

COAL AGE

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It Can't Be Done Alone

THE OPERATOR must have men who want to do their work safely or it won't be done in that way. Safety, like orderliness or industry, can be imposed to some extent, but it is better to have it come from the preference of the individual rather than as a result of discipline. If nearly every man in a mine is disposed toward unsafe ways, and there are such mines, it is of no use to try to correct the fault by a multitude of regulations and frequent dismissals.

It is far better to inculcate a new spirit, and sometimes disciplining individuals militates against the establishment of any such thing. After the right spirit is created and nearly all are agreed as to what should and should not be done, discipline that weeds out the recalcitrant is seen to be just and is heartily approved by those whose lives are jeopardized by the unsafe workers. It is not meant that there should be no disciplining before the right spirit is established, but it should be used judiciously, and the work of interesting the men in safety should be the main aim of the management.

To Know a Job Is to Do It

OUR MINING difficulties in the past have arisen quite generally from the fact that we have not seen what jobs had to be done. When mining was first commenced in America and needed study we still talked geology and natural resources. When transportation was our real problem we were found talking mining. Later we evinced a great distaste for discussing electricity, though no more vital subject in mine development can be found.

If we had known how important was the transportation job we would have been more ready to give regular service to loading machines, we would have saved transportation costs and given the miners more cars. But we did not see it as a job. We did not entrust it to experts. We did not realize that we were operating a network of narrow-gage railroads, and because we did not know, we went about the job in a faltering manner and would not meet the cost.

If we only knew our jobs and saw them each individually, we would expend more thought on them ourselves or engage some one who would do the thinking for us, and we would have success. For failure is likely if we have no aim. We may "muddle through" but the progress is slow and final success not assured. That is why we fail so often. We do not name our jobs or realize their serious nature and fuss about little matters when larger ones are to be confronted. We strive to make a record rerailing cars when we should make it in not having derailments. We pride ourselves on the number of armatures we rewind when we should earn credit for the few that need rewinding. We boast of our repair work when what would be better would be

to exhibit the merit of our inspection system. We glory in the way we meet emergencies when we would do better to forestall them. We save on safety and blow up the mine.

See the job as a job and do it! That is why reading technical papers, attending institutes and visiting the mines of other operators pays and pays well.

When Governors Convene

GREAT hopes are to be banked on the meeting of Governors to discuss safety legislation. We need more uniformity of practice, we must have more protective and more up-to-the-minute laws and we should be able to transfer foremen from one field to another on re-examination. The burden on the producer in all states having like conditions should be equal so that no state can underbid another relying on the looseness of its laws. Perhaps there is less to this statement than appears at first sight, for lack of safety is not usually profitable. It would be better to write it thus: No state should have cause to fear that the passing of remedial legislation will put it at a disadvantage with some other state whose laws are slack. Certain it is that, whether laws hamper or merely compel true economy, severe legislation in any one state will be opposed by someone who will allege that it puts a peculiar burden on the operators of that state. Therefore it will be of great assistance if the states together make provisions for equal safety.

At the same time the question of uniformity is raised by such a conference in the most unequivocal way, and unless everyone assembles with the fullest determination to amend conditions, the conference will have an unfortunate result. The advantage of states' rights has been that they initiated experimental legislation. Some state dares to go ahead of the rest, and, if results are good, public opinion compels the rest to follow, whereas if the results are bad the experimenting state comes back into line.

However, where competition is fierce there is always the feeling that legislation involving cost, even if in the end it saves expense, should be uniform, and surely rock dusting is one of the provisions which require such legislation. It should be made general in all the soft-coal states. Some states are not as clearly moved to favor it as others, but it should be practiced in all of them, nevertheless.

Perhaps mine foremen should not be allowed to drift from state to state without re-examination, but it would seem that years of experience in the mines of any one state should be as available in one commonwealth as in another, and that admission to the office of foreman should be granted on re-examination with only a questioning that will bring out the foreman's knowledge of the mining law in the state where certification is sought.

The Governors' conference should be welcome to in-

dustry. It portends greater safety at the mines which is what all of us want. It interferes with states' rights less than the accepted but unfortunate practice of calling operators to Washington or to other points of conference and then bringing pressure to bear on them by appeals to public prejudice to make contracts for long periods which bind some and not all and that are not revocable with changing conditions.

Worst Place to Economize

IN BUILDING and house repair the use of wood shingles in the roof is ill-considered economy, but most mine operators seem impressed with this method of "saving money." The National Board of Underwriters says that the losses due to wood shingle roofs in fires that have been reported have cost the country a million dollars monthly during the last five years. The unreported losses would increase this figure considerably if data were obtainable.

One hundred and eighteen American cities have prohibited the use of wood shingles for roofing purposes. The number of these cities is increasing. In the fire at Berkeley, Cal., roofs were ignited half a mile in advance of a conflagration involving houses having wood roofs. Of the 584 houses totally destroyed 540 were covered with wood shingles.

At the Salem, Mass., fire scores of houses in Marblehead, more than a mile away, were set on fire by flying brands landing on their roofs. Arverne, L. I., where shingle roofs predominated, was totally destroyed a few years ago in a similar manner. Photographs show the fire leaping from house to house by reason of the readily combustible roofs.

Mining towns, especially in the wooded and hilly regions are likely to be the prey of fires from the ignition of underbrush. The environing hills make it absolutely necessary to crowd the buildings, so that when one house catches fire the others are hard to save, especially with such inadequate and voluntary forces as such towns provide. In the winter this danger is decreased. We have passed, in fact, the most menacing period, the early fall, but the danger within the village is now at its height. Heavy winter firing and leaky chimneys are liable at any time to start a conflagration that will wipe out a town if the roofs are free of a covering of snow.

There will be no more building for a season, but shingle roofs need frequent and extensive repair and when they do why not make the job a good one by the use of slate, asbestos shingles, tile or sheet metal?

Process of Ossification

ANATION does not grow stiff in the joints in a night but by degrees. There is a disagreement between capital and labor and the public demands it must come to an end. The authorities find capital has no votes and is more amenable than labor to suggestion, so it lets labor decide the issue and tells the operators that it is the patriotic and prudent thing to give way. So capital does it and gradually gets accustomed to it. If it rebels it is not threatened with nationalization or control, but it is told that both will inevitably come if any resistance is attempted. In consequence capital is cowed and feels compelled to yield.

The new wage frequently causes unemployment because the employer cannot meet competition. In consequence it becomes necessary to reduce the pressure

on the employer. Sometimes that is done by a tariff, but if the competition is within the country, some other cure must be found. The consumer must be compelled to buy the high priced coal or else a pooling of the interests or even nationalization must be attempted. Perhaps, however, freight rates may be adjusted so as to give each section a chance to do its share of business regardless of price. Whatever happens there is more regulation. The nation undertakes readjustment instead of leaving the matter to natural law, and the processes of ossification are well on their way.

Wages being too high in the industry, too many men enter it, and working opportunity for the men in it becomes restricted. As the men cannot lay by money, the demand comes for old-age pensions, sickness benefits, minimum wages and unemployment insurance. Regulation in other lines having been provided it is instituted in these directions also. Furthermore as there are too many men, labor-saving contrivances are regarded as a menace to the worker, jurisdictional rules are established and men are kept out of the industry by law, by demanding certification or by union rules forbidding any man not related to another man in the industry from entering it.

As other industries get this protection a man is afraid, or perhaps cannot, enter any other industry, and caste is established. Later comes a sense that some industries are inferior and subordinate to others, and the castes are regarded as social sanctions, if not, as in India, as religious institutions. The whole social structure ossifies. A man, no matter how talented, must remain with his caste, must be content with a wage fixed by others, must perform only certain work, must do it in an inefficient way or rob some one of a job. He looks to the nation to maintain his status. He cannot well better it as he is fixed in his caste. The employing class, having rules fixed by law or inexorable custom, cannot prosper. Prices are fixed and duties are scheduled. Capital cannot shift from one useful work to another and cannot choose the scene of its labors.

This process of ossification has made lately much progress in Great Britain; it has exhibited itself in the United States. We must look for a Leo, the Isaurian, to prevent its progress and set us free of it much as the emperor freed the Byzantine empire of this kind of bureaucratic control. Instead we find almost every official at Washington wanting more regulation.

The miners in the Central Pennsylvania field having raised their wages and their conditions of employment so high that they cannot work are crying for unemployment doles. Some industries have such doles already provided. Consequently these industries when overcrowded remain in that unfortunate condition. When the nation makes itself responsible for every man it must expect every one to look to it for protection. No one will need to struggle and labor if the life raft of government support is handy.

If the men are assured of a wage, the operator must be certain that he will get the necessary price or he cannot afford to give the workman an opportunity to labor. If he is thus assured of a small profit and of no more than a small profit he will make no effort. Life will leave industry, and tissue will give place to bone. For freedom we shall have to move on once more.

Fortunately the Anglo-Saxon and other non-tropical peoples have a way of occasionally showing such a veneration for liberty that they break happily away from the gyves of their own making.



Springdale Mine Rescue Men

Mining Coal with Safety

Springdale Mined Nearly Million Tons with One Fatality—Competition Between Captains for Place of Flag on Masthead Aids Windsor Mine to Cut Accidents 57 per Cent

BY H. F. WEBB

General Safety Director, West Penn Power Co., Pittsburgh, Pa.



WHEN A MAN'S a miner, grubbing away, doing his daily dozen, perhaps hundreds of feet below the surface, and perhaps several miles from the point of entry, that the world may have for its varied uses the fruit of his labor, it is right that so far as practicable he should be protected against accident from physical or mechanical causes.

Sad experiences, taking the form of disasters, involving the lives of countless human beings, bring minute investigation, to be followed by a diagnosis and the enactment of new laws in addition to those already in effect and through the application of these laws and the active interest taken by operator and miners in safety work, the mining industry is beginning to see relief in the accident situation. However, no let-up must be permitted else we lose valuable ground gained in the past few years. The industry as a whole is showing a "slow but sure" downward trend in both frequency and severity of accidents.

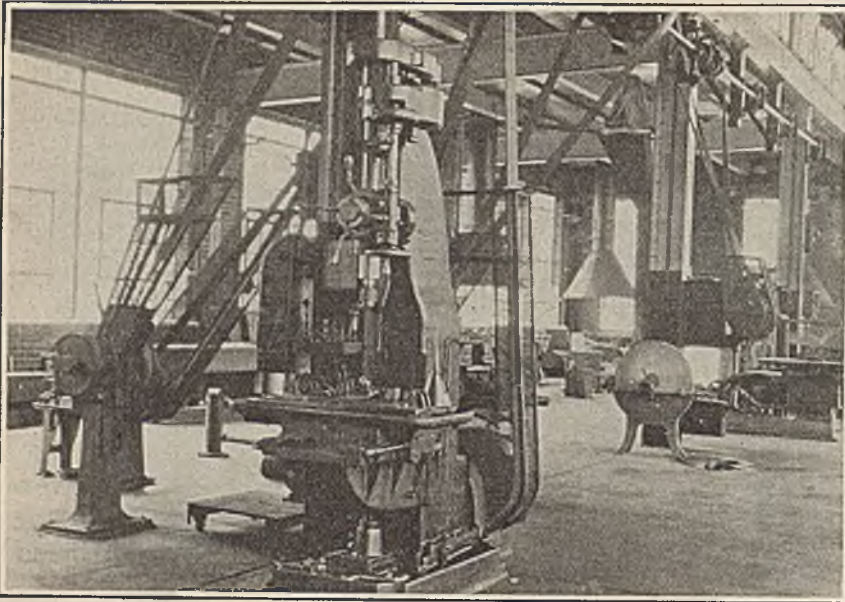
It is most gratifying to learn of an 8 per cent reduction in the fatality rate of the industry during the year 1923 as compared to 1922, a net saving of 210 lives. This could have been accomplished only by living up to prescribed laws for safe operation and by the earnest effort of all mine owners and miners. Experience is a hard teacher, and it is with sadness that we are sometimes forced to stand in the solemn presence of death before we learn to brush aside the artificial distinctions of society and come to realize that a life is a life and precious as such. We must find a solu-

tion. We must profit from experience of the past.

We must unite in our effort to solve the great problem of today, which is one of originating a formula for industry which shall comprise those basic principles and practical ideas and policies that will free those employed therein from the menace—accident.

The task of devising and establishing in general use those methods of organization and administration to fit all manner of operations and conditions would be well nigh impossible, but a closer relationship with particular regard to tried methods, practical ideas and policies devised with a distinct purpose of preventing accidents should be favored by all mine owners. Any program devised for the prevention of accidents when conscientiously and vigorously carried out will eventually repay the effort in lower cost of production and lower cost of insurance. To a profound satisfaction on the part of mine owners and officials in having a safe mine, there is bound to be added the additional gain of a higher morale in the workers.

A much used, and at least partly true statement, runs as follows: "A mine is as safe as the owners, operators, and workers want it to be!"



Springdale Machine Shop Has All Machinery Guarded

Only a few accidents around mines are caused by machine shop hazards, but only a few men are employed. It is just as necessary to guard the small number of men thus exposed to risk as the larger number engaged in a large shop, but how often that fact is overlooked! This illustration shows only a part of the machine shop.

With this statement accepted as a starting point, there must also be a will to make it so, from the owner down to the worker, and it will always be necessary for the "top notcher" to set his house in order and proclaim his stand before he can expect desired results to follow. It is but a simple procedure for any executive or group of employees to issue a proclamation against accidents, but a matter of setting the house in order is a horse of another color which involves money.

By setting the house to order is meant the correction of unsafe physical conditions, the guarding of exposed parts on mechanical equipment, the general adoption and use of safety devices and a general clean-up of the property. When these things have been done to satisfaction, there can be no question that the soil will be prepared for sowing seeds of safety that will have successful germination.

These seeds must take the form of educational propaganda because if safety is to succeed a safe atmosphere must not only be created, but what is far more a market must be found for this commodity—"Safety."

Education of the workers will now become the prime mover to which the wagon must be hitched, and it is a fact that a wagon load of ideas will be necessary to sell the safety idea to the average coal digger. A desire must be created, before a man can be successfully taught the fundamental principles of safety—he must desire the instruction. This has been most forcibly brought out in many failures when an effort has been made to cram safety down the workers' throats. It can't be done! "You can lead a horse to water, but you can't make him drink."

We must be human, reach the man through personal contact, feed him a steady flow of interesting safety literature, keep hammering away, and "sell him the idea" in a way he has never had it put to him before. The success of famous products comes through good advertising and salesmanship. Success in the prevention of accidents can be made to come in much the same manner.

Perhaps a digression from the path already beaten to describe methods devised and adopted to reduce both

the frequency and severity of accidents to what is probably a low minimum at two bituminous coal mines owned and operated by subsidiary companies of the West Penn Power Co., Pittsburgh, Pa., may be permitted.

The larger part of the production of these two mines, 974,247 tons in the year 1923, was absorbed by two power houses owned and operated by this company. The coal is transferred by direct mine haulage to tipple, thence to storage bins over boilers ready for consumption at these two power plants. The old axiom, "Things that are equal to the same thing, are equal to each other," would hardly apply to these two mines, so it will probably be of more interest to place each mine as a problem in itself and to describe the evolution of the safety movement within its precincts separately.

Logans Ferry, a gaseous mine operating in the thick Freeport seam, located on the east side of the Allegheny River opposite Springdale, Pa., is operated to supply coal to the Springdale Power Station of the West Penn Power Co. This mine started operations, Aug. 15, 1921, and from that date to Sept. 1, 1924, has produced 924,327 tons of coal. It has a rated capacity of approximately 3,000 tons per working day. During this period, only one fatal accident has occurred, which would seem to be a creditable record.

The company has realized that physical conditions of this property were such that the mine could be operated with comparative safety for the employees from both a physical and mechanical standpoint. Nevertheless, several things have been done which, although probably no different from general practices throughout the industry, are set down for general information.

The mine is ventilated by a 6x12-ft. fan which drives 220,000 cu.ft. of air per minute through the workings expelling any gas that may, or might, be generated



Supply Yard at Springdale Kept Neat and Clean

All material is carefully piled so as to prevent accident and waste of supplies. The ground is kept free of rubbish so as to prevent accidents from stumbling. Clearance room is maintained. In many yards the dexterity of employees alone saves them from accident—and sometimes fails entirely. After all is said, skillful piling is not a safety fad but a real economy, and costs little more than forethought.

within the mine. The cuttings from the mining machines are loaded out, all dust and fine coal is cleaned up and dry places sprinkled, to eliminate the hazard of a dust explosion. All haulage roads and working places in the mine have 4 ft. of leeway on the clearance side of the track, thus enabling motormen, brakemen and others who work around the cars to do their work safely and without danger of being squeezed between the car and the rib.

Shotfirers are employed to shoot down the coal for the miners, and after the holes are drilled, they are charged and shot by these experts. This eliminates the possibility of the shot being fired in the solid. The coal is shot down in two sections; the section below the bony, or parting, being shot down first and loaded out, after which the top coal is shot down. This not only lessens the danger of blownout shots, but also allows smaller charges to be used and permits the miner to clean the coal by taking out the bony.

All trolley wires are guarded so that the men cannot come in contact with them at crossover points, and electric flood lights have been placed at all switch points on main haulage roads to supply extra light to enable the motorman readily to see the switch. All track switches are equipped with parallel throws, which is a decided improvement over the regular or jack-knife type of switch.

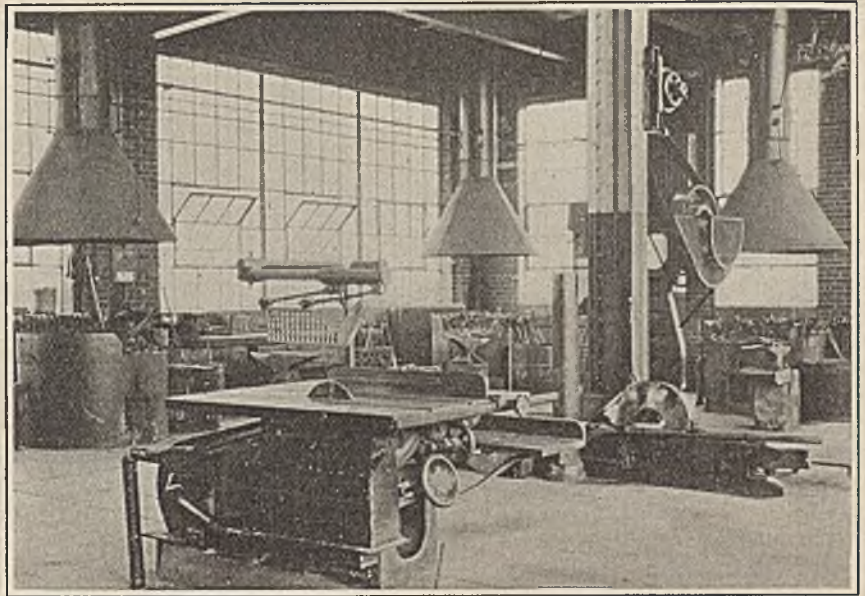
Elimination of possible injury to employees, such as motormen, brakemen, machine runners, scrapers, etc., from contact with cables has been accomplished on all cutting machines and gathering motors by equipping them with rubber-covered concentric cable. All frogs, switch points and guard rails throughout the mine are guarded with hardwood blocks to prevent an employee getting caught in them.

Twenty-seven men at the mine have been trained in the use of self-contained breathing apparatus, and thirty-eight men have received first-aid instruction. These men were trained by official instructors from the U. S. Bureau of Mines.



Slogan, Where Acts Are More Eloquent than Words

At Windsor the slogan, "Safety at All Times" in letters 3 ft. high decorates the shop buildings, but all such admonitions would be regarded as superfluous advice and as shifting the burden of accidents onto the employees were not the company taking the medicine it recommends by spending money and effort freely to make every part of the plant as safe as safety methods can make it.



Blacksmith Shop Light and Clean with Moving Parts Guarded

At Springdale the blacksmiths and carpenters work in a scrupulously clean shop with no dark spots and with all machinery protected. This promotes cheerfulness and a proper sentiment toward safety. The man who finds his comfort considered develops toward the company such a spirit of friendliness that a counsel of safety meets hearty response, as experience has often proved.

The mine is examined each morning by firebosses before the men enter the mine for the day's work, and is examined again by the firebosses while the men are at work. These examinations are very thorough. Each working place must be visited twice daily by a certified fireboss and the date and time of each visit must be marked in each working place. No miner is allowed to commence work without a visible proof of such a visit having been made.

During these visits, the fireboss makes a record of all dangerous conditions which are found, such as gas, bad roof, insufficient clearance, direction and quantity of air currents and general conditions in the mine. In addition to these visits by the firebosses, the mine is inspected at least twice daily by the mine foreman, the assistant mine foreman and by the safety inspector, whose duty it is to attend to general safety conditions within the mine.

The machine shop, where all general repairs for the mine are made, is 100 per cent guarded with standard wire mesh and special guards. The supply yard is kept clear and free of any accumulation of dirt or debris of any kind.

With a view to greater effort for safe operation, a rock-dusting machine has been installed and is now being tested in the mine. It is the hope of the management that rock dusting will prove to be safer and cheaper than sprinkling, which is the customary practice.

The workers have shown an active interest in all manner of safety educational propaganda placed in their hands in a continuous stream, yet they absorb it and are 100 per cent sold, probably largely because the "boss" leads the way. Let the "boss" lead, and to him goes the credit of operating a mine with safety. Well organized safety methods have caused a splendid reduction in the severity of accidents in year 1924 as compared to year 1923 at Logans Ferry mine.

"It can be done—It has been done!"

Windsor Mine, located at Power, W. Va., was a later year's acquisition and is operated to furnish coal to

the Windsor Power Station. This non-gaseous bituminous coal mine produced 554,175 tons of coal from the Pittsburgh, or No. 8, seam, here 4 ft. thick. It has now been developed to a rated capacity of approximately 3,000 tons per working day.

From the start of operations, the physical conditions of this mine have been unfavorable and the accident record has been made worse by bad roof. This coupled with a high labor turnover and the mixed class of labor available for employment made safety methods, of course, more difficult to apply. During the year 1923 the work of correcting unsafe physical conditions went on steadily with a result that thousands of feet of new timbering were erected to guard unsafe places in the roof and prevent possible rock falls. Mechanical equipment has been guarded according to standard regulations. Tracks have been straightened and repaired and new tracks laid where needed; switch throws have been set back a safe distance, and countless other provisions have been taken to increase safety in operation.

Another good move was removing obstructions and loose material in the yard and painting the buildings. Much effort is now being expended in keeping the property neat and orderly.

This mine is of the non-gaseous type, and, although ample ventilation systems have been installed for some time, additional air shafts have been sunk to increase the supply of safe, fresh air. The use of black powder was recently abolished, and only permissible explosives now are allowed. Safety trolley poles have been installed on mine locomotives which when removed or displaced from the wire can be replaced by the motor-man without leaving his seat.

