

COALAGE

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Big Savings from Small Investments

MANY BIG EQUIPMENT installations and the savings they make are spectacular. But after these heavy capital expenditures have been made the operating official may profitably turn his attention to smaller mechanical devices that will tend to lighten labor and increase the individual's production.

In some instances automatic scales will save a man's wages and in others will increase his accuracy and help to do the work better and quicker. At one mine, by the installation of an automatic scale, the weighmaster was enabled to devote much of his time to helping the dumper. A car stop was next installed and the weighmaster then supplanted the dumper who was thus released to work that was more productive. By this means the weighmaster accomplished twice as much as before with no more physical effort.

Rehabilitation of Coal Industry

MALADIES have an unfortunate cycle which tend to make them grow worse instead of better. It is well therefore to cure them in their incipience. A malady not only directly causes a specific functional derangement but also lowers the human vitality, giving the patient less power of resistance. This aggravates the disease, further lowering the strength of the patient and making him more readily a prey to the primal cause of ill health.

The condition of the coal industry resembles a malady in this respect. The inability of the industry to compel the public to pay a price for coal that will leave an adequate margin discourages the public from investing in stocks and bonds of coal companies and from taking a sympathetic interest in the fortunes of the coal industry, prevents it in fact from even making an intelligent study of the business of coal mining.

Because of the consumer ownership of public utilities, iron and steel, copper and other stocks, facts regarding these industries are frequently found in the newspapers. Coal too often finds a place only when there is a catastrophe or an actual or threatened strike. These are difficulties that do not prepossess the public mind in favor of the coal industry. The coal operator is therefore in a class apart. Until the public will buy coal stocks and read about the coal market, this condition will continue. An industry that has long periods of misfortune is regarded with little respect. It is visualized as a risky venture, and its operators are dubbed "gamblers."

The one form of consumer ownership that has made great progress has been the formation of subsidiary coal companies. It has, it is true, not brought the public in close touch with the coal industry. Those who have bought coal properties have not been disposed to divulge to the public that they have not found them

profitable ventures. Still the fact that they have resulted in losses or in margins incommensurable with those in other forms of industry has been instilled in the minds of the big investors in the parent companies and has spread from them among industrial leaders the country over. The companies thus formed may have had an unfortunate effect in weakening the market for fine coal, but they have had an important publicity value. The fact that these companies have their labor difficulties convinces the officials and the friends of these officials that the fault is not wholly on the side of the operators. The wages they pay also, which are higher than those of the plants of the parent companies, convince their bankers and associates that after all the miner, tonnage man or day man, is not ill-compensated as has been too freely alleged.

Under present conditions it is not possible to have stock ownership by employees, as in industries that have fewer financial misfortunes. One large bituminous company tried to interest its employees in owning stock, but as the price of its securities has steadily fallen, the result must have been unfortunate rather than helpful.

Furthermore, the straitened circumstances of the operators have made it impossible to introduce rapidly the mechanisms and systems that would have met the increased wage by increased efficiency. In fact, a raw-material industry has, like farming, less opportunity to realize economies than one that is devoted to manufacturing. Where as much as 70 per cent is expended in labor, the rise in labor costs makes it almost impossible to introduce means to completely offset the increases in wage. Moreover, not being a new industry, coal mining has perhaps somewhat less opportunity to effect economies such as have been possible in the automobile and public-utility industries.

No great hope can be held out until the demand for coal increases so as to restore, in a measure, regularity of operation. This change in the coal situation seems probable; expansion in the use of coal is everywhere apparent. The public utilities are bound eventually to demand more coal, because they are undertaking to give more and more service to the public. Some changes, like the installation of electric ranges and possibly central heating, may decrease or increase the use of coal depending on their conditions of installation. Others, like refrigeration, will have a beneficial effect, the more so because they will stabilize the coal demand.

A little courage on the part of the operator, a firmness in refusing to sell at a loss or to send to the market unbilled coal to be later sold to escape demurrage, would help even now. The industry must strive mightily to recover itself, for it has none of the advantages that other industries have. It cannot stimulate the public's affections by inducing it to buy stock; it cannot expect an understanding press or people but

must look forward for some time to having a public that knows only its less attractive characteristics; it cannot have employee ownership.

It must ingratiate itself in other ways, remembering always that a few thousand operators, if they are to get even-handed justice from the hundred million and more voters and consumers, first must create a favorable sentiment. What the people of the United States want to do they will insist on doing, so it is well to favor such friendly relations with them that they will want to rehabilitate rather than weaken the industry and will insist on justice for it rather than deny it a hearing. That situation will never be created by aloofness, vehemence and preachment, but only by a quiet friendly recognition that the operators are few and the voters and consumers many, and that it is well for the lowly to make peace with the mighty. The coal industry is on foot, and the consumer is a veritable "man on horseback."

Mutual Understanding Brings Its Reward

IN THESE DAYS of rapidly changing market conditions many coal producers vacillate back and forth between high and low production several times per year. As a result labor turnover is frequently abnormally high. By and large, but with, of course, some notable exceptions, little stability exists in the relations between employer and employee. Each is naturally more or less suspicious of the other. Under such circumstances tranquillity cannot long prevail.

In the midst of such widespread unrest it is refreshing to discover at least one coal-producing company that, more as an attitude of mind than as a matter of policy, has won the confidence of its employees, at least to the extent that all are striving to do their best. This firm, the Crozer Coal & Coke Co., operates in the Pocahontas field of West Virginia. It now employs about 300 men, approximately half of whom may rightly be considered "old timers." Ninety-five of these men have been in the company's service for ten years or more. Two have been employed continuously for 40 years; one for 35; four for 30; six for 25; and sixteen for 20 years. Thirty-six others have been with the company for more than 10 and less than 20 years. At the time these figures were secured only 27 men had been in the employ of this company less than, and 23 for only, one year. On the payroll were 121 contract miners, their service averaging 7.24 years each. The remaining personnel—inside and outside, including office and management forces—numbered 179. The average service of these men was 7.56 years. Occasionally a man seeks employment elsewhere, but like the Easterner who has "California in his blood" he generally returns shortly. Here is a record of which any company might well be proud.

How does this company do it? From its very inception it has treasured the confidence and goodwill of its employees. Its officers have always made it a point to know all the men by name. The best of living conditions have been provided, and the commissary successfully competes with nearby independent stores. House coal is furnished for a charge covering haulage only. Steady work prevails and satisfactory wages have always been paid. In short, the men came, were satisfied and stayed.

That the company has profited by its program of

fairness is only natural. The small labor turnover insures that the miner will gain an intimate knowledge of his work and enables the company to more thoroughly train its employees than would be the case if they were itinerant or nomadic. The extent of the company's reward is reflected in the daily output per man. This, for the year just past, amounted to practically 6 tons per employee, both above and below ground. During the same period the average daily output per underground employee slightly exceeded 8 tons, and the average daily production per loader was a trifle more than 14½ tons. These figures are significant and could hardly be attained under hand-loading methods except by satisfied and contented workmen.

Mass Production

OBSERVERS have said that one of the advantages of the United States has in holding the markets of the world lies in its mass production; Europe with her tariff walls must lean largely on custom-made articles for her foreign business. Ours is such a large market that companies can make exhaustive tests and experiments to determine the most salable product, can buy special machinery for making it, can plan the routing of its manufacture, can train men to make it with least effort and therefore can produce it with minimum waste of time and uncertainty. Thus the product is right, its cost reasonable, and the consumer is the gainer.

With coal-mining machinery the same is true though not so obviously as with automobiles and other products having an extensive sale. No one but an automobile manufacturer would think of making a motor car in his factory, certainly not in his repair shop. It is almost equally unreasonable for a mine operator to make any of the hundred and one pieces of equipment needed around a mine. He has not the tools, the experience, or the organization to support the effort. Nevertheless the experiment is often tried. Why should he not rather avail himself of the manufacturer's mass production?

Many a repair shop at the mines has men tinkering at this and that, making an inferior product at extravagant cost. The equipment thus made is clumsy and amateur in the extreme whether it be a tongs or a mining locomotive. For much of the material, costly drawings and patterns have to be made. In operation the mechanism breaks down even more rapidly than purchased equipment and it can be repaired only at a custom repair shop or at that of the company. A surplus of parts must be kept for it, because the shop may be too busy when called on for the lacking part. The cost of such construction or repair work is rarely kept. If it were it would be found that a better product could be purchased of some manufacturer at a much lower price. The reason usually advanced for such tinkering jobs is that the authorities who control the finances are resolutely opposed to the purchase of this or perhaps any equipment. In most cases this is mistaken economy, but surely a subordinate who undertakes to manufacture at a high cost what his superior refuses to buy at a reasonable price is taking an unfair advantage of an unfortunate situation.

It is true some types of equipment cannot be bought. In that case home manufacture is permissible, but that is an exceptional condition. Far more often the equipment thus manufactured is already on the market and should be requisitioned through the proper channels.

National Mining Society Discusses Secondary Ventilation and Coal Values

Importance of Friability and Size in Determining Quality of Coal for Water-Gas Purposes—Longwall Mining Reduces Frequency of Outbursts Which Appear Due to Roof, not to Gas Pressure

A LARGE number of mining men gathered Feb. 14-17 at the annual Winter meeting of the American Institute of Mining and Metallurgical Engineers, in the Engineers' Societies Building, New York City, to hear discussions mainly, as far as the coal engineers were concerned, on the value of coal for certain processes of gas making and on ventilation, both subjects of immediate vital interest to the coal industry.

A. C. Fieldner, chief chemist, U. S. Bureau of Mines, as chairman of the coal and coke section, opened the Monday morning meeting with a brief review of the gas-manufacturing industry. The object of the meeting, he said, was to disclose the present-day trends in gas manufacture. H. J. Rose led the discussion on "Mixing Coals for Gas Manufacture." Mr. Rose stated that there was a strong trend, at present, from carbureted water gas to coal gas, a change occasioned by the increasing cost and scarcity of gas oil and the greater financial stability of a coal-gas installation. Broadly speaking, in the change from water gas to coal gas, 6 tons of bituminous coal replace 1 ton of anthracite or coke. At the same time, about 3½ tons of coke are placed on the market.

At the present time, the cheapest gas and the best coke is produced in byproduct ovens, which have the further advantage of being able to use mixed and crushed coals with excellent results. In the vicinity of New York City, there are three byproduct plants which use 2½ million tons of coal, and produce 1½ million tons of coke, annually. One of the plants charges its ovens with a mixture of two-thirds high-volatile and one-third low-volatile coal. Another uses high- with low-volatile coal in the proportion of 80 per cent of the former to 20 per cent of the latter.

Professor D. J. Demorest, in continuing the discussion, stated that, because of the rapid depletion of the natural-gas supply of Ohio, there was a rapidly growing interest in the production of smokeless fuel. He said that it was his belief that the only solution to the problem of smoke abatement was to burn smokeless fuel and not to endeavor to burn smoky fuel smokelessly. If domestic consumers are to be converted to the use of coke, he said, they must be furnished with a product of uniform high quality. As a means of enriching blue water-gas for domestic consumption, Professor Demorest mentioned the fact that when this gas is passed over hot active carbon under proper conditions, the synthetic reactions between carbon monoxide and hydrogen so increase the methane content that the use of oil is unnecessary.

In the general discussion that followed, Mr. Fieldner said that it was readily possible, using the method described by Professor Demorest, to raise the calorific power of blue water-gas from 300 to 450 B.t.u. per cu.ft. H. C. Porter stated that the use of gas for domestic heating was becoming increasingly important and that one of the principal difficulties lay in providing for the seasonal fluctuation in demand. Byproduct

ovens are particularly flexible in this respect, said Mr. Porter, as they can be arranged to give more coke and less gas or more gas and less coke as the market demands. Excess coke in the summer can be stocked at the plants or in consumers' bins. However, the enriching of blue water-gas appeared to offer another solution to the problem of varying loads. W. W. Odell's paper, "Various Coals as Generator Fuels in the Manufacture of Water Gas," was reviewed, in Mr. Odell's absence, by W. H. Fulweiler. In considering the adaptability of a coal for use as a gas-generator fuel, Mr. Odell stated that some of the most important properties of coal which should be considered are: (1)

Composition, with respect to moisture, volatile matter, fixed carbon and ash; (2) calorific value; (3) size; (4) friability; (5) coking properties; (6) slacking properties; (7) fusibility of the coal ash; and (8) cost per ton delivered at the plant.

LARGE-SIZE COAL STILL PREFERABLE

In reviewing Mr. Odell's paper, W. H. Fulweiler said that in his opinion the size of the coal used is of the utmost importance in its effect on the efficiency of operation of a gas producer. He further stated that it was his general experience that bituminous coals containing between 30 and 35 per cent of volatile matter give the best results. W. J. Murdock said that the increased difficulty in operation when using bituminous coal in place of anthracite or coke arose from the fact that, in every producer operating with bituminous coal, there is a distillation zone. This zone packs and cakes to such an extent that, unless it is broken or prevented from forming in some manner, it will stop the passage of the gas through it. The Pier process has eliminated this difficulty but sizing of coal is still of great importance. W. H. Blauvelt said that each industry using coal should have its own coal specifications.

H. C. Porter next discussed the friability of various kinds of coal and showed, in a series of tests, that the low-volatile bituminous coals were the most highly friable. In a gas producer, these friable coals decrepitate under heat and fuse together. This action clogs the gen-

At the February meeting of the American Institute of Mining and Metallurgical Engineers the U. S. Bureau of Mines recommended that boosters and auxiliary fans be discarded, mainly because those using them sometimes failed to use good judgment in their application. Most of the evidence of this misuse was taken from mines where even the simple technique of building a stopping has not been understood.

erator and greatly reduces its efficiency and capacity. In Mr. Porter's opinion, it is of great importance to gas manufacturers that the friability of a coal be specified, and he suggested that some standard method of making such a test be developed. The original size of the coal was declared by Mr. Fulweiler to be of importance in influencing the quantity of "fines" produced in handling. In general, the larger the original lumps the less the breakage. F. C. Greene supported Mr. Fulweiler's views and said that there was more breakage in shipping 3x2-in. than 3x6-in. coal. Mr. Haas said that the gas manufacturers were asking for the "white



H. J. Rose,
Mellon Institute,
Pittsburgh, Pa.,
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"Mixing Coals for
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meat" of the coal and that, therefore, they must expect to pay a premium for it. It was suggested that some means of satisfactorily using the slack sizes of coal in a gas producer be evolved that would relieve the mine operator of a heavy burden.

F. C. Greene then presented his paper "Design Elements of a Coalotem Plant Carbonizing Coal at Low Temperatures" in which he reviewed the improvements that have been made in the Greene-Laucks process since its description last November at the International Conference on Bituminous Coal in Pittsburgh.

IN THE AFTERNOON session Walter L. Remick delivered an address on "Fine-Coal Cleaning by the Hydrotator Process" describing, one by one, its uses for cleaning anthracite silt from $\frac{3}{8}$ in. down, cleaning sizes too fine for recovery by other methods, removing coal from the sand circulated in the Chance sand-flotation process and cleaning bituminous sizes from $\frac{3}{8}$ in. down to dust. He also described its use for froth flotation. In reply to Eli T. Conner, he said that only experimental work had been done in sizes larger than barley, and in reply to A. W. Hesse, that the work in Alabama though done with a full-size unit was experimental also.

J. C. White addressed the meeting on "Management in Mechanization" discussing broadly the development of a management-engineering technique to plan loading-machine operations and to direct the crews by which the machines are operated. The technique of the mechanical and mining experts is different from that of management engineers. Mr. White urged that operators by an intensive study develop their management methods. Otherwise they may find that though the mechanical engineers have provided good equipment, well suited to local conditions and the mining engineers

have made excellent choice of mining methods there will be something lacking—namely, the co-ordination of one mechanical service with another so as to bring about almost continuous operation.

G. St. J. Perrott delivered an address on "Factors in the Ignition of Methane and Coal Dust by Explosives." This article appeared in *Coal Age*, Nov. 18, 1926, pp. 699-703. In the course of his remarks Mr. Perrott said that shots that are stemmed with coal dust may be more dangerous than unstemmed shots, that when a shot blows out, if an air space has been provided, it will increase the danger slightly and, also that rock-dust tamping is better than moist clay and that high explosives may ignite gas by compression.

EXPERIMENTS MADE IN CANNON

In reply to T. L. McCall, of Nova Scotia, Mr. Perrott said that it must be remembered that all the experiments of the Bureau of Mines were made in a cannon which the shots were unable to burst. Consequently they were all blown-out shots, and some of the facts thus ascertained might not be true of normal shots that were set in a yielding mass like a piece of coal. He had said, it is true, that a cushioned shot that blew out was more dangerous than one that was without a cushion. He was able to say that only of a shot that blew out; he could not assert that a cushioned shot that did not blow out would be more dangerous than one which was stemmed up to the explosive.

In the absence of C. E. Leshner, H. N. Eavenson made a report on the progress of the committee on the "Evaluation of Coals for Byproduct Coke Making." Mr. Eavenson said that a questionnaire had been sent out to coke users and information had been gathered, but it might be six years before standards could be set. It was pointed out that the Bureau of Standards at Washington was already sponsor of the Engineering Standards Committee for an inquiry into "Classification of Coal." The two investigations were practically side by side in their interests. Mr. Eavenson said that the committee had chosen to study the value of coals for byproduct coking because it raised the least difficulties, but they hoped to tackle other departments of the problem later. R. M. Sweetser said that if that was the case they should start at once to make evaluations for the coal to be used in other processes.

R. D. Hall declared that the discussion of the morning had shown what all technical men knew, that whenever a new development appears in the industry the evaluation of coals should be revised. Illinois coal was at one time worthless for coke. Then it was learned that it could be caused to make a good coke with the aid of a certain percentage of Pocahontas. Later it developed that with a hotter oven, Illinois coal could be coked without admixture. Consequently the value of the coal for byproduct coking changed with time. In six years the values of coal of today may be superseded by new values. The industry may then be indifferent to much that now seems of highest importance.

IN MINING WORK many ropes apparently fail prematurely. Would it be possible by making them just a little heavier to greatly increase their useful life? This was the premise upon which G. P. Boomsliker began experimental work on the "Acceleration Stresses in Wire Hoisting Ropes." He demonstrated that such stresses in hoisting cables followed the law of simple harmonic motion, their graph being thus a sine curve.

At mines the weight of the cable is seldom more than $\frac{1}{2}$ the weight of the load normally hoisted. If the stresses within such ropes are kept below the endurance limit, the latter will last almost indefinitely.

The next paper, on the "Hardness and Toughness of Rocks" by E. E. Gyss and H. G. Davis, elicited considerable discussion. Apparently no satisfactory means of determining the relative hardness of rocks has yet been devised. G. S. Rice stated that the Bureau of Mines has been much concerned with this problem, but that little progress has as yet been made toward its solution. He considered this subject well worthy of further consideration and would like to see it in charge of a sub-committee.

CALLS DRILLING AND BLASTING BASIC

B. F. Tillson stated that drilling and blasting are fundamental processes in modern mining. Distinctive hardness is no measure of "drillability." Hardness, the tensile and compressive strengths and the modulus of elasticity are all important qualities of rock, but, so far as practical drilling is concerned, abrasiveness is probably equally important. Many mines would reap much benefit from a suitable investigation of rock penetrability.

In presenting his paper on the use of "Liquid-Oxygen Explosives in Strip Mining" G. B. Holderer stated that many economies had been realized by the Enos Coal Co. whose plant near Oakland City, Ind., is the first commercial installation of its kind in this country. These savings are both direct and indirect in character.

In discussion it was stated that the life of a cartridge after soaking is directly proportional to its diameter. Improved methods of operation doubtless had much to do with the results obtained by the Enos Coal Co., which, it is estimated will increase its output by 25 per cent during the present year. This will mean a total output of a million tons.

GEORGE S. RICE, as chairman, opened the Tuesday afternoon session on coal mine ventilation by an address in which he said that as ventilation controls the depth to which mine workings can be carried, with the removal of the best coal this subject is becoming increasingly more important. He stated that the papers about to be presented would undoubtedly contribute much toward the standardization of mine-ventilation practice for which the committee was working.

William P. Yant then presented his paper entitled "Methane Content of Coal-Mine Air," in which he showed that there is a wide occurrence of methane in the coal mines of the United States and that the composition of mine air varies greatly from mine to mine as does the quantity of methane present. Basing his conclusions on some 300 samples, Mr. Yant showed that the content of carbon dioxide and oxygen in mine air remained practically constant despite the increase in the percentage of methane. On the same basis, Mr. Yant said that it appeared that ventilating conditions at the working face had greatly improved in recent years, but that there was not much change in the conditions in the main entries and splits.

In discussing this paper, Frank Haas said that the emission of methane in a mine varies from time to time and that what it was desirable to know statistically was how much gas a mine emitted, which an analysis of the gas would not show unless the volume of the air into which it was emitted was also given. On inquiry Mr.

Yant stated that the summaries were not really on a scientific statistical basis because they were of the particular atmospheres that chanced to have been sampled for laboratory determination. Replying to Mr. Haas, Mr. Yant said that it was not his intention to arrive



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at any definite conclusion as a result of his study of the samples examined. Rather, he endeavored to present, in a general way, the fact that there was an apparent tendency toward better ventilation in the coal mines of this country.

"Devices for Detecting Dangerous Gases in Mine Air," by John T. Ryan, was presented in Mr. Ryan's absence by Capt. Edward Steidle of the Carnegie Institute of Technology. Mr. Ryan reviewed at length the various devices that have been evolved for detecting methane and carbon monoxide in the mine air, including the methane continuous recorder. The instruments were classified in a table showing the lowest percentage of gas which they would detect, their field of use, and remarks as to their accuracy.

PORTABLE METHANE DETECTOR DEMONSTRATED

Dever C. Ashmead explained and demonstrated the new portable methane detector which weighs with battery and instruments, ready for operation, only 7 lb. This machine will detect as little as 0.16 per cent of methane, and was described in *Coal Age*, Vol. 31, No. 7, Feb. 7, 1927, p. 258. In the animated discussion of the device which followed, several members of the institute took part.

J. J. Rutledge next presented a paper entitled "Crosscuts or Break-throughs in Coal Mining." In this paper Mr. Rutledge discussed the single-entry method, the difficulties it occasioned and the objections thereto. He said that legal restrictions in regard to break-throughs prevent the revival of the single-entry system of mining which could now operate under more favorable conditions.

This paper provoked a great deal of discussion with reference to the distance between break-throughs and the use of auxiliary ventilation. Thomas D. Thomas said that in many instances the frequency with which crosscuts had to be driven greatly delayed development work and limited mine production. T. G. Fear said that in the modified long-wall system used by the Inland Steel Co., the entries are driven double. The cost of the double entry is not much, if any, in excess of a

single entry. The latter system at times involves a timber cost as high as 40c. per ton. Frank Haas said he did not favor auxiliary ventilation, but that he had adopted the four-entry system with which it is possible to omit all crosscuts between the intake and the return and yet follow the statute law in all its requirements. He declared that, if this system were used, the crosscuts should be placed from 800 to 1,000 ft. apart. T. L. McCall said that the double-entry system was not always applicable in deep mines.

METHANE CONTENT CRITERION CRITICIZED

The U. S. Bureau of Mines classification of coal mines on the basis of the methane content of the mine air was criticized by Frank Haas. He said that the Bureau's definition of a gassy mine was widely used in the United States and stated that 100 mines in four Appalachian States, classed as non-gassy according to the Bureau, had never consistently shown less than 0.5 per cent of methane. Mr. Haas suggested that the classifications be reduced to two: First, non-gassy mines which consistently show less than 0.25 per cent of methane nor more than 25 cu.ft. per min. of flammable gas in the air (split) current; second, gassy mines—all others not included in the first class. In continuing the discussion, E. A. Holbrook called attention to the many and varied definitions of "gassy mines." He stated that more exact regulations were necessary if mine safety was to be further increased.

One of the most important actions taken at this session was the distribution, to those in attendance, of mimeographed copies of Mine Safety Decision No. 4 signed by Scott Turner, Director, U. S. Bureau of Mines. This decision reads as follows: "In the interest of safety, the Bureau of Mines, Department of Commerce, recommends that auxiliary fans or blowers should not be used in coal mines as a substitute for methods of regular and continuous coursing of the air to every face of the mine."

