

# COAL AGE

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## What Is Safe?

MANY of us are ready to call safe that which can be used safely, but in practice we need a stricter definition and may define a safe device as one that probably or generally will be used with safety. When the life of one or two is involved that will serve as a definition of "safe" but when the lives of hundreds of men are jeopardized as a result of a single indiscretion we begin to take the view that only that which can never be used unsafely is safe. It is in some such sense that Dan Harrington has discussed the flame safety lamp and declared it unsafe. It is in such a way that we can designate the electric safety lamp safe and justify our designation.

Flame safety lamps, like certified explosives, at best can be designated merely permissible, not safe. Safe indeed they may be termed if they are used rightly. Used wrongly they are dangerous. The word "safe" where anything is so only when used rightly is a dangerous word—a bar to safety, a hindrance to progress. We need better flame safety lamps and better explosives and the words permissible or permitted would serve to emphasize that fact.

## Hygroscopic Dusts

WHERE is the cheap non-hygroscopic dust that will remain dry in a damp atmosphere? Alas, we know of but one—coal—and that is so explosive that we wish it were hygroscopic. Perhaps, however, there are others that, placed in a rock-dust barrier, will keep their condition. Nearly all the components of the earth take up moisture and bind themselves into rocks. In the crusher we merely reverse conditions temporarily. Time, which bound the rocks together in the past, soon binds the separated particles together again and laughs at all our efforts.

Nowhere do we need permanence of condition more than in our aircourses where it is so difficult to replace the dust and where frequent ingress and egress through the stoppings makes it difficult to prevent leakage of air. If we must make our stoppings temporary we are almost obliged to have them leaky, thus reducing the efficiency of the air on which safety so greatly depends. Find us then this non-explosive, non-hygroscopic dust, ever ready, no matter how long it has lain, to rise in a cloud when occasion demands.

Crockery, vitrified-brick and marble dusts are perhaps suitable. Shall we come, therefore, to the time when barrier dust and perhaps all dust for rock dusting is first vitrified and then crushed? Shall broken crockery, overburned brickbats, marble-quarry waste, slags and cinders, especially the cinders from the burning of pulverized coal, be our most dependable source of supply? Will these be found harmless to the respiratory organs? And if they are injurious shall we use them only in unused return aircourses or in suspended or shelf barriers where they cannot injure anyone?

## Keep Hoover's Men Abroad

COAL operators, especially those of the Crescent groups with a direct interest in America's coal export trade, might well speak a good word to their Congressmen for the Winslow-Jones bill. This measure, which did not pass at the last session of Congress because it came up too late to get on the calendar without a suspension of rules, would make permanent the foreign service of the Department of Commerce. As it is, the fourteen commercial attachés, forty-two trade commissioners, thirty-five assistant trade commissioners and nineteen American clerks in the department's forty offices scattered through the trade centers of the world never know whether their jobs are to continue until Congress periodically acts upon the departmental budget. If an appropriation sufficiently large is made, they continue; if not, they don't.

Permanency for this foreign service should be provided. Surely it has justified itself during the years that it has been functioning since 1913, and especially since the war. Coal men interested in export trade never before had such an adequate insight into coal market conditions abroad as they have now. Periodic and accurate information laid on their desks regularly and with frequency has taken much of the guesswork out of export. It has brought information that meant business. It has educated a good many coal men who needed educating. This service, which is a small part of the benefit American business reaps, certainly should be continued—with guaranteed permanence.

## Let the Foreman Do It

WE MUST get away from the idea that the foreman must do everything. It is surprising that we did not pass laws to make him test the places for gas before the miner went into the mine. One wonders why we did not require him to set all the props, so eager were we to ask the foreman to assume all the jobs in the mine that carried any degree of responsibility. Much better would it be to prescribe for him a certain number of helpers in a given area of operation and to require them to be capable.

In Great Britain the custom has been, as in Illinois, to put unreasonable restrictions and burdens on the manager. It has only made of the manager an official of lower caliber. The laws regarding the mine foreman are equally unfortunate. When the foreman is required to do more work than is physically possible, he neglects part of it. He does his best perhaps but usually the work required of him by the state goes by default. This is what always happens when we ask the impossible. "Let the foreman do it," is an unsafe cry. "Let him delegate it to a sufficient force of capable men under his supervision and direction," is a counsel of moderation that will end in our getting more closely what we seek.

## White House Wages

SAYS Holy Writ, "Agree with thine adversary quickly whilst thou art in the way with him, lest at any time the adversary deliver thee to the judge and the judge deliver thee to the officer and thou be cast into prison." With some such point of view the union operators signed the Jacksonville agreement. They had tried on several occasions to disagree with their adversary, the United Mine Workers of America, but the public and the administration had always been found to have their faces set against them, and they decided that on this occasion they would agree with their adversary without delay before the irate public ventured to take them by the neck and regulate or nationalize them.

The Jacksonville agreement seemed quite plausible. The price of coal it is true, was not high, not high enough to meet the old wage scale satisfactorily, but if the wage rate was decreased the price would be lowered in an equal degree, for the non-union operator would be well justified in the minds of his own men and in that of the union in reducing wages accordingly. So nothing was to be gained by lowering wages 10 or even 20 per cent. It was hoped that the non-union mines, which had been subject to continued attacks from the union when paying relatively high wages, would hesitate to cut wages drastically and thus invite union activity. In fact the non-union regions were rather doubtful as to the advisability of any such action and did not want to cut wages, but competition among themselves soon brought them to such a pass that they had to cut them more and more until they had pared them to the quick. The non-union men accepted these successive reductions, and the union mines were left high and dry with no market. Even their men, in places, deserted them to get work in non-union regions.

The trouble with the Jacksonville agreement was that it provided for a three-year continuance. It was conditioned on nothing. The union operators cast their future to the winds for three long years. They mortgaged their very existence for a period so long as to jeopardize their stability. Business can hope over a season or a year, but it looks askance at three years of no market.

At an appeal to patriotism and interest in the public weal the operators agreed to the Jacksonville wage scale. Did the public, which requested it, agree to buy of those that paid it? Not at all, not for one instant. They bought where they could get coal cheapest. They imposed the wage but they refuse to pay it. Thus they euchred the union operators. Will the operators feel again the compulsion to sacrifice themselves to the public weal? We think not. They will never again agree with their adversary quickly, regardless of judge and officer.

They have a right to consider their own interests in the matter. It does not concern the operator much what the miner is paid; he would sooner pay a big wage than a small one, but if the public wants to set the wage for certain operators and not for others it should buy from both its accustomed percentage. Conversely, if the public, as indeed it always does, wants to buy open shop, from union or non-union mines alike as is its pleasure and its right, it should set the wages for all alike or set them for none of them. However, the public should not regulate wages in non-union mines; it should recognize the right of mines that are unionized to make their own contracts without public pressure.

## Facing the Inevitable

NO ONE can fail to sympathize with Warren Stone, of the Brotherhood of Locomotive Engineers. He, probably, with a lot of budding capitalists and with some who have been in business many times already doubtless, believed that he could be a new type of industrialist who would pay high wages, give his men the best of working conditions and be hailed as a benefactor of mankind. Many working men and salaried employees of corporations, when they first enter the capitalist class, have such dreams. All honor to their ideals even though in nearly every case they have failed to make their visions realities.

Those who have are engaged in some business, hedged by patents and copyrights and free from labor agitation. Some others have managed to transfer their ideals to the field of operation, but they were in newly established industries where quantity production had not been attempted hitherto and where prices were, therefore, much higher than the nature of the product would warrant. But if Warren Stone wanted to be free of the stress of competition, if he wanted to make such profits that he could divide liberally with his employees and yet have usufruct for his toil and money, why did he attempt to go into the coal business? There have been years in the coal industry when such beneficence was possible, but 1924, as Warren Stone now recognizes, is not one of those years. At least the coal business in 1924 is not one in which that result can be attained. Probably the Brotherhood will realize that it will do well to enter industries which, like banking, employ little labor and have never known a union.

The mine workers have taken action against many of their numbers who have entered the troublous arena of life as capitalists. They have never escaped dissension and innuendo. Others have tried to act as combined workmen and capitalists, forming what is termed a "co-operative mine" and they have been threatened with expulsion from the union and practical boycott, because co-operation in gain means co-operation in loss, and so the men were soon working for what amounted to a concession in wages.

Stone has tried to be a capitalist with union money, and he is finding himself more handicapped than the mine worker who openly enters the capitalist class for his own gain. He has found himself facing both ways—a union man with regard to his brotherhood and a capitalist with regard to the United Mine Workers. The pipe dream has been nothing but rings of smoke. It cannot succeed, and it is likely that the unions may before long decide definitely that there is no halting between the union and Mammon, and that union men should cease to retain cards of membership as soon as they become capitalists.

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IN ALL THE RECENT CHARGING and countercharging in the battles over child labor legislation, the coal mines of the country cannot after all, be accused of much offence. In spite of the pictures often drawn of worn, emaciated little boys toiling pitifully underground in coal mines, statistics of the 1920 census show that the total number of boys under 15 employed in all mining and quarrying was only 7,191. After deductions have been made for operations other than coal, there remains comparatively little child labor for which the coal industry can be held accountable.

## Advances in Mine Plants and Safety Are Themes of Coal Mining Institute of America

Nicholas Evans Elected President for 1925—Sayers Discusses Effect of Excessive Dust, Heat and Humidity—Dawson Relates Nature and Advantages of Colonial Conveyor System—Detailed Discussion of Rock Dusting

BY R. DAWSON HALL  
Engineering Editor, *Coal Age*



LARGE numbers were down to the forty-eighth annual meeting of the Coal Mining Institute of America, at Pittsburgh, Pa., Dec. 3, 4 and 5, to hear about the belt conveyors at the Colonial Docks and about rock-dusting developments and to see the former working in the H. C. Frick Coke Co.'s mines and the dusting machines and dusted roadways at Indianola.

Business was quickly disposed of. The members learned from H. D. Mason, the secretary-treasurer, that the 2,661 members were increased by 350, due to new admissions at this meeting, bringing up the number to 3,011, that J. M. Armstrong, general manager of the Pittsburgh Coal Co., was responsible for bringing in more than one-half of the new members. They also learned that the finances were in better condition than ever in the history of the organization. They accepted the report on the Use-Classification of Coal and continued the life of the committee which reported, charging it with the duty of seeing that its recommendations be carried into practice.

The committee took Dr. Ashley's classification, modifying it only by using the percentages of volatile matter to the whole coal content on a moisture-free and ash-free basis. Dr. Ashley had favored allowing for 7 per cent of ash in the coal and estimating the volatile and fixed carbon so as to total 93 per cent, leaving a standard ash of 7 per cent. The committee viewed this as a somewhat artificial way of bringing the specifications to a comparable basis and not so productive of advantage as of misunderstanding, and decided to base the classification on an ash-and-moisture free basis instead, placing the dividing lines in the classification at even 7-per cent differences in volatile contents.

The tellers announced the election of Nicholas Evans as president, with 499 votes; J. M. Armstrong, first vice-president, with 463 votes; A. C. Fieldner, second vice-president, with 364 votes; W. C. Hood, third vice-

president with 315 votes; and H. D. Mason, secretary-treasurer with 566 votes.

M. D. Cooper, outgoing president, read an address on the "Positive Side of the Mining Industry," declaring that too much had been said about the faults and frailties of the business of coal mining and too little about its progress and about other qualities deserving of public approval. Other points he made were that greater continuity of operation was desirable and that this could be attained only by coal storage; that such storage was a matter rather for the consumer than the operator, for the latter could always produce enough to satisfy the consumer if the railroads could haul it. He said that storage serves the public best if done at destination rather than at the mines, despite the public's notion that coal should be stored where it is produced. He declared himself opposed to a Department of Mines. The creation of such an instrumentality, though it would elevate certain officials, would bring the Bureau of Mines into politics, of which hitherto it had managed to keep itself clear.

### KEEPING THE STANDBY LIMBER

Graham Bright then presented his paper on "Recent Electrical Progress in Coal Mining," which appears in this issue of *Coal Age*. W. L. Affelder, taking the chair for the discussion, Mr. Writh asked at what frequency and for what length of time should the standby unit be operated to be sure it always would be in condition for an emergency. He said that at a pumping plant in Oklahoma the standby was tested once a week for three minutes and it had been found possible to get the emergency unit operating in one minute from the supposed moment of breakdown of the regular unit.

Mr. Bright said he did not know how often the Youghiogheny & Ohio unit was tested but that when the mine was running, the emergency unit was operated at frequent and regular intervals. Asked by Mr. Affelder as to the cost of an installation such as that of the Youghiogheny & Ohio, he said that there were some refinements in the design of the standby engine that were hardly necessary, he thought, for a plant the

NOTE—Headpiece shows C. H. Dodge, research fellow on dusting, taking a sample in the No. 8 mine of the Pittsburgh Terminal Coal Co. The dust clinging to the ribs and roof in a strip 6 in. wide is carefully collected. About  $\frac{1}{2}$  lb. of that portion of the dust that will pass through a 10-mesh screen is put into one of the containers shown on the bottom and constitutes a sample.

operating economy of which was not a vital or even an important point. Such a plant with less elaboration but sufficient for all purposes could be constructed for \$6,000 to \$7,000.

H. J. Evans, of the Mather Collieries Co., said that his company's steam-engine standbys used only about 80 tons of coal a month. They did not require the services of a single man, for the power-house attendant kept the boilers fired. He said that the cost of the standby plant, which was built originally for the operation of the hoist and fan, was more than \$25,000. The emergency unit could be gotten into line in four or five minutes and with it men could be hoisted and the fan operated.

J. J. Rutledge, chief mining engineer, State of Maryland, said that in the Dolomite disaster the emergency equipment was brought into operation within seven minutes after the explosion. It undoubtedly saved many lives. It cleared the mine in a short time.

W. L. Affelder said he did not want to suggest to the mine inspectors what they should do, but he believed it might be well for them to require the testing of auxiliary equipment at mines when visiting a coal plant, just as some of them were requiring a test to be made of the overwind devices.

W. L. Maize said that when the Nemaclin mine took out its seven boilers and put in purchased power it laid off no less than sixteen men who in the course of twenty-four hours were employed at the boilers of that plant. He fully realized what it meant to maintain a steam standby.

In answering Question No. 1, which inquired why the Pennsylvania bituminous mining law demanded that "For work underground when supplied by current at voltage higher than medium voltage no transformer shall have a normal capacity of less than 5 kw., nor shall any motor have a normal capacity of less than 15 hp." Mr. Bright said that with 2,200-volt alternating-current the wire would be so small that a reliable motor or transformer could not be made. This was the objection from a manufacturing standpoint. Viewed as a mining matter, he would say that equipment so small would be regarded with more or less indifference and therefore might be neglected. Mr. Bryan remarked that where 440-volt alternating current was used for transmission the requirements as to size seemed too small.

#### CONDEMN 500-VOLT CIRCUITS

The question whether a voltage of 500 is reasonably safe for all working conditions in 3½ ft. of coal developed no conflict of opinion. Joseph Williams, Nicholas Evans, W. L. Maize and William Langan agreed in condemning it, wondering, however, if anywhere it was used in places as low as 3½ ft. R. N. Hosler said that four out of five electrical accidents came from the use of 500-volt circuits. He considered that this was sufficient evidence of their dangerous quality. William George, Madeira Hill Coal Mining Co., said that while a shock from a 250-volt current tends to knock one away from the circuit, a 500-volt circuit tends to hold you to it.

R. C. Beerbower said that on the opening of the Springdale mine there had been much discussion in his company as to the better voltage to use—250 or 500. As a result it was decided to use 250, the mining men vigorously protesting against the arguments of the electric power plant experts who favored 500 volts. He felt that it was the economical voltage because the ma-

chinery was more readily maintained in condition. Joseph Knapper said he had no more accidents where 500-volt circuits were established than where the voltage was 250. The men apparently had become educated to take no chances with such deadly current. Nevertheless he was opposed to so high a voltage. W. H. Howarth said that as the lower tension was likely to be made legal it was risky financially to install a higher tension.

At the afternoon session Alexander McCanch, state mine inspector at Monongahela, Pa., gave well-considered views of "Mine Accidents and Their Prevention." In commenting on Mr. McCanch's paper, F. B. Dunbar, general superintendent, Hillman Coal & Coke Co., said there always should be clearance on both sides of a mine



Nicholas Evans

For many years state mine inspector of Johnstown, Pa. Elected president, Coal Mining Institute of America for 1925. Mr. Evans has for many years been a member of the Coal Mining Institute of America and a regular attendant.

track—a wide or working clearance on one side and a man-clearance on the other. He said also that firebosses should be encouraged to report gas. Twenty years ago a fireboss would be discharged in some mines if he reported gas twice in the same section. It was an attitude like that which caused the fireboss to fail to report gas and this, in those days, was a cause of many accidents.

R. N. Hosler said that one-third of the men killed in haulage accidents were not employed in haulage, showing the need for separate travelingways for mine workers or for the introduction of the man-trip. Francis Feehan declared that the mine workers were quite frequently sent into the mines without being directed as to safety practices and without having it clearly understood that safe conduct at the mines was a condition of employment. He believed that men should be disciplined for infractions of the mine rules.

C. L. Lutton, of the H. C. Frick Coke Co., in reply to Mr. Feehan said that a colored man related at a safety meeting that he hadn't learned much about mining, but this he had learned that he must block his cars. He had lost a week on suspension, and the idea was clearly borne in on him that it was an excellent thing to do if one desired to hold one's job with the H. C. Frick Cok

superintendent, Jefferson & Clearfield Coal & Iron Co., believed that prosecution was the better way to enforce safety and asked, "Can you prosecute a man for disobeying safety provisions when the violation of the rules does not produce an accident?"

Mr. McCanch declared that a man could be prosecuted for a violation of the mining law but not for failure to comply with the orders of the foreman if those orders required him to do something that would promote safety but which was not a legal requirement. Thus the track in his room might be in such condition as to be likely to cause an accident. The foreman might order him to repair or relay the track. That was a proper order, but compliance with it was not required for the miner under any provision of the law. The foreman could discharge the man for failure to comply with the order, but he could not prosecute him, no matter how much his negligence might menace life or limb.

Mr. Steinheiser replied that he questioned whether the foreman could prosecute a man for failing to set a prop on being ordered to do so. Mr. McCanch said he had obtained the conviction of a man for that act of negligence, but it was necessary to show the court that the condition of the roof made the standing of a prop necessary for safety. John I. Pratt said that he knew of an instance where a foreman had ordered a man to stand a prop. When the man failed to do as directed, the foreman ordered the man to leave the room, and he then put a danger signal near the room mouth. He prosecuted the man for the act of disobedience, and the court found as requested, fining the man \$100.

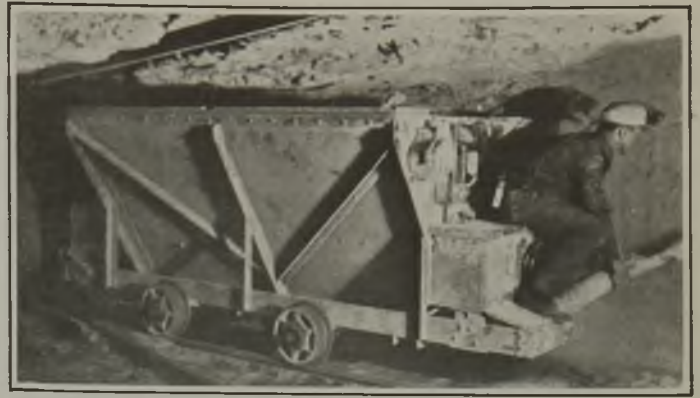
#### SUSPENSION MORE EFFECTIVE

W. G. Duncan declared that in a number of cases it had not been necessary in obtaining conviction to show that an accident had occurred. You cannot, he said, derive the whole law from any one paragraph. There are some unsafe practices for which a man can be prosecuted with or without an accident and others for which a man can be prosecuted only if an injury follows. A. C. Callen said that for some violations of the orders of a mine foreman mine workers cannot be convicted, and it is questionable whether they can be sentenced for not setting a post when ordered, if the roof is strong and sound. But "Why," said he, "prosecute a mine worker when suspension gets quicker results?"

H. E. Kinlock questioned the advantage of having miners set timber. He had gone to work in the mines in 1871, and in the mine in which he was employed, even in that early day, timbermen set all posts. Joseph Knapper said that the Secretary of Mines had this year pitted the anthracite mines against the bituminous mines in a contest for safety. The anthracite mines usually have one-fifth more fatalities per thousand men employed than bituminous mines. This year the latter, though they had worked irregularly, had experienced more fatalities per thousand than those in the anthracite region.

Dr. R. R. Sayers then delivered an address on "Health Hazards in the Mining Industry," describing the effects of high temperatures and humidities, of dusts, of oxygen depletion, of carbon dioxide, hydrogen sulphide, sulphur dioxide and carbon monoxide. He discussed also the methods employed underground for disposing of sewage and providing drinking water, the value of illumination and the diseases known as nystagmus, beat hand, beat knee and beat elbow.

He described, though his paper does not report it, the sanitary conditions inside and outside the mines



**Fear Rock-Dust Distributor in Operation**

This type has been developed for use in thick seams. It has a carrying capacity of 3 tons of rock dust and with two men will lay a uniform coat of dust over one mile of entry in a shift of 8 hours. This photograph was taken in the No. 8 mine of the Pittsburgh Terminal Coal Co.

the experiments made on animals by injecting dusts in the abdomen, thus creating in the subject tissue changes probably similar in all respects to those created in the lungs by inhaling dust. The action is more rapid, however, and these inquiries seem to indicate that dust of many, if not of all kinds if introduced in quantity has its harmful effect. Dust is like poisonous gas. The human organism can resist even the most poisonous of gases if presented in sufficiently diluted form, but succumbs readily to a dose of greater concentration. He said that Dr. Mavrogordato has concluded that "it is the dust that cannot escape from the tissues which is a source of danger and as long as elimination follows fairly closely upon the heels of ingestion not much harm is done. Coal seems to set up a sort of aseptic 'catarrh' in which there is a steady exodus of particles from the lungs." In reply to N. D. Hubbell, Dr. Sayers said that amorphous silica, such as kaolin, like crystalline silica, was harmful, at least when injected into the abdomen.

In response to an inquiry as to whether nystagmus might be a germ or worm disease transmitted in warm mines he said that men in clerical work with poor illumination often suffered from nystagmus which passed away when the working light was bettered. Some have thought, however, that nystagmus might be caused by gases. The victim of nystagmus at first carried, in the eye, images of things he had previously seen—after images—and later had oscillations of the eyeball, vertical or horizontal, usually the former.

#### COAL DUST CURED TUBERCULOSIS

Nicholas Evans said he questioned whether coal dust could be harmful to the human organism. He knew of a tubercular man who went to work at a coal dump to get his fill of coal dust; in consequence his tuberculosis was cured.

Dr. Sayers said that he thought that the claim that the presence of coal dust enabled the lungs to throw off dust cells was rather far fetched. It had, nevertheless, its advocates. Asked by J. F. Downs whether a man whose heart missed beats while working in a place where carbon dioxide was present in excess of the normal quantity, could ascribe the condition fairly to the presence of that gas, Dr. Sayers said that with such quantities as were likely to occur such an effect on the heart would be unlikely. He would want to know what the man was doing in the off-shift hours.

Questions Nos. 3 and 4 were combined to read "Are

much improved over thirty years ago? If so, what are the main reasons?" Dr. Sayers said that there was no doubt that conditions are now more favorable. Better air and water were provided. J. J. Rutledge said that the air had greatly improved since the time when it was said that the way to make an old man out of a young one was to put him at work driving entry. He thought all mines needed the man trip and the change house. However, to H. E. Kinlock, who in 1871 went to work in a mine where brattices were kept within 4 ft. of the face and where all the shooting was done at night, it appeared that conditions were worse than in years past.

In response to an inquiry, Dr. Sayers declared that burned-out carbide residue did no harm. Some silicon hydride might be emitted and this gas was dangerous like hydrogen sulphide, but occurring in small quantities it did no harm.

At the banquet, with M. D. Cooper presiding, the Rev. Dr. Frederick G. Budlong made an address on "Leadership"; Thomas S. Baker, president of the Carnegie Institute of Technology, one on "Engineering Education" and H. L. Cope a humorous address on the philosophy of laughter. Dr. Baker said that the large consolidations in industry restricted the number of places open for college graduates, but also made the few places available of more value for those who obtained them. He also said that the many specialties developing tempted the colleges to go too far into specialized education. He added that it seemed likely that, in order to give a student the material needed for meeting the problems of operation, the courses might have to be lengthened.

#### BELT CONVEYOR 4½ MILES LONG

At the morning session of Thursday, Ralph Beerbower, general manager, Pittsburgh-Allegheny Coal Co., presided, the session opening with an address by Thomas C. Dawson, chief engineer, H. C. Frick Coke Co., on "Underground Belt Transportation of Coal." In this address Mr. Dawson described the 4½-mile belt conveyor of the H. C. Frick Coke Co. at Colonial mines, which was to be visited the following morning. Mr. Dawson also showed moving pictures of the installation.

M. A. Kendall, chief engineer, Stephens-Adamson Manufacturing Co., read a paper on the same subject, giving details regarding the four belts of the Hardy Coal Co., at Panther, W. Va. He remarked that though the longest belt at the H. C. Frick Coke Co.'s installation was 1,513 ft. long his company was of the opinion that the distance between centers could be economically and safely extended to 2,500 or even 3,000 ft. The tensile strength of the belt at the Frick plant was 10 to 12 times the working strength. The energy consumed was 0.1 kw.-hr. per ton-mile on the level. There was practically no dust, though to obtain that condition the coal was watered at the face.

E. C. Auld, the mechanical engineer of the H. C. Frick

Coke Co., discussed the plant and said that there was practically no disintegration of the coal. W. L. Affelder wanted to know if the product had not deteriorated as a result of the use of the long rotary dump which made inspection of each individual mine-car load of coal practically impossible. Mr. Auld said that the Clairton furnace had made no complaint of that sort.

Means are afforded for slowing down the dumping of coal, so that it can be inspected as it is being discharged. Tracks are provided by which a full trip can be set aside for that purpose. This trip can be dumped

slowly and the coal watched as it leaves the cars. Should the coal from any section of the mine be suspected of having an abnormal percentage of ash, it can be side-tracked and examined at leisure.

In reply to M. D. Cooper, Mr. Auld stated that the accident rate had not increased as a result of the installation of the belts. Inquiry developed from Mr. Auld that no accidents had occurred in the operation of the belts, but that their installation had not reduced accidents because the coal prior to the operation of the belts traveled as far as it does now.