A study of the accidents showed that a number of cases were caused by downright carelessness on the part of the workers, and to improve this condition an intensive educational campaign was planned. The first effort took the form of a motion-picture show.

The men and their families were invited to enjoy this entertainment which was followed by pictures showing



Safety Standard

The captain of the safest team has his pennant nearest "Old Glory."

dangerous and safe methods of coal mining. Officials of the company were introduced, and short friendly talks started the campaign "right side up." A new brand of educational propaganda was started in the shape of what is now known as the West Penn Safety Dollar, new types of posters and bulletins were designed, posted on the bulletin boards and changed frequently.

One of the effective methods of educating the workers and reminding them that safety is the paramount consideration is the slogan, "Safety at All Times," painted in letters 3 ft. high on the shop buildings.

EVERY POLE CARRIES A MESSAGE

Another advertising stunt of note was the painting of varied slogans on every trolley post in the mine yards, which reminds each employee at every turn of his head. Next the mine forces were divided into teams, each team captained by an assistant mine foreman who is responsible for the safety of his men. Every lost-time accident charged to his team amounts to the same as a black mark, and now every captain is doing his level best to prevent accidents. He is not only watching his men, but educating them to safe methods of performing their work.

Another outdoor safety rally was held, with an attendance twice as large as that at the first meeting, and great enthusiasm was expressed when the team captains were presented with special symbolic pennants which were raised to the top of a 60-ft. steel pole in the order in which each team stood.

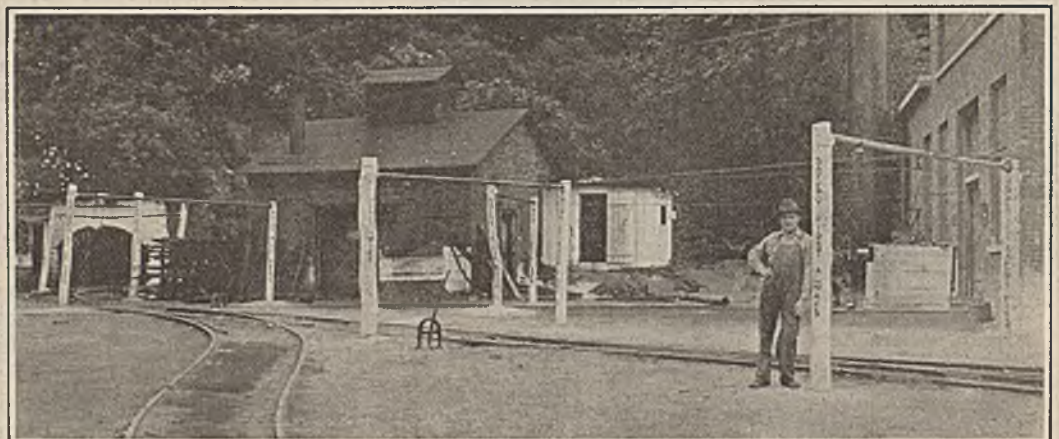
The pole was erected in the village where all could watch the flags which are changed as team records are shattered by accident. A third and last outdoor rally was held during September in celebration of this mine having gone through the thirty days producing a maximum tonnage of 4,500 tons per working day, with but three accidents causing loss of time.

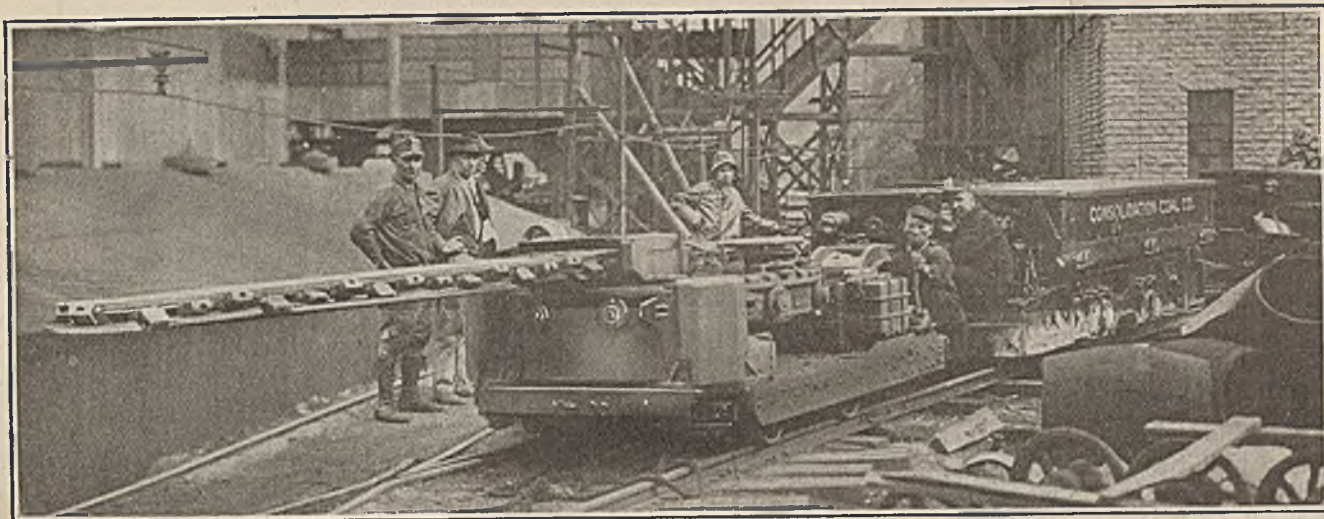
Several noteworthy results have come directly from the campaign being waged at this mine, viz.: To the date of this writing 576,635 tons of coal have been mined during 1924. The severity of the accidents has been reduced fifty-seven per cent in the year 1924, as compared to the experience of the year 1923. Permissible explosives are now used exclusively, lower insurance costs are anticipated, a number of first-aid teams have been organized, and every employee is becoming interested in "safety." Once again we have proved that there is some truth in the statement:

"A mine can be as safe as the owners, operators, and workers want it to be."

Slogans on Trolley Poles

Let us read the slogans for you from right: "Practice Safety First," "Safety First Always," "Think of Your Family," "Make Yourself Safe," "Safety Is Our Motto," "Hot Wire," "Think and Act Safely," "Work Safely," "Safety Today Insures Tomorrow," "It Pays to Be Safe," "Watch for Trip."





Power Plant Travels with Cutting Machine

Mine Cuts and Hauls Coal with Battery Power

Advantages Derivable from Use of Batteries to Drive Locomotives and Coal Cutters—Mules Used for Gathering—Will Apply Battery Equipment to Bailing and Sprinkling Car, Small Pumps and Air Compressors

By J. B. HICKS

Assistant Superintendent, Power Department,
Consolidation Coal Co.,
Fairmont, W. Va.

THE Consolidation Coal Co. has applied storage batteries to various uses. Its first use of such equipment was in open-light mines and on gathering locomotives. This venture proved successful, and it now has fifty such locomotives.

Its success with battery locomotives in open-light mines led it to conduct experiments in gaseous mines with the straight storage-battery type of locomotive and this it still continues to use. Each locomotive is equipped with a battery of approximately 55 kw.-hr. capacity. With this size of accumulator from 80 to 110 cars are gathered per shift. Each car averages 3.5 tons of coal, the empty car weighing 2 tons.

The number of cars gathered per shift varies with the mining and haulage conditions in the section worked, depending on the grades and on the direction and length of haul. Some of these locomotives are equipped with a meter which records the daily mileage of the locomotive. With this instrument, a record can be kept of what the locomotive is doing, and the distance traveled per car handled. Information thus obtained can be used to determine the necessity for a change in the haulageways.

The energy necessary to gather a car under the company's system of mining is approximately 0.75 kw.-hr. The average total distance traveled per shift of 8 hr. is about 18 miles.

After demonstrating that the gathering of coal in

NOTE—Paper read at the Welch meeting of the West Virginia Coal Mining Institute, entitled, "Electrification of Gaseous Mines by Storage Batteries."

The coal-cutting machine and power plant shown in the head-piece are always together. When the cutter works it receives its energy from the storage battery. The same battery supplies energy to transport the power truck and cutting machine from one room to another. All this equipment is supplied with 250-volt energy so that the machines can be interchanged with the ordinary mine apparatus.

gaseous mines with battery equipment has advantages, the company turned to the problem of cutting coal with energy supplied from batteries. Experiments were conducted by taking a sufficient number of gathering locomotives in the mines and connecting their battery cells in series to give 225 to 250 volts. The mining machine used was the arc-wall bottom-cutting type with standard 250-volt direct-current motor equipment.

The reason for using a sufficient number of cells to give the proper voltage for the motors, was to avoid making any changes in the motor equipment of the coal cutter. Thus all machines are standard. If occasion demanded a transfer of a coal cutter from a mine where it had been operating from a power truck, to a mine where the power is supplied from a feeder or trolley wire there would be no need to change the circuits of the machine.

When conducting the test on the machine with the battery, readings of the ammeter and voltmeter were obtained. These were useful data when ascertaining the size battery required for the work. A trial power truck was built and operated for about one year, proving that the coal cutter operated with the battery current was more dependable than the same type of machine taking its power from the trolley or feeder wire.

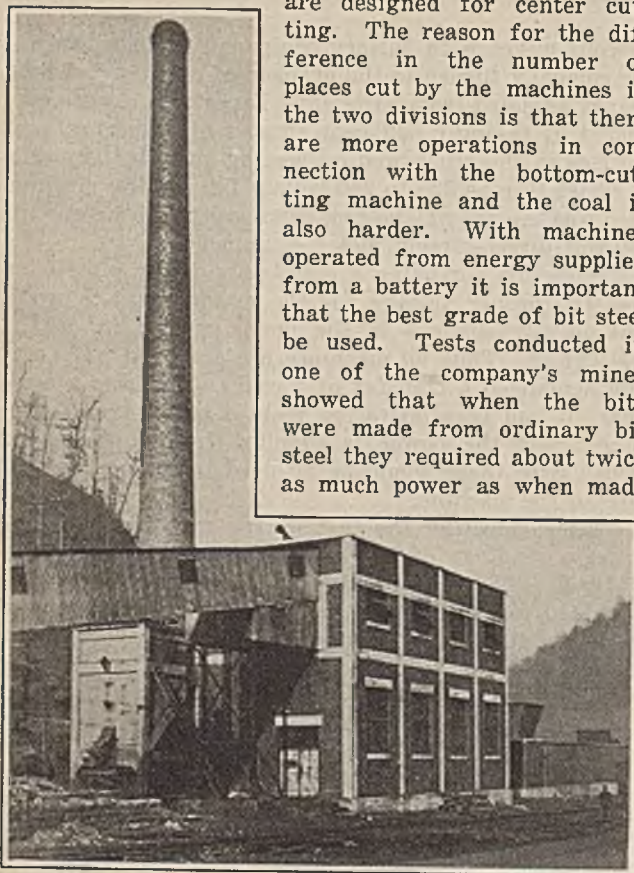
The power truck consists of two main parts, the chassis and the battery compartment. The chassis is propelled by a motor geared to both axles by worms and gears. The battery compartment accommodates 110 to 117 cells. Mounted on it are the headlights, switches and fuses for lights, ampere-hour meter, service receptacles and 3 three-point fuses.

One fuse is in the positive line of the battery, one in the negative line and one in the positive battery lead

arranged to protect the machine service receptacle. The battery compartment is insulated on sides and ends with skid-type rubber insulators. This type of insulation has been found preferable to porcelain and has decreased the breakage of jars and trays. One of the service receptacles is used to furnish power to the motor in the chassis, the other to furnish power to the machine. Near the machine service receptacle is a short chain attached to the chassis on the end of which is a hook. This hook is fastened to the cable by a special clamp, that prevents undue strain being imposed on the machine service receptacle. The machine is operated through the cable in the same manner as from a feeder wire, the end of the cable being fitted with a plug for connection with the receptacle.

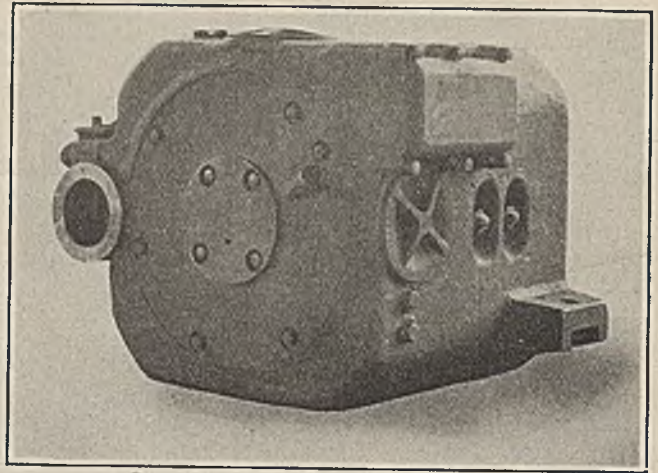
The capacity of the battery is approximately 91 kw.-hr. In the Pittsburgh seam of the Fairmont field, about 4 kw.-hr. is required to make a cut under the coal 7 ft. deep by 12 ft. wide. In the Pocahontas field, seam Number 4, about 2.8 kw.-hr. is required for making a 6½ ft. undercut 11 ft. wide. The average number of places cut in the Fairmont field over a period of five months was seventeen places, the largest number cut in one shift was twenty-two. The average number of places cut in the Pocahontas field over a period of two months was twenty-seven, the largest number thirty-six, with sufficient capacity left in the battery to cut ten to twelve more places.

The machines in both divisions are of the arc-wall type. In the Fairmont field the machines are of the bottom-cutting type, and those in the Pocahontas field are designed for center cutting. The reason for the difference in the number of places cut by the machines in the two divisions is that there are more operations in connection with the bottom-cutting machine and the coal is also harder. With machines operated from energy supplied from a battery it is important that the best grade of bit steel be used. Tests conducted in one of the company's mines showed that when the bits were made from ordinary bit steel they required about twice as much power as when made



Modern Small-Sized Power Plant Has Large Battery Charging Load

This new power house supplies steam direct to the mine-fan engine of the Consolidation Coal Co. mine at Coalwood, W. Va. Battery locomotives reduce peak loads on power plants because the batteries are recharged at periods when most other equipment is idle.



New Motor Used in Gassy Mines

This is the type motor used on the haulage locomotive which receives its operating energy from a 110-kw.-hr. storage battery. The motor is wound for 250-volts direct current.

from a higher grade of steel. The two tests were made with the same machine and in the same section of the mine. Thus, it can be seen that a saving in labor for bit sharpening and in energy consumption, will be effected by the use of a high-grade steel. All machines use pick-point bits.

The power truck with which the company first experimented is still in use. This unit has been in service about 20 months and has cut a total tonnage of 100,362 tons. More coal would have been cut had the mine worked full time. The battery at the present time shows but slight signs of depreciation. Places have never been shut down because of battery trouble or lack of capacity.

It is difficult to say definitely what the life of the battery will be in this kind of service, but judging from the condition of the cells the batteries are less than half worn out. It might be asked, "What would happen to the battery in case of a collision or other haulage accident to the power truck?" Unfortunately there has been one such experience. The result was a broken-end frame on the chassis of the truck. Five cell jars were broken by the fracturing of the porcelain insulators, pieces of which punctured the trays, cracking the jars. Examination of the battery showed no signs of arcing at any place. The electrolyte ran out of the cells but did not get on any of the wiring of the power truck, as it is protected by a solid sheet of iron under the entire bottom of the battery compartment.

The power truck was designed to be used in connection with the mining machine only. It is used to pull the machine from place to place. The wiring is so arranged as to make it possible to use the power from the battery on the truck motor and machine motors at the same time, if desired. We do not permit this truck to be used as a locomotive for shifting loads or empties. It is the duty of all foremen to see that the roads are clear for the machine before leaving their section.

Some of the advantages to the machine operator when energy is supplied by a power truck are as follows: (1) The men ride to and from work thus making the work easier and saving their time. (2) In case of trouble with the machine it can be brought to the motor barn more quickly than a man can walk out to call the electrician. (3) Men stay in the mines when there is trouble with a machine, they know they do not have to walk in and out to hunt repairmen, and

that the machine will be repaired quickly. (4) The machine makes unnecessary the hardest work of cutting which is dragging the machine conductor cable. (5) It eliminates all delays due to power interruptions. (6) It saves the time spent in tracing wire circuits, after a roof fall, to see where the wire is broken. (7) It eliminates the time lost in hunting broken bonds and making temporary repairs. (8) The machine cuts faster from the battery than when fed by a cable due to the ever-present and constant high voltage. (9) It eliminates all the time that is lost in hunting for short pieces of wire with which to extend lines a few feet in order to cut a place. (10) The machines are moved from place to place by the power truck. (11) Headlights on machine and power truck enable men to work faster and more safely.

The advantages to the company are as follows: (1) It is possible to use electricity in gaseous mines. (2) The tonnage per machine may be increased thereby reducing the number of machines per ton. (3) Less houses have to be constructed for the accommodation

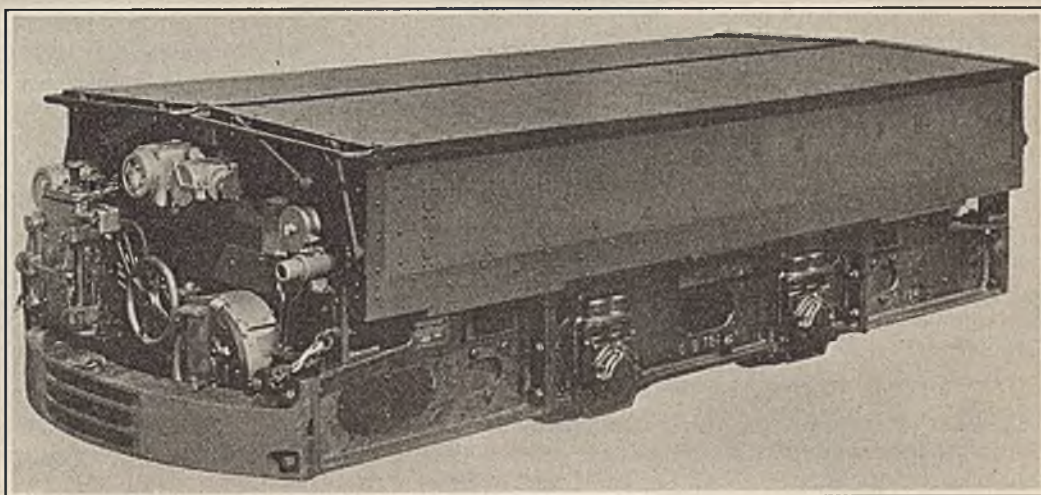
equipment each time the trolley is moved. (13) Greater efficiency is obtained from both men and machines. (14) First-class machinemen will always be available for these machines. This means less trouble with the cutting and lower maintenance costs. (15) The expense of lubrication is reduced. (16) The loss of tonnage due to power interruptions is eliminated.

STORAGE BATTERY ON LOCOMOTIVE

Another application of the storage battery is to the haulage locomotive, which consists mainly of three parts, the chassis and two battery compartments, one being used on the locomotive while the other is being charged. On the chassis are located the controller, resistance, brake mechanism, headlights, headlight switch and fuses and two 250-volt direct-current motors. The controller is of the series-and-parallel type. The resistance is entirely inclosed. The brake is of the screw type and the headlight is of the approved pattern. The motors are of the box type, wound for 250-volt trolley service, no changes being made in them

Power Unit

The Mancha power truck. It looks like a locomotive but is not. It is a power plant on wheels. The battery mounted on the chassis supplies energy to drive a coal-cutting machine and also to haul it from one room to another.



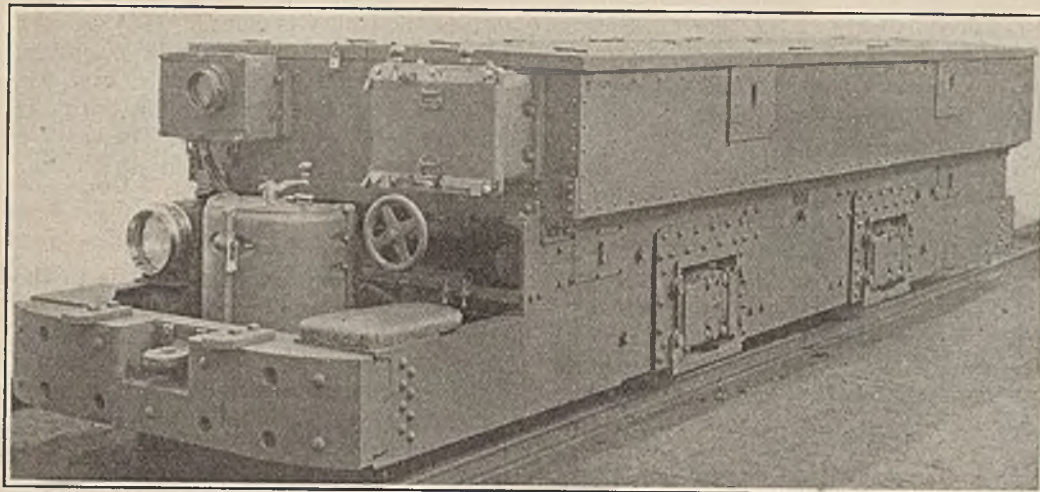
of machine men. (4) The repair work is done in the motor barn where it will be under better supervision at all times and where the repairmen will have the proper tools to work with. In consequence there are fewer breakdowns on machines and better workmanship. (5) Removing all wire circuits from the mine greatly reduces the fire hazard. (6) The use of the machine eliminates many bit boys, wiremen and one repairman. (7) It reduces peak power loads, thereby lowering the demand charge. (8) As the voltage is always that for which the machinery is designed, the armature and field coil do not fail. This helps to hold down the repair costs. (9) The removal of wire circuits from the mine makes it much safer for men, mules and material. (10) The use of the machine eliminates the purchase and installation of wires and bonds, and so saves the cost of maintaining them. (11) Copper wire is no longer covered by rock falls, nor are any short and left-over pieces for the making of splices buried by falling roof. With the use of trolley wires and rail bonds copper is often lost when bonds are cut off and consequently are not recovered as scrap. With storage-battery power, bonds are not required. (12) Loss of insulators due to non-recovery when moving wire from one section to another is eliminated, also the breakage of recovered insulators due to handling. The use of storage-battery equipment also saves the loss of trolley-wire hangers which is sustained with the ordinary

for use with batteries. The proper voltage is obtained by using sufficient cells to give the desired potential. The motors drive through single-reduction spur gears.

Each of the battery compartments accommodates 117 cells of 110 kw.-hr. capacity. Mounted on the end of the battery compartments is the housing for the ampere-hour meter, running receptacle, three-point fuse and switch boxes. One of the fuses is in the positive line of the battery and the other in the negative. The only electrical connection between the chassis and the battery compartments is through the running receptacle.

