

COAL AGE

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Dangerous Legislative Principles

THE SENATE COMMITTEE on interstate commerce has submitted a favorable report upon a bill to enlarge the membership of the Interstate Commerce Commission and to reorganize it upon a basis of mandatory regional representation. In pursuance of this latter aim, the bill (S. 2808) splits the country into seven territorial groups. One to three members of the Commission—the number varying with the size of the group and its commercial importance—would be appointed from each group. The total membership of the Commission would be increased from eleven to thirteen.

Proponents of the measure seek to justify such a regional reorganization on the ground that "the very structure of our government is based upon local self-government and local representation in the general government." They say that we should "bring together in the Commission as near as may be a personal knowledge of the transportation conditions and problems that exist in the different sections of the country." This from a committee that only recently refused to indorse a Presidential nomination to the Commission because the appointee had been a railroad director ought to provoke tears from those who hold consistency the most virtuous of vices.

Were inconsistency the only defect it might well be overlooked. But objection strikes deeper than that. The Congressional idea of local interests has been effectively exemplified in the log-rolling rivers and harbors appropriations bills in days gone by and in unanimous-consent action upon measures to flatter local pride with federal buildings far beyond community needs. The injection of anything akin to that idea in railroad regulation would be a national calamity.

The fear that a regional reorganization would open the way to a consideration of disputes from the standpoint of sectional desires instead of the national good is not as fanciful as it might seem. Since western Pennsylvania and Ohio were denied the relief they sought in the decision on cargo lake rates handed down last year, the energetic junior Senator from Pennsylvania has been outspoken in his criticism of the Commission and in his demand that a son of the Keystone State should sit on the rate regulating board. Had there been a Pennsylvanian on the Commission, is the implication, the decision would have been different. Of course, this ignores the fact that a Kentuckian opposed dismissing the complaints, but it illustrates what some Congressmen, at least, expect from regional representation.

No industry is more dependent upon transportation than the coal industry. To no industry are rate relationships between competing groups of mines more vital. Whether the Commission was right or wrong in the *Lake Cargo Coal cases* is beside this issue. What the industry needs, what the railroads need, what the country needs, is a tribunal which will decide questions in

the light of what it believes is just to all concerned. To break down the Commission into groups acting as watch-dogs over the private or sectional interests of individuals or communities would invite public distrust.

The Interstate Commerce Commission has won and held public confidence because the public felt that the Commissioners had divested themselves of all personal, partisan or sectional interests. Indeed, where there has been any suggestion that private opinion or past associations might color impartial judgment, individual Commissioners have refrained from participating in the decision. To insist upon such a reorganization as now proposed would be a backward step.

Danger, But No Signal

ACCUMULATING evidence that mechanical sparks and sparks resulting from static electricity may ignite mine gas further emphasizes the plain truth that the only sure way to prevent an explosion is to keep an explosive mixture from accumulating. The leaving open of a mine door and the resulting accumulation of gas has been, apparently, the underlying cause of a number of explosions.

The use of mine doors without an alarm or signal to indicate when they have been left open may be compared to operating a single-track railroad without block signals. Changing the single-track to a double-track road is the surest way of preventing head-on collisions, but when traffic does not permit of this expenditure, the installation of a signal system goes a long way toward eliminating the danger.

The same with the mine door. The safest way is to supplant the door by building an overcast, but this is not always possible or practicable. Then why not equip every door with a signal which has an indicator at some point where there is a man on constant duty. Not an unreliable open-circuit signal, but an "honest-to-goodness" closed-circuit signal such as used on railway or fire-alarm systems.

There are many variations and possibilities as to the arrangement. Cost is about the only limiting factor, and this can be held to a figure which is relatively insignificant compared to the risk eliminated. The time is sure to come when chance of a dangerous suspension of ventilation because of such a simple cause as a door being left open unnoticed will be practically eliminated.

Competition and Modern Merchandising

THE COAL MERCHANT or retail distributor is confronted with the same or similar problems encountered by other merchants. His commodity is an exceedingly useful one under certain circumstances and is in demand at certain times. Nobody buys it, however, except as a necessity. It falls into the class of commodities characterized by a large seasonal and usually a smaller continuing demand. Demand is difficult

to gage beforehand. Supplies are necessary and the amount of these supplies is related to demand, proximity of supply and reliability of transportation. Coal merchants like other merchants seek to avoid over-extension in stocks on hand. Unlike other merchants they do not plan a selling campaign nor do they seek to sign up their customers in advance of requirements except in those instances where the coal merchant has studied modern methods of selling. Nevertheless, many of the more active coal distributors advertise sparingly and but relatively few follow up this initial concession to competition.

The ancient business policy of placing the goods upon the shelf, in this case the coal in the bin, hanging a firm name above the door and nailing a board carrying the word "office" above a desk in a corner, or a little room at the side, and installing a telephone, rules in the coal trade far more than it should. In contrast with this the live merchant has not only his delivery facilities well organized but he has analyzed the possibilities of the business and has classified all of his probable clients within economic distance of his supply depot. His classification dissects the business into large users or industries and steam power plants, apartment houses and office buildings, and buyers of relatively small quantities. His card index supplies all of the necessary information about each prospective customer. The total annual requirement which represents his theoretical market is estimated and his next objective is to obtain as large a proportion of this market as possible consistent with good collections. Necessarily he will seek to avoid "bad accounts" and "slow payers." The activities of his competitors will be studied and where one or more are quite successful in their business, the reasons for this success will be investigated as far as practicable. Out of this survey of possibilities an annual selling campaign can be intelligently planned and an adequate control of selling expense established.

Modern business is aggressive and seeks the buyer in the most direct way. Either the coal dealer undertakes to be his own salesman or he employs one or more salesmen who not only have "selling" experience but who also know something about coal, combustion and the ordinary difficulties which are experienced in using solid fuel for specific purposes. Back of all salesmanship is a certain amount of service for, unless the salesman has something to offer besides his commodity, he will have nothing to distinguish his solicitation from that of every other salesman. Any service which he can give to the buyer, as in the selection of the best grade of coal for the specific conditions, or in pointing out better ways of stoking that will result in greater efficiency, will, as a rule, be appreciated and remembered. Good-will is greatly developed through resourceful salesmen.

Another element in selling is the co-ordination of sales with a delivery campaign. Low-cost distribution is obtained when the trucks and wagons are continuously employed. With careful planning it is possible to accomplish this over a considerable period. The salesmen are therefore acquainted with the plan for low-cost delivery and schedule the delivery of their orders in accordance with this plan.

In many communities especially the smaller ones, the aggregate coal business is not sufficient to saturate the labor employed and the trucking facilities available. It is for this reason that the coal dealer frequently

branches out into the building materials line and thus reduces overhead and operating costs during a period when the coal business is slack.

Existence of individual coal dealers is not alone determined by competition but largely by intelligent analyses of local situations and an aggressive policy having as its fundamental purpose the accumulation of good will and satisfactory service back of the firm's name.

Coal Land a Poor Investment

AT SEVEN PER CENT compound interest, money doubles itself about every ten years. When that investment is on land and taxes have to be paid, ranging in Pennsylvania bituminous regions from 15c. per acre in Center County to \$46.59 per acre in Fayette County, as the Coal & Coke Committee of the American Institute of Mining & Metallurgical Engineers has shown, that doubling occurs much more speedily. The tax itself may be equivalent to 3 per cent. In consequence it does not profit any company to load itself with large reserves. All it needs is enough land to complete the life of its present operations.

Let some one else carry the load. If there were not so many volunteering to do it, the price of coal lands would decline, but whether it will or will not, it is better to purchase coal lands when one desires to work them and not to carry them year after year. Many of the larger corporations are "land poor" and will never get out of their more distant idle lands the money they are pouring into them. Unfortunately, to many operators land is like the bear of the story: they are as afraid to let go as to hold on to it.

An operator a few years ago was ready to join a combine then in process of formation. This new corporation *in posse* had no large land reserves, and the operator mentioned regarding it as essential that his virgin land should be accepted and at his own high figure. But the suggested combine hesitated to take the land at his price and consequently refused to take the mines also. As a result the combine failed to materialize. In a short while the operator with the magnificent land reserves went to the wall. He had loaded himself down too heavily with his virgin territory.

It is better to sell coal land at a slight loss than to carry it indefinitely as a continual burden on the company's exchequer.

Fire Extinguishers in Mines

THE FACTS thus far known regarding the Horning mine disaster suggest the necessity for adequate fire-fighting equipment in coal mines. In its earliest stages the mine fire, which later caused the explosion, was of no consequence so far as the intensity of the flame was concerned. Even so the jackets and coats which were utilized in attempts by the attendants to beat out the fire were no match for the flame and merely served to chase it from one spot to another, on and under the cutting machine which caused the fire. To all appearances this fire could have been easily extinguished by a hand extinguisher.

An extinguisher may not be needed often; but when it is—it is needed badly. Some day mine laws may be enacted compelling the installation of a small fire extinguisher on cutting machines and locomotives and larger portable units at strategic points.

Lake Cargo Rate Case Raises Big Economic Issues Between Competing Fields

Interstate Commerce Commission Opens Way to Renewal of Battle of Northern and Southern Districts for Tonnage Mastery

By Sydney A. Hale
Special Contributor, *Coal Age*



Car Dumper at Ashtabula Harbor

A FORTNIGHT AGO word came from Washington that the Interstate Commerce Commission had reopened the question of rates on lake cargo coal. In a few lines it was stated that the Commission had taken favorable action upon the petitions of western Pennsylvania producers and their allies for a reconsideration of its decision of last July in *Lake Cargo Coal Rates, 1925*, 101 I.C.C. 513.

Behind this simple announcement, however, lies a bitter struggle between Pennsylvania, Ohio and northern West Virginia, on the one hand, and southern West Virginia and eastern Kentucky, on the other, for the lion's share of a business which has averaged 23,750,000 net tons per annum for the past fifteen years and which at times has approached the 30,000,000-ton mark. The tonnage is large enough to appeal to any producing district. Moving during the months of the year when production generally is caught in the valley of the seasonal rhythm, the lake trade is doubly attractive.

Thirty years ago this business, then totaling 4,071,157 tons, was the exclusive possession of the northern district—i.e., Pennsylvania, Ohio and the Fairmont field of West Virginia. In 1923, when the total lake cargo shipments aggregated 29,839,918 tons, these same districts controlled only 62.61 per cent of the tonnage.

The records for 1924 and 1925 "show so great a further loss of lake cargo business by these complaining districts," said counsel for the Pittsburgh group in his appeal to the Commission, "as to justify the assertion that they are now practically out of this market."

BUSINESS SHOWS TREMENDOUS GROWTH

The tremendous growth in the total volume of cargo coal shipped up the lakes to the Northwest since 1896 has pushed up actual tonnages from all fields, but some tonnage records are slipping fast. Western Pennsylvania and southern Ohio are the hardest hit. The Hocking district actually shipped less coal to the lakes in 1923 than it did in 1901. The Pittsburgh district, which furnished 65.54 per cent of the lake cargo tonnage in 1896, furnished only 26.74 per cent in 1923, and, as before suggested, figures for 1924 and 1925 would show up still more unfavorably. The share of the No. 8 Ohio and Cambridge fields, on the other hand, from 5.15 per cent to 15.66 per cent in 1923.

Protesting producers from the northern districts insist that their failure to maintain their grip upon the lake business to the exclusion of the southern fields is due primarily to the rate adjustments governing the transportation of coal from the Appalachian region to

Table I—Origin of Coal Cargo Shipments to Great Lakes: 1901-1923

| Year | Ohio | | | | West Virginia | | | | Kentucky | Per Cent | *Total Tons | | |
|------|-----------------|----------|--------------|----------|--------------------------|----------|---------------|----------|-----------|----------|-------------|---------------------|------------|
| | Pittsburgh Tons | Per Cent | Hocking Tons | Per Cent | No. 8 and Cambridge Tons | Per Cent | Fairmont Tons | Per Cent | | | | Kenova-Thacker Tons | Per Cent |
| 1901 | 3,197,748 | 55.50 | 1,513,646 | 26.27 | 274,554 | 4.77 | 739,011 | 12.83 | | | | | 5,761,416 |
| 1902 | 4,008,899 | 54.12 | 1,966,795 | 26.55 | 439,424 | 5.93 | 912,401 | 12.32 | | | | | 7,407,490 |
| 1903 | 5,460,215 | 56.64 | 1,631,485 | 16.93 | 577,509 | 5.99 | 1,119,288 | 11.61 | | | | | 9,639,934 |
| 1904 | 5,507,775 | 59.43 | 1,645,177 | 17.75 | 332,654 | 3.59 | 975,309 | 10.52 | | | | | 9,267,571 |
| 1905 | 6,249,054 | 59.79 | 1,312,428 | 12.56 | 547,197 | 5.24 | 884,407 | 8.46 | | | | | 10,451,496 |
| 1906 | 8,013,970 | 60.00 | 1,361,205 | 10.19 | 966,731 | 7.24 | 1,208,392 | 9.04 | | | | | 13,356,825 |
| 1907 | 9,270,775 | 55.11 | 2,125,692 | 12.64 | 1,577,630 | 9.38 | 1,321,299 | 7.86 | 1,723,460 | 10.24 | 204,746 | 1.22 | 16,821,695 |
| 1908 | 7,529,632 | 51.39 | 1,378,465 | 9.41 | 1,817,463 | 12.40 | 1,226,329 | 8.37 | 2,165,955 | 14.79 | 128,865 | 0.88 | 14,650,305 |
| 1909 | 7,842,971 | 51.09 | 1,999,670 | 7.82 | 1,650,890 | 10.75 | 1,277,011 | 8.32 | 2,017,767 | 13.15 | 1,034,544 | 6.74 | 15,350,559 |
| 1910 | 10,197,127 | 50.31 | 1,464,684 | 7.23 | 2,190,492 | 10.81 | 1,611,005 | 7.95 | 2,935,634 | 14.48 | 1,397,155 | 6.89 | 20,267,249 |
| 1911 | 10,071,930 | 46.57 | 1,370,925 | 6.34 | 2,598,943 | 12.01 | 1,784,279 | 8.25 | 3,488,151 | 16.13 | 1,963,409 | 9.08 | 21,310,004 |
| 1912 | 9,893,870 | 46.43 | 1,223,249 | 5.74 | 3,062,175 | 14.37 | 1,686,729 | 7.92 | 2,580,206 | 12.11 | 2,611,452 | 12.25 | 26,651 |
| 1913 | 12,261,334 | 45.70 | 1,397,718 | 5.21 | 4,022,483 | 14.99 | 2,161,523 | 8.06 | 3,543,969 | 13.21 | 2,486,454 | 9.27 | 397,120 |
| 1914 | 10,216,126 | 47.48 | 734,456 | 3.43 | 495,658 | 2.32 | 2,214,672 | 10.36 | 4,093,109 | 19.14 | 2,294,734 | 10.73 | 858,827 |
| 1915 | 9,350,166 | 43.48 | 315,846 | 1.47 | 1,993,303 | 9.27 | 2,030,408 | 9.44 | 4,131,188 | 19.21 | 2,514,347 | 11.69 | 701,174 |
| 1916 | 8,672,829 | 35.12 | 827,906 | 3.35 | 4,326,344 | 17.52 | 1,617,945 | 6.55 | 5,088,254 | 20.60 | 2,986,218 | 12.10 | 919,758 |
| 1917 | 6,659,447 | 24.82 | 2,907,625 | 10.84 | 4,613,891 | 17.20 | 1,029,201 | 3.84 | 6,074,183 | 22.64 | 3,154,270 | 11.75 | 1,188,766 |
| 1918 | 7,371,448 | 26.18 | 3,216,221 | 11.42 | 5,930,972 | 21.07 | 1,317,284 | 4.68 | 5,826,384 | 20.69 | 2,011,715 | 7.15 | 1,314,554 |
| 1919 | 6,512,051 | 29.93 | 1,072,424 | 4.93 | 4,611,734 | 21.20 | 828,383 | 3.81 | 3,707,875 | 17.04 | 2,851,164 | 13.11 | 1,425,466 |
| 1920 | 6,203,444 | 27.71 | 2,575,086 | 11.50 | 4,577,799 | 20.45 | 1,284,041 | 5.73 | 3,164,591 | 14.13 | 1,667,816 | 7.45 | 1,375,323 |
| 1921 | 5,907,489 | 26.42 | 668,577 | 2.99 | 4,660,551 | 20.84 | 1,014,514 | 4.54 | 3,878,047 | 17.34 | 2,639,449 | 11.80 | 2,624,194 |
| 1922 | 4,002,214 | 21.54 | 1,288,269 | 6.93 | 1,902,859 | 10.24 | 1,369,969 | 7.38 | 3,433,213 | 18.48 | 1,937,216 | 10.43 | 3,091,089 |
| 1923 | 7,977,903 | 26.74 | 919,927 | 3.08 | 4,671,174 | 15.66 | 3,169,505 | 10.62 | 4,964,672 | 16.64 | 2,894,073 | 9.70 | 3,297,476 |

* Includes tonnage of minor lake shipping districts analyzed in Table II.

TABLE II—Lake Coal Cargo Shipments from Minor Producing Districts
(In Net Tons)

| Year | Pennsylvania, Excluding Pittsburgh | Northern Ohio | Cumberland-Piedmont | Other Districts* | Per Cent of Total† |
|------|------------------------------------|---------------|---------------------|------------------|--------------------|
| 1901 | | 36,457 | | | 0.63 |
| 1902 | | 79,971 | | | 1.08 |
| 1903 | | 63,654 | 50,093 | 737,690 | 8.83 |
| 1904 | | 10,941 | | 795,715 | 8.71 |
| 1905 | 227,356 | 39,627 | 9,733 | 1,181,694 | 13.95 |
| 1906 | 241,504 | 81,445 | 49,224 | 1,434,354 | 13.55 |
| 1907 | 311,618 | 192,228 | 94,247 | | 3.53 |
| 1908 | 236,928 | 89,387 | 77,281 | | 2.76 |
| 1909 | 212,518 | 67,911 | 39,428 | | 2.08 |
| 1910 | 245,116 | 112,786 | 102,219 | | 2.27 |
| 1911 | 155,877 | 140,126 | 43,545 | | 1.57 |
| 1912 | 158,719 | 32,213 | 34,750 | | 1.05 |
| 1913 | 301,179 | 225,826 | 32,741 | | 2.08 |
| 1914 | 423,609 | 16,465 | 35,961 | | 2.23 |
| 1915 | 269,535 | 175,178 | 26,229 | | 2.18 |
| 1916 | 94,709 | 147,723 | 11,250 | | 1.03 |
| 1917 | 889,369 | 299,880 | 6,307 | 5,817 | 4.48 |
| 1918 | 778,285 | 389,541 | | 97 | 4.14 |
| 1919 | 567,784 | 155,646 | 8,642 | 14,700 | 3.43 |
| 1920 | 1,066,989 | 453,829 | 21,459 | 277 | 6.89 |
| 1921 | 754,001 | 208,994 | 4,352 | 3,731 | 4.34 |
| 1922 | 1,288,695 | 194,608 | 676 | 68,865 | 8.36 |
| 1923 | 1,582,102 | 361,567 | 796 | 723 | 6.51 |

* For 1903 to 1906 inclusive the figures represent tonnages shipped from southern West Virginia; during that period (see Table I) shipments from the Kanawha and Kenova-Thacker and the New River-Pocahontas districts were not reported separately. From 1907 to 1923 the figures in this column cover shipments from Virginia and Tennessee.

† The figures in this column are the percentage of the total lake cargo shipments shown in Table I which the aggregate shipments covered in Table II represents.

the lower lake ports for transshipment. They insist that the rates they are charged are *per se* unreasonable and that the relationship between those rates and the charges in effect from the southern regions unduly prefer the latter and unjustly discriminate against them.

These questions are not new. They have been before the Interstate Commerce Commission in one form or another since 1912. Their importance, however, has grown because the encroachment of the southern fields upon consuming territory served by the northern districts has been increasing year by year. Southern West Virginia is pushing east and west; eastern Kentucky is winning new markets west and south. These districts stand as a barrier to southern expansion of the northern fields. They contest with Ohio and Pennsylvania for tonnage in the Northwest.

In the Middle West, Ohio and Pennsylvania must battle with Illinois and Indiana as well as with southern West Virginia and eastern Kentucky. Illinois is thoroughly alive to this latter competition. Coal-producing interests of that state intervened in *Lake Cargo Coal Rates, 1925*, with the generous proposal that there be no reduction in the rates from the Pittsburgh and Ohio fields, but that the differentials over those rates from the southern districts be widened.

LABOR INTENSIFIES CONDITIONS

In recent years, the competitive situation between the northern and eastern districts of the Appalachian region has been further intensified by changes in the labor status of these districts. Ohio and western Pennsylvania are predominately union; southern West Virginia is predominately non-union; eastern Kentucky, too, has been free from dictatorship by the United Mine Workers of America. This is a phase of the situation which has been little stressed—particularly by the politicians who have injected themselves into the proceedings since the Interstate Commerce Commission dismissed the complaints of the northern districts last summer.

The mines that have lake cargo coal rates are divided

into fifty-three originating districts, taking twenty-one different rates, ranging from \$1.34 to \$2.88 per ton. Many of these districts, however, “participate slightly, if at all, in this traffic. During the five-year period 1910-1914 only eighteen districts, and during 1923, only twenty-eight districts, shipped lake cargo coal. In 1923 sixteen districts shipped approximately 95 per cent of the total.” These districts were the Middle, No. 8, Cambridge, Hocking and Pomeroy districts in Ohio; the Freeport, Pittsburgh and Connellsville districts in Pennsylvania; the Fairmont, Kanawha, Tug River, New River and Pocahontas districts in West Virginia and the Big Sandy, Hazard and Harlan districts in Kentucky. The controlling base rates are \$1.63 from the No. 8 and Cambridge fields, \$1.66 from Pittsburgh, \$1.81 from Fairmont, \$1.91 from the southern West Virginia and eastern Kentucky high-volatile districts and \$2.06 from Pocahontas and New River. The history of these rates is summarized in Table III.

TRIED TO CUT SOUTHERN RATES

The first clash of the conflicting interests came to a head before the Commission in 1912. Late in 1910 and during the first quarter of the following year the Chesapeake & Ohio, Baltimore & Ohio, Kanawha & Michigan and Norfolk & Western railroads, stirred to action by complaints of the Pittsburgh and Ohio No. 8 fields that existing rates unduly preferred West Virginia, filed tariffs advancing those rates. The Baltimore & Ohio proposed to increase its Fairmont rate from 96.75c. to \$1; the other lines proposed to advance Kanawha and Kenova-Thacker from 97c. to \$1.0625 and Pocahontas-New River from \$1.12 to \$1.2175.

The Commission suspended the tariffs on protests of affected shippers. Upon hearing, the Norfolk & Western assumed the burden of justifying the increase. The Commission, in *Advances in Coal Rates by C. & O. Ry. Co.*, 22, I.C.C. 604, held that the Norfolk & Western was entitled to the increase from the Thacker and Pocahontas districts, but that the other three roads and their connections had not made out a case. In order to preserve established relationships, the Norfolk & Western canceled the tariffs naming the higher rates and restored its old charges.

Simultaneously the Commission announced its deci-

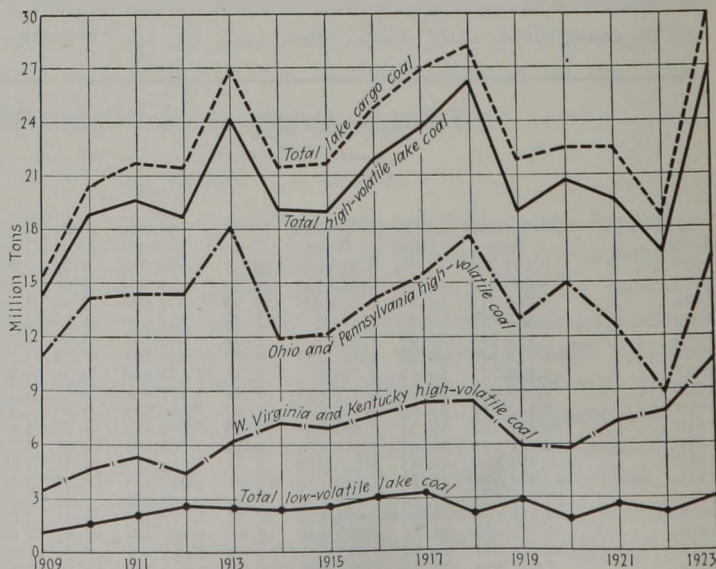


Fig. 1—Lake Cargo Coal Shipments: 1909-1923

This chart, based on the data incorporated in Table I and adapted from an exhibit filed in *Lake Cargo Coal Rates, 1925*, shows graphically the trend of lake shipments from the high- and low-volatile fields.

sion in the first formal complaint specifically attacking the rates from the Pittsburgh district to the lakes: *John W. Boileau vs. P. & L. R.R. Co.*, 22 I.C.C. 640. The order in this case directed the defendant carrier to reduce its rate on cargo coal to Ashtabula Harbor from 88 to 78c. per ton. The finding was based largely upon a study of the costs of transportation—one of the pioneering excursions of the Commission into that field of railroad economics. In commenting upon the complainant's contention that the rates attacked were unreasonable as compared with those in effect from West Virginia, the Commission declared that the evidence indicated that the rate complained of—which had fluctuated between 70c. and \$1 from 1887 and 1900—had been raised step by step for the purpose of permitting competing coal fields to participate.

A petition for a modification of the order was filed. This petition asked for a further reduction in the Pittsburgh rate and the establishment of a differential in favor of Pittsburgh against competing West Virginia districts. The Commission declined to modify its original order, holding that such modification would mean the fixing of minimum rates on West Virginia

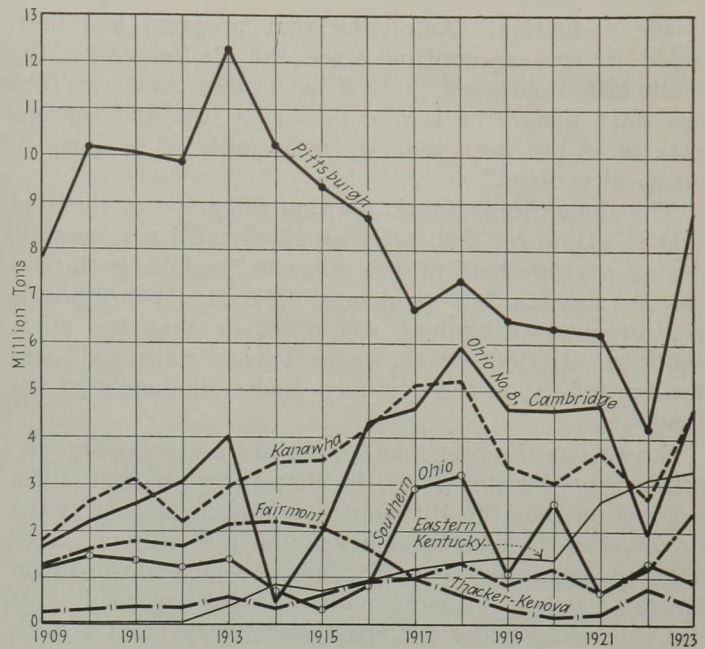


Fig. 2—High-Volatile Lake Cargo Shipments

This chart, a companion to Fig. 1, is a study in the trend of high-volatile coal shipments.

TABLE III—Base Rates on Lake Cargo Coal Traffic

(Rates in Cents per Net Ton)

| In effect | From | | | | |
|--------------------|------------------------------|------------------------|----------------------|-------------------------------|--------------------------------------|
| | No. 8— Cambridge, Ohio | Pittsburgh District | Fairmont District | Southern High- Volatile | West Virginia Low- Volatile |
| 1906..... | 80 | 83 | 91½ | 92 | 112 |
| 1911..... | 85 | 88 | 96½ | 97 | 112 |
| May, 1912..... | 75 | 78 | 90 | 97 | 112 |
| Apr. 16, 1917..... | 90 | 93 | 105 | 112 | 127 |
| Aug. 13, 1917..... | 90 | 93 | 108 | 118 | 133 |
| June 25, 1918..... | 127 | 130 | 145 | 155† | 170 |
| Aug. 26, 1920..... | 183 | 186 | 201 | 211‡ | 226§ |
| July 1, 1922..... | 163 | 166 | 181 | 191 | 206 |
| * Proposed Rates: | | | | | |
| A..... | 142 | 145 | 175 | 198 | 209 |
| B..... | 123 | 126 | 160 | 191 | 206 |
| Current Rates..... | 163 | 166 | 181 | 191 | 206 |

* The first set of rates (Group A) was proposed by the examiners for the Interstate Commerce Commission and submitted in their tentative opinion in *Lake Cargo Coal Rates, 1925*. The second set (Group B) was suggested by the Pennsylvania and Ohio complainants in that case. The decision of the Commission, however, refused to change the existing rate structure.