The coal formerly was not carried to the river but was discharged and used at points four miles or more from the docks. The system, however, increased the safety, as the cars were not uncoupled before dumping and did not have to be recoupled thereafter. No accidents had occurred while the idlers were being removed from under the moving belt for repairs. T. W. Dawson said that 1,000,000 tons had passed over the belt since its installation April 1.

#### NO COAL BROKEN ON CHUTES

In answer to an inquiry, Mr. Auld said no careful examination had been made, but he believed that no coal was broken in sliding on the chutes from one belt to the next in line. Some breakage occurred in falling into the bins and again in loading the coal into barges from the pockets at the docks. At the feeders, the coal falls on coal, the layer of coal being built up as the belt under the feeders progresses along the dump.

In answer to Question No. 6, "Is Underground Mechanical Loading a Success?" R. R. Dunlop read the paper of N. D. Levin, chief engineer, Jeffrey Manufacturing Co., on the new loading and belt conveyor methods of his company. He said he had in mind developments of this kind for twenty years, but felt sure they were foredoomed to failure so long as operators insisted 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.

His view was that the machines for loading should not be moved from place to place several times in a single shift; in fact he declared that the machine should remain in a single place, shift after shift, till the place was worked out. Mr. Levin said that the New

River Co. at its Cranberry mines with head offices at McDonald, W. Va., had a shortwall conveyor with a sectional conveyor at work and also a shortwall loader with sectional conveyor. Five blocks, 100 ft. wide by 100 ft. long, had been removed already.

He did not know, as yet, whether it would be found that the two upper cutterbars broke the coal to such a degree as to increase the percentage of fine coal. He thought not. The speed of the upper cutterbars was slow. With this device the coal could be shot lightly, far lighter than with other methods of loading. The machine could load coal even when the seam had been shot so lightly as just to shake or crack it without, however, bringing any coal to the floor.

Mr. Maize, state mine inspector, said that the main difficulty of the inspectors was to keep loading machines out of the mines. Operators inform them that they are going to put loaders to work and inquiry develops that the operator has not troubled to ask whether the loaders are flameproof. He wondered that the manufacturers of loading machines overlooked the importance of fitting them for use in gaseous mines. Mr. Levin said the motor on the 44-A loader had been approved by the Bureau of Mines. No official approval had yet been accorded the other loader, but they expected to receive it soon.

E. H. Coxe, general manager, Snowden Coke Co., said that he had been trying to work his coal by longwall. The main roof could be held satisfactorily, but the drawslate was giving much trouble. He could not hold the roof for a distance of more than 4 ft. from the face. He could make his 6½-ft. undercut, but the roof had to be posted as soon as the cut had been made.

#### MOVIES SHOW DUSTING METHODS IN WEST

At the afternoon session, over which R. N. Hosler presided, Edward Steidle, supervisor, co-operative courses, Carnegie Institute of Technology, read his paper on "Modern Methods of Rock Dusting in Coal Mines," the first part of which is published in this issue. H. I. Smith said that rock dusting was advocated by George S. Rice a third of a century ago. Mr. Rice told an operator in Illinois that explosions had been found to terminate in places where there was a large quantity of shale dust, and that he thought the artificial spreading of such dust would act as the natural dust had done. Later the Rainey mines had been dusted and one of the mines of the Pittsburgh Coal Co. Mr. Smith showed motion pictures of a trip he had taken with J. E. Jones through the West. They found that the Western mines had actively entered the rock-dusting campaign and devised several dusting machines for use in their entries.

J. T. Ryan also showed several pictures of the Bureau of Mines' barriers, the Fear rock-dusting cars and the Indianola mine. Mr. Fear said that the cost of rock dusting at his mine during the month of May was 7 mills per ton. He expected it would be less hereafter. His final machine had a large dusting capacity, but in practice, as there were delays, it would be likely not to average over 4,000 lineal feet a day.

He found that the finer dusts did not stick on the sides of the roadway not having, he believed, sufficient inertia, so he was going to use dust that was somewhat coarser. Dr. W. J. McConnell, of the Bureau of Mines, replying to Question 8, said that limestone was the preferable material for rock dusting because of its light color, its freedom from combustible and its probable

physiologic harmlessness. Shales contained usually from 2 to 20 per cent of combustible matter.

J. M. Armstrong, general manager, Pittsburgh Coal Co., said that rock dusting had cost them 2½c. per ton of coal mined but that he hoped the cost might be reduced to 1c. He doubted if the Pittsburgh Coal Co. would be able to reduce the cost below that figure. Mr. Dunbar, general superintendent, Hillman Coal & Coke Co., said that his company had dusted about 60,000 ft. of entry. It was using barriers where there was no road. He had never thought much of water sprinkling. Most managers did just enough to "get by the inspector." He believed that rock dust would not



**J. M. Armstrong**

General manager, Pittsburgh Coal Co., elected first vice-president Coal Mining Institute of America for 1925. Mr. Armstrong's efforts this year brought 161 new members to the institute.

only protect the mine against explosions but also against the slabbing of the pillars along the roadway.

A. C. Fieldner described the volumeter. Coal dust has a specific gravity of 1.3 and rock dust, whether limestone or shale, a specific gravity of 2.6 approximately. Twenty grams of collected dust are put in a receptacle and to it are added 50 c.c. of liquid. The level of the liquid is then read. Some kind of alcohol is used because alcohol will wet coal dust whereas water will not. Thus the dust will fail to receive the water into its interstices. If there is much coal in the dust a greater volume of dust would have to be used to provide the required weight (20g.) and the liquid will rise to a higher level in the volumeter. This method of determining the inertness of rock dust was suggested by M. Taffanel, the French mining expert.

Samples of dust from all over the country had been tested by this and by combustion methods, and no differences exceeding 5 per cent had been found in the indications by the two methods. In burning dusts if limestone is present not only will the combustible be burned away, but the limestone will be decomposed, giving excessive indications of "combustible." Conse-

quently, without great care to correct for this decomposition, the combustion method will give errors larger than those given by the volumeter method. Mr. Fieldner added that in France a method of measuring the inertness of mixed dust by the length of the flame produced in its combustion was practiced. He found it difficult to ascertain the length of the flame and, though he believed the ability to do so could be acquired, it would take long training and even then the method would be inexact and somewhat fortuitous.

Mr. Steidle said that he could not grant that there was any danger to health to be anticipated from the use of dust containing 35 per cent of free silica. Such dust had been used in Great Britain for years without unfavorable results. In Illinois dust of that character had been employed for three years.

Mr. Rice referred to the discovery, by Mr. Atkinson in England, that the presence of disintegrated rock dampened the violence of explosions, to the rock dusting work of Dr. Garforth at Alltofts and to the erection by that mine manager of a short dust gallery for experiments. He said that when he was traveling the mines of Great Britain he had never seen the dust rise in a cloud from the roadway except when a horse was hauling cars along the road. Then the dust would rise knee high, but above that the air was clear.

#### BARRIERS STILL GOOD AFTER A YEAR

Dusts from all over the country had been sent to the Bureau for test. Some were extremely bad, especially flue dust, which the Bureau had condemned. Despite all that had been said as to the packing of ground rock in the presence of moisture, the rock dust in the barriers at the experimental mine had remained in good condition for a year at a time, showing that some dusts at least did not harden in a short time and become valueless. About 90 per cent of the time the barriers proved effective but in 10 per cent of the cases they failed. Perhaps he might be pardoned in speaking about the Dawson explosion that occurred many years back. At that operation were two distinct mines connected by a passageway. The explosion in one mine communicated to the other, and a large number of men were killed in the second mine. A rock-dust barrier probably would have prevented the passage of the explosion from one mine to the other. Mr. Rice added that before he went to France on his recent trip an operator called him in consultation and told him he wanted to get the latest information on rock dusting. This operator said sprinkling was costing him 25c. a ton and that he had ordered the management, nevertheless, to spare no expense, but he wanted a cheaper and more assured way of obtaining safety. He is now using rock dust.

Mr. Enzian said several companies in central Pennsylvania were getting ready to rock dust. Others said that rock dusting was either being introduced or had been introduced at Wehrum, Robindale and Nantyglo.

In discussing Question No. 9 as to "The most effective way of minimizing the present appalling rate of fatalities due to falls," Mr. McCanch said that overdevelopment of mines should be avoided because when roadways were allowed to stand the rock became loose and was likely to fall. Of course, it was necessary in places when the measures were uncertain to keep the development well in advance, lest at any time it might be found that a certain area would yield no tonnage and consequently that provisions should have been made to open up an entirely different area.

On Friday at least two inspection trips were made, one to Colonial docks and the other to Indianola. The visitors to the former inspected the dump and then were taken in cars along the belt-conveyor line to the rotary dump where the first belt is loaded with coal from the mine cars, thirty-five to forty cars being dumped at one time. As Mr. Dawson described the plant quite completely in his paper it is not necessary to discuss it at length. It might be well to emphasize the freedom from dust throughout the operation.

In many places the old Alice mine, used as the approach to the Colonial mine, had caved to considerable heights, and it had been necessary to build arches over the entry. Large quantities of concrete, steel posts and steel beams have been used to protect the roadway, which in the Alice mine is 14 ft. wide. The coal is taken by the belts to a bin under which move two shuttle conveyors. Each conveyor can handle 1,000 tons per hour. They move backwards and forwards so that the point of discharge is varied. Each storage bin has a capacity of 1,200 tons. Barges, 26 ft. wide by 175 ft. long and carrying 850 tons are loaded by eight chutes and can be filled in ten minutes. All gates, chutes and the barge-mover are controlled from the operator's room under the bins. Lunch was served to the visitors by the H. C. Frick Coke Co., in the supply house of the mine.

R. C. Beerbower supervised the trip to the Indianola mine which was accomplished in automobiles. The Westinghouse Electric and Manufacturing Co. prepared an interesting exhibit at East Pittsburgh, showing a new permissible mining machine, a new arc-welding rheostat, a 200-amp. arc welder, clutch-type synchronous motors, a pneumatic hoist control, die-cast aluminum rotors for squirrel-cage motors, sealed sleeve bearing for motors and other interesting exhibits.

### Crush Their Own Stone at Paintsville, Ky.

Many coal mines produce a good grade of sand rock which can be broken up advantageously for tramroad and railroad ballast, for concrete and for village road improvements. At Thealka, Ky., the North East Coal Co. has erected a bin and purchased a stone crusher and elevator for the preparation and storing of stone to be used in their concrete construction work. This is located at the foot of the slate pile, the sand rock being slid down the face of the dump by means of a rudimentary chute.



Stone Crusher at Paintsville, Ky.

A portable crusher, an elevator and a roofed bin form a suitable plant for the crushing of sand rock and its storage preparatory to use for concreting. The North East Coal Co. has found this rough equipment of great use in reducing its concreting costs. much concrete work bei



# How Rock Dust Cures the Epidemic of Mine Explosions

Explosions' Fatalities Rise in 1924 to 25 per Cent of All Fatal Accidents in Mines—One Hundred Companies or More Are Now Rock Dusting—Some Rock Dust on All Roadways, Ribs, Roof and Timbers

BY EDWARD STEIDLE

Superintendent Co-operative Mining Course,  
Carnegie Institute of Technology,  
Pittsburgh, Pa.



AMERICA has experienced its full share of bituminous coal-mine explosions. The first on record in this country occurred on March 18, 1839, in the Black Heath mine near Richmond, Virginia, and resulted in 40 fatalities. Up to Nov. 1, 1924, according to reliable data, there have been 263 explosions in the bituminous mines of the United States, killing five or more men each, or a total of 7,735. The largest disaster took a toll of 361 lives.

Beginning with 1910 and ending with Dec. 4, 1924, there have been 58 explosions in which coal dust is known to have played an important part, with a total loss of 2,422 lives, to say nothing of millions of dollars in property. It is estimated that about 75 per cent of the lives lost in coal dust explosions could have been saved if the mines in which the explosions occurred had been systematically rock dusted.

It must be remembered too, that the majority of mine explosions occur when relatively few men are in the mine. In so far as the time element is concerned, the two high peaks for explosions are at 7:30 a.m. and 6 p.m.; the former is due in large measure to poor fire-bossing, or open lights (which means gas) and the latter to shotfiring (which means explosives and dust).

## EXPLOSION HAZARD MAGNIFIED

The figures mentioned look big, but it is true that normally, on a percentage basis, the explosion hazard is of minor importance. Over a period of 10 years from 1911 to 1920, inclusive, only about 12.21 per cent of the total number of fatalities in the bituminous coal mines was due to explosions and fires, whereas 41.19 per cent was due to falls of roof and coal. From another angle it might be added that the average number of men killed per 1,000 full-year (300-day) workers during this same 10-year period is less than 5, which means about 0.6 killed by explosion and fires per 1,000 full-year workers. On a million-ton basis this figure

would be even less. Therefore, the glaring headlines in the press, following a mine explosion are uncalled for and mislead the public, which can do little to remedy the evil, but is only too free to criticize.

However, if we consider the explosion record since 1920 we can readily appreciate why mine owners, mine workers, and the public are deeply concerned in the matter. Five explosions occurred during 1920 with an average of seven fatalities per explosion, eight explosions with an average of four deaths in 1921, seventeen explosions with an average of sixteen deaths in 1922, seventeen explosions and an average of twenty deaths in 1923, and eight explosions resulting in a total of 452 fatalities in 1924, up to and including Oct. 1. The percentage of the total number of fatalities due to explosions and fires has already jumped up from 12.21 to about 25 per cent in 1924. This is the tragic story of the past four years, and the cause for the feeling of alarm among our responsible coal mining men, who can and will improve these conditions.

## COMPARATIVE COST NEGLIGIBLE

Several of our leading mining men who have had experience in rock dusting believe that on a long-term basis the cost of applying rock dust will not exceed a quarter of a cent per ton of coal mined but obviously this figure has not been substantiated. In any event the cost should not exceed 1 cent per ton. However, any reasonable expense is an almost negligible item as compared with the loss of life and property. The cost to the public of widespread coal dust explosions is many times greater than the cost of preventing these explosions by rock dusting. The Castlegate and Benwood explosions are reported to have cost no less than \$2,000,000 in compensation, property damage, and recovery costs.

If 500,000,000 tons of bituminous coal are produced in 1924, this loss represents an added cost of 0.4c. per ton that in the last analysis must be paid by the consumer. In other words, the money lost by these two widespread explosions, which could have been prevented by systematic application of rock dust, would possibly have

NOTE—First part of paper entitled "Methods of Rock Dusting Bituminous Mines," read before the Coal Mining Institute of America, Pittsburgh, Pa., Dec. 4. Headpiece shows safety inspector ascertaining the percentage of inert material in the dust from the mine

rock dusted all the dry and dusty bituminous coal mines of the United States without increasing the total cost of coal for the year.

Bituminous coal mining operators do not knowingly and willingly allow potential explosion conditions to exist in their mines. Operators and officials are just as humane as mine workers and always guard against the horrors of an explosion. Yet the record just given is circumstantial evidence that there are evils of omission or commission, or both, on the part of someone. By an act of Congress, approved May 16, 1910, and effective July 1, 1910, a Bureau of Mines was established in the Department of the Interior. At first the Bureau, under the terms of the act, gave attention chiefly to investigation of causes of, and remedies for, accidents, especially coal mine explosions. With a view, therefore, of eliminating explosions from the miner's life and from a critical public, the characteristics of gas and coal dust explosions have been studied diligently by the Bureau since 1910. The scientific facts so ably established by the Bureau are sufficiently extensive to justify the expectation of a better history than the record shows. The Bureau has of course no mandatory power and does not wish to obtain it.

However, at least ten years ago, the Bureau recommended rock dusting among other things as a means of preventing and limiting mine explosions. Only five operators adopted the system in America up to 1924. Therefore, some mining men were either not fully informed regarding these preventive measures or did not give them proper weight in the conduct of their business. In due fairness it should be stated, however, that a few of our more serious explosions have occurred in mines where nearly every practical and physical precaution had been taken, only to be nullified by a false step on the part of some employee or by defective equipment.

#### WATERING METHOD COSTLY

Coal dust can be made harmless if it is wetted so that it cannot be thrown into suspension. Watering is the method which has been most commonly used, and to a limited extent successfully, but it is costly, deceptive and usually gives a false sense of security. For some years during the early days of the Bureau of Mines, humidification of mine air was considered to be the panacea for widespread explosions, in that it would allay the dust, but tests conducted by bureau engineers showed that humidification was not a satisfactory remedy. In our present enthusiasm over the use of rock dust, the good work that various mining companies throughout the country have done in wetting down coal dust and in humidifying mine air should not be overlooked. But at a number of mines where water was used consistently, violent and widespread explosions have occurred.

Up to June 17, 1924, only five companies were rock

dusting in America. But this safety measure has received a great impetus during the past six months. At least one hundred mining companies have adopted rock dusting in various parts of the country, and it is being taken up much faster than anyone anticipated. However, as usual among coal mining men, it is being done quietly and with due deliberation. One large company in the Pittsburgh district is systematically rock dusting eight of its mines, but no publicity whatsoever has been given to the matter. Mine operators are in earnest regarding the rock dusting of their mines, and the "boom" will naturally extend over the next two or three years.

In this connection the Carnegie Institute of Technology, in co-operation with the Bureau of Mines and the Advisory Board of Mine Operators and Engineers in western Pennsylvania, is carrying on fellowship researches relative to rock dusting during the present college year. It is endeavoring to devise a more satisfactory method of quantitative analysis for free silica, using microscopic means and to determine which rock formations associated with the coal measures in western Pennsylvania are suitable for rock dusting. It will collect data relating to costs, equipment, and systematic methods of treatment, particularly regarding the Pittsburgh Terminal No. 8 mine which is being rock dusted in an

up-to-date manner, and where accurate and detailed costs are being kept. A bulletin covering the results of these investigations will be ready for distribution in the early fall of 1925.

During the past ten months much has been said and written regarding rock dusting. In this period we have had considerable experience and, as usual, many of our theories have necessarily given way to practical considerations. We are just beginning to get at the bottom of the practical application of rock dusting, and one of the first conclusions is that rock dusting is truly an engineering problem. Sooner or later the Bureau of Mines will have to prepare a schedule of tests for rock dusting equipment. My endeavor in this paper is simply to point out some of the more practical phases and modern developments relative to this means of explosion prevention.

#### SAVES INSURANCE COMPENSATION

In June, 1924, the Coal Mine Section, Pennsylvania Compensation Rating and Inspection Bureau, revised Item 85 of its Rating Schedule so that a charge of 5c. is made for a dry and dusty mine, and at the same time a credit of 10c. is given where the mine is rock dusted. In other words, a properly rock dusted mine in Pennsylvania will save 15c. per \$100 of payroll in its compensation insurance. It might be added that Illinois, Indiana, Iowa, and Michigan allow a credit of 10c. for rock dusting. Kansas and Montana give a credit of 13c., and Utah a credit of 14c., while New Mexico, Ala-

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### ALREADY ROCK DUSTED BUT INSUFFICIENTLY

**E**XAMINATION has shown that in an undusted mine the road dust is as an average 43.5 per cent inert, ranging between 27.2 and 54.6 per cent. The dust on the rib, roof and timbers averages 30.8 per cent inert with a range between 20.7 and 50.1 per cent. Thus all roadways are rock-dusted in a degree, but dust explosions show how greatly that natural treatment fails to be adequate. Still, we may be encouraged by the fact that some of the needed work is done automatically, and our work is merely supplemental to what is already done. Physiologically also we are gratified to learn that we are not adding 50 or 60 per cent of dust but a much smaller quantity to what we already have on the roadway.

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#### Safety Inspector Waiting to Descend Shaft

He has hanging from a strap in his right hand a number of cartons for holding his dust samples. He carries also his lamp, battery and the means for sampling the dust. No elaborate outfit is required.

bama, Colorado, and Oklahoma head the list with a credit of 20c.

One steps into deep water when one discusses legislative matters. However, it is desirable to mention at this time the attention being given by various states to rock dusting and other preventive measures. A number of states propose a revision of their mining laws with regard to the coal dust hazard and rock dusting. During the last session of Congress, Representative John N. Robison, Chairman of the House Committee on Mines and Mining, suggested in a speech before the House of Representatives that the President should call a conference of Governors of coal producing states for the purpose of considering joint uniform action relative to safety measures in mines, including rock dusting.

Recent drastic Federal and State regulations approved by mine operators made rock dusting compulsory in the bituminous coal mines of Utah, beginning July 1, 1924. Legislative action favorable to rock dusting may be expected, furthermore, in other states. Colorado has already proposed legislative action, and Pennsylvania, Maryland, Washington, and West Virginia are now giving the matter due consideration. If we are to have new legislation it is, of course, essential that the various states know what they are about and then, if possible, work for uniform regulation.

Some mining men believe that we have too many mining laws, and that some of them need to be removed from the statute books and better ones standardized and substituted. Other men feel that supplementing statute laws with regulation, as is done in Maryland, Wisconsin, California and Utah, is the best way to cover these matters. Some men say that we have sufficient law, if it is enforced, and we need to put some regulation into effect. If the rock dusting problem is handled properly and it proves to be entirely successful, no mining man of any standing will delay its use in his mine. State legislation regarding this matter may or may not solve the problem. In other words, every

mine in the State of Utah is being rock dusted, and though some are doing it conscientiously, with intent to get what good can be obtained, others are reported to be doing it only to keep within state regulation.

It has been proved conclusively that if pure, fine, dry coal dust is raised into a cloud in the presence of a source of heat—for example, a blownout shot, an ignition of gas, or an electric arc—combustion takes place between the carbon and hydrogen of the dust and the oxygen of the air. This reaction may continue, and the flame travels or propagates through the dust cloud with rising temperature and increasing velocity and violence. One outstanding feature is the fact that bituminous coal dust is flammable in pure air. The presence of an explosive gas may aid, but is in no way required for a coal dust explosion. Explosions are sure to occur when there is a proper combination of conditions, and it is well understood that the season from, say, August to March, is always far more prolific of dust explosions than the remainder of the year.

When not less than a 50-50 mixture of rock dust and coal dust is thrown into suspension, the rock dust, together with the coal dust, absorbs heat and lowers the temperature of the flame of propagation below the ignition temperature of the coal dust. Also the particles of rock dust get between the particles of coal dust and have a curtain-like effect. One of the most reasonable merits of rock dusting is the fact that once the dust is distributed systematically throughout a mine, it remains there indefinitely and is always "on guard" during the dangerous period of the year.

It should, of course, be definitely understood that rock dusting is only an additional precaution, and is not expected to take the place of any existing practice of keeping the mine well ventilated and as clean of coal dust as is possible. In other words, mining men will not tie absolutely to rock dusting. It is entirely satisfactory for haulage entries and entry aircourses, but it may be desirable to "kill" the coal dust as it is in process of formation, or immediately afterwards and particularly in dry and dusty mines.

#### WATER USED AT WORKING FACES

The way some companies are doing this is by using water and plenty of it, at and near the working faces; for example, on machine cutter bars while undercutting, in the immediate vicinity of the face before blasting, and on the broken coal before and while shoveling. On the other hand some mining men believe that watering at the face is of no consequence as well as impracticable, and that sprinkling merely agitates the dry, fine dust. Others state that analysis records of samples taken before and several months after washing down the gob, indicate that the dry, fine dust before washing actually contained a greater amount of incombustible.

The production and accumulation of fine dust also can be eliminated in a large measure at the working face by driving all workings on sight, so that a minimum number of bumps will be left to be pick-mined; by more careful handling of bug dust; by loading out all bug dust in the beds of cars; and by more efficient use of explosives. On haulage roads the production of fine dust can be reduced by using tight-fitting and solid-body cars; by employing stiff hitchings; and by providing a well constructed track.

Some companies sprinkle loaded cars after they are loaded and before they leave the face, and also spray them as trips are leaving inside switches or partings.

The cost of drastic safety measures seems, on first thought, to be prohibitive, but our mines should be made safe, and any expense in this connection logically can be charged to the consuming public.

Coal mining men are now thoroughly convinced of the value of two safety measures—namely, the use of permissible explosives and of electric cap lamps. However, only 33 per cent of the coal mined in 1923 when bituminous production was 545,000,000 tons, was shot by permissible explosives. The number of electric cap lamps in use at the present time is estimated at something over 200,000, and is growing. Rock dusting and these other safety measures are important indeed, but it must not be overlooked that most mine explosions have had their beginning in gas accumulations and frequently originated in restricted areas at the working face, in abandoned areas or at some other place where ventilation is not maintained as it should be.

There must not be too much "rule-of-thumb" relative to the volume of air required and constantly furnished at a given working face or in a given entry panel or other area. The question uppermost in mind is whether a sufficient quantity of pure air reaches every portion of the mine, brushes all fresh working faces, and the shifting top in pillar-drawing areas. An accurate ventilating map and definite records of air at the face must be kept as well as barometric observations. It must be remembered also, that for each 1 per cent of methane in the mine air an increase in quantity of rock dust of 5 per cent will be required.

The Bureau of Mines seems to have established the fact that coal dust is flammable in proportion to its fineness and dryness, and to the proportion that the ratio:

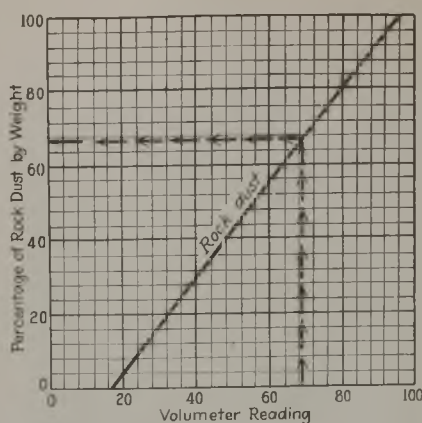
$$\frac{\text{Volatile matter}}{\text{Fixed carbon} + \text{Volatile matter}}$$

This ratio indicates that anthracite dust is practically non-explosive, that fine dry bituminous and lignitic dusts are highly flammable, and that dust of such a hydrocarbon solid as gilsonite is almost as explosive as gunpowder. Furthermore, it is established that bituminous dust which is larger than 20-mesh will scarcely enter into an explosion. One which is about 100-mesh is dangerous, especially if dry, and one which passes



Quartering the Dust for a Sample

As the quantity of dust removed from the floor or ribs and roof at any one point along an entry is greater than necessary for the actual determination of its contents, the dust is screened, mixed and divided into four parts and from each division is taken a few ounces to comprise the sample proper which weighs about  $\frac{1}{4}$  lb.