By the use of the two battery compartments the locomotives give continuous service, one battery being charged while the other is being used. As the changing of these battery compartments requires about 6 min. the loss of time when the change is made is inconsiderable. The battery is removed by the use of specially designed lifting racks, each operated by four hydraulic jacks. The jacks under both racks are connected to a pump in such a manner that it is possible to use any one at will.

The locomotive is 19 ft. 2½ in. long, 70 in. wide and 50 in. high above the top of the rail. The wheel base is 70 in., the diameter of the wheels 26 in. and the full-load speed 5½ m.p.h. The locomotive was placed in service Jan. 30, 1924, replacing three air locomotives. A decided saving in labor resulted and an increase of



Main Haulage Locomotive

All the coal is gathered by mules in the gaseous mines where this locomotive is used, but the main haulage work is done by this locomotive which is operated by storage batteries.

tonnage from 700 to 1,050 tons per day. This locomotive is at present hauling an average of 425 cars daily, serving seven side tracks. The mine cars with their load weigh about 8,400 lb. The cars are of the double-bumper type, some with plain bearings and others with the roller type.

The round-trip distance of each section is as follows:

	Ft.		Ft.
1—L. M. W.	7,400	1—L. M. E.	7,600
1—R. M. W.	5,300	2—L. M. E.	8,000
2—L. M. W.	9,600	1—R. M. E.	6,600
2—R. M. W.	10,300		
			54,800

The average round-trip distance traveled by the locomotive is 7,828 ft. The average time required to make each round trip is 23 minutes. The number of cars hauled per trip varies from 10 to 40. This wide variation is due to the fact that in some sections the pillars are being drawn with but few men employed on them.

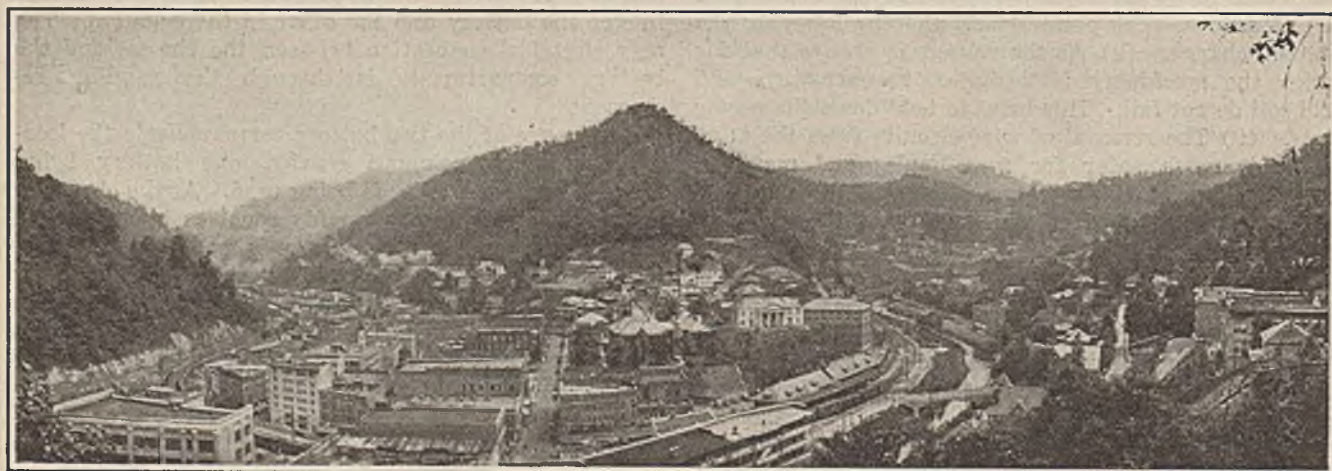
SOLITARY LOCOMOTIVE PROVES WORTH

The energy required for one round-trip per car is about 0.374 kw.-hr. The grade against the loads in some places runs from 1 to 1½ per cent, and in other sections the grades against the empties run about the same, so that in working out the capacity of the battery, all figures were based on level track.

This locomotive has proved most dependable. It is the only locomotive in service in this particular mine, the gathering being done by mules. During its 10 months of service, there has been no loss of tonnage.

It may be asked: "Does it not require specially trained superintendents and mine foremen to get satisfactory results from the storage-battery equipment?" This I will answer by relating the experience at the Consolidation Coal Co.'s mines. The mine management where the storage-battery equipment was installed consisted of mining men of long experience with trolley locomotives and cutting machines which took energy from a trolley wire. They state that during the ten months of service of this battery equipment, there have been no delays from power interruptions, and obviously no falls of slate, however small, have knocked down the wire, for there is no wire; and furthermore no bonding has had to be repaired for there are no bonds. All repair work is done in the motor barn under proper supervision. The superintendent and foreman of this particular mine feel that were they asked to choose between the battery equipment and the trolley equipment they would much prefer the batteries.

A part of the equipment described has been approved by the U. S. Bureau of Mines. The remainder is now being presented for approval. The company has completed tests on three other battery applications which will be put in service as soon as approved type motors can be obtained for them. These applications are made to a bailing and sprinkling car, gathering pumps, and portable air compressors, the last of which are to be used for the drilling of overcasts and ditches.



Welch, Western Gateway to Pocahontas Region

Bluefield at the eastern and Welch at the western end have grown rapidly as a result of the development of the Pocahontas coal field. Here the Tug Branch runs into the Elkhorn Creek to form the Tug River. Lack of space between the enveloping hills has made the Welch citizens erect many-storied buildings. The West Virginia Mining Institute met this year in Welch.

Little Steam Locomotives Once Hauled Coal Underground

Back in 1870 First Steam Unit Went to Work for Wilkes-Barre Coal & Iron Co.—First Air Locomotive Appeared in 1882

THE mine mule put up a long fight to maintain himself as the chief motive power for underground haulage in coal mines. Finally, however, he succumbed in large measure before the onslaughts of electricity. First he met—and often conquered—steam. This contest began in 1870 when the Wilkes-Barre Coal & Iron Co. bought from the Baldwin Locomotive Works the first two steam mine locomotives to be employed in the mines of this country. Then, beginning in 1882, he met compressed air. Because the mule emitted no flame and not much gas to endanger the mine and because he almost never ran out of air on a grade, he held his

stances, in order to obtain proper clearance, it was necessary to make the outside cross section of the tank cone shaped, that is, to draw it in sharply at the top instead of making it semi-circular, as in the ordinary construction.

In 1877 the Baldwin Locomotive Works built for the Plymouth Cordage Co., of Massachusetts, a small four-coupled locomotive operated by compressed air. The results obtained with this machine, the first compressed-air locomotive for industrial purposes, made it apparent that similar performance could be obtained by the use of compressed air as a motive power in mines. Such a locomotive was of especial advantage where the ventilation was poor and where danger from explosive gases was present. In other words, no possible danger could be experienced in the use of this medium, and the exhaust of the machine aided ventilation. Many mines already had air compressors installed to supply their pneumatic tools and this curtailed installation expense.



First Steam Mine Locomotive

This type of machine for underground haulage was delivered to the Wilkes-Barre Coal & Iron Co. in 1870, marking the beginning of steam's effort to win a place in coal-mine transportation. The locomotive weighed 7 tons, had a tractive effort of about 3,000 lb. and could haul, approximately, 180 tons on a level.

own pretty well against both steam and compressed air until the electric locomotive came along about 1890—but that's another story.

The competition between the mule and steam started as an experiment in 1870 when the first two steam mine locomotives were delivered to the coal company for use in anthracite operations. The contracted limits of the mine passages then employed made it necessary to use inside cylinders with center-crank axles. The general dimensions of these first steam locomotives for mine haulage were as follows: Gage of track, 3 ft., 6 in.; cylinders, 9-in. diameter and 12-in. stroke; driving wheels, 30-in. diameter; weight, in working order, about 14,000 lb.

The tractive effort developed ranged from 2,800 to 3,000 lb., but as the resistance of mine cars varied from 10 to 40 lb. per ton of weight it is difficult to estimate their exact hauling capacity. Under favorable conditions, however, it would be safe to say that one of these engines would haul on a level from 175 to 180 tons of cars and lading and on a one per cent grade from 75 to 80 tons.

The success attending the use of these locomotives was such as to open up a new field of development, and for the next twenty-five years frequent demands were made for these units. Where the mine passages admitted proper clearance, outside cylinders were always used, and locomotives with four- and six-coupled driving wheels of this construction were commonly employed.

Saddle tanks were invariably used but in some in-

The first compressed-air mine locomotive, in the United States, was built by the Baldwin company for W. H. Brown Sons, in 1882 and placed in the "Old Eagle" colliery on the Monongahela River about 27 miles above Pittsburgh. This machine was of somewhat peculiar construction. The available height above the rails was only 5 ft. 10 in. The air reservoirs were two in number, placed side by side, 36 in. in diameter and 22 ft. long. They carried a pressure of 400 lb. per sq.in. which was reduced to a normal working pressure of 50 lb.

The gage of track was 3 ft. 7½ in.; the cylinders were of 9-in. diameter and 14-in. stroke; driving wheels were of 28-in. diameter and the weight in working order was about 16,000 lb. This machine was guaranteed to haul a load of 50 tons, cars and lading, on a grade of 100 ft. per mile.

The locomotive is said to have done the work of twenty mules and hauled a load of 60 tons, supposed to be cars and lading, up a grade of 1.9 per cent. Another record states that the engine hauled a load of 30 tons on a grade of 1 per cent for 3 miles with one air charge. In the latter statement evidently, the net load is referred to.

The compressed-air locomotive had many virtues, chief of which was its safety in mines. For that reason it has continued to serve in a few underground developments where its speed and power displaced the mule. It lasted longer, in underground coal mining, than did the steam locomotive, but neither steam nor air was capable, alone, of completely ousting the mule.



News Of the Industry



Acceptance of Wage Cut Seen as Best Resolution Miners' Union Could Make

Contention That Non-Union Fields Would Cut Deeper Shown to Be
Untenable—Shift in Business Bears Marks of Permanency—
Discipline Needs Tightening

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Since this is the time of year when good resolutions are in order it is suggested in unprejudiced quarters that about the best resolution the United Mine Workers could make in their own behalf would be to accept a reduction in wages. About the only resolution that the operator in union territory can make is to pledge himself to die game. His destiny is in the hands of others.

Thus far the union has held tenaciously to its policy of what it terms no backward step in the matter of wages. Each suggestion from the operators that it would be better for the worker, as well as the employer, to accept a wage which would permit of operation has been met with the reply that such a course simply would invite an additional cut in the non-union field. To accept any wage reduction, the union has contended, would simply mean the hole in the dike through which the ocean might enter.

Non-Union Wages at Bottom

Whatever may have been the danger heretofore, there now are unmistakable signs that wage reductions in the non-union fields have proceeded as far as they can. Further cuts probably would mean loss of labor to other industries. Sight frequently is lost of the fact that the non-union operators must compete with other employers of labor.

The United Mine Workers have won as favorable concessions in the matter of wages and working conditions as ever have been obtained by any one group of employees in the world. Nevertheless, the sincerest friends of the organization concede that their present position is one calculated to cause great concern. There is no comfort for the members of the United Mine Workers when the market is being lost to their employers.

The shift of business at this time is not a temporary one such as is brought about during a strike. It is partaking more and more of permanency as the number of long-time contracts placed with non-union producers increases. If the process continues uninterrupted for another six months a large proportion of the country's coal business will be nailed down by the non-union operators for the period of those contracts.

It is significant that within two weeks the non-union operators of the Connellsville region have found it necessary to reinstate the 1920 wage scale. While it is true that this is not as high as the union scale in the Pittsburgh district, it is the non-union equivalent of the Pittsburgh scale. This step was taken by the Connellsville operators to hold their men against the increasing competition of the steel industry.

With immigration reduced so materially it is obviously only a question of time until the surplus of coal-mine labor will be converted into a deficiency. The pull of employment demand in industries of the North has been strong enough to draw negro labor in increasing numbers from the far South. It will exert itself just as irresistibly in the Virginias and in Kentucky if the level of wages there really falls below the level in other industries in the North. In former years one-third of the workers in coal mines were drawn from the stream of immigration. The native born do not take so readily to this work, which means there is a very definite limit beyond which wages cannot be cut in the non-union fields.

Wage Cut Seen as Good Business

With the situation shaping as it is at present it would seem that the union would be doing only the businesslike thing in accepting a reduction to the scale of April, 1920, or even to that of November, 1919. This would mean the difference between employment and unemployment for thousands of men.

Even if the union will not consider a reduction in the wage scale there are various other good resolutions that it could adopt by way of demonstrating that some of the criticisms of trade unionism do not apply to the United Mine Workers. It very properly could be resolved to rout out every trace of restriction of output, every trace of sabotage, interference with the admitted rights of management, button strikes and petty stoppages of the kind that made Alexander Howat and his Kansas district notorious.

This would seem to be an appropriate time for the management of the union to resolve to regain its hold on

2,000,000 British Workers To Ask Higher Pay

Skilled and unskilled workers in the United Kingdom are preparing to make a concerted effort early in the new year for an all-around increase in wages, it is understood.

The industries affected will include mining, engineering and shipbuilding. The employees concerned number about 2,000,000, and the claims, it is estimated, will aggregate about £100,000,000 a year.

The group of engineering and metal trades, involving about 500,000 men, want a flat £1 increase, the shipbuilding workers ask about the same rate of increase, while the miners will fight for a uniform minimum wage of 12s. per day.

discipline, which has been relaxed greatly since the days of Mitchell. The members of the union might resolve to abandon fraudulent claims for compensation, and the presentation of imaginary grievances. The leaders might resolve to muster more courage and turn down such claims regardless of political consequences.

No better time ever existed to resolve to build up a respect for the sanctity of contracts by observing them to the letter. The United Mine Workers as an institution has suffered from the fatty degeneration of the prosperity of the period from 1916 to 1920. If order and discipline and the faithful observation of contractual obligations can be reinstated in the rank and file, the present period of disintegration can be turned to one of healthy soundness.

There is evidence that the serious minded among the leaders of the union realize that they must re-establish the organization's reputation for good faith. To get a name for contract breaking is to discredit the whole labor movement. Mr. Lewis has done well, all agree, in his effort to discipline the Pittston miners in anthracite district No. 1. His action will be supported by the entire conservative element in the union. The Pittston case is only one of many instances.

Since the union has not risen in the past to its full measure of responsibility, its sincere friends think of many practical resolutions which it might adopt at the beginning of 1925, looking to higher standards of efficiency among its members and in working to reduce costs of production, thereby making it possible for union employers to retain those markets that rightfully belong to them.

Dawes Plan Brings About New Problems in British Export Coal Business

Great Britain's export coal trade will be compelled to reckon with new conditions on account of the arrangements under the Dawes plan and the London Agreement for the delivery of reparation coal, which, according to the British Information Service of the Bankers Trust Co. of New York, differ materially from the arrangement under the Versailles Treaty and Spa Agreement.

Some of the more important points of difference are the following: By the treaty of Versailles a limitation of ten years was imposed on the delivery of reparation coal to France, Belgium and Italy. This limitation for all practical purposes now has been removed. Under the Versailles Treaty Germany was placed under the obligation to deliver to those three countries definitely specified annual quantities of coal up to the end of June, 1929, when these deliveries would cease and complete freedom be restored to Germany.

Those terms were modified by the Spa Agreement, which fixed the total quantity to be delivered in any one year at about 20,000,000 tons distributed proportionately between Belgium, France and Italy. No quantities or periods are fixed under the Dawes scheme. The programs of reparation deliveries are to be varied from time to time according to circumstances, and apart from this program Germany is given economic freedom to make the best commercial use of her coal resources.

The arrangements made in pursuance of the Dawes plan also changed the price principle governing the delivery of reparation coal. Under the Treaty of Versailles the price to be paid for overland delivery was the German mine-head price to German nationals, plus the freight to French, Belgian, Italian or Luxemburg frontiers, provided that the mine-head price did not exceed the mine-head price of British coal for exports; and for sea delivery the German export price f.o.b. German ports, or the British export price



Tipple of Bowen Coal & Coke Co.

Located at Freeman, Mercer County, West Virginia. Mines the Pocahontas No. 3 seam, which here is 5 to 8 ft. thick. Coal is prepared on shaking screens and picking tables.

British ports, whichever might be lower was to govern.

This principle, which operated very prejudicially over a long period to the British coal export trade, while France, Belgium and Italy gained enormously, is improved by the Dawes scheme; first, because of the attempt to establish a gold standard in Germany, and secondly, by the laying down of the principle that deliveries must be made by means of commercial contracts passed under ordinary commercial conditions. A gold standard will not only prevent the depreciation in the value of the mark, from which the countries receiving reparation coal benefited in the past, but it also will tend to raise the level of prices in Germany.

In the third place, Germany, under the new arrangements, is placed in a more favorable position for the exploitation of her coal resources for export purposes. It is pointed out that France is now producing practically as much coal as she did in 1913; not only so, but her output, which in pre-war years had been almost stationary, is increasing so that it bids fair to exceed the pre-war maximum of 41,000,000 tons.

In Belgium also the present rate of production is said to be greater than that of 1913. Therefore neither country is in great need of German coal, although France requires an adequate supply of coke for the iron and steel industries in Lorraine. It is pointed out that Germany also has a surplus production at present. While her present production of 130,000,000 tons is 60,000,000 tons below that of 1913, still this much reduced output is beyond her requirements and will continue to be so until the present depression in the iron and steel and other coal consuming industries of Germany is overcome, so that it is expected that Germany temporarily will have a surplus of coal for exportation. The Dawes scheme places no obstacle in the way of the export of this surplus coal.

Under these conditions British coal export trade is said to be facing the probability of considerable competition from Germany, in which competition Germany will be helped by a longer working day in the mining industry and the lower cost of production.

Sales of Electric Locomotives Lag Behind Last Year's

Shipments of mining and industrial electric locomotives, collected from nine firms, comprising practically the entire

industry, for the quarter ending Sept. 30, 1924, as compiled by the Department of Commerce, with a comparison for the quarter ending June 30, 1924, are as follows, totals also being given for the nine months' period ending Sept. 30, 1924, and for the year 1923:

SHIPMENTS OF ELECTRIC LOCOMOTIVES

Type of Locomotive	Quarter Ending Sept. 30, 1924		Quarter Ending June 30, 1924	
	Number	Value	Number	Value
Mining locomotives:				
Trolley type.....	99	\$477,612	98	\$486,493
Storage-battery type.....	41	227,526	36	162,353
Total.....	140	\$705,138	134	\$648,846
Industrial locomotives:				
Trolley or third-rail type.....	2	\$6,070	9	\$150,112
Storage-battery type.....	6	27,332	12	69,714
Total.....	8	\$33,402	21	\$219,826
Type of Locomotive	—Nine Months, 1924—		Twelve Months, 1923	
	Number	Value	Number	Value
Mining locomotives:				
Trolley type.....	309	\$1,519,055	1,024	\$4,628,981
Storage-battery type.....	105	518,494	249	1,291,885
Total.....	414	\$2,037,549	1,273	\$5,920,866
Industrial locomotives:				
Trolley or third-rail type.....	30	\$303,321	10	\$60,942
Storage-battery type.....	44	240,938	51	239,362
Total.....	74	\$544,259	61	\$300,304

Coal to the extent of 81,538,273 tons was used in connection with the manufacture of coke (not including gas-house coke) during 1923, according to the Bureau of the Census report. Similar figures covering other industries are as follows: Wood preserving, 216,622 tons; paper boxes, 240,849 tons; cement, 8,444,609 tons; men's collars, 29,549 tons; leather, tanned, curried and finished, 2,029,993 tons; brass, bronze and copper products, 794,372 tons; machine tools, 173,704 tons; screw-machine products, 37,641 tons; textile machinery, 138,356 tons; manufactured fuel, 577,239 tons; brushes, other than rubber, 27,163 tons; lime, 965,210 tons; baskets and rattan and willow ware, 10,525 tons; window and door screens and weather strips, 5,945 tons; wool shoddy, 49,785 tons; flax and hemp, dressed, 18 tons; jewelry, 15,814 tons; safes and vaults, 25,845 tons; emery and other abrasive and polishing appliances, 57,901 tons; signs and advertising novelties, 40,763 tons; confectionery, 353,136 tons; ice cream and water ices, 292,014 tons.

Pinchot Message Expected to Touch on Coal Prices

Governor Pinchot of Pennsylvania will read his biennial message to the Legislature this week, and this is expected to contain his views on present coal prices.

The 1925 Legislature, which convenes January 6, will probably see the usual run of legislation dealing with coal. The Scranton legislators will present redrafted bills bearing on the mine cave situation. There will be a bill providing that the mining industry is a public utility and therefore subject to the jurisdiction of the Public Service Commission. The Governor, himself, may touch upon this matter in his message. There also will be measures providing for the wiping out of the anthracite tax.

Governor Pinchot following the strike conference at Harrisburg in August and September, 1923, announced that he would bring about a reduction in coal prices through legislation. He called several conferences of governors, one of which was attended by three state executives, and as a result drafted a bill that was later introduced in Congress. Nothing ever came of it and it will not be pushed by the Pennsylvania Governor.

Consumption of coal in various enterprises during 1923 is shown by the returns from the census of manufacturers, now being made public. The returns made public during the past week show 1923 coal consumption by certain industries as follows: Printing inks, 31,911 tons; umbrellas, parasols and

Nova Scotia Wage Parley Adjourns in Deadlock

The conference held at Sydney, N. S., between representatives of the United Mine Workers and officials of the British Empire Steel Corporation to arrange a new wage schedule resulted in a deadlock on Dec. 31, the miners refusing to accept the cut of 10 per cent proposed by the company. The miners desired to negotiate on the basis of the present wage scale. Notwithstanding this disagreement the conference was not broken off, but was adjourned until Jan. 8. It is officially announced that the company will apply to the federal government for the appointment of a Board of Conciliation under the Industrial Disputes Act.

Defective Oil Heater Causes \$300,000 Fire

Fire, believed to have started in a defective flue leading from an oil furnace, according to the *New York Times*, destroyed the \$300,000 North Shore residence of Frederic N. Watriss, at Wheatley Hills, L. I., Jan. 1. Valuable furniture, paintings and rare books, including first editions of Joseph Conrad, were destroyed. Five fire companies were hindered in their fight on the blaze through difficulty in getting water, the hydrants on the estate having been shut off to prevent the freezing of the pipes. The fire broke out a little after midnight. At dawn all that was left of the house were a few smoking timbers.