Following the circulation of this notice, there was an animated discussion relative to the wisdom of the Bureau's action in condemning auxiliary ventilation, and many opinions were expressed both favoring and opposing the use of supplemental fans or blowers to sweep the working faces of a mine in place of the usual methods of bratticing.

ON TUESDAY MORNING, S. A. Taylor, as president, opened the business meeting of the institute. He stressed the need for additional finances if the institute is to carry out its projected plans. The members required data on which to base their operations. Without assistants having specific knowledge of the various industries involved the institute was hampered in its work. He cited the petroleum and metals committees as especially worthy of support and suggested several ways of raising the required funds, among which was an increase in dues of \$5 per annum, which would bring the institute's fees more into line with those of the other big engineering societies.

The Institute received the reports of the officers and special committees. The treasurer, C. F. Rand, reported an income of \$201,400 and expenditures of \$195,800, \$5,600 being profit from a sale of securities. The budget prepared for 1927, provided for an \$11,000 deficit, which would, if it materialized, have to come from surplus.

The report of the membership committee under J. M. Callow, disclosed that during the year 672 persons were advised of their acceptability as members, of whom 583 became members. The total membership at the end of 1926 was 8,560 as against 8,602 on Dec. 31, 1925.

INCREASE IN DUES DISCUSSED

In the matter of increased dues for the membership, Mr. Taylor recommended that this matter be placed before the Institute during the year and the matter given careful study before any definite action upon it could be taken. He believed that if the members could be made to realize the need for increased work, and the greater service the Institute purposed to render, they would gladly pay the increased dues.

The report of the tellers committee showed that the following were elected officers of the Institute for the



Walter L. Remick,
Who Described
"Fine Coal Cleaning
by the Hydrotator
Process."

coming year: President, E. De Golyer, New York, N. Y.; vice-presidents, George Otis Smith, Washington, D. C. and F. Julian Fohs, New York, N. Y.; directors: Frank H. Crockard, Birmingham, Ala.; J. O. Elton, Salt Lake City, Utah; Dan C. Jackling, San Francisco, Calif., and Richard Peters, Jr., Philadelphia, Pa.

In a general discussion it was suggested that inasmuch as the residents of New York City and vicinity were specially favored by their location they might well be asked to pay a higher rate, as is customary in local societies and clubs. Furthermore, as those who attended conventions were benefited more than others, they might be asked to pay a registration fee, especially seeing that others than members who attended would then be obliged to pay for the privilege.

Walter Barnum, of New York City, president of the Pacific Coast Co. and president of the National Coal Association, appealed to the engineers to support the coal industry in resisting efforts to establish governmental control over business. He asked that "free play be allowed to economic laws, as against legislative curalls, predicated on half-truths and economic fallacies."

The rapid mechanization of the industry was stressed by Mr. Barnum, who stated that, whereas in 1900 only 3 per cent of the coal was undercut by machines, in 1925 the per cent of machine-cut coal reached 70.6. Mr. Barnum said the number of loading machines in coal-mining is growing at a rapid rate. Mechanical loaders increased 172 per cent in the three-year period

of 1923-1925, the only years for which figures are available. The quantity of coal loaded by machine in that period increased 232 per cent.

Mr. Barnum was optimistic as to the future of coal, and emphasized the dependence of industry on the bituminous product, stating that in 1925 more than 60 per cent of the total energy developed by the use of mineral fuels and water power was obtained from coal. If all the theoretically available water power east of the Mississippi were utilized, he said, it would replace only 24,300,000 tons of coal per year, or less than five per cent of the bituminous production. Considering the expectation of but little increase in oil production and also the constantly expanding demand for the lighter products of petroleum, the speaker believed that no further reliance could be placed on oil, which today was rapidly being displaced by coal as an industrial fuel. He also spoke of the remarkable economies in combustion methods recently achieved. Mr. Barnum is of the opinion that the high mark of such economies has been passed, which means that henceforth the rate of increase in coal consumption will keep pace with the industrial progress of the country. He called attention to the fact that in 1919 public utility plants consumed an average of 3.2 lb. of coal to produce one kw.-hr. of current, as against the 1926 average of 1.9 lb., a reduction of more than 40 per cent in seven years. In 1920, for every one thousand gross freight-ton miles of transportation service, 197 lb. of coal were consumed; in 1926, the estimate for that service is 155 lb. For present-day practical purposes our available coal reserves are unlimited, he said, and supported his statement by a report of members of the institute to the effect that, exclusive of lignite, there are one trillion and eighty-one billion tons of recoverable bituminous coal in this country.

In the way of a co-operative program between engineers and operators, Mr. Barnum advocated continuation of a joint educational effort between the institute, the American Society of Mechanical Engineers and the National Coal Association respecting mine mechanization. He advanced a plan for the establishment of advisory boards of engineers and operators, to co-operate with mining schools by way of suggesting the courses of instruction and promoting research fellowships. He commended the secondary school system of France and Germany, where sons of foremen are educated in mining, drafting and surveying.

THE SMALL ATTENDANCE at the Physiology meeting Wednesday afternoon raises the question whether members of the Institute appreciate sufficiently the importance of this subject, particularly in view of the increased use of machines for cutting and loading and the growth of rock dusting. The principal paper was presented by Dr. Collis, Talbot professor of preventive medicine, University of Wales, and guest professor at Harvard University. He said:

"Coal dust does not in itself appear to exert any particularly harmful effect upon the lungs, as may be seen by comparing the mortality from lung diseases experienced by the miners of Nottinghamshire and Derbyshire with that of all occupied males. Possibly the low phthisis mortality among coal miners is sufficiently explained by the isolation of the men underground when at work which does not favor easy transmission of the disease by direct infection; in this respect the miner is somewhat similarly placed to the

agricultural laborer whose mortality from this disease is similarly low.

"Attention may be drawn before leaving the coal miner to a correlation found between his ill health, as shown by mortality, and his industrial discontent, as measured by ballots taken of miners in Great Britain in connection with labor disputes. The figures of these ballots may be regarded as direct indications of the extent to which dissatisfaction prevails in the different coal fields. In this connection Lancashire in every instance leads and South Wales is in every case second, whereas Nottinghamshire (with the exception of the strike of 1920) stands on each occasion at the bottom. The similarity of the orders as obtained by the ballots, and the close similarity found between them and the orders as obtained by mortality records, can hardly be chance occurrences.

GREAT NEED IS TO LESSEN DUST HAZARD

"Useful, however, as is such exclusion of tuberculous infection from those exposed to a silica-dust hazard, of greater import is it to reduce to a minimum the dust hazard itself. In mining, dust is generated in three ways, (1) in drilling holes, particularly when percussive drills are used, (2) in shot firing, and (3) in breaking up and removing rock. The dust hazard can be reduced in various ways, (a) by keeping material damp so that dust is not formed, (b) by preventing any dust generated from gaining access to the atmosphere, (c) by allowing dust generated to settle out of the air before any one enters it, and (d) by the use of respirators of various kinds.

"Damping may be of some use when breaking up and removing rock, but here respirators may have to be used; water has been used in drilling, but has not proved entirely successful for suppressing dust.

"The only way of dealing with the dust generated by shot firing is to allow a sufficient interval to elapse after firing before men enter the air. For this purpose shots should be fired only at the end of a shift. From two to three hours are required in a still atmosphere for the dangerous particles of dust to settle sufficiently.

SOLVES DRILLING DUST PROBLEM

"The dust generated during drilling has always been the most difficult problem, but recently a device has been worked out which gives promise of solving it at least for the percussive drill. In the device referred to the air escaping from the percussive drill is made to discharge lengthwise through a nozzle into the middle of a tube; this escaping air, acting on the ejector principle, causes an inflow of air into the open end of the tube; this open end is placed around the shot hole and the inflowing air picks up the dust generated and prevents its escape into the atmosphere.

"The far end of the tube terminates in the top of a bag-filter made of ordinary flannel. The bottom of the filter bag is held by an elastic band to a metal receiver. The incoming air passes through the flannel leaving the dust within. As the blows of the hammer release the air in puffs, the exhaust draught comes into the bag-filter in puffs which shake the dust free to fall into the receiver.

"Dust counts made of the air escaping from the bag-filter show a content well below the 300 particles per cubic centimeter permitted in the South African mines. As, however, the filter can be placed several yards away

from the point where the man is at work, the dust content of the air he breathes should be well below the danger point.

"Patent rights have been obtained by the British Department of Mines, but with no intention of interfering with anyone who uses the device. The principle of the dust catcher seems sound, as the more the tool works, the greater is the exhaust draught created."

This article was followed by one on "Sources of Dust in Coal Mines," prepared by J. J. Forbes and Alden H. Emery and read by D. Harrington. The broad conclusions drawn after a thorough-going study follow:

"1. Jackhammer drilling produced the greatest concentrations of dust of any of the mine operations, ten times as much as any of the others, and the other dust-producing operations arranged in decreasing order of concentration were electric drilling, undercutting coal by dry methods, auger drilling by hand, loading coal, undercutting coal with the application of water on cutter-bar of mining machines, simultaneous pick mining and loading coal, loading rock, haulage, and finally pick mining.

"2. The largest total quantity of dust was raised by dry undercutting.

"3. Undercutting coal without the use of water on the cutter-bar raised the greatest concentration of dust of any of the common mine operations; loading coal ranked next and haulage last.

"4. The chief method for the prevention of dust is the liberal use of water at the face of the workings to prevent the distribution of the dust into the air at the point where it is formed. It was found that after water had been applied to cutter-bars the quantity of dust was reduced to one-seventh of that raised by dry cutting. Moreover, samples taken out by the face of workings where water was used plentifully at the face show a decided decrease in the quantity of dust over mines exclusively using dry methods.

"5. In almost every instance where sampling was done at the face there was no air movement and the dust was removed entirely by free settlement. The best method for removing suspended dust is to provide sufficient circulating air to the face of workings.

"6. The ideal combination for explosion prevention is the widespread use of rock dust supplemented with liberal use of water at the face."

ONE OF THE MOST INTERESTING, instructive and animated sessions was that on ground movement and subsidence which was held on Wednesday morning. In opening the session, H. G. Moulton as chairman briefly reviewed the history of surface rights and the theories of subsidence. He then called upon Mr. Stearns to introduce Robert G. Bosworth who delivered the only paper presented at this session. Choosing as his subject, "What Duty to Support the Surface Does a Sub-surface Owner Owe?" Mr. Bosworth stated that there was no absolute duty of support owed by the mineral owner to the surface owner. He said that he made this assertion with full knowledge of numerous rulings to the contrary made by the courts of Pennsylvania, Illinois, Colorado and other coal-mining states. He stated that whether or not any duty exists depends upon the circumstances surrounding each individual case and since, in the nature of things, those circumstances can rarely be identical there can be no absolute rule. Mr.

Bosworth then went on to point out the various fallacies in the different mining laws and reviewed several of the more prominent and earlier cases regarding the right or duty of surface support. He said that the majority of the present decisions in cases involving surface rights were based on the earliest court rulings in similar disputes. Mr. Bosworth further said the reasoning in this earlier litigation was largely misleading to present-day jurists as the cases were tried at a time when the surface was more valuable than the mineral beneath it. He stated that it was most important that some action be taken to insure that all future leases include some express provisions either requiring or waiving surface support. At present, in the majority of cases, there is no express stipulation in this regard.

More than ten written discussions of Mr. Bosworth's paper were submitted. These reviewed and criticized the laws regarding surface support in Ohio, Pennsylvania, Missouri, Kentucky, West Virginia, and other coal-mining states. The discussions were preprinted and distributed with copies of Mr. Bosworth's paper. Oral discussion was contributed by H. N. Eavenson, T. L. McCall, R. H. Sales, R. V. Morris, G. S. Rice and many others.

G. E. Stevenson entered into a detailed review of the Pennsylvania mining laws in regard to the right of surface support and paid particular reference to the anthracite field. He cited and reviewed many of the court decisions in that region and, in general, defended their decisions. Beyond a certain point, however, he agreed with the criticisms of the decisions and laws made by Mr. Bosworth.

IN THE AFTERNOON the session on ground movement was continued by W. T. Thom, Jr., who presented a paper entitled "Surface Subsidence Resulting from Extraction of Petroleum." Mr. Thom reviewed the conditions in the Goose Creek field of Texas, where the oil sands are approximately 3,000 ft. below the surface. In this area, the subsidence has averaged 16 in. and has broken fences, sidewalks, etc. Calculations have shown that the volume of the subsidence roughly equals one-fifth of the volume of the oil, gas and water removed from the wells. In the discussion which followed, it was revealed that this subsidence is but little known in other oil fields.

George S. Rice then presented a paper entitled "Digests of Report of Rand Rock Bursts Committee." It was shown that in the deep mines of Africa and India, and sometimes in the United States and Canada, rock-bursts occur which often have disastrous effects. These bursts are most common in the mines of Africa. In 1924 a committee was appointed to study the cause of these phenomena and, if possible, to devise means of controlling them. Sand filling which has been suggested will not entirely eliminate either outbursts or shocks as the sand compresses somewhat and throws a heavy load on the pillars that are left standing. It was shown that some rock bursts occur under as little as 750 ft. of cover, and that the number and their violence progressively increased with increase of depth.

T. L. McCall said that in the mines with which he is connected in Nova Scotia, they have been using the retreating longwall method (which was suggested to him by G. S. Rice) for about a year and half. Although conditions are much better than when they used the old method of "bord and pillar," they find that they

still have much to learn regarding "bursts." Mr. McCall then went on to describe in detail two particularly violent rock bursts which occurred when using the three-entry system of mining. Mr. McCall then stated that his company had arrived at the point where they expected rock bursts and were endeavoring to lessen their violent effects by trying to control the pressure along a fixed line of advance and by inducing caving of the worked-out areas.

H. N. Eavenson said that, although Mr. McCall and Prof. Sperr had said there was no evidence of surface



H. I. Smith,
Chief Mining
Supervisor, U. S.
Geological Survey,
who spoke on use
and danger of aux-
iliary and booster
fans for ventilation.

subsidence as the result of the rock bursts mentioned by them, this was no indication that such subsidence might not occur at a later date. G. S. Rice said that rock bursts occurred only where the rock or coal was strong and firm and that, as far as he knew, where the material was plastic or soft no such trouble had been experienced.

VANCOUVER "BURSTS" ANALYZED

The paper entitled "Outbursts in Coal Mines on Vancouver Island," by Robert Henderson and R. R. Wilson, was presented in their absence by the chairman, H. G. Moulton. The conditions at Cassidy, Nanaimo and Crownsnest were described and the conclusion reached that, in the first two regions at least, the outbursts were functions of the depth of the workings as there seemed to be no pockets of gas present. The mining law of British Columbia requires the drilling of three holes each 6 in. in diameter and 12 ft. deep in advance of the working face. These holes must be tested for gas before the workings can proceed. At Cassidy and Nanaimo, repeated tests of these holes with standard safety lamps have seldom revealed sufficient gas to produce even a small cap on the flame. The authors of the paper believe that the law requiring the drilling of the "test" holes is of no benefit and that it is dangerous inasmuch as it gives the men a false sense of security. Outbursts often are preceded either by a humming noise similar to that made by an air hammer, or by a rumble like that of a trip of runaway cars. In the Crownsnest district much gas is present and it is not certain whether the bursts occurring there are outbursts of gas or true rock bursts. The longwall retreating system has been tried at Cassidy and it was found to greatly reduce the number of bursts. Unfortunately, it was impossible to use it because of the numerous and extensive faults that occur in this region.

ON MONDAY EVENING the industrial relations committee held a dinner at Mecca Temple, and later the whole institute met at a smoker in the same place. Enough entertainment was provided to lighten the occasion, but not enough to prevent the members from utilizing the opportunity to become better acquainted. On Tuesday evening, a play and a dance at the Engineers' Societies' Building drew a large crowd. Dean E. A. Holbrook was the villain of the dramatic sketch.

DINNER AT WALDORF WELL ATTENDED

The annual dinner at the Waldorf-Astoria on Wednesday evening was as well attended as usual. The retiring president, and the president-elect had been cautioned to keep within a 3-min. limit. Thomas B. Stearns was toastmaster. What was gained by a restriction in presidential eloquence was lost in the speeches made in presenting medals. The W. L. Saunders medal was presented to David W. Brunton through a representative, Dr. Brunton being in the hospital. Charles F. Rand detailed the achievements of the medalist. The James Douglas Medal was presented to Dr. Zay Jeffries, the metallurgist. Dr. Paul D. Merica made the speech expatiating on Dr. Jeffries' service to the metal industry. The J. E. Johnson award went to T. L. Joseph, a steel metallurgist of U. S. Bureau of Mines. The services to the industry of his work were explained by John A. Mathews, chairman of the Iron & Steel Committee. After the banquet the tables were cleared for a dance.

AT WEDNESDAY'S afternoon meeting A. C. Callen presided. D. Harrington made a report for the committee on metal-mine ventilation which contained some interesting data of the effect of relatively high temperature, high humidity, absence of air current and presence of carbon dioxide on the attacks of fungus on timber. In a Utah mine the fan was shut down in order to economize power, but after two months it was restarted, and Mr. Harrington made an examination of the workings. In those two months the timber which had been clear of fungus had become entirely covered with it. For this reason the fan thereafter was run once every 24 hr. but, to save expense, only during periods of low electric demand. Later, inspection showed that the fungus had died in consequence of the ventilation. Since then the mine has been reopened and the timber is in good condition, showing the importance of ventilation in preserving timber, at least where certain kinds of timber are used and where perhaps certain fungus growths are prevalent.

H. I. Smith then read his paper on the "Use and Danger of Booster and Auxiliary Fans as Applied to Coal-Mining Ventilation," reciting the dangers accompanying misapplication of auxiliary fans and declaring broadly against booster fans as an attempt to correct inefficiently a state of affairs that might better be improved by erecting good brattices, cleaning and straightening airways and introducing overcasts. He said that the booster fan tended to create recirculation, and the same ill effects would occur with an auxiliary fan even if put outby of the last crosscut provided the return airway had a high resistance and the brattices were not tight. Mr. Smith described the work he had done in the Indian Segregated lands to induce the operators to depend less on auxiliary ventilation and to furnish sufficient air from the main fan for the ventilation of the

mine. Before the improvements had been made many of the operators had been providing all the air needed at the mouth of the mine but only little had been reaching the face, an evil condition that the operators had hoped in vain to remedy by auxiliary ventilation.

Mr. Smith said that even if fans were driven by compressed air or by permissible motors, there would be danger of ignition by static electricity. He condemned



T. T. Read

automatic starters. He declared that no wood stopping should be erected in a place where the water gage to be held exceeded 0.2-in. or where the period of service of the stopping was likely to exceed 18 months. Mr. Smith advocated the four-entry system with crosscuts between the outer pairs and none the center pillar.

In discussion R. D. Hall confirmed what Mr. Smith had said about the undesirability of the booster fan and the value of the four-entry system, but took issue with him in regard to auxiliary fans. Because they had been misapplied was no reason for not approving their use when properly installed. The justified contention of Mr. Smith that bratticing was frequently bad was an argument for auxiliary ventilation, which by reducing the necessity for frequent driving of crosscuts would decrease the number of such brattices and make it less costly to provide with good brattices such crosscuts as were driven. Mr. Hall said that it still remained to be proved that static electricity would ignite gas. The Bureau of Mines and the British Mines Bureau after taking an attitude that methane could not be ignited by mechanical sparks and static electricity, is taking a view more consonant with experience with regard to the first but one that is still a little problematic with regard to the second. Mr. Hall urged and Theodore Marvin concurred that correct engineering principles would dictate that auxiliary ventilation be introduced because of its safety and economic features, but that care be taken and rules be provided to prevent improper installation which was dangerous and uneconomic. Mr. Hall said that almost all air put into the mine that failed to reach the face was actually harmful as it dried up the mine without performing any service.

HARRINGTON WOULD FORBID AUXILIARY FAN

Dan Harrington amplified Mr. Smith's remarks. He would prevent misapplications by forbidding the use of the auxiliary fan entirely. Too often the introduction

of an auxiliary fan was offered as a sop to the miners and inspectors to justify the continuance of the most improper operation of the whole ventilation system.

Dr. Edgar L. Collis, of Cardiff, Wales, said that the question should be discussed with reference to the physiological reactions of miners. On Mr. Harrington declaring that American mines had such low temperatures that this was an unimportant consideration, Cadwallader Evans, general manager, Hudson Coal Co., declared that at his mines at a depth of 120 ft. below the surface, a temperature of 94 deg. had been encountered in opening up old and broken ground in which much decaying wood was buried. He had been using auxiliary ventilation to improve the conditions under which the miners were working. The coal is from 25 to 30 ft. thick, and the roof consists of 70 ft. of shale, surmounted by glacial drift. Without auxiliary ventilation the men would become exhausted in 15 or 20 min.

Frank Haas said that, if with auxiliary ventilation the operator arranged to reduce the number of crosscuts by one half, the operator still would not be satisfied. He would want to go 270 ft. before making a crosscut. In that case the delivery of air would be, he feared, inadequate, and the men would suffocate. He questioned a statement by H. I. Smith that 90 per cent of the air of the mine could be induced to reach the face of entries. He endeavored to have the sum of the quantities of air in all the splits, taken at the last crosscut of each split account for 80 per cent of the air supplied, not saying of course that all the 80 per cent actually swept the faces of the workings.

Louis F. Huber delivered a paper on the "Ventilation of the Liberty Tunnels," which was discussed by Ole Singstad. The article on Underground Air Conditions and Ventilation Methods at Tonopah, Nev., by A. O. Pickard, was presented by title only.

THE LUNCHEON and formal meeting of the committee on education on Monday, Feb. 14, were attended by thirty men representing some sixteen colleges of engineering; emphasis was laid on the problem of interesting high-school pupils and teachers in engineering as a desirable profession. It was also pointed out that the colleges should interest citizens at large in the work the institutions are doing.

Difficulties of Low-Temperature Carbonization

According to the U. S. Bureau of Mines, the fundamental difficulty encountered in carbonizing coal at low temperature lies in the slow flow of heat to the coal when a relatively slight difference in temperature prevails. Coal is a poor conductor of heat. Therefore, it requires a much longer time to transfer the necessary amount of heat through a given volume of coal when the retort walls are at a temperature of 500 deg. C. than when they are at about 1,200 deg. C. as is the case in the usual high-temperature process. As the cost of operation depends to a large extent upon the plant installation charges per ton of coal carbonized, it is advantageous to accelerate the rate of carbonization. This can be accomplished either by spreading the crushed coal in a thin layer on a heated surface; by agitating it and thus bringing fresh portions continually into contact with the heated walls; or by passing large volumes of hot producer-gas, products of combustion, or superheated steam through the mass.

Mine Rescue Work in the Netherlands

By W. H. D. de Jongh
Inspector of Mines, the Netherlands

AS EARLY as the 12th Century coal was dug on a small scale in the province of Limburg, the Netherlands. Only within the past 25 years, however, has there been any attempt to develop production on a large scale. During this latter period the output rose from 30,000 tons a year to about 7,000,000 tons and the number of workmen employed from 1,400 to 31,000.

Early in this period of growth it became evident that provision should be made for safety. Large mine calamities in 1906, particularly that of Courrières in which 1,100 persons lost their lives, brought about the mine act of 1906 which is still in force. The rescue service of the Netherlands mines is the result of this act. Apparatus was provided, training started and by 1913 the mines were connected by telephone so as to facilitate interchange of assistance. The outbreak of the war, however, greatly disorganized this service. Many of the trained men were foreigners called to their colors. Shortage of material acted as a further handicap both as regards proper equipment and the securing of new apparatus. In the face of this situation attention was centered on carefully preserving the equipment already on hand for emergency.

Although the mines in Limburg would not be counted in England, Belgium or Germany as having much gas or coal dust, still sufficient quantities have been found from time to time to justify precautionary measures. When it was again possible in 1919 to obtain rescue materials Chief Engineer of Mines Blankevoort initiated the reorganization of the rescue service. As a result of consultation with the directors of the various mines the following minimum requirements were prescribed:

1. *Training of Rescue Men*—A general knowledge of the rescue apparatus must be acquired by all the men while an accurate knowledge is necessary for the leaders. To be admitted to the rescue service, one has to pass a medical examination, may not be older than 45 years of age and must have participated in at least two exercises in suffocating air.

2. *Exercises*—The men must take at least five exercises a year. One of these must be in respirable air in the mine, and four in an irrespirable gas.