Volumeter Chart

The volumeter does not give the percentage of rock dust direct but it can be determined by the use of this chart.

through a 200-mesh sieve and is dry must be classed as exceedingly flammable. If, however, these coal dusts do not contain more than 45 per cent combustible matter, they are not likely to cause an explosion unless there is also 1 per cent or more of methane present in the air.

An examination for the coal dust hazard, by a competent safety engineer,

must be made of each mine contemplating rock dusting. Samples must be taken of the coal at different points in the mine, and of dust from the roads, and from rib, roof and timber in the approved manner, and then sized and analyzed. Likewise, the quantity of dangerous road and rib, roof and timber dusts in a specific stretch of passageway must be calculated with a view to determining whether they should be cleaned before rock dust is applied, also the approximate quantity of rock dust by weight that will be required to rock dust properly a given length of passageway. All records should be kept accurately and systematically.

It may be stated that in examining the records of the sizing and analysis tests of a number of samples of dust collected in entries of dry and dusty mines in the Pittsburgh bed before rock dusting was started, the average incombustible content of the haulage road samples was 43.5 per cent, the range being between 27.2 and 54.6 per cent. The average incombustible content of the same number of rib, roof, and timber samples taken at the same points was 30.8 per cent, with a range of 20.7 and 50.1 per cent. It might be added that the quantity of 200-mesh dust contained in the road samples, all of which had passed a 20-mesh sieve, ranged from 17.4 to 27.0 per cent. The quantity of 200-mesh dust contained in the rib, roof, and timber samples, all of which passed a 20-mesh sieve, ranged from 54 to 65.3 per cent.

A rock dusting testing kit is now on the market, and has been designed to collect samples, to make size tests of coal dust and pulverized rock dust, and to make a rapid "volumeter test" for incombustible matter in coal and rock dust mixtures. For convenience, the outfit is assembled in two distinct parts, one the sampling kit and the other the equipment necessary for sizing and testing. This outfit, with a few modifications, is that developed by the Bureau of Mines and is described in Technical Paper 144, a revised edition of which was published in October, 1924. With a little study, any responsible man about a mine can use this kit with a proper degree of accuracy and efficiency. It might be added that for all practical purposes, the carbon dioxide and inherent ash and moisture which may be in any particular coal, can be ignored in preparing calibration curves.

Physiological tests have shown that pure limestone dust is not injurious to health. This material is now commonly used at mines, principally because no mining company knows much about the pulverizing business and all desired to make an early start in rock dusting their mines. At mines practising rock dusting it is

agreed that the most convenient dust to handle, and obviously the most effective, is that dust all of which will pass a 50-mesh sieve, and at least 60 to 70 per cent of which will pass 200-mesh.

Limestone dust can be purchased from many limestone companies, and is usually shipped in 80-lb. sacks, similar to flour and cement, which arrangement facilitates and prevents loss in handling. Sacked limestone dust of which 50 to 60 per cent will pass through 200-mesh, can be purchased at Youngstown, Ohio, for \$4.50 per ton, plus freight charges to the Pittsburgh district of \$1.50 per ton, or a total of \$6.00 per ton. Limestone dust of which 75 per cent will pass 200-mesh and prepared for shipment in the same manner, can be purchased in Bellefonte, Pa., for \$5 per ton. Transportation charges to the Pittsburgh district are \$1.50 per ton, or a total of \$6.50 per ton. Sacked limestone dust, from Erie, Pa., 60 per cent of which passes 200-mesh, can be delivered in the Pittsburgh district for \$5.90 per ton, and dust 80 per cent of which will pass 200-mesh, at \$6.45 per ton.

## Machine Cuts Power Costs And Saves Copper

By Bettering the Power Factor of Present Circuits  
Expensive Changes May Not Be Necessary

By a British Correspondent

**S**YNCHRONOUS motors have been used for years to correct the power factor of alternating-current circuits. Their application in mine installations, however, has been limited to continuous-running machinery such as ventilating fans, air compressors and motor-generator sets. In these capacities the synchronous motor forms a useful adjunct to the electrical installations of mines. The original type of machine, with its salient poles resembling, in its construction, an ordinary alternating-current generator, has inherent weaknesses which militate against its use except in places where technical supervision is available. The synchronous motor and equipment entail a high capital cost, and require synchronizing gear as well as the ordinary switching equipment. Originally it had to be

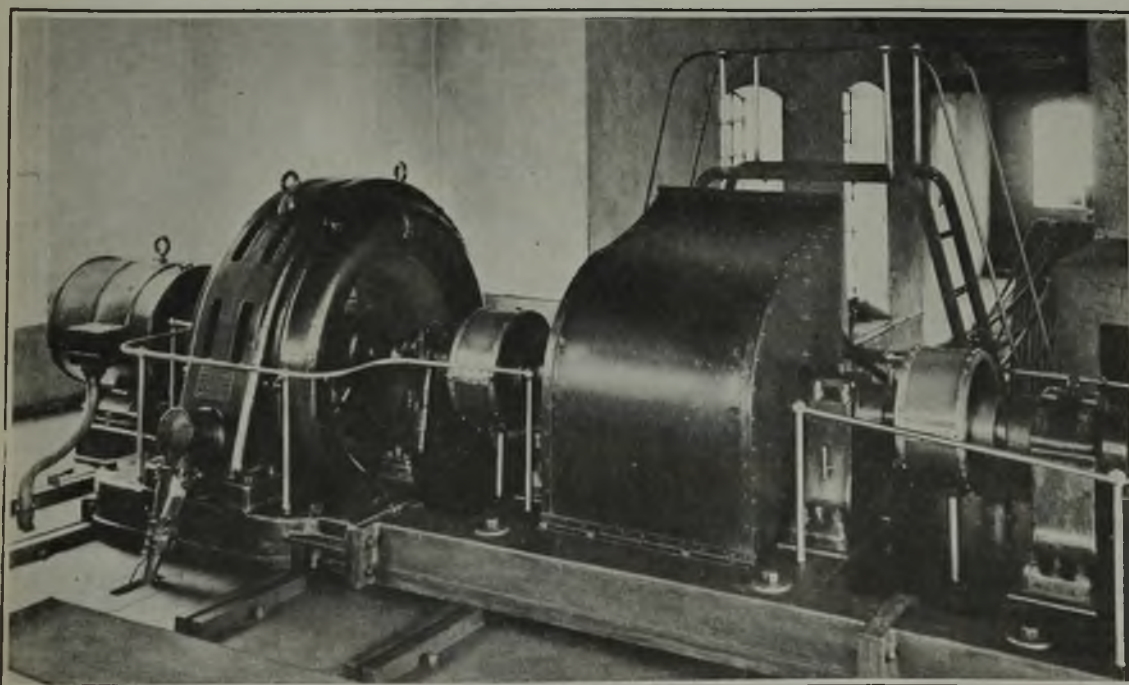
provided with an auxiliary motor, usually of the induction type and mounted on the same shaft, to bring it up as near as possible to synchronous speed, which could never be reached owing to the slip in the induction motor itself. A squirrel-cage damper winding is now employed for starting the more modern machines.

To synchronize effectually, the operative must be skilled, the operation often being attended with great difficulty, especially when the voltage and frequency of the power supply are unsteady, as indeed they often are where a fluctuating mine load is being carried by a comparatively small power plant. The difficulty is not entirely absent when power is supplied by a utility company which operates large generator units. However, the rapidly varying loads of the different consumers usually form a very small proportion of the total load carried by a large generating station and therefore do not so seriously influence either the voltage or frequency of the supply. Further disadvantages of the old-type synchronous motor are that any serious overload will cause it to fall out of step and come to a standstill, and that much time is lost when the processes of running up to speed and synchronizing have to be repeated.

These drawbacks of the synchronous motor have prevented many mines from adopting them even though they effect a large saving in line losses and also increase the power-carrying capacity of the power-distribution system. The effect of power factor on the current required for a given output on a three-phase system may readily be seen from the accompanying table which gives, for an output of 200 hp., the current necessary per line at power factors ranging from unity to 0.7 on a 400-volt circuit.

Current Needed with Varying Power Factor		
Horsepower	Power Factor	Amperes
200	1.00	215
200	0.95	227
200	0.90	239
200	0.85	253
200	0.80	269
200	0.75	287
200	0.70	308

It will be seen from these figures that a cable supplying 200 hp. at 0.7 power factor on a 400-volt circuit, has to carry about 43 per cent more current than it



**Synchronous  
Motor with  
Rope Drive**

Efficient slow-speed synchronous motors are now available for fan drives. When coupled to fans through speed-reducing devices a synchronous motor becomes a valuable asset to the mine property.

would if the power factor were unity. In that instance the raising of the power factor to unity would enable the same cable to carry more than 85 hp. of additional load at unity power factor. With old established plants contemplating extensions, power-factor improvement will often avert the heavy expense of scrapping existing cables and overhead lines for others of larger size. Therefore, should a suitable and cheap means of power-factor correction be available and one that does not entail the employment of expert operators, its advantages should appeal to the engineer of every mine alternating-current installation.

The asynchronous-synchronous type of motor combines in one machine the high starting torque common to the induction motor with the ability of the synchronous machine to operate at unity or even a leading power factor. Its construction is similar to the ordinary slipping induction motor, but the asynchronous-synchronous machine has four slip rings and has a small direct-coupled exciter. This type of motor, examples of which are shown in the accompanying illustrations, as manufactured by the English Electric Co., Ltd., of London, has the advantage over the salient-pole type of synchronous motor in that it has a high starting and synchronizing torque. Further, the salient-pole motor, as a rule, is synchronized when operating under reduced voltage, and this naturally increases the slip and reduces the power available during the synchronizing periods.

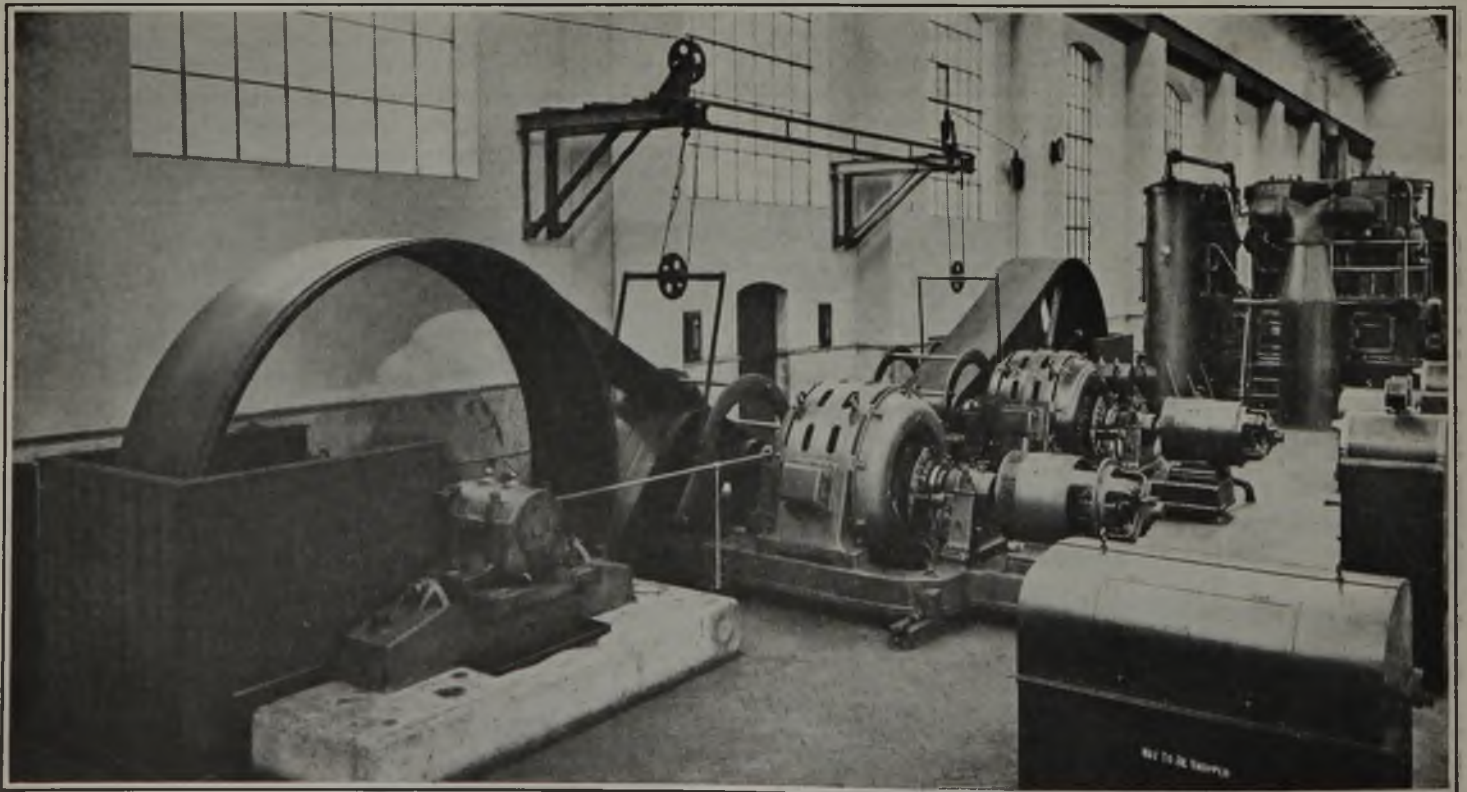
The efficiency of an asynchronous-synchronous motor of medium speed does not differ from that of the ordinary induction motor, yet it is from 0.5 per cent to 1 per cent higher at low speeds when built to operate at unity power factor. On the other hand, with a leading power-factor the efficiency is somewhat lower. The overload capacity of asynchronous-synchronous motors is roughly 70 per cent.

When being started the rotor is connected to an

ordinary type of liquid rheostat starter. After the motor is brought up to approximately full-load speed, by means of a double-throw switch the rotor leads are connected to an exciter. This affords additional torque which is alternately a motoring and a generating one as the rotor poles relatively slip backwards past the rotating stator field. The rotor increases in speed during the half cycle when the torque is motoring. Opposed to this increase in speed of course are the load torque on the motor and the inertia of the rotor and exciter to acceleration. Inversely proportional to the slip is the length of time during which acceleration takes place.

A useful feature of the asynchronous-synchronous motor is that it will synchronize without difficulty against a considerable overload. Moreover, when running in synchronism an excessive overload will have no more serious effect than to make the motor run as the ordinary induction type at a reduced speed. Immediately the overload is reduced to normal, the motor will again synchronize itself automatically.

As the asynchronous-synchronous motor runs at unity or leading power factor it may be employed to correct a low power-factor system, thus reducing the cost of feeder and substation extensions. If the asynchronous-synchronous motor does not have much lagging current of other power-consuming units to correct the design for unity power factor is the most suitable as it has greater efficiency and costs less than one rated for a leading power factor. For instance, a 500-hp. motor running at unity power factor on the same circuit as a similar machine operating at, say, 0.7 power factor will give a resultant of 0.9 for the total load of 1,000 hp. Everything considered, the asynchronous-synchronous motor is a desirable type of drive to install in suitable places about mines, for it combines in one machine the advantages of the induction and of the synchronous motor and thus corrects power factor.



**Complete Units Like These Frequently May Be Used To Better Voltage Conditions**

Air compressors, ventilating fans, pumps and motor-generator sets are specially suited to the use of synchronous motors. Heavy wattless currents flowing in conductors do no useful work, yet they necessitate oversize conductors and cause machines to heat unduly. The large quantity of power-factor corrective capacity is a synchronous motor while carrying a light mechanical load. Synchronous motors may be used to advantage and save money.

# Ten Notable Points of Electrical Progress

Special Emphasis Laid on Emergency Provisions in Case of Power Failure—Gasoline Engines Though Less Economical Are Preferable to Oil Because of Lower First Cost

By GRAHAM BRIGHT  
Consulting Electrical Engineer,\*  
Pittsburgh, Pa.

**D**URING the past twenty years the use of electric power in and about coal-mining properties has so greatly increased that already most coal mines are using electric power exclusively, but a fair proportion in some parts of the country are still using steam for all or part of their power requirements.

It has been demonstrated that, where power can be purchased at a reasonable rate, an entirely electrified mine with purchased power is usually the most economical.

Among the recent developments toward the better and more economical use of electric power might be mentioned: (1) Long belt conveyor systems involving several miles of belt and requiring electrical equipment of the highest order to meet the exacting requirements of such a system; (2) the application of the synchronous motor to mine-fan drive, using new types of synchronous motors combined with internal and external clutches, operating either automatically or manually; (3) the application of the commutator type of alternating-current polyphase motor to mine-fan drives for variable speed operation; (4) the application of automatic substation and switching equipment to coal mine operation; (5) permissible locomotives and motors for safe application to gaseous mines; (6) new methods of bonding rails, including electric bonding machines; (7) magnetic and pneumatic types of control for locomotives and hoists; (8) small steam turbo-generators and the uni-flow engine for isolated plants; (9) development of high grade and reliable gears of spur, herringbone and worm type, enabling the use of high speed motors for hoist, fan, locomotive, pump, and conveyor drives; (10) emergency power units to supply power to keep up ventilation and remove men from a shaft mine in case of failure of purchased power.

A complete paper could be written on any one of the above subjects, but this paper will be confined to the last.

## LINE TROUBLE UNLIKELY

The service at a modern, up-to-date central-station power plant, will be, in general, more continuous than at an isolated plant. The transmission system of the central-station company may change this situation, for the power lines often pass over wild country and in most cases line trouble cannot be cleared up immediately. Where duplicate power lines from two different directions are available, a prolonged shutdown due to line trouble is little likely to occur.

In some cases steam plants are installed to obtain the highest percentage of continuity of service possible. This is generally a mistaken idea, as a serious shutdown is just as likely to occur with a steam engine as with an

electric motor. It has been found that where engines in coal mines have established a long record for continuity of operation, these engines are invariably greatly underloaded and consequently wasteful in the use of power.

The most important reason for providing emergency power is the safety it affords. It is usually applied in mines that are gaseous and where a shutdown of short duration may prove dangerous to men and property. This is particularly true in regard to gaseous shaft mines. Maximum safety is assured when emergency power is afforded to maintain the ventilation and remove the men from the mine in a short space of time.

## STEAM FOR EMERGENCIES

A number of mines, in changing from steam power to purchased electric power, have retained part or all of the steam plant for emergencies. This necessitates generating steam 24 hr. per day and also keeping the fan and hoisting engines in good condition. A mine thus equipped may not use the steam plant once a year, but the equipment should be tested frequently to be sure that it will be in operating condition when needed. The cost of maintaining such a system is unduly high.

A scheme now coming into common use is to install a gasoline- or oil-engine driven generator of about 100 kva. capacity. The generator is usually wound to suit the auxiliary hoist motor, which, in most cases, is a 2,200- or 440-volt, three-phase, 60-cycle wound rotor induction motor. The auxiliary hoist usually operates in the air shaft and in most cases hoists and lowers the men.

If the fan requires much power, and in a large gaseous mine, it usually does, there will not be sufficient power to operate both the hoist and the fan from the emergency plant, unless a two speed or variable speed fan motor is used, in which case the power required by the fan can be greatly lowered by reducing the fan speed.

As there is no particular object in obtaining economy in the operation of emergency equipment, a gasoline engine should be chosen rather than an oil engine. A high grade gasoline engine can be started in a minute or two with assurance, and because the period in which it is in operation is short, the fuel consumption is not an item to be considered.

A gasoline engine has been used to drive the fan direct, in case of emergency. This is accomplished by clutches. In most cases, however, the electric drive is simpler and more satisfactory.

There are many operations in the coal fields where there is no hoist in the auxiliary shaft and the men are hoisted and lowered in the main shaft. The main hoists of such mines usually have a capacity ranging from 300 to 600 hp.

The largest gasoline engine available has a capacity

NOTE—Article entitled "Recent Progress in Use of Electricity in Coal Mines," read at the Coal Mining Institute of America, Dec. 3-5 at its annual meeting held at Pittsburgh, Pa.

\*Howard N. Eavenson and Associates.

of about 300 hp. at 1,000 to 1,200 r.p.m. An engine of this type undoubtedly would be inadequate to supply power for the main hoist and the fan. The main hoist, however, usually operates at a speed considerably higher than that necessary and desirable for hoisting men. Furthermore, during the short period required to get the men out, it would be permissible to operate the fan at a reduced speed, provided it has not previously been stopped an appreciable length of time.

Manifestly, a scheme that would permit the hoist and fan to operate at reduced speeds without any loss of power other than the inherent machine losses, would permit the use of a moderate size gasoline-engine generator equipment. Such a scheme is available by the use of a reduced frequency and voltage. An induction motor will operate economically at a reduced frequency if the voltage is reduced in the same proportion. The speed also will be reduced proportionately. If the frequency is reduced 50 per cent the power and speed of the hoist motor will be reduced 50 per cent with the same load, and the power required by the fan motor with a 50 per cent speed reduction will be from one-quarter to one-fifth the full-speed power.

About a year ago, at one of the plants of the Youghiogheny & Ohio Coal Co., near Pittsburgh, a scheme involving the use of reduced frequency was installed for emergency service. At this plant are located two hoists, each being equipped with a wound-rotor induction motor of 400 hp. capacity and two fans each being equipped with a 150-hp. wound-rotor induction motor. The hoists and fans are within a few hundred feet of each other, and as the mines are gaseous it is extremely important that some ventilation be kept up while the men are being removed from the mine, in case of failure of power.

#### HOISTS OPERATED ALTERNATELY

A cage load of men weighs less than the usual load of coal and the maximum load during the hoisting cycle when hoisting men with power of one-half frequency is about 120 hp. The load on each fan motor at half frequency is about 35 hp. The hoists can easily be operated alternately by signal lights so that both are not taking power at the same time. Under these conditions the maximum load required is 190 hp. when one hoist and both fans are operating, and 70 hp. when only the fans are running.

The equipment selected to meet the above conditions consists of a 240-hp. high-grade Sterling gasoline engine of the Viking type, with dual ignition and dual starting equipment, direct connected to a 175-kva., 1,100-volt, three-phase, 30-cycle, 900-r.p.m., alternating-current generator. If necessary, this equipment could be operated at 40 cycles, in which case the engine would be operated at 1,200 r.p.m., and thus have a capacity of 320 hp. The generator would have a capacity of 233 kva. at about 1,475 volts.

To assure satisfactory operation a voltage regulator should be installed with outfits of this type. The equipment, referred to above, meets all the safety requirements, and can be placed in operation within one minute after failure of power. It is only necessary to press a starting button and operate a double-throw switch to substitute 1,100-volt, three-phase, 30-cycle power for 2,200-volt, three-phase power at 60 cycles.

Various combinations of generators can be used to

meet different conditions. Where pumping must be done it would be necessary to furnish full-frequency power for centrifugal-pump motors. This could be accomplished by an extra 60-cycle generator or a separate gasoline engine-driven generator.

Where a direct-current hoist is used with field control, a variable voltage direct-current generator could be used with the emergency set, and the speed of the hoist would depend upon the capacity of the gasoline engine.

An arrangement of a small steam turbo-generator receiving steam from one or more flash-type boilers may be feasible. Boilers of this type are used on steam automobiles and can be fired in a short time or kept under pressure automatically. The generator would be geared to the turbine and designed for full-frequency or reduced-frequency alternating current or direct-current, as conditions may require.

The advantage of the type of emergency equipment installed at the Youghiogheny & Ohio mine is that it is reliable and may often save the loss of a day's run, which, if repeated too often, will make it difficult to keep men. The equipment is not expensive, and therefore can be purchased by small as well as by large mines.

## Carnegie Institute to Train Graduates at Mines

Pittsburgh Mining Men Agree to Give Three Years Experience to Certain Number of Students Paying Them Salary the While

**A**N OPPORTUNITY will be afforded the student of bituminous coal mining to bridge the gap between the class room and the practice of mining, according to the announcement of Edward Steidle, supervisor of co-operative mining courses at the Carnegie Institute of Technology, Pittsburgh, Pa. This is the outcome of a report made by a special committee to the advisory board, Nov. 10 of this year, the chairman of the committee being J. M. Armstrong, general manager of the Pittsburgh Coal Co. The committee said:

"Business may owe the graduate nothing that it does not also owe to every young man, but it is good business to train promising young men in industrial methods and operations and this fact is demonstrated by the large number of corporations in nearly every branch of industry that offer training courses for college graduates. A college education should enable a young man to develop more rapidly than he would have done without the education, and the obtaining of such an education is to his advantage, because business will compensate him according to service rendered. The burden of delivery, however, is on the man.

#### COMMON SENSE BIG ASSET

"A college should teach a young man that his real training begins when he graduates; that in college his mind is trained only to a quicker comprehension of the problems with which he will meet in the course of his practical education; that his examination for entrance to the school of practical education will be at least as severe as his entrance examination to college; that while philanthropy may be business, business is not philanthropy, and that common sense will be one of his greatest assets; that if he is to succeed it will be neces-



sary for him in many instances to subordinate to practical considerations the theory that he has been taught.

"College graduates have been willing to go into a banking institution, start at the bottom and spend years in working up to the compensation equivalent to that of the inside laborer of a coal mine; into a mercantile establishment to become the head of a department; into a manufacturing establishment to get within sight of the headship of the department; but they have not been willing as a class to start at the bottom in the mining industry and stick until developed into men that any well directed company would feel justified in placing in control of its properties.

"If a college will encourage its mining graduates to follow coal mining, there will be no question that the mining industry will co-operate to such an extent that it will develop its entire official personnel from college-trained men."

The "Training Course in Bituminous Coal Mining for Technical Graduates," as it is to be termed, is designed to accommodate men of good physique and address having had a technical education either at the Carnegie Institute of Technology or elsewhere. The course will extend over two years, or twenty-four months, and will begin on or about July 1 of each year. A third year will be spent in specialized training. The student will not be bound by contract. While on the training course he will be considered as a student employee, not necessarily, however, as a coal loader or machine helper, but in all cases, unless otherwise warranted, he will work as a helper. In other words, at no time during the training course shall he be expected to be a total liability to the company.

Effort will be made to place him at a mine supervised by a fair-minded and helpful superintendent and mine foreman, but he may be moved from one mine to another as warranted. While at a union mine he will not be required to join the United Mine Workers of America. On completing the training course he will be interviewed by the general manager or general superintendent and may be assigned to a definite position during the third year, concentrating on the class of work in which he is most interested or for which he seems best fitted but involving some measure of respon-

sibility. At the end of the course of training, the company may rate and place the student or may drop him entirely. The student, in turn, may stay with the company or seek other employment.

