 6, with a wire extending from the "planted mine" to a main entry switch.

The caps, found in a section of the mine where no work had been done for six months, were new.

It is now stated that the bodies of dead miners were found so far away from the center of the explosion that a volume of gas sufficient to blow the bodies for such a distance would have wrecked the entire mine.

Northwest Retailers Charged With Unfair Competition

The Northwestern Traffic & Service Bureau, its officers, directors and subscribers and the Northwestern Publishing Co., of Minneapolis, Minn., are cited in a complaint issued by the Federal Trade Commission charging unfair methods of competition in the marketing of coal. The subscribers of the Bureau, numbering approximately 1,800, are in large part retail coal dealers doing business in Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri and Kansas.

The complaint alleges that the respondents by co-operative means and methods prevent wholesalers of coal from selling in the territory served by respondents direct to consumers or to any other persons not retail dealers in coal qualified under the designations of "legitimate" or "regular" dealers as defined by the respondent organization. It is also alleged that the purpose and effect of respondents' co-operative methods were to control the price of coal to the consumer without interference from outside competition.

The following are officers and directors of the Northwestern Traffic & Service Bureau, and are named individually in the complaint: A. L. Havens, president; C. A. Cruikshank, vice-president; H. L. Laird, secretary-treasurer; H. T. Folsom, William Hardman, J. A. Young, F. N. Furber, C. F. Rourke, F. C. Potter, directors. I. C. Cuvellier, president of the Northwestern Publishing Co., also is named individually.



Problems In Underground Management



Suggestion for Regulating Flow of Air at Foot of Intake Shaft

Movable Triangular Framework Will Split Air Current Equally or in the Proportion Desired—Current in Either Direction Can Be Shut Off

BY HARVEY DABNEY
Harrisburg, Ill.

MANY air shafts are in bad condition, especially at the bottom. Here, in many cases old timbers, rock, etc., are piled, not infrequently obstructing the air and causing serious eddy currents and an inevitable loss of power. The device illustrated herewith is intended to take the place of a pile of rubbish in directing the air and at the same time to furnish an easy and effective means of regulating it in case the current divides at the foot of the shaft.

As may be seen in the accompanying illustration, this regulator is simple and can be built by almost any mine carpenter. It consists of an A-frame of heavy timber, say 6 x 6 in., resting

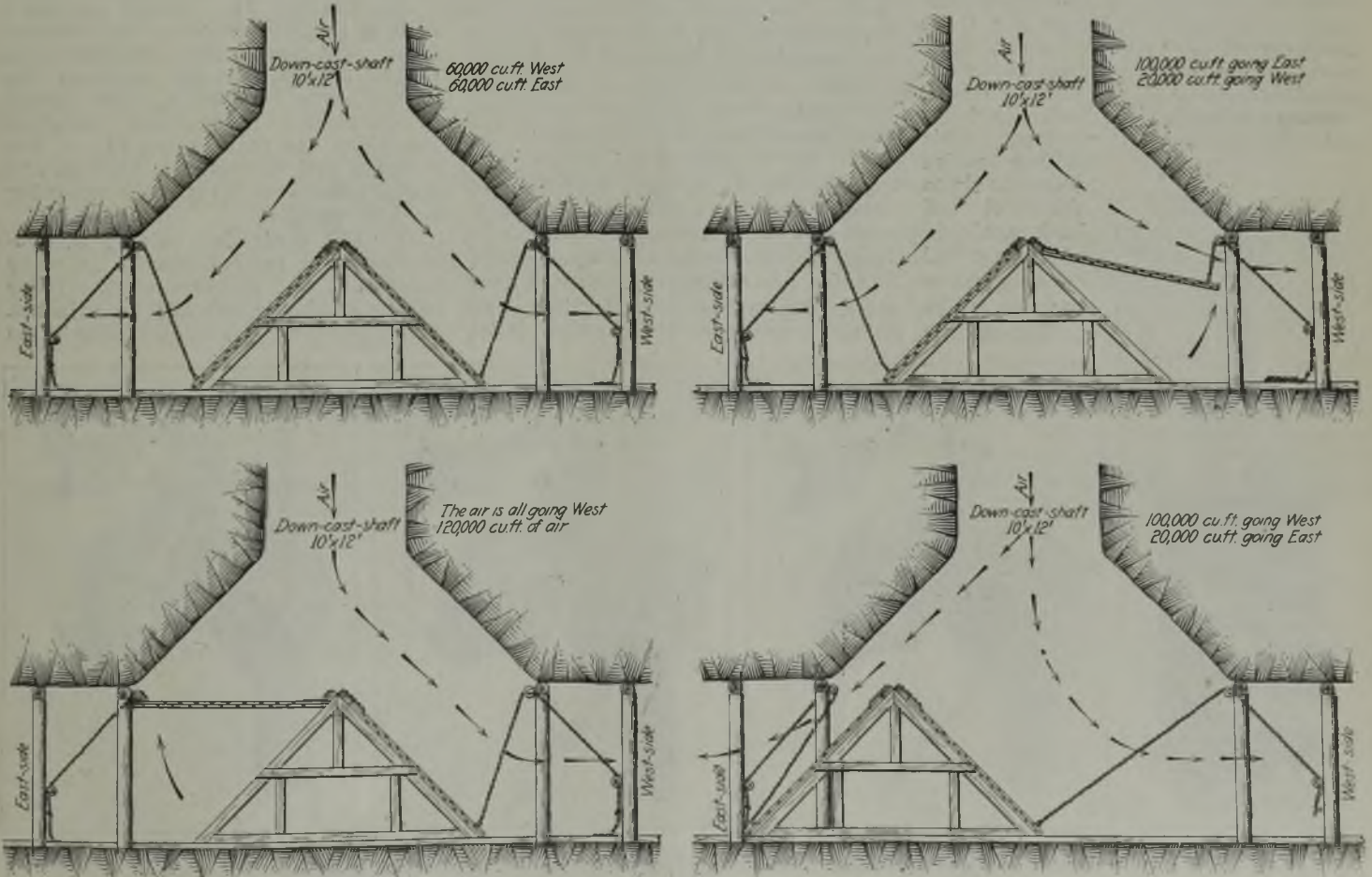
upon, but not attached to a set of sills. The frame may thus be moved from side to side of the air shaft or secured in any intermediate position. At the top of the movable frame two doors are hinged. These are made airtight and completely cover both sides of the A-frame. From their lower edges ropes or chains pass over pulleys attached to the cross timbers in the air courses extending on either side of the shaft bottom.

It will be seen that two means of regulating the flow of air to either side of the shaft are available. Thus a door upon one side of the A-frame may be lifted, in this manner choking

or throttling the air upon that side and allowing less of it to pass through. That same movement increases the quantity of air delivered to the other side. Again the whole A-frame may be shifted to one side of the air shaft, with the result that any desired volume of air may be made to take a path upon either side of the shaft, the limit of course being the total output of the fan.


In case a quick change in the regulation of the ventilating current is desired, the door should be raised, whereas if the division of the incoming current is to be more or less permanent, the position of the A-frame itself should be changed. Either means would be highly effective, but probably by shifting the frame the change would not be accompanied with so great a loss of power.

It would appear that this device offers a ready means of quickly regulating the flow of air to either side of the shaft bottom. It is simple in construction, inexpensive and would be easy to build and install. Once in place it should require little upkeep and should last indefinitely.

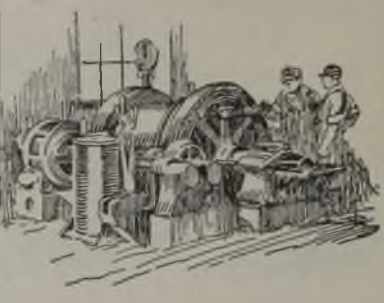


Easily Constructed Regulator for Installation at the Foot of Air Shaft

Raising one of the doors throttles the air going to that side and forces a larger proportion of it to the other airway. Moving the A-frame to the side accomplishes the same result.



Practical Pointers For Electrical And Mechanical Men



Care and Adjustment of Cam-Type Controllers for Electric Motors

Operation Similar to That of Drum-Type Equipment—Circuits
Made and Opened by Small Contactors—Lubricant
Applied Where Air Is Not Too Dusty

THE general appearance of cam-type controllers and their method of mounting and operating are much the same as for controllers of the drum type. The latter have rotating cylinders with segments which make contact with fingers, whereas the cam-type controller consists of a shaft which carries a series of cams that in turn cause the closing of one or many contactors. Fig. 2 illustrates a contactor in the open position. It consists of a stationary element *A*, which may or may not be provided with a blowout coil and a movable element *B*, held open by a spring *S*, and closed by a cam *C*. The action of this contact is exactly the same as that of a magnetic contactor, and the same contacts are used. Figs. 2 to 4 show the three positions of the contact: First, when open; second, when just touching at the tip; third, when it is entirely closed, making contact at the heel. In opening, the process is reversed. This

rolling action from the tip to the heel and back again in closing and opening causes the arc to be broken at the

tip and the current to be carried at the heel. By using a rolling instead of a sliding action, in closing, mechanical wear is eliminated and much heavier contact pressures can be used.

The current is carried from the movable contact to the terminal by means of a flexible shunt. One end of the spring is insulated so that no current can pass through this member. Because the spring is a considerable distance from the contact, it is not directly affected by heat from the contact or arcing, and is, therefore, in no danger of having its temper drawn.

Various combinations of switches can be obtained by changing the number of contactors and the shape of the cams. The length of the frame can be adapted to any desired combination by changing the length of the insulating bars and the sheet-iron cover. The following points should be observed when inspecting a cam controller:

(1) The contacts, when closing, first touch at the tip or upper edge and roll until the current-carrying contact is made and the heels touch. The reverse action should take place when opening. Examine the contacts to see that they act in this manner, and see that they engage throughout their entire width

when they are in their final closing position.