3. *Number of Equipments*—For every 300 men of the underground crew, one rescue apparatus must be provided with a minimum of five for any one mine; for every three equipments or any part thereof one smoke

Just as the West Virginia panhandle is a coal-producing area so also is the panhandle of Limburg, which juts downward from the main portion of The Netherlands between Belgium and northern Germany.

Influenced by American practice as advocated by Parker, McCaa and Denny mine rescue work has been as carefully organized as if Limburg were a gassy area. Rescue men are trained underground with apparatus. Smoke rooms form an integral part of the training equipment. Arm and bugle signals are taught. Telephones connect all mines of the area and relief is well organized.

helmet must be provided.

4. *Strength of the Brigade*—The number of rescue men available must be at least six times the number of equipments with a minimum of 30 men, leaders included.

5. *Composition of the Brigade*—The rescue corps is selected chiefly from underground men and foremen who live near the mine; so far as possible men performing different

kinds of duty underground are represented.

6. *Working of the Rescue Corps*—The rescue corps must be divided so far as possible into three relays.

7. *Management of the Brigade*—A special foreman is appointed to manage each brigade. He is furnished with instructions which must be shown to the Chief Engineer of Mines.

8. *Special Checks for the Rescue Corps*—Each man on the rescue corps receives a special check, which he must carry while underground so that the corps check board or other control shows at once which members of the brigade are in the mine.

The general arrangement of rescue stations is similar to that in Germany. This insures prompt action on the part of the men who are thoroughly familiar with the underground workings. The requirements adopted in 1919 are still observed except that the use of smoke helmets has become highly controversial. To those who would know more about experience in the Netherlands with smoke helmets I would recommend a study of "*Lauerstoff-Rettungswesen und Gasschutz*" by Wilhelm Haase.

Necessity for a careful selection and thorough training of rescue-brigade members was recognized early. When, however, some of the foremen who were appointed did not receive compensation for practice work, done largely in their spare time, they lost interest. This was corrected when all mine directors decided to give every man without exception compensation for practice work. It is no longer difficult to recruit new members.

The strength of the brigade, which includes all the rescue men of a mine, varies from 30 to 60. The chief of the brigade for each mine arranges and controls all exercises. He is responsible for seeing that all apparatus is ready for immediate use. Every brigade is divided into relays of four or five men of whom one is commander, and leads the exercises of his relay. At some mines the relays consist of men of the same service. Three relays composed of three different services may be united into one group, under one group leader.

By thus training together men grow accustomed to one another. Companies operating several mines have centralized the rescue service as much as possible under the direction of a training superintendent. These men are usually selected from among the mine foremen who are thoroughly acquainted with the underground workings. At present the mines of Limburg have 360 trained men.

Before the war Dräger and Proto equipments were thought to be excellent but experience with gas and gas fighting apparatus during the war naturally contributed toward improvement. For purposes of standardization mine directors have selected Dräger equipment. The mines of Limburg possess 74 Dräger apparatus model 1910-11, 72 smoke helmets and 400 mouth pieces, 9 Dräger apparatus model 1924 with 30 mouth pieces and necessary glasses; also several self rescuers of the Dräger system. Much assistance has been derived in the development of methods and care of apparatus from the American manual by Parker, McCaa and Denny. The necessity for constant experimentation is appreciated.

SMOKE ROOMS ARE PROVIDED

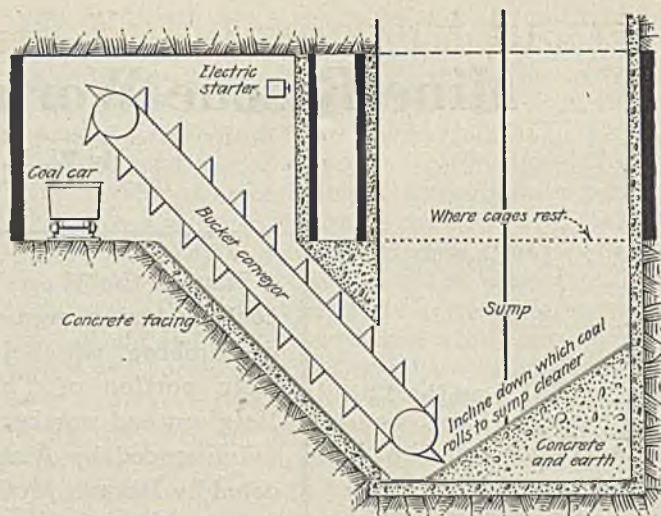
Most of the mines have been provided with smoke rooms. Each of these is equipped with several "try your strength" machines for striking, pulling, lifting and other varieties that give automatic registration. On these the men practice heavy work. There are also in these rooms imitations of shafts, inclines, galleries, etc., besides the usual materials and tools found in a mine. Here men can practice how to save and transport victims of mine accidents. The smoke rooms are properly fitted with windows, so that the work can be followed and controlled from outside. The necessity for this is obvious. The rescue brigades are trained in these smoke rooms as well as underground in the mines. Both types of training are considered necessary. As it is not possible to give oral commands during rescue work the men are taught arm signals. They also get practice in bugle signals by means of which several working groups may remain in contact with each other. The exercises are fatiguing. After practice each man is provided with a bottle of milk.

Under the direction of the chief mine surgeon, Dr. Vossenaar, well equipped surgical operating rooms are maintained above ground and a trained staff ready to render relief. Fortunately the Netherlands have had no occasion to use them but the necessity for eternal vigilance prompts us to keep prepared.

A Sump Cleaner that Cleans

Sometimes the person who schemes out a new device or an improvement to existing mining equipment is agreeably surprised at the results yielded by it when it comes to be given a thorough trial in practical use. Some time ago John Jones, master mechanic and top boss at the Vermillion mine of the United States Fuel Co., located at Georgetown, Ill., built and installed an automatic sump cleaner that has more than fulfilled expectations.

The sump under this shaft has an extreme depth of 17 ft., and is lined with concrete. As may be seen in the accompanying illustration, a concrete trough slopes downward from a point on the right wall of the sump to the bottom near the left wall. A bucket elevator extends from this low point through an inclined opening



Cross-Section Through Sump and Conveyor

Spillage from the cages falls into the sump where it rolls down the sloping bottom to the foot of the conveyor. By this it is elevated and discharged to a car in the room above. All rock surfaces are heavily lined or coated with concrete not only to afford smoothness but to prevent weathering. The performance of this device has far exceeded expectations.

to the mine floor and thence upward 18 ft. in a room above. Mine cars can thus be run to a point immediately below the upper end of this conveyor.

By this arrangement when pieces of coal or other material drop into the sump they roll down the concrete trough to the foot of the elevator. When this machine is started its buckets pick this material up and hoist it to the room above where it is discharged to waiting mine cars. When these have been filled they are run around a short curve to the main track upon which they can be pushed to the cage.

NOTEWORTHY DETAILS DESCRIBED

Certain details of this outfit deserve special mention. Thus the lower end of the concrete trough is naturally a trifle wider than the buckets of the conveyor. The elevator is driven electrically, a reversible controller being fitted to the driving motor. This is an important detail as this arrangement prevents undue jerking of the buckets when the elevator is started. It will hardly be necessary here to mention that the machine had to be heavily constructed throughout in order to withstand the severe service to which it has been subjected.

One of the highly practical features of this device is the fact that it can be used at any time regardless of whether or not loaded cars are being hoisted to the tippie.

This automatic cleaner was Mr. Jones' own idea and its successful installation was quite an achievement. The work had to be done at the busiest point in the entire mine and many other difficulties were encountered. Seepage of water from above constituted only a minor handicap. The mine where this sump cleaner is installed is one of the largest in the country. The operating company is a subsidiary of the United States Steel Corporation and the coal produced is used by it as a metallurgical fuel.

NO BETTER illustration of the usefulness of a trade association can be offered than its leadership in protecting an industry against any practice that might impair public confidence in its product.—Charles F. Abbott, American Institute of Steel Construction, Inc.

Broad Economies of Mine Timber Preservation*

Original Processes Devised to Protect English Ships Still Widely Used—Several Reagents Now Available—Type and Size of Mine Plant Can Be Determined Only After Careful Study of All Factors Involved

By George M. Hunt†

Madison, Wis.

THE FIRST PRACTICAL treatment of wood to prevent decay was devised early in the 19th century. At that time the oaken navy of England, when the nation was fighting for its very existence, seemed doomed to annihilation by the swift ravages of decay. The acute situation inspired a desperate search for preventive measures and resulted in the development of the Burnett, Bethal and Kyan processes for impregnating wood with zinc chloride, coal-tar creosote and mercuric chloride, respectively. In the century that has elapsed, the use of these chemicals has spread throughout the world and the three original preservatives are used today in enormous quantities. Meanwhile, improved processes have been developed, new preservatives discovered, and the practice of impregnating wood to make it last longer has attained a position of major importance in the field of structural materials.

In the application of wood preservatives in the United States the railroads have been the leaders for the past 50 years or more. Having found that decay is the chief cause of the early destruction of wood and that preservative treatment is the remedy, they have treated their ties and timber in ever increasing quantities—in 1925 about 220,000,000 cu.ft.

By preservative treatment the Santa Fe railroad saves annually 1,500,000 ties in its 18,000 miles of track, and many other roads effect similar savings. In like manner the life of wooden bridges and trestles, poles, marine piling, water tanks and other wooden railroad structures has been greatly increased, reducing the amount of timber required annually to maintain them.

This helps to keep down costs and to conserve the national timber supply. Without preservative treatment the life of ties and much other railroad timber and lumber would be so short that prices would increase much more rapidly, or else the roads by this time would be turning to the use of more expensive and less satisfactory substitutes.

The mines of this country, although they, too, use great quantities of wood, have not generally resorted to preservative processes. Apparently most of the mine operators who have looked into the problem either are not convinced that savings can be effected, or else have

not given their timber problem the study it deserves.

Perhaps 80 per cent or more of the timber used in mines is needed only for a short time. Much of it is abandoned in closed workings before serious decay sets in. Some of it breaks under the roof pressure or wears out. Such considerations may have led some operators to overlook the highly important fact that most of the wood that is used in permanent openings underground and for miscellaneous railway and structural purposes on the surface is destroyed by decay long before it has served its purpose and that the cost of labor and material for frequent replacements is worth saving.

Not all mines have failed to grasp the opportunity, however, there being several notable exceptions to the general rule. The Philadelphia & Reading Coal & Iron Co., at Pottsville, Pa., has operated a pressure wood-preserving plant for many years and has thoroughly demonstrated the fact that treated loblolly pine timber will last from 10 to 20 years in places where similar wood, untreated, rots in 2 or 3 years. So favorable has been this company's experience that it is now building a new and larger treating plant at St. Nicholas, Pa., to serve 14 collieries lying beyond the reach of the present plant. The Anaconda Copper Co., and the Tennessee Coal & Iron Co. also have operated treating plants for many years and have

demonstrated their economy and utility. More recently treating plants have been built by the Cleveland Cliffs Iron Co., at Negaunee, Mich., and the Miami Copper Co., at Miami, Ariz. Several other companies either are now building or have announced their intention to build similar plants within the near future. Some mines have also been using timber treated for the purpose by commercial wood-preserving companies. Many mines have begun to use preservatives by the superficial dipping of timbers. They may eventually take up more thorough processes of treatment.

In Germany, the practice of treating mine timbers is much more extensive than in the United States. It appears to have grown gradually during the last 15 or 20 years as experience with treated timber showed increasingly satisfactory results. At a number of German mines that I visited in the summer of 1926, treated sap-pine mine timber was in serviceable shape after long periods of service under conditions favorable to decay. The oldest timber work observed dates from 1911. Some decay was evident in this lot, but most of the original timbers were still in service and probably will be for

In this country the railroads have perhaps blazed the way for the other industries to follow in so far as wood preservation is concerned. They have demonstrated beyond shadow of a doubt that ties, bridge timbers, telegraph poles and the like when treated with preservative will last several times as long as they will if untreated. A few mining companies have imitated the railroads in their use of treated timbers. The results so far attained have been highly satisfactory although it by no means pays to treat all of the wood that is to be used underground.

*Paper entitled "Facts About Mine Timber Preservation," presented before the meeting of the American Institute of Mining and Metallurgical Engineers, held in New York City, Feb. 14 to 17, 1927.

†In charge of the Wood Preservation Section, Forest Products Laboratory, Forest Service, U. S. Department of Agriculture.

a number of years to come. Untreated timber in the same place would have required replacement two or three times by now. The pressure-treating plants at many mines in Germany are housed in substantial buildings, and according to my observation, most operators consider the use of treated timber in their permanent openings a matter of course.

It is not necessary, therefore, to turn from the mining industry for evidence as to the economy and effectiveness of preservative treatment, although as supporting evidence the experience of the railroads is of great interest and value. The question as to whether preservatives will economically prolong the life of mine timber has been positively answered in the affirmative. The real question is to determine how much of their timber should be treated and what is the most advantageous treatment for their needs. This is a problem worthy of thorough study by competent engineers. It should not be dismissed as of secondary importance or left to the decision of employees who lack the technical training, the interest, or the time to consider it intelligently, or who lack the influence to get action. Wood preservation may be considered as an instrument of proved worth, but like many a piece of equipment or mining method it requires intelligent application.

The engineer is faced with the necessity of choosing between the purchase of commercially-treated timber and the erection of a plant at the mine. Buying commercially-treated timber may prove to be the most satisfactory and convenient procedure in regions well supplied with treating plants. It allows a choice of preservatives and processes without the necessity of building a treating plant of a particular type and training men to use it. Timber treated under a good specification by a reliable treating company should be entirely satisfactory. It will be better than timber "home treated" in inefficient or poorly-operated equipment.

If, on the other hand, the decision is to treat at the mine, the operator must decide upon the type of plant, the preservative and the method of injection. In making a choice among the several types of treating plant which may be used, the operator faces the great temptation of securing cheap equipment, regardless of the greater economy usually to be derived from spending sufficient money to get the best. The question that naturally rises is, "Can we not build some kind of dipping plant that will not cost very much?" But the more intelligent and open-minded way for the engineer to approach the problem is to ask, "What kind and size of treating plant will most efficiently meet our special requirements?"

Where any considerable quantities of timber are to be treated it will rarely be found that the open tank will give results equal to those obtained with pressure equipment. By means of a closed cylinder and pressure it is possible to get good treatment in certain kinds of wood which are extremely difficult to treat well in open

tanks. With wood that is easy to treat a pressure plant will do the work well in much less time than is required by open tanks. In short, a pressure plant will treat wood better and more quickly. Inexpensive open-tank equipment has its legitimate field of usefulness, however, and should be employed in mines where it can be shown that the cost of pressure-treating equipment would not be justified.

Any one of several good preservatives may be selected with the assurance that it will be effective and economical if correctly used. Zinc chloride and coal-tar creosote have been employed for so many years both above and below ground that they have become the standards by which other preservatives are measured. Without doubt coal-tar creosote is the most effective wood preservative known, and it is so regarded the world around. But since its odor and black oily nature make it more or less objectionable to the men who must work with the treated timbers, most mine operators have not cared to insist upon its use.

Over 26,000,000 lb. of zinc chloride were used in the United States for preserving wood in 1925, most of it for railroad ties. This chemical has established its value for underground use in the experience of the Philadelphia & Reading Coal & Iron Co., in one of whose mines a considerable number of zinc-treated timbers were found in good condition after 18 years of service. In the same mine sodium fluoride has been used for about 10 years, and

it is reported that none of the timbers treated with it have been removed because of decay. Sodium fluoride has never been used in as large quantities as zinc chloride, but numerous experiments with railway ties have shown it to be generally effective.

Wolman salts, which have been used for many years in Germany and which are now being made and sold in the United States, consist largely of sodium fluoride. Other materials have been added to produce a mixture of greater toxicity. The extensive use of these salts in mines in Germany over a long period of time has shown them to be highly effective in preventing decay. The effectiveness of Basilit, which is similar in composition to Wolman salts, has also been demonstrated in Germany and Hungary as a mine-timber preservative, although it is not as extensively used as the Wolman products. The evidence as to the effectiveness of Ac-Zol, a preservative originating in Belgium and now sold in the United States, is not very complete, but there are indications that it will prevent decay satisfactorily.

Various types of equipment and preservatives and the methods by which they may be used in mine-timber treatment are fully described in a recent government bulletin, and there is considerable information on the various phases of wood preservation in other publications. Little of it, however, is so specific that it can be applied in individual cases without special study.

Before applying the remedy at any mine or group of mines it is well to diagnose the case and get the facts about existing conditions, methods, costs and desired

Several satisfactory preservatives and at least three methods for their application are available to the mine owner who contemplates erecting a wood treating plant. Before any decision is reached, however, all factors influencing the results that may logically be anticipated should be carefully weighed. The erection of a wood preserving plant is an engineering proposition and such a plant will not attain its maximum efficiency unless it is treated in an engineering manner.

improvements. How much timber is used per year? How much of it lasts long enough without treatment? What is the average life of the wood which fails prematurely? How long should it last to be satisfactory? What does it cost in place? What is the cost of keeping it in repair? It is only by answering these and similar questions that a logical basis can be prepared for a decision as to the preservative and the type and size of treating plant to use. Knowing the average life realized from untreated timber and the annual cost of maintaining structures with it, the amount which can be economically spent for treatment to make it last the desired length of time, may be easily calculated.

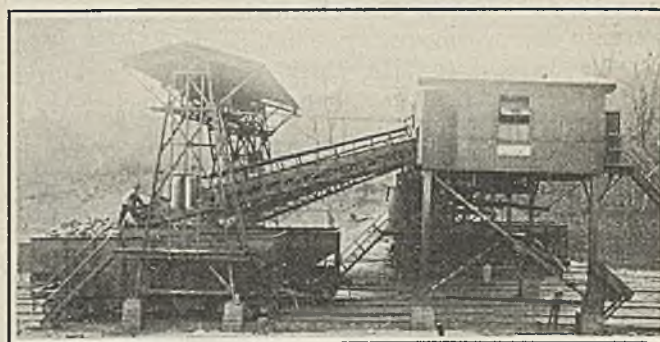


Screens and Picking Tables

Modern bituminous coal preparators can hardly be considered complete if they lack efficient means for cleaning and sizing the mine product. For sizing, shaking screens are all but universal, and picking tables form the usual means for ridding the larger sizes of the slate, rock and other extraneous material that accompanies them. Convenient chutes located beside the tables afford an easy means of slate disposal.

is of steel construction and spans four loading tracks.

An end-view of the tippie shows the rather unusual building design adopted in order to save construction cost. The loading booms are not under the tippie roof but each has a cover attached. The boom hoists are supported by a separate A-frame structure with a wide



End View of the Tippie

A somewhat peculiar but economical construction is here followed. The loading shed is built separate from the tippie proper and the counterweighted loading booms are suspended from its A-frame. Each loading boom is fitted with its own shed roof that is part and parcel with it. This roof therefore rises and falls with the conveyor it protects.

canopy roof. The tippie was designed by the Link Belt Co., and was built by that firm and by the Pittsburgh Bridge Co.

The shaker screen is 6 ft. wide and has a rated capacity of 300 tons per hour. The prepared sizes run from 50 to 51 per cent, which is a good percentage for the Sewall seam. The mine was recently equipped with 300 Enterprise solid-roller bearing cars which are loaded to an average of 2.25 tons. These are handled over a cross-over dump and the coal fed onto the belt conveyor by a bar feeder.

THE BUREAU OF MINES is studying the sensitiveness of detonating compounds to impact, friction and heat by means of standardized test apparatus and procedure. A comprehensive survey of the comparative sensitiveness of some twenty detonating compounds has been carried out. The work involved the construction and adaptation of a small frictional impact device, and the testing of several methods of determining explosion temperatures.

In figuring costs it is not sufficient to include only the expense incurred for timber and treatment. The labor cost of replacing the timber may be greater than the cost of the wood. In places where traffic is heavy the interference with it caused by frequent replacements of timber or ties may be the most important item of expense. The danger of accidents to track workers and timber men when employed near heavy traffic is also a cost factor. Increasing the life of the timber affects all of these expenses and perhaps others as well. Their importance will vary with local conditions, but in any cost calculations in which they may be factors they should be included and accorded due consideration.

This presentation of the subject is brief and general. It has been my purpose only to challenge the attention of mining engineers and direct it toward the saving of timber and money which may be realized if they will make the effort.

Combining Plants for Economy

No. 3 mine of the Stanaford (W. Va.) operation of the Elkhorn Piney Coal Mining Co., has lost its identity. The old tippie at the foot of the monitor plane on the Piney Creek branch of the C. & O. Ry. has been abandoned and the long outside haulway is no longer in use. The coal is now taken out through No. 6 mine and loaded over a new 2,400-ton tippie located on a joint branch of the C. & O. and Virginian railways near Skelton.

The 18-deg. slope is equipped with a 42-in. belt conveyor, the length of which is 180 ft. from the tail pulley in the mine, to the head pulley on the tippie. The belt is 6-ply with $\frac{1}{8}$ -in. of rubber on the carrying side. The drive is located in the small building at the slope portal, and consists of a 60-hp. high-starting-torque squirrel-cage motor with solenoid brake and a tandem-gear double-pulley driving unit. The tippie



Conveyor Delivery to Tippie

Each succeeding year sees the popularity of the conveyor grow. Silent, efficient operation and long life are some of its chief advantages. It will also transport coal either up or down hill or both if necessity requires.



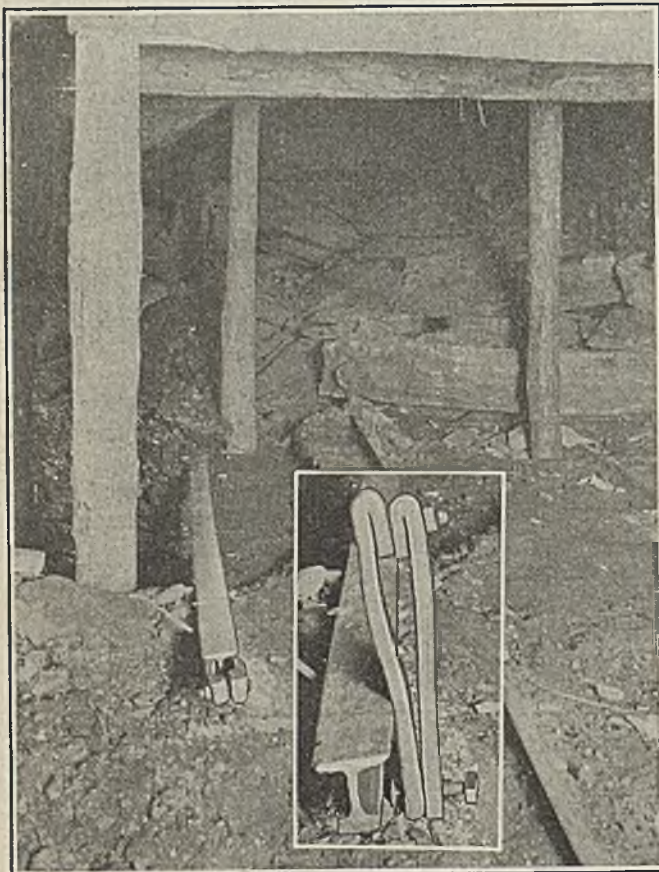
Practical Pointers For Electrical And Mechanical Men



A Hitching for Removing Buried Rails

When one end of a section of track rail is buried by a fall of rock a great strain, during its removal, is set up in the hitching attached to the end of the rail, that is in the clear. In the method most commonly followed a pair of fish plates and bolts are utilized as a hitching attached to the free end of the buried rail. Two bolts hold the fish plates to the rail, and two are run through the free end of the fish plates. These latter bolts serve to hold the hook or clevis of the chain, attached to a locomotive, by which the rail is pulled from under the fall. The fault with this scheme is that the clevis or hook pulls against only one bolt, which consequently breaks frequently.