**SALARY TO BEGIN \$100 PER MONTH**

At present the student will begin the course of training at a salary of \$100 a month, which will be increased \$10 at the end of each six months so that during the last six months he will receive \$130 a month. The pay during the third year will be the regular salary for the class of work performed. The employer is at liberty to drop the student at any time during the course if he shows a lack of interest in the work, does not perform it satisfactorily or does not mix well with the men.

Throughout the course of training the student will prepare comprehensive notes and follow as closely as practicable the headings and sub-headings indicated in the outline of training shown in the accompanying table. The officials of the Co-operative Mining Courses of the Carnegie Institute of Technology will keep in close contact with the student as approved by the mining company concerned. The College of Engineering will recommend for the degree of Engineer of Mines any student who has successfully completed the course of training and presented a satisfactory thesis on some phase of coal mining, provided further that he has had two years in responsible charge of work.

At present the State Department of Mines requires that applicants for the positions of mine foreman and fireboss must have had five years' experience in the bituminous mines of Pennsylvania. It is believed that this law will be revised, thus giving technical graduates in mining credit for two years of practical experience. This change in the law would allow students completing the training course to qualify for the state examinations for these certified positions.

At the end of the training course, the company will grade each student on the following points: Common sense, energy, initiative, leadership, reliability and general ability. If he has done satisfactory work, the company will give him an executive or operating position in the work for which he seems best suited.

<b>Outline of Training Course, Carnegie Institute of Technology</b>	
<i>Subjects to Be Studied</i>	
<b>Trackwork</b> (Materials, tools and labor necessary to accomplish certain results, bonding, grading, costs) .....	1 1/2 months
<b>Timbering</b> (Materials, methods of placement, quantity and labor needed, costs) .....	1 month
<b>Wiring</b> (Equipment, size of wire needed, hangers and insulators, switches for all conditions, placing of switches, guarding, costs) .....	1 month
<b>Drainage</b> (Elevations in mine and on surface, water centralization, pumping equipment, laying and connecting of pipe, guarding, costs) .....	1 month
<b>Ventilation</b> (Volume needed, ventilating equipment, air-courses, stoppings, splitting of air currents, regulators bratticing, materials and tools necessary, costs) .....	1 1/2 months
<b>Hoisting</b> (Hoisting plant, conveyors, operation, inspection and repair, costs) .....	1 month
<b>Haulage</b> (Gradients, condition of tracks, condition of trolley wire and bonding, locomotives and their operation, mule and rope haulage, mine wagons, distribution of haulage partings, gathering in all its phases) .....	1 1/2 months
<b>Shooting Coal and Rock</b> (Preparation of face, placing of holes, types of explosive, placing of explosives, tamping and material for same, precautions necessary) .....	1/2 month
<b>Mining</b> (Nature of coal being worked, top to be cared for, development methods, undercutting in advance and retreat, roof control, recovery of timber, modified methods, care of abandoned workings, costs) .....	2 1/2 months
<b>Coal Preparation</b> (Tipple design, sizing of coal, cleaning, weighing, trimming, costs) .....	1 month
<b>Supplies</b> (Quality and quantity, receipt and distribution, records, costs) .....	1 month
<b>Power and Substations, Surface and Underground</b> (Machine types, housing, lubrication, safeguarding, repairs, costs) .....	2 months
<b>Clerical</b> (Timekeeping, payrolls, records including costs, house rents, coal sales and reports to general office) .....	2 months
<b>Shop</b> (Work on all classes of electrical and mechanical appliances, pumping equipment and sufficient time in stock room to become familiarized with different classes of stock, costs) .....	2 months
<b>Supervision and Inspection</b> (Superintendent, mine foreman, assistant mine foreman, fire boss, company inspector, costs) .....	1 1/2 months
<b>Personnel Work</b> (Medical insurance, welfare, costs) .....	1/2 month
<b>Engineering Corps</b> (Surveying, construction, drafting, costs) .....	2 months
<b>Reports in Engineering Department</b> (Detailed investigation, valuation, surface and underground layouts) .....	1 1/2 months
<b>Total</b> .....	24 months



## Hail to the New World's Record Coal Mine!

Valier Mine in Southern Illinois Establishes New Mark  
By Hoisting 8,664 Tons in One Day

ON NOV. 25, another world's record was established. On that date the Valier Coal Co.'s mine at Valier, in southern Illinois, in 8 hr. hoisted more coal than any one shaft, so far as is known, ever produced before in the history of coal mining—8,664 tons. This exceeds by 446 tons the greatest day's hoist previously produced—the record of 8,218 tons established some time ago by the Orient No. 1 mine of the Chicago, Wilmington & Franklin Coal Co., at West Frankfort, Ill. Another of the "whopper" southern Illinois mines—Zeigler No. 1 of the Bell & Zoller Coal Co.—in October made the largest month's hoist in history—189,240 tons. Thus the record-breaking habit is strong in this region.

The Valier mine, owned and operated through a subsidiary by the Burlington railway, has long been recognized as a good 6,000-tonner but nobody expected it to break a world's production record. Changes in management and methods during the past year have increased the capacity of the plant without the installation of much additional equipment. Thus the great day's run of Nov. 25 was made possible without previous notice.

### MADE OVER TWO THOUSAND DUMPS

In the eight hours of hoisting on that day, the time lost totaled nine minutes. Two minutes were required for cleaning the sump, three were lost by a car getting stuck in the dump, power was off for one minute and three more minutes were consumed rerailing a load on the bottom. A total of 2,036 dumps was made which gives an average load of approximately 4.3 tons per car throughout the day. Only 600 cars were in coal service on the day in question so that they averaged about 3.5 round trips each, an unusual performance.

Naturally the neighbors wondered what made it possible for Valier to make such a huge run, and searched for causes. The best reasons they could find were as follows: On Nov. 24, the day previous, the dump broke at 12:40 p.m. The underground workings continued to produce coal for 2 hr., 10 min., or until 3 p.m. when the mine blew "all over" for the day and the last man came out. Of course some coal was produced and placed on wheels for the next day during this 2 hr. 10 min.

However, the critics certainly would agree that there would be nothing left over after the tremendous run of the 25th, yet on the 26th the mine produced 7,681 tons without half trying and with absolutely no preparation. This gives much justification to the claim that the mine has the "greatest" tonnage ever hoisted from a single shaft.

### TONNAGE EXCEEDS ESTIMATE

In the June 24, 1920 issue of *Coal Age*, Carl Scholz, who opened the property and designed the equipment, stated that the main shaft was planned to produce 6,500 tons daily. It is clear that it has a much larger capacity. For reaching the large tonnage the leisurely method of the two-car rotary dump and skip are used. Without unusual hustle such equipment makes possible a large tonnage. The skip has a capacity of 15 tons and the guides are of 85-lb. track rails.

The hoist is arranged for automatic acceleration, automatic slow-down and stop. It is necessary only for the operator to close the control switch in order to start the hoisting cycle. A pilot motor then turns the controller to the full-speed position, whereupon this motor is cut off and unclutched. Near the end of the travel of the hoist, cams turn the controller to the off-position and when this is reached the brakes are automatically applied.

One of the factors that permitted the large output to be made, doubtless is to be found in the large cars. Originally designed to hold 5½ tons they were, as stated earlier in this article, hauling only 4.3 tons, but even that is a tonnage per car that gives large economies in operation. Though shaft sinking was started in September, 1917, and coal was reached in May, 1918, and despite the fact that the Valier mine made remarkable advances in tonnage, it has taken over seven years to reach this preeminence. This is a clear indication of the long period between the inception of a coal project and the attainment of maximum output.

W. M. Dickson, purchasing agent for the Valier Coal Co., is acting general manager. F. F. Green is superintendent. D. W. Jones is electrical engineer and Charles E. Anderson underground manager.

# Live Topics Elicit Animated Discussion at Meeting of West Virginia Coal Mining Institute

Rock Dusting, Pneumatic Separation of Coal and Electrification of Gaseous Mines by Storage Batteries Hold Interest at Winter Session—Lambie is New President—First-Aid Meet Well Managed

BY J. H. EDWARDS  
Associate Editor, *Coal Age*  
Huntington, W. Va.

**R**OCK DUSTING, pneumatic separation of coal and electrification of gaseous mines by storage batteries, were the subjects dealt with at the winter meeting of the West Virginia Coal Mining Institute held at Welch, W. Va., Dec. 2 and 3. This meeting, quoting Frank Haas, consulting engineer, Consolidation Coal Co., "was one of the most successful in the history of the institute." The first morning session was attended by more than seventy-five men, this, according to Joseph Reed, retiring president of the institute, being almost a record attendance at an early morning session on the first day.

William J. O'Toole, general manager of the American Coal Cleaning Corporation, read a paper on pneumatic coal separation. He reviewed the progress of the dry-cleaning process to its present stage of development, citing a number of first class installations now in operation. He declared that treatment by air is yet in its infancy, but that water cleaning has already been perfected to a point where inherent characteristics limit further important development.

In his paper Mr. O'Toole stated that the use of rotary screens instead of other types would reduce the operating cost of the extensive sizing which is required for pneumatic separation. He also emphasized the point that the substitution of air cleaning for washing would eliminate the pollution of streams which is now becoming a serious problem.

He described the problem of handling the dust encountered with the first installations. A material increase in the volume of air drawn from above the table and into the dust collecting system has solved this difficulty. The ordinary cyclone collector system is satisfactory except in cities having strict anti-smoke ordinances, in which cases the bag type of collector must be used.

## DUST COLLECTOR LESSENS FIRE HAZARD

Answering a question, R. M. Lambie, chief of the West Virginia Department of Mines, said, in substance, that at a plant which is equipped with the latest type of cyclone dust collector there is no longer any fire hazard from dust floating about in the building.

Thomas Fear, general superintendent, Inland Collieries Co., Indianola, Pa., suggested the possibility of reducing the quantity of dust by treating the coal with oil or in some other manner before it goes to the air cleaner, or possibly before being dumped.

Questions were asked Mr. O'Toole regarding the commercial value of the dust. He stated that some dust had been sold at \$15 per ton for foundry facings. He added, however, that this market is limited. He also said that for some unexplained reason the dust runs higher in ash than the coal as received.

Mr. Fear read a paper describing rock dusting experience at the Indianola mine. Last February, sprinkling, for which approximately 20 miles of pipe was used, was abandoned in favor of rock dusting. There is now 58 miles of dusting in the Indianola mine. The present practice is to redust whenever an analysis of road dust samples indicates below 55 per cent of combustible content.

During May this mine used 2 to 3 lb. of limestone dust per lineal foot of entry, and the cost of dusting was 1.1c. per lineal foot. During the last six months the company's records show an average of 4,000 ft. of entry dusted in eight hours, at a cost of \$40.60. The experience to date indicates that if entries are dusted twice a year it will cost 2 mills per ton, and if dusted four times per year, 4 mills per ton.

A recent analysis disclosed that about 50 per cent of the rock dust applied last spring and which during the summer had become caked by moisture, had returned to such a condition that it would be thrown into suspension in case of a violent disturbance.

Mr. Fear's paper was followed by a lively discussion which brought about a comparison of conditions at Indianola and what might be encountered in a seam such as the Pocahontas No. 3. Mr. Lambie stated that in West Virginia no credit on compensation is allowed for rock dusting. Mr. Fear said that in Pennsylvania 10c. is allowed per \$100 of payroll.

## MAIN HAULWAYS DUSTED TWICE A YEAR

Mr. O'Toole asked how often per year the entries at Indianola must be dusted. Mr. Fear replied that present experience indicates that the main haulways must be dusted twice a year. About 300 tons of rock dust has been put into the Indianola mine this year.

Mr. Crawford, of the Mine Extension Department, University of West Virginia, inquired about the loading of machine cuttings into the bottom of the car, before shooting. Mr. Fear stated that this practice has been abandoned, the coal now being shot down on top of the dust. Replying to a query on how close rock dusting is kept to the face, Mr. Fear explained that entries are kept dusted to the last cross-cut, which ordinarily means a maximum of 80 ft. left undusted.

The possible difficulties of effective rock dusting in seams such as the Pocahontas No. 3, as compared to the Pittsburgh seam, which is mined at Indianola, were discussed by Mr. Lambie. The higher percentage of fines and lower height of entries were mentioned as possible difficulties. Mr. Fear stated that after a recent trip through a Pocahontas No. 3 mine he concluded that there is no more dust being deposited than at the Indianola mine. He also stated that low height with attendant greater air velocities would have little

effect in dislodging the rock dust from ribs and roof. He said that it is only the first trip passing through a newly dusted entry which dislodges any appreciable quantity of the dust. The second trip brings down very little.

At Indianola, washing down the ribs with water before rock dusting is not done, as rock dusting is not so effective if the ribs are slightly wet. Furthermore, it has been found that the blast of rock dust when being applied actually washes down to the floor a large percentage of the coal dust.

In his paper Mr. Fear described the advantages of rock dust stemming and he indicated this practice is being followed at Indianola. He cited as advantages, greater safety, a saving of 20 to 30 per cent in the quantity of explosive and an increase of 9 to 20 per cent in the quantity of lump coal.

Following Mr. Fear's paper, John T. Ryan, Mine Safety Appliance Co., Pittsburgh, Pa., gave an illustrated talk on sampling—and analyzed mine road dust and exhibited and demonstrated a compact commercial outfit for determining the non-combustible content by the specific gravity method. This method of analysis is correct to within about 5 per cent, the greatest error being introduced by the varying moisture in the sample. A correction can be made, however, if the quantity of moisture in the sample is known.

It was recommended that of the samples collected only that portion passing through a 10-mesh screen be brought out for analysis, and that this be further reduced by a 20-mesh screen before making the specific gravity test. Mr. Ryan stated that in France the regulations require that mine dust samples show 70 per cent of non-combustible before being considered entirely safe.

In answer to a defense of sprinkling Mr. Ryan stated that it requires at least 30 per cent of moisture in coal dust to insure any degree of safety, but that such a content does not remain fixed any definite length of time. A rock dust content, on the other hand, undergoes much slower changes.

#### ELECTRIFICATION GROWTH DESCRIBED

The paper read by John B. Hicks, of the Consolidation Coal Co., Fairmont, W. Va., on electrification of gaseous mines by storage batteries, described a new departure in methods of utilizing electricity with greater safety for coal cutting and handling. Developments in design of straight storage battery locomotives with safe electrical equipment, for gathering and handling, were described. The power truck or, in other words, the self-propelled portable storage battery for furnishing power to a mining machine, is a departure which, perhaps, no company besides the Consolidation has tried.

Experience with a number of these power truck outfits has demonstrated their practicability for gassy mines, indicating that their adoption in any mine may be considered from the standpoint of economy alone.

In the discussion Mr. Knight asked how teetering is avoided in the main haulage battery locomotive which was described in the paper as being 19 ft. long and having a 70-inch wheelbase. Mr. Hicks explained that the battery compartment is adjustable so as to obtain good balance and that the use of a long journal box with coil springs located about 12 in. apart also aids in overcoming any tendency the locomotive might have to teeter.

At the business meeting of the institute the following

officers were elected: President, R. M. Lambie, chief of the West Virginia Department of Mines, Charleston, W. Va.; first vice-president, T. M. Downing, Jr., general manager Logan Coal Corporation, Lundale, W. Va.; second vice-president, George Wolfe, secretary Winding Gulf Coal Operators Association; third vice-president, C. C. Morfit, secretary Tug River Coal Operators Association; fourth vice-president, E. S. Wade, West Penn Power Co., Beech Bottom, W. Va.; fifth vice-president, J. E. Lawall, head of mine extension department, University of West Virginia, Morgantown.

Executive committee—Frank Haas, consulting engineer, Consolidation Coal Co., Fairmont, W. Va.; W. E. E. Koepler, secretary Pocahontas Coal Operators Association, Bluefield, W. Va.; F. F. Carson, consulting mining engineer, Crane & Cole Co., Huntington, W. Va., and W. E. Fohl, consulting mining engineer, Pittsburgh, Pa.

The new president, Mr. Lambie, presided at a banquet of members which was held in the evening. Jack Morris, general manager of the MacBeth Coal Co., Logan County, and Thomas Stockdale, inspector of District 17, furnished vocal and instrumental entertainment.

#### REAPING THE UNDERGROUND HARVEST

The second day of the meeting was taken up by an automobile trip to nearby mines and by a first-aid contest. The first stop of the trip was at Gary No. 6 mine, where the visitors saw in operation the coal cutting and loading machine of Col. Edward O'Toole. This machine with its 43-ft. cutter bar, reminds one of the method used in the great wheat growing belts for harvesting grain. Like the large grain heading machines, it cuts a wide swath through the field, catches the material on a platform and elevates it into cars.

The party also visited the Gary power plant, where they saw two 750-hp. boilers being fired with powdered bone coal. Each furnace has five feeders, these blowing in and releasing the powdered fuel at a point 28 ft. from the floor of the combustion chamber. The bone coal is shipped in railroad cars to the power plant from nearby mines of the United States Coal & Coke Co.

From Gary the institute members were taken to Coalwood, where they were the guests of the Consolidation Coal Co. at a luncheon served at the club house. F. K. Day, general superintendent at Coalwood, was introduced as the man responsible for this wonderfully satisfying part of the day's program.

In connection with the institute meeting the McDowell County first-aid contest was held under the auspices of the Tug River and Pocahontas Coal Operators Association, the U. S. Bureau of Mines and the National Safety Council. Seventeen teams competed and, thanks to C. C. Morfit, who supervised the meet, there was no evidence of the confusion and long delays which are so often noticed at first aid contests.

The winning team from Exeter shaft of the Kingston-Pocahontas company, and captained by C. R. Angove, received a large silver trophy. According to the judges' score, two teams tied for second place, these being the team of the American Coal Co., McComas, captained by John W. Smith, and the team of the Lake Superior Coal Co., Superior, captained by Ray Ingole. The toss of a coin gave second place to the American company team, each individual member receiving as second prize a five dollar gold piece. A medal was given by the National Safety Council to each member of the three teams mentioned above.



## News Of the Industry



### Jacksonville Agreement Fails to Cure Ills of Coal Industry

Forty-three per Cent of Country's Mines Shut Tight—Puts Wagon Mines  
Off the Map—Competitive Situation Unchanged—  
Legislation Impends in Congress

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Eight of the thirty-six months which constitute the life of the Jacksonville agreement have passed. It has been in effect long enough, however, to produce some extraordinary and far-reaching results, and the leaven has only begun to work. It has shut down absolutely 43 per cent of the mines. Without question it has concentrated coal production at the low cost properties, but it has only accentuated the cutthroat competitive situation between the union and the non-union fields.

When the Jacksonville agreement was signed the general feeling was that coal would cease to be a public issue for the three years it would run. The developments of the presidential campaign led many to believe that the coal industry would be allowed to work out all phases of its own salvation without being trammelled by the public or any of its official representatives. In the meantime, however, Congress has assembled. Bills are to be introduced in each house of Congress, it is understood, which will have a bearing on the coal industry. They may not propose regulation, but they will remind the industry that legislators are going to continue to suggest means which they think will bring about better functioning of an industry on which the whole public welfare rests. Certain plans, not yet ready for announcement, are being formulated in the executive departments.

#### Public Opinion in Evidence

Striking evidence that the pressure of public opinion is behind these moves is had in the recent address of F. R. Low, retiring president of the American Society of Mechanical Engineers, who expressed satisfaction that the people's interest in power from hydro sources is protected by the federal water power act, but who brought out as one of the principal points of the message he left with his fellow engineers and with the country, that "an uninterrupted and abundant supply of power cannot be assured to the nation at reasonable rates so long as the fuel from which most of it is made is subjected to the uncontrolled manipulation of private interest and the organized

will—or won't—of labor." He cited as the "one crumb of comfort" in the report of the Harding Coal Commission its declaration that the mining and distribution of coal are charged with public interest.

The Jacksonville agreement was expected to freeze out the high cost mines. That it has done with a vengeance. No wagon mine has operated for over a year. Even among the more pretentious mines a large number are idle. A recent report to the U. S. Geological Survey shows that of 2,389 mines reporting 1,032 had been closed down. More than a thousand well equipped coal mines were not adding a ton to the country's production or contributing to any payroll. On the other hand, there were 295 mines which operated full time and 350 more that operated five days but less than six. The first part of the story is that the agreement has closed 43 per cent of the commercial mines and the business they formerly had has gone to some 25 per cent of the mines remaining, those better situated as to costs or markets.

#### Finish of Many Mines Seen

It remains to be seen whether the 43 per cent will stay closed. They will hang over the market until their equipment is scrapped. The probabilities are that most of them cannot stand three years of starvation.

The second part of the story, however, is different. There has been no alteration in the competitive situation between the North and the South, between the union operators with rigid wage scales and the non-union operators with flexible wage scales. The Jacksonville agreement simply has made the inequalities of the competitive struggle even more cruelly apparent. The business not only has been shifted from small to large mines but it has moved in millions of tons from union to non-union districts. Before the Jacksonville agreement can be said to have settled the coal problem it will have to provide for this second aspect.

One of the results predicted was a reduction in the union scale. That is very likely to come, but it does not

#### Talk of Queer Bedfellows!

To the miners' union the name "chamber of commerce" is as the scarlet to the bull. The International constitution of the union even specifies that union miners will have nothing whatever to do with a chamber of commerce. Yet what do we see out in Missouri? The miners' union of District 25 is trying its best to get the chambers of commerce of Missouri to co-operate in a "burn Missouri coal" movement and to enlist the chambers in a battle to give Missouri coal a more favorable freight rate in intrastate traffic.

constitute a permanent solution. It simply reduces the level below which the non-union operators must keep their wages in order to live. Even with union wages pegged where they are this has not been a profitable year for the non-union operators. They have shipped a large amount of coal, but few of them are doing more than breaking even. If union wages are reduced the pay at non-union mines will be reduced still more.

A result predicted by some is the distintegration of the union. It has been forced already to retreat from southern West Virginia and eastern Kentucky. Its hold on northern West Virginia, central Pennsylvania and the Southwest has been loosened. But even were the union to be broken up it would not constitute a permanent solution. Non-union territory simply would be swelled to larger proportions and even a more intensive competitive struggle would occur between non-union operators themselves. The more the union shrinks the more the non-union districts will find themselves in the condition that the whole country experienced during the nineties, when there was no agreement on wage rates and every man's hand was raised against his neighbor. The Jacksonville agreement has yet to demonstrate that it can settle the ills arising from union and non-union competition.

The feeling on Capitol Hill has not crystallized, but it is apparent that the legislators sense that the public has not forgotten its interest in coal. They also sense a very general feeling that the coal industry is not in an entirely healthy state. With the ever present desire on the part of the legislator to be doing something with matters which affect a large percentage of the people, there is no guarantee, even at this short session, against some agitation of coal legislation.

### Mine Accidents Claim 154 Lives in October; 10 Months Total 1,979

Accidents at coal mines in the United States during October, 1924, caused the death of 154 employees, according to reports received from state mine inspectors by the U. S. Bureau of Mines. The production of coal for the month was 54,487,000 tons; hence the fatality rate was 2.83 per million tons, as compared with 3.83 in the previous month and 3.11 for October last year. At bituminous mines throughout the country 123 men were killed and the fatality rate was 2.63 per million tons, as against 2.85 in October, 1923. At anthracite mines in Pennsylvania the number of fatalities was 31, indicating a fatality rate of 4.04, as compared with 4.59 for the same month last year.

The accident record for the year 1924 to Oct. 31 shows a total of 1,979 accidental deaths at the mines. Based on an output of 458,512,000 tons during the 10-month period, the fatality rate was 4.32 per million tons as compared with 3.91 for the corresponding months last year. For bituminous mines alone the 1924 rate for the ten months was 4.14 as compared with 3.63, while for anthracite mines alone it was 5.22 as compared with 5.56. The increase in the fatality rate for bituminous mines in 1924 was due to the larger number of deaths from explosions of gas and coal dust.

As no single accident in October killed as many as five men, the record of "major" disasters during the first ten months of 1924 shows 9 disasters with a loss of 452 lives as compared

### Miner Loses Two Thumbs From One Hand; Seeks Double Compensation

Born with two thumbs on the right hand, and losing them recently in a mine accident in the anthracite district of Pennsylvania, Anthony Cusatt, a miner, in a letter to the office of District 7 of the United Mine Workers, at Hazleton, last week, asked that he receive the backing of that body in an action for double compensation.

Cusatt wrote that the company employing him, the name of which he failed to give, had offered compensation for only one thumb at the rate of \$12 a week for sixty weeks. It is the most unusual case that has come to the attention of union officials, said John Yourishin, district secretary-treasurer, who looks after compensation claims of the miners.

with 8 similar accidents and a loss of 260 lives during the same months last year. The fatality rate based exclusively on major disasters stands at 0.99 per million tons for 1924 and 0.48 for the first ten months of 1923.

Explosions of gas and coal dust are the only class of accidents with increased fatality rates for 1924; for this group the fatality rate increased from 0.60 per million tons for January-October, 1923, to 1.13 per million tons in 1924.

### P. & W. V. Segregation Plan Approved by Stockholders

Pittsburgh & West Virginia Ry. stockholders have approved the proposal of the directors for the segregation of the Pittsburgh Terminal Coal Co. from the railway company. The proposed increase in the funded debt to \$3,000,000 by the issuance of equipment trust certificates also was approved.

F. E. Taplin, chairman of the board, said Dec. 2 that the segregation of the coal property and the retirement of the preferred stock would not be interfered with by any action on the part of the Interstate Commerce Commission regarding the proposed issue of equipment trust certificates. In an informal report on the application for authority to issue the certificates an examiner for the commission recommended that it be disallowed. Mr. Taplin said that even if the commission should uphold this report the Pittsburgh & West Virginia would adhere to its plan for the retirement of the preferred stock on the date designated.

The Department of State and Finance at Harrisburg, Pa., has approved the merging of the Pittsburgh Terminal Coal Co. and the Meadow Lands Coal Co., the name of the former being used. The capital stock of the company is \$17,200,000. The officers of the merged company are: C. E. Tuttle, New York, president; L. H. Kelly and G. F. Osley, Pittsburgh, vice-presidents; A. J. Appel, Pittsburgh, secretary, and E. C. McKibben, Pittsburgh, treasurer.