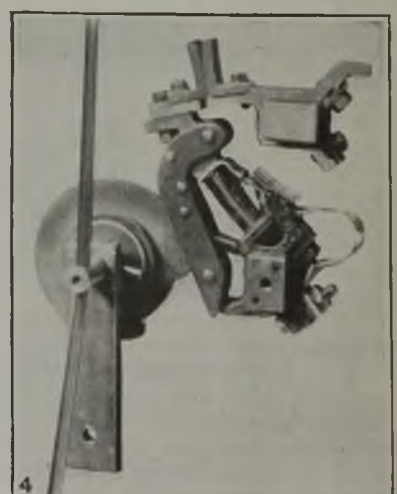
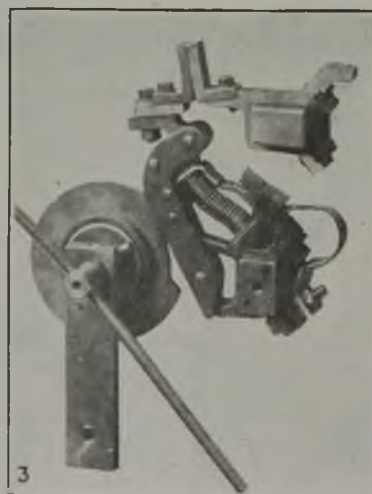
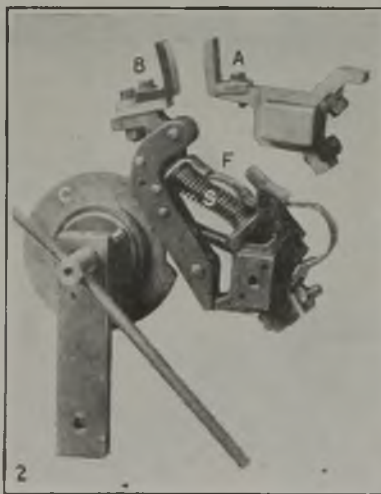
(2) Do not file the contacts, for the wear in operation improves their surfaces by eliminating the minor high spots. Ordinarily, a contact will carry more current after it has been "worn in" than when new. If the action of the contact is correct, the burning should all take place at the tip.

(3) When the contacts have burned back so that the arcing occurs close to the heel, both contacts should be renewed. Do not attempt to use an old contact in combination with a new one.

(4) Do not lubricate the contact surfaces. They are so designed that there is but little rubbing, making lubrication unnecessary. Oiling the contacts would not be well, for dirt always accumulates on lubricated surfaces. The roller pin, hinge pin, and camshaft bearings will operate to better advantage if lubricated a little unless the air is very dirty. Lubrication tends to hold dirt in the bearings, and under some conditions they will operate better if dry.

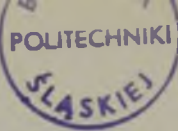
(5) Measure the contact pressure with a spring balance. For various types and sizes the manufacturer should furnish a table showing the normal contact pressure. This should be maintained if the best operating conditions are to be attained. A low pressure will increase the heating, and a high pressure will make the controller hard to operate.

(6) The controller notches are indicated by a ratchet wheel. In many controllers the pressure of the roller on the ratchet wheel can be adjusted. The operation of the controller often



Figs. 1 to 4—Illustrating Manner in Which Cam-Type Controllers Operate

Fig. 1—Controller with radial handle. Fig. 2—Contactor resting against low radius of cam, contact wide open. Fig. 3—Cam partly turned, toes of copper tips touching together. Fig. 4—Long radius of cam holds contact securely closed. The last three illustrations clearly demonstrate the method of operation and show how smooth action is obtainable by the use of the cams.



can be materially improved by the careful adjustment of the ratchet spring. Where the air is free from grit, the ratchet wheel and roller should be lubricated. Examine all the bolts to see that they are tight. This is particularly necessary on bolts that hold the contacts, shunts and terminals in place. A loosening of any of these bolts may materially increase the heating.

(7) If the controller is exposed to corrosive fumes which discolor the copper parts, it will be necessary to clean the contact with fine emery cloth or sandpaper, and occasionally the current-carrying joints may have to be disconnected and cleaned. Sometimes covering these joints with a thin coating of solder, called tinning, will prevent corrosion.

(8) The controller should be cleaned out from time to time, depending upon the rapidity with which dirt accumulates. A convenient method is to use compressed air at low pressure. Do not subject the controller parts, particularly the insulation, to a high-pressure air jet, as this may injure the insulation.

Both drum-type and cam-type controllers can be provided either with a rotating or with a lever handle. They may also be mounted vertically on the

rear of a panel and operated by a hand-wheel through gears and chains from the front. If the controller is mounted on the back of a panel with the shaft horizontal, it can be extended directly through the panel without the use of gearing.

Cam controllers are frequently built motor-operated. The construction of the controller is the same as for manual operation, the handle being replaced by a reduction gear and pilot motor.

The drum controller is more compact for certain switching combinations, such as reversing. On the other hand, the cam is more easily designed for complicated switching, and new combinations can be more easily made as they can be accomplished by using cams of different shapes, whereas in the drum design new drum castings are usually required. The cam units can be removed individually without dismantling the controller. The same is true of the contact fingers of drum controllers. It is usually necessary to take the drum out of the controller in order to replace any of the drum segments, and after replacement, these segments should be trued up in a lathe.

H. D. JAMES,
Control Engineer.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

located on this short suction line was suddenly opened while the pump was operating at full speed on the regular suction line, the pressure on the gage suddenly increased practically as has just been described. We came to the conclusion, therefore, that the pump was ordinarily getting much air with the water in the main suction and that when the short suction line was opened the pump received a full supply of water which caused a sudden increase in pressure. After a 3-in. relief valve was put on the line the pump operated satisfactorily, whereas prior to that time many valve chambers and connecting rods had been broken.

When acidulous mine water is being pumped the relief valve is rapidly destroyed by the corrosive action of the water. This causes the valve to leak and give trouble. In such cases it is advisable that a relief valve be placed as shown in the illustration on the end of a vertical section of pipe connected to the discharge line. If the valve is not allowed to leak, a cushion of air will form directly under it, thus preventing any water from coming in contact with the valve seat, except when the relief valve opens to relieve abnormal pressure.

When the discharge line does not have a check valve, the relief valve will also take care of the back surge when the pump is shut down.

E. E. KENDALL.

How Relief Valves Prevent Breakage of Pumps

Opinions differ as to whether a relief valve should be installed on the discharge line of a plunger pump. However, experience has proved that it is undoubtedly necessary where the pump is discharging into a long, high column line which exceeds 50 per cent of the rated foot-head capacity of the pump or where the suction line may collect much air.

Many pumps are broken by momentary high pressures built up in the pump during some abnormal condition which usually exists for but a short time. The most feasible explanation of these high pressures and of the accidents they cause is that the pump takes in air which is compressed with each stroke of the plunger; this causes the water in the column line to stop flowing. Finally, when the pump has built up enough pressure under the discharge valves to equal the weight of the water on top of them, the whole discharge column of water starts moving instantly. Previous to this time, the pump will be operating at its maximum speed and the result is that a high pressure is suddenly built up.

I have known several cases where pump breakages were frequent until a relief valve was installed on the dis-

charge line. The usual practice was to set the relief valve at a pressure about 25 lb. higher than that normally required in the column line, thus relieving abnormal pressures before they became unduly great.

I remember an instance where a pressure gage was installed on a 7x8-in. triplex pump. This pump had a suction line about 700 ft. long and a discharge line about 300 ft. long. Normally the gage showed a pressure of 140-lb. per square inch but occasionally, for some unknown reason, the pressure gage momentarily registered as much as 600 or 700 lb. In this particular installation a tee connection on the suction line led to a short piece of pipe which ran to another sump at the foot of the hoisting shaft.

We noticed that if the gate valve

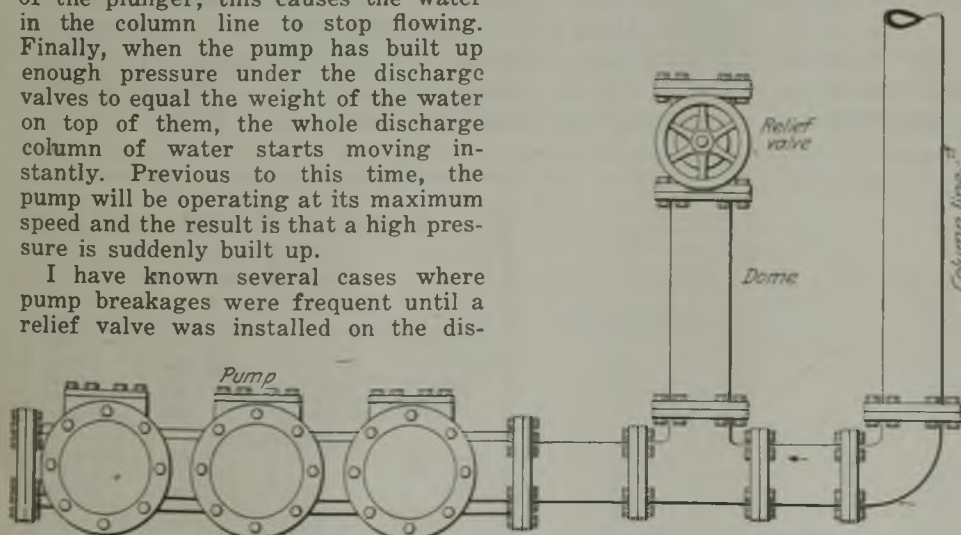
How Thermit Welding Is Done

Thermit welding is primarily a casting process used mostly for repair work where considerable metal is to be deposited. In the electrical repair shop it is frequently used for building up broken motor frames, heavy truck castings, bumpers and side plates. An intense heat is generated by a chemical combination of aluminum filings mixed with oxide of iron and primed by a magnesium powder.

Keep Locomotive Armature Bearings Clean

The commutator and armature bearing is ordinarily protected by a dust cap over the end of the shaft. This cap is made of sheet steel or malleable iron and is fastened to the housing or bearing by bolts or screws, thus completely enclosing the bearing. The dust cap should always be kept in place because the position of the bearing with respect to the wheel flange is such as to permit dirt, sand and wheel-wash from the flange to be thrown directly on this part of the motor.

The outer extremity of the pinion end bearing usually extends into the gear case and needs no further protection. The gear case fits over the armature bearing or an extension of the housing snug enough to keep the lubricant in the case. This tends to keep the dirt out of the bearing at this point. There is little possibility of dirt getting into the armature bearing from the inside of the motor because the oil-catchers on the shaft and the oil-catchers on the housings act as guards and give ample protection against the entrance of dirt.



Relief Valve Saves Pump from Abnormal Pressures

Before the pressure can rise to a point where it might throw unusually heavy stresses on any part of the pump or pipe line, the relief valve opens. Such an arrangement will cushion slight surges even during normal operation. The vertical pipe under the relief valve acts as an air dome.