J. D. Moore, assistant mine foreman at the Exeter mine of the Stonega Coke & Coal Co., Exeter, Va., has devised a rail hitching that eliminates this trouble. As shown in the accompanying illustration, it consists of two steel bars, $\frac{1}{2}$ to $\frac{3}{4}$ in. thick, which are bent over at one end in such manner as to form an anchor block



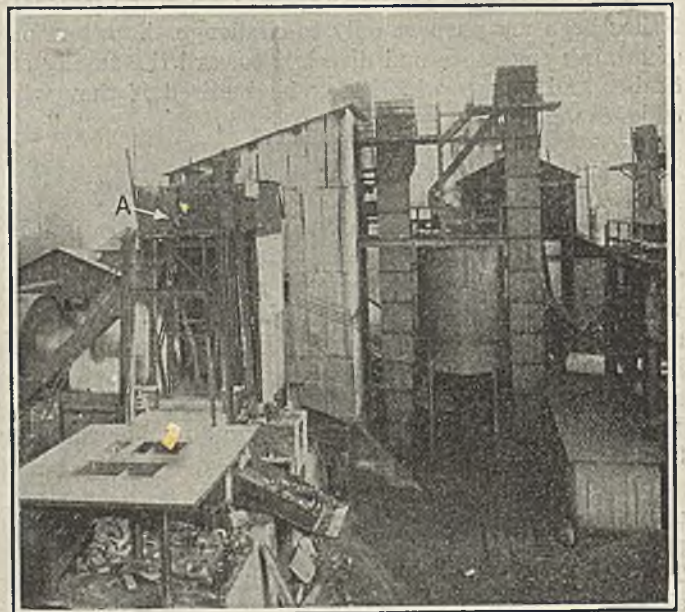
Rail Removal Hitching

Fish plates are not satisfactory as a hitching for the removal of partly buried rails. As a substitute, is offered a hitching consisting of two bars, which are lapped over at one end so as to form an anchor block for the hook or clevis of the pulling chain.

for the hook or clevis. The pull of the chain is exerted on the laps forming this block, and not on the bolt that holds them together. The other ends of the bars are fastened to the rail by two bolts, just as if they were fish plates.

Electric Welding Aids Construction And Is Wide in Scope

With the increase of electric welding in the coal-mining industry, the scope of work wherein this process can be used is increasing. This, of course, is natural, because, as the operatives become more experienced, about the only factor limiting the jobs that a welder can per-



Weld It and Save Time

In the construction of this coal processing plant at Fairmont, W. Va., welding played an important part in the fabrication of the steel members at a saving to the owners. In the above illustration the welder at work on the bin may be seen at A.

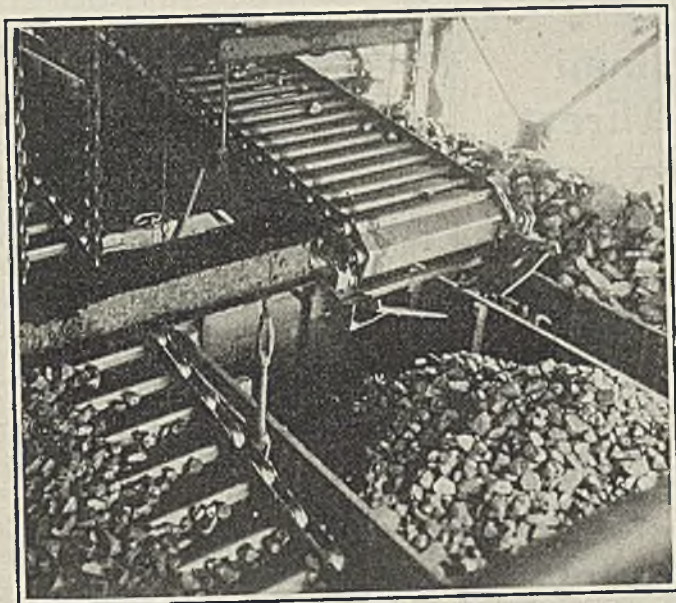
form is the ingenuity or initiative of the personnel of the operating organization.

The accompanying illustration shows a briquetting plant in the construction of which electric welding played an important part. The plant is that of the Consolidation Coal Products Co. at Fairmont, W. Va. Buckets, elevators, cylindrical bin, chute, tanks, etc., in the foreground of the illustration were all fabricated on the job. A Lincoln welder was used on this work.

Mr. MacIntire who is in charge of this coal processing company stated that throughout the course of the experimental work he has employed electric welding extensively with satisfactory results and a marked saving in time.

Device on Loading Boom Trims Car Automatically and Cheaply

To the discharge end of and beneath the loading boom handling furnace coal (size 3x6 in.) at the New Orient mine, of the Chicago, Wilmington & Franklin Coal Co., are attached two flexible rectangular flaps, converging downward toward each other. These concentrate the discharge of coal from the boom to the center-line of



Flaps Save Car Trimmer

Coal discharged from the outer edges of this loading boom falls upon two downwardly converging flaps. It is thus concentrated into a relatively narrow stream whose course is on the center-line of the railroad car. By this means trimming is automatic and the services of one man are eliminated.

the railroad car. They are made from heavy conveyor belting and are bolted to a frame structure of strap steel as indicated in the accompanying illustration. These flaps, naturally, are easily replaced when worn out.

By concentrating to the center-line of the car the discharge from the boom, the coal is built up in the car into a pointed hump, and the maximum tonnage is loaded without spillage. This device does away with the service of a car-trimmer. The scheme is adaptable only to booms of medium capacity handling coal of relatively small size.

Stroboscope Measures Belt Slip

Experiments conducted for the Leather Belting Exchange Foundation, at Cornell University, to determine the distribution of belt creep and slip around a pulley, were described by R. F. Jones in a paper at the recent annual meeting of the American Society of Mechanical Engineers, and reported in *Power*.

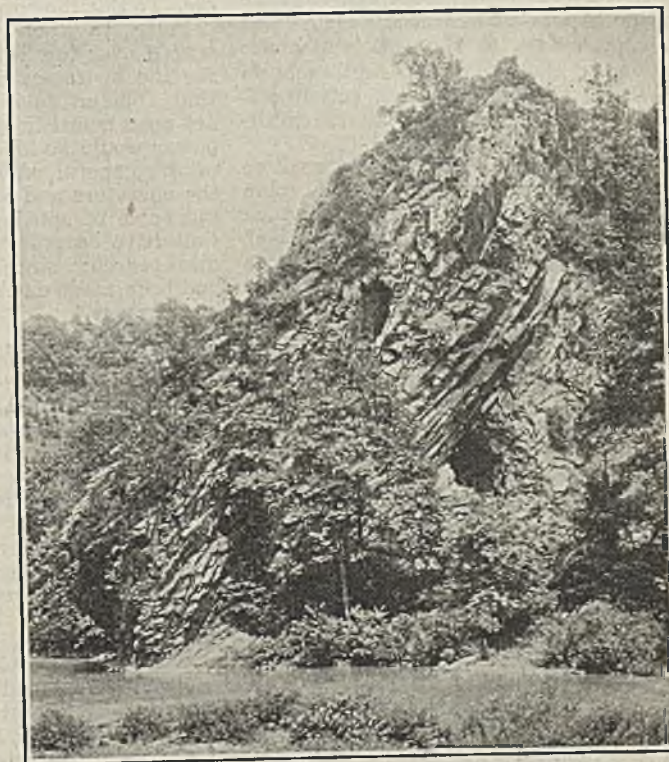
In the past, experimenters have attempted to determine this by measurement of the belt speed around the pulley, but the results have been unsatisfactory, since this speed is only slightly slower than that of the pulley. If this small difference, the speed of the belt relative to the pulley, could be measured directly, more reliable data should result.

The stroboscopic slip-meter permits this direct measurement. Briefly, this meter consists of a disk mounted on the pulley, with equally spaced oblong holes punched

around its periphery. A portable wheel is provided which runs on the belt and has similar oblong holes, so spaced that each time a hole in the disk comes opposite the wheel, there is, as closely as possible, a corresponding hole in the wheel in alignment when both the wheel and the disk are running with the same peripheral speed, except for the slight correction due to belt thickness. If a light is placed back of the wheel and disk, this condition of balance is evidenced by a lighter aperture, apparently stationary. When the belt is slipping on the pulley at the point where the wheel is in contact with the belt, the peripheral speed of the wheel is less than that of the pulley and the holes no longer align continuously. This is evidenced by a slow revolution of the lighter aperture, and the slip may be calculated from the time required for this aperture to make one revolution.

As a result of this investigation it was determined that the belt creep extends from the last point of contact backward through an arc that increases with the load. Slip begins when this arc becomes equal to the arc of contact. This condition limits the capacity of the belt unless the coefficient of friction increases with the slip, as in the case of leather, when much higher loads can be carried without extreme relative motion.

If a small pulley is used with a larger one, this slip begins first on the small pulley and the greater part of the total slip will take place upon it.



Shortest Railway Tunnel in the World

Traveling through the opening in the mountains between Appalachia and Big Stone Gap, Virginia, many interesting views may be seen from the highway which, in the main, parallels the winding course of Powell's River. Few of these, however, are more picturesque than the Bee Rock tunnel here shown. This subterranean passage measures only 54 ft. in length and is said to be the shortest railway tunnel ever built.

When the Louisville & Nashville R.R. was built into this region it was decided to pierce rather than cut through this rock for the obvious reason that its bedding planes are inclined at an angle of approximately 60 deg. to the horizontal. The rock got its name from the many swarms of bees that once inhabited its numerous cracks, fissures and crevices. When the rocks in the valley are tilted like this, it is no wonder that the cover over the coal beds of Big Black Mountain to the westward are full of slips and horsebacks which form a constant source of trouble and worry to the mine management.



News Of the Industry



Break-Up Without Agreement at Miami Seen as Prelude to Open-Shop Threat In Ohio and Western Pennsylvania

By Sydney A. Hale
Associate Editor, *Coal Age*
(By Wire from Miami)

Miami, Fla., Feb. 21.—Unless there should be an overnight change in attitude, the joint conference of miners and operators of the Central Competitive Field, which began its meeting here on Feb. 14, will adjourn sine die tomorrow. Not even the most optimistic observer of developments here expects such a change. The break was made practically certain when the subscale committee appointed last Wednesday voted to report back to the full conference tomorrow that it had been unable to reach an agreement. This action was taken at the end of a two hours' executive meeting this morning.

Since its appointment the committee has been considering the Toledo plan of the operators for a wage scale which would be "continuously competitive" with the labor rates in West Virginia and Kentucky and a resolution of the miners insisting upon the maintenance of the Jacksonville basis, but suggesting the permanent organization of the conference as a continuing body to handle other questions in which miners and operators are jointly interested. These propositions have been argued up hill and down dale in the three regular executive sessions of the committee without either side so modifying its position that a common ground could be located.

Although there are operators who believe that it would be possible to still pay the Jacksonville base rates if other burdensome conditions were ameliorated, officially all the operator conferees have been a unit in supporting the demands of the Ohio and western Pennsylvania groups that they must have the immediate and readily measured relief which they claim would be assured them under the Toledo plan. On the other hand, the miners, while asking many questions as to the workings of this plan, have reiterated time and again that they cannot and will not consent to any proposal which sets up the non-union fields as the arbiters of wages to be paid in the organized districts. They also have held firmly to the position that they cannot depart from the instructions of the delegates at their last convention to accept no reduction in wages.

A definite break over the Toledo plan for "a continuously competitive wage scale" was narrowly forestalled the third day of the conference when President Lewis offered as a substitute a resolution to make the joint conference a continuing body throughout the life of a new wage agreement. Taken by surprise, the operators moved that both proposals be referred to a subcommittee. To this the miners readily assented.

Prior to that action debate was waged over the Toledo plan. Speaking for the operators, Phil Penna declared that Indiana favored the proposal to set up a board in which the balance of power would be held by representatives of the general public because, he said, the operators and the union had proved incapable of settling their own affairs. Collective bargaining, he asserted, had disappeared; since 1916 agreements had been made as the result of political interference.

Seeks Protection from Renegades

"The signature of the United Mine Workers on the Jacksonville agreement," he continued, "has been of no more value than the signature of the Pittsburgh Coal Co. and other renegade operators to the union." In the past three years there had been literally hundreds of local strikes in Indiana in violation of the agreement and time after time the operators had been compelled to appeal to Mr. Lewis to bring peace. Since 1886, Indiana producers have been paying too high a price for the privilege of dealing with the union. "We can't continue to exist as we are."

Thomas Kennedy, secretary-treasurer of the union, retorted that the Toledo plan would continue the very political interference to which Mr. Penna had objected. It would create "a commission of perpetual motion" forever on the go trying to keep up with the changes in wage rates at 1,300 to 1,400 non-union mines in West Virginia and Kentucky.

Objecting to Mr. Kennedy's characterization of the Chief Justice of the Supreme Court, who would name the public representatives under the Toledo plan in the event that operators and miners could not agree, as a politician, W. H. Haskins declared he would just

Electricity Conserves Nation's Coal Pile

Electricity has been the means of saving 75,000,000 tons of coal in the United States during the last six years. This estimate was made in a report issued recently by the U. S. Geological Survey, which shows that during that period the consumption of coal and its equivalents in other fuels in central generating stations increased about 15 per cent, while the energy generated increased by almost 80 per cent.

This saving is attributed to progress that has brought the consumption to a pound of coal per kilowatt-hour in the most up-to-date plants, the elimination of inefficient equipment, the growth of interconnections and similar factors.

It was pointed out that in one year the power plants that are classed as public utilities generate and distribute more electricity than all the light and power companies of all the other countries in the world combined.

as soon have politicians of the Taft type "settle our affairs as the politicians of the United Mine Workers." The union wants to peg Central Competitive Field production at pre-war levels, while the Southern fields continue to grow. "Is that fair? Must the price of relationship with the union be commercial stagnation?"

Harry Fishwick, president of district 12 and chairman of the union scale committee, asserted that he was unable to understand how people can say they want to negotiate an agreement and in the next breath want to refer the question to outsiders who know nothing about the business. Salvation must come from within. Unemployment could not be escaped if union wages dropped to \$1 per day. The only solution was a curb upon new developments and the working out of that solution would be a slow process. In the meantime many operators must necessarily "go broke."

Mr. Fishwick also charged that the Toledo plan was in its essence a conspiracy. Remembering the indictments returned against the scale committee of 1919 by the U. S. District Court at Indianapolis, he, for one, did not propose to agree to a plan that might send him to jail. Reverting again to over-development, he denied that the miners were in anywise responsible. "Miners

can't work at mines which don't exist."

O. J. Owens, one of the union representatives from Ohio, pointed out that after the initial scale had been fixed under the Toledo plan, the commission would be controlled in its future actions by rates made by the non-union mines. "It isn't even arbitration or a sliding scale, but something worse." Ohio miners will never accept such an arrangement.

Emphasizing the protestations of the operators that they were ready to consider any constructive alternative to the Toledo plan, Mr. Lewis offered the following resolution:

(1) Resolved, That this conference recognize the inadequacy of wage reductions to effect commercial security and stability in the bituminous industry and agree that the contract to become effective April 1, 1927, will be for a period of two years and shall comprehend the above stated principle.

(2) The stabilization of the industry is of essential importance; it is, therefore, agreed that the present joint conference of operators and miners of the Central Competitive Field, as at present organized, shall continue in existence during the life of the aforesaid agreement and shall meet from time to time as may be mutually decided. The work and duties of this joint continuing agency shall be as follows:

(A) To strive for conditions in the industry which will give a proper return to capital invested and will protect and advance the living standards of those employed in the industry;

(B) To take such steps as may be necessary to lessen the prodigious number of fatalities and injuries now occurring in the industry;

(C) To promote a sales policy which will destroy the present practice of selling coal below the actual cost of production;

(D) To work for a scientific readjustment of coal freight rates and the elimination of the many discriminatory and prejudicial rates now maintained by the Interstate Commerce Commission for the harassment of the unionized industry;

(E) To protect the industry by opposing adverse legislation and to encourage the enactment of legislation of value to the industry and helpful in the saving of human life;

(F) To employ such legal counsel, rate experts, engineers and advisers as may be required for the competent execution of this program, the expense to be borne equally by the operators of the Central Competitive Field and the United Mine Workers of America.

"I am almost persuaded," announced Herman Perry of Illinois. "Outside of the wage question there is nothing more incorporated in this plan than the operators have expressed a desire for. If a remedy can be found with the present wages, the operators will gladly accept it." Mr. Perry, however, moved to amend the proposal by grafting the Toledo commission idea on it. The amendment provided for a commission of four operators, four miners and three representatives of the public to decide questions upon which the continuing joint conference was unable to agree. In the event operators and miners could not agree upon the three public representatives, such representatives would be named by the Chief Justice of the Supreme Court.

Horace E. Baker, Pittsburgh, wanted to know whether the first paragraph in the resolution meant no reduction in wages. Mr. Lewis replied in the affirmative. Joseph Zook, Illinois, pointed out that there was no provision for a meeting unless both sides would consent. Mr. Lewis answered that the conference might set up machinery for stated meetings.

Mr. Haskins moved that the Lewis and Toledo resolutions be referred to a subcommittee. P. T. Fagan, presi-

New Lottery Is Based On Mines' Output

Cape Breton newspaper offices, which handle daily reports of the output of Besco Mines, recently were swamped by telephone calls for exact official production records for certain mines and districts.

It was the opening day of the "miners' sweepstakes," a new form of lottery which has been extensively promoted and sold throughout the colliery districts for several weeks past. The scheme is similar, in its general outlines, to the "baseball pools," which operate in many Canadian cities when the big leagues are playing.

There are various prizes, and the winners are determined by the official figures as to output of coal in various mines and districts, as well as for the Besco collieries as a whole.

An additional cause of telephone inquiries was that the local newspapers happened to lump the outputs of the Springhill and Pictou mines, instead of giving them separately, as usual.

dent, district 5, seconded the motion. On request the motion was withdrawn to permit further discussion. Debate languished, the motion was renewed and adopted.

The following subcommittee was then named:

For the operators: George M. Jones and S. H. Robbins, Ohio; Whitney Warner and Horace E. Baker, western Pennsylvania; Phil Penna and Hugh Shirkie, Indiana; Herman Perry and George B. Harrington, Illinois. For the miners: Lee Hall and G. W. Savage, Ohio; P. T. Fagan and William Hargest, western Pennsylvania; T. G. Lawton and William Mitch, Indiana; Harry Fishwick and Walter Nesbitt, Illinois. The international officers of the union and the officers of the conference also were made members of the committee.

The joint conference thereupon adjourned, subject to call when the sub-scale committee was ready to report. As previously stated, this reconvening of the full conference has been set for to-morrow morning.

For the time being, developments between now and April 1 are any man's guess. Ohio and western Pennsylvania producers, who have felt the brunt of the non-union competition from the Southern fields, assert that it is impossible to continue operations under the existing wage scales. They declare, therefore, that they will return home and make preparations to run on the open-shop plan after the expiration of the present agreement. Illinois and Indiana operators are more reserved in announcing any future policy. They have little belief in the possibilities of running non-union although a small start was made in that direction in southern Indiana some time ago. Most of them frankly admit that a prolonged struggle with the union would mean the destruction of their business. They are

equally sure, however, that it also would mean the wrecking of the United Mine Workers of America. The operators in these two states, therefore, would like to find some workable basis for continuing their union relationship. They are one with Ohio and Pittsburgh in demanding relief, but probably less committed to any set plan for winning that relief.

Some of the outlying districts make no concealment of their hope that something may happen which will permit them to run. In some sections considerable progress has been made in the past three years in modifying conditions which have pegged production costs at high levels. In others, extensive mechanization has brought down costs. In the case of at least one important operation in the outlying districts an attempt will be made to arrive at an understanding with the union which will allow the mining of coal to go on pending final settlement of the wage question.

It is not believed that the adjournment tomorrow marks the end of the negotiations. In all probability another conference will be called early in March. Illinois, Indiana and some of the outlying districts—if invited—would undoubtedly be willing to attend. In the present temper of Ohio and western Pennsylvania, operator representation from those states would be unlikely.

In the event that such a conference also failed, it is predicted that the union then would endeavor to make district settlements and, failing in that, would offer contracts to individual operators. Such a procedure would be a repetition of the Cleveland agreement of 1922. While it might not be as successful, it is felt that the union would be able to sign up considerable tonnage on such a basis. For one thing, it is believed that the stripping mines of Illinois and Indiana would not hesitate to sign. There are some captive mines too that would join in, but would not lead a break.

Broad Gage Line Promised For Greene County

Definite assurance that the Chartiers Southern Ry. will extend a broad-gage railroad into Waynesburg, Pa., is seen in approval by the Interstate Commerce Commission of an application of the company to extend its line from Mather into Waynesburg. The Chartiers line connects with the Monongahela railroad at Rice's Landing. Under the provisions of the Commission's ruling, work on the new road is to be started not later than July 1, 1927 and is to be completed on or before Dec. 31, 1929.

The Commission's action is taken to mean that the vast coal fields of the central and western parts of Greene County are about to be opened for development. Practically all of the coal land in and near Waynesburg is held by Pittsburgh and other outside concerns, who have delayed opening mines because of a lack of shipping facilities. At present Waynesburg is served only by a narrow gage railway which is unsuitable for carrying large quantities of freight.

Oddie Asks More Funds For Bureau of Mines; Turner Explains Items

That the Bureau of Mines is not responsible for the scant attention given the mining industry in connection with the appropriations for the next fiscal year has been revealed by the Senate Committee on Mines and Mining. At a public reading Feb. 9 it was developed that the Bureau of Mines, after having made a careful and detailed estimate of its urgent needs, requested appropriations totalling \$2,504,100. When this request reached the Department of Commerce the financial officials there reduced the amount by more than \$500,000 before the estimate was submitted to the Bureau of the Budget. The Budget Bureau lopped off nearly \$100,000 more.

For work on the economics of mining, which had been recommended so strongly by the committee headed by J. V. W. Reynders, the Bureau asked \$325,210. The Department reduced this by \$30,210 before it went to the Budget. The Director of the Budget then made a further reduction of \$70,000 and the House Committee on Appropriations gave all new economic work the coup de grace by cutting out the remaining \$30,040.

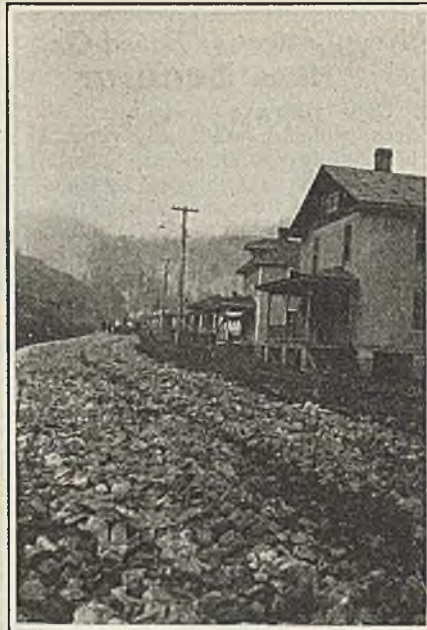
Seeks Help for Mining

When the Budget reached Congress and it was seen that the work of the Reynders committee, which was representative of all branches of mining, had gone for naught, Senator Oddie, of Nevada, chairman of the Committee on Mines and Mining, acting in that capacity and on behalf of a number of Senators from mining states, immediately took steps to obtain more recognition for the mining industry. The very large requests which were being made for agriculture emphasized the failure of federal officials to recognize their obligation to the other basic industry.

This led to the introduction of a bill proposing certain modest increases for the Bureau of Mines, including the following: One mine rescue car, \$45,000; replacing obsolete oxygen breathing apparatus, \$10,500; testing for permissibility of electrical equipment for underground use in gaseous coal mines, \$15,000; for the investigation of falls of roof and coal, \$10,000.

As Senator Oddie had called the attention of the Senate as a whole to the need for these appropriations and had appeared personally before the Senate Committee on Appropriations and had not been successful in obtaining any of these increases, he called his committee together for a special hearing. Following the hearing the committee recommended that the foregoing increases be granted and urged the Senate to pass the bill. The action of the committee simply authorizes these expenditures, but every effort will be made to secure the actual appropriations before the adjournment of the session. In all probability the fight for this money will have to be carried to the floor of the Senate.

Director Turner explained at length



Fine Houses to Have Good Roads

Employees of the Pocahontas Fuel Co. at its new operation at Faraday, Tazewell County, Va., have attractive, comfortable homes. The roads are made by rock fill, the one pictured above having a concrete retaining bank against the creek. The roads are to be paved.

the need for a new mine-rescue car to replace one which has been worn out in the service. In connection with the proposed increase for studies of falls of roof and coal, Director Turner explained that this is the cause for half of the deaths underground. Over 1,200 deaths annually are resulting from that cause. He also explained that sparks from electrical devices underground are particularly dangerous and cause many accidents. He stated that manufacturers as a rule do not have the facilities to make sure that their devices are spark-free.