## Coal-Mine Fatalities During October, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground								Shaft				Surface					Total by States								
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal.	Mine cars and locomotives.	Explosions of gas or coal-dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.)	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923
Alabama	3		2	1								9													9	10
Alaska																									0	0
Arkansas																									0	0
Colorado		1	1																						2	9
Illinois	4		1																						8	12
Indiana	1			4																					5	6
Iowa	1																								1	2
Kansas	1																								1	2
Kentucky	8		2	3	1		2	1				17													19	9
Maryland		1										1													1	1
Michigan																									0	0
Missouri																									1	1
Montana																									0	0
New Mexico	2											2													2	4
North Dakota		1										1													1	0
Ohio	6				1							7													8	11
Oklahoma	1						1					2													3	0
Pennsylvania (bituminous)	7	5	6		2			3				23	1					1	1				1	1	25	29
South Dakota																									0	0
Tennessee																									0	1
Texas																									0	0
Utah	1											1													2	2
Virginia	2											2													2	4
Washington	1		1									2													2	1
West Virginia	15	2	5					1				26						1					2	3	29	34
Wyoming	2											2													2	2
<b>Total (bituminous)</b>	<b>55</b>	<b>11</b>	<b>17</b>	<b>8</b>	<b>7</b>		<b>6</b>	<b>5</b>				<b>109</b>					<b>2</b>	<b>1</b>					<b>3</b>	<b>9</b>	<b>123</b>	<b>140</b>
<b>Pennsylvania (anthracite)</b>	<b>17</b>	<b>2</b>	<b>7</b>		<b>2</b>							<b>129</b>			<b>3</b>			<b>2</b>	<b>1</b>			<b>3</b>	<b>3</b>	<b>2</b>	<b>31</b>	<b>40</b>
<b>Total, October, 1924</b>	<b>72</b>	<b>13</b>	<b>24</b>	<b>8</b>	<b>9</b>		<b>6</b>	<b>5</b>				<b>138</b>	<b>2</b>		<b>3</b>			<b>5</b>	<b>4</b>	<b>1</b>		<b>3</b>	<b>3</b>	<b>11</b>	<b>154</b>	
<b>Total, October, 1923</b>	<b>93</b>	<b>6</b>	<b>34</b>	<b>13</b>	<b>8</b>		<b>6</b>	<b>3</b>				<b>170</b>	<b>1</b>					<b>1</b>	<b>2</b>	<b>2</b>		<b>2</b>	<b>3</b>	<b>9</b>		<b>180</b>

## Budget Allowance Lower For Bureau of Mines And Geological Survey

The President and the Director of the Budget have approved proposed appropriations for the next fiscal year of \$1,876,560 for the Bureau of Mines and \$1,654,595 for the Geological Survey. These amounts compare with \$1,900,468 and \$1,706,482, respectively, appropriated for the work of the current fiscal year. If Congress insists on paring the budget in the same proportion as has been its custom, it will mean heavy curtailment of the work done by these two agencies. It is believed, however, that Congress will take into account the fact that drastic reductions have been made in the amounts originally requested by the heads of the separate executive agencies, and the prospects favor the actual appropriation of approximately the amounts carried in the budget.

Among the items making up the Bureau of Mines budget are investigating mine accidents, \$400,000; general expense, \$86,000; mining investigations in Alaska, \$33,000; operating mine rescue cars and stations, \$281,840; testing fuel, \$155,000; oil, gas and oil shale investigations and leasing work, \$456,000; enforcement of mineral leases, \$86,920; mining experiment stations, \$200,000; care of buildings and grounds at Pittsburgh, \$65,000.

Items making up the Geological Survey budget are preparation of reports on the mineral resources of the United States, \$123,000; geologic maps, \$105,000; examination and classification of lands, \$265,695; gaging streams, \$165,000; investigations of the mineral resources of Alaska, \$72,000; chemical and physical research relating to geology, \$40,000; geologic surveys in various portions of the United States, \$326,140; topographic surveys, \$485,000; Director's office, \$54,760; preparation of illustrations, \$18,000.

## \$5,000,000 Company Formed In Central Pennsylvania

With the organization of the Madill Coal & Coke Co., at Indiana, Indiana County, with a capital stock of \$5,000,000, one of the largest deals in recent years in the coal industry in central Pennsylvania has been brought about. The active head in the movement is John Madill, of Indiana. The project is backed by Pittsburgh, Buffalo and Eastern interests.

The corporation has taken over large coal acreages in Indiana and Cambria Counties, where plans have been matured to open mines, build a railroad, erect a town and otherwise complete what will become one of the largest operations in the district.

Plans have been completed for the construction of a railroad connecting the mines of the company with the Buffalo, Rochester & Pittsburgh, the Pennsylvania R.R. and the Cambria & Indiana Ry. This road will give access to the Buffalo and Canadian markets, as well as facilitate shipments to the East and tidewater. The road also will connect with Johnstown and the Bethlehem Steel Works there.



James Elwood Jones

Vice-president, Pocahontas Operators' Association but better known as the developer of the celebrated Coloder machine at the mines of the Pocahontas Fuel Co. The loader fills 370 tons of coal daily in actual everyday operation.

## Hard Coal Regions Want Part Of Tax for Local Use

*Special to Coal Age*

Scranton, Pa., Dec. 8.—Indications point to a concerted move by members of the Legislature from the anthracite region to bring about a return of about 50 per cent of the money collected by the state under the present anthracite tonnage tax to the communities and cities in which hard coal is mined. The anthracite tax is collected on a basis of 1½ per cent of the market value of all coal produced and sold.

The move to obtain a portion of the tax for the direct use of the citizens residing in anthracite communities has been launched by the Scranton Chamber of Commerce. The organization is enlisting the support of various municipal bodies throughout the anthracite region in the project.

The fight will not be a new one in the state Legislature. In the 1923 session a similar bill was passed, but vetoed by Governor Gifford Pinchot. In vetoing the measure the Governor declared that the state needed every cent of revenue it could lay its hands on to "clean up the mess."

With this session of the Legislature improved state financial conditions will be used as a further argument toward the passing of the bill providing for a return of part of the tonnage tax. An anthracite bloc of legislators will be organized and, it is believed, will push the measure through.

## New Haven Seeks New Bids

Announcement has been made that the bids received on Nov. 17 by the New York, New Haven & Hartford R.R. Co. for furnishing and delivering alongside, Boston, 400,000 gross tons of high volatile run of mine coal have been rejected and that new bids will be received up to Dec. 15 for between 360,000 and 410,000 net tons of the same quality of coal. This contract will run for one year from May 1 of next year.

## Union Affairs in Muddle In Hard Coal Region as Result of Outlaw Strike

*Special to Coal Age*

Scranton, Pa., Dec. 8.—The outlaw strike of 12,000 Pennsylvania & Hillside Coal & Iron Co. mine workers in the Pittston anthracite field has developed many complicating angles. It has created a furor in district union circles that may end disastrously for the present executives of the district. When the strikers refused to return to work upon the demand of John L. Lewis, president of the international union, the charters of the local unions disobeying the order were revoked and as a result 12,000 former United Mine Workers are now non-union men.

As the international union did not want to lose these men, however, President Lewis has sent a commission of five International executive board members into the Scranton district for the purpose of counselling the men to return to work and restore peace and harmony in the district, intimating that "if they fall in line" their charters will be returned. The commission met with the general committee of the strikers, but was unable to console the men to the circumstances and as a result the strike is still on.

A new phase of the situation has assumed magnified proportions. It is in the form of a call for a special convention of all local unions of district 1, demanded by the strikers and indorsed by the general grievance committees of the Hudson Coal Co., the Glen Alden Coal Co., the Lehigh Valley Coal Co. and the Lehigh & Wilkes-Barre Coal Co., representing over 50,000 mine workers of the district. A formal petition for the convention will be filed with the executive board of the district within the next few days. It is expected that the majority members of the board will refuse the demand. An appeal may then be made to the international union board. The purpose of the convention is expressed by the strike leaders as an effort to "investigate the muddled conditions of the district and place responsibility for the improper handling of grievances."

Neal J. Ferry, of McAdoo, Pa., is chairman of the special international union commission sent here by president Lewis. Other members are Ed Dobbins, of Belleville, Ill.; John M. O'Leary, of Pittsburgh, Pa.; John Mates, of Williamstown, Pa., and John Ghizzoni, of Homer City, Pa. They will stay in the district, they say, until the situation is adjusted.

## Anthracite Circular Prices For December

(Gross Tons F.O.B. Mines)

	Chest-				
	Broken	Egg	Stove	nut	Pea
Lehigh & Wilkes-Barre.....	\$8 00	\$8.75	\$9.00	\$8.75	\$5.50
D., L. & W.....	8 00	8.75	9.00	8.75	5.85
Pattison & Bowns (Erie).....	9 00	9 00	9.25	9.25	5.50
Phila. & Reading.....	9.15	9.15	9.40	9.40	6.00
Hudson Coal Co.....	9.00	9.00	9.00	9.00	6.00
Lehigh Valley.....	8.50	8.80	9.15	9.15	6.00
Lehigh Coal & Navigation Co.....	9.25	9.25	9.50	9.25	6.00
M. A. Hanna Co.....	8.80	9.15	9.85	9.40	5.75

Steam sizes—Buckwheat No. 1, \$3@3.15; rice, \$2@2.25; barley, \$1.50; birdseye, \$1.60.

## W. A. Phillips, Well Known W. Va. Operator, Dies

W. A. Phillips, president of the Pemberton Coal & Coke Co., Affinity, W. Va., died Dec. 3 at the Lankenau Hospital, Philadelphia, where he had been for several weeks taking treatment for stomach trouble. Many years ago he started in the coal mines of the anthracite fields in an humble way. Realizing the possibilities of smokeless coal he and others from Schuylkill County, Pa., migrated to the Pocahontas fields of West Virginia, where they acquired valuable property. Later he went to the New River field, where he organized the Pemberton Coal & Coke Co. and acquired some valuable land in the Winding Gulf field. In this field he developed three mines, the companies which developed and operated them still owning and operating the same properties. Mr. Phillips also was president of the Ashland Coal & Coke Co., located in the Pocahontas field, and the Majestic Colliery Co., in the Williamson field. He also was extensively interested in the banking business at Mount Carmel.

Mr. Phillips was 84 years old. Funeral services were held at his late home, at Mount Carmel, Pa., Saturday afternoon, interment being at Fountain Springs Cemetery, Ashland, Pa.

## Reverses \$18,000 Judgment For L. & N. Against Nield

Judgment obtained last year in the Jefferson Circuit Court by the Louisville & Nashville R.R. against C. S. Nield, of Kettle Island, Bell County, Ky., was reversed, with directions that the petition be dismissed in an opinion delivered Nov. 21 by Judge E. S. Clarke, of the Kentucky Court of Appeals. The judgment, obtained in Judge Davis Edwards' court at Louisville, was for

## Lists Efficiency Experts Among National Wastes

National extravagance is the greatest danger to American prosperity, Robert E. M. Cowie, president of the American Railway Express Co., stated in an address before the Canadian Club of New York at the weekly luncheon at the Belmont Hotel, in New York, last week. Mr. Cowie attacked waste, the craze for efficiency agents and purchase on time payments as cardinal weaknesses, and described this country as "the most profligate of nations in the matter of waste and extravagance in business affairs."

The speaker, while admitting a greater need for efficient management in business, said that the idea of calling in outside assistance to create an efficient condition had been overdone.

\$18,000, representing a claim for \$11,000 and interest for ten years.

The L. & N. in its action sought to require Mr. Nield to pay for construction of 2,000 ft. of branch railroad track in Bell County, that being part of a branch from Pineville to coal properties in Kettle Island Creek. The appellate decision set forth that the railroad had not established a claim against Mr. Nield.

The branch was constructed in 1909 and 1910 at the instance of the Edgemont Coal Co., of which Mr. Nield was a stockholder. The other stockholders in the coal company resided in Atlanta, Ga. When the coal company planned to develop its property in Bell County, at the mouth of Kettle Creek, the L. & N. agreed to construct the necessary branch road.

## Constitutionality of Tax On Anthracite Upheld By U. S. Supreme Court

The U. S. Supreme Court on Dec. 8, without a written opinion, affirmed the decision of the lower court upholding the constitutionality of the Pennsylvania anthracite tax. An appeal was made by the Cranberry Coal Co. and others.

At the conclusion of arguments by counsel for the coal companies, on Dec. 4, the Supreme Court asked attorneys representing the state not to present oral argument. This is the usual course in cases where the court is convinced that there is no material merit in the appeal.

At its last term the Supreme Court upheld the constitutionality of this tax on anthracite levied by the State of Pennsylvania, which had been challenged by a number of mining companies on the ground that it was a tax on interstate commerce. At that time the court held that coal is a local commodity until placed on cars for interstate shipment, and that the tax was constitutional because it applied on coal before being loaded.

Following this decision a number of anthracite operators brought a new test case, the one just presented the Supreme Court. In effect, the basis of this action was that the state tax was applied by the weight of the coal; that it was not weighed as raised at the mines, no scales for the purpose being available, but was weighed in the cars after having been loaded for interstate shipment, therefore giving it an interstate commerce nature. The lower courts held that the time of weighing was a matter of convenience and an incident.

## Output and Value of Coal from Ohio 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
								Underground			Total	
								Miners, etc., a	All others	Surface		
Athens.....	4,133,625	76,744	74,959		4,285,328	\$10,315,000	\$2.41	5,765	1,786	930	8,481	109
Belmont.....	12,689,439	406,506	99,185		13,195,130	31,100,000	2.36	8,327	3,076	1,390	12,793	193
Carrroll.....	353,394	85,172	20,496		459,062	1,204,000	2.62	362	129	64	555	202
Columbiana.....	863,307	55,169	23,266		941,742	2,747,000	2.92	686	241	241	1,168	187
Coshocton.....	213,433	14,464	3,179		231,076	655,000	2.83	404	143	76	623	103
Guernsey.....	3,070,277	167,833	81,127		3,319,237	8,240,000	2.48	2,784	1,246	391	4,421	144
Harrison.....	2,695,323	17,249	53,382		2,765,954	6,168,000	2.23	1,220	424	1,032	2,676	145
Hocking.....	1,016,931	72,235	9,481		1,098,647	2,688,000	2.44	1,753	459	302	2,514	98
Holmes.....	250	2,725			2,975	8,000	2.81	8			8	148
Jackson.....	194,413	59,636	11,397		265,446	840,000	3.15	777	285	157	1,219	66
Jefferson.....	5,739,482	691,365	76,163		6,507,010	16,069,000	2.47	3,769	1,568	1,559	6,896	188
Lawrence.....	25,665	114,783	343		140,791	348,000	2.47	269	71	42	382	121
Mahoning.....	476	46,874	12		47,362	174,000	3.67	65	10	7	82	190
Medina.....		10,485	400		10,885	61,000	5.60	15	4	3	22	235
Meigs.....	1,166,420	26,926	23,983		1,217,329	3,141,000	2.57	1,847	694	333	2,874	114
Morgan, Scioto, and Washington.....	211,559	3,552	3,745		218,856	530,000	2.42	283	103	49	435	126
Muskingum.....	411,826	65,205	3,594		480,625	1,121,000	2.33	537	123	170	830	141
Noble.....	690,169	9,482	19,269		718,920	1,798,000	2.50	513	308	83	904	156
Perry.....	2,430,799	53,419	54,733		2,538,951	5,762,000	2.27	2,519	777	797	4,093	122
Portage, Summit and Wayne.....	80,027	21,624	16,803		118,454	475,000	4.01	136	50	43	229	159
Stark.....	127,185	311,249	5,128		443,562	1,345,000	3.03	406	109	74	589	206
Tuscarawas.....	977,253	356,332	16,739		1,350,324	3,311,000	2.45	1,382	507	382	2,271	131
Vinton.....	90,965	3,239	2,905		97,109	238,000	2.45	294	112	84	490	81
Total excluding wagon mines.....	37,182,218	2,672,268	600,289		40,454,775	98,338,000	2.43	34,121	12,225	8,209	54,555	150
Wagon mines served by rail.....	91,668				91,668	272,000	2.97					
Grand total.....	37,273,886	2,672,268	600,289		40,546,443	\$98,610,000	\$2.43					

a Includes also loaders and shotfirers.



## Scranton Companies Reject Higher Tax Valuations

Scranton, Pa., Dec. 8.—Coal companies of Scranton have practically rejected a request by the city administration that they agree to pay additional 1924 assessments representing a tax on a coal land valuation higher than \$200 per foot acre, the figure on which the payments have thus far been based. The city treasury is in financial difficulties and it is understood that counsel for the coal companies have agreed to come to the rescue, but will not consider any further tax payments if they are to be construed as an agreement to a higher assessment than the \$200 valuation. The coal companies in a formal appeal to court are protesting the increased valuation of their coal lands by the city and do not want to prejudice their case by paying on the new valuation.

## S. G. Memory Moves Up in D. L. & W. Coal Co.

Samuel G. Memory, who was sales agent for the Delaware, Lackawanna & Western Coal Co. in Newark for four years, has been elected a vice-president of the company, with offices at 120 Broadway, New York, according to an announcement by Eliot Farley, president of the company. Mr. Memory will have general supervision over line sales and coal handling facilities. H. A. Smith, connected with the company for six years at the New York office, has been re-elected a vice-president.

Mr. Memory's successor as sales agent at the Newark office is A. W. Decker, for twelve years superintendent of the Newark pockets of the company, but more recently connected with the Scranton agency. A. H. Pace is the new sales agent at Scranton and the estate of L. R. Schenck has been appointed sales agent at Toledo, Ohio.

## 21 Miners Rescued, 1 Killed In Nova Scotia Cave-in

A series of shocks that resembled an earthquake caused a cave-in of the roof of the Springfield Mine, near Amherst, N. S., Dec. 6, entombing twenty-two miners. After more than three hours' digging twenty-one of the men were rescued and the body of John Sweeney was recovered on Sunday. The heavy fall of earth took place on the 5,400 ft. level. Four shocks in quick succession brought down the roof of the mine, cutting off the miners working at this point and crushing Sweeney beneath the débris.

## U. P. Coal Co. Standardizes Practice for Safety

The Union Pacific Coal Co. has undertaken the preparation of a complete set of standards to be compiled for the use of superintendents and foremen, above and below ground, to govern all underground installations, including pump stations, transformer stations, motor generator substations, underground hoist installations, electric transmission and trolley line installation, bonding, standard track layouts, including standard switches, frogs and turnouts, standard rock dust barrier troughs, methods of underground rock dusting, etc. The purpose is to provide plans for the initial installation of all tracks, electric lines, underground construction, etc., on a definitely uniform basis, insuring maximum safety, as well as economy in construction and operating costs.

The coal company proposes to draw on the resources of its entire engineering and operating organization, obtaining in addition all possible information and advice from representatives of other companies, past recommendations of mining engineers, expressed through the several associations, etc.

The company has already made real progress for safety. It has substituted improved closed electric lamps for open lights in its seventeen Wyoming mines and has installed a shale pulverizing plant to advance its dusting program.

## Utility Fuel Consumption Up; Power Output at Peak

Electric public utility plants consumed 3,206,083 net tons of coal in October, according to a report by the U. S. Geological Survey, compared with 3,013,184 tons in September, as shown by revised figures. Fuel oil consumed by utilities plants in October totaled 1,401,624 barrels, as against 1,389,264 barrels in September.

The average daily production of electricity by public utility power plants in October was 167,300,000 kw.-hr., which was 4½ per cent greater than the daily output in September and practically equal to the record rate of January.

## Canadian Miners Vote to Form Own Union

Miners employed by the Crow's Nest Pass Coal Co. at Coal Creek and Fernie, B. C., voted to sever connection with the United Mine Workers of America and organize a Canadian union, it was announced following a secret poll on Saturday, Dec. 6.

## Nine Miners Die in Explosion In Welsh Mine

Nine miners were killed in a coal mine explosion Friday morning, Dec. 5, in the Llay Main colliery, near Wrexham, one of the largest mines in North Wales and also considered one of the safest. Ernest Williams, the mine foreman, fired a shot, which was quickly followed by a terrific blast caused by the setting off of a collection of gas.

Five men who were just beyond the range of the fire, gave the alarm and help was at once sent down. The first band of rescuers encountered the deadly firedamp. They were without gas masks, but for two hours they managed to fight the fumes. Eventually the bodies of the victims were recovered.

About 1,400 of the 3,000 men usually employed in the mine had already descended and twenty had got to work near a seam in No. 1 pit when the explosion occurred. It was the third disaster in British coal mines within nine days.

## Missouri Gets Some Scales For Machine Mining

After more than five weeks of conferences between operators and miners of Missouri, a detailed machine scale for the Richmond and Swanwick fields recently was completed in the offices of W. L. A. Johnson, general commissioner of the Southwestern Interstate Coal Operators' Association, Kansas City. The contract is on a basic scale of \$1.15½ a ton plus 14.4c. for pushing. The pushing clause was responsible for the length of the conference.

A detailed machine scale, based on the Richmond scale, also was arranged for the mine of the Mosby Block Coal Co., Mosby, Mo., reopened a little more than a year ago after several years of idleness due to water.

Another contract, one establishing a pick scale on a basis of \$1.92½ a ton at the mine of the St. Joseph Coal & Mining Co., Vibbard, Mo., also was signed during the conference.

## Want Illinois Institutions to Use Coal from That State

United Mine Workers officials of Illinois have issued a statewide appeal to miners and other unionists of the state to use none but Illinois coal. The State Executive Board, President Farrington has announced, instructed August Kerr, chief counsel for the mine workers, to draft a bill for presentation at the next session of the Legislature providing for exclusive use of Illinois coal in state-owned institutions.

A resolution to support this measure will declare: "In some instances municipally and state owned institutions of Illinois are being furnished with coal mined outside the State of Illinois. We believe that it is wrong for the taxpayers' money to be sent outside the State of Illinois to purchase any product which can be furnished in abundance in the state, and we believe that the policy of trading at home should be practiced by the State of Illinois, especially within the state, and produced by Illinois labor."

### Power Plant

Just being completed to supply Teas branch of No. 1 mine, North-East Coal Co., at Thealka, Ky. It comprises two 150-hp. boilers, one feed-water heater, an engine and one 100 kw. direct-current belted generator, this equipment being moved from the exhausted mine No. 2.



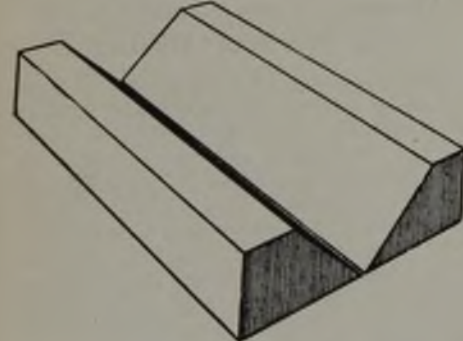


# Practical Pointers For Electrical And Mechanical Men



## Welded Cast-Iron Specimens Reveal Strength of Electric Process

**T**HE STRENGTH which may be attained in welding cast-iron parts with a new electrode, without any special heat treatment, has been determined by tests represented in Figs. 1 to 6, inclusive, made by the General Electric Co. The methods of making these tests will no doubt be useful to mining companies which can often

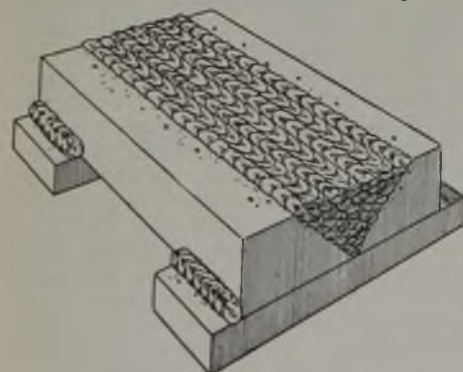


**Fig. 1—How the Parts Were Shaped**

Most materials can be welded efficiently if the groove to be filled is shaped to form a 90-deg. opening. When this angle is reduced the arc has a tendency to flash to the side of the V and thus not permit the deposited metal to unite the lower parts.

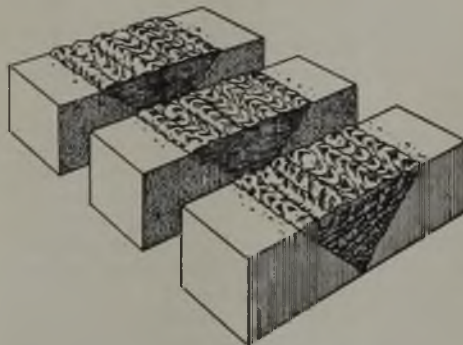
effect large savings by a more general application of electric welding.

Fig. 1 shows two blocks of gray cast iron, beveled along one edge at a 45 deg. angle preliminary to welding. Fig. 2 shows the same block assembled on two steel bars to which they were welded at the outer edges for rigid support. The welding was continuous; in parallel beads and horizontal layers as seen in Fig. 2. Care was taken to obtain suitable overlapping and interpenetration of the beads, but no effort was made to remove slag except by a wire brush which cleaned away the



**Fig. 2—One Layer Is Built Up on the Other**

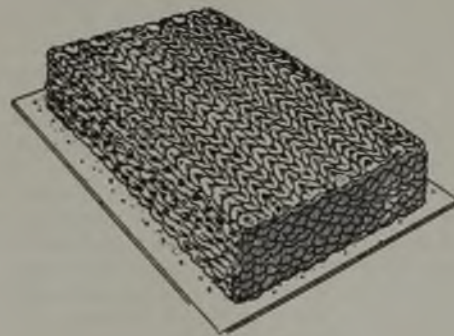
Fast welding is not always desirable because it permits the metal to cool too quickly.



**Fig. 3—Sectionalized for Tests**

The test pieces were obtained by cutting the specimen so that the stresses could be applied properly to the welded material.

loose material. The finished weld was permitted to cool naturally in the air, and then cut away from the steel supporting bars and machined into transverse segments for test specimens, as



**Fig. 4—Preparing Material for Test**

Layer upon layer of metal was deposited so that a test specimen of the electrode material could be obtained.

shown in Fig. 3. These were turned down to the A.S.T.M. standard dimensions for cast-iron tensile test specimens, except that the length was somewhat increased to include the weld properly between the shoulders of the specimen. As illustrated in Fig. 5, these specimens broke mostly outside of the welds the strength varying from 60 to 90 per cent of the base material. This reduced strength is due to the effect of the welding heat upon the cast iron during cooling because the deposited metal was not sufficiently ductile to release the internal strains set up in the weld.

Fig. 4 shows a block of metal deposited on a steel plate by the welding electrode for the purpose of obtaining



**Fig. 5—How the Specimen Broke**

Note that the deposited material did not break, instead, the fracture was in the material adjacent to the weld.

specimens for tensile tests. The plate was then cut away and the block cut up and machined into specimens and tested. The appearance after test is illustrated by Fig. 6, the ductility of the metal



**Fig. 6—Welding Rod Material Stretched**

Note that the specimen elongated when tested. This proves the high ductility of the metal.