Spanish Morocco Coal Output 355,333 Tons in 1923

During 1923 the Compania de Minas del Rif, in Morocco, the only coal mine in the Spanish territory of that country, produced 355,333 tons of bituminous coal, which was almost entirely exported to the mother country. The importance of this Moroccan production to the Spanish market may be gathered from the following figures showing the total coal production of Spain for 1923, as just published by the Mining Department at Madrid: Anthracite, 299,099 tons; brown coal, 359,503 tons; bituminous coal, 5,630,133 tons, a total of 6,288,705 tons as compared with 4,765,570 in the previous year. The largest Spanish coal-mining company, the Sociedad Hullera Espanola (with mines at Aller, Mieres, Lena and Quiros), produced 698,622 tons in 1923.

canes, 5,556 tons; iron and steel doors and shutters, 5,087 tons; aluminum manufacturers, 174,261 tons; reducing and refining of gold, silver and platinum, not from the ore, 6,135 tons; wool scouring, 39,095 tons; cash registers and calculating machines, 19,101 tons; boots and shoes, 410,785 tons; combs and hairpins, 5,586 tons; piano and organ materials, 39,341 tons; fountain and stylographic pens, 10,268 tons; artists' materials, 16,002 tons; aircraft, 10,042 tons; electroplating, 5,505 tons; wooden cigar boxes, 10,988 tons; organs, 4,533 tons; musical instruments other than pianos and organs, 7,698 tons; wool felt hats, 29,206 tons; plated ware, 63,628 tons.

Output and Value of Coal from West Virginia Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees				Average number of days worked
								Miners, etc., a	All others	Surface	Total	
Barbour.....	2,826,421	35,546	15,768	43,082	2,920,817	\$6,494,000	\$2.22	1,866	744	396	3,006	177
Boone.....	2,119,578	28,211	14,384	.....	2,162,173	5,321,000	2.46	1,662	823	537	3,022	130
Braxton.....	282,917	37,168	6,948	.....	327,033	780,000	2.39	308	123	78	509	170
Brooke.....	1,273,872	882,504	.....	.....	2,156,376	5,508,000	2.55	1,239	535	280	2,054	206
Clay.....	893,645	26,680	10,347	.....	930,672	2,352,000	2.53	584	247	202	1,033	167
Fayette.....	8,645,609	175,876	65,975	628,775	9,516,235	29,198,000	3.07	6,443	3,759	1,722	11,924	157
Gilmer.....	115,652	2,672	3,713	.....	122,037	295,000	1.95	64	26	21	111	167
Grant and Summers.....	118,990	1,655	6,706	.....	127,351	295,000	1.32	141	45	69	255	205
Greenbrier.....	669,275	53,874	1,877	.....	725,026	1,739,000	2.40	327	175	94	596	179
Hancock.....	700	2,892	.....	.....	3,592	13,000	3.62	16	5	3	24	70
Harrison.....	6,773,953	350,182	10,476	.....	7,134,611	15,647,000	2.19	4,617	1,895	1,110	7,622	158
Kanawha.....	5,671,369	82,459	26,351	.....	5,780,179	13,460,000	2.33	4,892	2,458	1,344	8,699	142
Lewis.....	52,923	22,307	.....	.....	75,230	170,000	2.26	126	46	30	202	112
Lincoln.....	310,678	1,574	1,753	.....	314,005	717,000	2.28	337	179	9	617	103
Logan.....	13,397,010	185,720	21,325	.....	13,604,055	34,115,000	2.51	6,807	4,493	2,311	13,411	172
McDowell.....	16,385,281	170,176	197,115	173,877	16,926,449	52,182,000	3.08	7,154	5,979	3,867	13,995	172
Marion.....	6,856,458	178,129	104,529	116,897	7,256,013	17,226,000	2.37	3,623	1,984	902	6,509	202
Marshall.....	1,140,203	555,882	26,827	.....	1,722,912	4,312,000	2.50	967	391	205	1,563	232
Mason.....	65,129	22,802	3,945	.....	91,876	241,000	2.63	132	44	32	208	117
Mercer.....	3,112,493	51,645	4,060	70,739	3,238,937	10,913,000	3.37	1,595	1,203	767	3,565	176
Mineral.....	403,502	6,355	3,781	.....	413,638	1,055,000	2.55	560	147	142	849	124
Mingo.....	3,949,279	42,658	33,574	.....	4,025,511	9,795,000	2.43	2,297	1,494	871	4,662	172
Monongalia.....	8,308,773	112,001	604	70,672	8,492,050	17,648,000	2.08	4,362	1,754	918	7,034	203
Nicholas.....	252,556	17,053	6,310	.....	275,919	760,000	2.75	284	125	78	487	137
Ohio.....	1,991,160	324,908	2,863	.....	2,318,931	5,830,000	2.51	1,165	332	224	1,721	235
Preston.....	1,665,455	210,443	16,378	159,294	2,051,570	4,746,000	2.31	1,773	728	467	2,968	161
Putnam.....	340,064	2,651	2,598	.....	345,313	1,178,000	3.41	481	196	84	761	155
Raleigh.....	9,013,149	152,048	82,622	.....	9,247,819	28,084,000	3.04	4,998	3,368	1,627	9,993	167
Randolph.....	606,475	15,838	14,923	68,830	706,066	2,214,000	3.14	438	131	83	652	148
Taylor.....	760,546	6,958	1,137	.....	768,641	1,599,000	2.08	802	294	190	1,286	108
Tucker.....	927,413	7,844	50,544	6,326	992,127	3,179,000	3.20	768	278	109	1,155	194
Upshur.....	932,047	49,774	9,122	.....	990,943	2,163,000	2.18	698	281	190	1,169	157
Wayne.....	195,191	565	2,397	.....	198,153	507,000	2.56	139	66	38	243	151
Webster.....	22,302	5,566	12	.....	27,880	94,000	3.37	39	17	11	67	169
Wyoming.....	1,812,638	18,750	9,940	.....	1,841,328	5,448,000	2.96	972	842	496	2,310	140
Total, excluding wagon mines.....	101,892,706	3,841,346	758,904	1,338,492	107,831,448	285,221,000	2.65	62,676	35,207	19,417	117,300	169
Wagon mines served by rail.....	68,493	.....	.....	.....	68,493	260,000	3.80	.....	.....	.....	.....	.....
Grand total.....	101,961,199	3,841,346	758,904	1,338,492	107,899,941	\$285,481,000	\$2.65	.....	.....	.....	.....	.....

(a) Includes also shotfireds.

Soviet Government Seeks Reform in Federal Control Of Coal Mining Industry

The Soviet Government of Russia, according to a Moscow dispatch, has appointed a commission to devise methods to reform the abuses of state ownership and management of coal mines. The troubles complained of are: (1) Expensive exploitation, for, though wages are abnormally low native coal is more costly than English or German; (2) excessive consumption at the mines; (3) inefficient distribution, as a result of which large stocks of unsold coal have accumulated in the Donetz region at a time when industrial concerns situated not far off cannot get fuel.

President Rykoff of the Council of People's Commissaries declares that despite the recent recovery in output the coal industry is the most inefficient of those which the state controls. Nevertheless he opposes an extension of private enterprise. The official press admits that the "New Economic Policy", devised by Lenine in 1921, has been only a qualified success in coal mining. This policy mitigated the rigid state coal ownership proclaimed on May 2, 1918. While some mines have since then been owned and directly managed by the state, some have been run by trusts founded with mixed state and private capital, but always kept under state supervision. Distribution is not free. Such coal as remains over after the state railroads and other authorities have been served is rationed among private consumers.

The Soviet Trade Commission in Berlin publishes a table of output since the year before the war. Figures for the Dombrowa fields are not given after 1914, as they fell into German military hands in 1915 and passed finally to Poland in 1919. Their output in 1922 was 7,054,950 metric tons, which exceeds the 1913 total attained when in Russian hands. The table is as follows, in metric tons:

	All Russia	Donetz District	Dombrowa District
1913	35,822,740	25,287,280	6,833,580
1914	35,755,900	27,583,920	3,865,680
1915	31,375,890	26,633,880	
1916	34,414,380	28,697,760	
1917	30,784,570	24,832,080	
1918	11,732,990	8,861,580	
1919	8,175,260	5,536,440	
1920	7,569,300	4,553,640	
1921	8,704,330	5,814,900	
1922	9,614,030	6,648,530	
1923	10,931,550	7,459,980	

If allowance be made for the output of lost territory, production in 1923 recovered to 38 per cent of the pre-war figure. That the loss of the Dombrowa coal fields does not necessarily mean a shortage of coal in Russia proper is shown by the fact that production in 1916 without Dombrowa reached 34,500,000 tons, whereas in 1913, including nearly 7,000,000 tons of Dombrowa coal, it was less than, 36,000,000 tons. Without Dombrowa, according to the Soviet inquiry of 1920 Russia has 474,180,000,000 metric tons of coal underground, and is fourth among the world's coal-owning powers.

Output reached its lowest point in 1920. In 1921 the "New Economic Policy" with its longer working hours and strict disciplinary methods toward



D. H. Barger

Pocahontas operator, banker and farmer of Virginia and West Virginia. Having been the first conductor of the Norfolk & Western Ry. south of Roanoke, he got in early in the mining game and has prospered greatly.

labor brought about an increase. Miners underground are now working 10 hours per day against 8 to 8½ in Germany. Consumption at the mines is reported as excessive, being in the last quarter of 1923, 17 per cent against 9.2 per cent in 1913. In 1920, when production was lowest, the percentage rose to 50. The number of coal-miners in the whole Republic in the first quarter of 1924 was 170,755, of whom 129,047 were in the Donetz district. In 1913, 160,400 miners were employed on the Donetz; in 1916, under war pressure, 235,000. In 1913 the yearly output per man was 149 tons, in 1920, 49 tons, and at present it is 84 tons. Wages in March, 1924, were 39.5 per cent below the average wage of skilled workmen in eleven leading industries.

Output of coke has declined much more than that of coal, and in 1920 almost entirely ceased. The figures in metric tons are:

1914	4,300,000	1920	9,800
1916	4,370,000	1922	112,333
1918	693,000	1923	130,000

Imports of coal and coke now are only a fraction of the pre-war volume. In 1913, 8,000,000 tons was imported mostly from England; in 1914, 4,773,464 tons of coal and 534,585 tons of coke. After the revolution imports entirely ceased; but revived in 1922 with 630,000 tons.

The Moscow *Pravda* publishes a scheme for the regeneration of the whole coal industry with the help of German engineers and coal-trade specialists. The original plan was to import 100 such Germans and to obtain 100,000,000 rubles worth of mining machinery and equipment from the Wolff Trust, Krupps and other big Western concerns. This plan broke down owing to the quarrel last May between the Soviet Trade Mission and the Berlin police, the result of which was a three months' mutual trade boycott. At present the shortage of capital in Germany is an obstacle to the resumption of the scheme.

Tax Deductions Judged on Merits of Each Case

A memorandum addressed to Deputy Commissioner of Internal Revenue Bright, under date of Dec. 17, 1924, and signed by the Solicitor of Internal Revenue, indicates that in the application of Art. 222 of the Income Tax Regulations, the deductions taken by each taxpayer are to be judged on the merits of each particular case, and the solicitor's Memorandum 2319, published in the Bulletin of the Bureau of Internal Revenue of Sept. 15, 1924, is not to be considered as a precedent.

This memorandum was written by the solicitor largely because of the facts presented to Acting Solicitor James C. Rogers by the Special Tax Committee of the National Coal Association in the conference with him on Nov. 12. Since it refers to a particular case under discussion and carries the name of the taxpayer, its text has not been made public. The gist of the memorandum was given to a representative of the National Coal Association by the commissioner's representative, and may be stated as follows:

(1) The solicitor's memorandum of Sept. 15, in which certain items claimed as expense by a coal company were disallowed because of the fact that they had a useful life of in excess of one year, referred to the particular case then under review and is not of general application.

(2) It was not the intention of the solicitor to set aside Art. 222 of the regulations.

(3) Each case coming before the Income Tax Unit is to be considered on its own merits.

(4) The fact that an item of equipment has a useful life of more than one year is not in itself proof that it is an item which must of necessity be capitalized. The fact that such equipment has a life of more than one year is in some measure a guide to the unit as to whether it is to be classed as a "major" or "minor" item of equipment as provided by the regulation in question.

(5) It is accepted that no hard and fast rule can be laid down by which the distinction between major and minor items may be determined. Due weight should be given to all pertinent facts in all cases under review.

Treasury officials state that the effect of this memorandum will be that in the audit and adjustment of returns and assessments the same full latitude of judgment will be permitted its conferees that existed prior to the issuance of the memorandum of Sept. 15, full weight being given to the provisions of Art. 222 of the Regulations.

Conditions are optimistic in southern Illinois despite the fact that here and there mines are still continuing to close down. The Peabody Coal Co. recently reopened the Burr Mine, near Carterville, employing 350 men. The Indiana & Illinois Coal Co. recently increased its working force 200 at its No. 10 mine, at Nokomis. Its Witt mine also is running again. The Saline County Coal Corporation also recently reopened its West mine, near Harrisburg, and thereby gave 350 men employment.

Preparations Afoot to Negotiate New Agreement For Anthracite Region

Scranton, Pa., Jan. 6.—Negotiations for a new contract between the United Mine Workers of the anthracite field, numbering nearly 155,000, and the operators are expected to begin in May or June, according to one of the local coal company officials. The present agreement between the workers and operators, which was drawn for two years, will expire on Aug. 31, 1925. There is much speculation concerning the outcome of negotiations. It is regarded as likely that the operators will request a reduction in present rates.

Leaders of the miners' union are preparing to fight for another advance for certain classes of workers and are now gathering data to justify the demands. In El Paso, Texas, several weeks ago, the presidents of the three hard-coal union districts conferred with International President John L. Lewis "on future policies of the organization." This conference is understood to have been called for the purpose of discussing a new wage and working contract.

The problem of assuring the operators that the new contract will be respected by the rank and file of the union will be a hard one for the union officials to solve. During the present contract period there have been hundreds of strikes in the anthracite field, all of which represented breaches of contract.

Nullifies Injunction Against Mine Guards in Logan

The Supreme Court of West Virginia has handed down a decision nullifying the injunction obtained by Attorney-General E. T. England from the Circuit Court of Kanawha County enjoining officials and coal operators of Logan County from maintaining the system whereby deputy sheriffs are paid through a fund raised by the operators. The decision of the State Supreme Court was based solely on the lack of jurisdiction of the Kanawha Circuit Court to issue such an injunction. The court found against the Attorney-General's contention that the statute empowered him to bring action in the name of the state in the county in which was the seat of government.

It was declared by the Court of Appeals that there was a qualifying clause in the statute and that an injunction could be brought only in the circuit court in the county in which the acts to be enjoined were taking place or were apprehended, or if the judge in that court were so situated that he could not act, then in an adjoining circuit. It was stated by the court that the Kanawha circuit was not an adjoining circuit.

A great many issues were raised by the Attorney-General in bringing the injunction suit and in seeking a writ of prohibition the question of whether or not a court of equity had jurisdiction was raised by the respondents in the injunction suit in taking an appeal. The court, however, took cognizance only of the question of jurisdiction of the Kanawha Circuit Court.

Oil Refinery Turns to Coal For Power Plant

Equipment for burning pulverized coal is being placed in the large oil refineries of Cosden & Co., Tulsa, Okla., according to information from the Southwest. This equipment will consume nearly 5,000 tons of coal per day. Experiments in the plant of this company, which owns its coal mines, these mines being operated by a subsidiary, the Seneca Coal Co., of Tulsa, it is reported, show that five and one-half barrels of oil are needed to do the work of one ton of coal, and that coal is the cheaper fuel. Coal has been found to be more efficient, as well, because it maintains a more uniform temperature.

Announcement also is made that Morris & Co., after extensive and thorough experiments, has decided to retire the oil-burning equipment in its Oklahoma City plant and go back to coal.

Cleveland-Cliffs Iron Co. To Sell Coal

The Cleveland-Cliffs Iron Co., of Cleveland, Ohio, has purchased the coal dock at Escanaba, Mich., owned by the Chicago, Milwaukee & St. Paul R.R. The dock has been operated only intermittently for several years but it is now planned to remodel it and to have the dock in readiness to operate by early spring. The dock has a capacity of 100,000 tons. The purchasing company plans to supply its Michigan plants with coal and at the same time to enter the wholesale coal business.

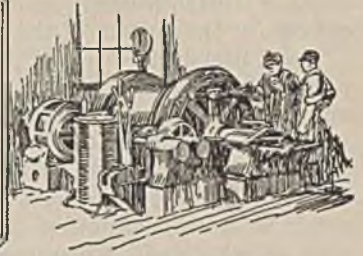
Coal Much Cheaper Than Oil, Plant's Figures Show

Some interesting revelations on the comparative cost of operation with coal and oil are contained in figures obtained by a New England manufacturing plant that gave up oil in favor of coal last year. The company carefully compiled its expenditures for fuel by both methods, which revealed a saving of \$36,139.55 when coal was used. The figures in detail are as follows:

1—Cost of Oil for 12 months ending Oct. 31, 1924—71,594 bbl.—actual cost.....	\$125,504.09	
Coal cost (assuming 3.86 bbl. oil is equivalent to 1 ton coal) 18,547 tons @ \$3.77.....	69,922.19	
2—Wages:		
OIL		
1 head fireman @ 54c. per hour—11 hr.....	\$5.94	
1 fireman @ 50c. per hour—11 hr.....	5.50	
	\$11.44 day	
2 firemen @ 50c. per hour—13 hr.....	13.00 night	
	\$24.44 per 24 hr.	
365 days x 24.44 =.....	\$8,920.60	
COAL		
Firemen—2 days and 2 nights as above.....	24.44	
2 men handling coal and ashes (1 day and 1 night) 12 hr. ea. @ 50c.....	12.00	
1 conveyor man (daily only) @ 50c.....	5.50	
	\$41.94 per 24 hr.	
365 days x \$41.94 =.....	\$15,308.10	
Allow for handling frozen coal.....	500.00	
	\$15,808.10	
3—Auxiliary Power:		
OIL		
Steam costs 38c. per 1,000 lb.		
Oil pump takes 2 hp. @ 125 lb. steam per hour = 250 lb. steam per hr.		
24 hr. per day x 250 lb. = \$2.28		
365 days x \$2.28 =.....	\$823.20	
COAL		
Steam costs 22c. per 1,000 lb.		
Forces draft fan steam consumption 75c. per hp. per hr.		
75 lb. steam x 50 hp. x 0.22 cost steam x 24 hr. = \$19.80		
\$19.80 x 365.....	\$7,277.00	
3 stoker engines @ 2.5 hp. each—7.5 hp.		
\$7.5 x 7.5 x 24 x 0.22 x 365.....	1,084.05	
Coal-conveyor motor.....	432.00	
Ash-skip motor.....	144.00	
	\$8,887.05	
4—Repairs:		
OIL		
Repairs on runners, etc.....	\$180.10	
COAL		
Stokers (4).....	\$1440.00	
Coal conveyor.....	600.00	
Ash skip.....	240.00	
	2,280.00	
5—Depreciation:		
OIL		
Oil equipment \$35,000.00 @ 6 per cent.....	2,100.00	
(Depreciation now provided for @ 4 per cent per annum)		
COAL		
Coal and ash handling plant and stokers		
\$90,000.00 @ 6 per cent.....	5,400.00	
SUMMARY		
1—Fuel cost.....	Oil	Coal
2—Wages.....	\$125,504.09	\$69,922.19
3—Auxiliary power.....	8,920.60	15,808.10
4—Repairs.....	832.20	8,887.05
5—Depreciation.....	180.00	2,280.00
	2,100.00	5,400.00
	\$137,536.89	\$102,297.34
Credit for ashes @ \$1.50 per 5-ton truck load		
2 loads per day = \$3 x 300 days.....		900.00
		101,397.34
Total cost with oil.....		\$137,536.89
Total cost with coal.....		101,397.34
Net saving per year, coal over oil.....		\$36,139.55



Practical Pointers For Electrical And Mechanical Men



Mining Company Repairs Its Lamp Batteries Whenever Defective

SELDOM is any attempt made in mine shops to repair the nickel-iron type of storage battery. It is difficult to open or reseal the nickel-iron cell unless the repair shop is specially equipped to do this work.

The central repair shop of the Pittsburgh Coal Co., at Library, Pa.,

cured in pairs by spring clamps. The wheel on which the cells are mounted is driven by a variable-speed motor and can be operated at any speed up to 600 r.p.m. This machine quickly rids the cells of the electrolyte.

A cell is opened by sawing the four sides of the steel container at a point

just below the welded seam which secures the cover. This is done by a 2-in. circular saw, the small table and guide of which can be seen on the bench at the right of the emery wheel, Fig. 1. The steel container cannot be used again, but the cover is not damaged, and after the welded edge is ground off on the small emery wheel it is ready to be welded to a new can.

After the elements of the cell have been renewed or repaired they are assembled in a new can and reinsulated. The cover is then welded on by the machine shown in Fig. 2. The oxyacetylene equipment is used to make the weld, the torch being supported by an adjustable bracket which is swung into position by the operator. The cell is moved and rotated automatically at the proper welding speed by a small electric motor. It is uncanny to watch the rack, which holds the cell, slide and twist around on the small metal table. Nothing can be seen driving it. The operation is accomplished by a small pinion recessed into the guide against which the rack is held by a pin extending from the table up into

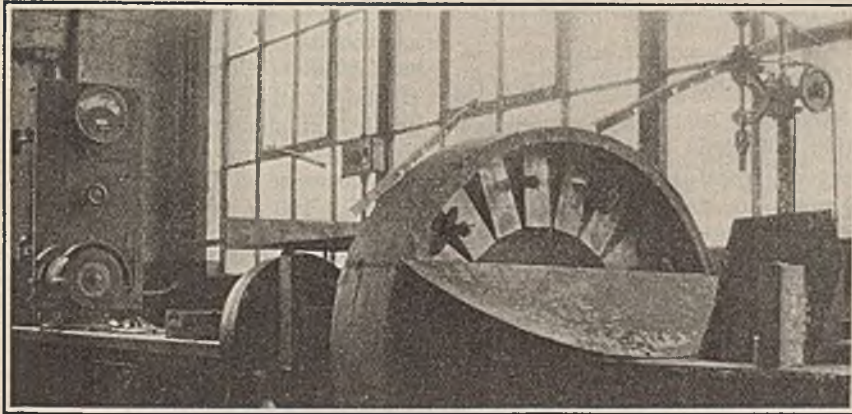


Fig. 1—Special Equipment for Repairing Lamp Batteries

Nuts are removed and replaced on terminal posts by the bench-type drill press on the right. A centrifugal drier with the cover opened to show the cells in position occupies the center of the picture. The steel cans are opened by a small circular saw, the guide of which can be seen on the bench just to the left of the drier.

is equipped for repairing the nickel-iron cells of electric safety mine lamps. A space about 20x24 ft. is devoted to this work. The center of this floor space is taken up by charging racks and the three sides by work benches and equipment. Four items of the special equipment are shown in Fig. 1. The small drill press, shown on the right, is used for removing and replacing the nuts of the terminal posts. It is belt-driven and equipped with a socket wrench instead of a chuck. The torque applied to the nuts is controlled by an adjustable friction.