† Also applicable to the Harlan, Hazard and McRoberts districts in eastern Kentucky. Since that date these districts have been on the same rate basis as southern West Virginia.

‡ South Jellico (Tennessee) group added.

§ Pocohontas-New River basis made applicable to Stonega.

traffic: *Boileau vs. P. & L. E. R.R. Co.*, 124 I.C.C. 129. Under the interstate commerce law then in effect the Commission's rate-fixing power was limited to establishing maximum rates.

In summing up its conclusions, however, the Commission made a statement with respect to the reasonableness of the Pittsburgh rate which has risen to plague it in later proceedings. The Commission said:

From the point of view of the specific cost of doing this particular business, the rate is still too high; but, as we have said before, cost is only one of the elements entering into a rate. When we consider the coal rates from all the fields which will be affected by this change in the Pittsburgh rate, the disturbance in established differentials, the possible deflection of the currents of coal trade, and its effect upon operators elsewhere, the effect upon the carriers directly involved and the indirect effect upon other carriers, and all the other valid considerations, we are forced to the conclusion that a rate lower than this would not be just and reasonable under the conditions disclosed by this record.

Four years later the Pittsburgh producers again attacked the lake cargo rates. The Commission, in an investigation instituted on its own motion, *Lake Cargo Coal Rates*, 46 I.C.C. 159, declined to pass upon the intrinsic reasonableness of the rates because of the abnormal conditions brought about by the entrance of

the United States into the World War. The Commission did, however, prescribe certain district relationships, which became effective on Aug. 13, 1917, four months after an increase of 15c. per ton had been made on all cargo rates.

In *Lake Cargo Coal Rates, 1925*, the old issues again were raised. Operators in Pittsburgh, Panhandle, Cambridge and Ohio No. 8 districts alleged that their rates were unjust and unreasonable and discriminated against them. Southern Ohio intervened to support that position, with the reservation that the rates from the southern Ohio fields should be continued on a parity with No. 8 and Cambridge rates. Fairmont charged that northern West Virginia rates were unduly high when compared with those in effect from the Pittsburgh and Ohio districts.

DRASTIC REVISION DISALLOWED

The examiners who heard the evidence recommended a revision changing every rate in effect on lake cargo coal. The proposed readjustment, summarized in Table IV, was sharply attacked by all parties to the record and was disregarded by the Commission. A similar fate awaited the elaborate costs studies upon which the Pennsylvania-Ohio complaints based their plea for

TABLE IV—A Rate Readjustment That Failed

Rates (in Cents per Ton) Suggested by Interstate Commerce Commission Examiners and Rates Now in Effect

| District | Present Rate | Proposed Rate | District | Present Rate | Proposed Rate |
|-----------------------|--------------|---------------|-----------------------|--------------|---------------|
| Butler-Mercer..... | 134 | 115 | Ironton-Kentucky.. | 191 | 175 |
| Deerfield..... | 148 | 115 | Ohio River (W. Va.), | | |
| Massillon..... | 148-153 | 115 | Belington, Kenova | 191 | 185 |
| Middle (Ohio)..... | 148-163 | 130 | Thacker, Big Sandy, | | |
| Jackson Center..... | 151 | 130 | Kanawha..... | 191 | 198 |
| Freeport..... | 151 | 142 | So. Jellico-Hazard.. | 191 | 209 |
| Reynoldsville..... | 151-156 | 142 | Harlan-McRoberts. | 191 | 218 |
| Oldham..... | 153-158 | 142 | Gauley..... | 193 | 198 |
| No. 8-Cambridge.. | 163 | 142 | Cumberland- | | |
| Crooksville, Hocking, | | | Piedmont..... | 193-288 | 198 |
| Shawnee..... | 163 | 150 | Vintondale..... | 198 | 159 |
| Pomeroy-Jackson | | | Spangler-Bellwood. | 198 | 175 |
| County..... | 163 | 167 | Cherry Tree..... | 203 | 185 |
| Pittsburgh..... | 166 | 145 | New River, Tug River, | | |
| Saltsburg-Derry.. | 171 | 150 | Pocahontas..... | 206 | 209 |
| Connellsville..... | 172 | 167 | Clinch Valley No. 1 | 206 | 218 |
| Ligonier-Blairville. | 176 | 150 | Cinch Valley No. 2, | | |
| New Florence- | | | Oakdale (Tenn.), | | |
| Indiana County.. | 181 | 159 | Stonega..... | 206 | 228 |
| Fairmont..... | 181 | 175 | Clearfield..... | 238 | 185 |
| Altoona..... | 188 | 167 | Radford, (Va.)..... | 241 | 228 |
| Myersdale..... | 188 | 185 | | | |

a 40c. reduction. Admitting that progress had been made in cost accounting since the *Boileau case*, the Commission observed that "it by no means follows that our duty under the law to prescribe just and reasonable rates has been reduced or assimilated to a mathematical process."

The Commission found nothing offensive in the fact that the Ohio No. 8 district paid 9.87 mills per ton-mile for an average haul of 165 miles to the lake ports and the Pocahontas field paid only 4.85 mills per ton-mile for an average haul of 424 miles or that the other southern districts, as shown in Table V, also paid less per ton-mile than the northern fields. It dismissed the complaints.

Conditions the past lake season did not make the dismissal more acceptable to the Pittsburgh district. The suggestion that the Pittsburgh producers appeal to the Commission to reconsider its action met with a favorable response. Governor Pinchot appealed to the Pittsburgh Chamber of Commerce to ask for a reopening of the proceedings and promised state support in a fight against non-union competition in lake and seaboard markets. Subsequently the State of Pennsylvania filed a petition with the Commission.

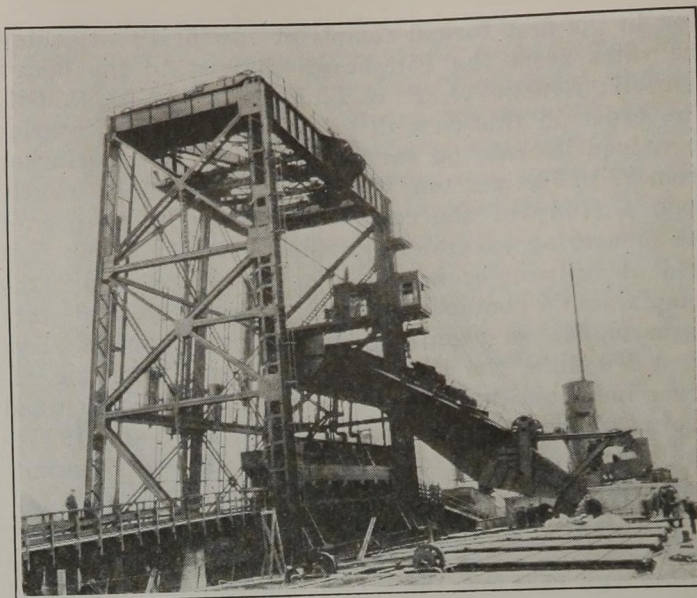
The United Mine Workers, too, appears in the role of an unofficial ally. In some quarters its interest in the situation is credited with having stirred Governor Pinchot to action. The union, weaker in power than it has been for many years, is developing a new sensitiveness to actions which may prejudice the successful operation of union mines. In its present chastened frame of mind it is willing to do almost anything to assist union fields—except to consider a revision of the Jacksonville wage agreement. So the leaders of that labor organization are outspoken in their condemnation of what they say are rate decisions fostering the non-union fields.

Opponents of the northern districts are not behind their adversaries in pressing the fight. West Virginia, not satisfied with the rejection of the complainants' pleas in the case, professes to believe that coal producers within its borders, and not Pennsylvania and Ohio, are the real victims of the existing adjustment.

In a narrow, technical sense, in moving for a reconsideration of *Lake Cargo Coal Rates, 1925*, the petitioners are asking the Interstate Commerce Commission again to pass upon two transportation questions:

- (1) Are rates of \$1.63 and \$1.66 per ton for average hauls of 165 and 172 miles excessive;
- (2) Do differentials ranging from 18 to 43c. per ton for additional hauls ranging from 96 to 304 miles represent a fair spread or are they so low that they deprive the northern districts of their natural advantage of greater proximity to the lake ports;

In a broad sense, however, the issue involves the whole question of the part transportation adjustments



Lake Cargo Coal Movement Is a High-Speed Business

Because the shipping season is limited by nature, the transportation end of the trade must be a highly co-ordinated business. Movement from mines to docks must be expedited, delays at the loading ports minimized. This calls for a high degree of managerial skill and efficient, high-speed machinery.

should play in the allocation of markets. That is no simple problem. It is not simple because rate-making itself is a complex undertaking, involving the evaluation of many elements. It is not simple because it involves the examination of many factors to determine which are and which are not determined by the rate adjustment.

QUESTION A COMPLICATED ONE

There is, for example, the question of how much weight should be given to the cost of production. With a few exceptions mines in Ohio and Pennsylvania are paying day labor \$7.50 for eight hours' work. In the southern fields the rate is probably \$4 to \$5—in some cases possibly less. Tonnage rates, too, are considerably higher in the northern districts, where the Jacksonville agreement, continuing the peak 1920 scale, is still in effect. Total labor production costs, it is estimated, are 25 to 65 per cent greater in the union areas than in the competing southern high-volatile districts.

To what extent are these changes responsible for the fact that the Pittsburgh district contributed only 14.5 per cent of the lake cargo total in 1924 and less than 9 per cent in 1925? Is the swing from union to non-union operation the explanation of the growth of Kanawha's share of this business, which increased from 11.58 per cent in 1909 to 25 per cent in 1924 and 29.75 per cent in 1925? What weight should be given to the fact that the average mine price on southern West Virginia high-volatile coals last year was \$1.68, as compared with \$1.97 for the No. 8 field and \$2 in the Pittsburgh district? Is any special significance to be attached to the fact that the Pittsburgh mine average was 32c. higher than the West Virginia average quoted and the freight rate to the lakes 25c. per ton less?

Technically, such questions are outside the scope of the Commission's inquiry. Actually, however, they intrude into the case because of the way the issues have been framed. One side contends it is being deprived of its natural share of a desirable business because of a prejudicial rate adjustment. The other side answers that its opponents are trying to set up rate barriers to impede the free movement of tonnage and to narrow the territory from which consumers can draw their fuel supplies.

TABLE V—How Rates and Distances Compare

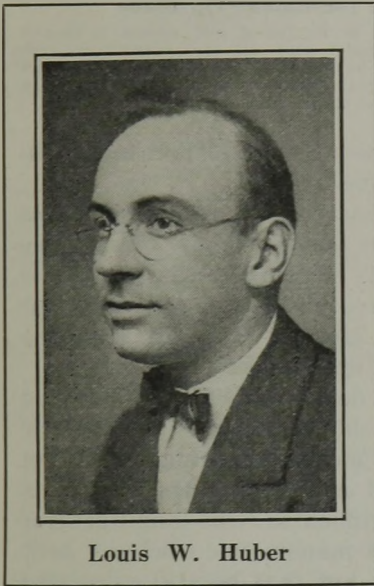
| District | Average Distance to Lake Ports, Miles | Rate | Ton-Mile Earnings, Mills |
|-----------------|---------------------------------------|--------|--------------------------|
| Ohio No. 8..... | 165.2 | \$1.63 | 9.87 |
| Cambridge..... | 172.2 | 1.63 | 9.47 |
| Pittsburgh..... | 177.1 | 1.66 | 9.37 |
| Fairmont..... | 261.2 | 1.81 | 6.93 |
| Kanawha..... | 362.8 | 1.91 | 5.27 |
| Big Sandy..... | 384.4 | 1.91 | 4.97 |
| Hazard..... | 419.2 | 1.91 | 4.56 |
| Harlan..... | 446.9 | 1.91 | 4.28 |
| McRoberts..... | 469.5 | 1.91 | 4.07 |
| Pocahontas..... | 424.8 | 2.06 | 4.85 |

Fans with Blades that Curve Backward Best Meet Varying Mine Pressures*

High Speeds Make Big Fans Unnecessary—Manometric Efficiency No Longer Gage of Good Fan Construction—Fan Should Meet Pressure Variations with Minimum Change in Air Delivered and Power Required

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Louis W. Huber

THOUGH centrifugal fans were first developed to ventilate mines and though the mines were the first places to be ventilated, mining men display much lack of knowledge on mine ventilation in general and on fan performances and characteristics in particular, even though it is true that mines are much better ventilated than they were twenty to thirty years ago.

The average mine operator is woefully dependent on the engi-

neers in the service of mine-fan manufacturers when he is in the market for a fan, and this fact works to the disadvantage of both operator and manufacturer. The former may be imposed upon by an unscrupulous sales engineer and induced to buy a fan which is not suited to the mine. When it is operating it may be wasteful of power and may be even an accessory to a serious mine disaster. More often, however, it is the fan manufacturer who suffers. If the operator asks him to build a fan that will deliver a certain quantity of air against a certain specified pressure and requiring a specified horsepower when operating under these conditions, the manufacturer may build a fan that will comply with these specifications to the letter, only to find when the fan is installed that it is delivering a greater quantity of air against a lesser pressure or a lesser quantity of air against a greater pressure and is requiring more horsepower than specified in the first case and delivering less air than that specified in the second.

*Article presented to the American Institute of Mining & Metallurgical Engineers, at the annual meeting, February, 1926, and entitled "Operating Characteristics of Centrifugal Fans and Use of Fan-Performance Curve."

In either case the operator usually upbraids the manufacturer for not meeting specifications and refuses to pay for the fan. The trouble in either case outlined above is that the pressure necessary to force the specified quantity of air through the mine has been estimated incorrectly by the operator or his engineers. When a fan is designed and built to deliver a certain quantity of air against a certain specified resistance it will operate at its maximum efficiency only when it is working under the conditions for which it was designed. With these conditions changed the efficiency of the fan will be changed.

A basic consideration that cannot be overemphasized is that a definite pressure is necessary to force a given quantity of air through a mine. For example, if it takes a pressure of $1\frac{1}{2}$ in. of water gage to force or draw 100,000 min.-ft. through a mine it makes no difference what means we use to cause the air to be coursed through the mine. We know from the mathematics of ventilation that the pressure necessary to cause ventilation varies directly as the square of the volume, when conditions causing resistance remain unchanged. This means that if a 2-in. water-gage pressure is required to force 100,000 min.-ft. through a mine, 8 in.

will be required to force 200,000 min.-ft. and only $\frac{1}{2}$ in. will be required to force 50,000 min.-ft. through. This simple and unfailing law is surprisingly often not understood. It is not at all rare for a mine-fan manufacturer to get an inquiry such as this: "We now have a fan at our mine that is delivering 50,000 min.-ft. at 1 in. and we want more air; will you please quote us on a fan to deliver 100,000 min.-ft. at 1 in.?" Obviously it is impossible to build a fan that will do this, for, unless the venti-

lating system is changed so that the resistance is decreased, 4-in. pressure will be required to force 100,000 min.-ft. through the mine no matter what type or make of fan is used.

It is interesting to trace the development of the centrifugal mine fan and see how some of the old, obsolete and incorrect ideas and efficiencies still persist. Years ago when mines were first ventilated by means of centrifugal fans, the latter were direct-connected to

steam engines. The speed or revolutions per minute of the fan depended on the steam-engine speed and was limited to the maximum speed of the steam engine. The pressure generated by a centrifugal fan depends on the peripheral velocity or tip speed—that is, the velocity or speed of the tips of the centrifugal-fan blades.

At first the mines to be ventilated were small. So also were the volumes and pressures required. As the mines became larger, the quantity of air and the pressures required became larger and so did the fans. As the fan speed was limited to the maximum speed of the steam engine, when a greater tip speed was required in order to generate higher pressures, the only alternative was to increase the diameter of the fan, so that higher tip speed could be attained, although the revolutions per minute of the fan remained the same. This condition resulted in the building of huge fans and of spreading the doctrine that it took a big fan to deliver a large quantity of air. Fans of 25-, 30- and 40-ft. diameter were common, and the records show that they were built as large as 60 ft. in diameter. Both the huge obsolete fans and the opinion that it takes a large fan to deliver a large quantity of air still remain with us to a certain extent today.

GET SPEED WITHOUT INCREASING DIAMETER

Now let us consider the development of another industry, that of electric-power generation, during the period just cited. In the early stages of electric-power generation, electrical engineers met with the same problem as mine-ventilation engineers; they had to drive their generators with the same slow-speed reciprocating steam engine. As the power output of an electric generator depends on the rate of cutting magnetic lines of force, when greater quantities of power and higher voltages were required it became necessary to increase the tip speed of the armature. This was accomplished at first by increasing the diameter of the armature and hence resulted in the building of large generators, the speed in revolutions per minute of which was low, but whose armature-tip or peripheral speed, and hence the rate of cutting magnetic lines of force, was high. We seldom find this type of generator in use in electric-power generation today, however; it has given way to the small, high-speed, and efficient generator. With the advent of the high-speed and efficient steam turbine, electrical engineers designed and made use of high-

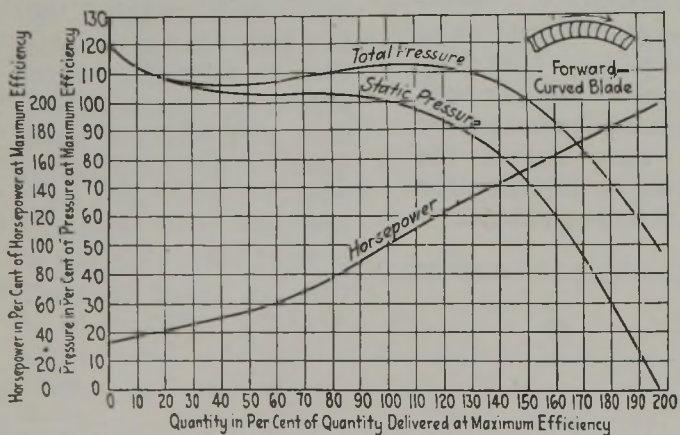


Fig. 1—Characteristic for Forward-Curved Blades

Take a given per cent of pressure and increase it or decrease it 10 per cent and note the position on the static-pressure curve which will result. Tracing downward note the horsepower at maximum efficiency for that point on the curve and tracing further downward note also the quantity of air delivered at that maximum efficiency. The result is startling. The fan is evidently not "stable" at constant speed.

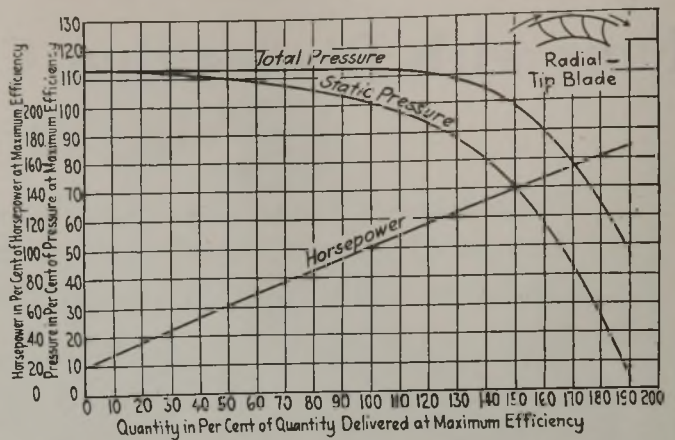


Fig. 2—Characteristic for Radial-Tip Blade

Here the static-pressure curve is flattened out where it has a drop for the forward-curved blade, and all the conditions are improved but not much as can be seen by making a trial. An increase in pressure of 10 per cent causes a 54-per cent decrease in volume and 44-per cent decrease in horsepower.

speed generators, and the result was smaller, more efficient, and less expensive units.

We frequently see extremely large slow-speed fans in use at our mines today; in fact it is rare to see smooth-running, high-speed, efficient ventilating units at mines, although they have been used for years for forced draft on mechanical stokers, for public-building ventilation, and on exhaust systems in factories.

Another relic of the old days that has been handed down to us along with the old-type fans is manometric efficiency. This no longer means anything to us, yet we see it in practically all mine fan tests, and it is frequently used in sales arguments. One manufacturer said to me not long ago that manometric efficiency as it is calculated is meaningless but that he still calculated and emphasized it because mining engineers demanded it.

MANOMETRIC RATIO FUTILE

Let us investigate manometric efficiency and see of what importance it really is. The definition of manometric efficiency is the ratio of actual pressure developed by the fan to the theoretical pressure or, as we express it in mine ventilation terms, actual water gage to theoretical water gage. In determining the manometric efficiency the actual water-gage pressure developed by the fan is measured, and the theoretical water gage is calculated from the tip or peripheral speed. The formula for calculating the theoretical water-gage pressure is:

$$w.g. = \frac{v^2 \times 0.078}{g \times 5.2}$$

The method by which the formula is obtained should be explained. In this formula water gage is expressed in inches of water. Let v = velocity of the periphery of the fan wheel in feet per second. This will be equal to $\pi \times \text{diameter in feet} \times \text{r.p.m.} \div 60$

0.078 = weight of air in pounds per cubic foot under average conditions of temperature and pressure and g = the acceleration of gravity in feet per second per second. The above formula was developed for calculating the theoretical pressure developed by a straight-blade or paddle-wheel type fan and is only correct when used in connection with this type of fan. Let w = weight of air in pounds per cubic foot; q = quantity of air in cubic feet; v = velocity of periphery of fan wheel in feet per second; $q \times w = W$ = weight in pounds.

$$W \div g = \text{mass} = M$$

Therefore, $qw \div g = M = \text{mass of air moved by the fan.}$

$Mv = \text{momentum} = qw \times v \div g$; $qw \times v \div g = \text{momentum of air in motion; it is also equal to the force producing or destroying this momentum; } qw = v \div g = \text{a definite force and this force acts through } v \text{ ft. per sec. Force multiplied by distance equals work. Therefore } qw \times v^2 \div g = \text{work done in foot-pounds. Work is also equal to } p \times q \text{ or pressure in pounds per square foot multiplied by quantity in cubic feet. Therefore, } p \times q = \text{work in foot-pounds; } p, \text{ pressure in pounds per square foot, is also equal to } H \times w \text{ or height of air column in feet multiplied by weight of air in pounds per cubic foot. As } p \times q = \text{work in foot-pounds and } p = H \times w, H \times w \times q = \text{work in foot-pounds. Therefore } H \times w \times q = qw \times v^2 \div g \text{ and by transposing we get}$

$$H = \frac{q \times w \times v^2}{w \times q \times g} = \frac{v^2}{g}$$

As 1 in. of water in the gage equals 5.2 lb. per square foot the water gage equals $H \times w \div 5.2$, and if we assume the weight of air to be 0.078 lb. per cubic foot the expression becomes

$$w.g. = H \times 0.078 \div 5.2$$

We know from the preceding that $H = v^2 \div g$ and by substituting the value $v^2 \div g$ for H the expression becomes

$$w.g. = \frac{v^2 \times 0.078}{5.2g}$$

This formula expresses the theoretical water gage that a straight-blade or paddle-wheel type fan which has no slippage around the tips of its blades will develop. By no slippage of air around the tips of the fan blades we mean that the velocity of the air leaving the fan blade is equal to the velocity of the blade tip. Obviously it would be impossible for air to leave the tip of a straight blade with greater velocity than that of the blade tip and the maximum possible velocity of air leaving a straight blade fan is equal to its peripheral velocity. It is evident then that formerly, when straight-blade fans were the only fans in existence and high peripheral velocity or tip speed was difficult and expensive to produce, it was highly desirable to have the air leaving the tips of the blades with a velocity as close to the peripheral velocity of the wheel as possible so that as high a pressure as possible was obtained by a given tip speed. This meant approaching 100 per cent manometric efficiency. Under these conditions all fan manufacturers strove to obtain it and it was under the circumstances a legitimate sales argument.

At the present time, however, by means of our high-speed electric motors and steam turbines we can easily get, with a comparatively small fan wheel, much more tip speed than is required to generate pressures sufficient for mine ventilation. Moreover, as our higher-speed motors and turbines are more efficient and inexpensive than those of lower speed, it is now desirable to have a fan of low manometric efficiency so as to make use of the high-speed machines on direct-connected ventilating units.

In the past few years, fan design, especially that applying to large constant-volume fans, has improved wonderfully after a long period of stagnation. Fans are now being built according to mathematical theory rather than by hit-or-miss methods. The increased

activity in scientific fan design is due, in large degree, to the advent of the airplane. With the development of this new device the attention of our prominent physicists and mathematicians was attracted to the theory of air flow, and the study of aerodynamics was as thoroughly investigated and developed as thermodynamics and hydrodynamics. Much of the theory and mathematics of these two sciences have been incorporated into the theory and mathematics of air flow or aerodynamics, so that blade shapes and air passages in our modern scientifically designed fans are as carefully worked out as impeller shapes and passages in our steam turbines and centrifugal pumps.

Centrifugal fans can be classified according to the curvature of their blades. We will consider the following four general types: (1) The forward-curved blade fan—that is the fan with blades curved forward in the direction of rotation, (2) the radial-tip blade fan, (3) the partial backward-curved blade and the straight-blade or paddle-wheel type fan, and (4) the full backward-curved blade fan. In order to study the effectiveness and performance of these different types of fans it is advantageous to study their characteristic operating curves. These are illustrated in Figs. 1, 2, 3, and 4.

In order to construct a characteristic operating curve it is necessary to get data on the performance of a fan when it is operating at constant speed but against different resistances. To get these data the fan is set

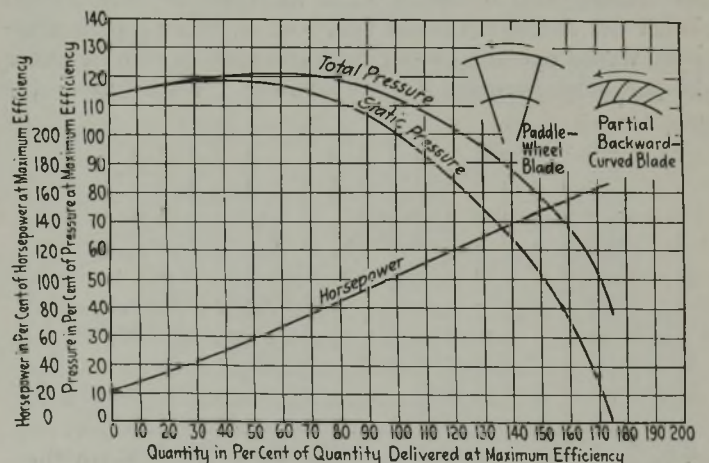


Fig. 3—Characteristic for Straight Paddle-Wheel Type or Partial Backward-Curve Blade

The steeply pitching static-pressure curve shows that a 10-per cent increase or decrease of pressure has less effect on volume at maximum efficiency than in either of the two previous instances. So the fan is "stable" in this regard. With a 10-per cent increase in pressure the decrease in volume would be 17 per cent and the decrease in horsepower 14 per cent.

up and is driven by means of an electric motor on which power readings can be easily taken. It is connected so that it discharges into a straight air duct.

At a point sufficiently distant from the fan so that a smooth flow of air is procured in the discharge air duct provisions are made to read static and velocity pressures. Average velocity pressure, static pressure and horsepower input are the three readings it is necessary to take for each resistance against which the fan operates. The fan is caused to run against different resistances by placing restrictions, usually in the form of orifice plates, in the end of the discharge duct.

The resistances vary from infinite resistance, when the duct is blocked tight so that no air can flow, to practically no resistance, the air flowing unhindered from the fan through the duct and into the outside

atmosphere. The horsepower output and static pressure are observed for each resistance against which the fan operates and the average velocity pressure, from which the velocity and subsequently the volume of air delivered is calculated, is observed for all resistances except infinite resistance which allows no air to flow. These readings are taken simultaneously for each resistance against which the fan operates and the speed of the fan is kept constant.

Let us consider the action or performance of each of the aforementioned types of fans under conditions that occur in mine ventilation. A desirable requirement for mine fans is that they deliver a constant volume, not easily altered by changing conditions in the ventilating system.

DROP IN PRESSURE UNBALANCES FAN

Let us assume that each of these fans is operating at a mine at constant speed and at its maximum efficiency and something occurs down in the mine that decreases the resistance and causes the pressure against which the fan is operating to decrease 10 per cent. Short-circuiting of the air through opened doors, or through broken stoppings and overcasts could easily cause this. The driving of new splits or increasing of the size of entries would also cause a decrease in resistance.