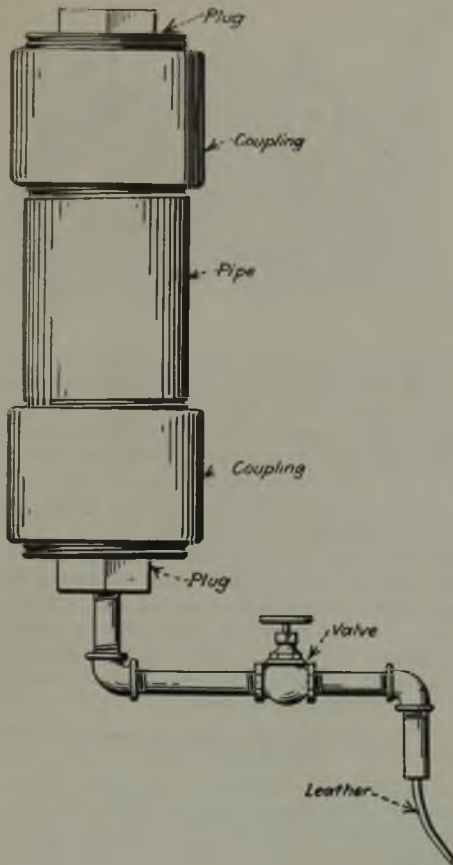
being shown by the elongation and reduction of cross section near the point of rupture. The test showed the following results:

Specimen	Ultimate Tensile Strength Lb. per Sq. In.	Yield Point Lb. per Sq. In.	Per Cent Elongation in 2 In.	Per Cent Reduction of Area
1	59,300	46,700	12½	13.3
2	54,800	45,700	11	18.2
3	59,000	45,600	12	21.8

## Conveyor Necessitates Use of Improvised Lubricator

It is always a problem to lubricate small moving parts so that each will receive the necessary oil to keep it working freely. At one of the Consolidated Coal Co.'s mines near St. Louis, the loading boom, like many others, consists of sections which travel on small iron rollers. Each of these rollers must be continually lubricated to prevent undue friction and wear. It would be unduly expensive to keep a man on the job to lubricate these parts, so the mechanics designed an automatic lubricator for the purpose.

As shown in the illustration, Fig. 1, the lubricator is made of a piece of pipe and pipe fittings. The ends of a short section of pipe of about 4 in. diameter were fitted with couplings and plugs. The bottom plug was tapped to admit a small piece of ½-in. pipe which leads to a valve and then to a leather wick. The piece of leather is of such length that it just reaches the top of the rollers of the loading boom. As each roller goes by, it wipes the oil off the wick and is thoroughly lubricated. The valve controls the quantity of oil flowing to the wick and is necessary because the viscosity of the oil changes from time to time. In summer when



**Fig. 1—Ingenious Lubricator Made of Pipe Fittings**

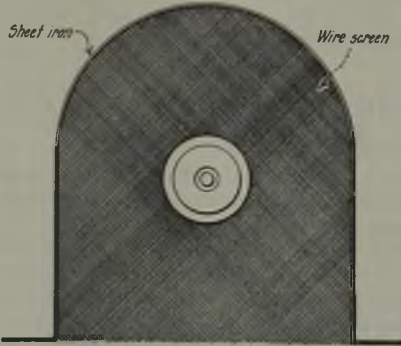
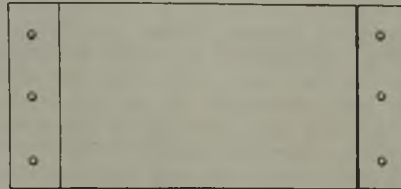
A few simple parts to be found around almost any mine make up this little device. Dust and dirt are kept out of the oil the flow of which is regulated by a valve. The leather wiper the part to be lubricated and each receives its proper quantity of oil.

the oil runs freely, the valve is kept nearly closed, but in winter the valve must be opened sufficiently to give the proper flow. The plug at the top of the lubricator excludes all dust and dirt from the oil. Occasionally a few quarts of oil are put in the lubricator and the top screwed on. Little or no attention is required because the device when once adjusted works automatically. The leather wick is constantly covered with oil.

**Motor Easily Screened Off from Dust**

Next to vibration and leakage of oil, dust causes more damage to equipment than anything else. Herewith is illustrated a cover used to screen off a motor from particles of coal which might otherwise easily fall upon it and damage the insulation.

The top part of this housing is made of sheet iron formed into the shape of an arch. At both ends is a screen which permits sufficient air to pass through the motor but prevents large



**Housing Protects Machine Against Dust and Dirt**

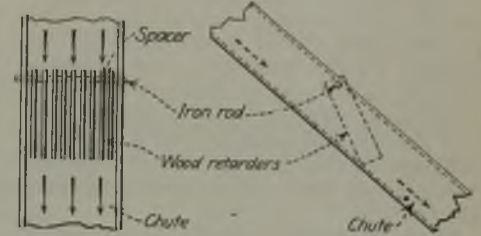
A piece of sheet iron and two pieces of wire screen were the only parts necessary to make this housing.

pieces of falling material from getting on the windings or the commutator. Much of the dust in the air clings to the screen and is thus prevented from settling on the motor. Housings of this type, and all housings in general, must be applied to motors only after the heating characteristics of the motor have been thoroughly investigated. If it is already heavily loaded, a screen

or covering cannot be applied unless some means is provided for obtaining proper ventilation. Most housings obstruct the circulation of air and thus cause the motor to heat unduly even under light load.

**Prevents Coal from Breaking**

Operators have long despaired of the possibility of sloping chutes and screens in such a manner that the coal would move steadily forward and yet would not travel so fast as to break up unduly. The speed with which coal travels over a screen influences its action and usefulness. When coal bounds forward at a high rate of speed it bounces over the holes of the screen

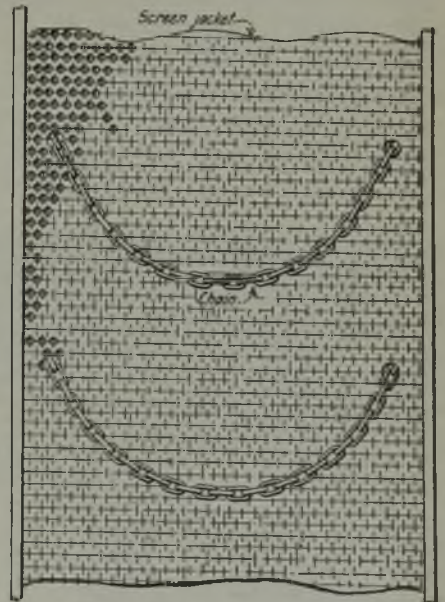


**Fig. 1—Wood Retarders Slow Down Coal**

Pieces of wood fastened to a through bolt prevent the coal from passing too quickly down the chute.

and therefore is not properly sized. A more serious difficulty, however, is the breaking down or degradation of the coal when it bumps against obstructions or jostles other coal. Again, if coal is traveling at a high velocity when it drops into the bin, it breaks up considerably.

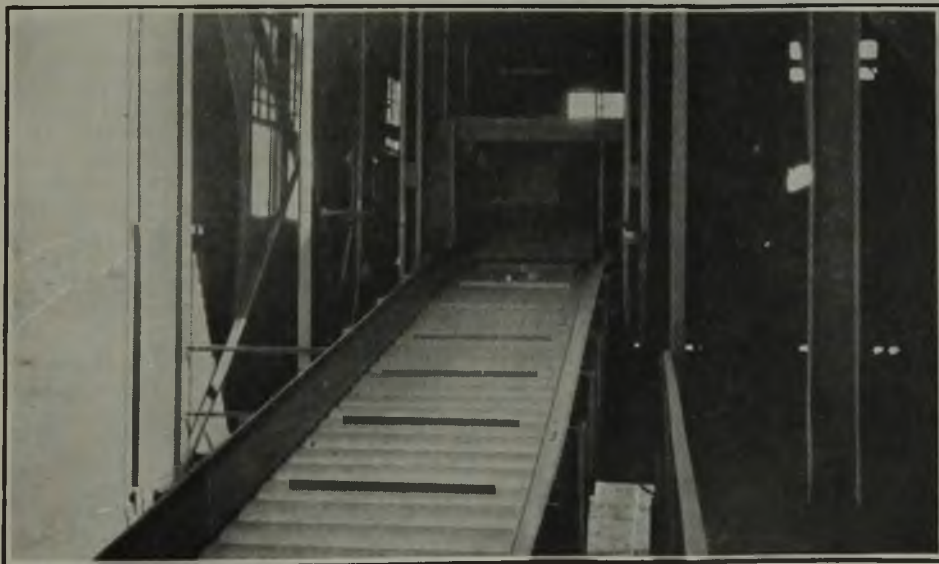
Many ingenious methods have been



**Fig. 2—Chains Slow Down Coal**

The chains are fastened to the screen by hooks. By increasing the number of such chains the coal may be retarded making the sizing better and lessening breakage.

employed to slow down the speed of coal. Fig. 1 shows wooden retarders set in a chute. The spacing and number of retarders is easily varied to control the speed of the coal. Fig. 2 illustrates chains with hooks at each end which can be attached to the screen jacket. By applying more or fewer of these chains the coal passing over the jacket may be speeded up or retarded.



**Fig. 2—Traveling Parts All Require Lubrication**

As the failure of any part of a conveyor shuts down the whole line, this one is provided with necessary lubrication by an automatic oiling device made at the mine and illustrated in Fig. 1. The lubricator works at all times regardless of the position of the boom.



## Problems In Underground Management



### Car Holds Rock for Gob, Clay for Shots or Serves As a Platform for Mixing

A specially constructed clean-up car, which also serves several other purposes, is being used in the mines of the Island Creek Coal Co., of Holden, W. Va. The body is fabricated of  $\frac{1}{4}$ -in. steel plate, braced with su table angles and straps and mounted on a standard mine-car truck. Details of its construction may be seen in the accompanying illustration.

Double 3x6-in. crosspieces, or joists, rest on the floor of the regular truck and support the steel body of this car. The lower blocks are as long as the truck floor is wide, and the upper pieces extend out over the wheels and support the floor plate of the steel body. This floor plate is made in one piece so that a smooth surface is afforded for shoveling. The ends of the car body are stiffened and joined securely to the floor of the truck by means of steel straps.

#### SIDES EASILY DETACHED

Each of the two sides can be completely detached from the car by releasing a set of hook latches. This allows the side to swing away from the ends and disengage its three keepers. Each of these consists of a U-shaped bracket, attached to the wooden cross-supports, into which fits a strap-lug, or tongue, fastened to the lower edge of

the side plate. This car has a capacity of 100 cu.ft. Its greatest use has been the transportation of gob material to abandoned rooms. Here the load is quickly discharged by easy shoveling from the flat floor plate after the sides have been dropped. It is also useful for carrying clay tamping to the working places from the outside of the mine. With the sides removed the one-piece floor makes an excellent platform for mixing concrete for use in the building of stoppings, overcasts and similar underground structures.

### Pennsylvania Roof Hazard Is Greatest in Morning

At a meeting of Pennsylvania state anthracite inspectors with Secretary Joseph J. Walsh, at Sunbury, Pa. earlier this month a letter was drafted that points out the preponderance of accidents due to falls of roof that occur in the early hours of the day. A similar letter to bituminous operators was drawn up in a meeting of bituminous state mine inspectors in Pittsburgh, on Oct. 15. The contents of these letters discloses the following facts:

During the first eight months of this year 144 fatal accidents in the anthracite mines and 122 fatal accidents in the bituminous mines were caused by falls of roof and coal. Of these, 76 in the anthracite mines and 43 in the bituminous mines occurred before an axamination of the working places had

been made by the mine foreman or his assistants, while 16 in the anthracite mines and 15 in the bituminous mines took place shortly after an examination.

In the anthracite mines 65 per cent, and in the bituminous mines 60 per cent of the accidents due to falls of roof occurred between the hours 7:30 and 11 a.m., during which time in all the mines only 35 per cent of the official visits of the day were made. These facts clearly indicate that the number of accidents due to falls of roof might be greatly reduced by better supervision of the working places.

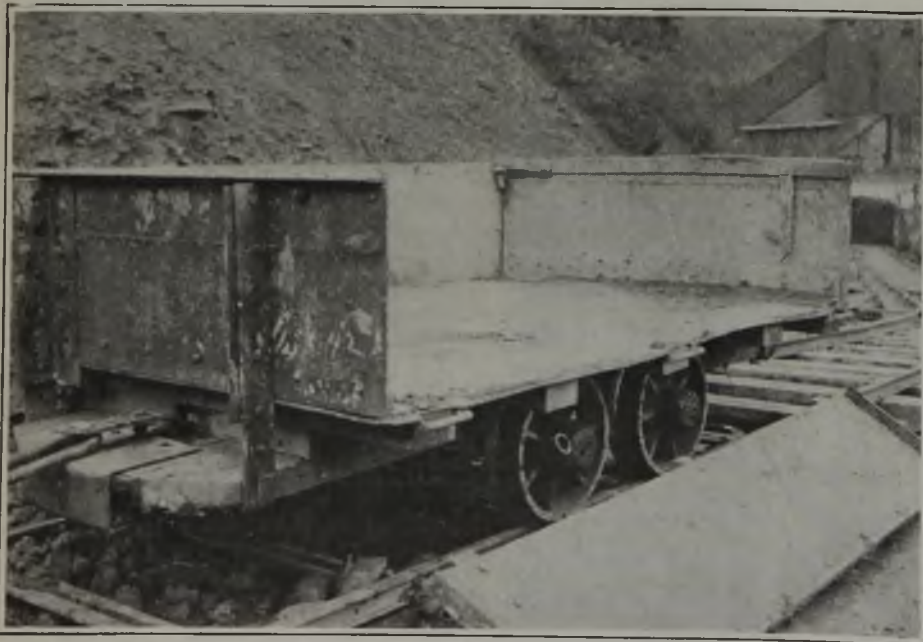
#### DAILY EXAMINATIONS URGED

Resolutions directed to the mine owners were drawn up by both bodies of inspectors urging the examination and making safe of every working place each day before 11 a.m. The resolutions admonish the mine officials who depend solely on observation in judging the condition of the roof in working places and recommend the use of a bar always for making the tests.

### Safety on Inclined Planes

Since a disaster occurred at East slope of the Nunnery mine, near Sheffield, England, one of the engine planes in that mine has been equipped with a device consisting of five specially built cars, fitted with tight couplings and springs to absorb shock. This has been placed in front of the man trip. The leading car of the five carries a strong sharply pointed iron sprag in suspension ready to be dropped in case of necessity. This car also carries about 1,000 lb. of scrap iron to give it the necessary stability. The iron sprag is connected by a cable to simple apparatus in the fifth car by which the former can be released by the operative and made to fall to the floor of the entry should the trip get out of control or the haulage rope break. The car in which the operative rides is padded, and he is secured to his seat by a broad strap around the waist to prevent him from being jerked upwards or out of the car.

Another device, which is being used is entirely mechanical. In this also five specially designed cars are required. The apparatus is placed on a steel frame running on wheels and consists of two pairs of sprags or forks, one pair pointing upward and the other downward and designed to grip the roof and floor of the entry respectively. The projecting sprags are controlled by a governor set so as to bring them into action if a predetermined speed is exceeded.



Most Mine Cars Are Boxes on Wheels, but This One is Different

When the sides are removed by detaching the hooks at either end the car is a one-piece flat plate mounted on wheels and forms an excellent platform upon which to mix concrete for underground structures.



# Production And the Market



## Soft-Coal Business Fitful as the Weather; Anthracite Trade Softens

With only fitful touches of cold weather here and there the bituminous coal trade exhibits marked irregularity. The spurt in the Middle West faded away almost as quickly as it appeared and inactivity best describes conditions there now, as it does also in Ohio and Kentucky. The situation in New England is somewhat the same only much worse. Business in Atlantic coast markets, the Southwest and the Northwest is somewhat better, especially in the last named section, where the lake season is making a Garrison finish; November shipments inland for November, in fact, are said to have been the largest in any one month during the last two years. Though total shipments are far behind those of a year ago the carryover to this season was such as to bring the supply up to normal requirements. The cessation of shipments to the lakes has hit production hard in the Ohio fields and much distress coal has reappeared, and it sells at figures that tend to demoralize prices.

General industry continues to show slow but steady improvement, iron and steel production in particular reporting pronounced gains. Perhaps the most promising development since last spring, however, was the announcement that 116 Fall River cotton mills employing 20,000 workers were to resume operations this week on full time—and without any reduction in wages. Some of these plants have been closed for many months. Only five mills will remain closed.

### Hard Coal Trade Fair but Featureless

The situation in the anthracite trade has undergone little change—business is not bad, but it could be much better without breaking any records. Stove is in strongest demand, except in Philadelphia, where chest-

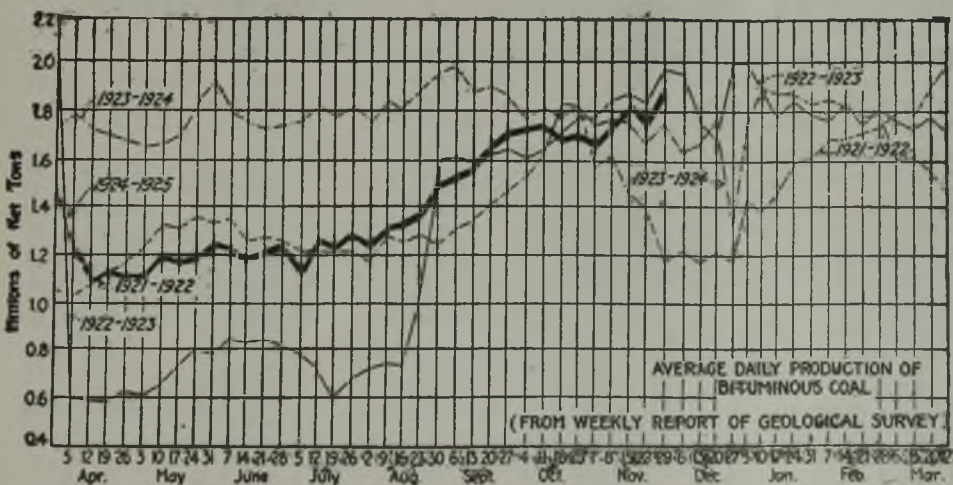
nut is in the van, but egg and pea move only with difficulty. Steam sizes are only moderately active, buckwheat showing a slight improvement. One of the old line companies has advanced the price of stove 25c. and another has tacked on the same amount for chestnut for December. Independent quotations are unchanged except for a 25c. cut on egg.

Coal Age Index of spot prices of bituminous coal holds its gain of a week ago, standing on Dec. 8 at 171, the corresponding price for which is \$2.07, the same as on Dec. 1.

Activity at Hampton Roads registered the biggest increase since the second week in July, dumpings of coal for all accounts during the week ended Dec. 4 totaling 433,722 net tons, the highest of the current coal year. This compares with 299,555 tons dumped during the previous week.

### Bituminous Output Higher Than a Year Ago

Production of bituminous coal during the week ended Nov. 29, according to the Geological Survey, was 9,646,000 net tons, a decline of 913,000 tons from the total for the preceding week, when 10,559,000 tons was produced as shown by revised figures. The decrease in output was due to the Thanksgiving holiday, which was more widely observed than usual in the coal fields. Despite the decline, however, production surpassed that of the corresponding week of last year for the third successive time. Anthracite output also was sharply curtailed by the holiday, the total for the week ended Nov. 29 being 1,611,000 net tons, compared with 1,827,000 tons in the preceding week and 1,691,000 tons during the corresponding week of 1923. Outlaw strikes also continue to limit output.



### Estimates of Production

(Net Tons)		
BITUMINOUS		
	1923	1924
Nov. 15	9,717,000	10,129,000
Nov. 22 (a)	10,160,000	10,559,000
Nov. 29 (b)	8,943,000	9,646,000
Daily average	1,767,000	1,866,000
Cal. yr. to date (c)	504,371,000	423,191,000
Daily av. to date	1,795,000	1,504,000
ANTHRACITE		
Nov. 15	1,669,000	1,674,000
Nov. 22	2,031,000	1,827,000
Nov. 29	1,691,000	1,611,000
Cal. yr. to date (c)	86,115,000	82,838,000
COKE		
Nov. 22	257,000	158,000
Nov. 29 (b)	245,000	158,000
Cal. yr. to date (c)	16,886,000	8,766,000

(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 Inactive

Mild weather has done it again to the domestic market of the Midwest. There is no heavy buying in any quarter of the region though a snow and sleet storm through parts of Iowa and the Northwest was expected to improve the takings in those territories. The domestic sag has been marked enough to influence steam coal slightly. It is a fact that most big steam consumers are getting a full supply on contracts running the rest of the winter, but small steam trade is paying a shade more than last week.

Pocahontas and anthracite trade in the Midwest is droning along without high lights and without change in prices. Good smokeless mine run is available at \$1.75 and none of it tops \$2. Lump and egg smokeless is slow at \$3.75.

A little seasonable weather caused a little demand in St. Louis but nothing to create any unusual stir-up. Most orders are small and the demand is mostly for high-grade coal. Country domestic shows a little improvement over the past three weeks. Country steam is slow while local car-load is fair and wagonload is good. There are no changes in prices.

Kentucky Not Busy

The Kentucky coal market hasn't shown any improvement over the week. Prices are a shade weaker, except on screenings, which are in good demand, lighter production, and are commanding steady prices in eastern Kentucky and better prices in western Kentucky. Prepared prices also

have slumped somewhat, the eastern Kentucky market being around \$2.75@3 on best block coals, with a few of the specialty blocks quoted at slightly above \$3. Western Kentucky 6-in. block worked lower and can be had at \$2.50@2.75. Lump sizes are around \$2.40@2.60 in western and \$2.25@2.75 in eastern, with egg at \$2@2.50 for western and \$1.75@2.15 for eastern. Nut is \$1.60@2 in either field and mine run \$1.50@1.75. Screenings are 85c.@\$1.10 for eastern Kentucky and \$1@1.25 for western.

Colder weather over the week has created a somewhat better demand from the rural districts, where dealers haven't much stock and where farmers buy in hand to mouth lots, or buy late in the season. City retailers as a rule are not buying much replacement fuel.

Gas and electric companies are carrying peak loads and are buying very well and there is a general movement to industrial and heating plants. The brick and cement companies also are unusually busy.

The mines that have opened in the western Kentucky strike zone have not worked up much production and have trouble marketing what they do produce.

Northwest Trade Is Active

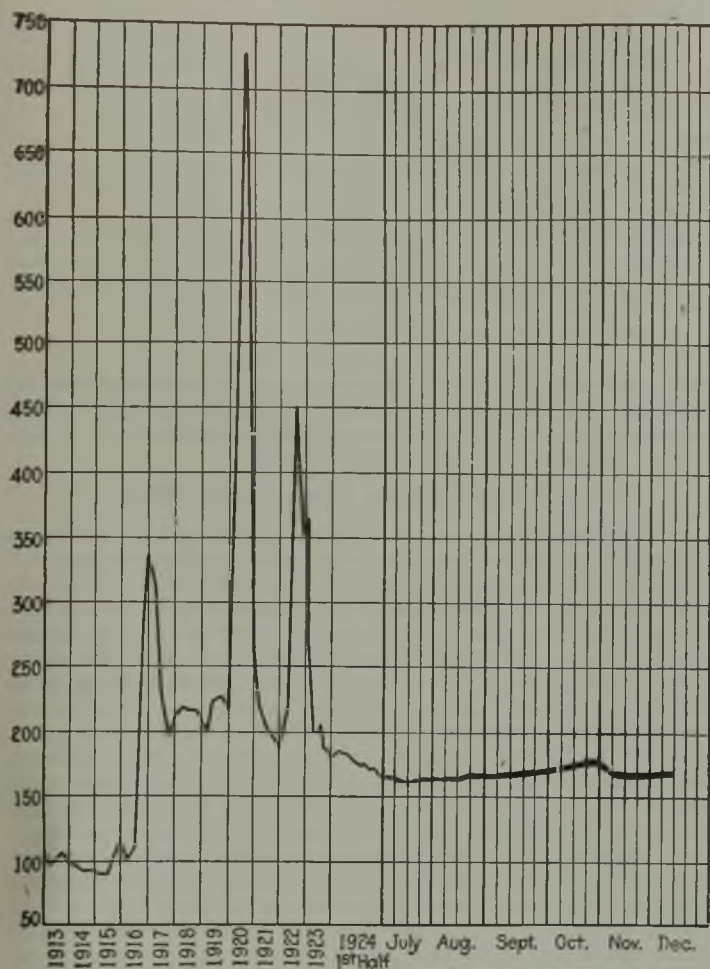
Business has been rushing at Duluth lately, and dock men admit that when the final tally of dock shipments inland for November is in they expect to find the biggest month in two years. It is estimated that at least 27,000 cars left the docks last month. The general tone is optimistic and

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

Table with multiple columns: Coal Type (Low-Volatile, Eastern; High-Volatile, Eastern; Midwest; South and Southwest), Market/Location, and Price/Date (Dec. 10, 1923, Nov. 24, 1924, Dec. 1, 1924, Dec. 8, 1924). Includes entries for Smokeless lump, Pool 1 (Navy Standard), Pittsburgh gas, etc.

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

Table with columns: Coal Type (Broken, Egg, Stove, Chestnut, Pea, Buckwheat, Rice, Barley, Birdseye), Market/Location, Freight Rates, and Prices/Date (Dec. 10, 1923; Dec. 4, 1924; Dec. 11, 1924). Includes entries for Broken Philadelphia, Egg New York, etc.



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

Index	1924			1923
	Dec. 8	Dec. 1	Nov. 24	Dec. 10
Weighted average price	\$2.07	\$2.07	\$2.06	\$2.18

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.

sales seem to justify the high hopes. There has been little contract business despite the rush.

Insurance rates went off Dec. 1, practically stopping dumping at lower Lake ports. Thirty-four cargoes arrived at Duluth last week, of which only one was hard coal, and twelve are reported on the way, of which three are hard. The arrival of the cargoes now on the way will mark the end of shipments this year, as navigation officially closed for departures Dec. 5.

There is a regular boycott on hard coal at the Head-of-the-Lakes. Consumers buy nearly anything in the soft coal line rather than pay the anthracite price asked. Pocahontas is gone except for the favored few who know the way to the coal man's heart, and other brands of smokeless and semi-smokeless are in demand. The big run reported in the east on Pocahontas has cut down the dock supply.