Production And the Market



Somnolent Condition Pervades Coal Markets; Contracting and Lake Preparations Tardy

Anxious to think of something pleasant in the midst of the depressing gloom that overhangs the soft-coal markets of the country, many producers are casting a hopeful glance in the direction of the lakes as the navigation season approaches. Hoping, like Micawber, that something eventually will turn up to dispel the prolonged dullness is the daily occupation of the trade—more favorable freight rates are the expectation of some while others look to the lake movement. The rate matter is yet to be threshed out in Washington, beginning next week, and the actual season of lake navigation is still some distance off, but the preliminary activities have been disappointing, bookings and arrangements being meager. Contracting also continues to lag, many large consumers showing a disposition to watch for bargains in the open market rather than tie themselves up to agreements.

Coal Age Index advanced 1 point to 172 as of April 14, the corresponding price being \$2.08. This compares with \$2.07 on April 7.

Small Sizes Stiffen in Midwest

With the general falling off in domestic business and increasing shutdowns of mines in the Middle West fine coals are on the upgrade, screenings showing a slow but steady firming up. Whereas more than 3,000 cars of lump, egg and nut stood at Franklin, Williamson and Saline County mines without bills, every load of screenings was shipped without delay. Even railroad business has slumped in the Carterville field, where the mines still running are getting only about two days a week, and it is worse in the Duquoin and Jackson County field. The Mount Olive and Standard fields also find the going hard.

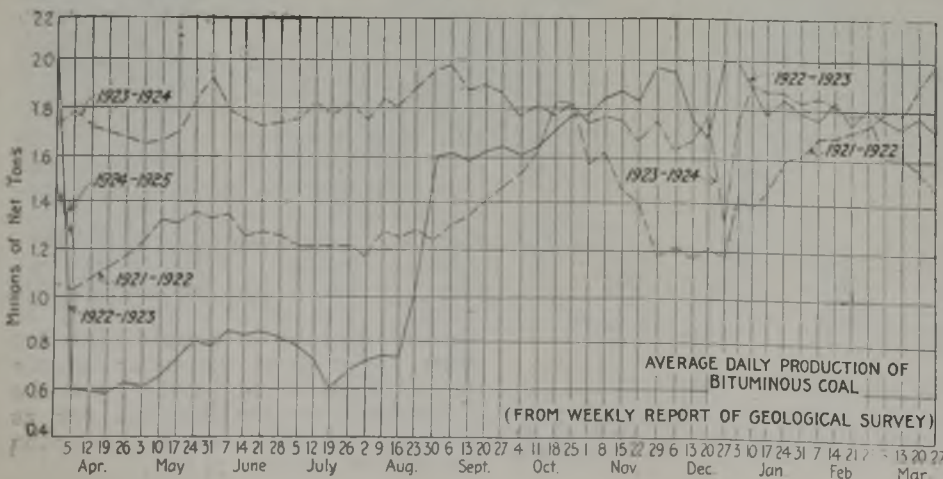
Unsettled labor conditions have put the Kentucky markets in a fretful state. Despite price cuts to encourage early stocking, business has been light in

Louisville. Trade is slow in western Kentucky also, there being practically no production of block or prepared sizes; this has tended, however, to cause prices for nut and screenings to be firmer. The heavy carry-over on the Northwest docks has deadened the market there to such an extent that even price cuts have little effect. Somnolence reigns at Milwaukee. Mines in the Southwest remain idle, the deadlock in wage negotiations at Kansas City being unbroken.

Ohio Markets Scrambled

Conditions in the Ohio markets are somewhat mixed, there being signs that the bottom has been reached in Cincinnati with the placing of railway contracts, though early lake business is lacking. Dullness and pessimism reign at Columbus and Cleveland. Production is very low in the Pittsburgh and central Pennsylvania districts. New England just plugs along at the recent low level. Atlantic seaboard markets show a tendency to steady somewhat, though a feeling of disquiet is evident at Philadelphia.

Production of bituminous coal took a pronounced drop during the week ended April 5, when output, according to the Geological Survey, amounted to 6,814,000 net tons, which was 2,004,000 tons less than was produced during the previous week. This is the lowest output on record for an 8-hour day week, except during the 1921 depression. The decrease was due in part to observance in union districts of the Eight-Hour Day, April 1, and in part to a large number of mines being idle. The total output for the coal year ended March 31 was about 542,000,000 net tons, compared with 427,598,000 tons in 1922-1923. Production of anthracite during the week ended April 5 was 1,548,000 net tons, a decrease of 394,000 tons compared with the preceding week. Total output for the coming year was about 96,000,000 tons, compared with 46,486,000 tons in 1922-1923.



Estimates of Production

(In Net Tons)
BITUMINOUS

	1923	1924
March 22 (a).....	10,424,000	9,261,000
March 29 (a).....	10,430,000	8,818,000
April 5 (b).....	9,629,000	6,814,000
Daily average.....	1,777,000	1,238,000
Calendar year to date	146,331,000	141,841,000
Daily average to date	1,791,000	1,740,000

ANTHRACITE

March 22.....	2,126,000	1,804,000
March 29.....	2,008,000	1,942,000
April 5.....	1,602,000	1,548,000
Calendar year to date	27,470,000	24,949,000

COKE

March 29 (a).....	388,000	296,000
April 5 (b).....	428,000	281,000
Calendar year to date	5,086,000	3,941,000

(a) Revised from last report. (b) Subject to revision.

Midwest Screenings Stiffen

The one thing that helps relieve gloom in the Midwest these days is the slow but steady firming up of screenings. Fine coals of all central western fields are on the upgrade, due to the general and almost complete collapse of domestic business and the shutdown of more mines. The total volume of coal produced was light indeed during the past week in Illinois and Indiana and practically nothing moved except the smallest sizes. More than 3,000 cars of lump, egg and nut stood without bills at the mines of Franklin, Williamson and Saline counties while every car of screenings left the mines immediately.

Southern Illinois screenings moved up from \$1.90 to an average of \$2.15, with some placed at \$2.25, and the price steadily bracing. Indiana No. 4 followed. Central Illinois screenings touched \$2 before the end of the week although most of it sold at \$1.80@1.90. Practically none was available, however. In another week it is expected the price will reach a point that will start the crushers working on domestic sizes now cluttering the tracks.

Some anthracite is moving to Midwest dealers following the price cut of April 1 because most dealers think it is rock-bottom for this summer and they might as well put in a little to handle the light early-summer trade.

The Illinois mining fields are full of "no bills" and miners' pessimism. In the Carterville region the few mines that are still open are getting only about two days a week. There is a slump in railroad business in this territory. In the DuQuoin and Jackson County fields conditions are worse than in the Carterville field, and prices are lower, with no railroad tonnage at all to speak of. The Mount Olive district is having a hard time. There is practically no domestic coal moving and the mines are not producing steam sizes in volume enough to take care of their customers. The Standard field is plugging along on from one day to three days a week. Railroad tonnage is light. Prices are below cost of production and the situation is an unusually unhealthy one.

Spring weather has put a sudden end to all activity in St. Louis retail coal yards. The dealers are making an effort to get early spring business started, but the public is slow in responding.

There is a little steam wagonload business, and carload steam and screenings from all fields is unusually good, with fairly good demand for the smaller sizes of nut. Country steam business is slowing up a little, but country domestic has dropped off entirely, with the exception of a little demand for chestnut anthracite.

New retail prices in St. Louis effective April 10 are:

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

Table with columns for Market Quoted, Apr. 16 1923, Mar. 31 1924, Apr. 7 1924, Apr. 14 1924†, and categories for Low-Volatile, Eastern; Midwest; High-Volatile, Eastern; South and Southwest.

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

Table with columns for Market Quoted, Freight Rates, April 16, 1923 (Independent, Company), April 7, 1924 (Independent, Company), and April 14, 1924† (Independent, Company). Lists various types of anthracite coal.

Northwest Trade Remains Flat

Nothing livened up the trade of the Northwest during the week. The carry-over coal on the docks—estimated by the Northwest Dock Operators' Association to be 1,400,000 tons as compared to only a few thousand tons last year—has a deadening effect on business and cuts in prices do not revive it. Industries and inland consumers are not buying anything to speak of and the domestic trade is satisfied. The main interest among dock men nowadays is: Will there be any change in freight rates off the docks to make it possible for the docks to do business this year. Very little coal seems to have been contracted for movement up the Lakes yet, though the opening of navigation is at hand.

The Milwaukee coal market continues in a state of somnolence. The cut of 50c. per ton in hard coal met with little response in the way of increased demand, as the weather continues mild. Soft coal is lifeless, prospective buyers holding off for the promised May reduction. Screenings and the cheaper steam coals are in fair demand for immediate use.

The mines through Kansas, Oklahoma, Arkansas and Missouri remain idle while the deadlock continues in the joint conference of scale committees in Kansas City. The small surplus of screenings which had accumulated when work was suspended April 1, is exhausted, and the surplus of domestic grades is rapidly melting.

The coal market in Colorado slowed down considerably last week due to warm weather, which has been prevailing throughout the mountains and eastern slope region. Mines worked on an average of three days last week and a number of unconsigned loads were reported on track. Prices are unchanged.

In Utah domestic consumption has fallen off, due to weather conditions. Industrials are demanding less slack, which is enabling operators to catch up on their orders for this grade. Retailers are buying little and stocks in Salt Lake City are lower than they ever were. Utah working time is around two days a week. Labor conditions are satisfactory.

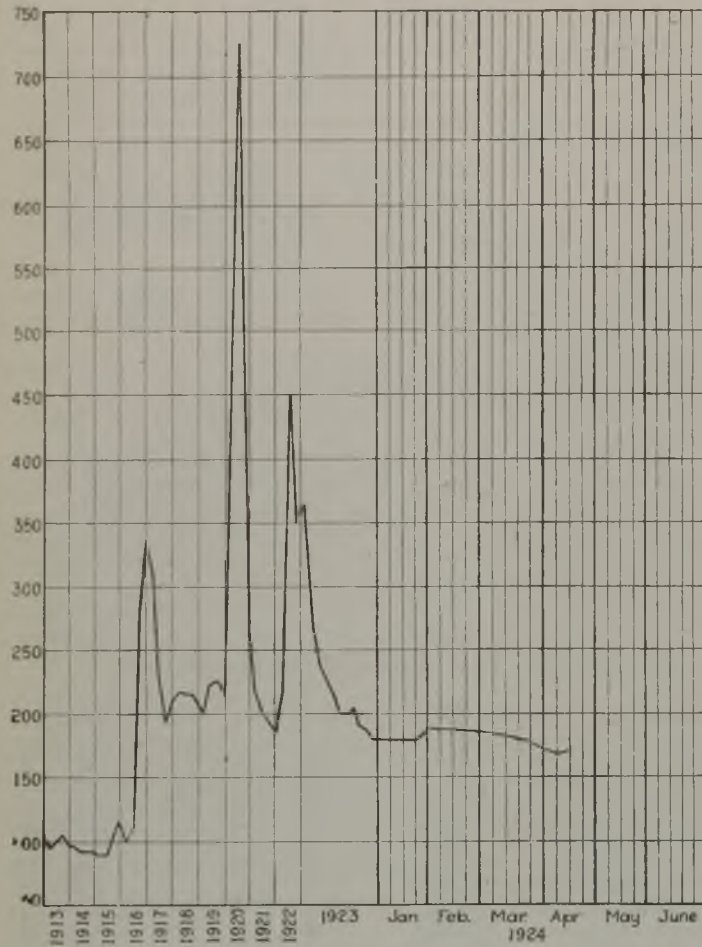
Cincinnati Begins to Look Up

Many signs at Cincinnati point to the fact that consumers are beginning to realize that the market has about hit bottom. One is found in the letting of railway contracts. The price list of the past week showed such a tremendous spread that the sales offices have been panicky and the buyer completely up in the air. Lake people are not venturing on this market, preferring to lay off as long as possible so that any buying orders that they might have will not favor an upward or stabilizing movement. Local offices are holding well to the circular on Pocahontas and the mines are holding down production to make the condition fit. New River and the off grades are a bit lower, some of these making \$3@3.25 price on lump and egg and \$2 on run of mine. Specialized coals are quoted as follows: Egg, \$2.25@2.75; block, \$3@3.50. Quotations and concessions do not interest the buyer, however, for he cannot digest more than is being put on the market. River business is booming along at a better rate than for some time.