With the forward-curved blade fan, Fig. 1, a 10-per cent drop in pressure would cause a 26-per cent increase in volume and a 28-per cent increase in horsepower. With the radial-tip blade fan, Fig. 2, this drop in pressure would cause a 26-per cent increase in volume and a 20-per cent increase in horsepower. With either the

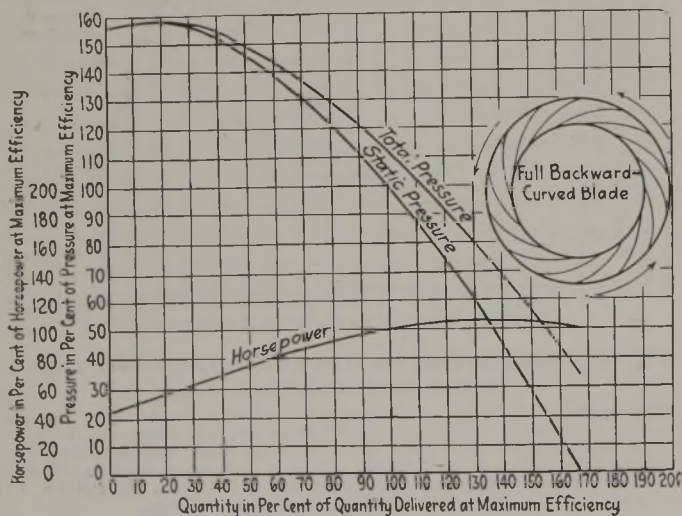


Fig. 4—Characteristic for a Full Backward-Curved Fan Blade

Here the pitch of the static-pressure curve is steeper than ever, and the horsepower characteristic is drooping. The maximum "stability" in consequence is afforded. A 10-per cent increase in pressure decreases the volume only 9 per cent and the horsepower still less—only 3 per cent.

paddle-wheel type or partial backward-curved blade fan, Fig. 3, the increase in volume would be 13 per cent and the increase in horsepower 13 per cent. With the full backward-curved blade fan, Fig. 4, a 10-per cent drop in pressure would cause but an 8-per cent increase in volume and a 2-per cent increase in horsepower.

Now let us determine how a 10-per cent increase in pressure would affect the performance of each of these types of fans. We will assume again that each of these fans is operated at the point of maximum efficiency and

at constant speed. An increase in resistance and, correspondingly, an increase in pressure, is caused in coal mines by falls and other obstructions in the aircourses, by installing smaller regulators, by extending the workings without providing new splits, etc. With the forward-curved blade fan, Fig. 1, a 10-per cent increase in pressure causes an 84-per cent decrease in volume and a 62-per cent decrease in horsepower. With the radial-tip blade fan, Fig. 2, this increase in pressure would cause a 54-per cent decrease in volume and a 44-per cent decrease in horsepower. With either the paddle-wheel or partial backward-curved blade fan, Fig. 3, the decrease in volume because of 10-per cent increase in pressure would be 17 per cent and the decrease in horsepower 14 per cent. With the full backward-curved blade fan the decrease in volume would be 9 per cent and the decrease in horsepower 3 per cent.

These considerations show us that the forward-curved blade fan is delicate and easily upset; that slight changes in operating conditions when it is running at its point of maximum efficiency will cause a large change in volume and horsepower and cause the fan to be operating very inefficiently. A fan of this type is not stable and should not be used for mine ventilation unless precautions are taken and determinations regularly made to prevent the resistance of the mine from changing. It is essential when a fan of this type is selected for mine ventilation that the resistance of the mine be accurately estimated in advance.

BACKWARD-CURVED BLADE FAN IS STABLE

The other types of fans are more stable as we proceed down the list in the order discussed above. The full backward-curved blade fan is by far the most stable and approaches a constant-volume fan. It will operate efficiently throughout a long range on its characteristic operating curve, a desirable quality with conditions in the mine constantly changing. Moreover at the present, with our incomplete knowledge of mine resistance, it is guesswork to estimate the resistance a mine will offer to a certain volume of air within at least 10 per cent of the actual resistance, unless we already have a fan operating at the mine. Certainly, under these conditions, a sensitive fan which will not work efficiently under conditions different from the peak for which it is selected is not the best fan for the job.

Table I—Effect of Ten-Per Cent Increase or Decrease in Pressure on Centrifugal Fans

| | Resistance or Pressure Decrease 10 per cent Increase in Vol. by Fan, Per Cent | Resistance or Pressure Increase 10 Per Cent Decrease in Hp. Required by Fan, Per Cent | Resistance or Pressure Decrease 10 Per Cent Increase in Vol. by Fan, Per Cent | Resistance or Pressure Increase 10 Per Cent Decrease in Hp. Required by Fan, Per Cent |
|---|---|---|---|---|
| Forward-curved blade, Fig. 1 | 26 | 28 | 84 | 62 |
| Radial-tipped blade, Fig. 2 | 26 | 20 | 54 | 44 |
| Paddle-wheel or partially backward-curved blade, Fig. 3 | 13 | 13 | 17 | 14 |
| Full backward-curved blade, Fig. 4 | 8 | 2 | 9 | 3 |

Next to the volume of air delivered by a fan the mine operator is interested in the horsepower the fan will require. On observing Figs. 1, 2 and 3 it is seen that the horsepower curves for each of these fans rises very steeply with increase in volume and decrease in pressure. If the forward-curved blade fan, Fig. 1, is run wide open, that is, against no resistance, it will require 196 per cent of the horsepower required at its point of maximum efficiency; the radial-tip blade fan, Fig. 2, 168 per cent, and the partial backward-curved blade or paddle-wheel type fan, Fig. 3, 165 per

cent. A drop in pressure or decrease in resistance and increase in volume occur coincidentally.

It is evident that as such changes take place more horsepower is consumed and the driving motor, engine, or turbine must be of ample size and capacity to take care of this overload. This means that in installing the ventilating unit with any of these three types of

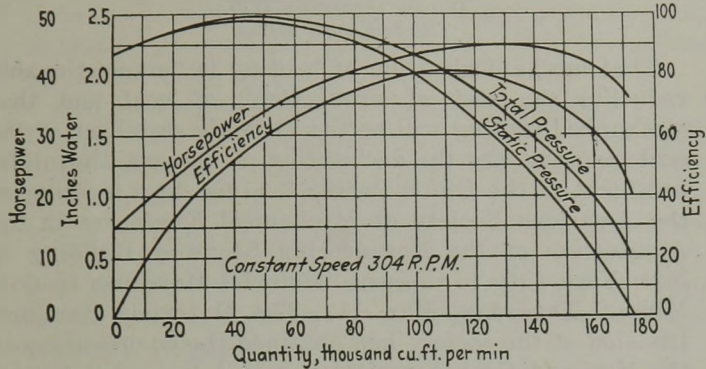


Fig. 5—Performance Curve Full Backward-Curved Blade Centrifugal Fan

This fan is designed to deliver 100,000 min.-ft. against a static-pressure resistance of 2 in. of water gage when operating at 304 r.p.m. Note the drooping curves of the total and static pressures and of horsepower and efficiency giving the fan stability with a wide range of pressure. Such a curve should be supplied with every fan.

fans it is necessary to provide a driving motor that has excess capacity. It is common when installing such units to provide a motor that can deliver about 35 per cent more energy than is normally needed and, of course, this means a more expensive unit.

It will be observed on Fig. 4 that the full backward-curved blade fan has a drooping horsepower characteristic. The horsepower curve is self-limiting, and the horsepower required cannot exceed a certain maximum no matter how the resistance is changed. When this fan is run wide open against no resistance it requires no more horsepower than it does when operating at its point of maximum efficiency and under no conditions will it require more than 106 per cent of the horsepower required at this point. This means that if the fan required 100 hp. when operating at its point of maximum efficiency a 100-hp. motor that would stand a 6-per cent overload would be big and safe enough for the unit under any circumstances.

When coal mines generated their own power, the energy consumed in the different mining operations was not given much consideration. With the more general electrification of mines and the use of purchased power, mine operators began to give this important contribution to the cost of mining the attention it warranted. Even now the large power consumption of mine ventilation is not appreciated as it should be. A recent survey of the energy consumed in Illinois coal mines, made by the University of Illinois Mining Engineering Experiment Station, showed that ventilation as a consumer of power was as important as haulage and mining. This study, which included 50 representative mines in Illinois, showed the power consumption to be distributed as follows:

| | Per Cent | | Per Cent |
|------------------|----------|--------------------|----------|
| Hoisting..... | 17.2 | Mining..... | 22.1 |
| Ventilation..... | 22.2 | Haulage..... | 23.0 |
| Pumping..... | 5.0 | Miscellaneous..... | 10.5 |

When it is considered that ventilation requires as much power as haulage or mining and more than hoisting, it is readily apparent that it is important

to have the ventilating unit operating as efficiently as possible. The mechanical efficiency of the fan is of equal importance with its operating characteristics and it may be more important. Fortunately, the mechanical efficiency of a full backward-curved blade fan is high. In fact, the efficiency of a well-designed full backward-curved blade fan is from 15 to 20 per cent higher than either of the first three types considered. Although this type of fan was first designed for forced-draft duty, it meets all the requirements of a good fan for mine ventilation as well as if it were originally designed for this purpose.

Much of the argument on whether a fan meets specifications and guarantees when it is bought would be avoided if fans were sold with a performance curve. The guarantee of a fan manufacturer usually states that the fan will deliver a certain quantity of air against a certain pressure when operating at a definite speed and that it will not require more than a specified horsepower. If the resistance of the mine is over-estimated most fans will deliver more air against less pressure and will require more horsepower and, if the resistance is underestimated, they will deliver less air against greater pressure and will require less horsepower. In either of these latter two cases it is an open question whether the fan is fulfilling the guarantee.

A performance curve as illustrated in Fig. 5 when compiled for a constant fan speed should indicate what quantity will be delivered, what horsepower will be required, and with what efficiency the fan will run when it is operating against different pressures or resistances.

The fan for which the performance curve shown in Fig. 5 is drawn is a full backward-curve blade fan designed to deliver 100,000 min.-ft. against 2-in. static-

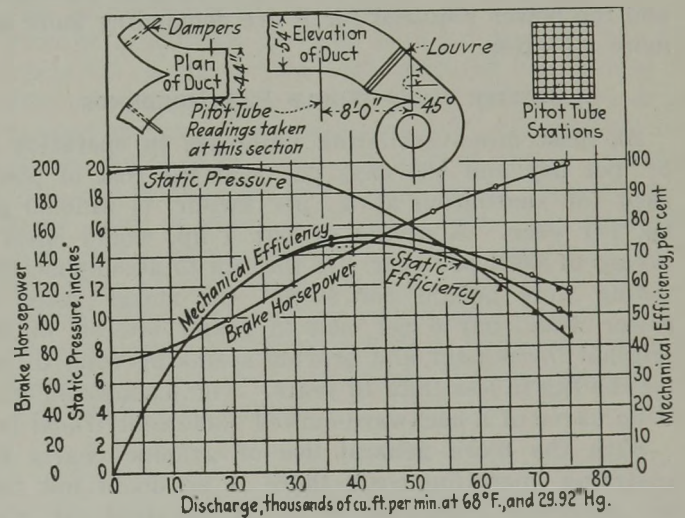


Fig. 6—Characteristic Operating Curve for Partial Backward-Curved Blade Fan

This fan was designed to deliver 42,500 min.-ft. against a static-pressure of 17.5 in. of water when operating at 1,200 r.p.m. The test was made after the fan was installed.

pressure resistance when operating at 304 r.p.m. and would be guaranteed by the manufacturer to require not more than 43 hp. when operating under these conditions. This work would give the fan a total mechanical efficiency of 80 per cent.

If the resistance of the mine were more than that estimated, say 2.28 in. of water gage for 80,000 min.-ft., or less than estimated, say 1.62 in. of water gage for 120,000 min.-ft., we could easily determine how the fan should perform against these changed conditions

by consulting the performance curve. According to the graph the fan should require but 40.5 hp. when operating against the higher resistance, 80,000 min.-ft. at 2.28 in. water gage, and 45 hp. when operating against the lesser pressure, 120,000 min.-ft. at 1.62 in. water gage.

In the first instance its total mechanical efficiency should be 74 per cent and in the second case 80 per cent. If the purchaser of a fan were given a performance curve with each fan as it is bought there would be no room for argument later as to whether the fan were meeting its guarantee. It is a simple matter for fan manufacturers to construct such a curve, and the responsible companies are glad to do it, for, as stated before, reputable manufacturers suffer more because of the lack of knowledge of the mine operator and his engineers than the operator does.

After the fan is installed and accepted by the mine operator it is advantageous for him to have and keep a performance curve. By frequent fan tests and reference to the performance curve it can be ascertained at just what point on the curve the fan is operating and whether the efficiency can be improved by decreasing or increasing the resistance. This use of the performance curve to check up on operation is more important on fans of the first three types discussed than on the full backward-curved blade fan, for the horsepower and efficiency curves of the latter are broad and flat. This characteristic indicates that there will be relatively slight change in horsepower and efficiency through a wide range in quantity of air delivered and pressure developed.

There is little doubt but that the backward-curved blade fan will be the predominating type among newly installed fans in the future, and it is likely that many progressive mining companies will see fit to replace the old inefficient fans now in use, because ventilation and the power required for it are demanding more and more attention.

BETTER FANS WOULD PAY DIVIDENDS

As most mine-ventilating units are in operation 24 hr. per day and 365 days per year the cost of power used for ventilation at 2c. per kw.-hr. is \$130.80 per hp. per year. A saving of but 5 hp. would effect a saving of \$654 per year. If the fan to accomplish this saving were bought for \$5,000, the money saved on power would pay 6 per cent in yearly interest on the original investment and provide a sinking fund to pay for the fan in less than 10 years. Fig. 6 shows an operating curve of a backward-curved blade centrifugal fan.

With the more general use of graphic charts for analyzing operating costs there is no doubt but that the enormous quantities of power required for mine ventilation will attract the attention of mine operators to the ventilating units and demonstrate conclusively not only the desirability of having a highly efficient ventilating unit at the mine but also that mine operators can afford to replace the old-fashioned inefficient fans that are so frequently found at otherwise modern and efficient coal mines with those of newer and more satisfactory design.

A CARBON MONOXIDE recorder developed at the U. S. Bureau of Mines, Pittsburgh experiment station, and which is so sensitive that it detects as little as 1 or 2 parts of carbon monoxide in 1,000,000 parts of air, has been installed at the Liberty Tunnels in Pittsburgh.

Coal Men Discuss Loading With "Mechanicals"

At Rock Springs One Scraper Loaded 288 Tons in
12 Hr.—Four Cuts per 8-Hr. Day Made
and Loaded Out in Entry

BY R. DAWSON HALL
Engineering Editor

That mechanicalization of loading is "unquestionably reducing the cost of production" of coal and that mechanical loading will be the ultimate stabilizer of the coal industry was the declaration of Eugene McAuliffe, president of the Union Pacific Coal Co. at a meeting of the American Society of Mechanical Engineers in the Auditorium of the Engineering Societies Building in New York City to discuss "Material Handling in Coal Mines," Thursday, Mar. 11. The Materials Handling Division of the society had obtained the co-operation of the National Coal Association and a large number of coal men attended, some coming from great distances.

Mr. McAuliffe presided and in his opening address invited the co-operation of their hosts, the "Mechanicals," and of the American Society of Electrical Engineers in the development of coal-mining practice. Mr. McAuliffe added that "he had visioned methods whereby development work could be carried on during the period of low market demand, the same force being put on face and room production when the demand was brisk, thereby establishing a more regular work year."

MECHANIZE IS TO AMERICANIZE

Nixon W. Elmer, a material-handling engineer of Quincy, Mass., said that the miner had cars only 75 per cent of the time and that not by any means necessarily at the time when he needed them. He believed that a group bonus would eventually be paid to the gang working the loader or feeding the conveyor. To him it seemed that by mechanicalization loading was made not only a lighter but a more cheerful job, the men mingling together and not being localized in separate gloomy chambers. As he put it: "To mechanize is to Americanize." In his belief one device should be installed at a time and not a combination of many. The conveyor should come first, he urged. It pays for itself rapidly and does not raise a cleaning problem. The loader, he thought, should be introduced later.

In discussing the paper, Mr. McAuliffe declared that the coal industry would welcome an injection of outside constructive advice that would assist in the solution of its loading and other problems. Edwin H. Johnson read an address on "Mechanical Loading in Coal Mines" and remarked that machine loading added to the impurities in the large coal but had no effect on the quality of fine coal, because the miner had never endeavored to clean the smaller impurities from his product. Machine mining has reduced tonnage where the number of cars hoisted in the shaft was close to capacity. The machine-loaded cars having a light load caused the hoist to work under less favorable conditions. To remedy this sideboards had to be used to increase car capacity.

W. K. Kavanaugh, president, Southern Coal, Coke & Mining Co. of St. Louis, stated that two men with a machine had loaded 125 tons in one day in one of his mines and that into cars of only 1½-ton capacity. He was shooting from the solid, and he believed that with

a careful and judicious placing of shots the percentage of fines was not much increased. With loading machines the impurities in the coal made it necessary to put more men alongside the picking belts. The fines were loaded into cars and shipped to a washer. C. E. Bockus, president, Clinchfield Coal Corporation welcomed mechanical methods to coal mines, but said that the efficiency of mining operation was not a proper subject of criticism so long as coal that had to be hauled two miles in small cars underground was delivered in the railroad car at the price of \$1.50 per ton.

Col. Edward O'Toole, general superintendent, U. S. Coal & Coke Co., Gary, W. Va., gave a brief review of the difficulties with roof action. The load that comes on the pillars with a meager 100 ft. of cover where the coal is 50 per cent extracted is 16 tons per square foot. This is the load prescribed as the limit for a brick foundation. To obtain a break in the roof the span has to be three times as great as the depth of the main resisting stratum.

SPAN THREE TIMES THICKNESS OF ROCK

Thus if the main stay for the roof was a body of 200 ft. of solid sandstone, the span that would cause a break would have to exceed 600 ft. Mr. O'Toole described his machine, which last month had an average output per man-hour of 2.47 tons. Under the methods prevailing where loading machines are not used the output for the same month was 1.88 tons. Thus 0.59 tons more per man-hour was produced by machine than by the old methods. The men working with the machine were paid \$1 an hour and the man in charge of the machine received \$1.25.

H. F. McCullough, of H. C. Frick Coke Co., admitted that the room-and-pillar was, as Mr. Elmer had said, an institution to which mining men were attached, but it was no more to be respected as an institution than the horse-drawn vehicle of thirty years ago. He believed in a wide face and in rapid extraction as a means of outstripping roof failure.

S. W. Blakeslee, division superintendent, Pennsylvania Coal & Coke Corporation, said that a dry, hard floor was desirable and a good roof. However, with too good a roof the conditions were unfavorable as the roof would not break and the crush became insupportable. S. W. Farnham described the scraper shovel of the Union Pacific Coal Co. at Rock Springs. He said his firm had increased the horsepower of the actuating motors of its scrapers from 10 hp. to 40 or 50 hp. and has enlarged its scrapers accordingly. The Rock Springs

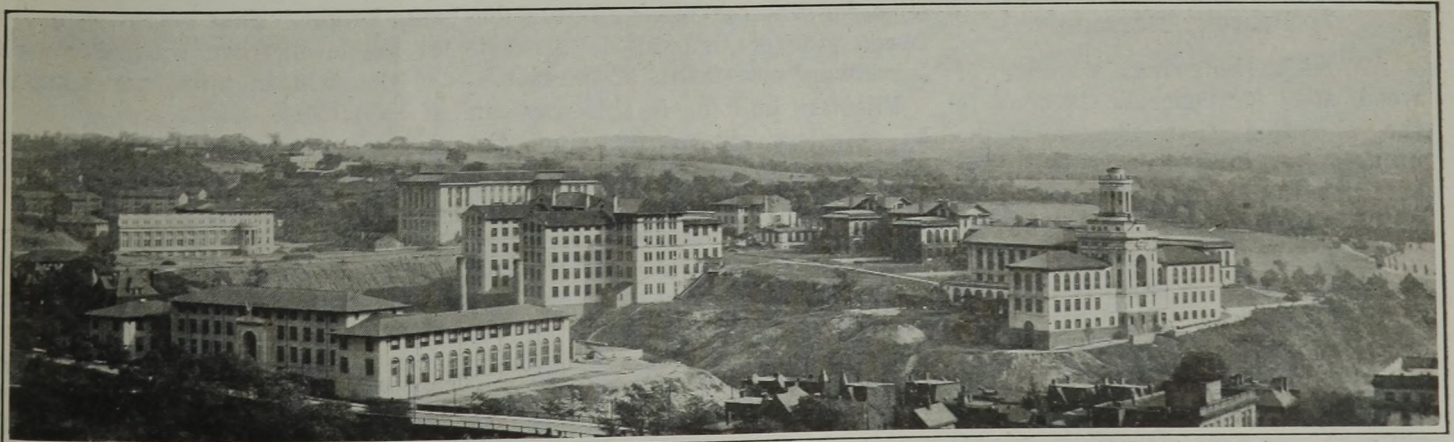
machine was a three-drum hoist with two drums for the straight face and another drum to direct the scraper at right angles to the face where that was desired. The machine had loaded 475 tons in a single 8-hr. shift into 3½-ton cars.

Mr. McAuliffe described the conditions at the Hanna mine in Wyoming where the coal is undercut, shot down to a height of 8 ft. and loaded by small loading machines. Though the model of shovel used had long been discarded by the manufacturer the results obtained are excellent. The upper coal is then shot down to a height of 36 ft. and loaded by ordinary surface shovels of the "steam-shovel" type using electric operation. The small shovels used for the 8-ft. cut have loaded an average of 147 tons a day. The tonnage has dropped heavily recently because the machines are being used for driving heading which is narrow work. There are twelve machines of the last-named type, and there are eleven out of twelve in service every day, because the repairs are well and expeditiously performed. The loading-machine men are paid \$11.50 per day.

Mr. McAuliffe said that it was 90 per cent of the struggle to get the staff "sold" on the loading machine. Once the company's staff is interested in the operation of the machines the task is as good as performed. Mr. McAuliffe said that on an investment of \$71,000 a saving was made last year of \$54,800, all this in excess of depreciation, maintenance and 6 per cent for interest.

ROCK SPRINGS COAL SCRAPERS

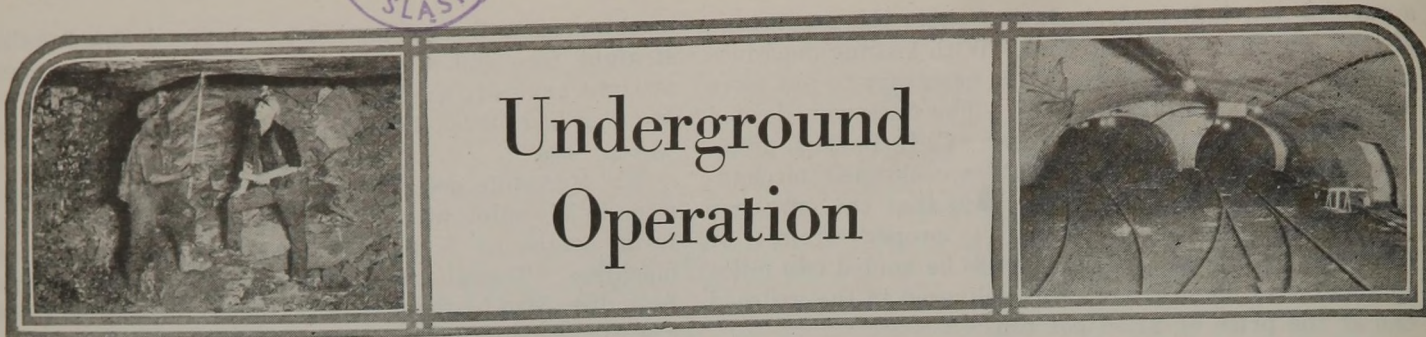
The scraper face in the Rock Springs mine is 200 ft. wide. The coal unfortunately is 12 ft. thick. That makes the problem more difficult than if it were 6 or 8 ft. as is the general run of coal at Rock Springs. Five rows of props each with cross cap pieces 2 ft. long and of the dimensions of a railroad tie are used back of the face to maintain the drawslate. In a 12-day run the average production was 288 tons per scraper, the cost being 42c. a ton for the coal delivered to a car at the parting. Seven more scrapers, each having two drums instead of three, have been ordered. Six shaking conveyors are to be installed. In a 10-ft. entry, 7 ft. high, four cuts were made and loaded out in eight hours by three men, or about 67 tons of coal. Mr. McAuliffe advocated a wage of about \$6 a day, graduated to the character of work done, with a bonus on all the coal mined. When the machine was being moved or repaired the men would be drawing a small wage and when the machine was actually loading coal they would be getting that wage plus a bonus.



A Good Many Ideas of Benefit to the Coal Industry Originate Here

The Pittsburgh station of the Bureau of Mines is located in the building occupying the left foreground in this picture. Here much experimental work of a laboratory nature goes on continu-

ally that the technical problems involved in coal may be more easily solved. The buildings of Carnegie Institute of Technology, an important engineering college, are behind the Bureau's station.



Underground Operation

Concrete Pilasters Sustain Both Sides and Roof

The combination of a friable coal and an uncertain roof is encountered fairly frequently in American coal mines. In rooms such conditions do not cause as much trouble as they do on main headings where the roof must be held up on permanent supports. The materials for this purpose commonly considered permanent are steel, masonry and concrete.

Although structural steel is frequently used for supporting the roofs of headings and haulageways, the legs of the three-piece sets normally employed for this purpose are seldom designed to withstand side pressure from the ribs which frequently develops with a friable coal or even with a solid non-weathering coal if the roof strata are full of slips, cracks, and clefts, and if the roof caves attain any great height above the coal.

Precast concrete timbers have been used to a somewhat limited extent to support the roof and sides of such passages. With reinforcement properly placed, the legs of concrete sets may be made amply strong to resist pressure from the sides. Such timbers are slightly more expensive to place than are steel sets, because of their greater weight, but when once in position they may be more durable than steel because they are immune to both oxidation and water.

TO PREVENT MOVEMENT

All such timbering, whether of wood, steel, or concrete, is open to the objection that it cannot be brought into direct contact with the surfaces to be supported. This is not of cardinal importance in the case of the roof, as experience has shown that it is advantageous slightly to cushion subsidence of the overlying strata upon wooden wedges or by other means. Control of the sides or ribs, however, is somewhat different, for here movement should be entirely prevented if possible.

No material will accomplish this

result as well or as effectively as concrete cast in contact with the ribs. Thus a concrete archway with the aggregates rammed tightly between the forms and the roof and sides will probably sustain as great a top and side pressure as it is possible to resist. In extremely "runny ground, the outline or cross-section of such a passage might advantageously be made circular or elliptical, as these shapes better resist pressure from all sides.

ARCHES EVEN UNNECESSARY

It is comparatively rare, however, that such extreme measures need be taken in the mines of this country. In most instances even the arch need not be resorted to. In many cases, however, the roof strata contain slips or clefts extending in planes corresponding to the angle of compression shear, or at roughly 45 deg. to the horizontal or horizon. Here concrete pilasters, cast in place and supporting steel roof beams, afford ample support while at the same time they effectively prevent side movement of the rock strata.

Building a three-side form for these pilasters—that is, letting the rib itself form the fourth side—brings the concrete into perfect contact with the rib, and makes the pilaster from a structural standpoint practically a part of it. Slabs of rock separated from the main body of the roof by microscopic clefts, slips, or fissures act as beams between pilasters, effectively preventing inward movements of the ribs.

Pilasters built up in this way can be as effectively reinforced as the legs of three-piece sets that are precast on the surface. If the ribs against which they are cast are so friable or shelly as to require lagging, this can be placed before the concrete is poured. Such lagging should naturally be of a permanent nature. Old pipe or old rails can often here be used to advantage. In extreme cases corrugated galvanized iron might well be placed behind these "stringers."

Momentum Grades Decrease Tractive Effort

If levels are taken in the mine, and if these levels are then plotted and the tracks graded in accordance with the findings, the locomotives can haul larger trips. The track, when surfaced, should have preferably an average grade of $\frac{1}{2}$ to 1 per cent in favor of the loads, according to J. L. Libby, writing in the *Employees' Magazine* of the Union Pacific Coal Co. But short slight changes in grade do not particularly interfere with the haulage, as the motor gets a run on the lighter pitches and will carry over the steeper portions, which are known as momentum grades.

EXCEED RULING GRADES

Momentum grades are those which, although steeper than the ruling grades, can invariably be approached at a velocity sufficient to carry the trip over the summit with the aid afforded by the energy stored up in trip when approaching the grade. If it is assumed that the trip is moving without track resistance its energy will lift it up a certain vertical height, and if the motor is developing sufficient energy at the foot of the grade to overcome tractive resistance it will overcome the track resistance on the grade, provided it does not reach too low a velocity, hence the trip will climb the momentum height. That height, h , in feet, at sea level, when v equals velocity of the trip in miles per hour, is:

$$H = 0.035v^2.$$

H then equals 0.1 ft. for 2 m.p.h.; 0.9 ft. for 5 m.p.h.; 1.3 ft. for 6 m.p.h.; 5.1 ft. for 12 m.p.h.; 9.0 ft. for 16 m.p.h.; 11.4 ft. for 18 m.p.h., and 14.0 ft. for 20 m.p.h.