Some years ago the Bureau built a large steel gallery in connection with its Pittsburgh experiment station, in which electrical equipment is tested in gaseous atmospheres. Full sized machines such as are to be sold to the user are tested in the exact atmosphere that may be met in the mine. When this work started there was no demand for it. The advantage of the service is so apparent, however, that the Bureau now is in the position of having created a demand which it cannot supply.

It is believed that Secretary Hoover took no personal part in the consideration of the estimates of the Bureau of Mines. In delegating budget work to his financial officers, he probably feels that he should not intervene in behalf of this or that item, but in the Bureau of Mines case he probably felt unusual restraint as the creation of the economics branch had been widely heralded as a sort of monument to perpetuate what his administration had done for the Bureau.

The Chesapeake & Ohio Ry. has ordered 500 70-ton car bodies from the Illinois Car & Equipment Co. and is in the market for 500 gondola cars.

Pittsburgh Coal Co. to Stick To Open-Shop Operation

The Pittsburgh Coal Co. will never operate again under an agreement with the United Mine Workers. This was made clear last week by J. D. A. Morrow, president of the company, in an open letter to the employees in which he declared that the company will remain open-shop and continue to open mines until production reaches 1,000,000 tons per month.

Mr. Morrow's letter follows:

"Don't believe any story that this company is going to sign up with the union on April 1, or any other time. This is not true and has been put out to scare you and make you unhappy. We will never sign a scale with any union again. We will always have open-shop mines.

"The Pittsburgh Coal Co. has now operated on the open-shop basis for over 18 months and will always operate that way. The open-shop plan makes it possible for us to give you men steadier work, better working conditions and better pay than is possible to give on any other plan.

"The open-shop policy wins because it is the fairest, squarest policy. Aug. 1, 1926, we had 3,295 men at work in 12 mines and produced 295,226 tons of coal in that month. Today we have 5,789 men at work in 18 mines and will produce 500,000 tons of coal in February—all open shop. We are going right on to open up more open-shop mines and increase our tonnage till we mine more than 1,000,000 tons of open-shop coal each month.

"There will be steady work for you at our mines at good wages. You will be protected. Don't believe any stories that we will change.

"We will never run any mine any way but open-shop."

Urges Coal Extension

The Nashville, Chattanooga & St. Louis Ry. has asked the Interstate Commerce Commission for permission to construct an extension from its Sequatchie Valley branch, in eastern Tennessee, into a new coal field, a distance of approximately one mile. Application stated that there are now only three coal mines on the company's lines south of the Cumberland Mountain, producing the quality of coal which can be advantageously used in its operations, and that some of the mines north of the mountain are rapidly being exhausted. It is important, therefore, it says, that there be developed on its line an adequate fuel supply for its own needs.

Brainerd Confirmed for I.C.C.

President Coolidge's nomination of Ezra Brainerd, Jr., of Muskogee, Okla., to be a member of the Interstate Commerce Commission, presented early last week, was confirmed Feb. 17 by the Senate. The nomination had been approved earlier in the day by the Committee on Interstate and Foreign Commerce and was taken up out of order on motion of Chairman Watson. Mr. Brainerd succeeds Frederick I. Cox of New Jersey.

Failure of Both Sides to Negotiate On Basis of Steadier Work Seen as Reason for Lack of Public Support

By Paul Wooton

Washington Correspondent of *Coal Age*

Because of the responsibility which rests with Congress with the refusal to grant emergency powers to the President in case of an emergency affecting coal, developments at Miami are being watched with unusual interest. Those who are hoping for a peaceful settlement of the wage question are not reassured by the tone of the press reports from the seat of the conference. It is recalled that they have a flavor much like those which emanated from Atlantic City, Philadelphia and New York during the anthracite negotiations. It was remarked that the arguments for and against the wage proposals are much the same as those presented at similar gatherings for the last fifty years and that it seems difficult for either side to think of a new way of stating the old ones. On the operators' side, particularly, the spokesmen are the same as have appeared at previous conferences.

It is admitted that the Haskins plan for a sliding scale based on a fixed percentage above the non-union wage presents a vestige of novelty, but it was noted that the discussion which followed immediately shifted to familiar ground.

Objects to Political Arbitrators

Sight has not been lost of the fact that the miners' verdict was forecast by Secretary Kennedy's reference to the Chief Justice of the United States, who is to name the neutral arbitrators under the Haskins plan. Mr. Kennedy insists that everyone knows that the Chief Justice is a politician by training and that he might be guided by political considerations in appointing arbitrators.

A distinguished man who has watched the panorama of life from Capitol Hill for more than ten years and who has followed with interest the fortunes of the coal industry since the strike of 1902 remarks that there has been no genuine effort to bring forward the real problem of the industry—irregularity of employment. The miners continue to pursue the will-o'-the-wisp of high daily wages, he says, while the operators have not sensed the real possibilities of guaranteeing increases of wages as the volume of output increases. He is not surprised that the arguments of the

operators, that a simple reduction in wage rates will result in more work, are regarded by the miners with skepticism.

There are many in Congress who believe that if the employers would seek a reduction contingent upon providing more work and a higher annual wage they would be standing on firm ground. It is feared that they are too prone to see the obstacles in the way of plans for more regular employment, but it is felt that the purpose is so important as to justify great efforts in bringing it about. If either side would base its plea on the regularity of employment rather than on the rate of the daily wage, it would receive large support in official Washington.

During the past ten years coal has come in for so much attention on Capitol Hill that many members are becoming well versed in its problems. It is very generally held that it was no more than natural that the union in its early days should conceive of the employer as its antagonist. Public sentiment in those days was with the miners when they would undertake to force the operators to grant them better terms. It is very generally recognized, however, that time has brought a change. The great antagonists of the miners' union are not union operators but those of the non-union fields. In the contest under present conditions it is felt that the union men must learn to think of union operators as their allies rather than as enemies. The union operator holds the meal ticket. Unless he can be kept in business there will be no work and there will be no wages.

Southern Gem Receivership Ends After 3 Years

The receivership of the Southern Gem Coal Corporation was closed by order of U. S. District Judge Lindley at East St. Louis, Ill., on Feb. 10. The total indebtedness of the Southern Gem company approximated \$3,000,000 while the reports of the receivers show that approximately \$2,700,000 was realized through the sale of the company's properties in Perry, Franklin, Williamson, Jefferson and Cook counties, Illinois. The receivership began in January, 1924, after the company had failed to meet payrolls of the previous two weeks.

The final reports of the receivers show that Mine No. 5, at Pinckneyville, returned a profit of \$25,000 while under the management of the receivers. A year ago the company's properties in Jefferson and Franklin counties were sold to the Brewerton Coal Co. of Chicago for \$1,750,000 while bondholders and creditors took over extensive properties in Perry County about six months ago.

Says World Grows Better

"Only the superficial observer of the signs of the times, basing his judgment on what he reads and sees in the sensational columns of the press, may dispute that the world is getting better," said Justice Arthur S. Tompkins of the New York Supreme Court at the eleventh annual dinner of the Oil Trades Association, Inc., held at the Waldorf-Astoria, New York City, on Feb. 9.

"But the press does not record all the daily activities, but only the sensational things, such as the records of crime and lawlessness," he continued. "These matters receive publicity because they are the unusual and the abnormal. The good, true and virtuous deeds are not recorded because they are the natural and the normal."

"Where there is one group of radicals to fill Madison Square Garden, threatening to destroy our institutions, we know there are millions and more patriotic Americans who are grateful for their country."

Boylan Asks Parker To Continue Efforts For Coal Legislation

Representative Boylan (Dem.), of New York City, last week made public a letter he had written to Representative Parker (Rep.), of Salem, N. Y., chairman of the House Committee on Interstate and Foreign Commerce, expressing hope that Mr. Parker will make another attempt to enact coal legislation. He asked Mr. Parker to ask the President to use his influence within the House Interstate Commerce Committee on behalf of a coal measure.

"May we expect," he asked, "positive action on your part looking toward protection of the public interest, especially as the wage agreements in the bituminous fields terminate on April 1, and both factions seem headed for a strike which may prove as serious as last year's prolonged lockout?"

Deplores Opposition to Public

Mr. Boylan insisted that the committee's treatment of the coal bills indicated that "it was packed against the public interest." He deplored the "influence" which he said was exerted by members from the anthracite field in preventing action on the coal bills.

"If the oil interests were to send a man to Congress to work against oil legislation of advantage to the public the public conscience would be aroused and such misrepresentation driven from public life," Mr. Boylan wrote.

"The same would be true if Wall Street were to attempt domination of legislation regarding the tariff, finance, foreign debts and banking. It would also apply were the bootleggers to elect a Representative and his vote should prove decisive in a modification proposal."

EDITOR'S NOTE—The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and COAL AGE editorial policy; neither do they necessarily represent Mr. Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically stated.

Loree and Pennsylvania R.R. Agreement Pending

The Delaware & Hudson R.R. and the Pennsylvania R.R., it was intimated Feb. 19, soon will make application to the Interstate Commerce Commission, whereby the former will acquire track-age rights from the Pennsylvania between Wilkes-Barre and Du Bois, Pa., giving the Delaware & Hudson a connection with the Buffalo, Rochester & Pittsburgh.

This is the first definite revelation of an understanding between L. F. Loree and the Pennsylvania R.R. It will provide Mr. Loree, promoter of the fifth trunk line system, a much-needed connection between the Delaware & Hudson and the Buffalo, Rochester & Pittsburgh. Besides, such a plan would give Mr. Loree a direct connection between Wilkes-Barre and Pittsburgh.

In view of the reported interest Mr. Loree has in the Lehigh Valley, it is clear that, with a connection between the Delaware & Hudson and Lehigh Valley at Wilkes-Barre, Mr. Loree could gain an important line to New York City. The Lehigh Valley could afford, as well, an opening into the Pennsylvania coal fields, which include cities such as Shenandoah, Mount Carmel, Hazelton, Mahanoy City, and which are not touched by the Delaware & Hudson.

With further extension of traffic agreements between the Pennsylvania and Mr. Loree's road, it becomes evident that the Delaware & Hudson would provide considerable assistance to the Pennsylvania in extensions into the Northeast and Canada. In the western end of Pennsylvania, the Buffalo, Rochester & Pittsburgh is seen as offering facilities for the relief of traffic originating at Buffalo and Rochester, and passing over the present lines of the Pennsylvania to Pittsburgh. Some relief would also be offered to the congestion on the Pennsylvania at Pittsburgh. In addition, the Lehigh Valley, should it come ultimately under control of the Pennsylvania-Loree affiliation, would also prove an important factor in caring for the excess traffic originating in Buffalo and Rochester, and would cover as well considerable territory in both Pennsylvania and New York not touched now by the other two roads.

That these developments mean the abandonment by Mr. Loree of his plan for a direct line across Pennsylvania, as proposed in his fifth trunk-line system, is a matter of conjecture, although it is rather evident that with conclusive agreements between the Pennsylvania and the Delaware & Hudson, such a line would be unnecessary.

B. & O. to Buy Equipment

Authority to issue and sell \$9,750,000 of 4½ per cent equipment trust certificates was asked of the Interstate Commerce Commission last week by the Baltimore & Ohio R.R. Proceeds from the sale of the certificates will be used in the purchase of 20 locomotives, 3,000 hopper cars, and other equipment costing \$13,930,477.

New Home Refrigerator Operated by Gas

A new home refrigerator operated by gas has been installed in the home of James A. Brown, Jackson, Mich. Mr. Brown is in charge of the gas department of the Consumers' Power Co. and is a past president of the Michigan Gas Association.

The cooling machine, which is manufactured in Evansville, Ind., has no moving parts. A gas flame heats ammonia, which is the refrigerant, and vaporizes it. In the process the vapor under pressure is cooled by water coils, then liberated in the refrigerating unit inside the box, where it absorbs the heat in the refrigerator. The ammonia is then absorbed in cold water, and the process is repeated. Since ammonia is a byproduct obtained from coal in the manufacture of gas, the refrigerator is in every sense a gas product.

Commercial production of the gas-fired refrigerator is anticipated for this year.

Hillcrest Blast Laid To Gas; Rice Urges Rock Dust

Dr. George S. Rice, chief engineer of the U. S. Bureau of Mines, who was asked by the Alberta Government to make an investigation into the cause of the explosion at the Hillcrest Mines last September, has presented his report. He suggests that the cause of the explosion was ignition of gas caused either directly by frictional sparks or indirectly by heating particles of coal or pyrite, which in turn ignited the fine coal dust in the working places. The Hillcrest mine was classed as gassy and all mining was done with the pick, no explosives being used at all. There was known to be an unusually large quantity of coal dust in this mine and Dr. Rice's theory is that the coal dust was ignited by an explosion of accumulated gas, the presence of which was caused either by a temporary failure of the ventilation system or by a fall of coal releasing a pocket of gas.

The report recommends that the coal dust found in this and other mines of Crow's Nest Pass district be treated by spreading through the workings a quantity of non-explosive rock dust such as limestone dust; also that some method of getting out the coal other than the present system of dumping into chutes be adopted so as to minimize the quantity of coal dust; that some improvement be made in the ventilation system and that the old workings be closed.

Detroit was selected as the next annual convention city of the National Retail Coal Merchants' Association at a recent meeting of the board of directors in Chicago. The convention will be held some time in June, the exact dates to be selected later.

North American Coal Corp. Buys Selling Agency

The sales organization of Landstreet-Downey Coal Co., Huntington, W. Va., will be taken over by North American Coal Corporation of Cleveland on June 1, when G. Faber Downey, vice-president of the Landstreet-Downey organization, will assume the position as assistant to F. E. Taplan, president of the North American.

The Landstreet-Downey company will continue its operations in the Norfolk & Western and other fields. Mr. Downey may go to Cleveland. F. S. Landstreet, president of the company, will remain in Huntington.

Object to Merging Actions In Assigned Car Case

Counsel for railroads and bituminous coal operators owning private coal cars have filed a motion in the U. S. Supreme Court objecting to the court treating as one case, for the purpose of argument, their suit involving the government's appeal from an injunction restraining the Interstate Commerce Commission from modifying rules, regulation and assignment of privately owned coal cars and preferential assignments of cars by railroads to mines producing railroad fuel. The case is assigned for oral argument Feb. 28, 1927.

The court recently granted a motion of the Attorney General to advance and argue the cases together. This was agreed to by the railroads and operators, but they did not and will not consent to treatment of the cases as one case for purposes of argument, the motion states.

Link to Hocking Valley Obtained by C. & O.

The Interstate Commerce Commission on Feb. 17 authorized the Chesapeake & Ohio Ry. to acquire control of the sixty miles of the Chesapeake & Hocking R.R. by lease. The Chesapeake & Hocking is the connecting link between the Chesapeake & Ohio at Gregg and the Hocking Valley Ry. at Valley Crossing, Ohio, and is said to be a vital link in the Nickel Plate system. The Chesapeake also was authorized to acquire control of the Island Creek R.R. by lease.

Raise in Coke Rates Suspended

By an order entered in Investigation and Suspension Docket No. 2847, the Interstate Commerce Commission suspended from Feb. 10 until June 10, 1927, the operation of certain schedules as published in the Cleveland, Cincinnati, Chicago & St. Louis Railway Co.'s tariff, I. C. C. No. 8346, and Supplement No. 1 thereto.

The suspended schedules propose to revise the carload rates on coke and related articles from stations on the C. C. C. & St. L. and the Cincinnati Northern R.R. Co. in Indiana and Illinois, to destinations in Central Freight Association and Western Trunk Line territories, which would result generally in increases.



News Items From Field and Trade



ALABAMA

First-Aid Makes Rapid Strides.—Increased interest in first-aid training among the mining men of the Birmingham district is strikingly shown by the fact that 724 men received first-aid training and 144 men were trained in mine-rescue work during the last half of 1926, which was an increase of nearly 100 per cent over the same period of 1925, according to a statement made by F. E. Cash, mining engineer of the U. S. Bureau of Mines in charge of this district. Mine-rescue car No. 10, sent into the district in charge of C. P. Dempsey and T. F. Brown, which was supposed to leave on Dec. 31, will be held here for probably six months more.

Convict Mine Problem Unsettled.—Frank Nelson, Jr., president of the Alabama Mining Institute, whose membership produce fully 90 per cent of all coal mined in Alabama, states that "neither the institute nor any representative of it, has in any way, directly or indirectly, sought to oppose legislation which would terminate the working of convicts in coal mines or to influence legislation in favor of extending the time when this should cease."

Under the terms of a bill which has been pending in the Alabama Legislature for several weeks and recently enacted into law, the leasing of state and county convicts is hereafter prohibited and June 30, 1928, was set as the date by which all prisoners must be removed from the coal mines in this district. County convicts are to be removed by June 1 of this year. There are approximately 1,500 convicts employed in coal-mining operations in this district in the mines of the Sloss Sheffield Steel & Iron Co., Alabama By-Products Corporation and Montevallo Coal Mining Co. A small contingent has already been transferred to state works.

Modernizing Sayreton No. 1.—The Republic Iron & Steel Co. will make extensive improvements at its No. 1 Sayreton mine. An electric hoist of large capacity, with the necessary auxiliary equipment, has been purchased and will be installed as soon as built. The capacity of all mine cars will be materially increased and the number handled per trip will be greater than at present, thereby enabling a much larger daily output to be obtained. A steel tippie of the most modern design has been contracted for and additional equipment will be installed for the handling and preparation of the product of the mine. The work of sinking a companion manway and auxiliary

ventilating slope to No. 1 mine has made good progress and the tram line for transporting the coal from this opening to No. 1 washery, and the conveying equipment necessary for handling to the washery bins, will soon be ready for operation.

New Mine Contemplated.—It is reported that the Alabama Fuel & Iron Co. is contemplating opening a new mine and other developments on its property near Parrish, Walker County. Considerable acreage is owned by the company in this section, which carries the America, Mary Lee and Pratt seams of coal and which is now undeveloped. Chas. F. DeBardeleben, Birmingham, is president of the corporation.

Stith Shaft Completed.—The new shaft mine of the Stith Coal Co., near America, Walker County, which has been in process of sinking for several years, has about been completed, the new hoist and other inside and outside equipment being ready for operation. The capacity of the new mine may be developed to 3,000 tons per day, as the handling and preparation equipment has been designed for this maximum production.

The Tennessee Coal, Iron & Railroad Co. has completed the installation of a main haulage conveyor belt system in its No. 8 Wylam mine and provided other modern equipment which will bring about greater efficiency in the handling of the product from this operation and enable an increased output to be obtained.

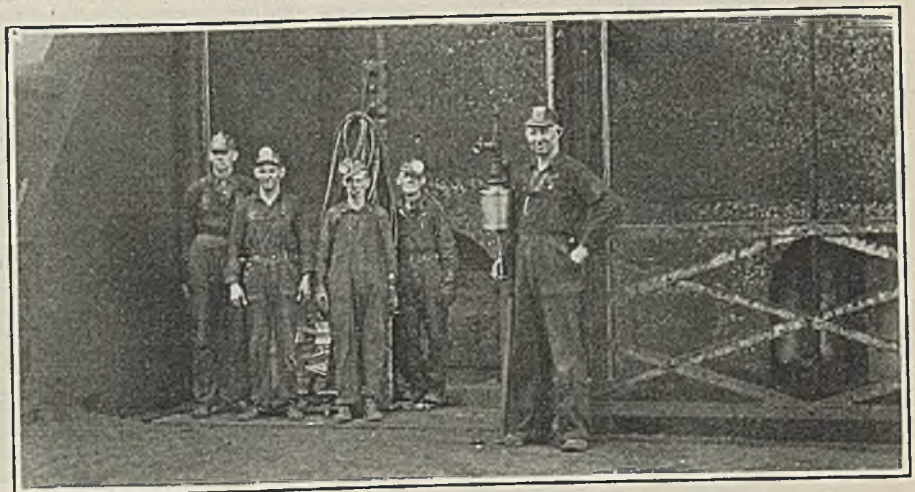
COLORADO

Partners Ask Receiver.—Asking for the appointment of a receiver for the Sleepy Cat Coal Co. in Routt County, in which they are interested, Cornelia B. White and Florilla M. White filed suit in district court, Denver, against Morris T. Streeter and Genett S. Streeter, their co-partners. Their complaint also asked the court to order Morris T. Streeter, who is manager of the company, to make an accounting of all his operations and that an injunction be issued restraining him from incurring further indebtedness in the name of the company.

Because of better safety methods rigidly enforced last year, fatal accidents in all of the coal mines of the Colorado Fuel & Iron Co. have been reduced 50 per cent, according to figures given out by E. H. Weitzel, vice-president and general manager. It is hoped to reduce the 1927 fatalities another 50 per cent.

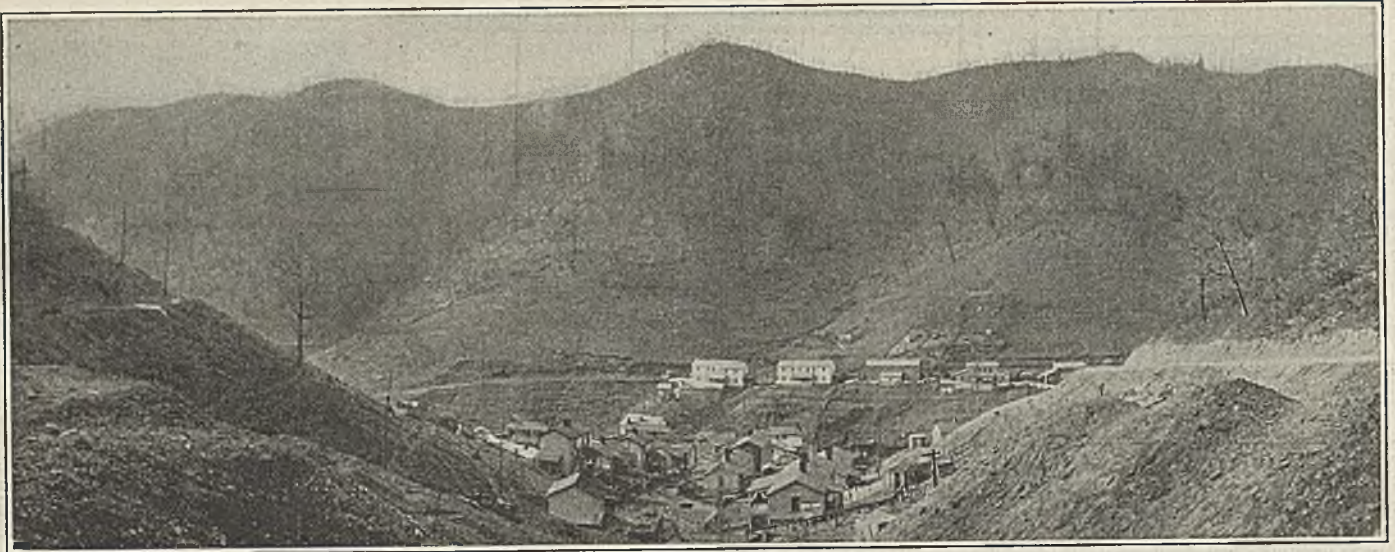
ILLINOIS

Rice W. Miller, of Hillsboro, traveling representative of the Hillsboro Coal Co., was elected a director of the Montgomery County Loan & Trust Co. of that city a few days ago. Mr. Miller, who is twenty-three years of age, is one of the youngest bank directors in the state. He was born in Hillsboro and attended the University of Wisconsin. The Hillsboro Coal Co., with which he is now identified, is



Giving Signal for Lowering Repair Gang

While the production of New Orient mine was curtailed during a redevelopment period, the equipment was "tuned up" for another long run in which the world's record will probably be again revised. The four repair men are standing on a temporary platform on top of one of the 13-ton skips. On the platform they have an oxyacetylene welder and a number of small steel plates, to be used in stiffening the guide fastenings.



Part of Mining Town Near Thorpe, W. Va.

This photograph was taken from near the drift mouth of Mine No. 4 of the United States Coal & Coke Co. Building space is at a premium here. The small, fairly flat space at the mouth of the hollow has been filled with houses.

owned by his father, Rice Miller, president of the Illinois Coal Operators' Association, and his grandfather, Amos Miller, who for years was vice-president of the Montgomery County Loan & Trust Co.

INDIANA

Preparing for Strike.—Indiana operators are preparing for a walk-out of their miners April 1 and one of the first actions has been the introduction in the state Legislature of a bill repealing a section of the mine labor laws prohibiting the use of unskilled labor. The proposed bill would legalize employment of any class of laborers, including convicts, in an emergency.