Unrelieved dullness prevails in the Columbus market. Trade in both domestic and steam is quiet, only a minimum tonnage moving. Producers and distributors expect the quietude to continue until lake trade is under way. Little demand for Pocahontas or other smokeless grades is reported and splints also are quiet. Production in Ohio fields shows that domestic lump demand is almost nil. Contracting for steam tonnage is quiet. Many of the larger consumers are content to buy in the open market while prices are low in preference to entering into agreements. Public utilities are buying slightly more, while the railroad demand is steady. Little is doing in the Lake trade.

Pessimism is the keynote of the coal trade at Cleveland. Consumption is at a minimum and stocks continue to be sufficient to take care of present needs. Mines continue to close down, nearly half those in eastern Ohio now being idle, and those still running are lucky to get half time. Lake boats are doing some shifting to take on coal cargoes, but it probably will be some time before any coal carriers leave for the upper Lakes. Loading in this trade is not as heavy as it was last April, and there has been a steady increase in stocks.

The coal market at Buffalo is unchanged. Operators and jobbers alike are steeped in gloom.



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

Index	1924		1923	
	April 14	April 7	March 31	April 16
Index	172	171	173	235
Weighted average price	\$2.08	\$2.07	\$2.09	\$2.84

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

Standard, \$5; Mount Olive, \$5.50; Carterville, \$6.75; Granite City byproduct coke, \$8.75; Elkhorn byproduct coke, \$10.75; St. Louis gas coke, \$10.25; Anthracite, chestnut, \$16; egg and stove, \$15.75; grate, \$15; Arkansas anthracite, \$13; West Virginia smokeless lump and egg, \$11.

Kentucky Does Little

Coal trade in Kentucky was light indeed during the past week, in spite of price cuts to induce early stocking. The steam trade still has a good deal of coal left over and the domestic business is saturated. This means that nothing will be doing until some real steam demand appears. Thus far it has merely been whispering. However, lack of production has stiffened up steam prices somewhat, as in other fields. The whole producing industry of the state remains in a state of fretfulness over the swing to non-unionism in the eastern end and the likelihood of a strike or open-shop outcome of negotiations in western Kentucky.

In an effort to interest domestic consumers in early stocking, prices in Louisville have been dropped from 50c. to \$1 a ton, putting the price of best West Virginia coal, delivered at retail, to \$7.25 a ton, with eastern Kentucky lump \$7; western Kentucky lump \$6; smokeless \$9; coke \$12; anthracite \$18.50; cannel \$10; blacksmith \$8.

The western Kentucky market is very slow with practically no production of block coal or prepared sizes. This results in screenings as well as nut coal being much firmer in price.

Between bad weather, clay slides, standing water, and low prices, it is reported that only the larger strip mines are operating.

Production in the Pittsburgh district is down to about 30 per cent of rated capacity. Prices in the spot market are unchanged. Expiration of contracts has brought little if any increased inquiry in the spot market. There do not seem to be even any negotiations for lake coal.

Production in central Pennsylvania is at the lowest ebb for a number of years and prices are below the point of profitable production.

New England Just Slogs Along

In New England the steam-coal market shows no improvement. There is enough tonnage being forced on reluctant buyers to keep reserves about on the level of a month ago, and only in few instances is there anything approaching comprehensive buying. Factors with rehandling plants of their own keep their stocks large to relieve pressure on Hampton Roads, and both on contract and on spot sales they are leaving no stone unturned to place enough coal to make room for weekly arrivals. Receipts all-rail as well as by water have diminished since April 1, and the number of contracts in force, especially by the rail route, has been materially reduced.

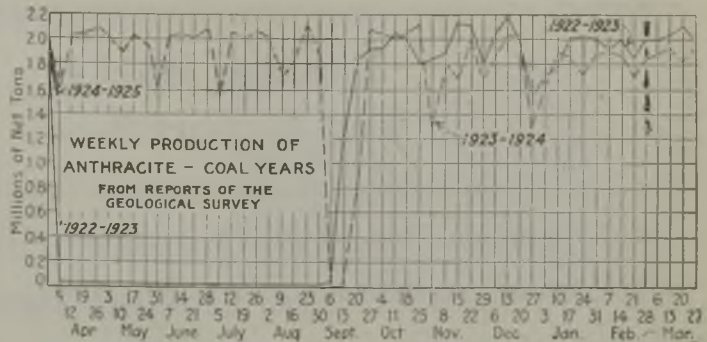
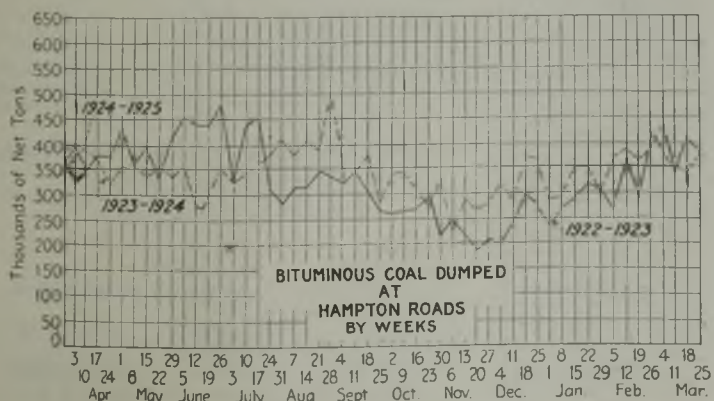
In certain cases the smokeless interests have curtailed output, but there remain enough in the open market to continue lively competition for what business offers. Prices f.o.b. vessel at Newport News and Norfolk therefore are in no wise improved; several agencies apparently are keen for orders at from \$4.15@4.25 for Pool 1. Navy standard grades. There have been reports of distress coal sold much lower than this, but no one in the trade expects to pick up any considerable quantity even of No. 2 coal at less than \$4. Similarly, prices on cars at Boston have gone to \$5.25 under pressure, but the bulk of what is being sold on the spot market returns \$5.50, and in some cases a little more.

All-rail the situation is rather different. Aside from a few operators who are striving to keep their mines running the industry as a whole is proceeding cautiously with respect to future deliveries. In other words, there is a disposition to keep coal in the ground unless mines can be operated at a profit, and while perhaps under current conditions it will take some time to derive any benefit from this policy it is certain to result in improved conditions, at least in some markets. A shortage of output in central Pennsylvania would hardly affect trade in this territory except in a restricted sense, but somewhat higher prices than now prevail would give distinctly a better tone and permit firmer quotations on Pocahontas and New River.

Atlantic Seaboard Markets Steady

The market at New York is gradually getting down to a steady basis. Demand is about the same on both line and at tidewater. Buyers want bargains when they want coal. With less coal mined, producers look for a steadier demand and possibly firmer prices. Continued inroads are being made in the large reserve piles, but this reduction depends largely on industrial conditions. Conditions at tidewater are slightly better than last week. Receipts were curtailed and there is not so much distress coal available at low prices. A few contracts are being signed, but at low prices.

Disquiet is evident at Philadelphia, as business displays little improvement. The labor question is far from settled, the union fields feeling that they are practically out of the trade, for most of the coal going to market is non-union. The general consumer is making no move to replace stock, many buyers holding off in the hope of saving some money on the price if they delay until midsummer.



Business at Baltimore has been demoralized by an output far in excess of consumption and demand, sales prices being below the actual cost of bringing the coal to the surface.

Production in West Virginia is greatly restricted in both high- and low-volatile territory, owing to extremely sluggish demand. Kanawha production is not over 30 per cent and Coal River production about the same but Logan mines are keeping up to about 60 per cent. New River, Pocahontas and Winding Gulf mines all have cut down operations, with the bulk of the tonnage moving being applied on contract.

Steam coal continues to be in scant demand in the Birmingham market, inquiry being light for spot coal and no great amount of interest being manifested in contract renewals among industrial consumers. The Louisville & Nashville R.R. is understood to have closed for its requirements from this field for the next twelve months, aggregating approximately 1,000,000 tons.

Anthracite Trade Settles to Even Basis

The spurt in the hard-coal market at New York following the announcement of the new prices, which are for the month of April only, is about over and demand has settled down to an even basis. Producers have enough business booked to assure them of a steady output for some weeks to come while the smaller independents are able to move their product without much trouble. Heavy buying by city departments during this and next month will provide an outlet for a heavy tonnage of the large sizes, especially broken, which is used extensively in the school houses and for which bids were opened on April 14. For the regular trade stove coal continues to head the list, with egg following. Pea coal moves steadily but at low figures for independent product. The steam coals are in fair demand. Rice and barley move steadily and without much trouble, some of the smaller producers having none to offer. Buckwheat is not so easily moved.

The anthracite trade at Philadelphia lacks the snap that was expected. Of course on the side of the producers conditions are better than during the last days of March, but no shipper has orders very far ahead. Stove is most in demand and most shippers are behind on it, but chestnut is quite plentiful and some independents have it in surplus, Pea has taken quite a turn for the better and there is very little free coal offering. Egg also is an easy size, but is moving fairly well. Steam trade is quiet, and even barley is in surplus with some of the independents. Buckwheat is particularly heavy and it is not unusual for this size, as well as rice, to be standing in cars at the mines awaiting consignees. The companies are putting both buckwheat and rice in the storage yards.