The cells are then emptied and dried by placing them in the centrifugal machine seen in the center of the illustration. The cover of this drier is opened to show several of the cells in position. It holds twenty-four cells, these being placed with the tops toward the outside and se-

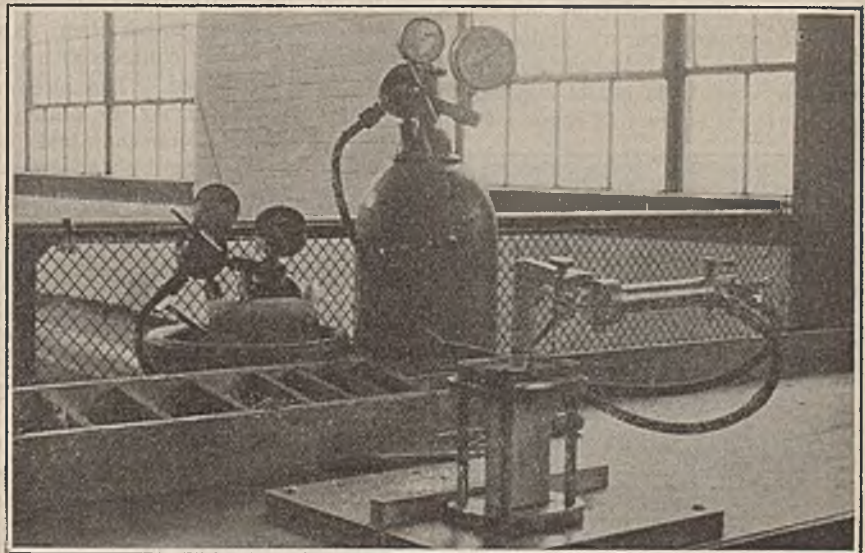


Fig. 2—Covers Are Welded in Position by Oxyacetylene Torch

The torch is clamped to an adjustable bracket and the cell swung into welding position by the operator. The cell is held in a rack which is moved and turned by a small motor. The driving mechanism being concealed, it is uncanny to see this rack travel and turn around on the table.

the hollowed-out bottom. The pinion engages teeth located around the outside, at the bottom of the rack.

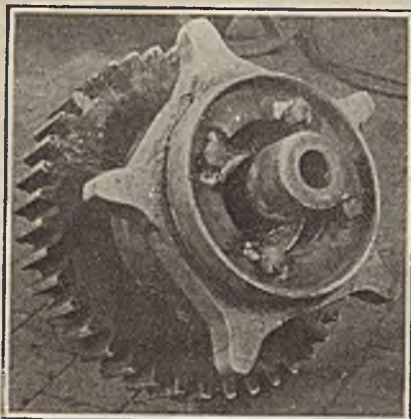
The Pittsburgh Coal Co. has approximately 15,000 electric safety mine lamps which use the nickel-iron type of battery. To facilitate the shipping of these batteries to and from the shop for repair, wooden shipping cases holding five batteries each are provided. When one of the mines accumulates five batteries which need repair, the Library shop sends out a case of five good batteries, and the mine returns, in the same crate, the five damaged ones. These batteries are immediately repaired and put into stock ready for shipment to another mine.

A rather surprising thing about

Bolt Heads Locked by a Bead Of Welded Material

Stud bolts and nuts are liable to work loose and this is especially troublesome when they are in inaccessible places. That is not a great handicap if the machine is being used where a mechanic is handy, but on a mining machine it is particularly annoying as it may be necessary to wait until the mechanic can be brought in and sometimes there is none at work at the time.

An easy way to correct this trouble is by the use of an electric arc-welding outfit. A globule or two of molten iron can be dropped on the side of the nut or bolt thus welding the latter to the piece being held. The illustration shows how the stud bolts, which hold the collar to the chain sprocket of a coal-cutting machine, are prevented from loosening by the application of globules of molten metal. A few light taps of a hammer on a cold chisel applied to these welded burrs will remove them



Bolts Locked in Place by Welded Bead

Careful observation of the bolts in the illustration will reveal the little dabs of metal that have welded them to the collar of the sprocket.

this repair work is the few parts which in some cases are recovered from the damaged cells. As explained before, the steel containers cannot be used again, and in many instances the covers are in such a condition that they too are useless. This means that when a battery requires a new positive element, the built-up cell is all new with the exception of the negative element, and possibly some small parts such as insulation, binding posts, etc. The question naturally arises: Why not buy new cells instead of repairing those that are in such bad condition? The reason is that the exact condition of a cell cannot be ascertained until after it is opened and carefully inspected.

so that the bolts can be unscrewed in the customary manner. This scheme is employed in the shops of the Island Creek Coal Co., at Holden, W. Va.

Convenient Cup-Forming Jig

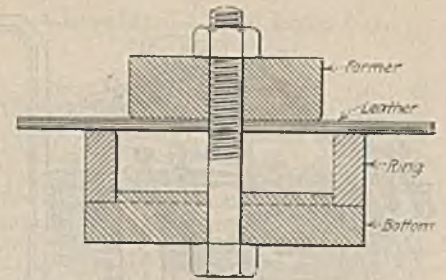
About the coal mines, as well as at other industrial plants, it frequently becomes necessary, or at least advantageous, to make at the plant the leather "cup-washers" used on certain types of pumps, in the dash-pots of Corliss engines and on other machines. In making such washers the forming jig shown in the accompanying illustration comes in handy.

This jig consists of five pieces all told—a bottom, a ring, a former, or plunger, a bolt and a nut. The three main pieces, namely, the bottom, ring and former preferably should be finished all over, although it is absolutely necessary to finish them only where they come in contact with the leather to be shaped. The outside diameter of the former, or plunger, should be less than the internal diameter of the ring by an amount equal to twice the thickness of the leather to be shaped.

LEAVE NO ROUGH EDGES

In use a hole of the proper size is first cut in the leather. This leather also is cut preferably to circular shape, although this is not absolutely necessary. It is then soaked in water until soft, after which it is placed in the jig as shown in the illustration and the former drawn home with the bolt. The jig with the leather in it should now be put in a warm place and the leather allowed to dry.

When the leather has been thoroughly dried out the protruding edge may be trimmed off with a knife or

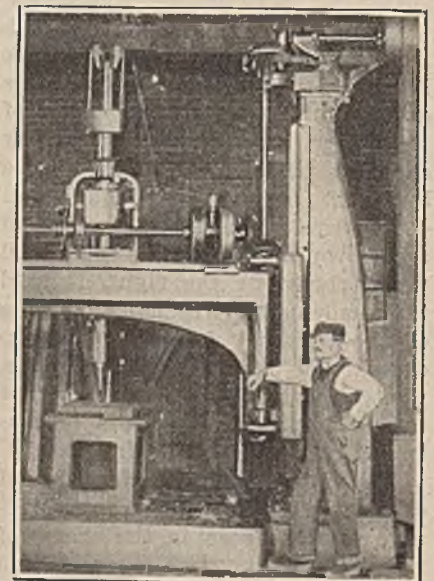


Cross-Section of Cup-Forming Jig

This shows the jig with the leather to be formed in place ready to be drawn into shape. After the leather has been formed, dried out and trimmed, the jig can be taken apart and the cup-washer slipped out. A jig of this kind will avoid delay in waiting for repair parts to be sent from the factory or the nearest supply house.

chisel, the jig taken apart and the formed cup washer removed. Making the forming cup of two pieces—bottom and ring—facilitates removal of the leathers.

Care should be taken, in making a jig of this kind, to round off the corners or edges of the parts across which the leather draws in forming, as otherwise this material is liable to cut, scrape or tear. The ring also should fit the boss on the bottom neatly but should not bind upon it. For a 6-in. cup a difference in diameter between boss and ring amounting to 1/100 to 1/64 in. is sufficient. The bolt should be long enough to give a full thread in the nut when the flat piece of leather is first placed in the jig, and the thread upon it should be ample to permit of forcing the former down tight to place. When using this jig the head of the bolt may advantageously be fastened in the vise while a wrench is used on the nut.



Drill Press in a Mine Shop

This mammoth machine is installed in the Barrackville, W. Va., plant of the Bethlehem Mines Corporation, a subsidiary of Bethlehem Steel Co.

Discussion

Big or Little Progress in Coal Industry?

Our Correspondent Reiterates His Belief That the
Introduction of the Rail and the Hoist Transcend All
Our Modern Contraptions and Gives His Reasons

I would hesitate to take exception to your excellent and intelligent review of my book were it not that you have developed a line of thought that I believe is of more than ordinary interest. The busy man of affairs, harassed with the problems of the moment, is prone to overlook certain obvious facts which the scribe, in duty to his readers, must delve into in considerable detail. And paradoxical as it may seem, I am constrained to class you with the busy man of affairs in this instance, rather than with the scribes.

With an almost uncanny prescience, you face up the widely separated pages 54 and 131 and sternly point an accusing finger to an apparent inconsistency. "He terms these revolutionary ideas," you say, "and prophesies their accomplishment, yet this is the man who, a few pages back, said the age of miracles was at an end, and that the revolutionary advances of the nineteenth century would never be equalled." And I have to admit that you make a strong case, though I must protest that the final decision must rest on one's individual interpretation of which is the greater miracle.

To me, this miracle occurred during the nineteenth century when we see the coal industry emerging for the first time from its long sojourn among the shadows. And I say this after a somewhat more than cursory reading of the past and a thoughtful study of what the future holds in store for us.

THE PAST VS. THE PRESENT

Let us make a psychological comparison, for the moment, of past and present miracles. A recent issue of *Coal Age* gives us the story of a great forward step in the science of mining, the installation of a four-mile under-ground conveyor system. On another page you tell us of a monster operation in Illinois vomiting coal at the almost incredible rate of a thousand tons an hour. If we may accept these things as symbolical of this egregious twentieth century, in which we are now living, it becomes proper to inquire as to just what importance the historian of a century hence will attach to them. I think you will bear me out in the assumption that a year from now these miracles of the moment will have become rather vague and in another decade they will belong to the forgotten past.

Is this true of those extremely crude but hard-won miracles of former generations? I think not. Take, for example, the time when the human brain had fertilized sufficiently to conceive the elementary idea of attaching thin

metal strips to the wooden rails then in use. Here was a miracle of such profound significance that a bard of the times was moved to record the event with the following whimsical lines:

God bliss the man wif' peace and plenty
That fust invented metal plates;
Draw out his years to five times twinty,
Then slide him through the hevenly gates.

No doubt the very able engineers of the H. C. Frick Coke Co. will be chagrined to see their masterpiece in coal transportation compared with such an astonishingly crude innovation of former times. But their very pre-eminence in this field of endeavor, only serves to bring the point home more vividly. And I trust I may not be misunderstood when I venture the assertion that the historian of 2001, viewing the development of the coal industry over the long perspective of that day, will devote substantially more space to the invention of the "metal plate" than he will give to our miracle of this day.

FUTURE HOISTING RECORDS

Nor do I think that he will find much cause for wonder at our miraculous hoisting record of eight thousand tons a day. In truth, I think he will even view our efforts with some compassion if we should succeed in doubling this or even increasing it to twenty thousand tons a day, though this thought rather staggers the imagination even in these sophisticated times. If we may assume the maximum hoisting capacity at the dawn of the present century at two thousand tons, even this rather stupendous figure is but a multiple of ten.

But what of the times when we were building up to this production of two thousand tons a day? Here is a period that seems bound to intrigue the interest of coming generations for all times. Peering back into this remote era we see a picture of women and children tolling their painful way up stepladders with a puny load of fifty or, perhaps a hundred pounds. Assuming that each of these may have transported five tons of coal in an eight-hour shift, it is at once apparent that four hundred persons would be required to raise the two thousand tons a day that was handled by a single hoisting engineer in the year of 1900. Please, Mr. Editor, observe that our multiple has increased from a figurative ten to an absolute four hundred.

Or turn, if you will, to Parker's curve showing the past and probable future rate of increase in production. If we may assume Mr. Parker to be reasonably correct as to the future—

and the chart appears to be running surprisingly close—our final maximum production will be only about ten times that output in the year 1900. A glance back into the performance of the epochal nineteenth century shows us an increase, not of tens or hundreds, but more nearly a *thousand!*

I should be the last to decry the splendid achievements of the present-day coal engineer, to which my own humble efforts have been dedicated, but I cannot permit this unconscious reflection on those hardy pioneers of other times to go unchallenged, puny as they may appear when measured in terms of the present day.

Athens, Ohio.

A. T. SHURICK,
Mining Engineer.

Pillars Left Crushed Easily When Weight Came

In your issue of Nov. 27, there is an interesting article by Alphonse F. Brosky on a partial longwall system of mining used by the Gay Coal & Coke Co., Logan Co., W. Va.

Figure No. 5 shows the operations are in drift mines but unfortunately does not give a profile showing the depth of cover overlying the coal. A profile along the 20th entry would be very interesting to some of your readers who might be tempted to try out the system.

On page 747 Mr. Brosky makes the following assertion: "Whether the thickness of the cover above the bed is 500 or 1,000 ft., the chain pillars between each pair of rooms serves its purpose with almost equal effectiveness."

It would be interesting to know how he arrived at this conclusion, as it is considered bad practice in longwall work at these depths to leave any pillars which might break the roof and prevent equal and uniform subsidence.

ROBERT HAMILTON,
Consulting Engineer.

Birmingham, Ala.

Asserts Superiority of Coke

Coal Age was recently in receipt of the following interesting letter: "In your editorial 'Manufactured Fuels Filling Need for Smokeless Coal' in the issue of Sept. 18, you make a statement about coke which is contrary to the results that have been obtained.

"You are correct in saying: 'Coke must be treated in the ordinary house furnace somewhat differently from anthracite.' Coke, on account of its greater porosity, requires much less draft, but when draft conditions are adjusted for the burning of coke, it has been found fully the equal of anthracite coal.

"For some time it has been the habit of unthinking people to say that coke burns out the grates and the firepot of the furnace. I have been using coke for nearly twenty years and have not yet had any difficulty with either firepot or grates. It is true that if you run a coke fire in a house-heating furnace like you do in a blast furnace, you can melt iron, but with proper regulation, there is no intense local heating in burning coke, nor is there any liability for damage to any part of the furnace. A coke fire may also be regulated to give off

a uniform flow of heat covering several hours duration without in any way entailing extra labor or undue attention.

"I also wish to take exception to your statement that coke is most successful in steam and hot water furnaces. Disregarding the amount of coke used in ordinary stoves, probably 75 per cent of all the coke used for house heating is burned in hot air furnaces. There are some types of furnaces which will not burn coke economically. For best results, therefore, a man who knows should inspect the heating plant before changing to coke. Such a demonstrator we have and his services are free to our present and prospective coke customers.

"I know that you always wish to state scientific facts and for that reason I am writing to call your attention to the mis-statements which you made in your editorial."

HARLAN M. CHAPMAN,
Assistant to the President.
Indiana Coke & Gas Co.,
Terre Haute, Ind.

In writing the editorial in question the idea kept in mind was not so much the possible efficiencies attainable by the use of coke as a domestic fuel as

the probabilities. Domestic fires are of necessity handled more or less unscientifically, frequently by more than one member of the family. It is but natural that at times such a fire will be forced to the limit and with a fuel possessing the excellent qualities of coke this may result in damage to the firepot or grate bars, or both. Inasmuch as the firepot of the steam or hot water furnace is surrounded, and consequently cooled by water its liability to damage is much less than that encountered with a hot air furnace.

One other detail of this letter should not go unnoticed, namely, that the Indiana Coke & Gas Co. regularly employs a demonstrator whose business it is to instruct customers and prospective customers in the proper and economical use of a fuel the excellence and possibilities of which are but little understood by the ordinary layman. This is a service that cannot fail to win results. It would probably pay many a coal company to follow a similar plan. Some have already adopted it and are now reaping its benefits, which are naturally most pronounced in times of depression when competition is keenest.—EDITOR.

justify any argument, as, with the degree of perfection that has been obtained for the electric cap lamp up to the present, both as to portability and illuminating power, the flame safety lamp eventually must be relegated to the "scrap heap," and this is said despite the fact that the flame safety lamp, for its usefulness and protection to the underground workers in the past, deserves a pedestal of honor in the annals of mining. Men who have had to do with the safety of mines have always recognized its safety limitations, realizing that a thin metal gauze and a fragile piece of glass usually marked the line between safety and extreme danger.

USE SHOULD BE LIMITED

The use of the flame safety lamp, in my opinion, should be limited to testing for explosive gas, and even then it should be placed solely in the hands of qualified men, firebosses, foremen and other officials. Turning it over to ordinary workmen, such as machinemen, for the intended purpose of making gas tests before cutting a place or to miners generally, for ordinary work, is a practice that should be discouraged. My experience and observation is that rarely, if ever, do such men seem to realize the importance of extreme care in handling the lamp. My experience with cutters is that the safety lamp usually is found on the bottom, behind the machine, in a dusty, dirty, greasy condition. I am willing to confess that I have frequently, while in charge of mines where this was the practice, smothered my conscience by turning over safety lamps for such use.

Furthermore, while we must as yet depend upon the use of the flame safety lamp in the hands of competent persons for the detection of gas, there is certainly no justification for allowing a safety lamp that can be opened by a key to be used in a mine either by miners, machinemen or shotfirers, or even by firebosses, foremen, inspectors and superintendents. We have sufficient indisputable evidence in recent catastrophes alone, to warrant this. I fail to understand where the difference in hazard lies between carrying a safety-lamp key and a pocketfull of matches. In fact the key obviously is of no use except in connection with the matches. In either case there is a ready access to an open flame, and this should not be permissible in a gaseous mine.

LOCK LAMP WITH MAGNET

Where it is necessary to use a locked safety lamp, the lamp should be magnetically locked, and the magnet kept in the lamproom on the surface. Firebosses and foremen frequently will contend that this is impracticable, as a fireboss may get in the dark while making his morning examination of the mine. This is a contingency that may be met by carrying a pocket flashlight, which will enable him to get to a safe place to attempt relighting his lamp by the inclosed friction igniting device, which, if given proper attention, should relight the lamp nine times out of ten.

SIM C. REYNOLDS,
Chief Inspector,
Aetna Life Insurance Co.
Pittsburgh, Pa.

Machine Should Stay in Room From Day to Day

I notice in the Dec. 11 issue of *Coal Age* under the report of the Coal Mining Institute of America's meeting in Pittsburgh, the following quoted as being statements made by me:

He said he had had in mind developments of this kind for twenty years, but felt sure that they were foredoomed to failure so long as the operators insist on maintaining their present room-and-pillar methods. Now that the longwall system is receiving tardy recognition, his company is preparing to supply the necessary machinery.

This statement is absolutely contrary to my views and to what I said. The room-and-pillar system is the proper and only known system under many conditions; therefore the Jeffrey Manufacturing Co. has developed machinery to promote concentrated mining, where the room-and-pillar system is preferable. I have never advocated longwall systems, or, in fact, any kind of a system in particular, but I have laid down as an underlying principle that the machinery must stay in the same place shift after shift, regardless of what system local conditions may require.

ACTUAL WORDS QUOTED

The following is an abstract from part of the paper read:

The question under discussion is, "Is underground mechanical loading a success," and this can be truthfully answered "No, not so far, but soon." I, for one, learned more than fifteen years ago, the reason why coal was not loaded with machinery, although a great number of very good machines were built from time to time. I found the reason to be due to delays; it is not possible to load coal with machinery unless the machines are kept in the same working place, not only the whole shift, but shift after shift. The mine operators could not see this; they said, "You must make loading machines to suit our mines, we cannot make the mines to suit the machines," and the result is that coal is still loaded by hand. During the last two years, however, many operators have begun to realize that they must arrange the mines so that the loading machines can work in the same place shift after shift. This being the case, I have designed a line

of machinery intended to facilitate concentrated mining. This machinery could have been designed and put on the market many years ago, but it was not done because there was no market for loading machines except those that were built to move from one room to another. I had tried in 1908-1909 to make such a machine pay, and failed, not due to the design of the machine, but to the fact that it was impossible to provide places ready to load in, and particularly, cars to load into. Nothing further was done in the loading-machine line until quite recently.

N. D. LEVIN,
Chief Engineer, Mining Department,
The Jeffrey Machinery Co.
Columbus, Ohio.

Give Safety Lamp Only to Authorized Men

The article by D. Harrington which appeared in *Coal Age* recently, disapproving of the flame safety lamp for use in mines except for gas testing, will no doubt receive approval of many mining men who have given thought to the dangers which arise in mines from the general use of that safety appliance. Many of us, who perhaps would not care to go as far as Mr. Harrington in condemning the use of open lights in any mine, even in nongaseous mines, readily will agree that the flame safety lamp is potent for danger in the presence of explosive gas, unless in the hands of a thoroughly competent man, one fully aware of its safety limitations.

SERVED TWO PURPOSES IN PAST

For a period of roughly a century the flame safety lamp served two distinct purposes: First, it was a means of detecting the presence of explosive gas in mines. Second, it was an illuminator to enable the miner to see his work and, notwithstanding the fact that other devices have been proposed, and, to some extent, used for the first purpose, the flame safety lamp is still indispensable for gas testing. As an illuminator, however, little can be offered in its defense, perhaps not enough to



Production And the Market



Continuance of Winter Weather Strengthens Prices And Demand in Coal Market

A heavy snowstorm which blanketed a large portion of the country during the past week caused a fair pick-up in coal demand in some sections, particularly the Middle West, Northwest and Southwest. The Cincinnati market also felt a notable brace, though the other Ohio markets noticed little change. Atlantic coast markets at least held their own or better, but New England and Pittsburgh still wallow in the slough of despond, seemingly unaffected by the advent of seasonable weather.

Prices developed a markedly shifty tendency, a number of big jumps being in evidence, but these were almost counterbalanced by slumps in other marts. While the net gain did not amount to much, quotations show a considerable increase in firmness, shading of circulars being less in evidence and fewer "no bills" are reported. Although export business is nothing to boast of, much comfort is felt over the practical doubling of that class of activity at Baltimore last month as compared with the previous month.

Hard Coal Market Position Better

The position of the anthracite market has improved under the impetus of snappy weather and a heavy snowfall. Chestnut still is in the van as to demand and price, closely followed by stove. Egg and pea are difficult to move; in fact some of the latter is being put in storage. Steam sizes are somewhat firmer and move more easily. Rice is scarcer than buckwheat or barley—due to the outlaw strikes in the northern anthracite field. Independent prices exhibit little change, but the undercurrent of sentiment is that their present position is none too secure.

Coal Age Index of spot prices of bituminous coal again advanced a point last week, standing on Jan. 5 at 172, the corresponding price for which is \$2.08. This

compares with 171 and \$2.07 respectively on Dec. 29.

Activity at Hampton Roads registered a slight further falling off during the holidays, dumpings of coal for all accounts during the week ended Jan. 1 totaling 327,951 net tons, compared with 331,913 tons dumped during the preceding week.