Charles Gottschalk, consulting mining engineer, of Evansville, is vice-president and general manager of the Big Vein Coal Co., which recently purchased the Buckskin mine of the Bosse Coal Co. Work has been started on a number of changes to be made and new equipment has been ordered. The mine will be electrified and all coal loaded mechanically. Rock-dusting also will be adopted.

Operators Oppose Benefit Boost.—Coal operators of Indiana are making every effort to stop the passage of a bill in the Legislature which would increase workmen's compensation from \$13.20 a week to \$16.50 a week and the minimum benefits from \$5.50 to \$8.80. At a recent hearing of the committee to which the bill was referred, organized labor went to the front for the bill. Henry Adamson of Terre Haute, attorney for a large group of coal operators, made a spirited attack on the bill on the ground that it is unsound economically and is drawn for the sole benefit of the wage earner. He said the effect of the bill would be to increase the insurance premiums in the coal fields of Indiana about \$250,000 annually.

A committee of the Rotary Club at Sullivan, investigating public service, self-sacrifice and heroism, has named

Emmett Shipman, a coal miner of Shelburn, as the one to receive the Rotary public service award, a gold medal. The service for which Shipman receives this recognition was performed along with other rescuers at the recent Francisco mine disaster, when he volunteered to head a small band of men and defied deadly gases in the recesses of the mine in search of victims of the explosion.

Rock-Dust Bill May Pass.—Carrying an amendment applying to all coal mines employing more than ten men, the Livingston bill in the Indiana Legislature to require rock-dusting of mines as a preventive against explosions, has been reported back to the House with recommendations that the measure be passed. Other measures before the committee include one which would require operators to "lose breakthroughs" in parts of mines that have been closed. The bill was designed to improve the ventilation in parts of mines being worked. Livingston is the author of another measure before the committee fixing five years' practical mining experience as the prerequisite to engaging in work as a shotfirer. A third measure introduced repeals part of the 1923 law relating to persons authorized to enter mines.

KANSAS

State Output Record Broken.—Despite one breakdown, which caused a few minutes' delay, a new state record for one day's production of coal for a single mine was established recently by the No. 22 mine of the Western Coal & Mining Co., at Arma, when 1,691 tons of coal was hoisted. This compares with the former record of 1,679 tons set Feb. 2, 1926.

KENTUCKY

The Middle West Coal Co., Ashland, has filed amended articles increasing capital stock from \$10,000 to \$300,000.

J. P. Martin, mine owner of Barbourville, has filed a voluntary petition in bankruptcy at London, Ky., listing liabilities at \$83,300, and assets at \$100.

The Upper Elk Coal Co., Argo, capital \$5,000, has filed amended articles increasing capital to \$20,000.

MARYLAND

Declaring that western Maryland coal is discriminated against through freight rates, the Cumberland Chamber of Commerce has adopted resolutions asking that the State Purchasing Agent require all bids to stipulate for consideration of Maryland coal. The chamber has also asked Governor Ritchie to remove the State Bureau of Mines from Baltimore to Cumberland or some other point near the mining district.

MINNESOTA

Traffic representatives of more than 200 firms in the Traffic Club of Minneapolis have formed a mercantile and manufacturers' group. A. E. Dypwick, of the St. Anthony & Dakota Elevator Co., is chairman of the fuel committee.

MONTANA

Edward L. Beyard, of Seligman, Ariz., and associates purpose organizing the Montana Coal, Iron & Metals Co. in order to develop a tract of 200,000 acres of coal land as well as lead and iron-ore deposits. Headquarters will be at Helena.

OHIO

Would Amend Mining Code.—Representative Roberts of Mahoning County has introduced a bill in the General Assembly amending the state mining code in a number of instances. One provision requires that interior fans be approved by the chief mine inspector before installation. The operation of the fan shall be subject to approval by the department. Firebosses

must pass an examination by the state board of mine examiners before being appointed. In all shaft mines when persons are lowered and raised on a cage a minimum of 4 sq.ft. per person is required. No higher voltage than 220 shall be permitted for the operation of underground stationary motors. Posts, where drawslate overlays the coal seam must be set upon approval by the district mine inspector and the operator is compelled to furnish a blueprint showing the location and number of supports and the blueprint is to be posted at a conspicuous place in the mine. Other minor changes are made by the bill, which has been referred to the committee on mines and mining.

OKLAHOMA

Five Banks Close Aften Run.—Five banks serving the Oklahoma coal field territory, with deposits estimated at \$2,500,000, were under the supervision of state bank examiners Feb. 5 because of a run on the McAlester Trust Co., the parent institution. Waldo Watkins, assistant bank examiner, attributed the closing of the trust company to frozen assets caused by a slump in cotton prices. Banks affected besides the parent institution, are the Bank of North McAlester, the Wapanucka State Bank, the Coalgate Bank of Commerce and the Bank of Pittsburgh.

PENNSYLVANIA

Attempt to Blow Up Mine.—Two attempts were made to dynamite the Maud mine of the McLain Mining Co., South Fayette township, Feb. 4. One charge partly wrecked the mouth of the mine. The other, which was set off along the Bridgeville and McDonald branch of the Pennsylvania R.R. wrecked the tracks. The mine is said to have been planning to reopen with non-union labor. According to County Detective Robert McMillan, an attempt was made to dynamite the mine tippie several weeks ago, but the charge of dynamite failed to explode.

The Bethlehem Mines Corporation of

the Johnstown area, mining about 1,750,000 tons of coal in 1926, completed the year without a fatal accident, according to an official company statement.

Again Breaks Open-Shop Record.—The Pittsburgh Coal Co. established a new high record for open-shop production in the week ended Feb. 5, when 117,878 tons were produced. Previous weekly high production was 115,784 tons in the week ended Jan. 8.

L. C. & N. Net Jumps.—Net income of the Lehigh Coal & Navigation Co. for 1926 available for dividends was \$4,177,477, an increase of \$2,382,651 over the preceding year. This is equivalent to approximately \$7.15 a share, or 14.26 per cent on the 584,868 shares of stock outstanding. The par value of the stock is \$50. Gross revenues were \$24,442,838, an increase of \$4,402,837.

WEST VIRGINIA

The fire in Mine No. 1 of the Connellsville By-Product Coal Co., operating on Scott's Run, has been completely extinguished as a result of the mine having been flooded for several weeks. An investigation is now being made to determine the extent of the damage. No definite information of the survey of the fire area is yet available.

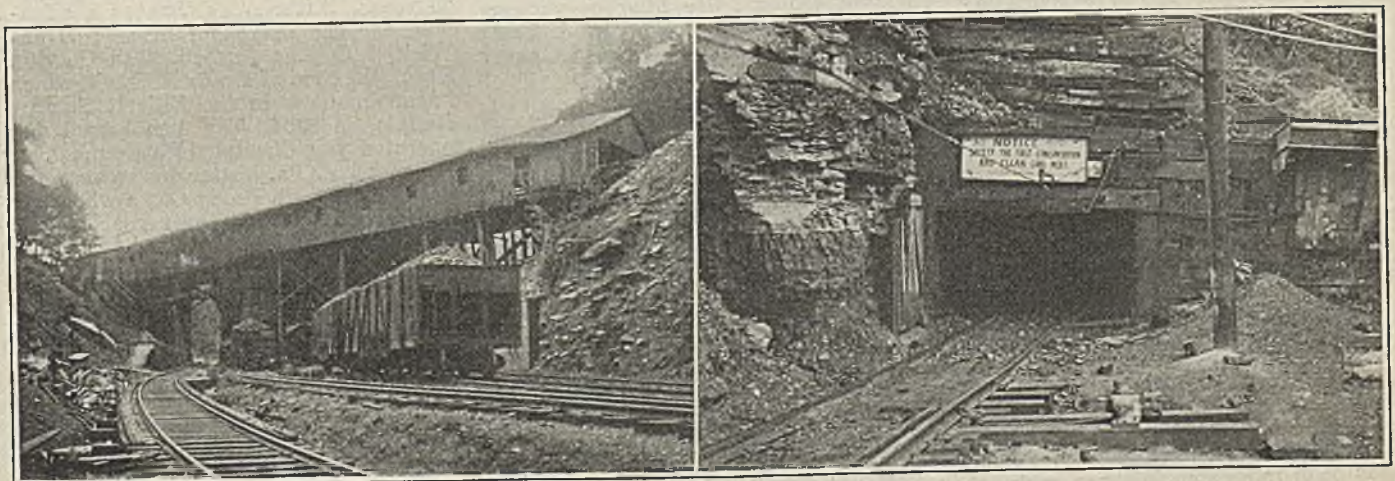
CANADA

Higher Duty Proposal Tabled.—Declaring that any increase in the duty on industrial coal coming into Canada from the United States would "immediately place the Maritime Province coal operators in a monopolistic position and enable them to fix a price which would be practically double the present price," the Dominion Fuel Board in a lengthy memorandum on the question of an all-British coal supply for Canada, which was tabled in the House by Charles Stewart, Minister of Mines, sees little, if any, advantage to be de-

rived from such a move. On the general question of replacing United States coal by an all-British supply, the memorandum quickly disposes of the idea that much help can be looked for in imports from Great Britain. The distance and the limited supply there are the large obstacles. As to the possibility of Canada becoming more dependent upon her own supplies, the memorandum says in part: "Assuming that it could be done at all, it would be a matter of some years."

Government to Market Peat.—With a view to assisting in the solution of the Quebec and Ontario fuel problem, the Dominion Government will conduct a peat distribution business for one year, from the Alfred (Ont.) bogs, Charles Stewart, Minister of the Interior, announced at Ottawa recently. This course had been decided upon, stated the Minister, to demonstrate to private industry and capital that preparation and retail distribution of peat at a commercial profit is entirely practicable. At the end of the year the government will announce the results of its operations and dispose of its plant and equipment to private interests. Mr. Stewart declared that he was convinced that Ontario's immense peat beds could be made to operate successfully in competition with imported coal.

Alberta Rate Matter Deferred.—Coal from Alberta cannot be moved to Ontario this year at a lower rate than \$9 per ton, as fixed by the railways some time ago. The case came up Feb. 10 at Ottawa before the Railway Commission and it was found that the experts for the railway and for the province had figured their costs by different systems so that the two results could not be compared. The commission ordered the experts to get together and to agree on a common basis of reckoning and adjourned the hearing until June 7. As coal from Alberta must be moved in the early months of the year before the cars are required for the shipment of grain, the date set for the hearing precludes any action in time for 1927.



Old Mine Is Being Re-equipped

When C. W. Rhodes of Middlesboro, Ky., became general manager of the Fork Ridge Coal & Coke Co., Fork Ridge, Tenn., he immediately made plans to modernize the equipment so as to increase the production and cut the cost. In November, 1925, the 800 old cars of 1½ tons capacity were replaced by 300 drop-bottom cars of 2.6 tons capacity. The use of drop-bottom cars made it possible to cut the tippie force to one man. At the left is shown the old tippie which was temporarily adapted to the new cars. This tippie is now being replaced by a new structure, the con-

crete foundations of which can be seen beside the old. The mine output has been raised to 1,100 tons per day, and the intention is to bring it to 50,000 tons per month within a year. The portal of the main haulway is shown at the right. The present production is coming from territory practically 3 miles from the drift opening. The coal is from the Mason seam. In the 56-in. bed are two partings. A 4-in. lamination occurs 4 in. from the bottom, and there is a 2- to 14-in. hard white clay 35 in. from the bottom.

Among the Coal Men

James A. Erskine, chief electrical engineer, Brady-Warner Coal Corporation, Fairmont, W. Va., has been appointed electrical engineer for the Monongahela Coal Operators' Association, with headquarters at Morgantown. Mr. Erskine is a graduate electrical engineer of Glasgow Technical College. After graduation he was employed by several large mining companies in Scotland and England until five years ago, when he was brought to Canada by the Dominion Coal Co., Sydney, N. S., to install electrical equipment at one of its mines. After this work was completed Mr. Erskine obtained a position with the Westinghouse Electric & Manufacturing Co. in the mining department. Since April of last year he has been employed by the Brady-Warner Co.

C. W. Nelson, Pittsburgh, Pa., has resigned as safety engineer of the Hillman Coal & Coke Co. to join the sales force of the Mine Safety Appliances Co. He will represent the last-named company in southern Ohio, southeastern Indiana and Kentucky, making his headquarters at Cincinnati. J. B. Moore, an official of the coal company's Edna No. 1 mine, will fill the place left vacant by Mr. Nelson.

A. Malcolm Allen, formerly of Oswego, N. Y., and for the past fifteen years a resident of Spokane, Wash., is now assistant manager of Corbin Coals, Ltd., a company which is opening up coal mines at Corbin, B. C. Steam shovels are being used to open up a seam of high-grade bituminous coal. There is being added to the washing equipment at Corbin sizing and drying apparatus, so that the coal will be uniform in size and sent into the market practically dry.

F. S. Knox, Jr., has been appointed general manager of the Elkhorn division, Consolidation Coal Co., with headquarters at Jenkins, Ky. The appointment became effective Feb. 15. Mr. Knox recently resigned from the Pittsburgh Coal Co., of which he was general superintendent, to accept the new position.

Richard H. Barry, for eight years superintendent of Colonial No. 1 mine of the H. C. Frick Coke Co., Smock, Pa., has resigned. He has not made any plans for the immediate future. Colonial No. 1 is one of the mines connected with the world's largest belt conveyor system.

Stuyvesant Peabody, of the Peabody coal interests, of Chicago, has been elected a director of the Kentucky Jockey Club, Louisville. Mr. Peabody has been interested in horse racing for some years, and is president of the Lincoln Fields Jockey Club, operating a new track at Crete, Ill., just out from Chicago.

Dr. T. D. Scales, owner of the John Bull mine, at Boonville, Ind., accompanied by his wife, has gone to Miami, Fla., to spend the balance of the winter.

Graham Bright, electrical engineer, for several years associated with Howard N. Eavenson, Pittsburgh, Pa., and before that, head of the mining division of the Westinghouse Electric & Manufacturing Co., has joined the Mine Safety Appliances Co. He will serve as sales engineer in charge of the Edison storage-battery mine-lamp division of this company.



Graham Bright

J. G. Bolen, long engaged in coal operations in the vicinity of Kansas City, had severed his connection with the Republic Coal Co. to become manager for the Keystone Coal Co., Kansas City, Mo.

George Loeb, for seven years a member of the Norfolk (Va.) staff of the Central Pocahontas Coal Co., has been appointed manager of the Norfolk office of that concern. He fills the vacancy caused by the resignation of J. Craig Nelson, who has become sales manager of the Fort Dearborn Coal Co.

John Bishop, of Princeton, Ind., has been appointed a deputy coal mine inspector to take the place of John Ellison, of Winslow, who resigned on Jan. 1. The appointment was made upon the recommendation of the miners' organizations of the Princeton district. He will have charge of the inspection of the mines in Pike, Daviess, Dubois, Perry, Spencer, Warrick, Vanderburgh, Gibson and Posey counties, Indiana.

B. F. Grimm, superintendent of power and mechanical department, West Virginia division, Consolidation Coal Co., Fairmont, has resigned his position, effective Jan. 31. After that date he will be affiliated with the power department of the Monongahela West Penn Public Service Co., with headquarters at Fairmont.

Miller D. Hay assumed the duties of chief mine inspector of Oklahoma on Jan. 10.

Larry Tucker, former partner in the

Brady-Tucker Coal Co. and the Central Fuel Co., has been appointed manager for Michigan of the Southern Coal & Coke Co., Cincinnati. His office will be in Detroit.

George Kearns, head of the Kearns Coal Co., of Cincinnati, was elected recently for his third term as secretary of the Cincinnati Chamber of Commerce.

William A. Reiss has been elected a director of the Pittsburgh Coal Co. as successor to the late Peter Reiss.

W. J. Ramsay has been appointed superintendent of the Yerkwood mine of the Pratt Fuel Corporation, succeeding T. H. Sorrells. This mine is located in Walker County, near Quinten, Ala.

Hoyt Capps has been added to the Norfolk (Va.) staff of the Central Pocahontas Coal Co. John Davis has left that company and has accepted a position with the Fort Dearborn Coal Co., in the Norfolk office.

Henry S. Gage has been appointed assistant sales agent of the Delaware, Lackawanna & Western Coal Co. at Buffalo, N. Y. He has been with the company's Buffalo office for a number of years.

Douglas M. Deringer, who for the last four years had been associated with the New York office of Dickson & Eddy, resigned as of Feb. 1 to join his father in the Deringer Fuel Co.

W. H. Naylor, of Baltimore, heretofore sales manager of the Davis Coal & Coke Co., has been elected vice-president of that company. Jesse Jeffries has been appointed general manager.

Obituary

John R. Brady, an Allegheny Valley (Pa.) operator for many years and also engaged in the wholesale coal trade at Buffalo, N. Y., died suddenly at his home in the latter city on Feb. 14, aged 59 years. After some time as a salesman for the operating firm of H. K. Wick & Co., he formed, with Clayton Ewell, the firm of Brady & Ewell, which began business in the Ellicott Square, Buffalo, in 1904. The firm owned and operated the Chestnut Ridge mine, at Rimersburg, Pa. Later he was at the head of the J. R. Brady Co., a wholesale concern, and for the past year he had an office in the Jackson Building.

William Graham, widely known Utah coal mining man and for several years an electrical engineer for the Utah Fuel Co. at Castle Gate, is dead at the age of 74. He assisted in opening a number of important coal properties in the Utah field. He was born in Scotland.

J. M. Lama, president of the Hocking Domestic Coal Co., who operated in both the Hocking and Pomeroy fields and well known among Ohio producers, died at Liverport, Ohio, where his mines are located, on Feb. 11. He was 69 years old. Funeral services were held at his late residence in Logan, Ohio. He leaves a widow, a son, Earl R. Lama, of the Hocking Domestic Coal Co., four sisters and four brothers.



Production And the Market



Calm Outward Tone of Bituminous Coal Market Veils Volume of Tonnage Moving

The conflicting effect of developments is strikingly reflected in the present situation in the bituminous coal markets of the country. To the casual observer, perhaps, coal consumers do not seem fully aware of their responsibilities as the expiration date of the Jacksonville agreement draws near, but, as usual, appearances are deceptive, for, while evidences of hysteria are lacking, a large volume of buying is being done in a quiet way.

The effect of this movement is being counteracted to a large extent by the heavy output, which keeps above 13,000,000 tons a week. A prolonged period of unseasonably mild weather has been another unfavorable factor, both actually, because it has held down consumption, and psychologically, in that it has tended to dispel the buying mood.

Storage Buying Saves Situation

Amid the maze of opposing conditions storage buying is the backbone of the market. Led by the railroads and utilities, which have been taking the heaviest tonnages, this class of business has been the greatest single stabilizing factor when, at times, it has seemed as if the bottom was about to drop out. Other large industrial consumers, with comparatively few exceptions, seem far from apprehensive regarding developments during the next few weeks. Shippers are quoting contract prices high in order to be on the safe side.

In the domestic end of the business it

is difficult to discern any awakening from the recently prevalent attitude of listlessness. Continuance of unseasonably mild temperature up until the last few days has been responsible for relatively low consumption and scarcity of refill orders from householders. In the circumstances those retailers who have been carrying good sized stocks are chary of making further additions, and those whose supplies are nearer depletion have been placing orders only for current requirements.

As usually happens in such a situation, there is an artificial show of strength in screenings, due to curtailment of supply by reason of the relatively smaller call for the larger sizes. Aside from this the price line-up moves within a limited range, and in the opposite direction to what one would be led to expect with conditions as they are.

Labor Question Still in Air

The Central Competitive Field operators and United Mine Workers representatives, in conference at Miami, seem no nearer a wage agreement than a week ago. At this time all indications point to a deadlock with an adjournment soon, to meet later—perhaps in a Northern city—before the opposing factions come to terms—if at all. If and when negotiations are broken off it is likely that the present complacency of consumers will be less in evidence.

Coal Age Index of spot bituminous

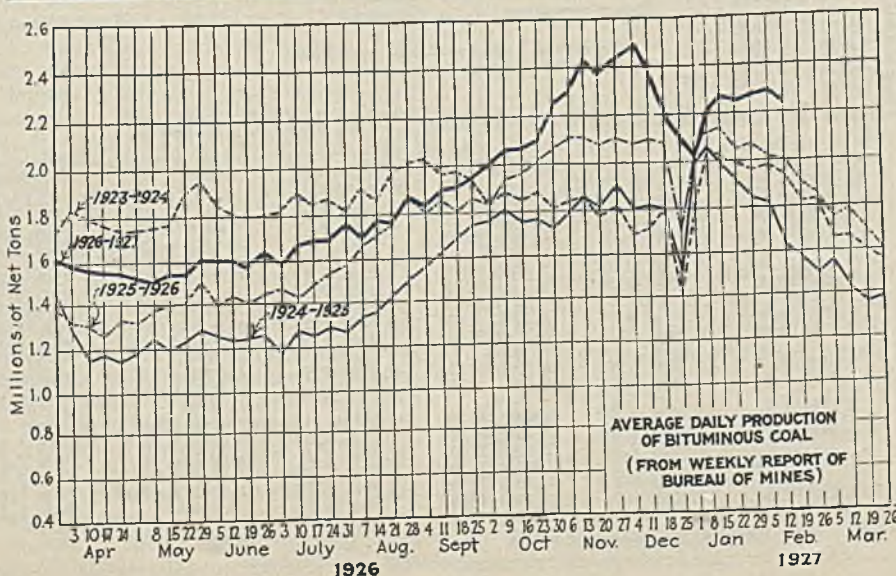
prices on Feb. 21 was 173 and the corresponding weighted average price was \$2.09. Compared with the figures for Feb. 14 this was a decline of a fraction over 1 point and 2c. Further dips in central Pennsylvania quotations on New England shipments and on West Virginia low-volatile accounted in most part for the loss.

Bituminous output for the week ended Feb. 12 is estimated by the U. S. Bureau of Mines at 13,463,000 net tons, a decrease of 120,000 tons from the total for the preceding week. Preliminary figures on loadings during the first two days of last week would indicate another heavy output.

Hard Coal Follows Weather

Demand for anthracite has settled down to the filling of only bare needs, and, as the weather last week almost to the close was quite mild, the trade was flat. Domestic sizes have been moving slowly and even No. 1 buckwheat is gradually heading toward its normal level. Independent producers in particular are finding the going hard, many of them having curtailed colliery operations to a greater extent than the company shippers.

The Connellsville spot coke market shows further signs of firmness. Buying, however, is scattered and far from active. Spot furnace coke has advanced to \$3.50; spot foundry is unchanged at \$4.25@4.75.



Estimates of Production

(Net Tons)

BITUMINOUS		
	1926	1927
Jan. 29.....	12,563,000	13,536,000
Feb. 5 (a).....	12,167,000	13,583,000
Feb. 12 (b).....	12,011,000	13,463,000
Coal yr. to date (c).....	468,707,000	513,431,000
Daily average.....	1,753,000	1,962,000
ANTHRACITE		
Jan. 29.....	34,000	1,670,000
Feb. 5 (a).....	27,000	1,402,000
Feb. 12 (b).....	35,000	1,501,000
Coal yr. to date (c).....	40,635,000	83,239,000
BEEHIVE COKE		
Jan. 29.....	339,000	190,000
Feb. 5 (a).....	366,000	187,000
Feb. 12 (b).....	362,000	188,000
Cal. yr. to date (c).....	2,059,000	1,130,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years

Midwest Retailers Storing

Outside of a light snow flurry a few days ago, the Midwest territory had springlike weather last week. Nevertheless the market on Illinois and Indiana coals appears to be in a fairly strong position. While the normal amount of coal is not being consumed, the strike threat for April 1 is causing an unusual amount of storage buying. Even retailers, who usually do not have any reserves on hand at the beginning of spring, are putting in a generous supply since the sharp cut in price on all Illinois and Indiana domestic coals.

Advances in steam-coal prices of a week ago have become so set that any likelihood of a recession between now and April 1 appears to be extremely remote.

Little interest is manifested in Eastern coals. Some tempting offers have been made during the past few days, but no placements of large tonnages with non-union operators has been reported lately.

Some coke is being put into storage by local retailers, but practically no anthracite. Anthracite seems to be very quiet and is being displaced rapidly by coke.