Coke Demand at Low Ebb

Coke demand in Connellsville is extremely slack, but prices show no further decline. Production of beehive coke during the week ended April 5 was 281,000 net tons, according to the Geological Survey, a decline of 15,000 tons from the preceding week. This is the fourth successive week that output has declined.

Car Loadings, Surpluses and Shortages

Week ended	Cars Loaded		Surplus Cars		Car Shortage	
	All Cars	Coal Cars	All Cars	Coal Cars	All Cars	Coal Cars
March 29, 1924	907,548	154,680				
Previous week	908,651	161,149				
Same week in 1923	938,725	182,668				
March 31, 1924	248,301	135,976	14,196	3,785	364	361
Previous week	213,093	115,361			68,986	29,281
Same date in 1923	14,196	3,785				

Foreign Market And Export News

British Market Quieter with Firm Undertone; Output Drops

The Welsh coal market has quieted down somewhat but is still notably firm. The recent agitation among buyers, both foreign and domestic, seems to have run its course, and this, coupled with the fact that in many quarters it is believed that the miners will not strike, has relieved the pressure. Aside from long-term contracts, all current business extends only over the next two weeks, beyond which period there is very little activity. German demand has sunk to a negligible quantity, but French business has improved with the recovery of the franc. There is a little business with Belgium and Holland, but not enough to make the operators anxious about fulfilment. Large quantities are ready for shipment to Italy, South America and coaling depots as soon as shipping is available.

The demand for anthracite is steady, though some kinds are very irregular.

The inquiry at Newcastle both from domestic and foreign consumers is heavy, especially for steam and gas coals. French, Swedish and Norwegian railways have bought over long periods and at prices which are very little below those now current. A fact which has perturbed British operators is that the Swedish railways have bought from Germany at lower prices.

The Egyptian Government is inviting tenders due May 14 on 150,000 tons of coal for delivery beginning June. It also has requested offers for 40,000 tons of American coal.

The miners' ballot is believed to be against acceptance of the operators' terms, but a substantial minority is favorable. The national executive committee of the Scottish Coal Miners' Union is recommending all Scottish members to reject the offers of the mine owners. The union leaders declare no intention of striking on April 17, when the present agreement expires, but may hold another ballot on the question of strike.

Brisk Trade at Hampton Roads; Market Tone Firm

Business at Hampton Roads is more brisk, with all unusual surplus removed from tide and prices slightly on the incline. Absence of contracts was one of the features of the market, the general run of consumers and retailers preferring to depend upon the spot market for supplies.

Coastwise trade is fairly active and overseas shipments are holding their own, with bunkers good and all piers reporting normal movement. The outlook is somewhat better, shippers predicting normal conditions during the next few months.

The tone of the market is firm, with reports from the coal fields that fully one-third of the operations serving this port have closed down temporarily, due to a rather uncertain market and a tendency to overproduction.

French Coal Market Notes Slackened Demand

Demands for industrial coals in French markets has slackened. As the difference in price between British and French coals is still very large, there has been a revival in the consumption of the latter and the Nord and Pas-de-Calais output is sold for several months ahead. Activity in household fuel has relaxed but is still higher than usual at this time of the year.

At a meeting of French and Belgian producers of house coals, to discuss summer prices, the French collieries decided that the present prices would be maintained up to Oct. 1, providing the summer premiums would be progressively deducted on the following basis: 5 fr. from April 1 to the end of May, 3 fr. in June and July, 2 fr. in August, the tonnage premiums to be unchanged. The Belgians, on the other hand, decided to leave prices as they actually stand up to the end of April,

in anticipation of a change in the position of the coal market in the event that the British miners strike.

Imports of British coals have been rather heavy of late and prices have gone up 1 to 2s. at the shipping docks.

Receipts of indemnity fuels in March are believed to have totaled between 850,000 and 900,000 tons for the month. The Office de Répartition des Cokes Allemands received coke from the Ruhr at the rate of 12,310 tons per day during March, which is about on the level of before the occupation.

Export Clearances Week Ended

April 12, 1924

FROM BALTIMORE

For Argentina:	Tons
Br. Str. Thamesmede	4,800
For Italy:	
Amer. Str. Winding Gulf	7,361
For Ecuador:	
Br. Str. Arana	1,000

FROM HAMPTON ROADS

For Argentina:	
Ital. Str. Stromboli for Buenos Aires	6,751
Ital. Str. Adige for Buenos Aires	8,406
For Brazil:	
Br. Str. Glenfinlas for Rio de Janeiro	4,593
Braz. Str. Joazeiro for Pernambuco	3,842
For Canada:	
Nor. Str. Haraldshaug for St. Georges	2,185
Nor. Str. Besseggen for Kingston	4,338
For Cuba:	
Nor. Str. Lonstakken for Havana	3,353
Amer. Schr. Dewitt Brown for Cienfuegos	1,881
For Mexico:	
Amer. Str. Orozal for San Juan	4,015
Swed. Str. Adolf for Tampico	2,818
For Italy:	
Ital. Str. Cerea for Genoa	4,874
Dan. Str. Fie Jensen for Naples	1,110
Ital. Str. Concordia for Porto Ferrajo	9,233
For West Indies:	
Ger. Str. Osterndorf for Barbados	3,948

Hampton Roads Pier Situation

	April 3	April 10
N. & W. piers, Lamberts Pt.:		
Cars on hand.....	2,040	1,546
Tons on hand.....	118,498	91,081
Tons dumped for week.....	133,323	126,711
Tonnage waiting.....	12,100	18,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,853	1,366
Tons on hand.....	125,850	105,800
Tons dumped for week.....	67,573	106,452
Tonnage waiting.....	2,200	962
C. & O. Piers, Newport News:		
Cars on hand.....	1,967	1,450
Tons on hand.....	99,190	72,865
Tons dumped for week.....	88,863	70,670
Tonnage waiting.....	5,025	1,390

Pier and Bunker Prices, Gross Tons

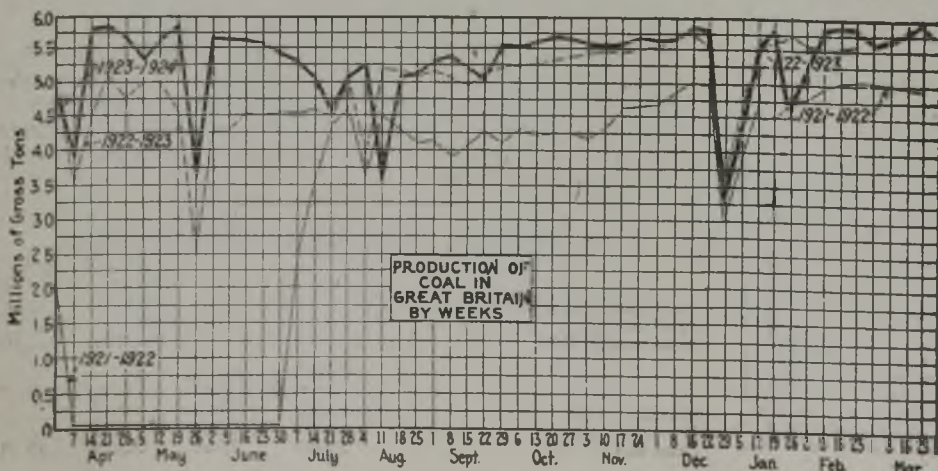
	PIERS	
	April 5	April 12†
Pool 9, New York.....	\$4.75@ \$5.00	\$4.50@ \$5.00
Pool 10, New York.....	4.50@ 4.75	4.25@ 4.75
Pool 11, New York.....	4.25@ 4.50	4.00@ 4.50
Pool 9, Philadelphia.....	4.80@ 5.20	4.80@ 5.20
Pool 10, Philadelphia.....	4.55@ 4.90	4.55@ 4.90
Pool 11, Philadelphia.....	4.35@ 4.65	4.35@ 4.65
Pool 1, Hamp. Roads.....	4.15@ 4.25	4.25@ 4.35
Pool 2, Hamp. Roads.....	3.85@ 4.00	4.00@ 4.15
Pools 5-6-7 Hamp. Rds.....	3.75@ 3.85	4.00@ 4.10
BUNKERS		
Pool 9, New York.....	5.05@ 5.30	4.80@ 5.30
Pool 10, New York.....	4.80@ 5.05	4.55@ 5.05
Pool 11, New York.....	4.55@ 4.80	4.30@ 4.80
Pool 9, Philadelphia.....	5.10@ 5.55	5.10@ 5.55
Pool 10, Philadelphia.....	4.90@ 5.20	4.90@ 5.20
Pool 11, Philadelphia.....	4.65@ 5.00	4.65@ 5.00
Pool 1, Hamp. Roads.....	4.15@ 4.25	4.25@ 4.35
Pool 2, Hamp. Roads.....	3.85@ 4.00	4.00@ 4.15
Pools 5-6-7 Hamp. Rds.....	3.75@ 3.85	4.00@ 4.10

Current Quotations British Coal f.o.b.

Port, Gross Tons

	Quotations by Cable to <i>Coal Age</i>	
	April 5	April 12†
Cardiff:		
Admiralty, large.....	32s.@ 33s.	31s.
Steam smalls.....	22s.6d.	22s.6d.@ 23s.6d.
Newcastle:		
Best steams.....	26s.6d.@ 27s.	27s.@ 27s.6d.
Best gas.....	25s.6d.	25s.6d.
Best bunkers.....	24s.6d.	24s.6d.@ 25s.

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





News Items From Field and Trade



ARKANSAS

Several of the mines in the Spadra coal fields opened again the last week in April after having shut down, presumably until June 1. A protracted cool spell in the north created more demand than was anticipated.

CALIFORNIA

California coal development is reported on the increase. One of the recent activities is that of the Calcoal & Iron Co., of which H. C. Haas is president and W. Warner Thayer secretary, on 2,300 acres of coal land in southeastern Monterey County between Paso Robles and Coalinga.

ILLINOIS

Fifteen men were more or less seriously injured April 10, when a double-deck cage dropped 50 ft. to the bottom of the shaft at the Kathleen mine, at Dowell. The failure of the safety dogs on the hoisting drum to function when the fuse blew out on the electric man hoist caused the drop. The fact that a miners' train bringing additional men to the shaft was late probably saved a greater number from being injured. Several of the injured suffered broken legs and other hurts, but none is considered in danger of losing his life. The mine is operated by the Union Colliery Co., of St. Louis.