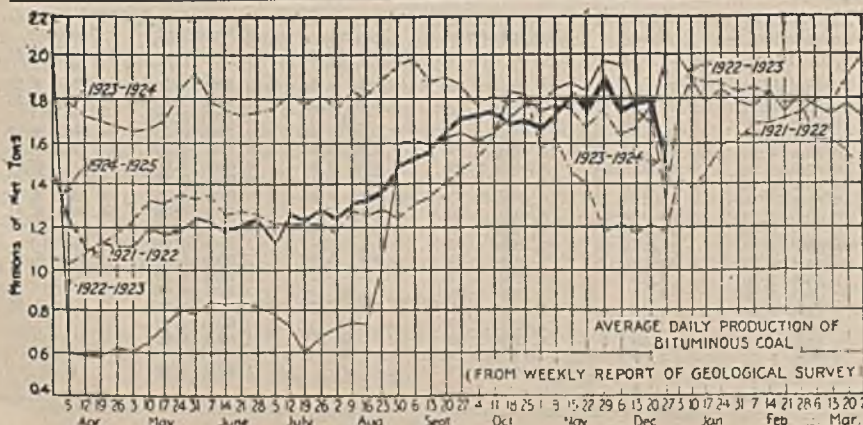
As is usual during Christmas week, there was a pronounced falling off in the production of bituminous coal during the week ended Dec. 27, figures by the Geological Survey indicating an output of 7,638,000 net tons. This compares with 10,760,000 tons produced in the previous week and 6,713,000 tons in the corresponding week of 1923. The holidays also caused a sharp drop in the output of anthracite, the total for the week ended Dec. 27 being 1,029,000 net tons, compared with 1,867,000 tons in the previous week and 1,196,000 tons in the corresponding week a year ago.

Output Fell Away in 1924

Soft-coal output in 1924, according to the preliminary estimate of the Geological Survey, was 467,700,000 net tons, though the Survey adds that final figures usually show the preliminary total to be from 2 to 3 per cent too low, which would indicate that the total may be as high as 480,000,000 tons. This is a decrease of nearly 100,000,000 tons from the 1923 total, when 564,157,000 net tons was produced.

Anthracite production for last year up to Dec. 27 was 89,320,000 net tons, compared with 93,020,000 tons in the corresponding period of the previous year.

Cumulative dumpings of cargo coal at lower Lake Erie ports for lake shipment during 1924 were 22,972,784 net tons up to Dec. 27, a decrease from the corresponding period a year ago of 6,816,099 tons, or 23 per cent. Dumpings during the season just closed, however, were greatly in excess of those of 1922 and 1921.



Estimates of Production

(Net Tons)		
BITUMINOUS		
Week Ended	1923	1924
Dec. 13	9,936,000	10,723,000
Dec. 20	10,543,000	10,763,000
Dec. 27	6,713,000	7,638,000
Daily average	1,343,000	1,521,000
Cal. yr. to date	564,157,000	467,700,000
Daily av. for year	1,788,000	1,520,000
ANTHRACITE		
Dec. 13	1,947,000	1,772,000
Dec. 20	1,925,000	1,867,000
Dec. 27	1,196,000	1,029,000
Cal. yr. to date	93,020,000	89,320,000
COKE		
Dec. 20 (a)	256,000	219,000
Dec. 27 (b)	223,000	210,000
Cal. yr. to date (c)	17,869,000	9,563,000

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

Midwest Business Continues Good

Markets of the Middle West continued strong during the past week and prices stiffened on many coals of Illinois and Indiana. The holidays, which reduced output; the storms which handicapped transportation temporarily in certain sections, and the general industrial pickup, which raised steam demand, combined to give the market the best tone it has had in almost a year.

The volume of smokeless coal available in the Middle West tended to keep prices from increasing much, although good Pocahontas mine-run pushed itself solidly up to \$2 without passing that price, which has been the top of the quotation range for some time.

Continued cold weather has pretty well cleaned up the steam sizes in the southern Illinois field. Up to New Year's

even there was plenty of lump and egg available. Williamson County was selling egg at \$3 and lump for \$3.25 and Franklin County prices were 25c. higher. No. 1 nut ranges from \$2.75 to \$3. Railroad business is fairly good though cars are beginning to show shortage.

In the Duquoin field conditions are somewhat similar and prices are about at the independent price figures of the Carterville field. Screenings are in demand everywhere and range from \$1.75 to better than \$2.

St. Louis dealers all report good movement of domestic coal, mostly of medium and cheaper grades, with advance orders for January on higher grades of Carterville and some movement of anthracite, coke and smokeless.

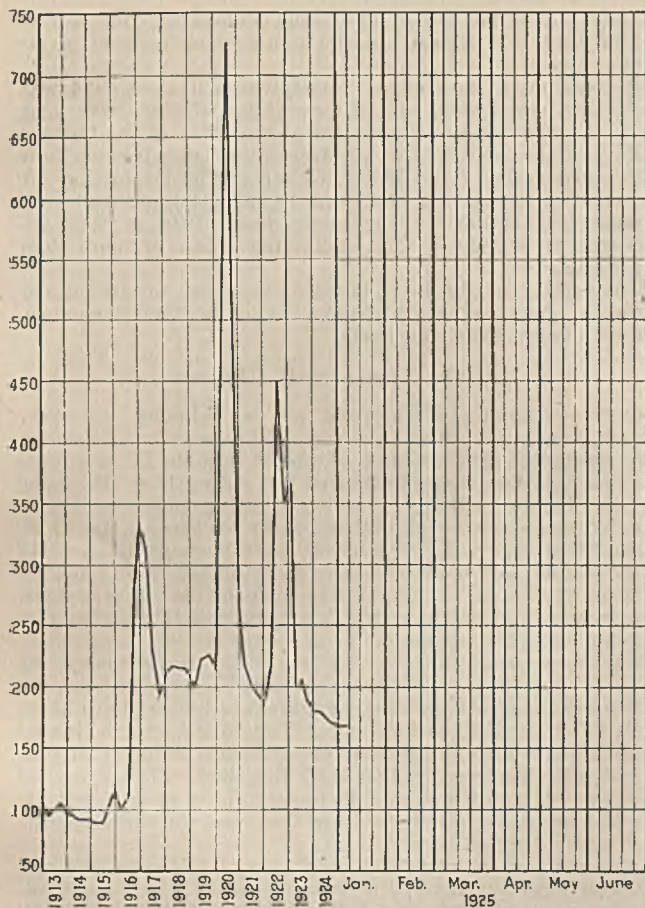
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Table with multiple columns: Market Quoted, Jan. 7 1924, Dec. 22 1924, Dec. 29 1924, Jan. 5 1925. Rows include Low-Volatile, Eastern; High-Volatile, Eastern; Midwest; South and Southwest.

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

Table with columns: Market Quoted, Freight Rates, Jan. 7, 1924 (Independent, Company), Dec. 29, 1924 (Independent, Company), Jan. 5, 1925 (Independent, Company). Rows include Broken, Egg, Stove, Chestnut, Pea, Buckwheat, Rice, Barley, Birdseye.

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



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

	1925		1924	
Index	Jan. 5	Dec. 29	Dec. 22	Jan. 7
Weighted average price	172	171	170	182
	\$2.08	\$2.07	\$2.06	\$2.20

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.

is available. Local wagonload steam is exceedingly good and carload is brisk. Country steam shows some activity but nothing unusual. There is no change in local prices.

Kentucky Prices Steady

Severe zero temperatures over Christmas and holding through the end of the week have resulted in heavy consumption of coal in Louisville over the past few days, which means that while there has not been much improvement in immediate demand, consumption is cutting stocks in the hands of consumers, retailers, heating plants, etc.

Due to the fact that a few sleepers have been sold at good prices there has been a lot of talk in the local market indicating higher prices and naming \$3 and upward on block coal. However, block coal from both the eastern and western Kentucky fields is being quoted at \$2.25@\$.2.75, with a few specialty coals going as high as \$3.

While the curtailment of production has eased conditions in regard to unsold or distress coal, there is still plenty of coal available and too many people are willing to sell to make it possible to push the market to any extent. Curtailment has made for firmer screenings at \$1@\$.1.25 in western Kentucky and 90c@\$.1.10 in eastern Kentucky. Lump in either field is \$2@\$.2.25, and mine run as low as \$1.35, but with best grades at from \$1.50 upward.

Northwest "Snaps Into It"

Pocahontas is again the feature of the Duluth market as it has been practically exhausted, and hard coal is expected to come into demand in the near future. The winter has been especially severe.

The market is unchanged in both hard and soft coal. Soft coal is booming but prices have not advanced. The docks are still working overtime and the trade shows every indication of booming instead of dropping off. Of course, there is the holiday lull at present, but everyone expects the trade to resume with more pep than ever after the holidays.

Hard coal has started to move in small lots, and the movement probably will increase with the progress of the winter. The price is holding firm and coal men say that there are sufficient stocks on docks to carry the Northwest throughout the winter.

Coal now is moving very freely from Milwaukee docks, and the clerical forces of the larger corporations are working overtime. A succession of cold waves with record-breaking temperatures has driven consumers to the coal offices with orders of winter size coupled with appeals for immediate service. The docks are well supplied, and there is no hint of scarcity; but if January and February should match December's close, stocks that seem ample would soon melt away. Dealers say they would not object to a forced clean-up.

West Is Busy Too

Operators of the Southwest are snowed under with orders as a result of continued cold weather, and would be enjoying the sensation, novel to this season, were it not for the fact that loss of working time, due to holidays and inclement weather, is partly responsible for it. Mines, with orders which would justify operating full time, in the last week have worked only from 50 to 60 per cent time, while operators are from a week to ten days behind with deliveries.

Arkansas semi-anthracite lump is quoted at from \$5.50 to \$6.75; mine run, \$3.50 and screenings \$2. Screenings are almost unobtainable, and the cold weather has not yet been of sufficient duration to create a demand for lump, users of which stored heavily in the early fall. Henryetta (Okla.) lump is \$5.50; nut, \$4; mine run, \$3.25, and screenings, \$2.

Conditions in the Colorado coal market for the week ending Dec. 27 have been very materially improved, in fact it has been one of the best weeks that the operators have enjoyed for a period of years, due to the severe cold weather that prevailed throughout Colorado, Nebraska, Kansas, Oklahoma, Texas and the Dakotas. Increased demand is largely attributed to the gradual depletion of the storage coal. A great many operators are booked far into the latter part of January for delivery. Steam sluggishness has largely disappeared and Colorado mines are working full time.

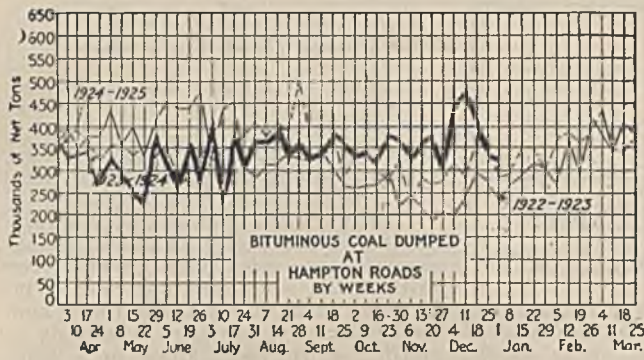
The present quotations on Walsenburg and Canon City coals for domestic use are \$5.25 for lump, \$4.25 for nut and \$3.50 for pea (washed); slack coal prices are \$1.25@\$.2.

Utah mines are working near capacity as a result of the cold snap which struck the Western section of the country recently. Operators are in most cases a little behind on their orders, but are rapidly catching up. The weather has moderated and a general thaw set in. The car situation is fair. The zero weather interfered with the motive power of the railroads somewhat for a few days, but the situation is much improved. The improvement in the trade is general throughout the territory, operators report. Orders are coming in from the Pacific Coast and Northwest, Idaho, Nevada, etc., as well as Utah.

Cincinnati Market Takes Brace

Due to many contributing causes, but cold weather in particular, the market in Cincinnati took a decided brace with the coming of the new year. The mines that had closed down took enough coal off the distress lists to make trading much better; the demand from the West and inland points quickened to such an extent that the disposition toward cut-throat prices ceased.

West Virginia high-volatile coals, which have been notoriously underpriced on this market for six weeks or two months, even felt the quickening impulses. The spread of \$2-\$2.50 on 4-in. lump does not give a correct reflection, for one firm with low costs and seeking a volume of business, still persists in holding to the price it established some time ago, while little "free" coal can be had between the \$2.25-\$2.50 range on Kanawha, Logan County or Thacker. Mine run holds steady, though there is but a slight differentiation in the price of steam, gas or by-product. This is largely due to the little interest shown by



New York Market Inactive

The soft-coal situation at New York remains dull and inactive. There was no increased call for shipments last week and consequently quotations remain unchanged. Indications point to early action on contracts for the current year although so far nothing authentic has been learned concerning prices. Increased business activity should soon be reflected in the coal industry, salesmen report who have recently returned from a tour of industries. There is considerable optimism regarding this year's business.

The trade at Philadelphia is feeling something of the better buying engendered by the upturn in the iron and steel industry. Industry generally has improved and the prospects are good for further advancement, although this is not so noticeable as yet in the coal buying. The first real snowstorm of the winter, last week, seemed to impress buyers with the advisability of keeping quite a stock ahead. As quite a few operations closed their plants down entirely between Christmas and the New Year's vacation certain grades of coal were just a bit scarce. There also has been a slight upward movement in prices.

The contract season has not thus far been productive of any particular increase in this class of trade, although some consumers seem to be in a more receptive mood since the recent snowstorm. Business at the piers is far from brisk, and loadings for export have almost vanished. The bunker trade is normal compared with the business offering for the past four or five months, and the prospects for improvement are good. Prices here show no change.

Slack coal is still rather scarce, especially since the holiday lay-off has reduced the output. Orders for three-quarter coal show no signs of an increase and this condition of slack probably will continue indefinitely.

A blanket of snow last week caused difficulties in coal deliveries at Baltimore. Railroad movement, especially in the western end of the state, was impeded for a time, but despite this fact, sufficient coal was moved through to tide, or was already at tide for distribution, to prevent any decided rise in price. The export situation continues to show some improvement, shipments during December having more than doubled those of the previous month.

Situation Improves at Birmingham

The Birmingham domestic market is in much better shape than it was a week ago, dealers having moved a large amount of coal and those who were not heavily stocked are now placing orders for replenishment. Domestic coal, which had been standing in cars at the mines in considerable quantity on account of no billing, has been entirely cleared away and the market demand at present is about sufficient to move current production.

There has been some let-up in steam business on account of stock accumulations and slowing down in industrial operations, but few consumers have large supplies and buying is expected to set in on a pre-holiday basis early in January. Current orders and contract deliveries are sufficient to keep mines going on present basis of operation.

Mine prices prevailing for some weeks past have been well sustained according to reports.

Cold and Snow Bolster Up Hard Coal Trade

Seasonable temperatures and a snowstorm helped to put the hard-coal market at New York in a more favorable position in the first week of the new year. There was no rush of orders but movement of the domestic coals was steady. Retail demand grew stronger and although retail dealers have enough coal in their yards to withstand any

sudden activity they are keeping their supplies replenished. There are many boats of domestic coals in the harbor, some of which have been there since early in November last, and these have been offered at figures below the current mine quotations for independent coals. Chestnut retains the leadership in demand and price, with stove a close second. Independent operators are making efforts to move egg and pea coals. The steam sizes are firmer and easier to move. Due to the outlaw strikes in the upper anthracite fields, rice coal is scarcer than either buckwheat or barley.

The Philadelphia market is easy, with the consumer not particularly desirous for any size but nut. The present state of the market is becoming rather menacing to independent operators, whose prices are 50 to 75c. higher than company producers on all sizes except pea and steam. All shippers are finding egg and pea difficult to move and some of the latter is going into storage. The yards contain good stocks of coal, and there is a tendency on the part of a growing number of dealers to turn the coal into cash. They feel that independent shippers must soon reduce prices, and they do not want to be caught with too much high-priced coal on hand. Steam coals are draggy, although the colder weather has helped this trade a bit.

Baltimore Market Unaffected by Snow

Despite the heavy snow, coal yards at Baltimore report that not only were orders rather slow in coming through, but there were sufficient stocks on hand to care not only for the present emergency but for a considerable time to come. The only real troubles of the coal men came in making some of the deliveries on orders they received, as a result of the snow-laden streets. The fact that the majority of the coal men are now delivering by motor trucks instead of by horse-drawn vehicles has eliminated many of the troubles along this line, also.

The Buffalo hard-coal trade has been active since the heavy snow came and the demand for stove and chestnut continues to embarrass the shipper and retailer. All that can be done is to give the consumer what there is of those sizes and if the furnace sizes will not be taken the customer must wait. As a rule the laying in of full season's supply is not common. The consumer still seems to fear that the price is about to come down and to lose a dollar on coal would be ruinous. The supply is good, despite strikes at the mines.

At Toronto recent severe weather has caused a heavy demand for anthracite for domestic uses and dealers are kept busy filling rush orders. The yards have abundant supplies on hand of all grades except stove, which is much in demand and hard to obtain. Consignments from the mines are coming forward freely and no shortage is likely to be experienced. The use of coke is increasing.

Coke Output Slows Down Less than Usual

Coke production in the Connellsville region did not slow down over the holidays as it usually has done. The furnaces have been very far from friendly to the wage advance of Dec. 16, expressing doubts whether it was really necessary at the time, hence they have been fighting the price increase the wage advance would naturally bring. One argument was that the market had already advanced, hence the entire cost of the wage advance ought not to be added to the market price then ruling.

The spot market has had a hard time getting up, there being so very little furnace buying, but it has gotten up now, sales in the past week being at \$4.25@\$4.50 for furnace coke, which compares with \$3.50@\$3.65 ruling just before the wage advance. Spot foundry coke is quotable up 50 cents further, at \$5@\$5.50, this comparing with \$4@\$4.50 ruling for several months before the wage advance. As to contract furnace coke, that is entirely a matter of asking prices, at \$5 for first quarter and \$6 for second quarter, prices which consumers refuse to pay.

Car Loadings, Surpluses and Shortages

	Cars Loaded		Car Shortage
	All Cars	Coal Cars	
Week ended Dec. 20, 1924.....	899,776	190,133	
Previous week.....	956,761	191,854	
Week ended Dec. 22, 1923.....	877,257	183,377	
	Surplus Cars		
	All Cars	Coal Cars	
Dec. 22, 1924.....	230,798	100,330	
Dec. 14, 1924.....	223,431	100,793	
Dec. 24, 1923.....	237,343	115,071	

Foreign Market And Export News

British Market Holds Recent Gains; Trade Far Below Last Year's

The Welsh steam coal trade has maintained the improvement shown in recent weeks, but shipments have been delayed by the holidays and stormy weather. There is no comparison between the state of trade now and that of twelve months ago, and though it has been possible to reopen several collieries which had been closed down for some months, there are still many pits idle without prospect of restarting.

There has been some contracting for supplies over 1925, particularly in Monmouthshire coals, some of the leading collieries having obtained orders aggregating around 750,000 tons at about 25s. 6d. for best locomotives and 24s. 6d. for ordinary Western Valleys coal. The Roumanian Government is inquiring for 100,000 tons of the best large steams, deliveries running through 1925. Portuguese railway interests are in the market for 20,000 tons of smalls.

The Newcastle market is quieter, as the collieries are running short of sup-

plies for early shipment. Heavy orders have been booked for the shipment of bunker coals over next year to the Mediterranean coaling stations. The total quantities exceed 400,000 tons. The prices vary with the descriptions and range from 18s. 6d. to 20s., according to the brand, which compare with 22s. 6d. and to 24s. a year ago. The French State Railways have ordered 50,000 tons of Durham steam small coals for shipment from January to March, at 17s. 6d. per ton, c.i.f., Havre, Dieppe, etc., also 30,000 tons of D.C.B. steam coals at 18s. 8d. per ton f.o.b. The Bordeaux Gas Works has booked orders for 10,500 tons of Wear gas coals for January shipment, at 22s. 3d. per ton c.i.f.

Production by British collieries in the week ended Dec. 20, a cable to *Coal Age* states, was 5,561,000 tons, according to official reports. This compares with 5,413,000 tons produced in the preceding week.

Cold Wave Quickens Demand In French Market

Consumption and trading in French house coals have picked up, due to a cold wave. The demand for industrial coal, however, continues dull and smalls are neglected.

The supply of rolling stock to the mines is satisfactory. Water traffic has been impeded of late by accidents in the canals and the menace of frost discloses further difficulties. The freight rate is steady at 25f., Bethune-Paris.

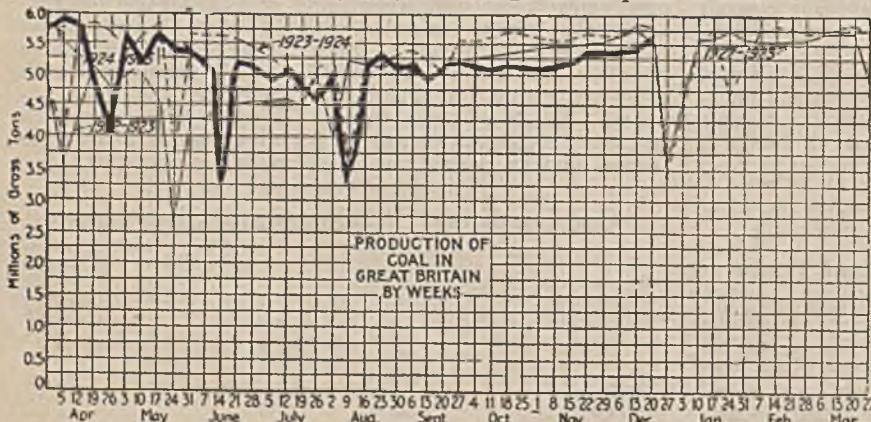
Deliveries of idemnity fuels in November to France and Luxemburg were 221,700 tons of coal, 225,500 tons of coke and 43,500 tons of lignite briquets, a total of 490,700 tons. Receipts in October were 884,800 tons. The deficiency of 160,000 tons in deliveries to France in November is likely to be made up in December. From Dec. 1 to 6 the total receipts were 149,200 tons, including 42,500 tons of coal, 100,000

tons of coke and 6,700 tons of lignite briquets, a daily average of 24,850 tons.

According to a recent declaration by the Director of Mines to the Minister of Public Works, the French Government has now decided not to yield a point in the agreement with Germany for payment in kind to France. Up to the present, the state, in selling indemnity fuel to its nationals, has sustained losses sometimes as high as 50 to 60f. per ton, the average being 30 to 35f. per ton.

The present administration wishes French consumers to pay a price for indemnity fuel at least equal to that it is paying to Germany through the Transfer Committee. This would make the marketing of indemnity fuel in France difficult.

Receipts of coke by the O. R. C. A. during the first sixteen days of December totaled 183,385 tons, reducing the daily average from 13,400 to 11,500 tons. Up to date there has been no change in the price of coke.



Trade Lags at Hampton Roads; Prices Hold Their Own

Business at Hampton Roads has been unusually dull, in view of the general holiday shutdown, but dumpings for December, 1,600,000 net tons, were heavier than in any other month last year.