In the southern Illinois mining fields there is an abundance of all sizes. In spite of the heavy movement into storage, "no bills" are numerous at all mines. Some of the railroads are taking much of this for stocking at their own price. Large sizes are in oversupply at nearly all Duquoin and Jackson County mines. As screenings are long at some and short at others, however, the situation is somewhat spotty, though the price variation is not great.

Mt. Olive Steam Grades Active

Tonnage to railroads and other steam consumers for storage is moving briskly in the Mt. Olive field. All sizes find a ready market, and although domestic consumption is not heavy a good quantity of this coal is being stored. "No bills" are disappearing rapidly and the

mines are working full time. In the Standard district there is an overproduction and nearly all mines have unbilled coal. Screenings are tightening because of the slow movement of the larger sizes. Running time varies from three to five days a week, depending upon railroad orders, which are a big help to some mines.

Domestic demand has been unusually light in St. Louis because of mild weather. Dealers' yards are well stocked in anticipation of a strike. West Kentucky coals, at lower prices, are displacing Illinois middle grades, which are going on railroad and storage orders. Country domestic demand is quiet and few dealers are storing. Local wagon steam is still fairly good but easing. Carload buying of industrial coal for storage is fair, but current needs are light.

Domestic Sags Kentucky List

Continued mild weather has caused further weakness in domestic sizes in

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

Table with multiple columns for coal grades (Low-Volatile, High-Volatile, Midwest, South and Southwest), market quoted prices, and dates (Feb. 22, 1926; Feb. 7, 1927; Feb. 14, 1927; Feb. 21, 1927). Includes sub-sections for Eastern and Midwest regions.

* Gross tons, f.o.b. vessel, Hampton Roads. † Advances over previous week shown in heavy type; declines in italics.

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

Table with columns for coal grades (Broken, Egg, Stove, Chestnut, Pea, Buckwheat, Rice, Barley, Birdseye), market quoted prices, freight rates, and dates (Feb. 22, 1926; Feb. 14, 1927; Feb. 21, 1927). Includes sub-sections for Independent and Company prices.

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

Kentucky. Scarcity of such demand in conjunction with increased stocking by steam consumers has stiffened screenings; many operators have difficulty in filling contracts. Inquiries are coming from such distant points as Buffalo and parts of Pennsylvania for eastern Kentucky screenings, which have advanced to \$1.25@1.65 in both fields; mine-run is \$1.50@1.85 in eastern Kentucky and \$1.35@1.65 in western Kentucky; block is \$2.25 and up in both fields; lump and egg, \$2 up, and nut, \$1.75 and better. Consumers with contracts about to expire are a trifle anxious about renewal prospects.

Unusually heavy industrial demand keeps coal moving briskly off the docks at the Head of the Lakes; the docks are so well sold up in fact that no new contracts are being booked. It is evident that very little steam coal will remain at the opening of navigation. Quotations rule firm throughout the list. Heavier ordering of low-volatile soft coal is expected next season, and by the same token the quantity of anthracite will be reduced. Production of coke by a Duluth plant is falling far short of meeting demand; briquets also are moving freely.

Mild days in the Twin Cities have cut down the coal movement. Demand from the retail trade is meager, as lower prices are near enough to make everyone hold back. The break in Illinois prices gives a little better chance to sell all-rail coal in this market, but buyers are not inclined to take hold. They hope for further cuts even in the face of the negotiations for the new wage scale. The trade in Milwaukee is unusually slow owing to the prevalence of very mild weather. Prices are unchanged.

All Grades Lag in Southwest

Demand for domestic grades is rather slow in the Southwest. Prices continue easy, even on screenings, although steam grades are being rather closely cleaned up. Accumulations at the mines are of inconsequential proportions, except in Arkansas, where the outlet has been especially slow recently; many mines in the Spadra anthracite field are closing. Retailers are not buying except for immediate needs.

As a result of warm weather and price slashing to move coal the Colorado market is demoralized. Cuts of as high as \$1 have been made on lump, and on other sizes in proportion, so that slack is going at barely more than cost of production. The only hope of improvement lies in a fall in temperature. Running time is about 65 per cent, except in the Crested Butte anthracite field, where it has fallen even lower. Prices are unchanged.

The market for steam coals is rather quiet in Utah, with the metal mines and smelters the heaviest consumers. Sudden changes in the weather are making it difficult for purchasers of heating coal to order supplies intelligently. The slack situation is easy in general, with the tendency toward a surplus. Prices are steady. Latest reports concerning "no bills" show 445 loaded cars on the tracks. Retailers are holding stocks down for spring.

Almost a record movement of cars into Cincinnati has unsettled the Cin-

cinnati market; loads are backed up to the mines. In many instances, especially in the Pocahontas field, this has caused shutdowns or lowered production. Domestic business has shrunk until lump and egg, both high and low volatile, are in distress. The one bright spot is railroad and stockpile business.

There is an accumulation of smokeless awaiting reconignment in the Portsmouth yards, but the disposition is to hold to the circular. With the reduced make of domestic sizes screenings are rather scarce at \$2@2.25. The spread on mine-run also has contracted to \$2.50@2.75. Many cars of high-volatile are lying at Russell, Ky., but this is only a reserve, with shutdown mines behind it. As with smokeless, mine-run and slack are in best demand and prices have advanced under stockpile buying.

The total number of coal loads interchanged through the Cincinnati gateway last week was 14,875, as against 16,186 the preceding week and 11,940 a year ago. Louisville & Nashville interchange decreased 1,023 cars; Chesapeake & Ohio, 209; Norfolk & Western, 58, and Southern, 21. The number of empties en route to the mines increased from 14,428 to 15,905 cars.

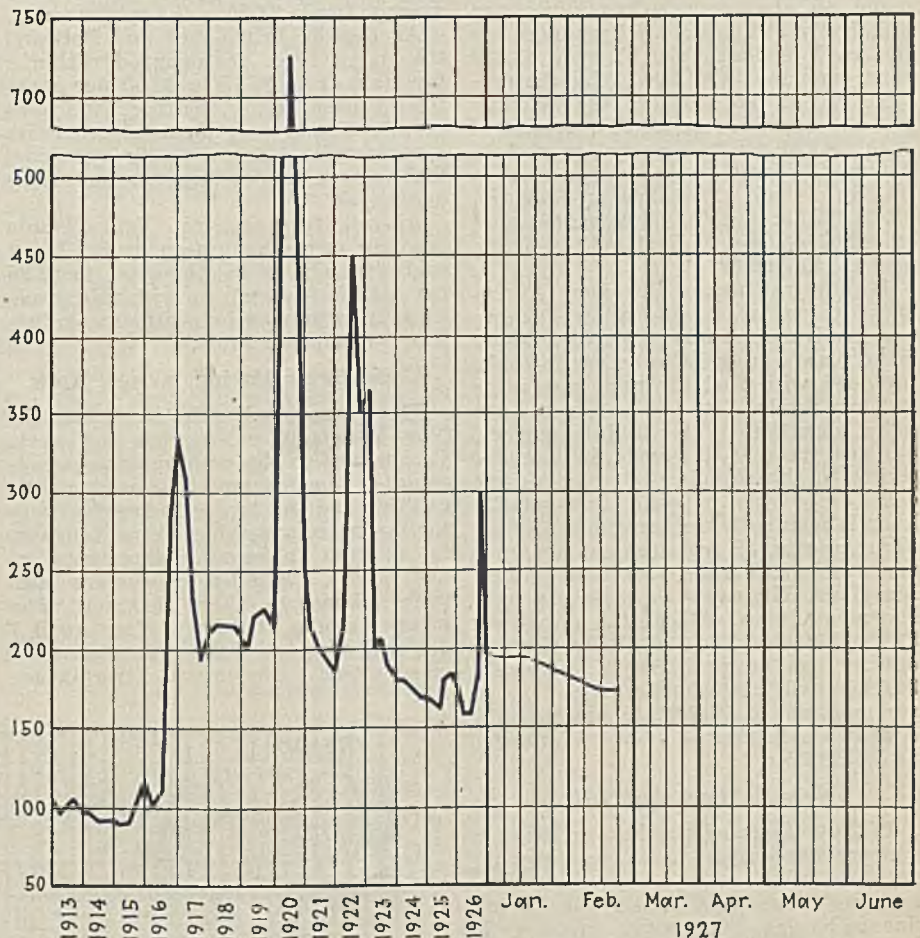
Prices have softened further in some instances on domestic sizes in central

Ohio, due to balmy days. Curtailment of production has lightened the burden of distress coal. Steam grades are sharing the weakness of prepared sizes, but not to the same extent. Railroads and utilities continue to stock lest there be a tie-up April 1, but smaller users exhibit no anxiety. Inquiries for contract tonnage have met with higher prices from producers than last year. Southern Ohio output is less than 25 per cent of capacity.

Both steam and domestic inquiries are scarce in the northern Ohio market. Screenings are somewhat scarce on account of the dearth of orders for lump. A number of buyers are awaiting developments at Miami; meanwhile non-union encroachment on this market is increasing. Output in the Ohio No. 8 field during the week ended Feb. 12 was 359,000 tons, or approximately 51 per cent of capacity. The tonnage now moving is going largely to railroads, steel plants, utilities and lake boats.

Pittsburgh Trade Flat

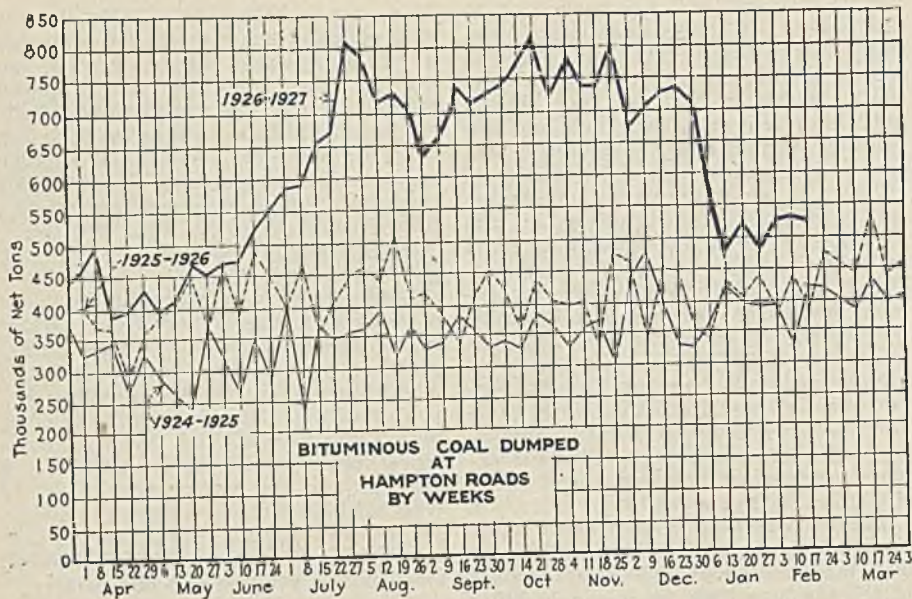
In the Pittsburgh district domestic demand in the open market, both steam and gas, is extremely flat and industrial and railroad consumption, too, has been adversely affected by unseasonable weather. Large accumulations of coal are still on tracks, but sales out of



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

	1927			1926	1925
	Feb. 21	Feb. 14	Feb. 7	Jan. 31	Feb. 22
Index	173	174	179	185	170
Weighted average price.....	\$2.09	\$2.11	\$2.16	\$2.24	\$2.06

This diagram shows the relative, not the actual, price on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first 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.



these are being made right along. Connellsville byproduct operators are actively stocking byproduct coal, which is now \$2@2.25.

With the possibility of a shutdown of the union mines on April 1, central Pennsylvania bituminous operators are reaping a harvest. There is a good demand all along and prices have been materially stiffened. Coal loadings for the week ending Feb. 12 were 21,389 cars, compared with 20,701 for the previous week. To the 12th the loadings for the month were 38,547, compared with 29,720 for the similar period in January. Prices at the mines run as follows: Pool 1, \$2.75@3; Pool 71, \$2.65@2.75; pool 9, \$2.45@2.65; pool 10, \$2.35@2.45; pool 11, \$2.10@2.20; pool 18, \$1.80@2.

Buffalo consumers are slow to respond to the arguments as to stocking coal in advance of labor troubles. Many large plants are said to be comfortably provided with fuel for their needs for several weeks, at least. Prices are quite unsettled in the Buffalo market, and still more so, it is said, in Toronto, owing to the shipping of consignment coal from the mines. Low-volatile lump is nominally unchanged at \$2.75@4; mine-run, \$2 from central Pennsylvania and \$2.25 from West Virginia and Maryland. High-volatile quotations are: Fairmont lump, \$2@2.25; mine-run, \$1.75@2; slack, \$1.35@1.50; Youghiogheny gas lump, \$2.50@2.60; slack, \$1.50@1.60; Pittsburgh and No. 8 steam lump, \$1.90@2.10; slack, \$1.35@1.45; Allegheny Valley mine-run, \$1.75@1.90.

New England Apathetic

In New England the lack of buying support has caused a further drop of 25c. in price on most grades. The agencies have used strike talk to influence buying, but among consumers a mild reaction has set in, and except for certain smaller buyers who are maintaining 60-day reserves there is practically no interest in the current spot market. Quotations are nearly as low as during the long dull period in 1926, and there are those in the trade who feel there cannot possibly be any advance, even with a strike, until May or June.

At Hampton Roads No. 1 Navy Standard Pocahontas and New River can be bought at from \$4.50@4.65 per gross ton f.o.b. vessel, and even on this basis heavy accumulations are again the order of the day. A few smokeless shippers have named \$4.40 as an inducement to move spot coal, but for average grade \$4.50 is the minimum.

At Boston, Providence and Portland the on-car level has dropped within a few days from \$6.75 to \$6.50 per gross ton. Unless better weather conditions permit normal movement of coastwise transportation it is freely predicted that factors here will again adjust their quotations.

All-rail from central Pennsylvania new low prices have been made. No. 1 coals can now be bought down to \$2.35 per net ton f.o.b. mines, with fair grade Clearfields moving on scattering orders at not much over \$1.65.

Under-Cover Buying in New York

There was much quiet buying in the New York soft-coal market last week. Coal moved easily, with quotations covering a wide range. Railroads, public utilities and the larger industries were taking in considerable extra tonnage, in addition to regular shipments, at low prices. Smaller consumers also were adding to their reserves. The prospects of a shutdown after April 1 did not seem to cause any apprehension among consumers. High-grade

coals are firm and comparatively little of the cheaper grades is to be had because of the lack of demand and the large number of these mines closed down. Tonnage at the piers is accumulating and there is some distress coal to be gotten cheaply.

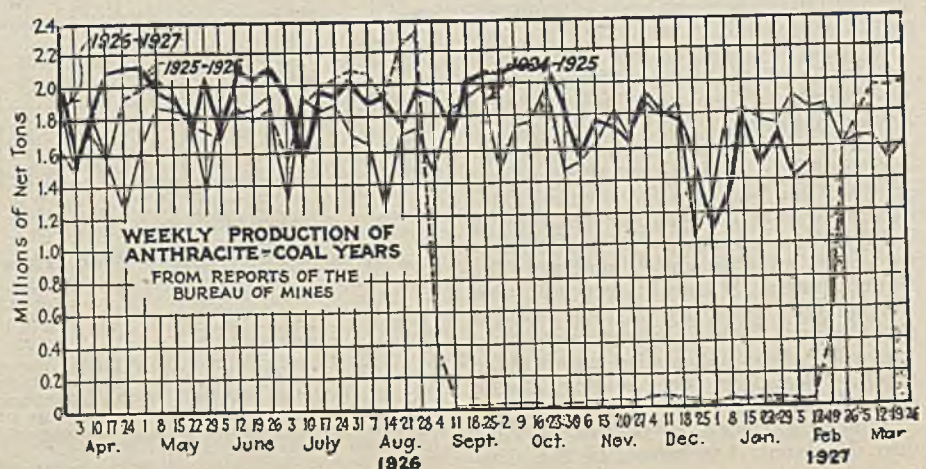
As April 1 approaches demand is steadily picking up at Philadelphia. Despite strike talk the wage tendency among nearby producers is downward, and prices show a sympathetic softness. The railroads are placing good sized orders for delivery between now and April 1. At Baltimore, on the other hand, the trade is listless, with low-volatiles fairly steady and high volatiles dragging.

Birmingham consumers show little interest beyond immediate requirements, which have not reached a normal basis since the beginning of the year. Industrial plants with contracts are taking a fairly good tonnage but are accumulating no surplus. Railroads are taking a little more fuel than currently consumed. A good tonnage of washed coal is being coked, as there has been no material reduction in the consumption of furnace coke and the foundry market is in moderately good shape, most of the movement being on contract. Bunkers continue dull and there is no domestic market worth mentioning. There has been no change in quotable prices.

Hard Coal Trade Slackens

Buying of domestic sizes of anthracite at New York depends entirely upon weather conditions. These sizes are moving slowly and No. 1 buckwheat, which in the past few weeks headed the market, is gradually finding its level. Dealers and consumers are thinking about the usual spring discount and are endeavoring to reduce supplies before the announcement is made, if made at all. There is considerable coal at the piers, and several loaded boats are in the harbor waiting for buyers. Independent coals are not moved easily. Quotations have a wide range and there is a further tendency to soften. Pea, like the larger sizes, is weaker.

A foretaste of spring in Philadelphia has greatly lessened hard-coal consumption. Company producers, who had been storing domestic sizes, have curtailed this. The independents, even with cuts in price, find business scarce. Therefore many of these are working even less time than company shippers.



Car Loadings and Supply

	Cars Loaded	
	All Cars	Coal Cars
Week ended Feb. 5, 1927.....	970,892	219,113
Week ended Jan. 29, 1927.....	950,969	225,459
Week ended Feb. 6, 1926.....	914,904	175,964
Week ended Jan. 30, 1926.....	925,263	183,071

	Surplus Cars		Car Shortages	
	All Cars	Coal Cars	All Cars	Coal Cars
Feb. 8, 1927.....	257,767	64,718	.....	.....
Jan. 31, 1927.....	259,548	62,588	.....	.....
Feb. 7, 1926.....	240,424	93,207	.....	.....

Pea is loosening and all the other domestic sizes are plentiful. Steam tonnage—in reduced supply—finds a ready market, although premiums on No. 1 buckwheat have decreased considerably.

Light consumption at Baltimore is holding back refill orders to an unusual extent. The trade is expectant regarding wholesale prices beginning April 1.

The anthracite trade at Buffalo is slow, not only because of comparatively mild weather but because dealers are more interested in reducing their present stocks than in adding more to them. Consumers are buying just enough coal to keep them going.

Connellsville Coke Trade Stiffens

The firming up tendency in Connellsville spot furnace coke is now more pronounced. Offerings at \$3.25, which was the quotable market for three weeks, were entirely taken up and in the past two or three days offerings at \$3.35 have been scant, the market being more commonly quoted at \$3.50. Buying has been small, by miscellaneous consumers, and the advanced price is only an approximation to cost. There is nothing like an active market in anticipation of trouble April 1.

Spot foundry coke remains quotable at \$4.25@4.75, as a general range, but the average of transactions is a trifle higher than a week ago. Various foundries are buying extra carloads for stock against possible trouble. The blast furnaces, on the other hand, have absolutely no disposition to stock. This would take too much coke, and the pig-iron market is in such poor shape that it would not be worth while.

Some operators expect a little labor trouble in the region April 1, but there is really nothing but guessing. It is

Coal More Reliable Fuel As Power Generator

Coal is declared the most reliable fuel to be used in the generation of power by Prof. E. F. Miller, head of the department of mechanical engineering of the Massachusetts Institute of Technology.

Professor Miller says that while fuel oil is still used to some extent in some of the plants of New England, it is probable that few, if any, of the plants now being constructed or those for which plans are being made, will be designed for oil burners. He pointed out that with oil there is always the uncertainty of price and of surety to deliver.

"Some plants which have shifted from coal to oil have been caught in the middle of winter without sufficient oil to operate and with no possibility of getting oil," he declared. Had these plants been equipped to burn coal, the fuel shortage would not have occurred.

"As a result of conditions similar to these, he says that engineers by continually experimenting have learned more about combustion in the last 10 years than in the 30 years preceding. Naturally with better and more complete combustion the thermal efficiency of boilers has increased, and we are now getting 82 to 85 per cent as against 68 to 70 per cent in earlier years."

thought that not a few men holding union cards are working in the region, but whether they can influence things is a question.

Coke production in the Connellsville and Lower Connellsville region in the week ended Feb. 12 was 140,010 tons, according to the Connellsville Courier. Furnace-oven production was 64,250 tons, an increase of 3,450 tons over the figure for the preceding week. Merchant-oven output was 75,760 tons, an advance of 100 tons.

N. F. Hopkins Discusses Economics of Coal Mining

The mining section of the Engineers Society of Western Pennsylvania closed the term of office of its last year's officials with a meeting at the William Penn Hotel in Pittsburgh on Jan. 25. N. F. Hopkins, consulting engineer, retired as chairman of the section after delivering a paper on the economics of coal mining. C. E. Leshner, executive vice-president of the Pittsburgh Coal Co., was elected chairman of the section for 1927. L. O. Longee, of G. S. Baton & Co., consulting engineers, was chosen vice-chairman. W. E. Fohl presided over the meeting.

Mr. Hopkins believes it entirely possible that coal will furnish the fuel for the automobile in 1960. The old-time coal companies are not responsible for the great overexpansion that took place as a result of the last war. It is rather the Fuel Administration that should be held accountable inasmuch as it encouraged an increase in a productive capacity which had already shown itself to be sufficiently developed to meet the nation's fuel requirements. The larger companies did not derive great profits during the days of bonanza prices because they adhered honorably to the fulfillment of their contracts. The "rank, green" outsiders who went into the coal business temporarily, on the other hand, made fortunes by gouging the public.

Better recovery is now being attained. In the old days, the speaker stated, operating companies were satisfied if they produced 1,000 tons per acre-foot. Today they are getting nearly 1,500 tons. Of all industrialists the mine operator derives least benefit from the taxes he pays. The opportunity to speed up production by installing machinery or increasing the productivity of that already in place is far smaller in mining than in ordinary lines of manufacture. In mining, under present conditions, the machinery cost of producing a ton of coal is approximately 5c.; but when loading machines are employed this item may rise to 30c. or more. In spite of this increase, however, the present trend is strongly toward the use of loading machines.

Coal Produced in Tennessee in 1925¹

(Exclusive of Product of Wagon Mines)

County	Net Tons				Value			Number of Employees				Average Number of Days Worked	Average Tons per Man per Day	
	Loaded at Mines for Shipment	Sold to Local Trade and Used by Employees	Used at Mines for Steam and Heat	Made Into Coke at Mines	Total Quantity	Average per Ton	Underground			Total				
							Miners, Loaders, and Shot-firers	Haulage and Track	All Others					
Anderson.....	892,437	7,274	9,192	.....	908,903	\$1,489,000	\$1.64	709	151	142	184	1,186	223	3.44
Campbell.....	976,787	52,941	23,923	.....	1,053,651	2,104,000	2.00	1,267	211	135	275	1,888	204	2.73
Claiborne.....	1,105,319	11,303	11,553	.....	1,128,175	2,098,000	1.86	850	222	166	214	1,452	193	4.02
Fentress.....	457,906	5,220	8,917	.....	472,043	726,000	1.54	289	47	34	70	440	265	4.04
Grundy.....	319,409	1,254	2,666	36,173	359,502	739,000	2.06	357	78	23	102	560	205	3.14
Hamilton.....	163,463	6,461	10,604	.....	180,528	424,000	2.35	241	50	35	64	390	214	2.16
Marion.....	260,683	4,317	5,687	.....	270,687	545,000	2.01	285	43	31	93	452	228	2.63
Morgan.....	338,407	3,941	11,052	35,590	388,990	655,000	1.68	412	97	137	82	728	237	2.26
Roane.....	300	3,185	3,278	127,498	134,261	356,000	2.65	89	87	47	34	257	297	1.76
Scott.....	143,780	10,235	4,746	.....	158,761	228,000	1.44	150	15	36	40	241	182	3.62
Other counties ²	655,588	10,803	12,552	1,702	680,645	1,221,000	1.79	650	115	98	147	1,010	182	3.71
Total.....	5,314,079	116,934	104,170	200,963	5,736,146	\$10,585,000	\$1.85	5,299	1,116	884	1,305	8,604	212	3.14

¹ The figures relate only to active mines of commercial size that produced coal in 1925. The number of such mines in Tennessee was 112 in 1925, 139 in 1924 and 191 in 1923. Methods of mining in 1925: The tonnage undercut by hand was 970,882; shot off the solid, 2,109,114; cut by machines, 2,646,943; not specified 9,207. Size classes of commercial mines in 1925: There were 4 mines in Class 1 B (200,000 to 500,000 tons) producing 18.5 per cent of the tonnage; 18 in Class 2

(100,000 to 200,000 tons) with 45.8 per cent; 15 in Class 3 (50,000 to 100,000 tons) with 16.6 per cent; 37 in Class 4 (10,000 to 50,000 tons) with 16.3 per cent; and 38 in Class 5 (less than 10,000 tons) producing 2.8 per cent.