INDIANA

Indiana's state institution coal bill will not be as high this year as it was last, it is indicated by bids now being tabulated by Fred B. Robinson, secretary of the state purchasing committee, but the question is whether the bids on about 170,000 tons are low enough even if they are lower than last year. The committee will meet soon to determine this. In 1923 the state bought mine run coal for \$2.40 a ton; egg size, \$2.60, and screenings, \$2.05. Most of the coal bought came from the Fourth Vein.

James D. Sisson, owning the Dixburg hills, near Hazelton, has leased coal rights on part of the property to William Dempsey. It is understood that Mr. Dempsey has decided to begin operations within thirty days.

Committees are preparing for the mine-rescue and first aid meet of District No. 11, which will be held in Princeton June 28. The meeting will be similar to that held at Sullivan last year. It is understood that all the Indiana mines will close on that date, the first time such action has been taken by the Indiana mine operators.

Work of mines in the Terre Haute-Clinton field, gradually decreasing for the past few weeks, took a decided slump last week with the closing down of five mines in sub-district No. 4. The Submarine, Talleydale, Clovally, Pine Ridge and Grasselli mines closed for an indefinite period, Talleydale closing to make extensive repairs. While many of the mines are closing down, a few are reopening, but the per cent of the latter is vastly less than of the former. Blackhawk mine, which was down for several weeks, was scheduled to resume work last week. Talleydale is closing down for repairs, for a period of about six weeks, it is said. The Fort Harrison Mining Co., which owns the mine, is expected to improve the Badyke mine in the same manner after the improvements in Talleydale are completed.

KANSAS

Directors of the Central Coal & Coke Co., at a meeting in Kansas City, March 20, voted to suspend the regular quarterly dividend due April 15 on both preferred and common stock. The suspension was attributed to the heavy cost of preparing for new lumber production in the West and to conditions in the coal industry throughout the Southwest.

KENTUCKY

A suit has been filed in the U. S. District Court at Covington by the Harvey Coal Co., of Perry County, against the Hazard-Jellico Coal Co., asking that a receiver be appointed to take charge of the defendant company's business. The Harvey Coal Co. leased coal land near Lost Creek to the Hazard-Jellico Coal Co. on May 27, 1919, at an annual rental of \$36,900 for a period of ten years. The petition charges that the provisions of the lease have not been met.

MARYLAND

Operations at the Big Vein mine of the Maryland Coal Co., which has been closed down for nearly a year, were resumed on April 10 with a force of about 75 men. According to an announcement made by Elkins Read, general manager of the company, the scale of wages will be about on a par with that generally prevailing in the Georges Creek region, the rate for pick mining to be 90c. and that for day labor \$4.64 per day. This company has one of the larger operations in the Georges Creek field but has not been operating regularly in the immediate vicinity of Lonaconing for several years. Still the mines are in fair condition notwithstanding such idleness.

MINNESOTA

F. G. Prest, director of purchases for the Northern Pacific Ry., Railroad Building, St. Paul, is taking bids until April 18, for furnishing fuel for that railroad, one set of bids for the section between Mandan, N. D., and Helena and Butte, Mont., and the other from Helena to the Pacific Coast. The first section calls for from 600,000 tons to 1,200,000 tons of lump and from 95,000 tons to 220,000 tons of sized washed nut, 2, 3, 4 and 5. The section to the west requires for 1,400,000 tons to 2,000,000 tons of mine run.

NEW YORK

Plans have been made for the retirement of all outstanding prior preference stock of the Burns Bros. Coal Co., New York City. The company is offering 120 for the stock and is taking it as fast as it can be acquired either in the open market or from individual owners. Last year plans for a readjustment of the company's capital structure were frustrated by opposition from holders of the prior preference stock. Officials are quoted as saying that rumors that the prior preference stock is being retired for the purpose of paving the way to readjust the capital structure are premature.

On May 1 the National Industrial Conference Board will move from 10 East Thirty-ninth St. to the fourth floor of the Park-Lexington Building, New York City. The board, which acts as the research organization for more than 30 of the largest associations of manufacturers in the country, was organized in Boston, in May, 1916, and for four years occupied quarters in Beacon Street with a small staff. Its New York offices were occupied in 1920, and at present it has more than 100 persons actively engaged in industrial research work in its headquarters, its branch offices in Washington, and in the field.

The report of the Pennsylvania Coal & Coke Corporation for the year ended Dec. 31, 1923, shows consolidated net income of \$741,704 after depletion, depreciation, federal taxes, etc., equivalent to \$4.29 a share earned on \$8,630,300 capital stock, par \$50. This compares with \$510,807, or \$4.14 a share, earned on \$6,164,500 stock outstanding in 1922.

OHIO

The coal-mining properties of the Blackburn Coal Co. located in Springfield Township, Jefferson County, will be sold at public auction by the receiver, James R. Hinchliffe, 1026 Guardian Building, Cleveland, on April 22. The properties consist of nine parcels of coal-mining lands, complete machinery and equipment, electrical railways and trackage etc.

The Vincent Coal Mining Co. has taken over the offices of the Blue Ash Coal Co. at 1820 First National Bank Building, Cincinnati, with George S. Payne in charge. The headquarters of the company is in Portsmouth and the move is the result of the acquisition of certain properties of the Doepke interests.

The McMyler-Interstate Co has been awarded a contract to install car-dumping machine for the New York Central R.R. for its projected \$1,000,000 coal handling pier at Ashtabula. The machine will cost approximately \$500,000 and will be of the most modern type.

John J. Moore, long connected with the Thomas Elevator Co., Chicago, has resigned his position to go with the Day & Maddock Co., Cleveland, Ohio.

PENNSYLVANIA

Seventy-five members of the Knickerbocker company's safety personnel were entertained at a banquet in the Fort Stanwix Hotel, Johnstown, April 10, as the guests of Superintendent R. A. Suppes. The Knickerbocker mines embrace the Telford, Jasahill and Wilbur operations. Warren Shumaker acted as toastmaster and safety addresses were made by Sheriff Martin Markle, of Somerset County; George Playez, superintendent of Jasahill and Telford No. 1 mines; D. Q. Williams, superintendent of Wilbur Mines Nos. 5, 6 and 2; Gordon Francis, superintendent of Wilbur mines Nos. 1, 3 and 4, and William Beahm, foreman of Jasahill mine No. 1. The host, General Superintendent R. A. Suppes also delivered a fine address.

A state charter has been issued at Harrisburg to the Bridgeville Coal Co., mining and producing coal and buying and selling coal, Bridgeville; capital \$25,000; President, Charles F. Brozier, Findley Avenue, Scott Township, Allegheny County. Incorporators: Charles F. Brozier, William F. Findley, and August Brozier.

C. J. Goodyear has been elected commissioner of the Pittsburgh Coal Producers' Association, succeeding Richard W. Gardiner, who resigned last June. Mr. Goodyear since that time had been acting commissioner. The newly elected official has been associated with the organization for more than four years and for three and a half years was the association's traffic manager. He was identified with the Pittsburgh & Lake Erie R.R. in various capacities for 16 years and for two years was connected with the Ore & Coal Exchange at Cleveland. He left the Cleveland organization to accept the traffic manager position with the coal producers' organization.

The Pittsburgh Coal Washer Co. is erecting a modern steel tiple with a capacity of 300 tons of coal per hour at the old Sample Run mine of the Clearfield Bituminous Coal Corporation. The headhouse is being erected on the site of an old slate dump, necessitating excavation to solid rock. The equipment to be installed includes shaker screens, a picking table and a loading boom. A rock disposal plant also is under construction.

Fire recently destroyed fourteen houses in the mining town of Arden, about two miles north of Washington. Dynamite was used to check the progress of the fire, seven houses being destroyed by that method. The houses destroyed were owned by the Meadow Lands Coal Co., of which James Cock is superintendent. The loss will aggregate about \$35,000.

The **Cosgrove-Meehan Coal Co.** has purchased the stock of the **Harco Coal Co.**, the merger being effective as of April 1. The capital stock of the Harco company is \$500,000, while that of the purchasing company is \$3,000,000. Payment will be made in stock of the Cosgrove company at the rate of \$15,000 annually at a price not to exceed \$105 per share. This preference stock is a 7 per cent issue, dividends being cumulative and payable quarterly. By the terms of the agreement the Harco company will surrender its charter.

Sealed Proposals will be opened by the Superintendent of Lighthouses, Philadelphia, 2 p. m., May 20, 1924, for **anthracite and bituminous coal**, gasoline, acetylene and acetone for fiscal year 1925. Information upon application.

The annual report of the **Jefferson & Clearfield Coal & Iron Co.** for 1923 shows gross earnings of \$3,989,840; expenses and ordinary taxes, \$3,253,602; depreciation, depletion, interest and federal taxes, \$324,063; profit, \$412,175; dividends, \$4,695,000; deficit, \$4,282,825. Profit and loss surplus on Dec. 31, 1923, totaled \$1,584,729.

A new mine is being opened up by the **Hale Coal Co.** at Phillipsburg. Two shafts have been sunk to the Miller seam. Erection of a steel tippie has started. Its capacity will be 250 tons per hour, hoisted in self-dumping cages. Sundry equipment includes weigh baskets, shaker screens, a picking table and a loading boom, and the necessary conveyors.

WASHINGTON

A new effort is to be made this summer to operate the old **Cherry Coal Co.** mine, four miles west of Castle Rock. H. Simon and N. Anches, both of Seattle, have taken over the property and will make the attempt. They hope eventually to have the mine connected by spur to the line of the Longview, Portland & Northern Ry.

E. P. Lucas, of Bellingham, head of the **Bellingham Coal Mines**, recently announced that his company is **rehabilitating its property**. A new 18-per cent slope is being driven to increase the output of the operation. Heavy steel is to be laid on the slope. A rotary dump has been ordered but some other new equipment will be necessary both top and bottom.

WEST VIRGINIA

Since operations were begun in 1833 there has been produced in Pocahontas territory a total of 283,558,779 gross tons of coal, according to W. E. E. Koepler, secretary of the Pocahontas Operators Association. A chart he has prepared also discloses that the year of largest production was 1916, when the output was 16,161,782 gross tons. Since the Pocahontas field was opened a total of 35,753,191 gross tons of coke has been shipped. Coke production in the Pocahontas region has been comparatively small in the last three years, the output for 1923 being 136,136 tons, as compared with only 80,900 tons the year before.

The **Wilbur Fuel Co.**, D. J. Carter, president, has purchased the **Vulcan Coal Co.** and the **Eastern Utilities Coal Co.**, with lands and mining plants for about \$1,000,000 and will undertake extensive additional developments. Its purchase includes 1,198 acres in fee, 468 acres with a mining town of 115 houses, mining machinery, etc., producing the Red Stone vein coal.