The Milwaukee market experienced no change during last week. Activity depends upon the weather, which of late has been a little more favorable for dealers in fuel. Only a few more lake cargoes are expected at Milwaukee. Receipts for the year up to and including Dec. 3 total 788,862 tons of anthracite and 2,532,970 tons of bituminous coal—3,321,832 tons in all. During the same period of 1923 the receipts were 958,124 tons of anthracite and 3,204,772 tons of bituminous coal, a total of 4,162,896 tons.

**West Gets Stronger**

Signs of convalescence are noticeable in the Southwest, where the market has been suffering from warm weather anemia. As yet the improvement has had slight effect upon working time at the mines, but retail supplies are rapidly diminishing, and within a few weeks operators expect their

mines to be back on a full time basis. The demand for screenings is still disproportionately strong. Kansas screenings are selling generally at \$2.25, with some as high as \$2.35. Arkansas semi-anthracite screenings, which not long ago were offered at \$1, are now quoted at between \$1.75 and \$2. Kansas lump, the list price for which is \$5 a ton, is being sold at as low as \$4.50.

In the Utah coal fields production continues at 60 per cent. Colder weather has stimulated demand for slack for heating purposes. The metal mining industry is the largest consumer of coal among the industrials. Business is improving in most of the territory served by Salt Lake City coal producers beyond the borders of the state. Prices, both retail and wholesale, remain steady.

**Ohio Markets Are Spotty**

Complete lapse of lake buying, shrinkage of domestic demand due to occasional mild weather, and the usual disposition of manufacturers to withhold purchases during December, have combined with an oversupply to make the Cincinnati market weak on all grades of fuel except by-product coals, which are in good demand and holding firm. Distress coal is offered at demoralizing prices, congestion is reported at the railroad transfer points and the mine tracks are full of loaded cars waiting for a call for numbers.

Kentucky L. & N. operators have resumed all-rail fuel shipments to Iowa, Minnesota and the Dakotas, their differential having been restored on the postponement of the hearing of the appeal of the C. & O. and N. & W. shippers to be let in on the lower rate and the tactical request of L. & N. shippers for a further cut. The I. C. C. was to have heard the case on Dec. 4, but put it over to January.

Output has fallen off markedly in eastern Ohio, due to cessation of shipments to the lakes and the languid industrial situation. At Cleveland slack and nut-and-slack continue to be scarce and the price remains firm at the high figures of last week. Inquiries for all other grades are very quiet. In the domestic market retail dealers are well stocked, with little disposition to make further commitments until consumers draw more heavily upon these stocks.

Trade at Columbus has been spotty during the past week, especially in domestic, which apparently has been stimulated by colder weather, though there are still quite a few cancellations. Prices for domestic sizes are rather steady at recent levels. Smokeless is noticeably slower although prices have not been reduced. Retail trade has been rather good but dealers have fairly large stocks and in some cases are not yet inclined to replenish them. Retail prices are steady and little cutting is reported. Industrial conditions have improved somewhat, and this has been reflected in the steam demand. Less demurrage coal is in evidence, which has relieved the situation to a certain extent. Production in the Hocking Valley is at about 20 per cent of capacity. Pomeroy, Jackson, Cambridge and Crooksville are doing only slightly better.

**Pittsburgh Market in Doldrums**

The Pittsburgh market shows no signs of recovery from the depression which struck it late in October. Shipments of operators to regular consumers are proceeding much as formerly, but there is very little inquiry in the spot market, and demand from all retail dealers is poor. Railroad operations are heavy and industrial operations are moderately heavy. The steel industry is running at about 75 per cent, against 66 per cent in October. Prices are unchanged.

Coal production in the central Pennsylvania bituminous field in November totaled 59,114 carloads compared with 66,792 in October. The drop was due largely to a number of holidays on which the mines were idle. The rate of production was about the same, considering the number of days worked. No bill cars reported at the close of the month were 1,200. Prices range as follows: Pool 11, \$1.70@ \$1.80; pool 10, \$1.85@ \$2.10; pool 9, \$2.15@ \$2.25; pool 71, \$2.35@ \$2.40; pool 1, \$2.40@ \$2.65.

Winter weather has improved Buffalo's coal trade all through. Prices, however, are unchanged, except for slack, which is stronger, some shippers asking 10 to 15c. more for it, due to the closing of the lakes. West Virginia and Kentucky coals, paying much higher freight than any from Pennsylvania, are finding their way here. The movement of all freight, including coal, is still good. The lake trade is about at an end, shipments for the week being only four cargoes, totaling 31,400 tons.

**New England Has Discouraging Outlook**

To the steam trade in New England the outlook is anything but encouraging. Not only are prices drooping but there is very little buying interest discoverable in any quarter. Purchases of a few weeks ago are by this time fully delivered and it is likely that there will be renewed accumulations at the Hampton Roads piers. It has long been the practice of smokeless agencies to send coal to tidewater when the Western and line trades slacken, and this season is no exception. What meager inquiry develops is discriminating as between coals. Slack is offering freely, with prices 30@40c. less than mine run of equal grade, but there is so much high volatile slack available that sales are few and far between.

Owing to the dull market and the discontinuance of pool designations Pocahontas and New River mine run coal of recognized grade can be had from \$4.25 down to \$4 flat, and there are rumors of somewhat higher ash coals selling at less than the \$4 level. Off-shore business also is light and coastwise tonnage is falling off as the 60 to 90 day purchases are being filled.

On cars Boston the price curve has dipped in sympathy with going figures at Hampton Roads. High grade smokeless coals are to be had at \$5.25@\$5.50 per gross ton, but sales at the latter level are special or are confined to single carload lots.

All-rail from central Pennsylvania there is no perceptible change. In the always widening territory open to Pocahontas and New River from tidewater there is an ample tonnage of Cambria and Clearfield coals offering at the same low range that has been characteristic the whole season. Dumpings via the New York and Philadelphia piers are light.

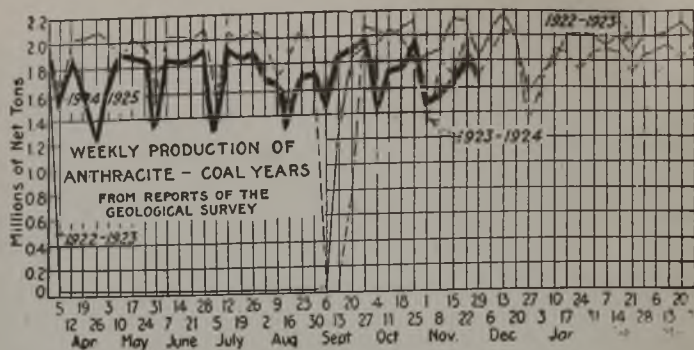
**Buyers Perk Up in Atlantic Markets**

Buyers showed more interest in the market at New York last week, but orders were not heavy. The better grades are scarce, as the spot buyer is not willing to take the poorer grades when he can obtain better coals at a trifle higher cost. Contract holders are taking their full requirements, leaving comparatively little coal for the occasional buyer. Although reports show a daily average of about 1,700 cars of coal at the piers at New York there is no distress coal around, shippers being able to dispose of all surplus coal without much trouble.

While demand at Philadelphia is not particularly active, considerable tonnage is moving. Many mines are doing better now than for months past. Railroads are active buyers and their stockpiles are growing. The average consumer, however, is cautious. There are signs of improving trade, and this is giving the buyer more courage to take in more than current requirements. Prices are unchanged.

Demand has not improved at Baltimore, the situation remaining as it has been for some time past, with no change in prices. November proved to be the lightest export month for coal for the present year, falling far behind Novembers of other years.

The trade at Birmingham is virtually marking time awaiting some development to stimulate demand. The recent cold weather was not of sufficient intensity or duration to benefit the wholesale market to any marked extent, and though yards moved considerable fuel to householders in small lots their reserves were not seriously crippled and they are taking on very little coal from the mines. Spot market business is scarce and much solicitation is required to move the domestic production. Steam consumption has



not increased in several weeks past as inquiry from industrial sources has not been up to expectations, the spot supply being absorbed principally by operations of a seasonal character.

**Anthracite Trade Slips Some More**

The anthracite market at New York is not as active as it might be. Stove and chestnut move easily but egg and pea are becoming more difficult to move daily. Retailers are prepared to take care of a reasonable increase in orders, as they are well supplied with all sizes except stove. Last week they increased the retail price for stove and chestnut 25c. per ton, making the price in Manhattan \$14.25. No other prices were changed. On Dec. 1 one of the old-line companies increased its price for stove 25c. per ton and another advanced chestnut the same amount. Independent quotations, except for egg, have not been affected by the lull, but a cut in output is expected to affect these coals. There is not much activity in steam coals.

A few cool days in Philadelphia brought retailers demand into the market, but only for a short time. Dealers' demand for nut has greatly strengthened and the call for stove is fairly strong, but egg and pea are slow movers. Steam sizes are fairly well taken, with the demand for buckwheat a bit better than last week.

A real touch of winter at Baltimore has awakened demand for hard coal. There is no scarcity of fuel here, however, and dealers are moving orders promptly. Due to delay in shipment of apparatus, the exhibit of appliances to educate the public in the use of steam coals has been held off for a few days.

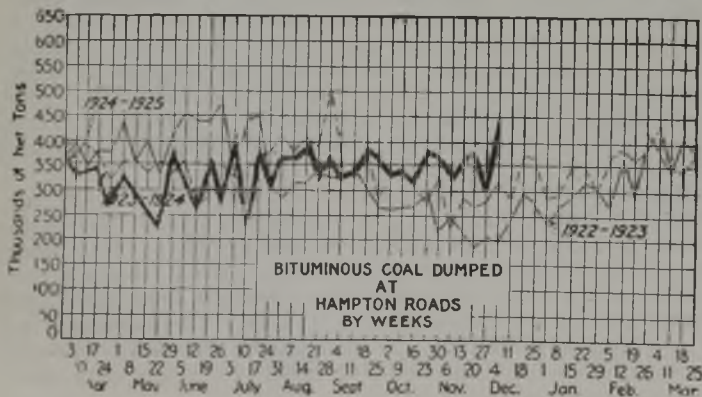
The situation at Buffalo is good, but the demand is not large enough to make up the shortage that has existed all summer. The use of the smaller sizes is increasing, as the consumer is finding that he can put in buckwheat for banking at night or for choking down fires that have gone too high and at a cost only a trifle over half that of the regular sizes. The coke trade is light. Some wholesale shippers report a fair trade to certain parts of Canada, but the Buffalo trade does not improve much.

**Coke Market Stiffens**

The first quarter contracting movement in Connellsville furnace coke has turned out to be a very remarkable one, totaling about 225,000 net tons a month, and prices advanced sharply during the movement from \$3.25 to \$4 for a recent contract. Apparently all the furnaces now in operation, or definitely scheduled to blow in, such as use purchased Connellsville coke, are covered, but there is some inquiry on the part of idle furnaces considering the question of going in. The sales do not by any means take up the merchant capacity of the region, but they take up pretty well all that can be gotten into operation promptly. The spot furnace coke market in the past week has developed a little demand, recent lots going at \$3.50. Spot foundry coke has been in poor demand, being still quotable at \$4@\$4.50. Heating coke is quotable all the way from \$2.60 to \$3.

**Car Loadings, Surpluses and Shortages**

	Cars Loaded		Car Shortage	
	All Cars	Coal Cars		
Week ended Nov. 22, 1924	1,010,122	195,553		
Previous week	1,015,704	188,229		
Week ended Nov. 24, 1923	990,217	182,158		
	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Nov. 22, 1924	166,101	84,367		
Nov. 14, 1924	145,589	79,111		
Nov. 22, 1923	111,797	58,490	1,866	907





## Foreign Market And Export News

### Inquiry Stronger in British Market; Contracting Picks Up

Business is better and inquiry stronger in the South Wales coal markets than for several months. Shipments also have increased owing to a better supply of shipping tonnage. The market still is unsatisfactory and, though some collieries have been able to increase the number of shifts operated, many are still on short time.

The greatest concern to the South Wales operator now is German competition in Europe. German miners are working nine hours a day at a low wage, so that German coal is available at a much lower rate than British. In addition the German operators have opened up depots in South America and Portugal, and are doing their utmost to procure business to an extent which will insure full working time for the German mines. German operators also are offering ship owners sixty days' credit on bunker coal, so that a round trip voyage can be made before

the coal is paid for. In South Wales the collieries ask for payment in seven days, so that the weight of German competition is felt more than ever.

In North England business has been steady since last week, though it is still below normal. Orders for more than 1,000,000 tons of second admiralty qualities have been placed by one factor at about 25s. 3d. f.o.b., but he is now asking a material advance. French railways have booked large quantities over the first half of 1925. Contracts aggregating 70,000 tons of gas coals have been placed at Newcastle, but Germany has obtained the order for 30,000 tons of steam coals for the Lithuanian State Rys.

Production by British collieries in the week ended Nov. 22, a cable to *Coal Age* states, was 5,309,000 tons, according to official reports. This compares with 5,232,000 tons produced in the preceding week.

#### French Industrial Coal More Active; House Grades Quiet

Save for a slight improvement in industrial fuel the French coal market continues unchanged. After being more active last week, the demand for house coal is again quiet, due to mild weather.

In the East, supplies of industrial beans are plentiful and competition for business is keen. The marketing of patent fuel is heavy, in spite of further price concessions.

Arrivals from South Wales have been normal of late.

From Nov. 1 to 16, France and Luxemburg received 172,600 tons of indemnity fuel, consisting of 115,500 tons of coal, 38,200 tons of coke, 18,900 tons of lignite briquets, a daily average of 10,800 tons, compared with 28,550 tons in October.

During the first eighteen days of November receipts of indemnity coke aggregated 36,932 tons. Since then,

however, deliveries have recovered their normal pace and arrivals between Nov. 19 and 25 inclusive were 73,035 tons.

#### Trade in All Lines but Bunkers Slow at Hampton Roads

Hampton Roads business is dull, with the market weakening and demand dropping off. Foreign trade is at a very low ebb and coastwise movement and bunker trade are barely holding their own.

Inquiries have fallen off and the market lacks stimulus. Domestic business is holding fairly strong in the retail trade, with increasing cold weather having a tendency to hold prices and keep up demand.

The bunker trade alone is being depended on to keep the piers moving at full time. Movement from the mines is regular and considerably above the demand. Very little spot business is being transacted.

#### Destination of Fuel Exports from United States in October

	(In Gross Tons)	
	1923	1924
Anthracite.....	400,599	362,118
Bituminous.....	1,488,887	1,534,459
Coke.....	77,737	55,759
Bituminous:		
Exported to:		
France.....	27,045	24,004
Italy.....	59,068	38,418
Netherlands.....	8,876	
Other Europe.....		3,500
Canada.....	1,247,952	1,293,963
Panama.....		24,082
Mexico.....	5,136	6,830
Br. W. Indies.....	10,542	6,364
Cuba.....	52,680	51,358
Other W. Indies.....	21,923	18,771
Argentina.....		14,973
Chile.....	794	
Egypt.....		2,216
Fr. Africa.....		
Brazil.....	31,664	18,228
Other countries.....	23,207	31,752

#### Fuel Imports to the United States In October

	(In Gross Tons)	
	1923	1924
Anthracite.....	40,213	6,155
Bituminous.....	89,059	31,643
Coke.....	3,815	6,091

#### Export Clearances Week Ended Dec. 6, 1924.

FROM HAMPTON ROADS		
For Italy:		Tons
Ital. Str. Volturno, for Genoa.....		7,064
For West Indies:		
Nor. Str. Jacob Christensen, for Fort de France.....		5,349
Swed. Str. Freja, for Kingston.....		1,824
Nor. Str. Bur, for St. Thomas.....		6,319
FROM PHILADELPHIA		
For Cuba:		
Br. Str. River Taff, for Havana....		—

#### Hampton Roads Pier Situation

	Nov. 27	Dec. 4
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,158	1,742
Tons on hand.....	69,545	108,290
Tons dumped for week.....	105,526	147,162
Tonnage waiting.....	13,000	30,000
Virginia Piers, Sewalls Pt.:		
Cars on hand.....	1,840	1,970
Tons on hand.....	123,950	125,150
Tons dumped for week.....	95,128	114,211
Tonnage waiting.....	14,245	2,200
C. & O. Piers, Newport News:		
Cars on hand.....	2,073	1,848
Tons on hand.....	107,490	84,125
Tons dumped for week.....	66,806	125,889
Tonnage waiting.....	7,875	15,715

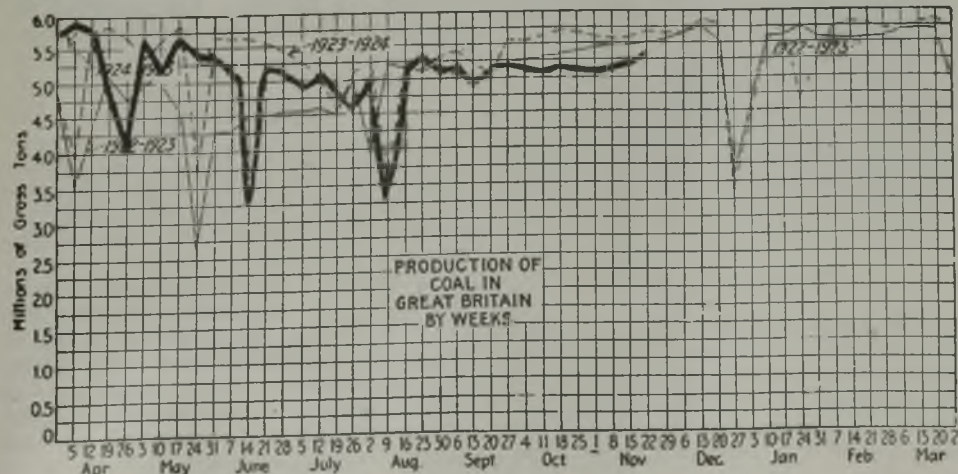
#### Pier and Bunker Prices, Gross Tons

	PIERS	
	Nov. 26	Dec. 6†
Pool 9, New York....	\$4.75@4.85	\$4.75@4.90
Pool 10, New York....	4.40@4.65	4.40@4.65
Pool 11, New York....	4.20@4.35	4.20@4.45
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.	4.20	4.15
Pool 2, Hamp. Roads.	4.10	4.00
Pools 5-6-7 Hamp. Rds.	4.00	4.00
BUNKERS		
Pool 9, New York....	\$5.00@5.10	\$5.00@5.15
Pool 10, New York....	4.65@4.90	4.65@4.90
Pool 11, New York....	4.45@4.60	4.50@4.70
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.	4.30	4.25
Pool 2, Hamp. Roads.	4.20	4.10
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>		
	Nov. 29	Dec. 6†
Cardiff		
Admiralty, large...	27s.@27s.6d.	27s.@27s.6d.
Steam smalls.....	16s.@17s.	16s.
Newcastle:		
Best steams.....	19s.	18s.9d.@19s.
Best gas.....	22s.	21s.6d.@22s.6d.
Best Bunkers.....	17s.6d.@18s.	17s.6d.@19s.

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





## News Items From Field and Trade



### ALABAMA

Reports reaching Jasper are that the De Bardeleben Coal Co. has begun active work on its new \$100,000 coal washer at Empire. It is stated the company will also erect a new modern tippie near the new washer.

The Sloss Sheffield Steel & Iron Co. assumed control and operation of the physical properties of the Alabama Company on Dec. 1, announcement being made that one of the idle stacks of the latter at Alabama City will be made ready for operation Jan. 1. The Alabama Company had active coal mining operations at Mary Lee, Jefferson County, and at Searles and Brookwood, Tuscaloosa County.

Details of the merger of the properties of the Pratt Consolidated Coal Co. with those of the Alabama By-Product Corporation have been worked out, as the consolidation has been approved by the stockholders of the respective companies. The properties will be operated as the Alabama By-Product Corporation with Morris Bush, president; Horace Hammond, A. P. Bush and Carr McCormack, vice-presidents; J. A. Shook, secretary; H. L. Morrow, treasurer; H. M. Cowart, assistant secretary and assistant treasurer. G. B. McCormack is chairman of the board, which is composed of the above officers with the exception of Mr. Cowart and the addition of Erskine Ramsay. No new financing was necessary according to official statement, ample cash being in hand for working capital and such expansion and improvements as may be contemplated for the near future.

### COLORADO

J. B. Marks, purchasing agent of the Colorado Fuel & Iron Co., has been named assistant to President Welborn to take over some of the work performed by Fred Farrar, who recently resigned as vice-president. Mr. Marks continues also as purchasing agent.

A decision was handed down by the State Industrial Commission in favor of the owners and operators of the Morning Glory mine, near Walsenburg, in Huerfano County, in a dispute between the miners and operators as to charges for recharging the storage batteries used for the miners' electric cap lamps. Several months ago a state mine inspector ordered the change from carbide to electric lamps because of gas in the mine. The operators deduct \$2 a month from each miners' pay for recharging the batteries. A number of

workers quit one day in protest, but the next day returned to work after agreeing to submit the matter to arbitration before the State Industrial Commission. The commission held that the charge is fair and reasonable. On a complaint of the miners that the operators had been, in a few isolated cases, changing wages without due notice, the commission also ruled in favor of the employers.

### ILLINOIS

The Fallon Coal Mines Co., of O'Fallon, has been petitioned in receivership by the Security Trust Co., of Detroit. The Belleville Savings Bank, of Belleville, has been appointed receiver. Most of the stock and bonds of this company is owned by Michigan people. The Detroit bank is foreclosing on a mortgage.

The washhouse of Mine A of the Central Illinois Coal Mining Co., a few miles west of Springfield, was destroyed by fire a few days ago, with its contents and with the clothes of the 130 miners employed. A carload of powder was on a nearby siding but the wind carried the fire away from the car.

The Donk Bros. Coal & Coke Co. railroad, the St. Louis, Troy & Eastern, has been purchased by the Illinois Light & Power Co. This road has operated 18 miles of track from Troy to East St. Louis and a 7-mile spur from Edwardsville to Formosa. The purchase also included the Illinois Belt Ry., a small switching line in East St. Louis.

### INDIANA

The Indiana Public Service Commission soon will hear the petition of miners about Blackhawk for a change in miners' train service on the C. M. & St. P. R.R. The case dates back several months when the railroad discontinued operation of the train because of lack of business in the coal industry. Later partial service was restored but the cars of the miners' train, which are left on a siding, are picked up by a passenger train and taken to Terre Haute. The miners say sometimes they are compelled to wait an hour or more for the passenger train.

### KENTUCKY

It is reported that certain political and newspaper interests of Kentucky are starting a fresh fight for a coal tonnage tax to come up in the 1926 session of the Legislature, but a few newspapers are combating the move-

ment and endeavoring to show that the coal business has been in a bad way without any taxes to add to the complications of competitive conditions north of the Ohio River.

C. J. Neekamp, secretary of the Northeastern Kentucky Coal Operators Association, Ashland, was re-elected chairman of the Coal & Coke Committee of the Ohio Valley Shippers Regional Advisory Board at the annual meeting held in Louisville on Nov. 25. At this meeting Mr. Neekamp reported for his committee, and stated that the Kentucky and Virginia section would need more coal cars over the next ninety days than was the case last year.

The Kentucky River Coal Corporation is about to erect a store building in Heiner.

The Hatcher Coal Co., near Pikeville, suffered fire loss of about \$16,000 when the headhouse and part of its chute were burned at night on Nov. 19.

It is reported from Paducah, that the First District Educational Association, meeting there on Nov. 29, after discussion on recommendation of the finance committee, adopted resolutions favoring a state tax on coal, a percentage of the tax return to be paid to the state school funds.

The Gorman-Pursiful Coal Co. is about to let the contract for a store building in Whitesburg, Ky.

The Coil Coal Co., Madisonville, operators, recently contracted the tonnage of the Co-operative Coal Co., at Nebo, effective Dec. 1. The capacity is about 1,000 tons daily.

### MINNESOTA

Announcement was made last week of the wedding of Henry E. Smith, vice-president of the M. A. Hanna Coal & Dock Co., St. Paul, and Mrs. E. H. Windom, of Duluth. The wedding occurred at Dellwood, on White Bear Lake.

### NEW YORK

Net earnings of the United States Distributing Corporation for the two months ended Oct. 31 were \$248,170, against \$133,204 for the two corresponding months in 1923, or a gain of 85 per cent, according to President Harry N. Taylor. "After allowing for the \$192,500 annual preferred dividend requirements," Mr. Taylor said, "these figures indicate annual earnings of better than \$11 a share on the 110,000 shares of common stock of no par value now outstanding."

## OHIO

N. L. Mahan, for many years general manager of the Southern Coal & Coke Co., with executive offices in Cincinnati, Ohio, is now connected with the General Coal Co., Philadelphia, as Western sales manager, located in the Dime Bank Building, Detroit, Mich.

The New York Coal Co., of Columbus, has placed in operation Mine No. 36 at Buchtel, following a shutdown of almost a year. It gives employment to about 150 men. Officials of the company believe that the mine will be operated on full time for the greater part of the winter season.

In the Nelsonville district there are 48 mines operating of which 15 are on railroad fuel. The daily tonnage of the district is about one-fourth normal. Many of the operators say that they are merely holding on and keeping operations going in the hope of better demand in the near future.

## PENNSYLVANIA

The Mid Valley Coal Co., a subsidiary of the Hazle Brook Coal Co., has closed its No. 2 breaker for an indefinite period. It is said to be the intention of the concern to dismantle the breaker and run the coal to the Raven Run operations to be prepared for market. The Mid Valley mine has an output of approximately 800 tons a day.

F. D. Welsh has been appointed superintendent of the Rossiter Mines and property of the Clearfield Bituminous Coal Corporation, of Indiana, Pa., at Rossiter.

Arthur Williams, of Scranton has been appointed superintendent of the Powderly mine of the Hudson Coal Co., at Mayfield. This is one of the largest operations in the anthracite region. Mr. Williams will rank as one of the youngest mine superintendents in the Lackawanna valley.

Newspapers in the anthracite field are carrying reports to the effect that in case John L. Lewis, president of the miners' union, becomes Secretary of Labor under President Coolidge, Philip Murray, of Pittsburgh, will be advanced to the presidency and that a boom probably will be launched to make Thomas Kennedy, of Hazleton, head of District 7 and a member of the Anthracite Conciliation Board, an international vice-president.

E. B. Jermyn, former independent coal operator, has announced himself as a candidate for Mayor of Scranton in 1925.

The American Coke & Fuel Corporation has resumed operations at the Sunshine coal and coke plant, at Martin, Fayette County, after being idle more than a year.

Fourteen workers in mines near Wilkes-Barre, recently were found to possess miners' certificates even though none could show the necessary qualifications. They were immediately directed in court to surrender their papers. Under the Pennsylvania law no anthracite employee can take a test

for a miner's certificate until he has had two years' experience in the industry.