For example, suppose that a locomotive is so loaded that its entire drawbar pull is necessary to overcome the resistance of the trip on a 1 per cent grade, but that through favorable grades it reaches the foot of a 2 per cent grade, 800 ft. long, traveling at a velocity of 16 m.p.h., will it carry over?

Eight hundred feet of 2 per cent

grade entails a vertical height of 16 ft. Assuming, as already said, that the locomotive's full loaded capacity is equal to surmounting a 1 per cent grade without retardation and, consequently, that the capacity for 800 ft. is 8 ft.; the difference is 8 ft.; which must be overcome by momentum. The momentum height for a speed of 16 m.p.h. is 9 ft., as stated. This, minus 8 ft. necessary for the grade equals 1 ft. of reserve, or a momentum head, which corresponds to 5 m.p.h. If the locomotive were moving at a low speed at the bottom of the grade, it would become necessary to split the trip in order to pull it over.

Where Too Much Mechanism Decreased Efficiency

Over a year ago we installed a shearing machine, used it several months and, thought it was all right mechanically. We then discontinued its use. Our trouble was that we were trying to do too many things at the same time. As we were loading coal mechanically on the day and night shifts we were required to keep in operation at one and the same time our loading machines, undercutters, locomotives, drilling trucks and the shearing machine. These pieces of equipment all trying to move over track in the same area, interfered with each other and caused much confusion.

Of course, right-of-way had to be given to the loading machines. Equally important was a clear track for the movement of cars to and from the loaders. As a result the undercutters were required to move and operate as best they could without interfering with the major operations of loading. And then, with still less freedom of action, came the drills and shearing machine.

SHEARS FIFTEEN ROOMS

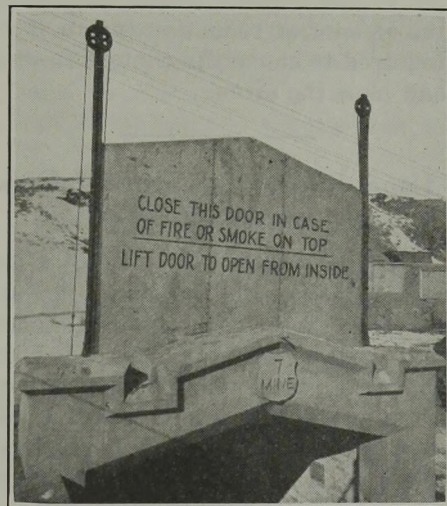
The shearing machine could easily shear fifteen places per shift when not held up. It actually averaged about six places because it had to wait most of the time for a right-of-way to move from one place to another. Because this machine was idle most of the day the expense of keeping the men who manned it was prohibitive. Naturally, the ideal way would be to do all the cutting, drilling and shearing at night; but such a procedure would cut down production by permitting loader operation during only one shift.

One other objection was found to the shearing machine under our conditions: It produced lumps that were too big. We wanted lump coal and we got it, but the lumps were too big to pass between the top of the loader and the roof. When a big lump hung against the roof the usual result was a damaged conveyor. The shearing machine would work all right in a seam which is thick enough, but ours is not.

DAVID INGLE,
President Ayrshire Coal Co.
Oakland City, Ind.

Sliding Door Keeps Out Surface Fires

Unwilling to overlook a single opportunity to make its mines safer, the Union Pacific Coal Co. is equipping them all with sliding doors such as the one illustrated in the accompanying photograph. The door is mounted in the slope portal of No. 7 mine at Winton, Wyo., in such a way that it can easily be closed, by anyone who notices that smoke or flame from any nearby fire on top is blowing into the mine. The air intakes



It May Save Lives Some Day

This door, recently built at the portal of the Union Pacific Coal Co.'s No. 7 mine at Winton, Wyo.—an air intake—is to be closed in case smoke or flame from any fire near the slope mouth threatens to blow into the mine.

of Wyoming mines readily can draw in smoke and dust from considerable distances because of the heavy winds that so often blow in that country.

There is one chance in a thousand, possibly, that a conflagration of top buildings, or even a bonfire might send enough smoke into a mine to cause great excitement and possible injury to men underground. Two men were killed in a Colorado metal mine during an incident such as this. To reduce the likelihood of any such

trouble at Union Pacific mines the sliding doors, made of wood and covered with sheet metal, are now being installed. Each one is counter-weighted for ease of operation and is fitted with handles on the inside so that men can make their exit without difficulty even though the door might be closed.

Trucks for Fighting Fires Aid in Erecting Seals

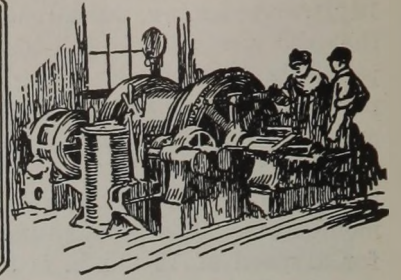
About five years ago a fire broke out in No. 1 Shaft Mine of the Ford Collieries Co., at Curtisville, Pa., the fighting of which was greatly facilitated by two fire trucks, one a part of the equipment of the colliery and one brought from an adjoining mine. The fire had been burning for some time when it was discovered, so that the apparatus could not be utilized for entirely extinguishing the flame. But the two machines, operating alternately, one being discharged while the other was being filled, subdued the flames sufficiently to enable the workers to erect seals.

Each of the three shaft mines of the Ford Collieries Co. is equipped with a fire truck on which is mounted a closed tank of 80 gal. capacity and a reel of 500 to 800 ft. of 1½-in. hose. These trucks are provided with un-flanged wheels and are each mounted on a mine car truck, so that they can be pulled to any tracked portion of the mine by a locomotive. In the tank water is stored, and above it are receptacles for holding an acid and soda, which ingredients when mixed together with water in the tank form an aqueous solution of carbon dioxide of 80 to 100 lb. pressure per square inch. This pressure is preserved within the chamber until all of the solution has been forced from the closed chamber and through the hose. Every four months the chemicals are discharged to test the apparatus.

The fire truck is kept near the shaft bottom in a concrete-lined stall turned from a track which is always kept clear of standing rolling stock. The stall is padlocked, but the key is kept in a case with a glass front that, in the event of a telephone call for the fire equipment, can readily be broken. The apparatus is hauled to the nearest point to the fire to which mine track extends, from which point the hose is unreel and carried to the fire, or the fire truck itself is unloaded from the mine truck and wheeled over untracked entry to any point desired.



Practical Pointers For Electrical And Mechanical Men



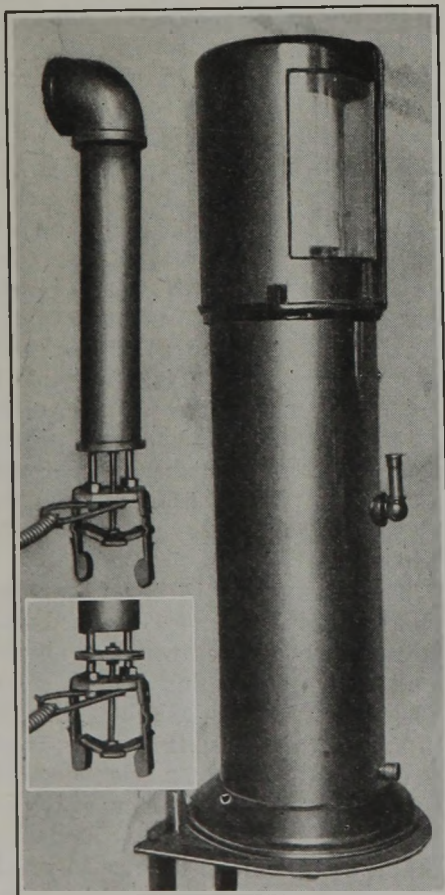
Electric Siren Blows If Fan Slows Down

By properly equipping steam-driven fans with protective and alarm devices it is practical to operate them without regular attendants provided there is always someone available who can get to the fan within a few minutes. At the Virginia mine of the Gulf States Steel Co., near Bessemer, Ala., the fan is located several hundred feet from the power plant engine room yet this engine is tended by the shift engineer of the plant.

The engine, which is belt connected to the fan, is equipped with an automatic stop. This is so arranged that the throttle valve is closed by overspeed or can be shut

from push buttons located at the fan and in the power plant. If for any reason the fan should slow down appreciably, the decrease in vacuum causes electric sirens in the power plant and at the tippie to be sounded.

In the accompanying illustration, the siren contact-making device can be seen at the left of the recording gage. The copper leaf contact brush is attached to a disk made of $\frac{1}{4}$ -in. asbestos board. Normally this disk is held up against the open end of the 2-in. pipe by virtue of the vacuum created by the fan. In this position the circuit is open. Weights in the form of washers, added to or taken off of the contact brush, determine the amount of reduction in fan speed required to cause the contact to drop and blow the siren.



Contact Device Beside Water Gage

The insert in the lower left-hand corner shows the disk and contact after dropping and while blowing the siren. Normally the vacuum created by the fan holds the disk up against the open end of the 2-in. pipe.

Load Found by Timing Disk of Watthour Meter

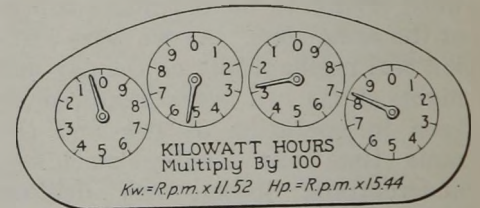
Equipping substations with watt-hour meters has become standard practice, and many companies now have such meters installed on all important circuits and principal motors. It is often important to know the load in kilowatts or horsepower taken by a substation or by a large alternating-current motor driving a fan, pump, conveyor or the like. Many electricians do not realize that if the motor is equipped with a watt-hour meter this instrument can be used to indicate with fair accuracy the average kilowatts or horsepower input during a half minute, a minute or longer interval.

To use a wattmeter in this way it is necessary to know the meter constant and to count the revolutions of the meter disk during a period such as one minute. This constant which is the number of watthours per revolution of the disk is usually marked on the face of the meter. Having counted these revolutions per minute with a certain load, and knowing the meter constant, it is

then a matter of simple multiplication to calculate the kilowatts or horsepower.

The electrical engineer of a company operating mines in southern West Virginia and eastern Kentucky marked in pencil on the register of all stationary watthour meters a simple formula for use in determining the load. The accompanying sketch shows the register of one of these meters.

The nameplate of the meter carries the following data; type D-6, 3-wire, 3-phase, 80-amp., 2,200 volts, 60 cycles, current transformer ratio



Formulas Marked on Register

The figure by which the revolutions per minute of the disk must be multiplied to give the kilowatts or horsepower, is determined from the meter constant which is usually found marked on the disk.

16 to 1, potential transformer ratio 20 to 1. On the upper disk (seen by removing the cover) is the marking, "K-192." For this particular meter the simplified formula can be found by substituting 192 for "K" in the following relation:

Kilowatts = r.p.m. of disk \times K \times minutes per hour \div 1000
then, Kw. = r.p.m. \times 192 \times 60 \div 1000

or, Kw. = r.p.m. \times 11.52.

From this it follows that,

Hp. = r.p.m. \times 11.52 \div 0.746 = r.p.m. \times 15.44.

With these simple formulas it is hardly necessary to use a pencil in calculating the load after the revolutions of the meter disk have been counted for a minute. With a constant load, greater accuracy can be obtained by taking a longer time interval and dividing by the number of minutes. With a fluctuating load the method gives the average during the period of time that the revolutions are counted.

Instances are known where an elec-

trician was in the habit of going to the work and expense of connecting a portable indicating meter in the circuits of motors already equipped with stationary watthour meters. He did not realize the possibility of determining the load by timing the disk of the stationary meter.

Water Jet Protects Motors From Creek Floods

While employed by a coal company in the Birmingham district I was in charge of the power plant equipment. This was a steam plant with high-pressure turbines of the condensing type. The pumps that furnished condensing water were located on a creek about a quarter of a mile from the plant, and were controlled from the plant switchboard. They operated without attendance other than inspection by a plant mechanic once or twice a day. The pumps being of the centrifugal type were located just above the normal level of the creek so that they would not have a high lift.

FORESTALLING FLOODING

When the creek was swollen during wet weather the water would rise on the discharge pipe from the building and flood the pump room, if the valve on this pipe had not been previously closed. When this valve was closed there was the additional danger of the pumproom being flooded by leaking or blown out packing. To prevent the possibility of this happening the mechanic had to go to the pumproom several times each day or night that the valve was closed. One rainy night the valve was not closed either through negligence on the mechanic's part or by his thinking that the rain would not be sufficient to raise the creek to flood stage. Of course, anyone familiar with the operation of centrifugal pumps realizes that there is a leakage at the packing glands all the time.

CREEK ROSE AT NIGHT

This leakage cools the glands and also prevents the pump from taking air. The creek rose up into the pump room, causing quite a lot of damage and killing the power for about half an hour. The actual damage of the pump motors and cables amounted to several hundred dollars, besides a costly production delay. The chief and myself decided that this must not happen again, so he suggested getting an ordinary water jet and

connecting it to the discharge side of the pumps. As all the pumps did not run all the time the intake pipe of the jet was connected to the discharge of the two largest machines.

REMOVES GLAND LEAKAGE

This jet when tested was found to more than carry away the gland leakage. This would eliminate the necessity of the mechanic losing sleep at night on account of the pump-house as the discharge valve was to remain closed in the winter or rainy season and the jet to be kept on continually. The small amount of water necessary to operate this device would never be missed. Each of the large pumps had a capacity of over 2,000 gallons per minute and the jet only required a 3/4-in. pipe for an intake. The jet, installation and all, did not cost over \$25.

Electric Power Costs in Southern Fields

Extensive data on mine power costs, principally in southern West Virginia, and Eastern Kentucky, are tabulated on a sheet made up by the West Virginia Engineering Co., of Charleston, W. Va., listing (without name of company) power and tonnage figures for 95 of their representative clients, during the year of 1924.

A summary of several of the columns of this sheet is shown in the accompanying table. The kilowatt-hour and cost figures include all power used inside and outside the mines. At practically all of the mines listed, the employees live in company houses and therefore power for house lighting is included.

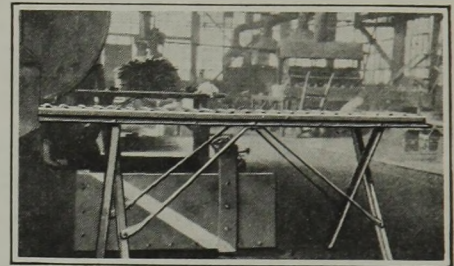
It is interesting to note that there is an increase in kilowatt-hours per ton for operations producing above 10,000 to 20,000 tons per month. The cost per kilowatt-hour shows a regular decrease for larger tonnage, as is to be expected due to the sliding-scale rate schedules. The power cost per ton decreases but slightly

as the production increases beyond 10,000 tons.

Comparing the cost per ton of purchased power against that of power generated by private steam plants, generally speaking, the operating cost alone of a steam plant is greater than the total cost of purchased power.

"Old Woman" Aids Work of Punch and Shear

In the machine or blacksmith shop, the "old woman" is a device that may take almost as many forms as the "old man." In the accompanying illustration may be seen a contrivance



"Old Woman" Beside Punch Press

Car belts or other work for the press may be supported on this old woman. The rollers on its top render it easy to slide the work along as punching or shearing progresses.

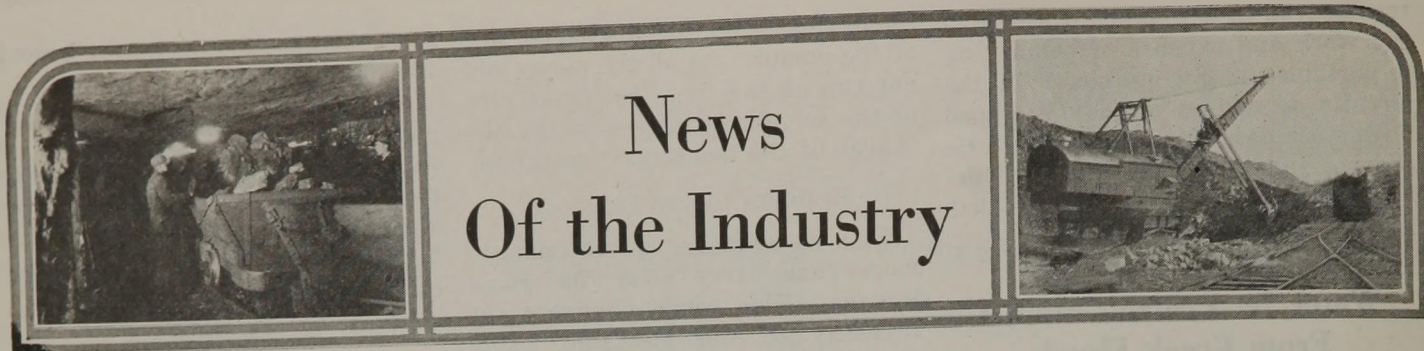
of this kind intended to serve a punch and shear in a large mine shop. It is peculiar as old women go, in that its top is provided with a whole series of rollers so that the work its supports may be readily slid along upon it.

Little need be said in explanation of the illustration. The supporting frame is built up of small angles and straps and the top made such a height as to bring it to the level of the die plate of the punch or the lower or stationary jaw of the shear. The rollers extending across the top of this device make it easy to move the work along as successive holes are punched or piece after piece is sheared from the end. Its utility in punching such parts as car belts can readily be appreciated.

Summary of Power Data of Almost 100 Mines

| Number of Mining Operations Purchased Power | Range of Monthly Tonnage | Kw.-Hr. per Ton | Cost per Kw.-Hr. c. | Power Cost Per Ton c. | Percentage of Electrification |
|---|--------------------------|-----------------|---------------------|-----------------------|-------------------------------|
| 14 | 0-5000 | 5.13 | 2.81 (a) | 14.42 (a) | 94.5 |
| 23 | 5,000 to 10,000 | 5.36 | 2.34 (a) | 12.56 (a) | 95.3 |
| 24 | 10,000 to 20,000 | 3.62 | 2.22 (a) | 7.93 (a) | 93.7 |
| 12 | 20,000 to 30,000 | 4.04 | 2.04 (a) | 7.82 (a) | 94.3 |
| 7 | Over 30,000 | 4.19 | 1.86 (a) | 7.81 (a) | 98.6 |
| Private steam plants | | | | | |
| 13 | 9,000 to 60,000 | | | 8.69 (b) | 92.4 |

(a) Power bills only; (b) Operating costs only, does not include fixed charges. Why the steam plants are put in one group only instead of being divided into four classes as are the purchased power plants is not explained. Nor are any details available as regards the equipment in the private steam plants included.



Consumers Had 45,000,000 Tons Of Soft Coal Feb. 1; Would Last 28 Days if Evenly Distributed

Stocks of bituminous coal in the hands of consumers on Feb. 1, 1926, were approximately 45,000,000 net tons, according to the U. S. Bureau of Mines. This was slightly higher than at a corresponding date a year ago while Nov. 1, 1925, stocks totaled 48,000,000 net tons. Between Nov. 1 and Jan. 1 something less than 1,000,000 tons was added to total reserves, but between Jan. 1 and Feb. 1, 1926, approximately 4,000,000 tons was removed from storage. The trends of production and consumption since Feb. 1 indicate that storage piles have been further reduced.

At the rate of consumption prevailing during January, when the industries of the country were active and when bituminous coal was being substituted for anthracite, the stocks of bituminous coal on Feb. 1 were sufficient for 28 days. If no substitution for anthracite had been necessary the supply would have been enough for 31 days. This may be compared with a supply of 37 days on March 1, 1925; with 46 days on Jan. 1, 1924, and 24 days on Feb. 1, 1923. But all of these averages, however useful for comparison, fail to take into consideration the fact that the supply is never equally distributed. Some consumers may have plentiful supplies; others none.

Big Stocks at Head of Lakes

Besides the supply of coal in consumers' hands on Feb. 1, there were 5,176,000 tons of bituminous coal piled on the docks of Lakes Superior and Michigan, approximately 185,000 tons held in storage at the mines or intermediate points by producers, and 760,000 tons loaded in cars unbilled at the mines.

Anthracite and Substitutes.—By Feb. 1 the stoppage of anthracite production had caused retail dealers' stocks of anthracite to drop to the lowest level on record, with the possible exception of September, 1923. Retail stocks of bituminous coal on Feb. 1, 1926, when measured in tons, were large, though the volume was less than on Jan. 1, 1924, and some earlier dates. Surplus stocks of coke at merchant byproduct coke plants had dropped to 87,000 tons as compared with 832,000 tons on Sept. 1, when the anthracite suspension began.

The estimates of the total quantity of soft coal in the hands of commercial

consumers are based on practically complete reports from byproduct coke plants and steel plants, railroads and utilities, together with reports from a selected list of other consumers—more than 5,000 in all. The estimate of 45,000,000 tons, which is believed to be accurate within 5,000,000 tons, does not include the quantity of coal in householders' bins, for which no reasonably accurate figures are obtainable, nor the tonnage of steamship fuel. The tonnage on hand on the Lake docks also is omitted from the estimate as above given, being classed as bituminous coal in transit.

As shown in the accompanying illustration the total stock of coal on Feb. 1 was higher than on March 1 of last year, the nearest date of 1924 which may be used for comparison. It is almost the same as the level on Jan. 1, 1921, but lower than the figures in the fall and at the end of 1921, and very much less than in the period October-December, 1923, when consumers were laying in large stocks in the event that there would be another strike.

The reports from consumers, together with some supplemental information, indicate that the average rate of consumption, plus exports, during November, December and January was around 12,300,000 tons of bituminous coal per week. This unusually high rate, while indicative of the business activity of the coal-using industries, also reveals that bituminous coal was being extensively used as a substitute for anthracite.

Comparison of the days' supply of the principal classes of consumers on Feb. 1, 1926, with those on varying dates during 1919-1925, given in Table I, shows that the reserves of each

group are regularly lower than they were in March a year ago. Special interest attaches to the reserves held by retailers. At the rate their customers were demanding soft coal in January, retailers' stocks on Feb. 1 would only last 17 days. At the normal rate for January, however, when soft coal is not being used to replace anthracite, the same volume of retail stocks would have lasted 28 days. In comparing the figures for the dates given, it should be remembered that they are only averages, and as such do not reveal pronounced fluctuations between the individual plants in every group or the variations between different localities.

Reserves by States Vary Widely

Reserves of soft coal on Feb. 1 in terms of days' supply differed widely, as usual, from state to state. The best indicators for this purpose are the returns from the general industrial concerns, other than byproduct coke and steel plants. They are the largest single group of coal users, both as to number and tonnage consumed, and being widely distributed throughout the country their stores of coal are a sensitive barometer of conditions in the coal market. New England on Feb. 1 was carrying considerable stocks of coal, four of the six states showing more than 70 days' supply, the average for the entire region being 65 days. The stocks in the northern peninsula of Michigan also are maintained at a high figure, the highest in terms of days' supply for any section of the country. In New York State stocks averaged 59 days, almost the same as that for Massachusetts. Lower Michigan was carrying 53 days' supply; Colorado 46 days. The remaining states show reserves varying from 4 to 43 days' supply, except Oklahoma, which shows especially heavy reserves.

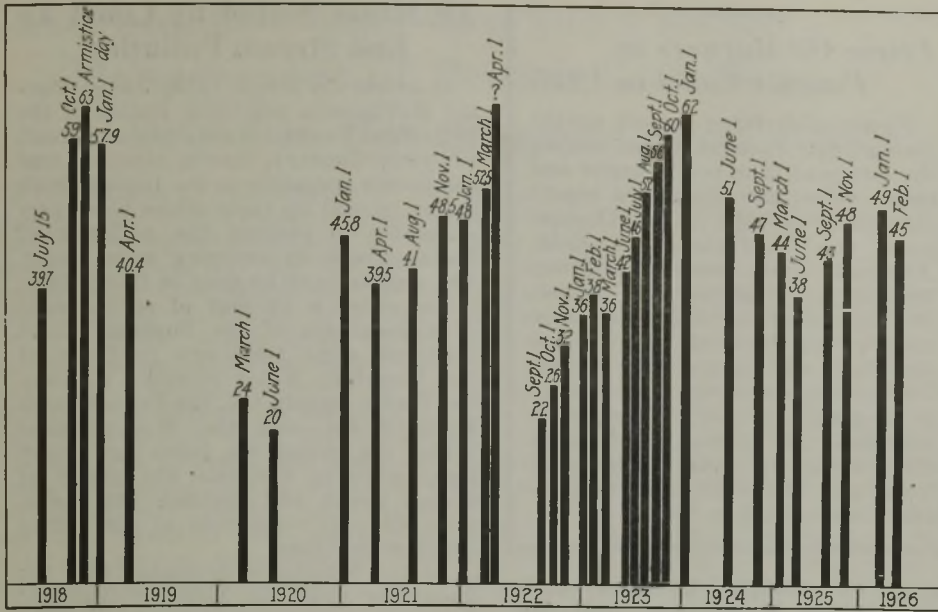
Public utilities, as is customary, carried larger reserves than any of the other groups of consumers. The coal-

Table I—Days' Supply of Bituminous Coal in Hands of Various Classes of Consumers in the United States, Jan. 1, 1919, to Feb. 1, 1926 (a)

(Figures represent number of days that supply would last at rate of consumption at time of stock taking.)

| | Jan. 1, 1919 | Mar. 1, 1920 | Jan. 1, 1921 | Jan. 1, 1922 | Mar. 1, 1922 | Feb. 1, 1923 | Jan. 1, 1924 | Mar. 1, 1925 | Sept. 1, 1925 | Nov. 1, 1925 | Jan. 1, 1926b | Feb. 1, 1926b |
|---------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|---------------|---------------|
| Byproduct coke plants... | 32 | 15 | 29 | 42 | 39 | 20 | 35 | 25 | 22 | 26 | 26 | 23 |
| Steel plants..... | 42 | 9 | 42 | 48 | 48 | 26 | 43 | 30 | 30 | 32 | 28 | 26 |
| Other industrials..... | 65 | 27 | 64 | 51 | 56 | 36 | 55 | 40 | 38 | 44 | 39 | 37 |
| Coal-gas plants..... | 81 | 31 | 55 | 89 | 82 | 62 | 91 | 78 | 67 | 78 | 72 | 67 |
| Electric utilities..... | 49 | 21 | 44 | 51 | 54 | 35 | 51 | 51 | 43 | 46 | 48 | 47 |
| Coal dealers (bitum.).... | 39 | 13 | 30 | 33 | 23 | 15 | 34 | 33 | 27 | 30 | 20c | 17c |
| Railroads..... | 32 | 11 | 23 | 35 | 42 | 18 | 44 | 35 | 28 | 30 | 27 | 25 |
| Total bituminous..... | 42 | 18 | 39 | 41 | 43 | 24 | 46 | 37 | 32 | 35 | 30d | 28d |

(a) These figures are based on incomplete data. (b) Calculated at average rate of consumption in January, 1926. (c) At delivery rates normally prevailing in January, the tonnage of bituminous coal on hand on Jan. 1 and Feb. 1 would be sufficient for about 33 and 28 days respectively. (d) Using the normal January rate of delivery of bituminous coal by retail dealers, the total stocks on Jan. 1 would be sufficient for 34 days, and those on Feb. 1 for 31 days.



Total Commercial Stocks of Bituminous Coal, Oct. 1, 1916-Feb. 1, 1926

Figures represent million net tons and include coal in the hands of railroads, industrial consumers, public utilities and retail dealers. Coal for steam ship fuel, on lake docks, in transit and in the bins of householders is not included. Reports are to the effect that since Feb. 1 stocks have been further reduced.

gas plants on Feb. 1 had a supply sufficient to run them, on the average, for 67 days; the electric central stations had a 47-day supply.

Byproduct coke and steel plants had a smaller tonnage in reserve on Feb. 1 than on Nov. 1, 1925, the decrease being greater for the steel plants. Complete returns from these groups follow:

Stocks at Byproduct Coke Plants

| | Days' Supply | | | |
|--------------------|--------------|--------------|--------------|--------------|
| | Mar. 1, 1925 | Nov. 1, 1925 | Jan. 1, 1926 | Feb. 1, 1926 |
| Low volatile..... | 23 | 28 | 28 | 24 |
| High volatile..... | 26 | 26 | 26 | 23 |
| Average..... | 25 | 26 | 26 | 23 |

Stocks at Steel Plants

| | Day's Supply | | | |
|-----------------|--------------|--------------|--------------|--------------|
| | Mar. 1, 1925 | Nov. 1, 1925 | Jan. 1, 1926 | Feb. 1, 1926 |
| Steam coal..... | 36 | 31 | 37 | 36 |
| Gas coal..... | 26 | 33 | 23 | 21 |
| Average..... | 30 | 32 | 28 | 26 |

The total quantity of railroad fuel on hand Feb. 1, according to information received from the American Railway Association, was 10,235,000 tons, or approximately a 25 days' supply.