² Bledsoe, Cumberland, Overton, Putnam, Rhea, Sequatchie and White. Compiled by U. S. Bureau of Mines.

Foreign Market And Export News

British Market Disappoints; Inquiries Gaining

London, England, Feb. 7.—Though inquiries are increasing the general condition of the British coal market is very unsatisfactory. Storms have interfered with shipments, stocks have been held up and a number of mines have reduced prices several shillings in order to ease the movement of cars. Prices are practically at rock bottom, for which reason the general view is that any further movement is bound to be upward.

The British Admiralty has contracted for 100,000 tons of bituminous large at 22s.@22s. 6d. f.o.b., delivery to extend over the year. Steps also have been taken by the Egyptian State Rys. to call for further tenders for 300,000 tons of locomotive coal.

Prices for South Wales coal are now competitive with foreign markets, and demand has improved as a result. Italian trade is a little better and the tonnage moving to South America is about up to the average. Best Admiralty large is 23s.@23s. 6d. f.o.b. and best steam smalls are 15s. 6d. Best Blyth steams are 16s. 6d.@17s.; unscreened bunkers, 17s. 6d.

Coal production during the week ended Feb. 5 was 5,267,200 tons, against 5,225,100 in the previous week. This establishes the highest weekly figure since full resumption of the coal mines. The number of miners employed is nearly up to the pre-strike total of 1,000,600, against 1,100,000 before the strike.

British coal exports to Germany in December amounted to 99,583 tons, against none in November. Nevertheless, the Ruhr authorities declare that England cannot make any really serious inroad on the German coal market before summer. The German coal market is weaker, however. Output of the Ruhr and its sales are declining, partly because imports of British coal have been resumed.

Belgian Trade Still Softer

Brussels, Belgium, Feb. 3.—This week the recessions recently noted in coal sales and rates were accentuated. Not only are sales diminishing but stocks are accumulating and price decline has a tendency to become general in industrial as well as in household fuels.

Two chief reasons may account for this tendency. These are the comparatively slight demand and the stress of foreign competition. Some special coals are free from this general trend but they are few in number.

Borinage coals are unchanged. Some contracts have been signed—grudgingly—at a reduction of 20 fr. from former levels. In the Charleroi basin also the tendency is downward as re-

gards both semi-bituminous and lower-grade coals. Some deals in patent fuels have been made at nominal prices.

Cokes likewise are on the decline. True, the Syndicate has pegged quotations, but some deals have been made at 230 fr. whereas the official figure is 250 fr.

Domestic fuels are progressively weakening. Deals are made at declining prices and stocks have begun to accumulate. Competition from abroad grows keener.

French Depression Grows; Small Cuts in Prices

Paris, France, Feb. 3.—The situation affecting French coals showed little outward change. Nevertheless, some slackening has been noted in the movement of industrial fuels and talk of "stocks" will soon be heard again. So far as household fuels are concerned the situation seems to grow worse and worse as winter draws to a close without cold weather. Middle class dealers without big yards see their storage places glutted but can only ask their suppliers—mines or importers—to reduce shipments.

The government, considering the numerous complaints received from industrial organizations protesting the retention of high fuel prices, has urged collieries to reduce their production. Such a reduction has been made but on low-grade coals it is so slight as to be negligible except in so far as it shows a willingness on the part of the producers to lower prices.

On and after Feb. 1 prices of washed and screened peas was reduced 5 fr.; unscreened and washed peas, 4 fr., and raw smalls 3 fr. On metallurgical and foundry coke a reduction of 6½ fr. brings the price of the former to 191 fr. and that of the latter to 211 fr. Ovoids have been reduced 26 fr. per ton, making their present price 180 fr. This represents a total reduction of 86 fr. since Jan. 1. A new reduction of 27½ fr. brings the price of briquets to 223 fr. This fuel has declined 65 fr. since the first of the year. The changes above noted were made by Nord and Pasde-Calais collieries.

In the Loire basin also the producers have made reductions. These amount to 3 per cent on low-grade coals, 15 fr. on cokes, making the prevailing prices 215@225 fr. for foundry and 204@210 fr. for metallurgical grades. Briquets are reduced 55 fr., the present price range being 235@261 fr.

The O.H.S. has reduced French coal prices in the western and southwestern coastal regions. These reductions amounted to 4 fr. on unscreened and washed peas and 3 fr. on smalls. Coke prices were not changed, as there was a reduction on Jan. 1.

It is not known how far the Saar collieries will go in the way of reductions. It is believed, however, that in-

dustrial grades from this region will be reduced 6 fr. within the first zone and 10 fr. in the second.

Only 102,000 tons were received from Wales last week. This shows that orders for foreign coal are declining, although British exporters are quoting attractive prices. Belgian offers are numerous and although official rates are well maintained what business is done is transacted far below them. From Germany also offers are plentiful and substantial reductions are obtained by those who really mean business.

At Rouen, Russian anthracites have steadily declined in price. Sales have not equalled expectations and importers have not renewed their contracts.

Within 24 hours after the O.R.C.A. had ceased its activities it was found necessary to maintain an organization to centralize orders placed in Germany and elsewhere. The exact part that will be played by the new organization has not yet been determined.

Export Clearances of Coal, Week Ended Feb. 17

FROM HAMPTON ROADS	
For United Kingdom:	Tons
Br. Str. Kewwickhall.....	7,015
For Cuba:	
Nor. Str. Haraldshaug, for Puerto Tarafa.....	2,508
Nor. Str. Sydfold, for Havana.....	3,461
For Barbados and Dutch Gulana:	
Nor. Str. Svartfond, for Bridgetown, 1,604 tons; for Paramaribo	1,430
For Egypt:	
Br. Str. City of Dunkirk, for Port Said.....	3,048
For France:	
Br. Str. Anglo Chilean, for Marselles.....	11,299
For West Africa:	
Ital. Str. Dello Terzo, for Dakar....	8,561
FROM BALTIMORE	
For Porto Rico:	
Am. Str. Gov. John Lind for Guanica	480
For United Kingdom:	
Br. Str. Aspleyhall for Queenstown, Ireland (for orders).....	7,732
For Cuba:	
Dan. Str. Jelling for Daiquiri.....	3,412

Hampton Roads Coal Dumpings*

(In Gross Tons)		
N. & W. Piers, Lamberts Pt.:	Feb. 10	Feb. 17
Tons dumped for week.....	159,207	199,598
Virginian Piers, Sewalls Pt.:		
Tons dumped for week.....	133,943	100,458
C. & O. Piers, Newport News:		
Tons dumped for week.....	190,039	172,734

*Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers protest.

Pier and Bunker Prices, Gross Tons

	PIERS	
	Feb. 10	Feb. 17†
Pool 1, New York....	\$5.75@\$.62.25	\$5.75@\$.62.00
Pool 9, New York....	5.10@ 5.50	5.10@ 5.50
Pool 10, New York....	4.90@ 5.25	4.90@ 5.25
Pool 11, New York....	4.50@ 5.00	4.50@ 5.00
Pool 9, Philadelphia..	5.25@ 5.45	5.25@ 5.45
Pool 10, Philadelphia..	5.00@ 5.20	4.90@ 5.20
Pool 11, Philadelphia..	4.50@ 4.90	4.45@ 4.85
Pool 1, Hamp. Roads.	4.75@ 4.90	4.75@ 4.90
Pool 2, Hamp. Roads.	4.50	4.50@ 4.65
Pool 3, Hamp. Roads.	3.90@ 4.00	3.90@ 4.00
Pools 5-6-7, Hamp. Rds.	4.00@ 4.10	4.20@ 4.30

BUNKERS	
Pool 1, New York....	\$6.00@\$.65.50 \$6.00@\$.65.25
Pool 9, New York....	5.35@ 5.75
Pool 10, New York....	5.15@ 5.50
Pool 11, New York....	4.75@ 5.25
Pool 9, Philadelphia..	5.50@ 5.70
Pool 10, Philadelphia..	5.25@ 5.45
Pool 11, Philadelphia..	4.75@ 5.15
Pool 1, Hamp. Roads.	4.90
Pool 2, Hamp. Roads.	4.65
Pools 5-6-7, Hamp. Rds.	4.10

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

Coming Meetings

American Society for Testing Materials will hold certain committee meetings, among which will be one on coal and coke, in conjunction with a four-day group meeting at the Bellevue-Stratford, Philadelphia, Pa., March 15-18. Secretary-treasurer, C. L. Warwick, 1315 Spruce St., Philadelphia, Pa.

National Retail Coal Merchants Association. Annual convention June 6-8, Detroit, Mich. Resident vice-president, Joseph E. O'Toole, Washington, D. C.

National Coal Association. Annual meeting June 15-17, at Edgewater Beach Hotel, Chicago, Ill. Assistant secretary, J. C. Crowe, Washington, D. C.

American Mining Congress. Annual convention May 16-20, Cincinnati, Ohio. Secretary, J. F. Callbreath, Munsey Bldg., Washington, D. C.

Colorado and New Mexico Coal Operators Association. Meeting at Boston Building, Denver, Colo., June 15. Secretary, F. O. Sandstrom, Denver, Colo.

New England Coal Dealers' Association. Annual meeting June 14-16, Hotel Griswold, New London, Conn. Executive secretary, E. I. Clark, Boston, Mass.

New York State Coal Merchants' Association. Ninth annual group meeting, Hotel Pennsylvania, New York City, March 15. Executive secretary, G. F. W. Woodside, Albany, N. Y.

Michigan-Ohio-Indiana Coal Association. Annual convention at Cedar Point, Ohio, June 28-30. Secretary, B. F. Nigh, Columbus, Ohio.

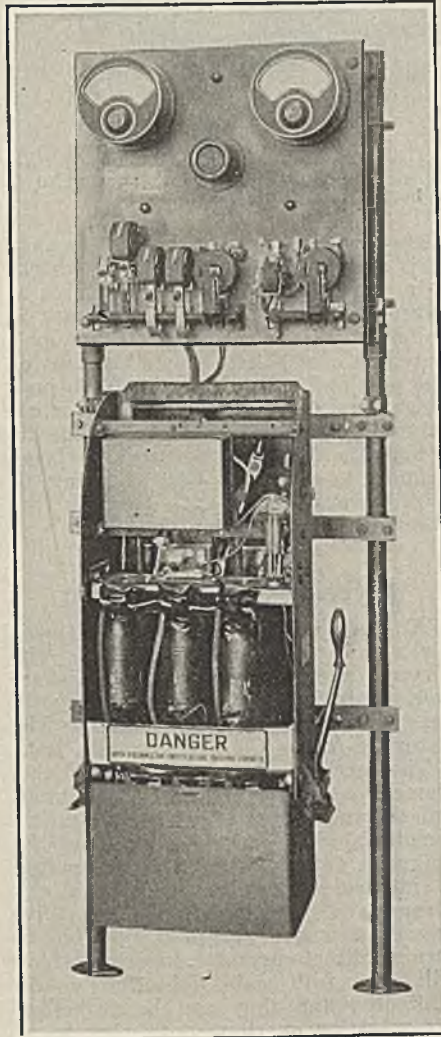
Association Activities

At the annual meeting of the Monongahela Coal Operators' Association held in Morgantown, W. Va., on Feb. 9, President John H. Jones of Pittsburgh, head of the Bertha Consumers Coal Co., together with all other officers was re-elected. The other officers are R. M. Davis, Gilbert-Davis Coal Co., vice-president; Frank Shriver, Chaplin Collieries Co., treasurer, and D. H. Pape, secretary. Directors re-elected were Howard Showalter, Continental Coal Co.; John F. Phillips, Delmar Coal Co.; W. E. Watson, Fairmont-Cleveland Coal Co.; E. H. Gilbert, Gilbert-Davis Coal Co.; Col. Everhart Bierer, Shriver Coal Co.; Joseph Pursglove, Pursglove Coal Mining Co.; Major S. D. Brady, Brady-Warner Coal Corp.; Charles Owens, Crown Hill Coal Co.; Whitney Warner, Warner Collieries Co.; W. H. Soper, Soper-Mitchell Coal Co. John C. Brydon of Baltimore, former president of the National Coal Association, spoke on property and compensation insurance for coal concerns and touched on all phases of coal mining insurance. The members discussed a national advertising campaign designed to increase sales of coal produced in the upper Monongahela valley.

New Equipment

Improvement in Synchronous Motor Control

It is claimed that the starting of synchronous motors has been made just as simple as the starting of a standard squirrel-cage motor by means of the hand compensator, being manufactured by the General Electric Co., Schenectady, N. Y. The opening and closing



Simplifies Starting of Synchronous Motors

This device is intended to facilitate the starting of synchronous motors by opening and closing the field circuits at the proper intervals.

of the field circuit at the correct moment in the starting cycle is timed automatically in this new compensator.

Ball-Bearing Motors

A line of ball-bearing squirrel-cage polyphase induction motors from 1/4 hp. to 50 hp., known as the type IM, has been developed by the B. F. Sturtevant Co., Hyde Park, Boston, Mass. The type IM motors are designed for constant speed and for voltages of 220, 440 and 550, also for 110 volts up to 15 hp.,

two or three phase, for standard frequencies of 25 and 60 cycles. These motors can also be furnished for 30, 40 or 50 cycle operation. The rotors are of the welded-end-ring type and are ground after the core is assembled so as to maintain a small and uniform air gap. The type of construction of this line of motors is such that the end shields can be removed without removing the ball bearings from the shafts as the caps are on the inside.—*Electrical World*.

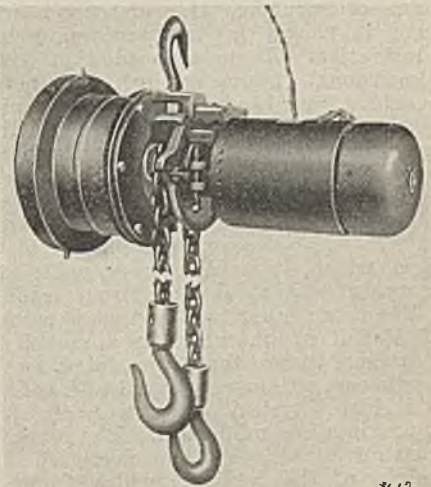
Novel Telephone System Uses Power Transmission Lines

One of the recent developments of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is duplex automatic telephony. This telephone equipment is designed so that communication may be established on a power system using the existing transmission lines as a channel of communication. The transmission line conductors serve as the connecting medium demanded in any system of telephony and take the place of the separate wires used in ordinary installations.

This means of communication, the methods employed in its operation, difficulties during development and the need for such a system are described in a booklet "Duplex Automatic High Frequency Telephony" published by the Westinghouse Electric & Mfg. Co.

Block Lowers by Gravity

Development and final marketing of a gravity-lowering chain block is announced by Herbert Morris, Inc., Buffalo, N. Y. It is stated that steel plate and forgings are used throughout in the construction of this device. The worm has a double thread and is turned from a solid steel shaft which is then



Automatic Brake Holds the Load

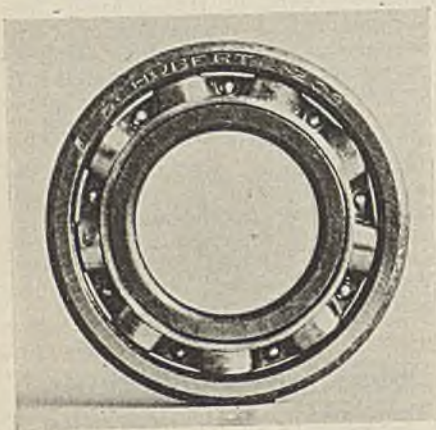
A centrifugal brake keeps the lowering speed within safe limits, and an automatic brake sustains the load when the hand chain is released.

heat-treated, hardened and ground. Ball bearings are used to take the end thrust on the worm shaft. The load-chain wheel and worm wheel are made in one piece. An automatic brake on the worm shaft sustains the load whenever the hand chain is released. A centrifugal brake keeps the lowering speed within safe limits when lowering by gravity. Over-lowering is prevented by an automatic stop which applies the brake as the hook reaches its lowest point. This unit is rated at 1 ton, but, it is stated, this allows for a considerable margin of safety.

For hoisting, only a light pull on the hand chain is necessary. To lower by gravity, a pull on the gravity lowering handle releases the automatic brake. The hand chain does not move when lowering by gravity. However, the load may be lowered by pulling on the hand chain, as is necessary when adjusting a load or when lowering a very short distance.

Novel Ball Bearings

A new type of deep-groove ball bearing in standard sizes with both double and single row, is announced by the McGill Metal Co., Valparaiso, Ind.



Deep-Groove Ball Bearing

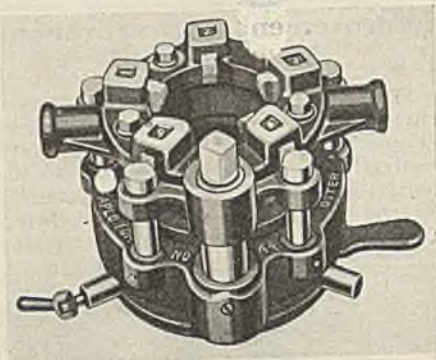
The retainer is made of McGill metal, a modified aluminum bronze. It is stated that on account of the high inherent heat conductivity of the bronze the tendency is to dissipate any heat developed.

These are to be marketed under the name of Schubert. One of these bearings is shown in the accompanying illustration. It is claimed that the dimensional tolerances of the new bearings have been reduced to approximately one-half of the standard S.A.E. tolerances and that particular attention has been given to the finish of the high-carbon, alloy-steel surfaces of the races and the balls. The bearings are of the deep-groove, non-filling, slot type, which, it is said, are capable of carrying both axial and thrust loads.

The retainer for the bearings is made of McGill metal, which is a modified aluminum bronze that, it is stated, may be die-cast within very small tolerances and has physical properties closely approximating mild steel. The manufacturer states that the decrease in weight of the retainer, which results from using this metal, is important, especially at high speed. It is stated also that the high inherent heat conductivity of the bronze tends to dissipate any heat developed.

Receding Diestocks

Development of its No. 44 new receding diestock for 2½-in. to 4-in. pipe inclusive, has been announced by The Oster Manufacturing Co., Cleveland, Ohio. This tool is ground and is furnished



Starts on the Pipe Easily

A lead screw protected by a chip shield starts the dies on the pipe and forces them along, thus saving time and helping to do a better job of threading.

nished with a ratchet handle so that, it is stated, one man can easily thread 4-in. pipe. Other operating features as given out by the manufacturer are as follows: A lead screw, protected by a patented chip shield, starts the dies on the pipe and pulls them along. Adjustment for deep or shallow threads is obtained by a rotary movement of the die head. The bore of the stock is large enough to allow a 4-in. coupling to pass through and thus permits the threading of short nipples.

Increases Meter Range

A new, heavy-duty meter element for use in d.-c. ammeters, d.-c. voltmeters and speed recorders where heavy damping is required has recently been placed on the market by The Esterline-Angus Co., Indianapolis, Ind.

The mechanical construction of this element is similar to that in the standard meter elements, but the magnetic circuit is made stronger, so that the magnetic field in which the coil moves is intense. This increases both the torque and the damping effect. Increase in torque makes it possible to furnish direct-current ammeters which will give full scale deflection on 75 millivolts, and they can be furnished for operation on shunts of either 75 or 100 millivolt drop. The damping effect is said to be such that current sufficient to bring the instrument to full scale can be applied instantaneously, without causing the pointer to overshoot.

Recent Patents

Cooling of Fuel Briquettes; 1,609,498. Albert L. Stillman, Plainfield, N. J., assignor to the General Fuel Briquette Corp., New York City. Dec. 7, 1926. Filed June 25, 1926; serial No. 118,599.

Mining Machine; 1,609,624. Morris P. Holmes, Claremont, N. H., assignor to Sullivan Machinery Co., Chicago, Ill. Dec. 7, 1926. Filed June 17, 1921; serial No. 478,396. Renewed March 26, 1925.

Blasting Method and Apparatus; 1,610,274. Dent Ferrell, Arthur W. Helmholtz and John H. Crawford, Harrisburg, Ill., assignors to Safety Pressure Mining & Equipment Co., Harrisburg, Ill. Dec. 14, 1926. Filed Feb. 11, 1925; serial No. 8,328. Renewed Dec. 19, 1925.

Pulverizing Apparatus; 1,610,345. W. C. Williams, Decatur, Ill., assignor to McLaughlin Coal Reduction Co., Decatur, Ill. Dec. 14, 1926. Filed April 10, 1922; serial No. 551,012.

Hub for Fan Blowers; 1,611,547. Allen O. Miller, Seattle, Wash. Dec. 21, 1926. Filed Jan. 31, 1925; serial No. 6,025.

Cutter Head for Mining Machines; 1,612,066. Charles W. Shanaberger, Indiana, Pa. Dec. 28, 1926. Filed March 17, 1925; serial No. 16,224.

Cutter; 1,612,288. Morris P. Holmes, Claremont, N. H., assignor to Sullivan Machinery Co., Chicago, Ill. Dec. 28, 1926. Filed Sept. 26, 1921; serial No. 503,345.

Coal-Washing Jig; 1,612,586. U. S. James, assignor to James Ore Concentrator Co., Newark, N. J. Dec. 28, 1926. Filed Oct. 17, 1921; serial No. 508,155.

Apparatus for Drawing Gas from Mines; 1,612,599. Lawrence Auerbach and Louis Kover, Pageton, W. Va. Dec. 28, 1926. Filed Dec. 27, 1924; serial No. 758,389.

Miner's Lamp; 1,612,694. Fred R. Belt, Chicago, Ill., assignor to Fred R. Belt Co., Chicago, Ill. Dec. 28, 1926. Filed May 2, 1923; serial No. 636,110.

Miner's Acetylene Lamp; 1,612,695. Fred R. Belt, Chicago, Ill., assignor to Fred R. Belt Co., Chicago, Ill. Dec. 28, 1926. Filed May 6, 1925; serial No. 28,287.

Coal-Cutting Link; 1,612,789. James F. Dillon, Bowdill, Ohio, assignor one-half to Harold E. Snyder, Massillon, Ohio, and one-half to N. K. Bowman, Bowdill, Ohio. Dec. 28, 1926. Filed Sept. 20, 1923; serial No. 663,884.

Treatment of Boiler Water; 1,613,701. Ralph E. Hall, Pittsburgh, Pa., assignor to John M. Hopwood, Dormont Borough, Pa. Jan. 11, 1927. Filed June 6, 1924; serial No. 718,322.

Hoisting Apparatus for Collieries; 1,613,786. Donald F. Brown and Frederick J. Raymer, London, Eng., assignors to the Union Switch & Signal Co., Swissvale, Pa. Jan. 11, 1927. Filed Sept. 23, 1925; serial No. 58,103.

Mining Machine; 1,614,034. Morris P. Holmes, Claremont, N. H., assignor to Sullivan Machinery Co., Chicago, Ill. Jan. 11, 1927. Filed Oct. 22, 1924; serial No. 745,252.

Process and Apparatus for Briquetting; 1,614,095. Ellsworth B. Zwoyer, Perth Amboy, N. J., assignor to the General Fuel Briquette Corp., New York City. Jan. 11, 1927. Filed June 6, 1925; serial No. 35,496.

Coal Cutter; 1,614,182. John C. Brackett, New York City, assignor to the Ingersoll-Rand Co., New York City. Jan. 11, 1927. Filed March 31, 1926; serial No. 98,739.

Cutting Machine; 1,614,287. Kenneth Davis, St. Benedict, Pa., assignor to Rembrandt Peale, New York. Jan. 11, 1927. Filed July 17, 1920; serial No. 397,050.