Lee J. Sandridge, general manager of the Meriden Smokeless Coal Co., with headquarters at Philippi, has been undergoing treatment at the Davis Memorial Hospital, at Elkins.

W. Kirby Schaefer, assistant labor commissioner of the Northern West Virginia Coal Operators Association, has resigned, his resignation taking effect early in April.

It is shown in statistics compiled by the Winding Gulf Operators Association of West Virginia that a total of 35,778,101 tons of smokeless coal was produced during the calendar year ending Dec. 31, 1923, which was not far short of the maximum reached in 1916, when 36,000,000 tons was produced. The increased tonnage in 1923 over 1922 amounts to 2,009,335 tons, states the Winding Gulf report. The Pocahontas district, producing a little over sixteen million tons, was still short of 1922 production by more than 500,000 tons. The Winding Gulf district in 1923 also was short approximately 57,000 tons of 1922 production and the Tug River field was short some 32,000 tons as compared with the previous year. To the New River field must go the great increase in tonnage in 1923, having produced over eight million tons, an increase over 1922 of 2,634,049 tons. As

usual, the bulk of the smokeless tonnage came from the mines on the Norfolk & Western Ry. The Pocahontas and Tug River fields produced over one-half the year's output. Over five and a half million tons of the year's production was "captive coal," or coal consumed by those interests producing it. Of this tonnage, the United States Steel Corporation consumed slightly over four million tons, all produced by its mines in the Pocahontas district. The year 1923 registered a high-water mark in coal tonnage hauled by the three railroads serving the smokeless fields of West Virginia, the Chesapeake & Ohio leading with nearly 33,000,000 tons, followed by the Norfolk & Western with nearly 31,000,000 tons. The Virginian experienced its largest year, with nearly 8,000,000 tons to its credit.

The **Hunter Crucible Steel Co.**, of Cleveland, has consummated negotiations for the purchase of 4,064 acres of coal land and three mines in Upshur, Webster and Nicholas Counties, the deal involving something like \$1,800,000. Included in the purchase were the **Excello** mine of the Hesper Coal & Coke Co. and 764 acres of **Kittanning** coal land; **Pittsburgh** mines Nos. 1 and 2 of the **Philmont Coal Co.**, together with 600 acres of **Pittsburgh** in Upshur County, near **Buckhannon**, and a tract of 2,700 acres of coal in the **Kanawha** series, so far undeveloped, in **Nicholas** and **Webster** Counties, owned by the **Stanfield Coal Co.** The same people are interested in all three of the selling companies, **L. O. Knipp**, of Philadelphia, being president, and **George H. Grone**, of Philadelphia, secretary and treasurer. The mines purchased have an aggregate production of 45 cars of coal per day. This, it is proposed to increase to about 2,500 tons a day through additional openings and the installation of additional equipment. The output of the mines acquired and to be opened will be used by the steel company to supply its mills at **Pittsburgh** and **Cleveland** with fuel.

The **Killarney Smokeless Coal Co.**, chartered under the laws of Virginia, has been authorized to transact business in West Virginia.

ALASKA

The **Evan Jones Coal Co.**, operating in the **Matanuska** field of Alaska, is about to install a complete washery, according to "Jack" Collins, of Anchorage, Alaska, one of the principal stockholders. **Oscar Anderson** of Anchorage, president of the company, has just returned from the States where he went to purchase a steamer and make other arrangements for an attempt at marketing coal from the **Evan Jones** mine in the Alaskan coast country.

CANADA

By a vote of 24 to 4 the Nova Scotia Legislature has passed a resolution stating that "in any readjustment of the federal tariff to be considered by the federal Parliament at its present session, this House is of the opinion that proper consideration be given. (a) To so increase the tariff on American slack coal as to preclude it from entering into this country in unfair competition with slack coal from the Nova Scotia mines; (b) to so readjust the tariff that this slack coal will not be sold as run-of-mine coal without paying the customs duty which run-of-mine coal is subject to; (c) to place some duty upon the importation of American coke with a view to encouraging the manufacture of Nova Scotia coal into coke for the purpose of supplying the Quebec and Ontario markets, and as a substitute for anthracite."

Roy M. Wolvin, president of the British Empire Steel Corporation, speaking at a recent luncheon, declared that his corporation would continue to pay the coal miners of Nova Scotia the 1924 rate of pay agreed upon at Montreal between representatives of the miners and the company. He said that large quantities of American coal were being used in Quebec, and that it was the intention of his corporation to displace some of that this year. Some sales will have to be made at much less than the average cost of coal delivered, but "we will do our part."

The **Clear Mountain Coal Co.**, which has been developing a property in the **Lillooet** mining division of **British Columbia**, has sunk two prospecting shafts through a seam of coal ranging from 8 to 10 ft. thick and at a depth of about 30 ft. below the surface. The company announces that it will erect coal bunkers at **Pavilion**, on the **Pacific Great Eastern Ry.**, and will convey the coal from the mine to railway in five-ton motor trucks. The general

manager expects to be able to maintain an output of 200 tons per day, which, it is thought, easily will be absorbed by towns situated on the railway.

Hillcrest Collieries, Ltd., reports net profits for 1923 at \$117,958, as compared with \$91,960 in the preceding year. Miscellaneous revenue amounted to \$37,704, which brought the total net revenue to \$155,662, as compared with \$126,730 in 1922. After deductions of bond interest at \$16,250 and preferred dividends \$49,399, there remained \$90,013 applicable to the common stock, which was equal to 9 per cent and compares with \$61,081 in the previous year. Surplus for the year after deduction of \$15,000 for contingent reserve was shown at \$15,013, which, added to the previous balance of \$269,174, brings the total profit and loss balance to \$284,187. An increase of about \$100,000 is shown in the net working capital of the company, which is placed at \$580,877.

A new 7-ft. seam of semi-anthracite recently was uncovered at **Coal Canyon**, in the **Peace River** region. So far, this is the largest seam of coal that has been found in this field. The principal owners of coal areas in this district are negotiating with the **Canadian Pacific Ry.** for the extension of the **Edmonton, Dunvegan & British Columbia** branch from **Spirit River**, the present end of the line, to the property. The distance is only 125 miles through a country offering few engineering difficulties, and the construction of the line would make available what undoubtedly is the highest grade of coal so far discovered in western Canada.

William Wilson has been appointed manager of the **South Wellington** mine of the **Canadian Collieries (D) Ltd.**

Robert Laird, who was manager at **No. 1 Mine**, **Western Fuel Corporation** of Canada, now is the manager of the **Wakesiah Mine** of the same corporation. His place at **No. 1 Mine** has been taken by **Arthur Newberry**.

According to a recent statement the supposed hard-coal area at **Sudbury** is to be definitely tested this year by **United States** interests, under whose auspices leasing for drilling tests was now under way.

The **Okonite Co.** of **Passaic**, manufacturers of "Okonite" insulated wires and cables, splicing tapes, etc., recently appointed the **Engineering Materials, Ltd.**, **McGill Building, Montreal, P. C.**, as their Canadian representatives.

The new 5 ft. seam opened some weeks ago by the **Princeton Coal & Land Co.** is developing well and is adding appreciably to the company's output.

Industrial Notes

H. H. Valiquet, for the past eighteen years chief engineer of the **B. F. Sturtevant Co.** (Chicago division), has joined the organization of the **Kirk & Blum Mfg. Co.**, **Cincinnati, Ohio**, as chief engineer, specializing in the designing of dust-collecting and pneumatic conveying systems, drying, heating, ventilating, cooling and fume removal systems, air-conditioning systems including humidifying, dehumidifying, and automatic temperature and humidity-control systems.

Within the last few weeks the **Spring Canyon Coal Co.**, of **Storrs, Utah**, placed a contract with the **Link-Belt Co.**, of **Chicago**, for a large capacity tippie. This tippie will include an extensive dry cleaning plant for fine sizes. Erection and construction work on this tippie will start as soon as conditions permit.

The **Baridan East Brady Coal Co.**, **Logansport, Pa.**, is installing complete shaker screen equipment furnished by the **Fairmont Mining Machinery Co.**, **Fairmont, W. Va.**

The **Crozer Coal & Coke Co.**, of **Elkhorn**, has contracted with the **Roberts & Schaefer Co.** for a new steel tippie and screening bins. The tippie will be complete with the latest improved **Marcus** screen, shaker loading booms and latest devices for re-screening fine sizes of coal. This will be one of the most modern tipples in the **Pocahontas** field.

The **Sterling Anthracite Coal Co.**, at **Clarksville, Ark.** is equipping its mines with new and up-to-date handling and preparation machinery, including automatic weighing pan, feeder, breaker, shaker screens, picking tables, loading booms, boilers and engines. The **United Iron Works, Inc.**, of **Kansas City, Mo.**, is doing the engineering work, furnishing and installing the equipment.

Traffic News

Indiana Rate Cut May Be Postponed Again

Following a preliminary hearing on a petition of twenty-one railroads in Indiana to set aside a recent order of the Public Service Commission that rearranged and reduced intrastate coal rates, an agreement was reached April 6 in Superior Court, Indianapolis, to ask the commission to defer the date of taking effect until June 1. May 19 was set as the date to hear evidence on the petition. The original order of the commission, that was written by Oscar Ratts, of the commission, provided that the rates would go into effect April 1. The date later was changed to May 1. Judge Hay said that in case the commission did not extend the time limit of the order to June 1, as requested, a temporary injunction would be granted.

In the petition asking that an injunction be granted setting aside the order of the commission, the railroads allege that the order will decrease their revenue more than \$1,000,000 a year. The order provides for a decrease of about 10 per cent in coal rates to dealers and large consumers. The rates on some roads, however, are slightly increased.

Hearing in Mine-Rating Case Postponed by I.C.C.

Hearings in the mine-rating case, set for April 23, will be postponed until some future date, according to an announcement by the Interstate Commerce Commission. Owing to those most vitally interested in this case being involved in the Lake Cargo Coal Case, which is set for hearing April 22, it was felt by the majority of those interested that justice could not be done the mine-rating case at this time. It is probable that the hearing will be set for some time in June.

Illinois Central Builds Branch

The Illinois Central R.R. is contemplating construction of a branch of several miles to connect the Eldorado-St. Louis branch with the new proposed Edgewood-Metropolis cutoff. The new branch will shorten the route of the output of the Williamson and Franklin county mines. Right of way has been procured for this new branch and work probably will begin at an early date.