All coal brought to the surface and made ready for market, but not yet delivered to a retail dealer or a consumer may be considered "in transit." The largest element in this mobile reserve is the coal in railroad cars, which, though it has never been accurately measured, is known to run into millions of tons.

A few producers of soft coal follow the practice of storing coal at the mines. The quantity stored at present is small. From a list of 43 companies that have at some time in the past stored in quantity at the mines or at some intermediate point, the bureau has received reports of only 185,000 tons so held on Feb. 1, or 36,000 tons less than on Nov. 1, 1925, the date of the last stock report. In March, 1923, these companies had 808,000 tons.

The total quantity of unbilled coal in cars at the mines was 760,000 tons

on Feb. 1, as against 452,000 tons on Jan. 1, 504,000 tons on Nov. 1, 1925, and 600,000 tons on March 1 a year ago.

Reports from all of the companies show stocks of 6,551,000 tons on the docks of Lakes Superior and Michigan on Jan. 1, and 5,176,000 on Feb. 1, compared with 3,840,000 tons on March 1, 1925; 7,806,000 tons on Jan. 1, 1924; 3,129,000 tons on Jan. 1, 1923, and 7,151,000 tons on Jan. 1, 1922.

On Feb. 1, the date covered by this report, the anthracite suspension was still in effect, and the stocks of anthracite had fallen to a low level. It was not possible to obtain reports from all retail dealers, but a selected group who have been reporting regularly for seven years are covered by table II.

Table II—Coal in Yards of a Selected List of Retail Coal Dealers

| Date | (In Net Tons) | | Total |
|--------------|----------------|----------------|-----------|
| | Anthracite (a) | Bituminous (a) | |
| 1919 | | | |
| Jan. 1..... | 910,988 | 1,411,231 | 2,322,219 |
| 1920 | | | |
| March 1..... | 718,510 | 615,632 | 1,334,142 |
| 1921 | | | |
| Jan. 1..... | 658,112 | 1,158,358 | 1,816,470 |
| 1922 | | | |
| Jan. 1..... | 1,208,935 | 1,303,074 | 1,512,009 |
| March 1..... | 1,052,464 | 1,062,995 | 2,115,459 |
| 1923 | | | |
| Feb. 1..... | 326,527 | 970,477 | 1,297,004 |
| 1924 | | | |
| Jan. 1..... | 949,441 | 1,421,999 | 2,371,440 |
| 1925 | | | |
| March 1..... | 1,109,418 | 1,012,260 | 2,121,678 |
| Sept. 1..... | 1,395,289 | 1,213,370 | 2,608,659 |
| Nov. 1..... | 745,445 | 1,300,150 | 2,045,595 |
| 1926 | | | |
| Jan. 1..... | 306,607 | 1,418,402 | 1,725,009 |
| Feb. 1..... | 183,757 | 1,221,133 | 1,404,890 |

(a) The number of dealers reporting their stocks of anthracite on each date was 535, although many of these had no anthracite at all on Feb. 1, 1926. The number of dealers reporting their stocks of bituminous coal on each date was 739.

A group of 21 byproduct coke plants supplying gas for city use reported only 87,000 net tons of unsold coke on hand Feb. 1, the lowest figure of record since October, 1923. The stocks on other recent dates have been: March 1, 1922, 987,000 tons; Jan. 1, 1923, 212,000 tons; Jan. 1, 1924, 772,000 tons; March 1, 1925, 606,000 tons; Jan. 1, 1926, 246,000 tons.

Wheeler Bill Proposes Seizure of Coal Mines By U. S. in Emergency

Senator B. K. Wheeler, of Montana, on March 11 introduced a bill to authorize the creation in a national emergency of a Federal Anthracite Corporation to take over coal properties and to operate them. The directors of this corporation are to be appointed by the President, representing in a measure the consumers and workers, but primarily the public as the owner and beneficiary of the properties.

"The detailed provisions of this bill are of little importance compared with its primary purpose," said Senator Wheeler. "I present it not as a finished product nor as a detailed program which should be enacted as written but as a challenge to industrial statesmen. A law of this character would provide the means for ending an intolerable situation; a means for substituting public order for private disorder in an essential industry; a means for substituting a reasonable average cost of production for the highest cost of production as the basis of price to the consumer; a means for substituting the payment of just wages as a matter of right and as the product of genuine collective bargaining for wages determined as the spoils of victory by the winner of an industrial war.

"In offering this bill, I invite intelligent constructive criticism to aid in developing a workable program to protect the public interest, which should be enacted into law before an emergency arises in order that the public may be prepared.

"No more than a fair price should be paid the present owners of the mines, which is to be based on the prudent cost of their investment."

Offers Bill to Regulate Coal And Prevent Strikes

A bill to regulate the coal industry and prevent strikes was introduced in the House March 13 by Representative Morris Jacobstein, Democrat, of New York. In event of a strike which could not be settled by any other means, it would empower the President to take over the mines.

The bill would establish a Bureau of Coal Industry as a federal agency, which would report on conditions of production, distribution and storage of coal, including costs, prices, profits, marketing, wages and working conditions. In cases of dispute between miners and operators the President would be empowered to "induce them to submit the controversy by voluntary agreement to the decision of arbitrators."

"If this failed, the President would appoint an Emergency Coal Board to investigate the situation and report within thirty days whether there was likelihood of a settlement and whether the public was being deprived of an adequate supply of coal. Only after the failure of all means of arbitration would the President seize the mines.

L. I. Dealers Embargoed for Refusing Soft Coal

Seven Long Island coal dealers were embargoed by the Long Island R.R. on March 15 because they refused to accept consignments of bituminous coal and coke delivered to their order after the anthracite strike was settled. More than 800 cars of soft coal and coke, it was said on March 15, were tied up on metropolitan zone tracks because the dealers to whom they were consigned would not unload them. It was said that at one time in the last fortnight there were more than 1,200 cars loaded with coal at sidings. Demurrage charges on these cars are said to total \$35,000.

The dealers who refused to handle the soft coal and coke consigned to them, it is said, admitted having ordered the substitutes, but said that they were not up to specifications and gave other reasons for refusing the shipments. So long as the dealers mentioned in the embargo order refuse to receive the coal consigned to them they will be unable to receive hard coal, it was reported.

In a formal order filed with the Interstate Commerce Commission on March 1 by the Long Island R.R. the following dealers were embargoed: Rubel Coal & Ice Co., Putnam Coal & Ice Co., Commonwealth Fuel Co., Glendale Coal Co., and the Metropolitan Coal Co. On March 2 the embargo was extended to cover shipments to the Bushwick Coal Co., People's Coal Co., Shanley Coal & Ice Co. and the Home Co. The embargo was later lifted in so far as it applied to the Commonwealth and Shanley companies.

The embargo was held to be necessary by the Long Island Railroad because trackage was needed to bring hard coal into the city, and this work would be hampered so long as the tracks were clogged with the cars of soft coal.

N. Y. Retailers to Discuss Anthracite Situation

The anthracite situation, especially as concerns steam sizes, will be the chief topic of discussion at the eighth annual sectional meeting, New York group, of the New York State Coal Merchants' Association, which will be held Thursday, March 25, at the Hotel Pennsylvania, New York City. The meeting will open with a luncheon at 1 p.m., at which Richard J. Wulff, president of the Commonwealth Fuel Co., Brooklyn, will preside.

The business session will begin at 2 p.m. and the speakers and subjects so far arranged will be:

"Is Coke a Permanent Substitute?" by Walter R. Morris, Seaboard By-products Coke Co.; "The Future of Bituminous Coal in Anthracite Territory," Charles A. Owen, president, Imperial Coal Corp.; "Merchandising Steam Sizes of Anthracite," Charles A. Connell, assistant manager, Anthracite Coal Service; "Our National Organization," Samuel B. Crowell, president, National Retail Coal Merchants' Association; "Can Domestic Sizes of Anthracite Regain Their Markets?" Arthur C. Madley, president, Shanferoke Coal &

Fewer Oil Burners in Panama Canal in 1925

Fewer oil-burning vessels passed through the Panama Canal during the last year than coal burners and motor ships, according to a report submitted to the War Department at Washington last week. Although there were 119 fewer transits of commercial vessels in 1925 than in 1924, 85 more coal-burning and 94 more motor passenger and cargo ships passed through the waterway in 1925 than in the preceding year. There were, however, 300 fewer oil-burning ships using the canal. The total transits in 1925 were 4,774, as compared with 4,893 in 1924.

Supply Corp.; "The Retailers' Viewpoint," Hiram B. Blauvelt, vice-president, Comfort Coal & Lumber Co., Hackensack, N. J. Dr. Louis I. Harris, Health Commissioner of New York City, also will be a speaker at the afternoon session.

The banquet will take place at 6.30 p.m., the speakers to be announced later. Charles B. Staats, of Albany, president of the New York State Coal Merchants' Association, will preside, and Thomas F. Farrell, vice-president, Burns Brothers, will be the toastmaster.

Smoke Ordinance Revived in New York

Dr. Louis Harris, Health Commissioner of New York City, announced on March 11 that after March 17 the city ordinance against the consumption of soft coal will be strictly enforced, particularly where a heavy smoke nuisance is created.

Dr. Harris stated that he thought the time had arrived when consumers would be able to obtain an adequate supply of anthracite, but he wanted those who have soft coal to have a chance to get rid of it by using it in combination with coke or some hard coal, so that it would not vitiate the atmosphere.

Dealers would be advised to warn buyers of these instructions.

In the case of a breach of the ordinance being committed health inspectors would issue a warning to the offender so as to give him a chance to stop the offense before any summary action is called for.

Schuylkill Exchange Dissolves

The Schuylkill Coal Exchange has gone out of business. Its chief object was the maintenance of order on mine property in the lower anthracite field in Pennsylvania belonging to the Philadelphia & Reading Coal & Iron Co., which will take care of this work itself hereafter. Robert J. Montgomery, vice-president and general sales agent of the P. & R. C. & I. Co., was president of the exchange and Joseph B. Givin, of the Charles D. Norton Coal Co., was secretary-treasurer.

19 Mines Sealed by Court To End Stream Pollution

A decree on March 11 by Judge Donald McPherson, presiding justice of the Fifty-first Pennsylvania Judicial Circuit (Fayette County), directs nineteen coal companies operating in the Indian Creek valley to seal up their mines so as permanently to prevent the pollution of Indian Creek by escaping mine water. The sealing is to be done in thirty days.

The order is by way of enforcement of a judgment of the Supreme Court rendered some time ago in favor of the Mountain Water Supply Co., Dunbar Water Supply Co., the Pennsylvania Railroad Co. and the Westmoreland Water Co., which six years ago began legal steps to maintain the purity of Indian Creek and restrain the operations of coal companies in the Indian Creek water shed.

At the hearing it developed that the Sagamore Coal Co., Melcroft Coal Co., Indian Creek Coal & Coke Co. and the Romney Coal Mining Co. are constructing a drainage tunnel through the coal seam to convey all mine water from their workings to a point below the dam of the Mountain Water Supply Co. By consent of the Pennsylvania Railroad Co., which is making a determined fight to keep its water supply pure for use in its locomotive boilers, and the associated water companies which serve the greater part of Westmoreland County consumers, these four coal companies were granted an extension of the rule until June 16, 1926.

Alabama Holds No-Accident Crusade at Mines

To wage a relentless fight against carelessness and to join intensively and without relaxing for one year beginning March 1, and from year to year thereafter, in a crusade to prevent injury to persons and property is the purpose of the Alabama Mining Institute, operating through its mine casualty committee. At a meeting formulating this campaign were present Erskine Ramsay (chairman), Milton H. Fies, W. E. Leake, A. Sicard, Eugene C. Morgan, James B. Donaldson and Priestly Toulmin. The committee has circulated a 67-point questionnaire asking for information as to safety provisions at the various mines. The committee urges membership in the Joseph A. Holmes Safety Association.

C. W. Hunt Confirmed for Trade Board

The U. S. Senate on March 10 confirmed the appointment of Charles W. Hunt, of Iowa, for another term as a member of the Federal Trade Commission by a vote of 48 to 20, after a debate lasting two hours.

The fight on Hunt revolved about the policy of the Trade Commission as it has been restricted by Commissioners Humphrey, Van Fleet and Hunt against the opposition of the Democratic members, Commissioners Thompson and Nugent. Hunt, former secretary of the Iowa Farm Bureau, was scored in speeches by Senators Walsh, King, Norris and others. Senator Cummins led in his defense.

Government Ownership and Private Management of British Coal Mines Urged in Royal Commission Report

A compromise of the demands of the operators and miners fairly accurately sums up the recommendations in the long-awaited report of Sir Herbert L. Samuel's Coal Commission for the re-organization of the British coal industry. The report, which probes deeply into every phase of the coal crisis, was issued March 10. It is signed by the Chairman, Sir Herbert L. Samuel; Sir William Beveridge, Gen. Sir Herbert Lawrence and Kenneth Lee, who were named six months ago to work out a plan to put the industry on a sound basis and eliminate the disputes between the miners and operators that threatened industrial disaster.

State ownership of the mines, but continuance of their development by private enterprise under government supervision, is recommended, the commission declaring against nationalization as recommended by the Miners' Federation.

The report is equally emphatic in declaring that the coal subsidy—in force since last August, when Premier Baldwin, by granting it, postponed the final solution of the coal problem until next May—should stop immediately and should never be repeated. In so deciding the drafters of the report line up firmly against all those who are advocating further purely temporary remedies, and in support of those wishing to see the coal crisis brought to a head once and for all by drastic means.

Opposes Lower Wages

The depression in the industry, says the report, cannot be attributed to political unrest or restriction of output by the miners or inefficiency of management, but it disagrees with the view of the mine owners that the only practicable remedy is to reduce wages, lengthen the hours of work and decrease railway rates by lowering wages of railway men.

It says that the way to prosperity lies in three chief lines of advance, namely, greater application of science to the mining of coal, larger units for production and distribution and fuller partnership between employees and employers.

The six outstanding points in the commission's report are as follows:

(1) The error formerly made of allowing ownership of coal to fall into private hands should be retrieved and

the mineral should be acquired by the state by purchase or by declaration of state ownership.

(2) Amalgamation of many present small units of production is desirable and practical. Legislation should provide for compulsory transfer of interests under existing leases in such cases.

(3) Closer connection of mining and allied industries should be promoted.

(4) Existing provision for research should be largely extended by the industry with support of the state.

(5) Comparative agencies, particularly for selling, should be formed. A governmental system for the analysis and sampling of coal should be established. Coal authorities should be empowered to engage in the retail sale of coal.

(6) The existing wage agreement of the system is sound, but amendments are needed in the method for ascertaining profits. The seven and a half-hour working day under ground should stand. Profit-sharing schemes should be introduced and holidays with pay given later.

Would Withdraw Subsidy

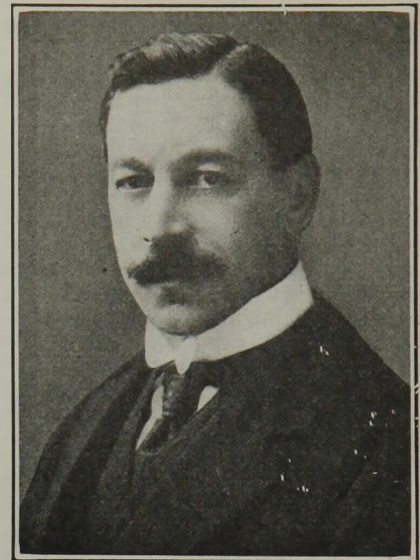
"We express no opinion as to whether the grant of a subsidy last July was unavoidable, but we think its continuance is indefensible," the commission reports. "The subsidy should cease at the end of its authorized term and should never be repeated."

The nationalization scheme advocated by the Miners' Federation was rejected by the commission because it contains "grave economic dangers" and because it is neither "workable nor offers a clear social gain."

In the opinion of the commission nationalization would involve the state in the business of exporting coal. The state would become a coal merchant, which would lead to international complications, the report holds. The report also estimates that nationalization would cost £350,000,000.

The commissioners warn the public that their scheme cannot be applied immediately and is not a panacea for all the troubles of the industry. "It will take months to inaugurate it," the report states, "and years to put it into full operation."

Although there is no direct recommendation that uneconomic pits should be abandoned, it is implied in the body



Keystone View Co.

Sir Herbert L. Samuel

Chairman of Royal Commission which has just presented its report on the British coal industry after six months' study.

of the report that such pits should, in the natural course, be closed.

While advising the preservation of the present wage agreement system, the report recommends the miners accepting in the immediate future a smaller minimum percentage over the standard rates of pay. The report says:

"Disaster is impending over the industry and the immediate reduction in working costs that can be affected in this way alone is essential to save it. The minimum percentage is not a minimum wage in the usual sense of the term. The wages to the lowest paid men will be safeguarded by continuance of the system of subsidence and allowance."

The commissioners found that, if the government subsidy were excluded, 73 per cent of the coal mined in Great Britain the last quarter of last year was taken out at a loss.

One of the most interesting passages of the Coal Commission's report reads:

"Heat, power and light requirements of the country should be under the constant and comprehensive survey of a body formed for this purpose. We propose for consideration the establishment of a national fuel power committee, with advisory powers, to be composed of representatives nominated by the government from among official and other bodies concerned."

So far over £15,000,000 has been paid in subsidy, the table herewith showing the claims paid up to the end of February.

British Coal Subsidy Payments, August to February

| | Aug. to Nov., 1925 | Dec., 1925 | Jan., 1926 | Total |
|-----------------------------------|-----------------------|------------------|------------------|-------------------|
| Scotland..... | £1,464,895 | £519,554 | £427,162 | £2,411,611 |
| Northumberland..... | 597,339 | 228,890 | 199,411 | 1,025,640 |
| Durham..... | 1,436,867 | 542,218 | 515,572 | 2,494,757 |
| S. Wales and Mons..... | 2,156,440 | 942,281 | 847,549 | 3,946,270 |
| E. Div. of Fed. area..... | 1,614,754 | 662,542 | 506,330 | 2,783,626 |
| Lancs., N. Staffs & Cheshire..... | 989,667 | 393,154 | 275,712 | 1,658,533 |
| N. Wales..... | 150,529 | 58,503 | 49,946 | 258,978 |
| S. Staffs and Salop..... | 91,302 | 33,266 | 9,981 | 154,549 |
| Cumberland..... | 144,619 | 54,348 | 50,135 | 249,102 |
| Bristol..... | 10,351 | 4,879 | 4,934 | 20,164 |
| Forest of Dean..... | 56,655 | 22,409 | 21,028 | 100,092 |
| Somerset..... | 9,145 | 4,050 | 4,699 | 17,894 |
| Kent..... | 11,992 | 5,173 | 5,741 | 22,906 |
| Total..... | 8,734,555 | 3,471,267 | 2,938,300 | 15,144,122 |

Better Track Facilities to Lakes for N. Y. Central

The New York Central Lines announce a program of laying additional passing tracks between Columbus, Ohio, and the Toledo docks in order to aid in the movement of lake coal and heavy traffic in general. The passing tracks, which will cost upward of \$1,000,000, will be placed along the entire T. & O. C. track between the two cities named. A large part of the work will be done north of Kenton.

Was Horning Explosion Caused by Switch Of Cutting Machine Igniting Gas?

The substance of the verdict returned by the jury at the Coroner's inquest of the disaster of Feb. 3 in the Horning mine of the Pittsburgh Terminal Coal Corporation, at Horning, Pa., was that the twenty victims met death "through an explosion the cause of which was undetermined." This verdict however, failed to record certain facts established by the testimony, the recital of which did not leave the causes entirely shrouded in doubt. This, in short, is what the witnesses set forth: At the time of the explosion the victims were engaged in putting the finishing touches to two seals, inby of which was a fire which had originated from the ignition by a cutting machine of a feeder of gas in a clay vein. The inquest was held in Pittsburgh on March 11 by W. J. McGregor, Coroner of Allegheny County.

The fire which caused the explosion was started about 10:30 a.m. at the face of Butt 16 in Sec. 4. Prior to the fire on Feb. 3, Joseph Mott, fireboss, made two inspections of the places on his run, which included Butt 16. He read his report for that day covering these inspections. No gas was detected at the face of this entry nor at the face of the companion entry. He did detect, however, slight traces of gas being emitted from a clay vein at the face of 9-Face South, one of three entries from which Butts 15 and 16 are turned. Mr. Mott said that he had noticed a portion of a clay vein in the lower left-hand corner of the face of Butt 16. This place had remained idle for about six weeks prior to Feb. 3 while a crosscut was being put through to Butt 15 at a point a short distance behind the faces of these entries.

Test Failed to Reveal Gas

Frank Demshar and Rudolph Valentine, loaders, had been engaged as buddies in advancing these entries. Mr. Demshar testified that he entered Butt 16 at 7 a.m. on Feb. 3, intending to resume the advance of this place, the required crosscut having been completed. He remained idle until about 10 a.m., when the cutters arrived accompanied by George Denard, assistant foreman. Mr. Denard tested for gas, and finding none, instructed the machine men to proceed with the cutting.

On being questioned by Inspector John I. Pratt, technical adviser for Coroner McGregor, Mr. Demshar said that a test hole was not drilled into the clay vein prior to the cutting operation. No gas emission was noticed until the cut had been completed to a point about 8 in. from the right-hand rib. Gas being discovered at this stage, Mr. Denard told the cutters to stop the machine and ordered Mr. Demshar to get a piece of canvas. This was wrapped about the starting box (open type) of the cutting machine, after which an attempt was made to back out the machine. A burst of flame followed, which was not of sufficient intensity to burn any of the men present.

Mr. Demshar, who at one time was a cutter, was positive that ignition orig-

inated in the starting box. He stated that he advised Mr. Denard not to attempt to move the machine in the presence of gas, but was told that the machine had to be removed. As attempts to beat out the flame entirely failed, Mr. Denard set off in the open one shot of permissible explosive 10 min. after the fire started and another 10 min. after the first. No reason for his act was revealed at the inquest. It must be inferred that he expected the concussive force of these blasts to extinguish the flame. Mr. Valentine, the second loader, substantiated the evidence given by his companion.

Two types of cutting machines (shortwall and breast) were in use in this mine, according to Herman Ludwig, machine boss. The motors on the shortwalls were inclosed, but those on the breast machines were open. On some of the shortwall machines were starters which, he aptly remarked, "were closed and safe when properly adjusted." The machine used for cutting the face of Butt 16 on Feb. 3 was a shortwall equipped with an open starting box.

Joseph Trevorow, who for 23 months ending Jan. 30 had been superintendent of the Horning mine and then had been transferred to another of the company's mines, explained that the workings of Butts 15 and 16 were ventilated by a split of 16,000 cu.ft. per minute. This air followed an inby course in Butt 16 and returned in Butt 15. The face of Butt 16 had been advanced to a point about 3,000 ft. from an airshaft and 9,000 ft. from the hoisting shaft. All workmen were equipped with electric cap lamps and the officials with flame safety lamps, some locked with keys and others magnetically.

At the time of his last inspection of the Horning mine as safety engineer, during the second week in January, G. W. Owing found conditions good. Haulways had been cleared of all debris in preparation for rock dusting, which had already been started. On no split did he find less than 12,000 cu.ft. of air at the last crosscut. Prior to

the explosion rock dust had been applied as far as the end of the trolley wire in the main haulway of Sec. 4 and had been extended 100 ft. into Butt 15. Inasmuch as the dusting machine is propelled by a trolley locomotive, rock dust could not be applied by this means beyond the limits of the trolley wires.

John I. Pratt, state mine inspector of the seventeenth bituminous district, inspected the Horning mine on Jan. 12, 13 and 14. At that time the fan was developing 236,000 cu.ft. of air per minute against a 35-in. water gage. He found at that time some gas in two places in Sec. 4; otherwise the mine was in good condition.

Efforts to Extinguish Fire

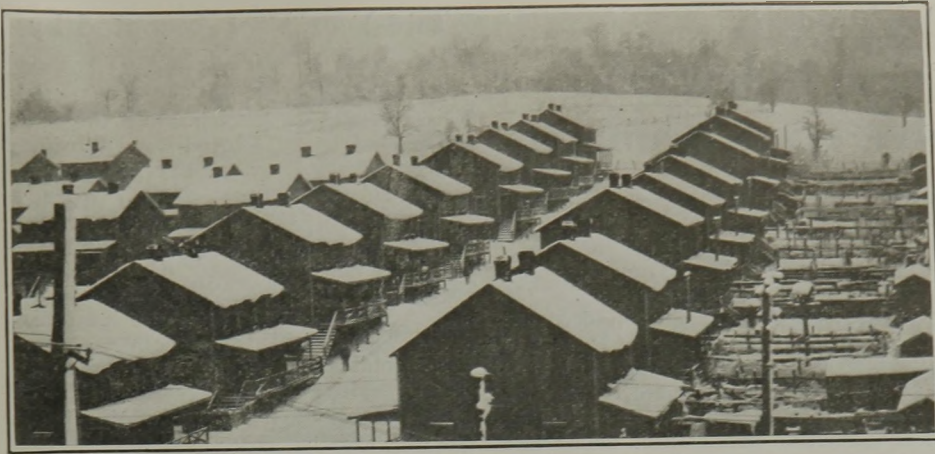
Details as to the attempts made prior to the explosion to put out the fire and afterward to seal it were given by George S. Osler, vice-president and general manager of the coal company. When he arrived at the seat of the fire, about 12:20 p.m., he found that a 3-ply canvas stopping had been erected in Butt 16 intake at a point between a chute and the last crosscut. In his presence a line brattice was tacked to posts and carried up close to the cutting machine by men who held these posts while others attempted to move the truck of the cutting machine and put out the fire. A water box had been hauled to the scene. Pieces of canvas were wetted with water and used in an effort to extinguish the fire, which, obviously, was of small proportions. It broke out, however, with renewed vigor when fanned by the air which was conducted to it by the brattice. During this time tests for gas were made continually but none was detected. It was decided then to seal off the fire.

A 2-ply stopping was erected at a point about 100 ft. from the face. Behind this was erected a single-course dry brick stopping with a pilaster in the middle. The canvas stopping was completed at about 2 p.m. Outby of the dry brick wall was erected a double-course brick-and-mortar stopping which had been completed before the explosion took place, at about 4 p.m. Likewise on the return side, or Butt 15, a 3-ply canvas stopping was erected followed by a brick-and-mortar stopping which must have been nearly completed when the explosion occurred. Each of

Horning Mine Tipple

Twenty men who perished in the disaster of Feb. 3 met death, according to the jury at the Coroner's inquest, "through an explosion the cause of which was undetermined."





A Portion of the Town of Horning, Pa.

High winds and a heavy snowstorm, as shown in the picture, hampered the rescuers in reaching the scene of the explosion in No. 4 mine of the Pittsburgh Terminal Coal Corp. on Feb. 3. Twenty men were killed by the blast.

these airtight walls was provided with a pipe and valve.

The construction work was delayed by the fact that cars of supplies could not be hauled by locomotive to the location and therefore were pushed by men. Mr. Osler left the fire zone shortly before the explosion and was not aware that an explosion had taken place until told by men on the outside.

Coroner McGregor asked why so small an area was inclosed by the seals. He wondered whether a larger zone would have allowed for expansion and contraction to a greater extent and delayed the time when an explosive mixture might have been developed. Mr. Osler remarked that all present were of one opinion with regard to the most feasible location for the seals. He thought the explosion was due to a radical change of conditions after the walls were erected. He is certain that rock dust stopped the explosion from going any farther than it did.

Matches in Victims' Clothes

John B. Black, superintendent of the Allegheny County morgue, said that in a search he found matches in the clothes of a number of the victims. On two men he found cigarettes and on one tobacco and a pipe. Edward B. Laughlin, funeral director, testified that he found twenty matches in the clothes of one victim. He bore out the statement by Mr. Black to the effect that quite a few of the men had matches in their clothes.

State Mine Inspector Alexander McCanch testified as to the findings of a state investigation commission of which he was a member. The commission believes that the most likely source of ignition of the fire which afterward initiated the explosion was the starting box of the cutting machine. Coal dust must have propagated the explosion beyond the limits of the gas explosion which originated at the face of Butt 16, and the commission believes that gas may have accumulated at the face of 9-Face entry and assisted in the propagation. The commission is further of the opinion that a large open area near the seat of the explosion allowed it to expand and spend its force quickly without carrying any great distance, and that rock dust was a big factor in checking the flame.

William Young, captain of a rescue team of the Pittsburgh Coal Co., Beadling, Pa., testified that no great violence was displayed near the seat of the explosion. The bricks of the seals lay in such positions on the bottom as to lead one to decide that the walls were merely toppled over. Few of the bricks traveled any great distance and some of those near the bottom remained in the position in which they were set by the bricklayers.