Coal moved to tidewater very slowly last week, practically all mines having closed down. Coastwise trade was fairly brisk, some coal was moving in foreign trade on old contracts and bunker business was fair. The trade is settling down preparatory to a generally expected pick-up in business early in the new year.

Export Clearances, Week Ended Jan. 3, 1925

FROM HAMPTON ROADS		Tons
For Brazil:		
Ger. Str. Fredericus Rex, for Rio de Janeiro		6,620
Br. Str. Cuthbert, for Bahia		1,809
Br. Str. Erlesburg, for Rio de Janeiro		5,372
For Bermuda:		
Amer. Schr. Augusta, for Hamilton		930
Amer. Schr. Katherine May, for Hamilton		1,023
For Cuba:		
Nor. Str. Bratland, for Santiago		2,090
Amer. Schr. Lieut. Sam Mengel, for Quantanamo		1,016
Br. Str. Berwindmoor, for Havana		9,457
For France:		
Nor. Str. Hektor, for Marseilles		2,614
For Ecuador:		
Amer. Schr. Esther K., for Manabi		1,210
For Italy:		
Br. Str. Penrhydd, for Genoa		5,914
For West Indies:		
Br. Str. Dunclutha, for Fort de France		6,008
Nor. Str. Songelv, for Kingston		2,515
For Philippine Islands:		
Br. Str. Perseus, for Manila		2,544

Hampton Roads Pier Situation

	Dec. 24	Dec. 31
N. & W. Piers, Lamberts Pt.:		
Cars on hand	2,174	1,054
Tons on hand	142,914	70,883
Tons dumped for week	115,955	137,291
Tonnage waiting	26,000	1,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,752	1,685
Tons on hand	113,550	108,200
Tons dumped for week	78,710	58,737
Tonnage waiting	6,324	1,276
C. & O. Piers, Newport News:		
Cars on hand	2,047	1,424
Tons on hand	98,660	69,355
Tons dumped for week	101,677	96,786
Tonnage waiting	4,575	4,355

Pier and Bunker Prices, Gross Tons

	PIERS	
	Dec. 27	Jan. 3†
Pool 9, New York	\$4.75@5.00	\$4.75@5.00
Pool 10, New York	4.40@4.65	4.50@4.65
Pool 11, New York	4.30@4.45	4.40@4.55
Pool 9, Philadelphia	4.90@5.25	4.90@5.25
Pool 10, Philadelphia	4.45@4.70	4.45@4.70
Pool 11, Philadelphia	4.30@4.50	4.30@4.50
Pool 1, Hamp. Roads	4.00	4.10
Pool 2, Hamp. Roads	3.90	3.90
Pools 5-6-7 Hamp. Rds.	4.00	4.00


BUNKERS

Pool 9, New York	\$5.00@5.25	\$5.00@5.25
Pool 10, New York	4.65@4.90	4.75@4.90
Pool 11, New York	4.55@4.70	4.65@4.80
Pool 9, Philadelphia	4.90@5.25	4.90@5.25
Pool 10, Philadelphia	4.75@4.95	4.75@4.95
Pool 11, Philadelphia	4.50@4.70	4.50@4.70
Pool 1, Hamp. Roads	4.10	4.15
Pool 2, Hamp. Roads	4.00	4.00
Pools 5-6-7 Hamp. Rds.	4.10	4.10


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

	Quotations by Cable to <i>Coal Age</i>	
	Dec. 27	Jan. 3†
Cardiff		
Admiralty, large	27s. 6d. @ 28s.	27s. 6d. @ 27s. 9d.
Stemm smalls	17s.	16s. 9d. @ 17s.
Newcastle:		
Best steams	19s.	12s. 3d. @ 22s. 6d.
Best gas	21s. 6d. @ 22s. 6d.	21s.
Best Bunkers	18s. 6d. @ 21s.	19s. @ 20s.

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



News Items From Field and Trade



ALABAMA

James Bowron, vice-president of the Bessemer Coal, Iron & Land Co., is acting as executive head of the corporation pending the election of a successor to the late president, Henry Lee Badham, which will take place at a meeting of the stockholders in January. Mr. Bowron is chairman of the board of the Gulf States Steel Co. and doubtless will decline a promotion to the presidency of the Bessemer company.

The Deep Water Coal Co. is said to be negotiating for the purchase of the coal properties of the American Fuel Co., which operates two drift mines at Beltona, in the upper part of Jefferson County in the Black Creek and Jefferson seams. The properties are owned principally by Charles B. Teasley, of Montgomery, who has operated the mines for several years past. It will be recalled that the Deep Water Coal Co. was organized by L. B. Musgrove, of Jasper, and Eastern capitalists early in 1924, with a reported capitalization of \$15,000,000 and is said to have purchased some 500,000 acres of coal lands in Jefferson, Walker and Winston counties, but as yet has begun no active operations.

COLORADO

The November report of James Dalrymple, state coal mine inspector, shows that despite the late fall this year the total production of coal in the state almost equals that for the first eleven months in 1923. Including November, when 988,524 tons of coal was produced, the 1924 total aggregates 9,267,592 tons. In 1923 from Jan. 1 to Nov. 30, 9,287,143 tons of coal was produced. It is expected that by the end of this month the 1923 output will be equaled, if not surpassed, by this year's, according to Mr. Dalrymple.

ILLINOIS

With the sale of the St. Louis, Troy & Eastern R.R. and the East St. Louis, Columbia & Waterloo R.R. the Donk Bros. Coal & Coke Co. has lost its two railroads that in the past have made this company one of the big ones in the so-called inner district of Illinois immediately east of St. Louis, Mo. The high cost of producing coal, together with the cost of a modern mine, recently sunk, with no market that would permit the sale of coal much if any above cost, forced this company gradually to let go of its more profitable holdings in order to keep its mine properties intact. With the two big mines, one at Maryville and one at Thermal, located on the Troy line, the

problem of selling steam coal became a serious one. With the sale of the railroads to the Illinois Traction System a contract made for a long term of years assures a market for the screenings with the traction system at its power house. The same interest that controls the Donk Bros. Coal & Coke Co.'s mines still controls its several retail yards in St. Louis, through which the larger sizes of coal will be marketed. The concern is reported to be interested in a sand and material company, whose business has for the past few years been in a prosperous condition.

The Old Mine at Pana, has resumed operations after having been closed for over a year. The management of the mine has obtained a contract for the coaling of Baltimore & Ohio engines and also will supply local demands.

John Morris, superintendent of the coal mine near Watseka, has been made chief of police at Springfield, the position having been made vacant by the resignation of John E. George, the dollar a year police chief. Morris formerly lived in Springfield.

INDIANA

The Liberty Coal & Engineering Co., St. Louis, Mo., has leased three farms at Yeddo, a few miles southeast of Danville, and will open strip mines.

Joseph W. Stickney, receiver for the Coal Ridge Mining Co., has obtained permission of the judge of Superior Court at Indianapolis, for the sale of the assets of the company. Ralph K. Perry brought the suit that threw the mine into the hands of a receiver. The property includes 442 acres of Fifth vein coal in Greene County, and includes mine buildings, locomotives, cars, cutting machines, tipple, screens, picking tables, loading booms, electric hoist, motors, rotary converters, office equipment and a railroad switch.

KANSAS

After several months of idleness, mine No. 19 of the Sheridan Coal Co., at Mulberry, has been reopened under lease by Thomas Harvey and Pete Giavando, union miners. The mine will employ 200 men.

Miners of the southeastern Kansas field were paid \$500,000 the Tuesday before Christmas. Payday was advanced from Saturday to Tuesday to give the miners holiday money. The payroll, which was for the first two weeks of December, was the equal of any other of 1924. Due to increased working time resulting from the heavier demand created by cold

weather, an even larger one was expected for the second half of the month.

Katy mines Nos. 6 and 7, near Mineral, have been closed following the surrender of leases held by Pete Russell, of Mineral. No. 6 will reopen soon, however, under a new lease by John Reid, Hugh Reid and Frank Crosby, all of Mineral. The three men have taken over the mine and all equipment. This raises the number of operating mines near Mineral from three to four.

Plans for a first aid and mine rescue meet to be held in Kansas next May have been started. Leon Besson, state mine inspector, has invited operators and miners to meet at Arma, Jan. 12, at which time a permanent organization is expected to be formed. The 1925 meet probably will be held at Arma, where money was collected last spring for a state meet which was not held because of the demoralization of the district. Mines had been closed several weeks at that time as a result of delay in signing a scale contract.

KENTUCKY

The Illinois Central R.R. has let a number of contracts, and has several hundred men working near Paducah, alone, in construction of the new cut off, known as the Edgewood, which will materially shorten distance from Western Kentucky to Chicago.

The Louisville & Nashville R.R. has a considerable force at work on Coal Tunnel Hill, thirty miles south of Louisville, where a big grade reducing task is in hand, while the road also has some big projects in eastern Kentucky in connection with extensions and connections to the Carolina, Clinchfield & Ohio lines.

Numerous coal men from western Kentucky arranged to attend a celebration at Dawson Springs, on Dec. 19, in connection with completion of the Dawson to Madisonville division of the Illinois Central R.R. and of the "Federal Aid Road" from Dawson to Earl- ington.

An interesting dispatch from Danville is to the effect that the Southern Ry. has a crew of twenty surveyors working on a survey from Danville southeast through Stanford to the Bell and Harlan coal fields, connecting with the Middlesboro and Knoxville division of the Southern, thence to the main stem South, giving the road connections through from St. Louis. It is understood that the Southern had a falling out with the Louisville & Nashville over rental of connections into the South-

eastern Kentucky coal fields some months ago, and withdrew from the field. This is indicated in the survey for a company-owned line into the territory.

Elmore E. Manning, Louisville operator and jobber, official of the Downard-Manning Coal Co. and allied companies, is back at the office part of his time, following a very painful operation.

Louis E. Harvie and others, of Whitesburg, recently took over the Storm King Coal Co., at Storm King, on the Louisville & Nashville R. R., and will start operations in January, the plant having been down for nearly a year. The company will have its name changed to the Storm King Fuel Co.

Traffic is at a complete standstill on the Ohio River, as heavy running ice has driven all transportation equipment into ice harbors for the time being to prevent a repetition of the tremendous destruction in the winter of 1917, which put the river coal-handling business on the shelf.

The Interstate Commerce Commission on Dec. 30 authorized the Chesapeake & Ohio R.R., to take over and operate the 28-mile line of the Ashland Coal & Iron Ry., from Ashland to Seaton, Ky., the C. & O. now owning the capital stock of the company, which is a feeder. The C. & O. also plans to take leases on the Long Fork and Hillers' Creek railroad lines, which operate in Kentucky coal fields. These leases have also been approved.

MINNESOTA

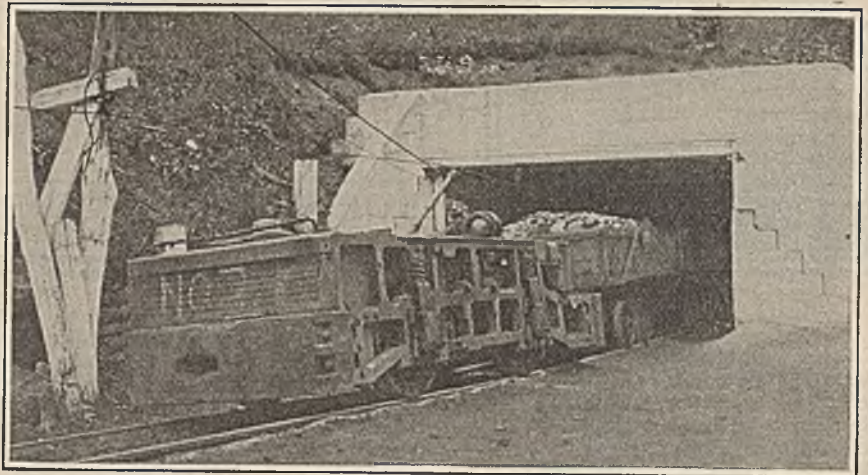
Contracts have been placed for the Minneapolis public schools as follows: Hartzell Coal & Transfer Co., 12,100 tons West Virginia coal, \$7,383; Flour City Fuel & Transfer Co., 2,940 tons Pocahontas mine run, \$7,909, and for 2,540 tons of splint stove at \$7,413; C. Reiss Coal Co., 2,440 tons Pocahontas screenings, \$6,387. All are on a B.t.u. basis, delivered.

In St. Paul a step is under consideration to develop a river-front area for industrial use for three miles toward the Ford plant. It is urged that southern Illinois coal can be brought by barge to the tract at \$1.90 to \$1.95 while the new rail rate is \$3.75. Negotiations are pending with two barge lines to interest them in soliciting northbound coal business. This long-haul barging of coal has been tried before without resulting in a continuing business. Experimentally it was reasonably successful.

MONTANA

Montana's coal production in 1924 was somewhat smaller than that of 1923, according to State Inspector Griffin, due to oil competition, more electric power development, increasing household use of gas and increased production of lignite in North Dakota.

A new shaft mine at Jennison has been sunk 90 ft. to a 9-ft. seam of lignite which is now being mined. The mine may eventually reach a point where 100 men will be employed.



Courtesy Bertha-Consumers Co.

Coal Trip Bound for the Eureka Tipple

This operation of the Bertha-Consumers Co., located at Randall, Monongalia County, W. Va., has a railroad rating of seventy-six cars per day. The tipple machinery and screening facilities are modern and complete, including a reciprocating feeder arranged to regulate the flow of coal, an apron conveyor and a picking table.

Coal from the new strip mine of the Northern Pacific Ry. is now supplying the Montana-Yellowstone division and Red Lodge coal serves the Missoula division. This supplants all Washington coal that has been hauled into Montana for railroad use.

NORTH DAKOTA

The Washburn Lignite Coal Co., of Wilton, is mining from 1,600 to 1,800 tons a day. This company went on a non-union basis last fall.

OHIO

Alex Bonnyman, chairman of the Board of Directors of the Blue Diamond Coal Co., Knoxville, Tenn., and James Bonnyman, president of the Blue Diamond Coal Sales Co., Cincinnati, sailed for Naples from New York for a two months stay abroad on Jan. 4. Their time will be spent in Italy and southern France.

With the closing down of the Putney mine of the Cambria Collieries Co., in South Bellaire, in the Wheeling district, the men employed at that plant will be given employment at the company's Webb mine which recently resumed operations. The Webb mine, which has been closed down much of the time in the last year or two owing to disagreements between the miners and the company, will operate steadily. Although the working force is being increased at the Webb plant the maximum number of miners is not as yet being employed.

Fred Legg, president of the Logan & Kanawha Coal Co., William Heitzman, sales manager for the Central Pocahontas Coal Co.; John Glaser, vice president of the Midland Coal Sales Co., and Burke H. Keeney, sales manager for the Middle West Coal Co., were the new directors chosen by the Cincinnati Coal Exchange at its annual election. These with the hold-over directors will elect the officers for the coming year at the first meeting in January.

Eugene Dupuis, who has been with the Consolidated Mining Co., Columbus,

for about a year following a term with the Columbus office of the Philadelphia & Cleveland Coal Co., has resigned to become manager of the Columbus office of the Philadelphia & Cleveland Coal Co., succeeding R. J. Bush, who becomes assistant sales manager of the Chesapeake & Virginia Coal Co., of Cincinnati. Mr. Dupuis will be succeeded by Orville White in the Consolidated Mining Co. The changes were effective Jan. 1.

PENNSYLVANIA

Directors of the Delaware, Lackawanna & Western Coal Co. last week declared an extra dividend of 5 per cent in addition to the regular quarterly dividend of 2½ per cent. Both dividends are payable Jan. 15 to stock of record Dec. 31.

Foremen and assistants of the Had-dock Mining Co., Wilkes-Barre, were entertained at dinner at the Hazleton country club shortly before Christmas. During the dinner bonus checks were given out by the company to the sixty foremen, superintendents and assistants in attendance.

It is reported the reopening of a mine at Mahonoy City that has not been in operation for half a century is contemplated.

The mining school at the Pennsylvania State College will be known in the future as "The School of Mines and Metallurgy." This action was taken by the college trustees and was announced by Dean Elmer A. Holbrook. The move was made to more clearly present the character of the training offered students in this particular school. Dean Holbrook pointed out that for the past six years the school has enrolled as many students in metallurgy as in mining.

With the razing of the old combination breaker and washery on the site of the former Neilson colliery on the outskirts of Shamokin and the continued lowering of the water in the shaft, progress toward what promises to be one of the most modern operations in the anthracite region, goes

steadily forward. The colliery company now operating the mine is headed by B. C. Osler, formerly of Hazleton. It is understood that the Shamokin Coal Co., the million and a quarter dollar corporation backing the mining enterprise, has been successful in arranging for extension of the present tract so as to make possible even greater bodies of coal than had been anticipated. A steel breaker is to be constructed, plans for which have been completed and within a short time estimates will be sought from the largest breaker builders in the region. The improvements will cost in excess of \$650,000.

The Kramer mine at Kramer, Pa., which was closed lately by the inspector on the claim that dirty coal was being turned out by the miners, is in operation again. It had been idle for half a month. About 200 men have gone to work.

The current bulletin of the Department of Labor and Industry contains a table showing the number of persons who applied at the various local offices of the State employment bureau. Under the heading "Mines," the table shows that in November, 1924, there were but 48 applicants for work, while during the same month in 1923 there were 267 applications received. Employers in November, 1923, asked for 60 miners and this year but 46. Thirty-seven of those applying during November, 1924, were referred to positions and during the same period in 1923 62 were referred to work. All of the 62 sent to where work was available in 1923 landed the jobs, but of the 37 referred to work in November, 1924, but 21 received positions.

TENNESSEE

O. P. Hood, chief mechanical engineer of the U. S. Bureau of Mines, has accepted an invitation of the City Council of Knoxville to address its members Jan. 20 on smoke abatement. Municipal authorities and civic associations of the Tennessee city are contemplating a survey to discover the sources of excessive smoke in that community and a campaign to abate the nuisance.

UTAH

The new Ogden Radio Club, of Ogden, will have as its president Halsey C. Marchant, general manager of the Superior-Rock Springs Coal Co., of Ogden.

The United States Fuel Co. has just broadcast the first story of coal ever sent over the radio in this section. The data were prepared by O. Herres, assistant to vice president and general manager Muir and included items on the early history of coal mining in Utah and elsewhere and some interesting facts about coal and its uses.

WASHINGTON

Seven is the total death toll taken by the explosion in the Burnett mine of the Pacific Coast Coal Co. Dec. 17. The cause remains a mystery.

WEST VIRGINIA

Merger of coal properties valued at \$30,000,000 was officially announced Dec. 30 by the Hutchinson interests. The coal holdings of the Hutchinson company and the West Virginia Coal & Coke Co., located in northern, central and southern west Virginia, will be consolidated under the name of the West Virginia Coal & Coke Co.

The firm of Cutchall & Gates have taken back their Nethken mine, at Bayard, formerly leased to the McKanwig Coal Co. and resumed operation on Jan. 1. The business will be conducted by J. E. Cutchall and J. Warren Gates.

A dividend of \$3 per share has been declared on the capital stock of the Davis Coal & Coke Co., payable Jan. 15 to stockholders of record at the close of business Dec. 31, 1924.

An issue of \$10,000,000 West Virginia Coal & Coke Co. first closed mortgage 6 per cent twenty-five-year sinking fund gold bonds maturing Jan. 1, 1950, was offered Dec. 29, by the First National Bank and the National City Co., New York City, at 96 to yield 6.32 per cent. The financing is to help the com-

pany pay for new properties. After this is done the company will control by ownership or by long-term lease an aggregate of 800,000,000 tons of recoverable high-grade bituminous coal in West Virginia. The bonds will be secured by a closed first mortgage on all real estate, coal acreage and surface lands, mine plant, machinery and equipment, leaseholds and other fixed assets now owned or hereafter acquired by the company except for purchase-money obligations on property hereafter acquired. Application will be made to list the bonds on the New York Stock Exchange.

ALASKA

The report of the Alaskan Railroad for 1923 sent to Congress by the President refers to "much needed coal of a high grade being mined, and apparently available for mining on Moose Creek," to which a spur track of the railroad has been extended. The report says prospecting and mining operations in the Chickaloon field and operation of the Eska mine owned by it was abandoned in order to foster development of the coal mining industry by private enterprise. The railroad has obtained its coal from the Healy and Matanuska districts. It notes movement of commercial coal in Alaska.

WASHINGTON, D. C.

Representative Sinnott, (Rep. Ore.) reported from the Public Lands Committee of which he is chairman, H. R. 6713, to define a trespass on United States coal lands. The bill makes it unlawful to mine and remove coal from lands owned or reserved by the government. Violation of the law would subject the offender to a fine of \$1,000 and imprisonment for one year. The bill was suggested by the Interior Department, which seeks the legislation as a basis for criminal proceedings in coal trespass cases. "Operations of coal trespassers are a serious menace to the local market which legitimate operators would otherwise enjoy," says the department.

CANADA

The movement of coal from Alberta mines to prairie points was greatly interrupted by the recent severe weather, which made railway connections almost impossible for nearly a week. Huge drifts held up outgoing coal as well as supplies of empties, while a temperature of 50 deg. below zero made working conditions at the mineheads anything but enviable. Normal output at the Drumheller mines has been restored and orders for Eastern points are leaving daily.

S. G. Blaylock, general manager of the Consolidated Mining & Smelting Co. of Canada, recently declared that there was something radically wrong with the situation in Western coal fields when British Columbia coke cost more than three times Pennsylvania coke at the ovens. With only a double price, the Crow's Nest field could supply every Western smelter. His company uses only 100 to 150 tons of coke a day,



Warehouse of Phelps-Dodge Corporation at Dawson, N. M.

A good example of permanent construction. The distance from the source of supplies makes it necessary to keep large stocks on hand. In order to prevent loss a fire-resisting structure is desirable, especially in a country where the general aridity makes fire a constant menace.

which is such a small quantity comparatively that it could not have a material bearing on the question of production. The price of coke in the Crow's Nest Pass at the ovens is \$9.48 per ton, and the product is not better than what could be bought in Pennsylvania for from \$2.50 to \$3.20 a ton. He thinks there is no reason whatever why there should be this marked difference.

Reports have been received that, as a result of an agreement entered into with the men, and the consequent reduced quotations the Crow's Nest Pass Coal Co. has been enabled to make to the trade, an output of at least 30,000 tons a month can be taken care of. This will give employment to about 400 men and should materially relieve unemployment in that district.

W. A. Sherman, president of District 18 of the United Mine Workers, returning from a visit of inspection in the Fernie and Coal Creek districts, where the miners recently broke away from the United Mine Workers and signed a new agreement with the Crow's Nest Pass Coal Co., says. "The action of the company constitutes the most serious breach of contract in the history of District 18. Their attitude toward the starving miners and their families has been extremely brutal and they have certainly left the road clear for many serious industrial conflicts in that region in the near future." It is stated by the general manager of the Crow's Nest Pass Coal Co. that the company considers it can build a sound business and a stable industry within twelve months working on the new rates.