Obituary

George W. Hill, Western sales manager of the Chesapeake & Virginian Coal Co. and member of the Executive Committee of the American Wholesale Coal Association, died April 10 at Asheville, N. C., where he had gone to regain his health following an attack of pneumonia last winter. His death was unexpected.

Earl A. Henry, chief of the West Virginia Department of Mines under former Governor Henry D. Hatfield and general superintendent of the Liverpool Salt & Coal Co., of Hartford, W. Va., died suddenly on March 31 while at work in the mine of the company. Heart failure is said to have been the cause of his

death. Before becoming chief of the department of mines Mr. Henry served for a number of years as a district mine inspector and also had been a deputy sheriff of Mason County. Mr. Henry is survived by his widow, his father, Darius Henry; a brother and two sons.

H. D. Megary, managing director of the Consolidated Pneumatic Tool Co., London, England, died suddenly March 20. Mr. Megary was born in Philadelphia, April 21, 1888, and was graduated from the University of Pennsylvania in 1909. Following his graduation he became affiliated with the Bethlehem Steel Co., remaining with that company until June, 1918, when he became connected with the Chicago Pneumatic Tool Co. as assistant to the president, later being made secretary of the company. In 1921 he was transferred to London to assume the duties of managing director of the English company. He also was director of European sales.

Charles Tedrow, of Nelsonville, Ohio, who had been in charge of the land department of the New York Coal Co. for a number of years, died recently at the age of 67 years. The funeral was held March 20, and was attended by officers and department managers of the New York Coal Co.

D. D. Christie, died in Guelph, Ont., recently, at the age of 85 years. The late Mr. Christie was president of the Winnipeg Fuel & Supply Co., Winnipeg, Man., and also was a director of the Drumheller mines, in Alberta.

Coming Meetings

American Welding Society. Annual meeting, April 22-24, Engineering Societies Building, 33 West 39th St., New York City. Secretary, W. M. Kelly, 33 West 39th St., New York City.

Chamber of Commerce of the United States. Twelfth annual meeting at Cleveland, Ohio, May 6-8. Secretary, D. A. Skinner, Mills Bldg., Washington, D. C.

National Exposition of Coal Mining Equipment and Machinery of the American Mining Congress, May 12-17, Cincinnati, in conjunction with the annual meeting of the National Coal Association.

West Virginia Coal Association. Annual meeting May 13-17, Cincinnati, Ohio. Secretary, W. H. Cunningham, First National Bank Building, Huntington, W. Va.

National Coal Association. Annual meeting, May 14-16, Cincinnati, Ohio. Executive Secretary, H. L. Gandy, Southern Building, Washington, D. C.

Retail Coal Dealers Association of Texas. Nineteenth annual convention, May 20 and 21, Vernon, Texas. Secretary, C. R. Goldman, Dallas, Texas.

Pennsylvania Retail Coal Merchants Association. Twentieth annual meeting and exposition, Commercial Museum, 34th and Spruce Sts., Philadelphia, Pa., May 22-23. Secretary, W. M. Bertolet, Reading, Pa.

International Railway Fuel Association. Sixteenth annual convention, May 26-29, Chicago, Ill. Secretary-Treasurer, J. B. Hutchinson, 600 Michigan Ave., Chicago, Ill.

The American Society of Mechanical Engineers. Spring meeting May 26-29, Cleveland, Ohio. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

American Wholesale Coal Association. Annual convention, White Sulphur Springs, W. Va., June 3-4. Secretary, G. H. Merryweather, Chicago Temple Bldg., Chicago, Ill.

The National Foreign Trade Convention. June 4-6, Boston, Mass. Secretary, O. K. Davis, 1 Hanover Square, New York City.

National Retail Coal Merchants' Association. Annual meeting, Hotel Virginian, Bluefield, W. Va., June 4-6. Secretary, Walter D. Rogers, Transportation Building, Washington, D. C.

Southwestern Interstate Coal Operators Association. Annual meeting June 10, Kansas City, Mo. General Commissioner, W. L. A. Johnson, Keith & Perry Bldg., Kansas City, Mo.

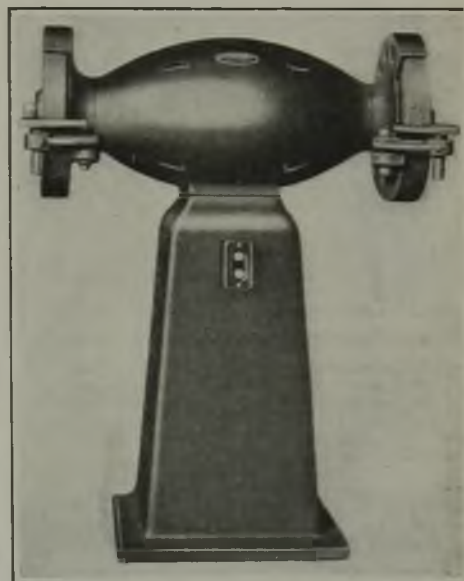
Illinois & Wisconsin Retail Coal Dealers Association. Annual meeting, June 10-12, Delavan, Wis. Secretary, I. L. Runyan, Great Northern Bldg., Chicago, Ill.

American Society for Testing Materials. Annual meeting, Chalfonte Hotel, Atlantic City, N. J., June 23-27. Secretary, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

New Equipment

Totally Inclosed Grinders For Mine Shops

For use in coal-mine shops where it is necessary to contend with more or less fine dust, the Glow Electric Co., of Cincinnati, Ohio, have developed a totally inclosed grinder. The inclosing case of this device completely shuts out any dirt or dust flying from the grinding wheels. Suitable guards are mounted over each of the two grinding



Inclosed Grinding Wheel

This motor-driven outfit is totally inclosed so that no dust or dirt can get into the motor or the bearings. The grinding wheels are shielded by means of guards, thus the dust, and fragments are prevented from flying in a direction where they may cause serious danger to the eyes of the operative.

wheels. The grinders are mounted on pedestals which are designed to give a large clearance with a short spindle extension. The outfit is driven by an electric motor, controlled by means of either a push button or snap switch located so that it may be within easy reach of the operator.

Paint-Spraying Gun

Important improvements have been made by the DeVilbiss Manufacturing Co. of Toledo, Ohio in the gun they have been manufacturing for the purpose of spraying paints and varnishes.

All nozzle parts are self-centering, thus making it impossible for the nozzle to get out of alignment even when parts are interchanged. When the gun is used in a horizontal or vertical position the revolving air cap produces a wide fan spray and when the gun is placed in any intermediate position a round concentrated spray is obtained. It is claimed that this gun produces a truly atomized and uniform spray under all conditions.

Another important feature is that all parts requiring any cleaning can be easily disassembled and can always be

kept in condition ready for operation. The gun-shaped handle is well balanced, and rests easily in the hand. The trigger which regulates the flow of paint operates freely.

In mine service when used around electrical equipment the gun has several points of advantage, for the paint or varnish may be made to flow in and around insulating material which could not be reached with a paint brush. Its use for finishing the work on newly installed switchboards, located adjacent to panels and switching equipment carrying power, will result in greater safety to the operator.



Paint Gun Easily Used and Cleaned

This complete little gun weighs only 10½ oz. and can be used with great ease for spraying paint or varnish on any kind of surface. Its use around electrical equipment will make the work much safer than is possible by any other means.

Track Tie Made in One Piece Easily Attached to Rails

A new steel cross-tie to be known as the Bethlehem mine tie has recently been developed and placed on the market by the Bethlehem Steel Co. This tie succeeds the Cambria mine tie manufactured at the Cambria plant of the company.

The tie has fastenings permitting it to be added to or taken from the track without the rails being disassembled. The stationary and movable fastenings are arranged in such a manner that the tie can be slipped under the rails, brought into position and fastened while the rails remain in place.



Fig. 1—Shows How Easily Tie May Be Installed

No special wedges or tools are required to attach this tie to the rails. The larger size ties have two clips which make the joint more rigid and prolong its life.

The rail is fastened to the tie by turning the rotating clips to their clamping positions, using for that purpose a hammer, axe, or any tool available, as shown in the illustration, a feature of the device being that no special wrench or other equipment is necessary for its use.

These ties are made in three sizes, Nos. 1, 2, and 3. Each end of the latter two types of tie is equipped with two fastenings, doubling the holding power. Only one clip is necessary for the holding of the rail, and should this clip become damaged or worn, the reserve clip may then be brought into use by turning it to the clamping position. This feature has the effect of greatly lengthening the life of the tie.

The rotating clips are made of heavy rolled steel with reinforcing ribs back and front, offering a large section on which to hammer them in and out of position.

The tie is one-piece construction and is complete in itself, requiring no extra wedges, loose parts or special tools. These ties are shipped complete ready to install in bundles of convenient size. One man can easily carry fifteen No. 1 ties or ten No. 2 ties.

Shovel Driven by Ford Engine

A new shovel suitable for light stripping and coal loading has been developed by the Glasgow Engineering Co., 3720 N. Newstead Ave., St. Louis, Mo. The machine consists of a bucket or dipper mounted on a pair of dipper sticks, which are carried on a heavy structural steel framework mounted on a Fordson Tractor. The action of the



Fig. 2—One-Piece Steel Mine Tie

With this tie, track laying is made easy. There are no loose parts to get lost and delay the work. This feature is important in mine service, for the supply room is usually a long way from the working face.

machine is similar to that of a baby shovel, except that it is preferable to back the tractor about 4 ft. from the pile of material to be handled and then run it forward into the pile before hoisting the dipper.

This dipper is raised by a cable which runs back to the main hoisting drum and is made to dig into the ground or crowd into a pile by the action of the hoisting cable looped over a sheave on the upper end of the dipper sticks. The side-swinging motion is controlled through two cables which run from each side of the bull wheel back to two small drums on the main power shaft. The whole machine is heavily built to withstand severe usage.

Power is taken from the main power shaft gear of the tractor and is transmitted through a worm and worm gears to a shaft which carries both the hoisting and the swinging drums. The driving gear, worm, worm gear, and ball bearings, are adaptations of standard Ford parts which make replacement in case of emergency easy. The main hoisting drum is 4 in. diameter and 8 in. long, with high flanges and is controlled by a large expanding clutch and a 10-in. hand brake fitted with standard brake lining.

The dipper is built of ¼-in. plate with a renewable cutting lip ½ in. thick. The back is hinged on top and held at the bottom by a latch.



Shovel Relocated as Easily as Truck

Mounted on a Fordson tractor, this shovel can be used to dig, hoist or shovel. The ¼-yd. dipper is elevated and swung by means of power taken from the main drive shaft of the engine.