Following are the commission's recommendations to Joseph Walsh, Secretary of Mines of Pennsylvania, following its investigation, which, incidentally, were not presented at the inquest:

"Because of the large number of mine officials lost in this disaster there will always be some doubt about the conditions and circumstances surrounding this explosion. The occurrence of this explosion announces in no unmistakable terms the great need of excluding from the working face, as far as consistent with mine practice, from dry and dusty mines that generate gas either regularly or intermittently all sources that give rise to ignition; that, to make rock dusting so effective as to confine flammation within narrow limits, all avenues of escape from the face of the workings must be liberally and systematically rock-dusted and that this treatment be extended and maintained close to the face concurrent with the advance of workings.

"It is equally important from the viewpoint of safety that all electrical equipment and material used in the mining of coal, which through defect or misuse may furnish a source for the ignition of gas or coal dust, be placed in the hands of competent and authorized persons and carefully supervised by the mine management."

California Mine Ships Coal

The first shipment of coal from Shasta County mines was made March 1, when five tons was dispatched from the mines on Oak Run to the Pacific Gas & Electric Co., San Francisco, to be given a working test in gas works. There is a possibility that the company eventually will substitute coal for oil as fuel in its various gas plants.

Kansas Union Men Restless; Would Close Strippings

Arrest of several of the officials of District 14, United Mine Workers, and Alexander Howat, deposed president of the district, has halted "marches" by union miners in the Pittsburg (Kan.) district. The "marching," all of which was done in motor cars, was a gesture of the unionists to stop work at a number of steam-shovel mines in an effort to force the operators to sign a contract with the union under the Jacksonville agreement.

Charges of unlawful assembly were filed against seven district officials of the union and five miners. All were released under \$1,000 bond each. Three miners also were charged with assault and battery.

Union district officials arrested included Matt L. Walters, president; Harry W. Burr, secretary-treasurer; Dan O'Donnell, vice-president; Charles Skidmore, William Brady and Ed McCluckie, district board members, and James Fitzgibbon, joint board member.

District President Walters declared that the union would seek to remove the cause of the controversy over wages at the non-union shovel mines by having the Kansas Legislature enact a law against removing coal from shallow veins. He declared that shovel mining is an economic waste of land.

Coronado Case Rival Results In Second Mistrial

The Pennsylvania Mining Co.'s \$600,000 damage suit against the United Mine Workers resulted in a second mistrial at Fort Smith, Ark., March 13, when a jury reported itself unable to agree upon a verdict after more than fourteen hours of deliberation.

The coal company's suit was the outgrowth of the Jamestown labor troubles several years ago, and was similar in many respects to the famous Coronado case, which was tried in federal court for the third time last December. All three of the juries which heard the Coronado case failed to agree upon a verdict.

The Pennsylvania case was tried originally in 1920, the jury failing to reach a verdict.

Jail Awaits Bittner

The West Virginia Supreme Court of Appeals has dismissed the writ of error granted last June to Van A. Bittner, international representative of the United Mine Workers in northern West Virginia. The decision upholds the Monongalia County Circuit Court in sentencing Bittner to six months in jail and fining him \$500 on a contempt charge for violating an injunction of Judge I. Grant Lazelle forbidding interference with non-union workers at mines on Scotts Run last spring. The court ruled that contempt charges would be reviewed by the court only to ascertain whether the lower court acted within its jurisdiction, holding that a circuit court may punish summarily, without trial by jury, a person who has disobeyed or resisted a lawful decree of that court.

May Defer Action on Oddie Bill Awaiting Results of Coal Industry's Efforts to Solve Own Problems

By Paul Wooton

Washington Correspondent of *Coal Age*

Impressed with the progress which the coal industry is making in providing for the settlement of its own quarrels and in the matter of voluntary fact-finding, Senator Oddie, of Nevada, chairman of the Mines and Mining Committee of the Senate, apparently is willing to withhold consideration of his bill until the results of these activities can be determined. He greatly prefers that the industry do these things for itself and, despite the advanced state of its plans, is inclined to await the result of current developments. Senator Oddie expresses his views on the subject as follows:

"When the President sent his first message to Congress, urging action on the report of the Harding Coal Commission, I felt, as chairman of the Committee on Mines and Mining, to which the report of the Coal Commission had been referred, that it was incumbent on me to take action. This led me to draft the legislation which I introduced on January, 1925, just following the report of the Coal Commission's report.

"In the preparation of that measure I consulted with the representatives of all the departments interested and made a thorough study of the recommendations of the war-time fuel administration and all other bodies which had studied the subject. I took especial pains to explain the bill to representatives of the industry.

"When Congress met last December the anthracite strike was in progress. The President again in his message urged legislation along the lines of the Coal Commission's report, but as the anthracite controversy dragged on it became increasingly clear that any legislation during the pendency of the strike would make less likely the settlement of the quarrel by the participants themselves—an end to which the President was committed.

Calls Settlement Constructive

"Now that the strike is over the constructive nature of the settlement has taken a new aspect on the situation. It appears that this settlement has provided a means for arbitration and that peace and production are likely to continue in the anthracite region for five years. The agreement gives promise of accomplishing many of the ends contemplated by my bill. I find that the aspects of the settlement are so promising as to have impressed the administration to the point where it is not disposed to press for legislation at this time, but is inclined rather to await results under the new contract.

In view of the existing situation there are reasons which may influence me not to push my bill at this time. If the settlement yields the happy results desired for, legislation may not be needed. It is very much better that industry should set up its own machinery for settling disputes rather than have

the method handed down from above by the federal government.

"On the other hand, if we find at the opening of the next session of Congress that we have a coal problem still with us, I then will press my bill, because I am convinced it is the one conservative and constructive proposition which has come from Congress after all these years of agitation."

In addition to the consideration being given plans for setting up machinery to handle labor disputes, the bituminous-coal industry is making rapid progress in its statistical activities. Apparently the coal operators are bent on doing their own fact-finding. The need now is for a clearing house where statistics of national interest can be assembled. The National Coal Association promises such a summary just as soon as the statistical work of the local associations has reached the point where it will cover enough tonnage to be thoroughly representative. Many local associations are planning to gather statistics dealing with other phases of mining.

Many Arrests as Troops Leave Southern Indiana

Arrest of William Stinson, board member of District 11, United Mine Workers, at Boonville, March 13 brought the total number of arrests in the recent rioting in the southern Indiana mine fields to 55. About 25 more arrests are expected, according to Sheriff Spradley, of Warrick County, where the attacks on non-union miners occurred. All those arrested were said to be either members of the United Mine Workers or sympathizers of the organization.

The arrests followed a grand jury investigation, in which 96 indictments charging assault and battery, rioting and assault with intent to kill were returned.

Those arrested will be arraigned March 22. Bonds in most of the cases were fixed at \$1,000.

The last of the National Guardsmen dispatched to Evansville Feb. 16 in connection with disturbances in the southern Indiana mine fields were withdrawn by order of Adjutant General William Kershner, March 12.

The troops, numbering approximately 50 officers and men, were quartered in the National Guard armory at Evansville throughout their stay, no disturbances occurring to warrant their dispatch to mine properties in the district. Two airplanes made daily reconnaissance flights over the district during their stay. This marked the first time that a National Guard aerial unit has been called into service during a labor disturbance.

Mine operators of the district entered a protest with Governor Jackson two weeks ago when withdrawal of the troops was first rumored.

Two-Year Pact Accepted by Nova Scotia Miners

A settlement between the British Empire Steel Corporation and the miners of District 26, United Mine Workers (Nova Scotia), was arrived at on March 11 at Sydney, N. S., when a referendum to accept a two-year wage agreement with the corporation was voted on and carried by a majority of 201. The agreement is based on the report of the Duncan Royal Commission. The number of ballots cast was 4,853, indicating that about half the Besco employed miners voted. Included in the agreement is the union check-off, but a provision whereby miners and their families were to be guaranteed medical treatment for a small sum payable each week was not included.

Ohio Companies to Expand Byproduct Coke Plants

The Central Steel Co., Massillon, Ohio, has placed an order for a byproduct coke plant, including all essential byproduct and benzol equipment as well as coal- and coke-handling machinery. The plant will consist of 49 Koppers-Becker combination ovens with a carbonizing capacity of approximately 1,350 tons of coal daily. On a basis of 70 per cent yield that would mean the consumption of 492,750 tons of coal and an output of 344,925 tons of coke annually.

The Republic Iron & Steel Co., Youngstown, Ohio, will add a battery of 43 Koppers-Becker combination ovens to its plant in Youngstown. The new unit is rated as capable of carbonizing about 1,100 tons of coal daily, or 401,500 tons per year, and when completed will give the company a total of 247 ovens with an annual coal-carbonizing capacity of 1,939,800 tons and an output of 1,257,860 tons of metallurgical coke.

Lawton Gets 60 Days in Jail And \$200 Fine

Tyler G. Lawton, president of District No. 11, United Mine Workers (Indiana), who was found guilty several weeks ago of contempt of court by Judge Edgar S. Durre, of Vanderburgh County Superior Court, Evansville, was fined \$200 and sentenced to sixty days in jail last week. His conviction and sentence grew out of his alleged interference with the operation of the Green Mound Coal Co. mine, near Washington, Ind., a property that was being operated on a co-operative basis following a receivership that had placed it under jurisdiction of the Vanderburgh County Court.

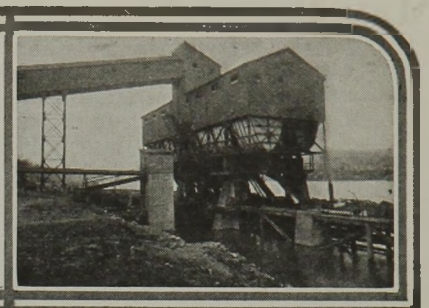
Mine union officials have declared that the conviction and sentence will be appealed to the State Supreme Court.

To Test Anthracite Culm Piles

The Bureau of Mines and the State of Pennsylvania have undertaken to cooperate in sampling of anthracite culm piles. The work is in charge of D. C. Ashmead. The amount of recoverable coal will be determined. Tests will be made of its quality and of the grade of all marketable sizes.



News Items From Field and Trade



ALABAMA

The Alabama Fuel Association is the latest association affiliated with the National Coal Association to inaugurate past sales reports. The system began operation on March 1.

ILLINOIS

The Paradise Mine at Duquoin, owned and operated for many years by the Paradise Coal Co., Duquoin, closed down March 12. It is the first time in several years that this mine has closed except for repairs or some similar cause. Officials stated that the mine would be closed indefinitely as the company could not operate the mine profitably under the Jacksonville agreement. Four hundred and fifty men are affected. The company owns large tracts of coal lands in the vicinity of the Paradise Mine and had planned to sink a new mine. These plans will be shelved temporarily.

Five company houses owned by the Black Star Coal Co. at Logan, near Benton, in Franklin County, were destroyed by fire recently. The fire truck from Benton made a run and prevented additional destruction.

Blue Bird Mine, belonging to the Harrisburg Coal Co., northwest of Carriers Mills, after being idle for more than a year, has resumed work. The mine employs about 150 men.

The Chicago & Eastern Illinois R.R. has placed an order for 500 coal cars with the Mt. Vernon Car Manufacturing Co.

Ten of the twelve mines owned by the Old Ben Coal Corp. in Williamson and Franklin counties have suspended operations. The latest of the company's mines to close down was the No. 20 mine, located in the Valier section, which suspended work March 13. High percentage of screenings found in the output and inability to compete with mines in the non-union Kentucky fields were given as the cause of No. 20's close. The mine normally employs 450 men. More than 8,000 men are employed by the Old Ben company when all twelve mines are running at capacity.

Possibility of the reopening of a number of mines in the Marion district is seen by coal operators there in the announcement that the Missouri Pacific R.R. will operate the Marion & Eastern R.R., serving that field.

The Lovington Coal Co., Decatur, has elected officers as follows: Oscar J. Danzelson, president; Dennis Houlihan, vice-president, and William R. Kirkpatrick, secretary-treasurer. The direc-

tors elected are Daniel Hall, W. L. Huff, R. E. Bowers, A. B. Chapman, D. A. Beggs and the above named officers. This company purchased the interests of the old bankrupt Lovington Coal Co., which include a mine at Lovington.

Divernon mine No. 6, Divernon, operated by the Madison Coal Co., will be electrically operated in the future, having been connected with the Central Illinois Public Service Co. at Kincaid.

INDIANA

The American Cannel Coal Co., Cannelton, has reduced its capital stock from \$30,000 to \$25,000.

KANSAS

Jackson-Walker mine No. 16, near Dunkirk, operated under lease by John Fulton for the last three months, was closed down March 5. The mine employed 150 men.

Tentative arrangements have been completed for holding the Kansas first-aid and mine-rescue meet on the athletic field of the Kansas State Teachers' College, at Pittsburgh, on May 22. Miners' and operators' organizations and the Pittsburg Chamber of Commerce will co-operate toward financing the meet. It is proposed to have the miners in Barton County, Missouri, immediately east of the Kansas line and included in District 14 of the United Mine Workers, participate in the meet. The question of whether this can be done will be passed on by W. D. Ryan of Kansas City, mine safety representative of the U. S. Bureau of Mines for the Southwest.

KENTUCKY

The Old Straight Creek Coal Corporation, composed of Charleston (W. Va.) coal tradesmen, has acquired the Hamby mine of the Straight Creek Fuel Co., near Pineville, Bell County, and will start to operate the plant soon. The mine produces 500 tons of coal daily.

PENNSYLVANIA

The tri-district executive board of the United Mine Workers, representing the anthracite union districts, 1, 7 and 9, has taken initial steps in a campaign to interest manufacturing and industrial plants in the anthracite region in burning anthracite exclusively. All of the local unions in the three districts will be asked to aid in the campaign.

A. K. Morris, vice-president and gen-

eral manager of the Pennsylvania Coal Co., announced on last Friday that the collieries of his company on that day reached the peak of production since the termination of the strike. A total of 35,071 tons of hard coal was shipped in ten hours on Friday. The greatest daily tonnage ever shipped to market by the Pennsylvania was reached on Aug. 29 of last year, when 47,000 tons was shipped.

Hearings on the appeals of the large anthracite corporations for a reduction in county taxable valuations were continued last week in the Northumberland County courts. The operators are opposing a total assessment of approximately \$34,000,000 for the three years beginning Jan. 1, 1925. They claim this an overestimate of \$10,000,000. Three years ago the assessment was fixed at \$24,000,000, or a 40 per cent increase. In a similar case in Schuylkill County the Supreme Court decided that the comparative sale value is the proper way to value coal lands for taxation purposes. This decision may result in the coal companies gaining their point in Northumberland County.

The Lehigh & Wilkes-Barre Coal Co. since the end of the suspension has had to obtain 200 laborers through New York and Philadelphia employment agencies because of inability to obtain local residents to work in this capacity at their mines. Officials of the company state that hundreds of mine workers who left this section when the suspension became effective have not returned. About sixty men a week are being brought into Wilkes-Barre and adjoining towns. The company finds boarding houses for the new employees and endeavors to place the men with others of the same nationality.

The history of anthracite is to be depicted in the historical exhibit by the State of Pennsylvania at Philadelphia during the Sesquicentennial. Arrangements have been made to take scenes associated with the early development of the great industries of the state and show them in addition to the present-day operations.

The land and plants of the Buck Ridge Colliery in Coal Township, Northumberland County, will be sold at public auction at the court house, Sunbury, on March 22, according to an announcement by the receivers for the Puritan Coal Mining Co., Inc. One of the conditions of the sale is an upset price of \$275,000 in cash to cover all claims and taxes. The plant has been operated for some time by the receivers, E. H. Sueder and Benjamin K. Focht.

W. H. Blight, of Elmira, N. Y., who has been in the coal business for 45 years, recently purchased the Pine Run Coal Co., near New Bethlehem, Clarion County, from the Bader Coal Co., of New York and Boston. His new acquisition adjoins the Eagle Mine, of which Mr. Blight is the principal owner. The two plants will have a daily capacity of 25 carloads, mined from the Freeport and Lower Kittanning seams, which will be shipped via the Shawmut and Pennsylvania railroads.

The Pittsburgh Terminal Coal Corp. and subsidiaries for the year ended Dec. 31, 1925, report net income of \$314,790 after depreciation, depletion, interest, federal taxes, etc., equivalent after preferred dividends, to 69c. a share earned on \$12,000,000 outstanding common stock.

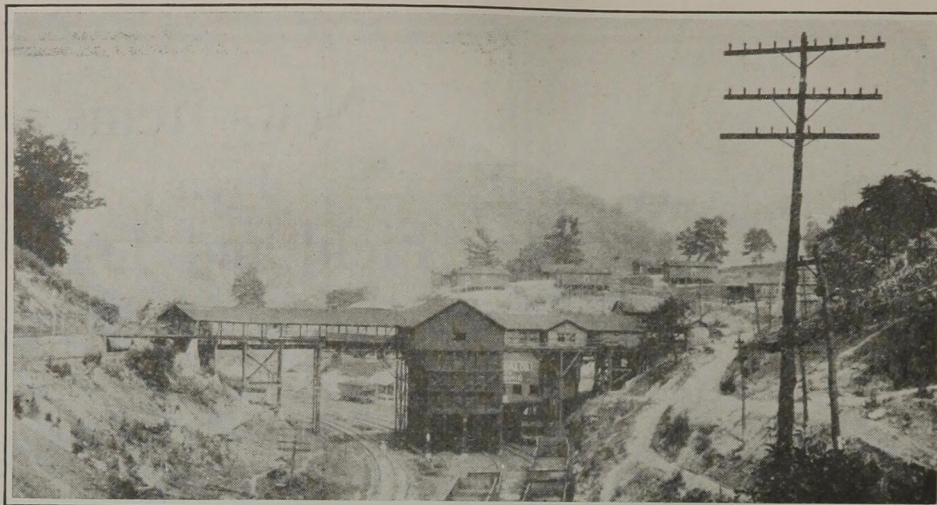
A series of lectures on the subject of "Combustion" has been instituted in Philadelphia under the auspices of the Anthracite Operators' Conference. The course, which is intended for the sales forces of the various anthracite operating companies, began March 10, and will continue for five consecutive Wednesday evenings. The first three lectures are to be given in the William Penn High School and the remaining two in the Central High School. It is understood that similar courses will be given in New York, Albany, Syracuse, Boston, Providence and Washington.

The Orient Coal & Coke Co., a subsidiary of A. M. Byers & Co., has inaugurated a co-operative group life insurance program providing \$422,000 protection for its employees in Pittsburgh and Orient. With the adoption of this plan, the total coverage on workers either directly or indirectly employed by A. M. Byers & Co. has been increased to nearly \$3,000,000.

The Hudson Coal Co. is reported to have plans in mind whereby all coal mined between Forest City and Archbald will be prepared for market at one new big breaker. It is said the company plans to build the new breaker close to the present Coalbrook plant and that after the new structure has been erected the present breakers at Vandling, the Powderly and Coalbrook at Carbondale, and the Archbald at Archbald, will be abandoned. When the new breaker is in operation the old structures, it is understood, will not be razed but instead will be turned into washeries, thus making use of some big culm dumps owned by the company. Official announcement of the company's plan to centralize the preparation of anthracite probably will be made before segregation of the coal and railroad interests of the company, which is expected soon.

Five hundred men formerly in the employ of the Buffalo & Susquehanna Coal & Coke Co. at its Sagamore Mine recently passed a resolution reaffirming their determination not to return to work until the company restores the Jacksonville wage agreement.

Bituminous coal transported by the Reading Co. during January, 1926, totaled 2,303,939 gross tons, compared with 1,596,158 tons in the corresponding month of last year.



Mine No. 9 of the Daniel Boone Coal Corporation

This operation, located at Lennut, Perry County, Ky., on the main line of the L. & E. division of the Louisville & Nashville R.R., is controlled by the Columbus Mining Co. The mine, which is one of the oldest and largest in the Hazard field, is equipped with shaker screens, picking tables and loading booms. The coal is taken from the Fire Clay Seam on both sides of the valley.

Fire early Thursday morning, March 4, destroyed the offices of the Rich Hill Coal Co., in Hastings, Cambria County. The United Mine Workers' hall, on the same block also was destroyed, as well as a number of stores and several dwellings. The total loss exceeds \$200,000.

William J. Patton, vice-president of District No. 5, United Mine Workers, has been elected president of the Pittsburgh Central Labor Union of the American Federation of Labor. Mr. Patton was a former secretary and treasurer of District No. 5 of the United Mine Workers and served for a number of years as a member of the legislative committee at Harrisburg.

UTAH

The Interstate Commerce Commission on March 11 authorized the Utah Railway Co. to acquire control of the National Coal Railway Co. by purchase of its capital stock and by lease.

A tract of coal land in Carbon County, township 22.S., range 3 E., is to be offered for public lease in the near future on application of the Boston Acme Mines Development Co. and W. R. Hutchinson of Salt Lake City. A coal prospecting permit has been denied on the ground that it is a known coal section. A number of small coal leases have been granted to residents of Emery County for wagon haul, but the authorities have refused to allow individuals to tie up large coal deposits in this way.

The Salt Lake County Commissioners have rescinded their action regarding the refusal to accept a bid for coal because it carried 20c. a ton more than the city authorities were paying. The result is that the Kinney Coal Co. will receive \$3.40 a ton for a supply of slack. The commissioners decided that they were not likely to get a lower bid, and also took into consideration that the contract under which the city was receiving its coal would expire soon.

The Denver & Rio Grande Western R.R. has been authorized by the Public Utilities Commission to construct and operate a new line in Carbon County.

It will commence at a junction with its existing line near Spring Canyon, well known coal camp, and will extend in a general easterly direction for about 6.28 miles, connecting with tracks to be constructed by the Independent Coal & Coke Co. to serve its Aberdeen mine and to reach existing tracks to the Kenilworth mine of the Independent. Permission also was given the company to abandon 3.75 miles of road from Kenilworth Junction to the Kenilworth mines.

The Columbia Steel Corp., which was organized two or three years ago, more than doubled its earnings during 1925, according to the annual report. Net earnings on sales amounted to \$1,895,225. L. F. Rains, president of the Carbon Coal Co. and widely known in Utah coal-mining circles, was responsible for the organization of the company.

VIRGINIA

City coal contracts for the Danville municipal plants have been awarded, the Logan County (W. Va.) Coal Co. receiving the contract for 10,000 tons of steam coal at \$1.75 per ton. The contract for 14,000 tons of gas coal was awarded to the Eastern Coal Co., also at \$1.75. The price in both instances is the same as last year.

Whitney & Kemmerer have acquired two mines at Brier Ridge, in the St. Charles district, which are to be operated from this time on in connection with their other operations in the vicinity at Dorchester.

The Clinchfield Coal Corp. reports for the year ended Dec. 31, 1925, net income of \$445,520 after charges, federal taxes, depreciation and depletion, equivalent after preferred dividends to \$2.50 a share earned on outstanding 145,476 shares of common stock. This compares with \$561,243, or \$3.28 a share, earned in 1924.

The Virginia Iron, Coal & Coke Co. for the year ended Dec. 31, 1925, shows net profit of \$193,297 after interest, federal taxes, etc., equivalent after dividends on 5 per cent preferred stock, to 68c. a share earned on \$10,000,000

common stock. This compares with a net loss of \$53,503 in 1924.

WASHINGTON

Operation of the 50-oven coking plant of the California-Alaska Corporation near Snoqualmie, 30 miles east of Seattle, is expected to begin in April. The California-Alaska Corporation acquired about 2,000 acres of coal lands about a mile south of the town of Snoqualmie last summer and has been pushing work forward to the point of commercial production of coke.

WEST VIRGINIA

T. B. Chaffin, of Montgomery, has acquired a valuable long-term lease on Cabin Creek in the Kanawha coal field, according to reports.

During February the mines of the Pocahontas Fuel Co. loaded 382,420 cars of coal in Mingo County; plants of the United States Coal & Coke Co. produced 289,365 tons, and the Fordson Coal Co. (Henry Ford interests), 107,750 tons.

G. H. Caperton, president of the New River Coal Co., Charleston, says that the smokeless coal operators at the recent meeting in Washington, D. C., decided to continue the New England service bureau in Boston, Mass. Effort is being made to educate consumers to burn West Virginia coal.

Production in the Tug River field broke all records during the week ending Feb. 13 with 166,638 tons and since that time, despite the settlement of the anthracite strike, output has been above 160,000 tons a week. In 1925 production was 6,064,732 tons as compared with 4,939,706 in 1924.

Branch offices have been established in Webster Springs by the Guardian Coal Co., of Philadelphia, Pa., with Hoover & Hoover, attorneys for the company, in charge. Establishment of this branch is the first step in the development of 7,500 acres of coal lands lying on Lick Run and Holly River.

Fire destroyed a large frame store building of the Kelly's Creek Colliery Co. at Ward, near Charleston, on March 3, causing a loss of between \$75,000 and \$80,000. The origin of the fire has not been determined.

Loading 2,559 tons of coal March 5, the Dakota mine of the Bethlehem Mines Corporation set a production record which exceeds any other day's loading in the history of the mine.

A fire broke out in mine No. 5 of the Crab Orchard Improvement Co. at Eccles, W. Va., on March 10, and was not extinguished entirely until March 14, according to reports. The mine fire followed the explosion. State mine inspectors and U. S. Bureau of Mines representatives fought the fire direct with extinguishers and fire hose. Robert M. Lambie, chief of the state Department of Mines, was a patient in the Beckley hospital three days, suffering from exhaustion and inhaling fumes of carbon monoxide following the explosion. Mining men say that Chief Lambie in his zeal to reach the portion of the mine where he figured that there

would be sufficient oxygen in the mine air to support life, had overworked himself, having spent practically 26 hours straight in the mine. Mr. Lambie's drive to reach the men resulted in the rescue of 10 men.

The Elkhorn-Hazard Coal Co., Bluefield, has dissolved its corporate existence, according to papers filed at the office of the Secretary of State in Charleston. C. B. Bell was appointed trustee to dispose of the holdings.

The Lynwin Coal Co., Charleston, has been purchased by the Smokeless Fuel Co., Charleston.

The Pond Coal Co., Charleston, has disposed of its holdings and has filed notice of dissolution at the office of the Secretary of State.

The Pocahontas Fuel Co., in McDowell County, produced 444,650 net tons of coal in January. The mines are located along the Norfolk & Western Ry. The plants of the United States Coal & Coke Co. in the same month loaded 297,650 net tons. These mines are located in the same field.

The Blue Creek Coal & Land Co., of Charleston, has sold the timber rights on a large tract of land in Elk district, Kanawha County, along Spangler fork of the Blue Creek to L. C. Steinbeck, of Charleston.

Preparations are being made to rebuild the tipple at the Hardesty mine, near Shinnston, destroyed by fire last week. Although the mine is working on a non-union basis, no union activity is regarded as being responsible for the fire. The tipple at this mine, however, was blown up about two years ago, during trouble near the mine.

The Daisy Coal Co., of Huntington, has surrendered its charter at the office of the Secretary of State.

WYOMING

The Kemmerer Coal Co.'s plant near Frontier is reported as shut down and

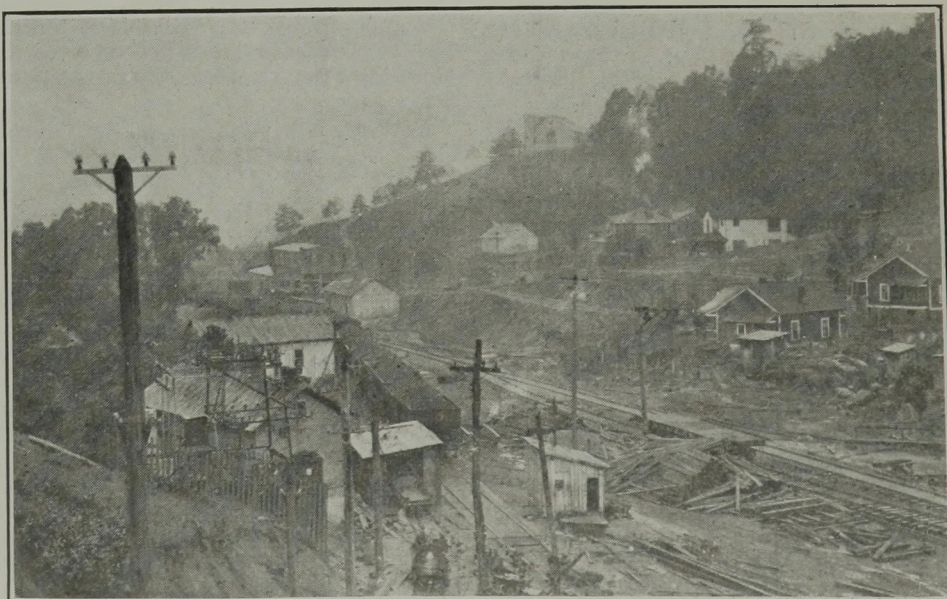
the Central Coal & Coke Co., of Kansas City, is closing its Tipperary Mine, at Rock Springs. The latter company will work its remaining mines in that vicinity as near capacity as possible and may work some double shifts. The Cambria Coal Co. has closed its mines at New Castle. This action left New Castle without electricity, as the town's power was furnished by the Cambria company. This deficiency was soon solved by the formation of a local power company.