Arthur Etienne, paymaster, and Edward Kelley, mine foreman of the Marion Center Coal Mining Co., Greenwich, Cambria County, were arrested, charged with having "framed" the \$7,000 robbery of the company's payroll, Nov. 28. The police said that both men confessed and that all but \$300 of the loot had been recovered. The authorities said Kelley, disguised, had entered the coal company's office, "assaulted" Etienne and made off with \$7,155. Then, the police said, Kelley walked out of town, removed his disguise and returned home as if nothing had happened.

Charged with violating the state mining law by smoking in a coal mine, Joseph Solgoda of Acosta, Somerset County, was sentenced to pay the costs, a fine of \$90 and serve 90 days in jail by Judge John A. Berkey when he pleaded guilty. The prosecution was brought by Fletcher W. Cunningham, state mine inspector of the Twentieth Bituminous district.

## UTAH

The Liberty Fuel Co., of which George Schultz is superintendent, is building a rescreening plant quite similar to the new one at the Mutual Coal Co.'s mine.

W. H. Homer and Albert Shaw, president and superintendent respectively of the Mutual Coal Co. at Rains, recently completed the installation of a loading boom for lump coal, and a rescreening



Courtesy Bertha-Consumers Co.

## Unusual Gravity Plane at Goucher Mine

Note the force rails that give one the impression that a Barney is used. Not at all! Numbering the rails from left to right the 5-ton loaded monitor in the foreground is running on rails Nos. 1 and 3 and the 5-ton empty monitor in the rear is traveling on rails Nos. 2 and 4. Thus switches but not frogs are eliminated

plant. The loading boom, 48 in. wide, provides facilities for thorough picking. The rescreen consists of a super-capacity continuous elevator, taking the coal from the main shaking screen and delivering it to a set of flexible hanger screens over the bins, each of which has a capacity of 60 tons.

Robert Howard, superintendent of the Peerless Coal Co., has just finished the erection of a commodious nine-room clubhouse at Peerless for the entertainment of officials of the company and others who wish to spend time at the mine. The building is a bungalow with a two-color composition shingle roof. On the main floor are a combination sun parlor and dining room, a kitchen, a hall, six bedrooms, and two baths. In the basement is a recreation room. This clubhouse is considered one of the most attractive buildings in Spring Canyon.

The Rains mine in Carbon County, blown up on Sept. 21, is working regularly again and is producing 1,000 tons a day. Its normal capacity is 1,700 tons, and this amount is expected to be produced after the first week in December, officials stated. The State Mining Department has as yet not issued its report regarding the cause of the explosion in question.

Roy G. Mead and Joel H. Richardson have acquired a lease on 160 acres of coal land in Grand County, following an auction at the State Land Office. They agreed to spend at least \$3,000 on the property and to produce coal commencing with the fourth year amounting to a minimum of 1,600 tons. The government will receive a royalty of 10c. a ton. A premium of \$50 was paid. Messrs. Mead & Richardson are from Los Angeles, Cal.

George A. Storrs, charged, with three others, with fraud in connection with the promotion of the Great Western Coal Mines Co., and under indictment by a federal grand jury, has entered a plea of not guilty in the United States District Court, at Salt Lake City. The defendants were arraigned before Judge Tillman D. Johnson.

## VIRGINIA

The U. S. Shipping Board has awarded to the Willard Sutherland Coal Co. a contract for 1,700 tons of pool 2 coal, for immediate delivery at the Sewalls Point piers at \$3.92 per ton. The figure was regarded as representing a very low market level. The other bidders were Robert Hasler & Co., \$3.93; W. C. Atwater & Co., \$4.04; Dexter-Carpenter Coal Co., \$4.05; W. H. Brown Coal Co., \$4.07; West Virginia Coal Co., \$4.25. The contract figure was not regarded in the trade as indicative of the real market, however, which was held to be nearer \$4@\$.4.10.

## WASHINGTON

Wylie Hemphill, who had been general sales manager of the Pacific Coast Coal Co. at Seattle, has been promoted to the second vice-presidency. He continues as general sales manager also. Mr. Hemphill has just returned from a trip to Europe.

## WEST VIRGINIA

The Morrison Coal Co., owned by the Laing interests and operating mines at Glen Morrison, has presented to its colored employees a church and a lodge hall.

One of the largest store buildings in West Virginia will be opened in the near future by the Pocahontas Fuel Co. at Itmann, just below Mullens. The structure is built of native stone with a garage and warehouse beneath it. The cost of the building and stone wall around it will run well up to \$400,000, it is stated.

Permanent financing of the fourteen-story Coal Exchange Building, in Huntington, has been arranged for. The structure will be completed about Feb. 1. and will cost about a million dollars. S. W. Straus & Co., of New York, have underwritten an issue of \$600,000 first mortgage 6 per cent serial coupon gold bonds, to be secured by the land and the building now in course of erection. A large proportion of the rentable space in the building has already been leased. D. C. Schonthal, A. Solef, M. A. Zeller and H. A. Glick are officers of the building company.

In connection with the effort of the government to collect \$38,653.90 alleged to be due for internal revenue and excess profits taxes from the Knob Coal Co., a subsidiary of the American Gas Coal Co., it has developed that attorneys for the government failed to take an appeal from a decree of sale in the lower court. When an appeal was taken it was only as to the priority of the government's claim for taxes. The Supreme Court ruled that the government did possess the right of priority in its claim for internal revenue and excess profits tax but since there was nothing else asked for, that part of the decision of the lower court ordering a decree of sale was not reversed, so that there is a tangle to be unraveled in the Circuit Court of Monongalia County.

Additional loading facilities are being provided at the Pinnacle mine and the Thomas No. 1 mine, of the Thomas Coal Co. on Crane Creek, by the Norfolk & Western Ry. A new loading track is being installed and existing tracks are being rebuilt. Retaining walls also are being built along the creek bank and the county road right of way in order to prevent a washout in the future such as that which occurred last spring in the Crane Creek section.

Thomas Jones, of Thurmond, has been named as receiver for the New Fire Creek Fuel Co., formerly the Hump Mountain Smokeless Coal Co., of Summers County. Judge J. H. Hatcher, of the Circuit Court of Summers, made the appointment in chambers at Charleston.

Coal companies recently increasing their capital stock were the Kentucky & West Virginia Coal & Mining Co., from \$100,000 to \$500,000; the Superior Harlan Coal Co., from \$250,000 to \$300,000, and the Raleigh-Wyoming Coal Co., from \$4,100,000 to \$4,700,000. The W. H. Green Coal Co., of Elkins,

has decreased its capital stock from \$50,000 to \$25,000.

The Campbells Creek Coal Co. has authorized the resumption of work on the large steel tippie and preparation equipment for the Point Lick mine. This is a new shaft operation and will be one of the largest output mines in the state, the tippie being designed for an output of 600 tons per hour. The complete steel tippie and all equipment is being designed, manufactured and erected by the Fairmont Mining Machinery Co.

The mining town of Yukon, in McDowell County, seat of operations of the Yukon Pocahontas Coal Co., was almost totally destroyed by fire late in November, the loss being estimated at \$100,000. About fifty people were made homeless. The fire, which started in a vacant dwelling near the general store of the company, is thought to have been of incendiary origin. The only buildings remaining after the fire were the company store, one other building and a dwelling.

Orders were received at Gary, operating headquarters of the United States Coal & Coke Co., a subsidiary of the United States Steel Corporation, late in November to increase coal production 5,000 tons per week, it was announced by Colonel Edward O'Toole, general superintendent of the company. A few weeks ago orders for coal were received necessitating the reopening of Mine No. 7, and a little later Mine No. 4 was put in operation.

## WYOMING

The Hellgate Coal Co., a commercial company with headquarters at Denver, Colo., has announced it will soon open its coal properties four miles west of Rawlins. Practically all of its output will be used to supply its Denver trade, though some will be sold to retailing companies outside that city.

It is reported from Corbin that coal trains are moving from there over the Cincinnati division of the Louisville & Nashville R.R. at an average of one every 30 minutes, this coal coming from the big coal companies and industrial mines of southeastern Kentucky, which comes into the division quarters at Corbin. Car supply has been adequate but there hasn't been any surplus motive power, and the Corbin yards have been congested.

## CANADA

A reorganization of the Fundy Coal Co. has been effected. These pits are at Joggins. They have been idle for some time but under the reorganization plans, they will be operated at capacity henceforth. The intention of the new executive is to install new and modern equipment next year that will increase the capacity greatly.

The mines of the Inverness Coal & Railway Co. at Inverness, which have been idle for several months, have resumed operation. As the mines had fallen into disrepair, only 250 men were employed at first, the plan being to enlarge this crew as soon as possible. The management have been able to

interest the miners in a co-operative project, to cut the costs of mining. For the past two years operations in the Inverness mines have been far below capacity owing to inability to show profits. The mines have been closed thrice during that period. According to the management no difficulty is being experienced in marketing the coal.

The Manitoba Department of Public Works has awarded contracts for 36,000 tons of coal for public institutions, the total price involved being \$203,468. This constitutes the bulk of the government requirements until November, 1925. There were in all 57 tenders. Orders for 10,000 tons, 80 per cent of which was from the Souris mines, were distributed among six companies, the prices being for Souris coal, \$3.85; Souris slack, \$3.60; Youghiogheny slack, \$7.34 for delivery on railway siding at Hospital for Mental Diseases, Selkirk. Among the other contracts were these: Capital Coal Co., 6,000 tons of Youghiogheny screenings, \$7.45; Winnipeg Supply & Fuel Co., 5,000 tons Youghiogheny screenings, \$7; Manitoba & Saskatchewan Coal Co., 5,000 tons Souris mine run, \$4; C. J. Sharp & Sons, 3,000 tons Souris mine run, \$4.70 for delivery at Portage la Prairie.

The last week in November was exceptionally busy at the Drumheller mines and, according to indications, many records for daily output and shipment will be broken before the end of the year. On Monday, Nov. 24, 322 cars passed over the Canadian National Ry. scales, being billed to various points in the prairie provinces. This constitutes a record since the mines resumed work in the fall. As a direct result of the increased activity in the Drumheller field, general business conditions are said to be excellent. The pay roll on Saturday, Nov. 22, was \$150,000 which is well above the average for this district.

## New Companies

The Rio Verde Coal Co. has been incorporated in Denver, Colo., with a capital stock of \$50,000, by W. D. Waltman, W. O. Gara and M. A. Wogan.

The Rathbun Coal Co. has been incorporated in Centerville, Iowa, with a capital stock of \$25,000, by L. B. Harbold and Joseph Swab.

The McHoma Coal Co. has been incorporated in McAlester, Okla., with a capital stock of \$25,000, by Egbert D. Buchanan, Roy Caldwell and C. A. Sturgeon.

Consolidation Coal Lands, Ltd., of Coalhurst, Alta., has been incorporated with a capital of 100 shares of no par value to carry on the business of a mining, mineral reduction and development company by Eric A. Lovett, George L. Brockbank, and Thomas C. Boyd.

Phoenix Coal Co., Ltd., has been incorporated with \$40,000 capital and head office in Toronto, Can., to manufacture and deal in fuel. The provisional directors are Grace Cutler, Tavia Shunk and Edible J. Clark.

Prairie Coal Land, Ltd., of Coalhurst, Alta., has been incorporated with a capital of 500 shares of no par value to carry on the business of a mining, mineral reduction and development company by Eric A. Lovett, George L. Brockbank and Thomas C. Boyd.

The United Bituminous Products Co., Inc., New York City, has been chartered at Albany, with \$25,000 capital, to manufacture bituminous products. R. P. Buell, William H. Hall and Max N. Hammerling, 165 Broadway, are the directors and subscribers. Graham, McMahan, Buell and Knox, 165 Broadway, are attorneys for the corporation.

## Traffic

### Short Haul Rate Adjustment Deferred in West Virginia

It has been announced by the Public Service Commission of West Virginia that the proposed adjustment in the short haul freight rate on coal and "coke-in-transit" will not become effective on Dec. 21, as originally fixed, but that the application of the rate had been deferred until Jan. 1. No special reason has been given for the change in the dates but the understanding is that no harm will be done Clarksburg interests by the change. Postponement will not result in a change of the original order, it is understood.

### Rate to East St. Louis Not Likely To Stand

The decision by Judge Crow, at Belleville, Ill., in which a rate to East St. Louis, Ill., of 70c. was made from a group of mines, is looked upon as a joke for the reason that the Judge did not pass on the matter that was presented to him as a whole, but his decision altered that and his action is regarded as rate making, which is beyond the authority of the court. Therefore the application of the low rate is regarded as unconstitutional.

### New York Commission Approves New Fuel Rates

The Public Service Commission of New York has approved a carload rate on coke, minimum weight 40,000 lb., on the Arcade & Attica R.R. from Attica when coming from points on connecting lines to Arcade, Arcade Center, Curriers, Earls, Java Center, Johnsonburg, North Java, Perrys and Varysburg, of 78c. per net ton, effective Dec. 10, 1924. No rates heretofore have been in effect.

New rates of the New York Central (East) on coke in carloads, minimum weight in open cars 50,000 lb. and when in box or stock cars 40,000 lb., also have been approved. Rates per ton from Buffalo, East Buffalo and Harriet to stations as follows: Stafford to Shortville, inclusive, \$1.51; Clifton Springs to Geneva inclusive, \$1.89; Waterloo to Solvay, inclusive, and Corning, \$2.02. Reductions effective Dec. 5, 1924.

The Commission has approved a new joint rate on coal of the Delaware & Hudson R.R. (anthracite, birdseye and bituminous) in carloads from Mechanicville to South Schenectady (on West Shore) of \$1.60 per gross ton, effective Jan. 10, 1925. No joint rate hitherto has been in effect.

## Industrial Notes

The Osgood Company, of Marion, Ohio, announces the appointment of C. J. Thompson as district sales manager in charge of the New York district with offices at 50 Church Street, New York City, effective Dec. 1. Mr. Thompson has had wide experience in the excavating machinery and contracting field.

The Cutler-Hammer Mfg. Co., of Milwaukee, announces the addition to its industrial sales engineering force of the

eastern district of T. E. Beddoe, at one time connected with the Pittsburgh and Chicago offices of the company. He is now located in the Philadelphia office. Paul Darlington, for the past four years in the industrial controller engineering department at the Milwaukee factory, has joined the New York staff.

Foot Bros. Gear & Machine Co. recently completed arrangements with Chas. Bond & Co., Philadelphia, Pa., for the distribution of its IXL gear products and speed reducers in eastern Pennsylvania and Maryland, the state of Delaware and all of New Jersey south of Mercer County.

The Hyman-Michaels Co. of Chicago, due to its expansion in the railway equipment field, has engaged the services of F. W. Glauser, formerly associated with the Mid-Continent Equipment & Machinery Co., of St. Louis. Mr. Glauser will be located in St. Louis, where he will assume the management of the equipment department for the Southern territory.

The Central Steel Co., of Massillon, Ohio, manufacturers of Agathon alloy steels, announce the appointment of A. B. Cooper as their Philadelphia district sales manager with offices in the Widener Building. Mr. Cooper has been identified with the steel industry for 17 years in both operating and sales work and is well known in the Philadelphia territory, where he was formerly identified with the Tacony Steel Co. and the Penn Seaboard Steel Corporation.

## Obituary

Henry P. Adams, well known in the coal industry of southern West Virginia, died late in November at his home near Lynchburg, Va. Mr. Adams was for more than 20 years City Treasurer of Lynchburg but resigned that post a few years ago to devote more attention to his rapidly growing coal interests. He became president of the Ivy White Ash Coal Co., operating at Ivaton, W. Va. He also was vice-president of the Pinnacle Block Coal Co. as well as vice-president of the Imperial Coal Sales Co. of Lynchburg, Va. Surviving him are a wife and three children.

Evan W. Evans, 55, well known mining expert, died Nov. 27 at his home in Scranton following a ten days' illness that developed into pneumonia. Mr. Evans was for many years mine foreman of the Capouse colliery, of the Scranton Coal Co. He was born in Scranton and began his career as an employee in the coal breaker. While engaged in this work he studied at night, eventually becoming a recognized anthracite authority. He also organized a mining school in West Scranton for the instruction of eager students of limited resources. His course was finally adopted by the Y. M. C. A., and there he continued to help those who desired to prepare for state examinations for mine foremen and superintendents. Surviving him are his wife, four daughters and three sons.

While taking lunch at the Macdonald Hotel, Edmonton, Alta., on Thursday, Nov. 27, Louis Pratt of Montreal, president of the Coal Valley Mining Co., collapsed and died within a few hours from heart failure. A close friend of Premier King, Sir Henry Thornton and other big men and himself a prominent financier in eastern Canada, Mr. Pratt was well known in coal circles. At the time of the fatal seizure he was luncheon with C. E. Berry, his co-director of the Coal Valley Co., with whom he had been spending a few days investigating mining conditions in Alberta. The remains were forwarded to Montreal for burial.

## Coming Meetings

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

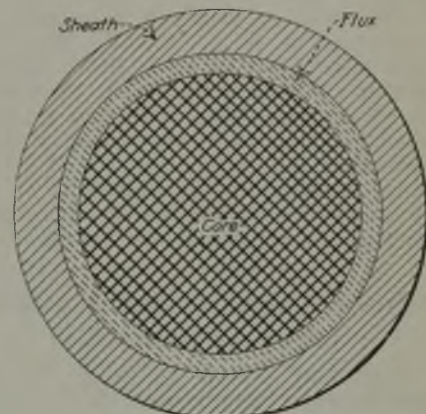
American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

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.

## New Equipment

### Self-Fluxing Electrode for Welding Cast Iron

The type A welding electrode is a product of extensive research by the General Electric Co., and it differs radically from other electrodes in its make-up and characteristics. It is a fluxed electrode having a construction that protects the flux from dissipation. The clean metallic surface renders it adaptable to automatic welding equip-



### Flux Combined with Rod

The action of the flux is to assist the deposition of metal and also to prevent oxidation and nitrification. The proper quantity of flux is always applied because it is fed with the welding rod.

ment. Its outstanding features are: Arc stability, ease of manipulation, rapid deposition, good penetration, sound tough welds, and economy. The electrode consists of a central metallic core surrounded by a layer of flux, which is protected by a metallic sheath.

Arc stability, is obtained by the use of a special flux. By a unique construction, this is included within the body of the electrode, being inclosed between the metallic core and the sheath. This prevents loss of the flux in transit or during welding and insures the presence of the correct quantity at the arc.

On account of the stability of the arc, it is easy to "strike" and to "hold" it. This makes it easier to make a good weld, because it permits the operative to concentrate his attention on other features of the welding operation. The training period of operatives is greatly reduced, and those who are already trained are able to do more and better work with less fatigue.

Rapid deposition is possible because the stable confined arc concentrates the heat at the point where it is needed, and hastens the rate of melting at the arc. The electrode can be used on either alternating- or direct-current systems.

The metal of the electrode can easily be made to penetrate effectually the metal being welded. The arc presents the minimum area of exposure to the surrounding air, thus restricting the opportunity for oxidation and nitrifi-

cation, which are most active around the borders of the arc. Sound, tough welds result from this restriction of atmospheric action. Moreover, the flux is a scavenger for oxygen and nitrogen and carries them out in a thin layer of slag. This slag further protects the deposited metal while it is cooling.

Maximum economy is obtained owing to the increased speed with which the weld is made, the more rapid deposition of metal and the fact that the operative can apply himself continuously to the work without fatigue. Other sources of economy are the reduction of power consumption, the smaller quantity of electrode metal necessary to make the required weld, and, most important of all, the better quality and greater reliability of the weld.

The welding electrode is supplied in diameters of  $\frac{1}{8}$ ,  $\frac{3}{16}$ ,  $\frac{1}{4}$  and  $\frac{5}{16}$  in. The  $\frac{1}{4}$ -in. size is furnished in 22-in. lengths and in approximately 200-lb. quantities on reels. All other sizes can be supplied in either 14-in. lengths or on reels containing approximately 200 lb. The short lengths are furnished in 50-lb. bundles covered with heavy burlap and securely fastened with a steel tape.

### Shock Absorber and Flexible Coupling Combined

Extremely simple in design is the new flexible coupling of the pin and bushing type introduced by the Terry Steam Turbine Co., of Hartford, Conn. The materials used in its construction have been selected with care and have demonstrated their fitness under actual working conditions.

The flanges are machined all over and are made from special composition steel forgings. Steel is used in preference to cast iron because of its greater uniformity and higher tensile strength. One of the most common faults of other couplings of this same general type is that they are constructed of cast iron. Castings are seldom uniform in density and free from blowholes. Lack of uniformity results in very low tensile strength, and makes it difficult and sometimes impossible to obtain correct balance. Both of these items are of major importance on relatively high speed, as well as on moderate speed apparatus where centrifugal force is an important factor.

The pins are also made of steel. To assure a smooth surface and long life, the cylindrical portion of the pins are hardened and ground. In this way the bushings are free to adjust themselves

under load and are prevented from transmitting end thrust. The pins are provided with screw heads and fibre washers which keep the bushings in their proper location within the driven flange. They may be removed readily with an ordinary wrench.

The bushings, which are the flexible medium, are made from a uniform grade of rubber that has demonstrated its ability to withstand hard usage. They are fastened securely to flanged steel spools which fully protect the ends and inner surface from wear. The rubber is ground to an exact outside diameter so that each bushing transmits its portion of the load. Since there is no chance of the bushings working into the space between the flanges they cannot become enlarged or transmit any axial motion.

#### BUSHINGS EASILY REPLACED

All parts of the coupling are made to limit gages, which assure accuracy and perfect interchangeability. Should the bushings need replacement, due to a large amount of misalignment, it easily can be done without any fitting whatsoever. The holes in the flanges are drilled and reamed with accurate jigs so that the pins are equally spaced and parallel to the axis of rotation.

Although every precaution is taken to insure uniformity of the flange forgings, very slight differences in density are unavoidable, therefore, the coupling is balanced after it has been finish machined. This prevents vibration set up by the coupling. Vibration would lead to wear and rapid deterioration of the connected apparatus or cause it to operate badly.

Aside from the excellency of the materials and the care used in the manufacture of the coupling, it possesses certain features which make it particularly desirable for all classes of service. Briefly its advantages are as follows: It compensates for both angular and off-center misalignment; it allows free end float of the connected shafts and will not transmit end thrusts; no special tools are required to disconnect it; by removing the pins, the shaft of either machine may be raised vertically without disturbing the other; it is easily and quickly checked for alignment; the driving flange is provided with a lip to protect operators; it does not depend on metal strips, rubbing surfaces, or any other unreliable medium for its flexibility; it requires no lubrication; it has a tendency to prevent the transmission of shocks; it acts as an insulator between the two machines, and, it is designed to

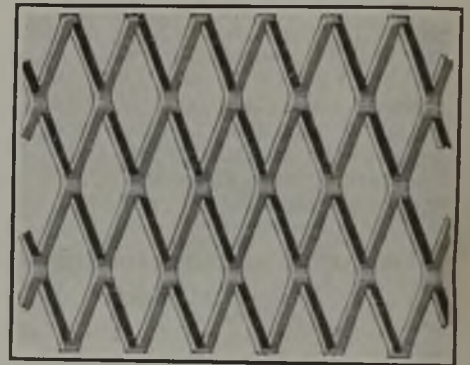
operate in either direction of rotation.

The ratings which are assigned the flexible coupling are conservative and are based on many years of experience. Couplings are available in capacities up to 400 hp. per 100 r.p.m. In all cases it is rated so as to give maximum life and minimum wear. Generally speaking, it is stronger than the shafts on which it can be mounted.

The coupling is suitable for use with such equipment as steam turbines, electric motors and generators, fans, pumps, reduction gears, coal pulverizers, line shafting, etc.

### Expanded Metal Screening Withstands Vibration

A screen, which comes in stiff flat sheets and with edges clean-cut on both sides, has recently been developed by the Northwestern Expanded Metal Co., 407 S. Dearborn St., Chicago, Ill. This screening retains the strength of a steel plate without, however, its disadvantages of weight and bulk. Unlike most



Section of Expanded Metal Screening

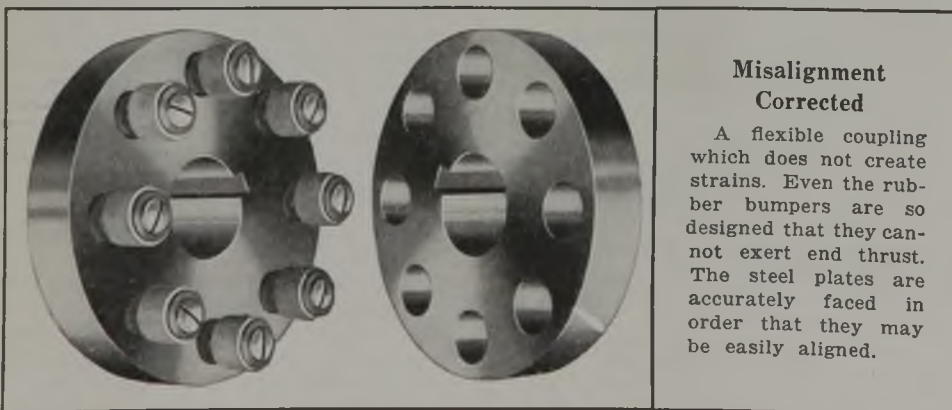
There are no joints to become loose and thus cause the screening to unravel in this sheet of expanded metal.

guard fabrics it will not loosen up and sag even when subjected to a continual vibration and the mesh cannot unravel under handling or when being cut away. A blow or other accident may dent or possibly fracture a strand, but the injury is localized and will not spread or impair the general efficiency of the guard. Repairs can be made easily and inexpensively and openings cut at any point. The general rigidity of the expanded metal permits a wide spacing of supports.

#### SOON PAYS FOR ITSELF

A properly constructed, well-fitted guard made from this material will pay for itself in a surprisingly few years. On the other hand, a poorly built or flimsy guard is a constant expense, a nuisance, and also an added hazard, because it implies a protection which actually does not exist.

In the manufacture of this screening, sheets of medium open hearth steel are cut and expanded to form a fabric of diamond shaped meshes. The diamonds are formed by short sections of the original unsharped plate, and hence not dependent upon mechanical joints of any kind. The low carbon steel and cold rolling process of manufacture makes it a very tough, high elastic limit material.



#### Misalignment Corrected

A flexible coupling which does not create strains. Even the rubber bumpers are so designed that they cannot exert end thrust. The steel plates are accurately faced in order that they may be easily aligned.