Traffic

Clinchfield R.R. Lease Ready; Coal Men Interested

It is reported that the last of the red tape has been cleaned up with the Interstate Commerce Commission and in completing the lease arrangements whereby the Louisville & Nashville R.R. and the Atlantic Coast Line R.R. jointly obtain the Carolina, Clinchfield & Ohio properties under a 999-year lease, planning to use the C. C. & O. as a connection between the eastern Kentucky terminals in the Harlan and Hazard coal fields to the Atlantic Coast Line, thence to the South Atlantic ports and Southeast.

Inquiries are being made in the coal trade as to when the physical connections will be made, and what routes they will cover, as it will open a lot of new coal and timber property on the Kentucky border. An inquiry at the Louisville & Nashville office in Louisville failed to develop any information, as President W. P. Mapother, who is handling that end of it, is out of the city. However, it will take some time to make the surveys and drive the connections, which will represent some real engineering in view of the rugged structure of the mountains. The physical connection from the eastern Kentucky division is said to be about 25 miles in length and that from the Harlan section about 40 miles.

Rate Changes on Fuel Approved By New York Commission

The New York Public Service Commission has approved new rates of the Pittsburgh, Shawmut & Northern R.R. on coal, bituminous and cannel, carloads (minimum weight 60,000 lb. on box or stock cars having a marked capacity of 80,000 lb. or less, and 80,000 lb. on cars having marked capacity of over 80,000 lb. and on open cars the marked capacity will apply, except that when the weight of coal in car that has been fully loaded does not equal the marked capacity weight, actual weight will apply). The new rates per net or gross ton from Olean to Bolivar and Ceres is \$1.89, an advance of 50c.; effective Jan. 25, 1925.—Sup. No. 7 to P. S. C. No. 829.

The commission also has approved a new ruling of the New York Central R.R. (West) on coke, including breeze, dust and screenings, increasing carload minimum weight from 40,000 to 50,000 lb. except that when cars are loaded to cubical or visible capacity the actual weight will apply but not less than 35,000 lb. When loaded in box or stock cars minimum weight will be 40,000 lb.; effective Jan. 21, 1925.—P. S. C. L. S. No. C-70.

The commission likewise has approved the cancellation of rates by the New York Central (East) on coke, coke breeze and coke dust, carload minimum weight 50,000 lb. in open cars except that when cars are loaded to full visible or cubical capacity actual weight will apply but not less than 35,000 lb. and 40,000 lb. in box and stock cars; rates per net ton from Geneva to Erie stations, Elmira, \$1.51; Endicott, \$2.27; Painted Post, \$1.76; Savona, \$2.02; Wayland, \$2.27, canceled. Advanced combination rates will apply, effective Jan. 25, 1925.—Sup. No. 7 to P. S. C. N. Y. C. No. C-126.

The Erie R.R. recently announced the following appointments: J. B. Ford, freight traffic manager at New York; F. D. Austin, freight traffic manager at Chicago, and G. H. Reinbrecht, general coal freight agent at New York.

Association Activities

Members of the board of directors of the Central Pennsylvania Coal Producers' Association and of the executive council of the Central Pennsylvania Association of Bituminous Coal Operators met at the association headquarters in the Lincoln Trust Co. Building in Altoona on Dec. 23. President B. M. Clark, of Indiana, presiding. President John Brophy, Vice-President James Mark and Secretary-Treasurer Richard Gilbert, of the district miners' union, attended a conference with President B. M. Clark, Secretary Charles O'Neill, Harry Boulton and Rembrandt Peale relative to a successor to Clark Miller, of Clearfield, as the umpire for the district in adjusting differences arising from the scale. After thoroughly discussing the matter it was left in the hands of Messrs. Clark and Brophy for final decision.

At the annual meeting of the New River Operators' Association, held at the White Oak Country Club, near Oak Hill, W. Va., M. L. Garvey was elected president, succeeding S. A. Scott, of the New River company. In calling the meeting to order, retiring President Scott briefly summarized the developments of the year and discussed transportation matters. Treasurer P. M. Snyder submitted his annual report and S. C. Higgins, secretary, comprehensively dealt with the work of the association during the year. The following members of

the board of governors were nominated and elected: Harry Caperton, William McKell, P. M. Snyder, M. L. Garvey, Mr. Taggart, Ernest Chilson and S. A. Scott. The new board immediately after its election went into executive session and later reported the election of the following officers: M. L. Garvey, president; William McKell, vice-president; P. M. Snyder, treasurer, and S. C. Higgins, secretary. The association named G. H. Caperton and Holly Stover to represent it on the board of governors of the Smokeless Operators' Association. At the same time Mr. Caperton was again named as chairman of the transportation committee.

At a meeting of the Pennsylvania Coal Mining Institute, of Johnstown, Charles Enzian, of Windber, chief engineer for the Berwind-White Coal Mining Co. was elected president. Other officers chosen are: First vice-president, T. J. Davies; second vice-president, D. L. Boyle; third vice-president, B. F. Baldwin; secretary, William Fleming; treasurer Vincent A. Stanton. The executive committee includes Prof. W. R. Chedsey and W. G. Duncan of State College; T. J. Gatehouse, and Patrick Frear, of Seward, and W. A. Swift, Nicholas Evans, John Ira Thomas, H. V. Brown and Patrick Nairn, of Johnstown. Prof. James Killus, director of vocational education in the Johnstown High School, delivered an address on the subject, "Coal Is Still King." He touched on the possibilities of water power and showed that the power from that source is insufficient and that coal will rule.

Obituary

William C. Johnston, 61 years old, general freight agent and sales manager for the Donk Brothers Coal & Coke Co., of St. Louis, Mo., dropped dead in his apartment at the Melbourne Hotel, St. Louis. He had been with the company for approximately twenty-five years. He is survived by his wife, one son and one daughter.

Alex McDonald, a well known mining contractor in the Shamokin (Pa.) field died recently as a result of a wound said to have been self-inflicted. Mr. McDonald was considered an expert on rock tunnel work and directed numerous important operations in the Schuylkill Valley. A widow, three sons, and three daughters survive.

Death recently claimed Charles L. Palmer, 56, who had a notable career in the Hazleton (Pa.) mining district. Mr. Palmer died in Ohio, where he had been serving as a soft coal operator. He was at one time mining engineer for the G. B. Markle Co. He is survived by a widow and four children.

Coming Meetings

American Engineering Council. Annual meeting Jan. 16-17, 1925, Washington, D. C. American Engineering Council, 29 West 39th St., New York City.

Northeast Kentucky Coal Association. Annual meeting Jan. 22, 1925, Ventura Hotel, Ashland, Ky. Secretary, C. J. Neekamp, 816 Ashland National Bank Bldg., Ashland, Ky.

American Management Association. Annual convention, Jan. 28-30, Hotel Astor, New York City. Managing director, W. J. Donald, 20 Vesey St., New York City.

American Wood Preservers' Association. Twenty-first annual convention, Feb. 3-5, Congress Hotel, Chicago, Ill. P. R. Hicks, secretary, Service Bureau, 1146 Otis Building, Chicago, Ill.

American Institute of Electrical Engineers. Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

Northern West Virginia Coal Operators' Association. Annual meeting, Feb. 10, Fairmont, W. Va. Executive vice-president, George S. Brackett, Fairmont, W. Va.

American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. E. Sharpless, 29 West 39th St., New York City.

New England Coal Dealers' Association. Annual meeting, March 25-26, Springfield Auditorium, Springfield, Mass. Secretary C. R. Elder, 141 Milk St., Boston, Mass.

New Equipment

Speed Transformers Easily Aligned to Low Shafts

Two new types of reduction gears, known as type H and type K, recently have been placed on the market by the Poole Engineering & Machine Co., Baltimore, Md.

The type H reduction gear or speed transformer consists of a double helical or herringbone gear made of special open-hearth steel forging and a herringbone pinion cut integral with a high-speed shaft made of chrome vanadium steel. Both gear members are heat-treated to proper hardness to minimize wear. Gear members are accurately ground and carefully tested for static balance before being assembled in the gear casing.

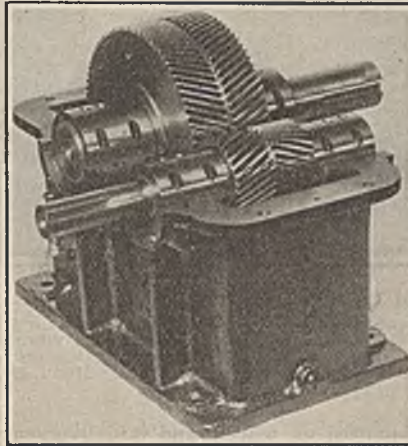
Gears and pinions are totally inclosed in a cast-iron horizontally split casing with bearing bosses integral with the top and bottom halves of the casing. Casing joints are ground true to insure their being oil-tight.

The bearings, which consist of cast-iron shells lined with genuine babbitt metal, are removable and are supported in bosses integral with top and bottom halves of the casing thus assuring accurate and permanent alignment.

For low-speed drives thorough lubrication is obtained by an improved splash and gravity system in which the gear dips in the oil sufficiently to carry oil to a reservoir in the upper casing, from which it feeds to all bearings and directly between the gear teeth at the line of contact.

For turbine and high-speed drives, an oil pump and cooler is provided, thus cool oil under pressure is supplied to the bearings and gear teeth.

The type K reduction gear consists of a double helical or herringbone forged-steel pinion integral with its shaft and a cast-steel double helical spur gear. Both gear and pinion have cut stub teeth. The gear and pinion shafts are mounted in substantial babbitted bearings of the ring oiling type, and the gear and pinion are lubri-



Gears Run in Oil-Tight Cast-Iron Housings

The herringbone forged steel pinion and cast steel double helical gear make this a quiet, efficient speed reducer.

cated by the splash system; the gear and pinion running in an oil-tight, oil-filled case.

The high-speed shaft or driving pinion in the type K gear is located in the top of the casing and the driven shaft is directly under the pinion shaft and just below or near the floor line, which makes it especially desirable for certain types of machines used in industries where the line shaft is close to the floor.

Vertical Cylinders Decrease Compressor Vibration

With the extensive adoption of electrical distribution of power in and about the mines has come a demand for portable electrically driven air compressors that can be moved readily from point to point within the workings. Unquestionably certain kinds of pneumatic tools, especially percussive rock drills and similar apparatus are more efficacious than those electrically driven.

Utilization of small compressors for driving such machines obviates the employment of the long and expensive pipe lines rendered necessary if a central compressing plant on the surface is the only available source of compressed air.

A new line of machines of this variety known as Type 20, has recently been placed on the market by the Ingersoll-Rand Co., 11 Broadway, New York, one of which is shown in the accompanying illustration. This type of compressor embodies several radical changes in design from machines of like character previously built. The truck is much like that of an ordinary mine car except that it consists essentially of a steel-casting frame. This is mounted on ordinary mine-car wheels set at approximately the regular mine-car wheel base.

COMPRESSOR IS IMPROVED

The improvement of chief interest embodied in this machine is the compressor itself. This is a two-cylinder, vertical, single-acting device mounted directly over one of the truck axles. Several of the structural details of this machine have been borrowed or adapted from automobile practice. Thus the upper half of the crank case, the cylinders and the water jackets are all cast *en bloc*. The same is true of the cylinder heads containing the valves and valve chambers.

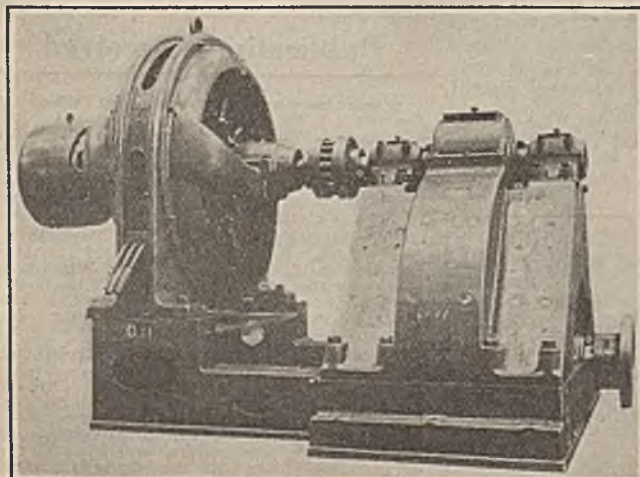
Lubrication is of the fixed level, splash variety, that is, oil is pumped from the crank case reservoir to pans beneath the cranks. Thence it is carried to the bearings, gears and pistons by the aid of dippers on the lower ends of the connecting rods. So long as oil remains in the reservoir lubrication of all internal parts is copious and adequate.

The compressor is connected to, and driven by, a motor mounted over the other axle of the truck. This machine may be of either the direct- or alternating-current type. Motor and compressor are joined by means of an easily detachable flexible coupling. The smallest machine of this type has no reduction in speed between motor and compressor; the two larger sizes are provided with back gears. These are housed in an extension of the crankcase where they receive ample lubrication.

EQUIPMENT WELL PROTECTED

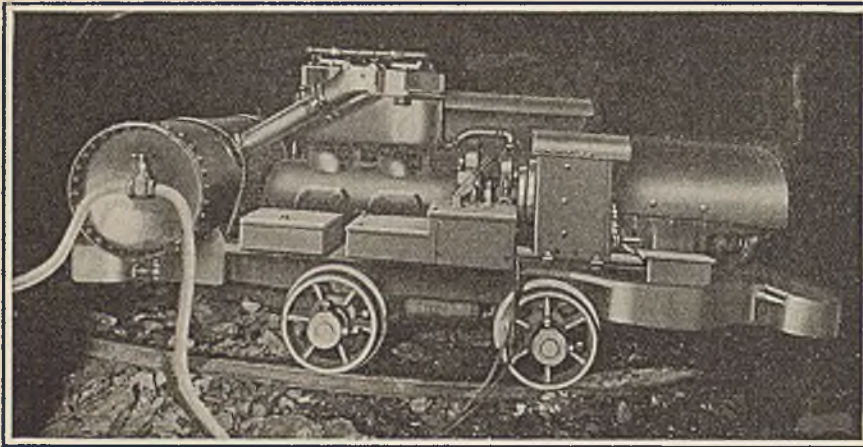
Electrical control equipment is mounted on the motor end of the truck and a cylindrical air receiver together with a tank for the jacket water is similarly mounted on the other end. The arrangement is compact yet accessible, and all parts requiring protection are either shielded or completely housed.

It is impossible to balance a reciprocating machine of this kind perfectly, and a certain degree of vibration is unavoidable. In any device of this nature, however, the unbalanced force of the vibration will exert itself in the line of the piston movement. Making the air compressor vertical and placing it directly above one of the truck axles practically places a foundation under the machine so that it is unnecessary to block the truck in any way. The general construction of this compressor and the fact that light plate valves are used renders it possible to operate at high speed. This in turn means cheaper



Machined To Fit

Heat-treated gears carefully tested for static balance comprise the running parts of this unit.



The Compressor and Its Mounting

This unit consists of two chief elements, the compressor and the motor that drives it. Making the compressor cylinders vertical causes all tendency of the machine to vibrate to be vertical. Placing the center of the compressor over one of the truck axles practically puts a foundation under the machine so that no blocking is required. Motor and compressor are joined by a flexible coupling.

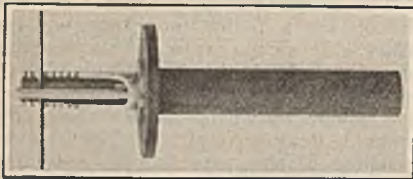
construction and lighter weight for a given capacity.

In addition to the fact that vibration is negligible and blocking is unnecessary, the manufacturers claim the following advantages: The machine is compact; it is a truly portable piece of equipment, not merely a stationary unit

mounted on wheels and it delivers approximately 20 per cent more air per dollar of first cost than its predecessors. This compressor at present is manufactured in three sizes, namely, 5 x 5, 7 x 6 and 9 x 8 in., the corresponding piston displacements being 91, 160 and 230 cu.ft. per minute respectively.

Electrode Holder Speeds Up Production

A new type of welding electrode holder, marketed by the General Electric Co., enables welding operators quickly to change an electrode burned down to a useless stub for a new one.



Electrode Handle Which Is Easy to Refill

A quick change from an old stub to a new electrode easily can be made with this holder.

The operator needs only to strike the stub end of the old electrode against some object and it will drop out, then the new wire can be inserted instantly without unnecessary effort.

The new holder consists of a punched fiber tube with a tinned brass plug inserted in the end. A steel spring rod holds the electrode in place against one of a number of different sized notches provided for the purpose. The welding

cable, running to the source of power, is soldered to the other end of the holder after the fiber tube and fiber guard have been removed which can be done by loosening a single screw.

This holder is so constructed that the contact of the electrode is not weakened by heat, the spring by which the pressure is maintained continuing to give equal service at high temperatures.

Electric Thread Tapper Cuts Labor Costs

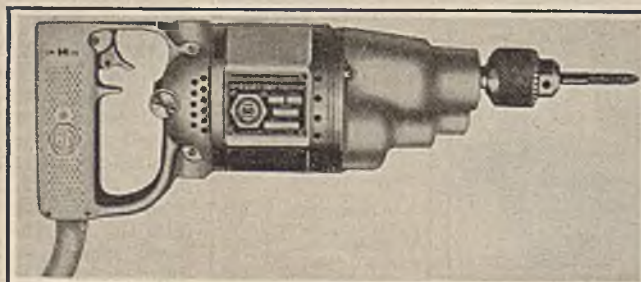
An electric tapper, designed to drill at high speed and having an automatic reverse control, is a recent addition to the portable electric tools manufactured by the Black & Decker Manufacturing Co.

The mechanism in the gear case of this machine is so designed that the tap is driven in at a speed of 350 r.p.m. and, by a slight backward pull on the machine, the tap chuck is reversed automatically and the tap withdrawn from the threaded hole at double the driving speed. No reversing switch is needed.

Equipped with an universal motor and weighing only 8½ lb., this portable electric tool will tap holes in steel up to ½ in., in cast iron up to ¾ in. and in brass or aluminum up to ¾ in.

Speeds Up Output

The universal motor in this outfit makes it satisfactory for portable service.



Recent Patents

Release Stop or Support for Hoist Cages; 1,497,501. Leo D. Graboski, Duryea, Pa., assignor to Vulcan Iron Works, Wilkes-Barre, Pa. June 10, 1924. Filed June 23, 1921; serial No. 479,846.

Coal Atomizer; 1,497,792. J. B. Perkins, Franklin, Ill. June 17, 1924. Filed Oct. 8, 1923; serial No. 667,294.

Drilling Apparatus; 1,498,492. Michael P. Stretausky, Parsons, Pa. June 17, 1924. Filed July 24, 1920; serial No. 398,643.

Loading Machine; 1,498,506. Frederick D. Buffum, Pittsburgh, Pa. June 17, 1924. Filed Jan. 27, 1922; serial No. 632,175.

Miner's Acetylene Lamp; 1,498,803. Wm. J. Mitchell, Kopiah, Wash. June 24, 1924. Filed May 13, 1922; serial No. 560,557.

Miner's Drill; 1,499,141. Peter Bagdon, Kincaid, Ill. June 24, 1924. Filed Aug. 22, 1922; serial No. 583,566.

Apparatus for Feeding Pulverized Fuel; 1,499,396. Henry Mueller, Pittsburgh, Pa., assignor to United Engineering & Foundry Co., Pittsburgh, Pa. July 1, 1924. Filed Jan. 26, 1923; serial No. 614,961.

Machine for Compressing or Briquetting Coal; 1,499,487. Edgar R. Sutcliffe, Leigh, England, July 1, 1924. Filed Dec. 22, 1923; serial No. 682,266.

Mine-Car Brake; 1,499,674. John McCool, Lilly, Pa. July 1, 1924. Filed April 9, 1923; serial No. 630,899.

Preservative Treatment for Timbers; 1,499,791. Grant B. Shipley, Pittsburgh, Pa. July 1, 1924. Filed Dec. 19, 1923; serial No. 681,533.

Treatment of Coal; 1,499,872. Frederick Glyn Price, London, England, assignor to Minerals Separation North American Corp., New York, N. Y. July 1, 1924. Filed April 27, 1922; serial No. 557,018.

Resilient Connector for Mine Cars; 1,500,151. John F. O'Connor, Chicago, Ill. July 8, 1924. Filed Sept. 4, 1923; serial No. 660,726.

Coal-Mining Machine; 1,500,352. James Walker, Nettleton, Pa. July 8, 1924; Filed Feb. 4, 1921; serial No. 442,501.

Carrier for Miners' Battery Boxes; 1,500,510. Carl McElvar and Samuel Simmons, Nesquehoning, Pa. July 8, 1924. Filed April 30, 1923; serial No. 635,765.

Mining Machine; 1,501,030. David Scott Allison, Salt Lake City, Utah, assignor to Sullivan Machinery Co., Chicago, Ill. July 8, 1924. Filed Jan. 23, 1918; serial No. 213,280.

Coal-Cutting Machine; 1,505,093. Joseph W. Blower, Columbus, Ohio. July 15, 1924. Filed March 20, 1922; serial No. 545,148.

Coal Jig; 1,501,577. George W. Wilmot, Hazleton, Pa., assignor to Wilmot Engineering Co., Hazleton, Pa. July 15, 1924. Filed Dec. 23, 1921; serial No. 524,343.

Method of Mining; 1,501,936. Edwin Ball, Birmingham, Ala., and Clarence E. Abbott, Bessemer, Ala. July 22, 1924. Filed May 12, 1923; serial No. 560,394.

Check Hanger for Mine Cars; 1,502,049. John Mervin, Johnstown, Pa. July 22, 1924. Filed July 19, 1923; serial No. 652,625.

Blasting Gun; 1,503,420. Ernest Hutton, Fairmont, W. Va. July 29, 1924. Filed June 2, 1923; serial No. 643,078.

Publications Received

When Insurance Insures, and When It Doesn't. The American Appraisal Co., Milwaukee, Wis. This booklet deals with the use of an appraisal in the proper placing and collection of insurance and contains a number of interesting charts on price fluctuations and the operation of the insurance clause.

Herman H. Sticht & Co., 15 Park Row, New York, has just announced a new booklet entitled "The National Electrical Code and the Megohmer." This little booklet is one of a series and relates to one of the important applications for resistance-measuring equipment.

Tests of Marine Boilers, by H. Kreisler, John Blizard, A. R. Mumford, B. J. Cross, W. R. Argyle and R. A. Sherman. Bureau of Mines, Washington, D. C. Bulletin 214. Pp. 309; 6x9 in.; illustrated. Price, 55c. Part I describes the evaporative tests of marine water tube boilers, and Part II the evaporative tests of the Scotch marine boiler.