Considerable interest is evinced in the southern Wyoming field in a report that the Browning-Eccles interests will soon consolidate their various holdings in the Rock Springs district under one company. According to a recent statement the properties to be merged include the Lion Coal Co., at Lionkol; the Wyoming Coal Co., at Blairtown, and the Rock-Springs-Superior and Premier companies, operating at Superior.

Wyoming mines produced 6,557,576 tons of bituminous coal during 1925, according to the annual report of the state mining inspector, Hugh McLeod, issued on March 2. This was a reduction of output from 1924 of 156,977 tons. Sixty mines operated in 12 counties, with a total of 6,364 men employed. In 1924 7,210 men were employed at the mines.

CANADA

According to a statement made March 12 at Ottawa by Charles Stewart, Minister of Mines, negotiations for hauling coal from Alberta to eastern Canada at the rate of \$9 a ton have been abandoned. He stated that the Governments of Ontario and Alberta were both opposed to the \$9 rate, and favored the rate of \$7. Whether any coal will be hauled at the low rate will be decided by the Canadian National Railways.



In the Fading Light of Evening at Balkan, Ky.

Looking toward the commissary from the man and supply incline of the Southern Mining Co. This mine, in the Tejay seam, is producing 1,400 to 1,500 tons per day. The coal averages 53 in. in "hickness. Balkan is situated in Bell County, close to the Harlan County line. F. E. Gilbert, general superintendent of the three operations of the Southern Mining Co., lives in the white house in the left center of the picture.

Personal

General J. B. Sanborn has resigned as president of the J. B. Sanborn Co., of Chicago, publishers of the Coal Dealers' Blue Book since 1886, and announces his retirement from active business. In 1898 he accompanied his regiment to Cuba, holding the rank of major. For several years he was head of the First Regiment of the Illinois National Guard and served with distinction in France during the World War as a brigade commander. He is succeeded by William S. Hamblen, who will continue the policies of the old management.

John L. Lewis, president of the United Mine Workers, is slightly ill at his home, Indianapolis, Ind., from an attack of influenza. Although the miners' president has been incapacitated for several days, he now is convalescing, Ellis Searles, editor of the *Mine Workers' Journal*, told the Associated Press.

Samuel D. Winsor, Jr., has been elected a member of the board of directors of the Westmoreland Coal Co., to fill the vacancy caused by the death of Col. Daniel B. Wentz.

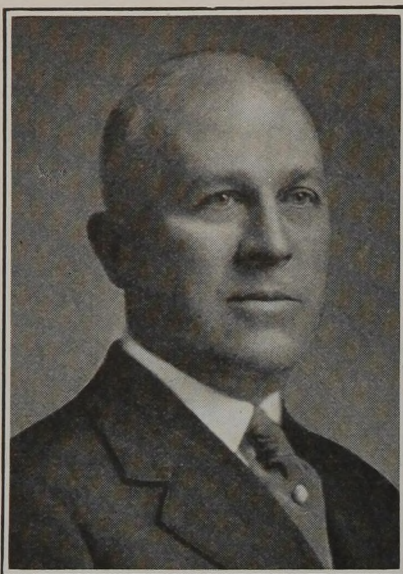
W. M. Wilshire, now receiver of the Carnegie Coal Co., Pittsburgh, Pa., has been elected president and director of the West Virginia Coal & Coke Co. He succeeds C. E. Hutchinson as president and fills a vacancy on the board. Mr. Hutchinson continues as a director. The company operates mines at Omar and other sections in the Logan field as well as in the Elkins section of northern West Virginia.

Governor Gifford Pinchot, of Pennsylvania, has announced himself a candidate for Senator. He will be opposed by Senator George Wharton Pepper and probably Representative Vare.

George Gore, formerly with the North American Coal Corporation and well known in the Cleveland trade, has become associated with the Fuel Distributors, Inc., Cleveland representatives of the Coal River Collieries.

Herbert Greener and **Richard Pease**, of the Hugh-Wood Co. of Newcastle-on-Tyne, England, one of the largest British coal producing concerns, arrived in Welch, W. Va., during the latter part of last week, accompanied by Thomas S. Downing, Jr., of Philadelphia. As the guests of Col. Edward Toole, general manager of the United States Coal & Coke Co., they inspected many mine No. 6 and other plants in the Welch section. The British mining men, it is reported, are making a careful study of mining machinery, operating and safety in American coal mines.

Lewis Stockett, general superintendent at Calgary of the coal mines branch, Department of Natural Resources, Canadian Pacific Railway, has been elected president of the Canadian Institute of Mining and Metallurgy for the coming year. Mr. Stockett, who was born in the United States, has resided in Canada since 1905. He has been a member of the Canadian Institute for the past 21 years, and has belonged to the American Institute since 1881.



W. W. Inglis

William W. Inglis, president of the Glen Alden Coal Co., is on a southern cruise, having decided to take a rest soon after the mines resumed work following the long strike. Efforts have been made to adjust certain disputes in District 7 but so far no general meeting of the conciliation board has been held. It is said that none will be called until Mr. Inglis returns to his office.

Scott Turner, on leaving Canada to go to Washington to begin his duties as Director of the U. S. Bureau of Mines, tendered his resignation as chairman of the Toronto branch of the Canadian Institute of Mining and Metallurgy. The chapter declined to accept the resignation, so Mr. Turner has consented to serve out his term.

Dr. W. T. Thom chief of the fuel section of the U. S. Geological Survey, recently delivered the first of a series of eight lectures on coal, petroleum and oil shale to the students in geology at Princeton University, the lectures constituting a part of their regular term work.

The Fork Ridge Coal and Coke Co. Inc., Fork Ridge, Tenn., announces the appointment of **William H. Smith, Jr.**, as Southern sales manager, with offices in the Candler Bldg., Atlanta, Ga.

C. A. Cabell, president of the Carbon Fuel Co., who spent the winter in Florida, returned to Charleston early this week.

Obituary

War-Time Fuel Administrator Of New England Dies

James Jackson Storrow, of Boston, senior member of the banking house of Lee, Higginson & Co., who was Federal Fuel Administrator for New England during the war, died March 13 at the Hotel Plaza, New York City, where he had been staying for several weeks. He was 62 years old.

Mr. Storrow was graduated from Harvard in 1885 and from the Harvard law school three years later. For eleven years he practiced law as a member of Fish, Richardson & Storrow, which handled the legal business for Lee, Hig-

ginson & Co. The bankers finally persuaded Mr. Storrow in 1900 to leave the bar and join them as a partner. He had many other important business affiliations.

Mr. Storrow was Good Government candidate for Mayor of Boston in 1909, but was defeated. Subsequently he was elected to the Boston City Council and served four years, being president of it for the final year.

In the World War period he was Chairman of the Massachusetts Committee on Public Safety, pioneer organization of the kind in this country. When immediate action was necessary to relieve the acute coal shortage in New England in the war stringency, he pledged his personal credit for shipments of coal and subsequently shipped and distributed at his personal risk more than a million tons of coal, a gross business exceeding \$10,000,000.

John B. Devers, 52, one of the wealthiest coal operators and land owners in western Kentucky, died in a Madisonville (Ky.) hospital March 9 of injuries sustained a week earlier when an automobile in which he and three others were riding was wrecked on a steep hill near Providence, Ky. The accident claimed the life of Ernest Jones, 40, of Providence, also. Mr. Devers leaves a wife and daughter.

George S. McSweeney, former president of the Montreal Amateur Athletic Association, and well known in Montreal business circles, choked to death while eating at the Mount Royal Hotel, Montreal, at 9.40 p.m. March 4. George Spencer McSweeney was born in Halifax in 1886, his father being the late Wm. B. McSweeney. He was educated at the St. Francis Xavier University and the Antigonish University. He began his business career with the *Glace Bay Gazette* and later was news editor of the *Sydney Post*. He then joined the staff of the Dominion Steel Co. at Sydney. Later he was transferred to the Dominion Coal Co. In 1916 he organized the Century Coal Co., Ltd., in Montreal. Mr. McSweeney was a member of the Board of Trade and a life governor of the Montreal General Hospital.

Traffic

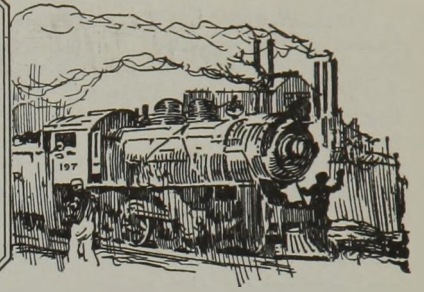
Authorized to Intervene In Lake Rate Case

The Interstate Commerce Commission has authorized intervention in the lake cargo coal-rate case by the Public Service Commission of Pennsylvania, the Attorney General of Ohio, the Tri-State Coal Shipping Association, the Board of Commerce of Butler, Pa., and the Butler-Mercer Coal Operators' Association. The Commerce Commission recently announced a reopening of the case, giving the parties concerned until March 22 to advise whether they desire to submit additional evidence.

J. E. Gorman, president of the Chicago, Rock Island & Pacific Ry., announces the promotion on March 1 of Arthur Mackenzie from assistant freight traffic manager to freight traffic manager with headquarters at Chicago, Ill.



Production And the Market



Liquidation in Bituminous Output and Prices Nearing End; Technical Position Better

The liquidation in bituminous coal production and prices made necessary by the settlement of the anthracite strike is nearing completion. Notwithstanding the large number of individual price declines reported from various distributing centers last week, the technical position of the market has improved. For one thing, there is less distress tonnage to create fictitious price bases. For another, there is less coal at the mines and en route.

During the first week in March, according to the estimates of the Bureau of Mines, output totaled 10,500,000 net tons, as compared with 10,890,000 tons in the preceding week and 12,167,000 tons in the first week in February. Current output, however, is still 1,000,000 tons ahead of the figures for the first week in March, 1925. Even allowing full weight to improved industrial conditions, it would seem that there is still some shrinkage to be effected before production is strictly in line with consumption.

Coal Age Index of spot bituminous prices for March 15 was 168 and the corresponding price was \$2.03. This was an increase of one point and 1c. over the figures for the preceding week. This increase was made possible by a stronger tone to screenings in nearly all producing fields and in all-rail central Pennsylvania coals in New England. Pool prices at New York and Baltimore were weaker.

Prepared Coals Suffer in Price Decline

With few exceptions, the prices on prepared coals were shaded in all markets. Naturally, seaboard quotations were the worst sufferers. Inland prices on eastern and southern high-volatiles, however, did not escape. Quotations in the Southwest and the Far West also sagged. The most conspicuous exception to the general

trend was in southern Illinois, where the efforts to stabilize prices were abetted by the weather.

To the weather, too, must be given credit for pushing up anthracite output to 1,787,000 net tons the first week in March, as compared with 1,655,000 tons a year ago. The bulk of the buying, of course, is for current consumption. The average householder in the anthracite-consuming territory bought sparingly of other fuels during the suspension, so that his immediate requirements are not inconsiderable in the aggregate.

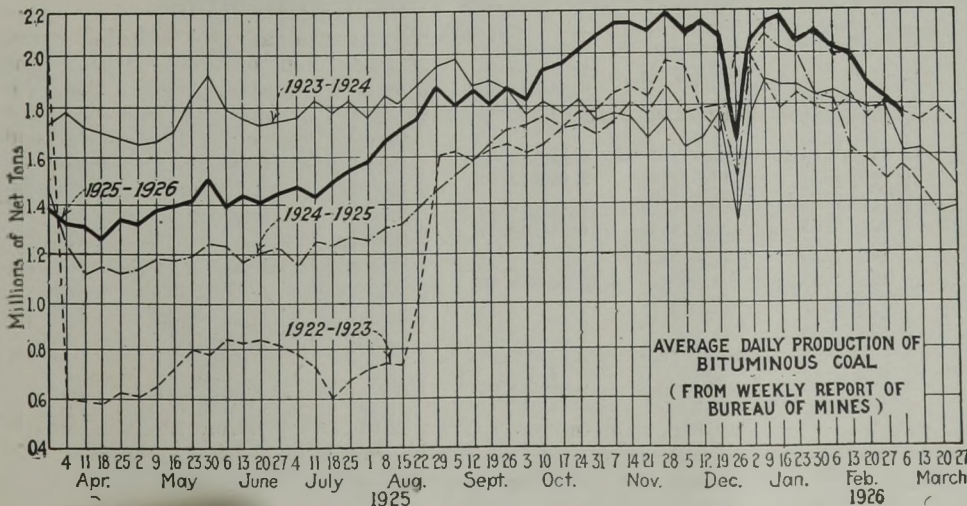
Chestnut and Pea Lead

In so far as there are pronounced indications of choice in the present buying, chestnut has the call over the lordly stove. The lowly pea size also is experiencing a period of public favor not ordinarily its lot. Demand, however, is not such that independent shippers have been able to move tonnage at the peak prices obtainable the first week production was resumed.

Spot movement of the steam sizes is back to pre-strike levels. That means that producers have little difficulty in selling rice and barley and that No. 1 buckwheat is more or less of a drug on the market.

Spot prices on metallurgical coke in the Connellsville region are close to the levels of a year ago. Furnace coke is possibly 25c. weaker and foundry 25c. stronger. Production, however, has not yet been brought within the limits of estimated demand. Output for the first week in March was only 51,290 tons under the record production four weeks earlier.

There still is yard-crushed coke waiting in vain for buyers. Ovens are laboring to make adjustments with their late eastern retail customers and to move rejected tonnage. The Alabama market, too, is easier, but no excess production is reported.



| Estimates of Production | | | |
|-------------------------|-----------------|-------------|--|
| (Net Tons) | | | |
| BITUMINOUS | | | |
| | 1925 | 1926 | |
| Feb. 20 | 9,464,000 | 11,509,000 | |
| Feb. 27 (a) | 8,855,000 | 10,890,000 | |
| Mar. 6 (b) | 9,384,000 | 10,500,000 | |
| Daily average | 1,564,000 | 1,750,000 | |
| Coal yr. to date | (c) 442,890,000 | 505,092,000 | |
| Daily av. to date | 1,551,000 | 1,764,000 | |
| ANTHRACITE | | | |
| Feb. 20 | 1,838,000 | 408,000 | |
| Feb. 27 (a) | 1,605,000 | 1,609,000 | |
| Mar. 6 (b) | 1,655,000 | 1,787,000 | |
| Coal yr. to date | (c) 80,818,000 | 44,520,000 | |
| BEEHIVE COKE | | | |
| Feb. 27 (a) | 254,000 | 320,000 | |
| Mar. 6 (b) | 281,000 | 265,000 | |
| Cal. yr. to date | (c) 2,425,000 | 3,046,000 | |

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

Winter Plays Heroic Role

King Winter in his roughest mood came to the rescue of the domestic business in the Middle West last week, but his blizzard visitations caused no hurries in the steam-coal market. The increased production of large coal, however, was not great enough to create an undigested surplus of steam sizes. As a matter of fact, spot prices on screenings in southern Illinois were stronger. Producers and sales agents are canvassing the contract situation, but buyers display little interest in early renewals.

Although running time in southern Illinois exceeded expectations, operators viewed it as "a flash in the pan" and are going ahead with plans for further suspensions. In general this was true also of the central, Mt. Olive, Jackson County and Duquoin fields. In all of them there was a better inquiry for domestic coal and a fair movement of industrial and railroad tonnage, with prices unchanged. Fourth Vein Indiana

lump and mine-run, on the other hand, were weaker. The Standard district in Illinois was probably the greatest laggard.

Under the weather pressure, producers of high-grade Illinois coals had little difficulty in maintaining circular figures on prepared coal. No such good fortune attended eastern shippers of high-volatile coal to the Middle West. As low as \$2 was quoted on West Virginia 4-in. splint block and eastern Kentucky in the Chicago market, but the best-known coals commanded \$2.25 @ \$2.75. Smokeless lump and egg, too, were heavy and some prices were cut to \$2.75. Anthracite is beginning to dribble in at standard prices. The better grades of coke are in good demand.

St. Louis, like Chicago, saw a brisker domestic demand because of weather conditions last week. The bulk of the buying in the Missouri city was in medium grade coals. Anthracite and West Virginia smokeless were backward, but coke held its own.

Western Kentucky Optimistic

Louisville trade observers are optimistic over the outlook for western Kentucky during the coming coal year. The basis for this optimism is the fact that the Peabody Coal Co. has taken over exclusive distribution in the Middle West and the Northwest of the output of four well-known operating companies with a combined daily capacity of 10,700 tons. This is believed to presage still more active competition between non-union western Kentucky and union Illinois and Indiana.

Current demand, however, is reflecting the normal seasonal slump. Large coal is weak, but nut and screenings have benefited from curtailed production. Mine-run is sluggish and some sales have been made around \$1, although the general range is \$1.25 @ \$1.50. Screenings are 75c. @ \$1.10; nut, \$1.40 @ \$1.65; lump and egg, \$1.50 @ \$1.75, and 6-in. block, \$1.75 @ \$2.

Output is falling rapidly in the eastern part of the state. Many mines are

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

Table with multiple columns for market quoted prices, dates (Mar. 16, 1925, Mar. 1, 1926, Mar. 8, 1926, Mar. 15, 1926), and categories (Low-Volatile, Eastern; Midwest; South and Southwest; High-Volatile, Eastern). Includes various coal types like Smokeless lump, Franklin, Ill. mine run, etc.

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

Table with columns for Market Quoted, Freight Rates, and prices for March 16, 1925, March 8, 1926, and March 15, 1926. Categories include Broken, Egg, Stove, Chestnut, Pea, etc.

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

down in the Harlan field. Traffic in the Elkhorn and Hazard districts has dropped off to such an extent that it is reported that the Louisville & Nashville is laying off train crews. No improvement is expected until the lake movement gets under way. Prices, except on slack, are easy. Little block is bringing over \$2.50 and some has sold at \$2. Lump is \$2@2.25; egg and nut, \$1.75@2; mine-run, \$1.35@1.75, and slack, 90c.@1.10.

Dock Trade Satisfactory

Despite weather ups and downs in demand, the volume of coal moving off the docks at the Head of the Lakes is substantial. February loadings were 19,219 cars, as compared with 23,990 cars in January and 17,666 cars in February, 1925. Stocks on hand March 1 were estimated at 3,450,000 tons and dock operators expect no troublesome carry-overs of any grade. The anthracite outlook for 1926-27 is encouraging.

The brightest spot in the present situation is the increasing demand for industrial coal. Most of the buying, however, is on a hand-to-mouth basis. Some of the docks are still scurrying around for screenings to take care of contract deliveries. Prices on all grades of coal are unchanged and there seems to be no inclination to shade quotations.

Hand-to-mouth buying characterizes the market at the Twin Cities. Accelerated demand due to weather conditions soon dies out. The all-rail trade from Illinois and Indiana is irregular and uncertain. With the movement of anthracite in heavier volume to Milwaukee territory, there has been a noticeable decline in consumer buying of coke and semi-bituminous coals. Retail prices, however, are unchanged.

Business Fades Out in Southwest

In the Southwest current business is confined to the odds and ends of the waning coal year. Production in Arkansas and Oklahoma is tapering off; few Kansas operations are doing better than two days a week. Accumulations of "no bills," approximating 300 cars, of which 250 are lump and egg, have caused Kansas prices to break 25@50c. Screenings, on the other hand, are firm at \$2.35@2.50.

Unbalanced demand has demoralized the Colorado market and cut into production. The dearth of domestic business is emphasized in April price lists, which go into effect next Monday. Under the new schedules Walsenburg and Canon City lump is \$4.25; washed nut, \$4; washed chestnut, \$3; Trinidad coal, all sizes, \$2.75; Crested Butte lump, \$4.25; nut, \$4; Crested Butte anthracite, \$2.75@6.75 for Elk Mountain and \$4.50@7.75 for Horace. The new bituminous prices are \$1@1.75 under March circulars.

The Salt Lake City market is in the doldrums. There is no active demand for any grade of Utah coal. Working time has been cut to one and two days a week. This has created a scarcity of slack.

The lake trade holds the center of interest in the Cincinnati market. Two orders for 100,000 tons have been shuttled back and forth without decision. One larger order has been placed on

a mine-run basis of \$1.50 and this has had a disturbing effect upon the situation. The opening of Chesapeake & Ohio Ry. bids within a few days is another straw in the wind many will study.

Low-volatile shippers are going through a period of readjustment. New River nut prices are down to \$2.50@2.75; egg, \$3.50@3.75, and lump, \$3.25. Mine-run is up to \$1.25@1.50. Standard Pocahontas prices are pegged about 25c. higher than the New River quotations.

High-Volatile Market Unsettled

The high-volatile market has been restive and unsettled, but the curtailment policy in production is showing its effect. For the first time since Christmas, loads moving through the Cincinnati gateway dropped to 10,483 cars, a decrease of 1,291 cars when compared with the preceding week. The number of empties going to the mines also is less. This reduction in output has stiffened screenings quotations 15 @25c. per ton and has taken most of the low-priced mine-run out of the market. Egg drags and only weather spurts prevent a bad slump in lump and block.

Repeat orders have kept the retail

market brisk, with little sign of any revision of prices before April 1. River operations have been impeded somewhat by heavy snows, but there has been little diminution in the volume of tonnage.

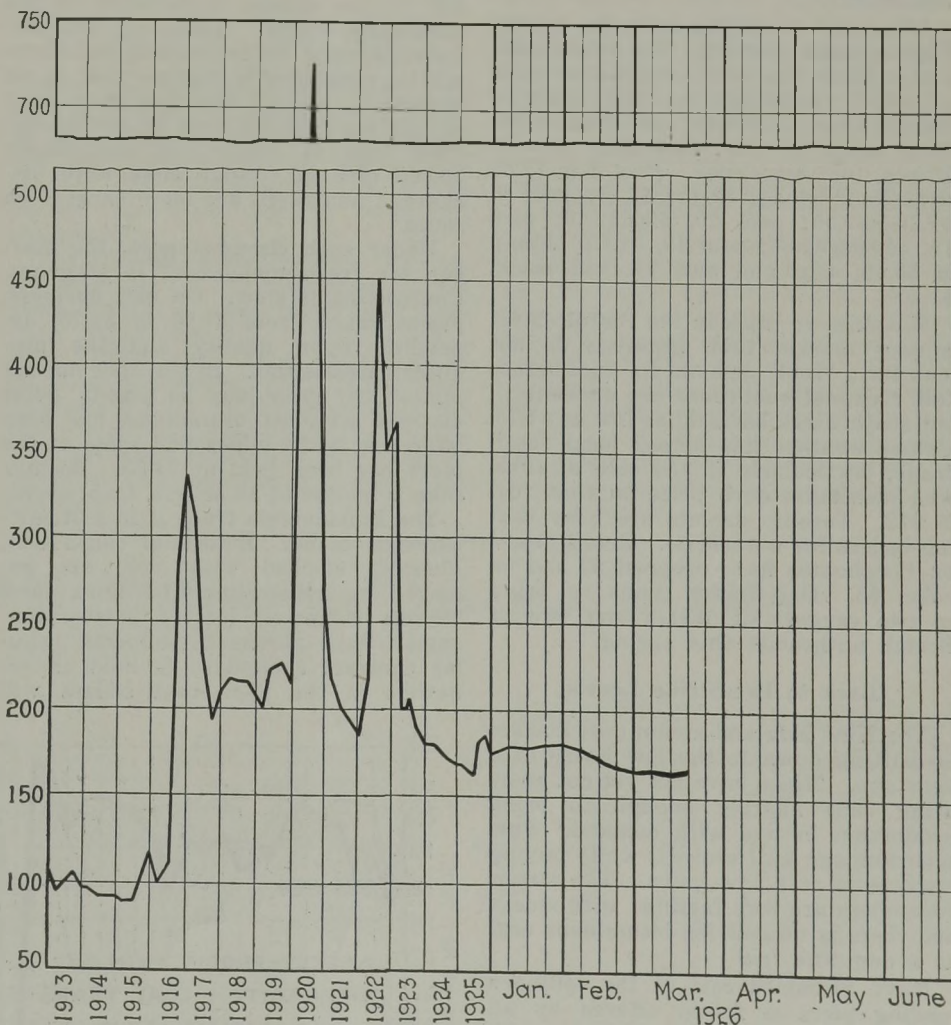
Central Ohio Looks to Future

Central Ohio coal men find speculation as to the future more interesting than consideration of the season-end dregs of trade. The outlook for domestic business is regarded as particularly favorable, although Kentucky and West Virginia will have first call on orders. A brief cold snap helped the Columbus retail dealers last week, but yard stocks were more than ample to take care of requirements. The steam trade is unchanged. Few contracts have been renewed.

Production in southern Ohio is still under 20 per cent of capacity. Until the lake trade opens up it is not likely that this percentage will be increased.

More Pittsburgh Mines Close

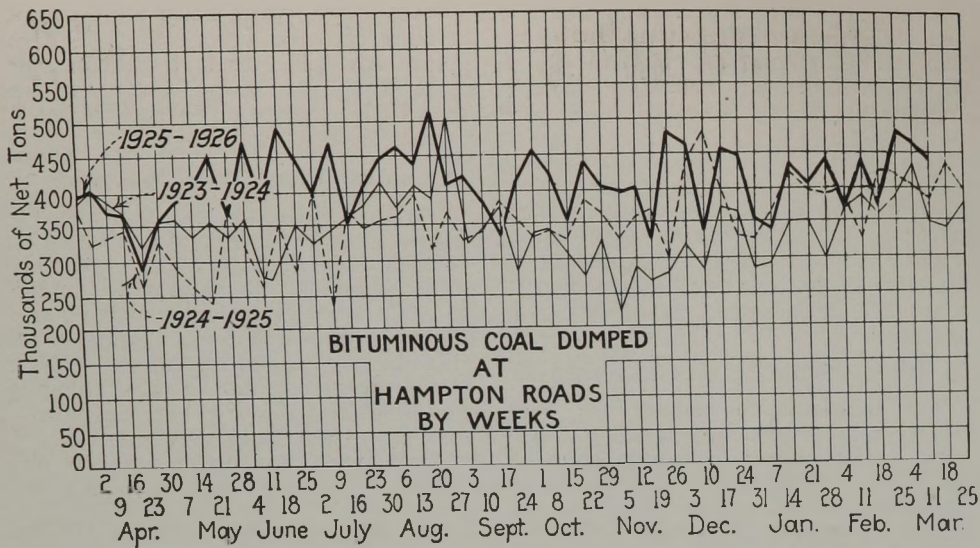
An increase in the number of mines closed down tells the story of the week in the Pittsburgh district. The largest operator in the field is producing about 14 per cent of its 1923 weekly average. Some individual mines are doing bet-



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

| Index | 1926 | | | | 1925 | 1924 |
|------------------------|---------|--------|--------|---------|---------|---------|
| | Mar. 15 | Mar. 8 | Mar. 1 | Feb. 22 | Mar. 16 | Mar. 17 |
| Index | 168 | 167 | 169 | 170 | 165 | 179 |
| Weighted average price | \$2.03 | \$2.02 | \$2.04 | \$2.06 | \$1.99 | \$2.16 |

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average of 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.



ter, but it is questionable whether they can maintain last summer's levels.

Minimum prices on mine-run and lump are unchanged, but maximum spot quotations have dropped a dime. Slack, on the other hand, has jumped another 20c., making a net advance of 40c. over the prices current when eastern demand for prepared coal created a surplus of fine stuff.

"No bills" are piling up in the central Pennsylvania district. The latest estimates place the total of unbilled loads at 1,800. Loadings the first week of March were 4,774 cars less than in the first week of the preceding month. Prices, too, are easier. Pool 1 is \$2.60 @ \$2.75; pool 71, \$2.45 @ \$2.55; pool 9, \$2.20 @ \$2.30; pool 10, \$2 @ \$2.10; pool 11, \$1.80 @ \$1.85; pool 18, \$1.75. Lump is \$3.50; egg and nut, \$4, and slack, \$1.40.

Gloom is so thick in the Buffalo bituminous market that optimists do not look for a "real" demand for fuel before fall. Nominal quotations are unchanged, but steam slack has sold as low as \$1.15. Colder weather has helped local retail trade, particularly in the sale of coke. The maximum curb price on that fuel is \$12. Toronto dealers are busy taking orders for anthracite. Retail prices on Pocahontas have dropped \$2 and on coke, \$3. One factor plans to bring in two cargoes of Welsh and two of Scotch anthracite this spring.

Back to Pre-Strike Levels

The New England steam coal market is drifting down to the low levels of a year ago. Mines have not yet cut operating time sharply enough to bring production in line with demand. Surplus tonnage still crowds, while buying interest is at a low point. The larger consumers are well fortified with stocks and there is no call for bituminous coal as a domestic fuel.

Navy Standard coal at the southern loading piers is freely offered by all shippers at quotations which, for the time being, have established \$4.35 per gross ton, f.o.b. vessels at Hampton Roads, as the minimum. For inland delivery, the same coals can be had at \$6 or less on cars at Providence and Boston, with further declines in prospect.

All-rail trade shows no signs of betterment. Most of the central Pennsyl-

vania districts are back to a part-time basis. There are relatively few cars of prepared sizes seeping in and even they are rapidly diminishing. Mine-run prices are firmer.

Distress Tonnage Disappearing

The New York bituminous trade is gradually working itself out of the mess left by the sudden termination of the anthracite strike. There is less distress tonnage to be moved, but there still is considerable foreign coal to be absorbed. During the first four days of last week 38,766 tons of anthracite, 6,000 tons of steam coal and nearly 10,000 tons of foreign coke were discharged and there are more cargoes en route.

Under such circumstances, the market for fresh-mined coal is stagnant. Contracting is slow. On new business, prices range from \$1.90 to \$2.75, depending upon quality and the producer's necessities. In the spot market almost any price may be heard. Some distress screened bituminous has been offered at \$1.25 mines and some at the piers has been held at \$4.25. Beehive coke is quoted at \$5 or less, f.o.b. ovens.

The Philadelphia trade is in a Micawberesque mood. Industrial consumers, liberally stocked with coal, are unmoved by solicitation and limit their buying to bargain lots of distress tonnage. Such purchases influence regular contract customers to hold off renewals in the hope that sellers will

make a downward revision in price offers. Spot movement, except in screenings, is very quiet. Coke ovens are trying their best to stay in the domestic market, but there is little interest shown in quotations of \$5 @ \$5.50 to the retail dealer.

Prices Decline at Baltimore

Keen competition for the comparatively small amount of tonnage to be sold in the Baltimore spot market has resulted in quotations 15 @ 20c. less than prices ruling at the beginning of the month. Contracting, too, is backward as it is always difficult to convince a purchasing agent that it is good policy to commit himself to a fixed price when quotations are on the downgrade. Export trade shows some signs of renewed activity. February exports totaled 30,172 tons, against 19,866 tons the preceding month.

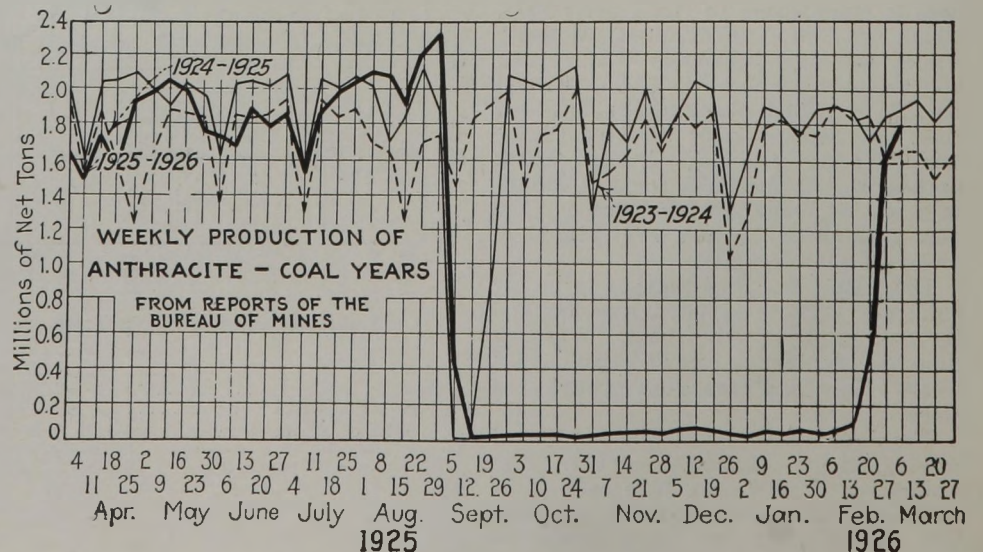
Hampton Roads is marking time. Until the contract situation has cleared, there will be little but routine business moving. Buyers are playing a waiting game to depress prices. Low-volatile coal is standing this pressure better than high-volatile. Some of the latter sold as low as \$3.90 last week. Dumpings for the week ended March 11 dropped to 397,322 gross tons, as compared with 414,270 tons the preceding week.

Conditions in the Birmingham market last week were a repetition of those controlling the preceding fortnight. High and medium grades still move well, but the poorer grades are sluggish. On the whole, however, industrial demand is active. The domestic trade is soft. The coke market, too, is easier, but no surplus production is reported. Nut and egg coke are quoted at \$5.25 @ \$5.50; spot foundry and gas coke is \$6.50.

Anthracite Movement Increasing

Anthracite receipts at New York are increasing daily, but shipments have not yet reached such a volume that the retailer can take care of all the orders on his books. Independent producers no longer are able to find buyers willing to pay extravagant premiums and little coal is moving at more than \$1 over the maximum company circular. Most of the buying is for current delivery. Chestnut is the favored size. Pea is unusually active.

Conditions in the anthracite steam



Foreign Market And Export News

Shipping Troubles Still Hamper Welsh Trading; Tyne Buying Backward

The Welsh steam coal trade has been in rather an unsettled state owing to the prolonged gales of unusual severity. Where buyers have been found for prompt shipment a few sales have taken place at reduced prices, though colliery owners are well booked up for some time to come. The lack of shipping is causing great inconvenience to some operators and stoppages are frequent.

Ships also are scarce owing to the heavy exports of coal to North and South America. In many cases these ships are being held for homeward cargoes, which are not always forthcoming. This condition of things is expected to last another week or ten days, though the advanced freight rates to South America and the Mediterranean ports no doubt will attract tonnage to South Wales.

Work at the pits, of course, is irregular, and prices for spot shipment are discounted 6d. or more per ton. Owing to these conditions there is not so much talk of restarting closed mines, and nothing has so far come of the suggestion of reopening the Cambrian pits.

The Newcastle market is dull and rather weak and is suffering from the same trouble as South Wales. Foreign buyers are holding back on this account. German and Silesian coals are ousting many British varieties in the European market. Most of the collieries are fairly well employed, though prices seem to be taking a downward tendency.

Output by British collieries during the week ended Feb. 27, according to a special cable to *Coal Age*, totaled 5,370,000 gross tons, compared with 5,420,000 tons in the preceding week.

Little Change in French Demand

Paris, France, Feb. 25.—There has been little change in the French market the past week. The tone is firm although the demand for domestic coals is not so great. Even flaming coals, which were very scarce, are coming in more plentifully, consequently the buying of British coals D.C.B. and Hastings will be reduced.

Canal transport is still very slow, owing to their obstruction by barges

in some places between the Belgian frontier and the Nord and Pas-de-Calais on the one hand, and Paris, on the other.

During the first 13 days of February, France received 186,900 tons of coal, 122,600 tons of coke and 14,700 tons of lignite briquets, from the Ruhr. During the first twenty-three days of this month the O.R.C.A. received 208,600 tons of coke from the Ruhr.

The price of the indemnity coke for March has been definitely fixed at 163 fr. on truck Cierck, plus 5.1 fr. customs duties, plus 1.15 fr. for the O.R.C.A.'s expenses, or a total of 169.25 fr.

During January, France imported 1,432,409 metric tons of coal and exported—principally to Belgium, Germany and Switzerland—300,605 tons. Of the imports, 803,701 tons came from Great Britain, 164,375 tons from Belgium and Luxemburg, 4,609 tons from the United States and 384,960 tons from Germany. Coke imports for the month were 459,578 tons; exports, 55,652; patent fuel imports, 125,997 tons; exports, 18,338 tons.

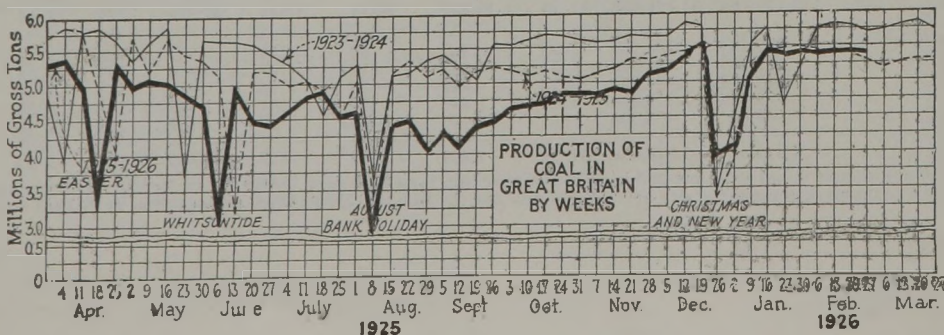
Belgian Demand Enters Decline

The seasonal falling of in demand for domestic grades of coal in the Belgian market has been intensified by a decline in the orders placed from industrial fuel, reports Brussels under date of Feb. 25. The latter decline is attributed to dissipation of fears of a general British coal strike. Screened sorts, however, are still very scarce in the Borinage and coking smalls are steady.

In general the market in coke is fairly firm. There also has been some improvement in the demand for patent fuel.

During January, Belgium produced 1,976,320 metric tons of coal, as compared with an output of 1,936,670 tons in December. Stocks on hand declined from 1,558,020 tons on Dec. 31, 1925, to 1,398,120 tons on Jan. 31, 1926. Coke production for the month was 321,220 tons—25,120 tons less than in December. Patent fuel output for January, 203,630 tons, showed an increase of 25,540 tons over the December figures.

A decree recently published by the Spanish Government restricts the use of British coal on railroads and state subsidized industries to 10 to 30 per cent. In many instances the use of foreign fuel is banned.



Buys More British Anthracite

Canada's imports of Welsh and Scotch anthracite coal from the United Kingdom increased from 275,277 net tons, valued at \$2,472,737, in 1924 to 560,684 tons, valued at \$5,138,342, in 1925. Figures for the latter year include, as nearly as it can be ascertained, the tonnage imported through Portland, Me., and transshipped to Canada after the close of navigation on the St. Lawrence.

Quebec received the largest shipments, totaling 487,049 tons, the remainder being assigned to New Brunswick, Ontario, Nova Scotia, Prince Edward Island and British Columbia. Retail prices increased steadily during the year, starting at \$16.50 per ton in May and reaching \$23 per ton in December.

Export Clearances, Week Ended March 11, 1926

| FROM HAMPTON ROADS | |
|---|-------|
| For Brazil: | |
| Grk. Str. Kalypso Vergotti, for Santos | 7,030 |
| Du. Str. Admiral de Ruijter, for Rio de Janeiro | 6,656 |
| Ital. Str. Artenia, for Rio de Janeiro | 7,635 |
| For Cuba: | |
| Nor. Str. Bratland, for Niguero | 1,232 |
| Du. Str. Trompenberg, for Cienfuegos | 1,646 |
| Br. Str. Pengreep, for Felton | 3,952 |
| For Peru: | |
| Nor. Str. Herakles, for Callao | 4,813 |
| For Argentina: | |
| Br. Str. Flimston, for Puerto la Plata | 6,046 |
| For Portugal: | |
| Br. Str. Maidenhead, for Oporto | 2,712 |
| For Italy: | |
| Ital. Str. Antonio Tripovich, for Fiume | 1,850 |
| Ital. Str. Ida, for Trieste | 3,055 |
| Ital. Str. Monginevro, for Genoa | 3,232 |
| Jap. Str. India Maru, for Genoa | 7,257 |
| For British West Indies: | |
| Nor. Str. Thornsald, for Castries | 3,226 |

Hampton Roads Coal Dumpings*

| | (In Gross Tons) | |
|------------------------------|-----------------|---------|
| | Mar. 4 | Mar. 11 |
| N. & W. Piers, Lamberts Pt. | 170,257 | 164,800 |
| Tons dumped for week | 113,135 | 84,816 |
| Virginian Piers, Sewalls Pt. | | |
| Tons dumped for week | 130,878 | 147,706 |
| C. & O. Piers, Newport News: | | |
| Tons dumped for week | | |

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

Pier and Bunker Prices, Gross Tons

| | PIERS | |
|-------------------------|----------------|----------------|
| | March 6 | March 13† |
| Pool 1, New York | \$5.75@ \$6.00 | \$5.65@ \$5.85 |
| Pool 9, New York | 5.30@ 5.55 | 6.20@ 5.40 |
| Pool 10, New York | 5.00@ 5.25 | 4.80@ 5.10 |
| Pool 11, New York | 4.50@ 4.80 | 4.50@ 4.75 |
| Pool 9, Philadelphia | 5.10@ 5.40 | 5.10@ 5.40 |
| Pool 10, Philadelphia | 4.95@ 5.15 | 4.95@ 5.15 |
| Pool 11, Philadelphia | 4.60@ 4.80 | 4.60@ 4.80 |
| Pool 1, Hamp. Roads | 4.50@ 4.60 | 4.50@ 4.55 |
| Pool 2, Hamp. Roads | 4.30@ 4.35 | 4.20@ 4.30 |
| Pools 5-6-7, Hamp. Rds. | 4.00@ 4.10 | 3.90@ 4.00 |
| BUNKERS | | |
| Pool 1, New York | \$6.00@ \$6.25 | \$5.90@ \$6.10 |
| Pool 9, New York | 5.55@ 5.80 | 5.45@ 5.65 |
| Pool 10, New York | 5.25@ 5.50 | 5.05@ 5.35 |
| Pool 11, New York | 4.75@ 5.05 | 4.75@ 5.00 |
| Pool 9, Philadelphia | 5.35@ 5.65 | 5.35@ 5.65 |
| Pool 10, Philadelphia | 5.20@ 5.40 | 5.20@ 5.40 |
| Pool 11, Philadelphia | 4.85@ 5.05 | 4.85@ 5.05 |
| Pool 1, Hamp. Roads | 4.60 | 4.55 |
| Pool 2, Hamp. Roads | 4.35 | 4.30 |
| Pools 5-6-7, Hamp. Rds. | 4.10 | 4.00 |

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

| Quotations by Cable to <i>Coal Age</i> | | |
|--|-----------------|-------------|
| | March 6 | March 13† |
| Cardiff: | | |
| Admiralty, large | 23s. @ 24s. | 23s. @ 24s. |
| Steam smalls | 12s. | 12s. |
| Newcastle: | | |
| Best steams | 15s. 6d. @ 16s. | 17s. @ 18s. |
| Best gas | 17s. 6d. | 19s. |
| Best bunkers | 16s. 9d. | 16s. 6d. |

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

Coming Meetings

New York State Coal Merchants' Association. Annual group meeting, March 25, Pennsylvania Hotel, New York City. Executive secretary, G. W. F. Woodside, 250 Arkay Bldg., Albany, N. Y.

New England Coal Dealers' Association. Annual meeting, State Armory, Worcester, Mass., April 7 and 8. Secretary, E. I. Clark, 141 Milk St., Boston, Mass.

American Welding Society. Annual convention, 29 West 39th St., New York City, April 21-23. Secretary, M. M. Kelly, 29 West 39th St., New York City.

California Retail Fuel Dealers Association. Thirteenth annual convention at Del Monte, Calif., April 22-24. Secretary, J. B. Muir, Oakland, Calif.

National Retail Coal Merchants' Association. Ninth annual convention, New Willard Hotel, Washington, D. C., May 17-19. Resident vice-president, Joseph E. O'Toole, Transportation Bldg., Washington, D. C.

Electric Power Club. Convention at The Homestead, Hot Springs, Va., May 24-27. Secretary, S. N. Clarkson, B. F. Keith Bldg., Cleveland, Ohio.

The American Mining Congress. Annual Exposition of Coal Mining Equipment, May 24-28, at Cincinnati, Ohio, in conjunction with the annual meeting of practical operating officials. Assistant secretary, E. R. Coombes, Washington, D. C.

International Geological Congress. The fourteenth congress will be held in Madrid, Spain, commencing May 24, 1926. From May 5 to 22 excursions of interest to the visiting delegates will be arranged. Information concerning the congress can be obtained from the secretary of the organizing committee, Enrique Dupuy de Lome, Plaza de los Mostenses, 2, Madrid, Spain.

Midwest Retail Coal Merchants Association. Annual meeting, May 25 and 26, at Kansas City, Mo. Secretary, James P. Andriano, St. Joseph, Mo.

Western Canada Fuel Association. Annual meeting at Winnipeg, Manitoba, Can., May 27 and 28. Secretary, W. H. Morrison, Winnipeg.

American Wholesale Coal Association. Annual meeting at Toledo, Ohio, June 7-9. Treasurer, R. B. Starek, Union Fuel Bldg., Chicago, Ill.

Association of Iron & Steel Electrical Engineers. Exposition and convention at Hotel Sherman, Chicago, Ill., June 7-10. Secretary, J. F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

American Institute of Electrical Engineers. Annual convention, White Sulphur Springs, W. Va., June 21-25. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Society for Testing Materials. Convention at Haddon Hall, Atlantic City, N. J., June 21-25. Secretary, C. L. Warwick, 1315 Spruce St., Philadelphia, Pa.

American Society of Mechanical Engineers. Spring convention at San Francisco, Calif., June 28-30. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

New Equipment

Soldering Iron Heats Quickly

A new soldering iron of light construction and designed to heat up quickly has been recently placed on the market by the General Electric Co., of Schenectady, N. Y. This iron is made in standard sizes ranging from $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. tip.

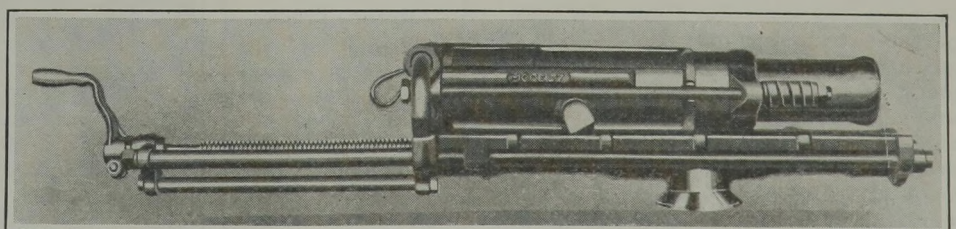
Power consumption ranges from 70 watts for the smaller iron for light and intermittent use, to 350 watts for the larger size on heavy duty. The irons for heavy duty are provided with radiating stands for the purpose of maintaining the iron at the correct operating temperature when temporarily not in use. The rapid rate of initial heating is brought about by unusually good heat conduction between the heating element and the copper tip. Heat from the tip is prevented from reaching the handle by means of a special mechanical construction between the two parts, this being in the form of a spiral made from a steel rod. This also provides a rigid connection between the handle and tip.

Instead of mica, usually used for an electrical insulator in the heating unit of soldering irons of this type, the heating unit has an insulating powder so highly compressed that it becomes a good heat conductor and will withstand temperatures of more than 2,000 deg. F. The iron is provided with a standard lead and connection plug. Its construction is simple, and all parts are easily replaceable.

Waugh Drifting Drill for Hard Mine Usage

Two new rock drills have recently been developed and placed on the market by the Denver Rock Drill Mfg. Co. of Denver, Colo. These are models 7 and 17. In the model 7 the manufacturer claims a pneumatic hammer drill of simple symmetrical construction and high efficiency. The design is conservative yet many original features of proven value have been incorporated. The drill steel is rotated by means of a ratchet, pawl and rifle bar. The valve is of the tubular type operating axially in the machine. It is completely housed within the cylinder and is fully protected against rough usage.

Drop forgings and high-grade alloy



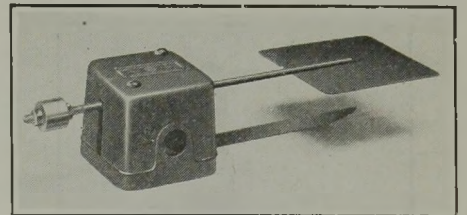
Drill for Tripod Mounting with Automatic Air-Line Oiler

This drill is fitted for mounting on the ordinary tripod or bar. It is claimed by the maker to be extremely simple and rugged in construction, and highly efficient in operation. Oil chambers are made unnecessary because the air is lubricated by the automatic air-line lubricator.

steel subjected to scientific heat treatment have been used throughout in the construction of this machine. Provision is made for easy replacement of parts, ordinarily subjected to the heaviest wear. The ratchet ring and pawls are reversible, thus doubling their life. Lubrication is effected by an automatic air-line oiler, which obviates use of inefficient oil chambers, packings, plugs and other parts in the machine proper and contributes to higher drilling efficiency and long dependable service. Model 17 is similar in design to the No. 7, but is heavier and more powerful.

Will Act as Watchdog Over Ventilating Current

Although designed primarily for installation on air-cooled electrical apparatus such as transformers, regulators and similar equipment the air-flow relay shown in the accompanying illustration and recently placed on the market by the Albert & J. M. Anderson Mfg. Co., of Boston, Mass. may



Watching the Ventilating Current

The relay here shown is designed for installation in an upwardly moving current. It would be an extremely easy matter to make the vane vertical and thus adapt this instrument to a horizontal air flow. A fall in current velocity would thus be readily detected.

also be installed to show the existence or non-existence of an air current in the ventilation passages of a mine. This device is placed directly in the path of the air and consequently is operated by the air flow itself. As a result it performs a service which cannot be rendered by devices that indicate only the pressure of the air supplied.

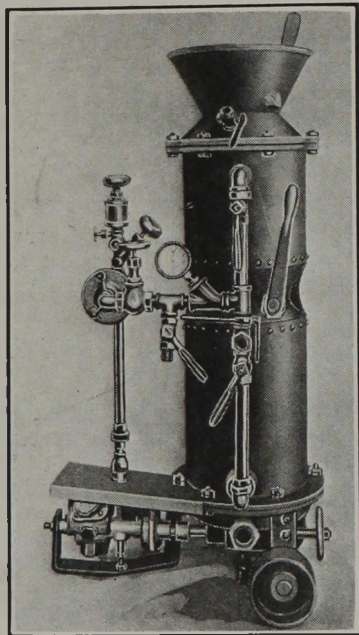
In the construction of this relay a counterweighted aluminum vane is pivoted on steel points and may be so adjusted that the minimum flow will allow the vane to drop, thus tilting a mercury-tube switch also suspended on the same pivot. This tube is so

mounted that when the air current is reduced to what is considered the danger point, the vane drops, the switch tilts and opens the signal circuit. A fixed pointer attached to the base of the relay extends below the vane. This assists the observer in quickly noting the angle of the vane when seen from a distance.

Standard relays of this type are of the single-pole variety designed to control non-inductive currents of $\frac{1}{2}$ amp. at 250 volts or one ampere at 125 volts direct or alternating current. A hole is tapped in the side of the case for connection of a $\frac{1}{2}$ -in. conduit, permits ready insertion of the lead wires. This device will doubtless be found useful in mines where it will indicate both visually and audibly any decided changes that may take place in the velocity of air flow.

Baby Cement Projector for Repair Work

A small size "Cement-Gun," known as the Type N-00, which can be operated with a one-drill compressor, has recently been developed and placed on the market by the Cement-Gun Co., Inc., of Allentown, Pa. This machine is particularly adapted to the repair and restoration of honeycombed concrete and other small patchwork as well as for small construction. It is easily



For Light Guniting of Furnace Lining and Mines.

This new cement-gun weighs only 200 lb. and can be operated on 60 cu.ft. of free air per minute. Because of its ready portability it is particularly adapted to small jobs and repair work

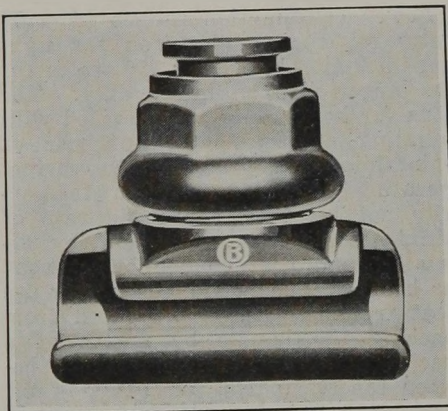
portable, weighing only 200 lb., and requires only 60 cu.ft., actual measurement, of free air per minute for proper and efficient operation. It is thus available for use with small portable compressors such as are standard equipment in many mines. Its operation is identical with that of larger machines of the same make, and it offers all the advantages of the larger cement projectors with the exception of capacity.

This machine is well adapted to the repair and the maintenance of furnace

linings. It may also be used for general repairs around mines, industrial and other plants where the supply of compressed air is limited.

An Easily Installed Feeder Clamp

A new member of the bulldog family was recently announced by the Ohio Brass Co. It is a cable clamp, which consists of a simple cable sling with clamping jaws similar to those applied to the standard bulldog clamp. The cable sling may be used first when



Clamp Holds Feed Wire

This device can be used as a support to hold the wire when being installed and later to keep it from sliding or pulling off its support.

stringing a feeder line and later as a support by turning the nut which squeezes the sling and jaw together, thus providing not only a rest for the cable, but an effective grip as well. This grip eliminates longitudinal motion and prevents tension from being carried through the cable to its end supports.

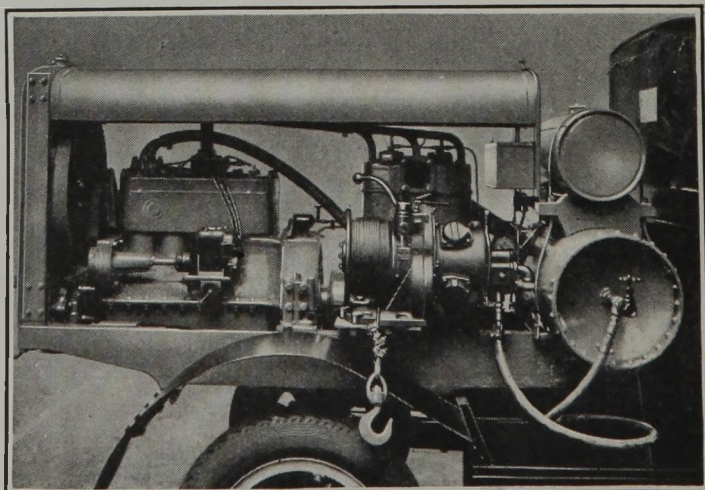
This cable clamp is tapped for attachment to the standard insulated hanger. Flecto Iron, a new malleable iron developed by the company is used throughout its construction.

Swiveled Air-Motor Hoist Pulls in Any Direction

A new size DU "Utility" air-motor hoist has been recently developed and placed on the market by the Ingersoll-Rand Co. of 11 Broadway, New York City. This size of hoist has been especially designed for use with portable

Air Hoist on Motor Truck

Attached to the side of a gas-engine driven compressor. The hoist may be swiveled so that the rope pull leads in any desired direction.



compressors and is suitable for a wide variety of work. It is a general-utility machine, particularly adapted to portable use. It consist of a light compact hoist of the winch type provided with mountings by which it may be attached to the rear end of a 5 $\frac{1}{2}$ x5 or a 5x5-in. portable compressor, to the side of larger machines or to compressors mounted on motor trucks. It is always ready for use and adds but little to the overall dimensions and weight of the compressor that drives it. It is thus extremely useful for temporary service where a greater pull than its capacity is not needed.

This machine is sturdily built and is claimed to be reliable and economical in operation. It is capable of exerting a rope pull of 1,000 lb. and of coiling 350 ft. of $\frac{1}{8}$ -in. cable. A swivel bolt through the base permits the machine to be swung around into any desired position. It is provided with a clutch so that the cable may be easily paid out by hand or by a down-grade load without revolving the motor and consuming air. A hand brake is provided on the drum to check unwinding and to stop motion in any desired position. The throttle control is sturdy yet extremely sensitive so that any desired speed up to 65 ft. per minute may be attained, this, of course, under full load of 1,000 lb. and with an air pressure of 80 lb. per square inch.

Some of the principal dimensions and details of this machine are as follows: Rope speed, at 80-lb. air pressure, 61 ft. per minute; width, 15 in.; length, 25 $\frac{3}{8}$ in.; height, 19 $\frac{1}{2}$ in.; net weight, 250 lb.

This machine is said to be highly economical in air consumption. Even when lifting a 1,000-lb. weight it can be operated by a 5 $\frac{1}{2}$ x5-in. portable compressor. A winch head can, of course, be furnished in place of the rope drum normally supplied.

Publications Received

The Pennsylvania State College and Its Service. Annual report of the college officers for the year 1924-1925. Pp. 141; 6x9 in.

Seventh Annual Report, Coal Mine Inspection Department of North Dakota. Pp. 31; 6x9 in.

American Society for Testing Materials. Proceedings of the Twenty-eighth annual meeting. Vol. 25. Part I; 962 pp. Part II, 454 pp.