

COAL AGE

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For a New Era in Safety

SAFETY in mining has been endowed by the accident compensation acts. Prevention of accidents has been made profitable and can no longer be regarded as an unremunerative, though worthy, way of spending money. Unfortunately, the effect of compensation has not been as great as might have been expected. Several ways of obtaining greater safety still are being overlooked, and it seems now, after several years of accident compensation, that the laws must be strengthened.

In many sections of the country have been found operators ready to co-operate in a revision of the laws having that end in view. A. J. Moorshead tried through the American Mining Congress to have such revision put into practice, but his effort seems long ago to have spent its force.

The Rocky Mountain coal operators are actively advocating better legislation and the Rocky Mountain Coal Mining Institute is even now canvassing ways of achieving greater safety in the dry areas of the West. This effort of the operating men will surely meet with the approbation of all the mining fraternity.

Some time back some of the western Pennsylvania operators sought to eliminate the menace of mixed lights by demanding that all mines having areas operated by safety lamps be operated entirely with such lamps. They were not successful, however, in procuring sufficient support to make their legislative plans successful.

An effort should be made to get safety measures required in one state adopted in all others where conditions are similar. Much credit should be given to those concerns which, like the Old Ben Coal Corporation, have adopted safeguards outdistancing those provided in mines confronted with similar safety problems. In the long run such precautions are not only salutary but profitable, especially when taken to prevent such accidents as may involve a whole mine in a common catastrophe.

A New Use of Trade Associations

ASPEAKER at a recent meeting of the Philadelphia Coal Club jocularly refused to give statistics regarding farming, for fear that agents of the Department of Justice might be around. We must be equally careful and shall avoid giving any statistics of mine explosions caused by coal dust, for fear some one might make an improper use of them.

A brick, we are told, is a construction material of use in masonry, but it has been used to commit murder. Statistics resemble that brick and if someone used it improperly, the Department of Justice might ask who it was that smuggled in the brick and we could be convicted of being the guilty party. Someone might say, for instance, that mine explosions were so many and the cost is so high that the price—but that is enough.

Before we write more we must ask the subscription department if Secretary Daugherty or any of his henchmen are reading *Coal Age*.

Avoiding bricks, whether in hand or in flight, we wish to suggest a new use of trade associations. Could not some such body erect for its members a mill, centrally located, yet far enough from the mines to avoid having a scale made for it by the United Mine Workers, where rock could be ground for the use of members and others in the rock dusting of mines? Of course unless it was intrastate it would not be allowed to ascertain the cost of the installation, the cost of grinding the rock, the quantity ground or distributed, the percentage of its product that would go through any given screen, but nevertheless it might be well to install it if it could be done without the aid of statistics and if it rendered no accounts to its members. At least, we believe it might be permitted to exist for a while till the Department of Justice tried once again to legislate the action into one of criminal intent.

Such a mill could do much to make mines safe in the area it served. The suggestion has been made to *Coal Age*; it surely is worthy of consideration—if legal, of course.

Can't Win with Poor Cards

NO ONE can hope to meet the present low cost of coal with equipment that has a high cost of operation. Circumspect development is the one hope for staying in the competition. If care be taken to provide appliances that will save labor and increase production the race may be won. Mere economy and a decision to get along with what equipment is in hand may carry a plant along a month or so, but only judicious expenditure will give the operator such advantage as to protect him for a long period of low prices.

Coal operators in flush times overextend themselves. They load their financial structure with mines and lands until it fairly groans under the strain. They do not put enough of their profits back into the plants they have, but squander their money in plants they desire to add to their holdings. As a result when the close margin comes they are taken entirely by surprise.

If they had loading machines and shortwall cutters, good tracks and switches, pipes and screens which did not have to be perpetually renewed, automatic substations, reclosing circuit breakers, pumps and doors—to mention a few items—they could clip off the few cents that would keep them out of the market, and, being in the market, they would be able to run steadily and clip off some more cents.

A vicious cycle in high cost perpetually drives the operator further and further to the wall. When the cost is high, the price of coal must be high, and being high must be made a little higher because the mines cannot run steadily. When for this reason the price

is raised a little higher, then the mine runs still more irregularly, and the price must be raised again. Just a little advantage—two cents on the steady-run basis—may make a difference of ten or more times that much because of its effect on steadiness and intensity of run.

Times of low prices call for high courage combined with circumspection. A little diligent figuring, however, will show just where a man can be relieved here, there and the other place to engage at other and more profitable work for the company.

There are in this world but two cycles, the cycle of success and the cycle of failure. A little profit makes efficient operation and steady business and spells success. A little loss of money and of faith results in an excessive economy and that again in inefficient, irregular, ill-sustained operation and bankruptcy. A trifling difference in cost oftentimes separates the two. Low cost sets the cycle of success in operation. High cost brings in operation the vicious cycle of failure.

Give Them a Boost

YEARs of experience have given the coal industry confidence in the U. S. Bureau of Mines. It is critical of the industry but not muckraking. It holds up a true mirror to us and to the public. We see ourselves not as others see us but as we are. They "nothing extenuate nor set down aught in malice." For a little while the Bureau seemed to be following the lines of government organizations which prescribe "Make out a bad case against industry, and jobs, salaries, honor and public approbation will flow therefrom." The Bureau has come scot-free from that Adam's apple, tantalizingly tempting as it was. It never tried to tell anything but the truth, and the best elements in the coal industry have been helped. As for the worst, no one wants to spare them. They are the true enemies of every coal man, vociferously though they may declare their interest in backing the industry.

Manning, Cottrell and Bain have each in their turn tried to do their work fearlessly and constructively. Mistakes of judgment may have been made but not of heart. They have deserved a more outspoken note of approval. Their effort to keep safety before the industry should be given wholehearted support. Their advocacy of rock dust should bear more effective fruit. Their investigations of safety appliances should meet with greater interest and what they have recommended and devised should have speedier acceptance.

They are the friends of the industry and no one can conceive any instrumentality better suited than the U. S. Bureau of Mines for the obtaining of that greatest of needs for the reformation of the industry—cleaner coal.

A concern in Buenos Aires purchased its coal for some twenty years from a company of standing in the United States. In the course of those years the mine became exhausted, and the Argentine firm was notified by the American company of that fact. "We have," said the United States company, "other coal which might suit you." The Argentine firm tried it and did not like it as well. Its officials, accordingly, said: "There are lots of mines in the United States; let us try some of them." They did so, and got in the hands of the sharks that seem more active in the export field than perhaps in the domestic. As a result these Buenos Aires buyers said they would never try again to buy in this country. They purchased coal from Europe and told an American

commercial attaché that never till the United States would guarantee coal quality would they again be in the market for coal from this country's mines.

Shall we never learn that adequate inspection has been, and ever will be, the sheet anchor of successful trade?

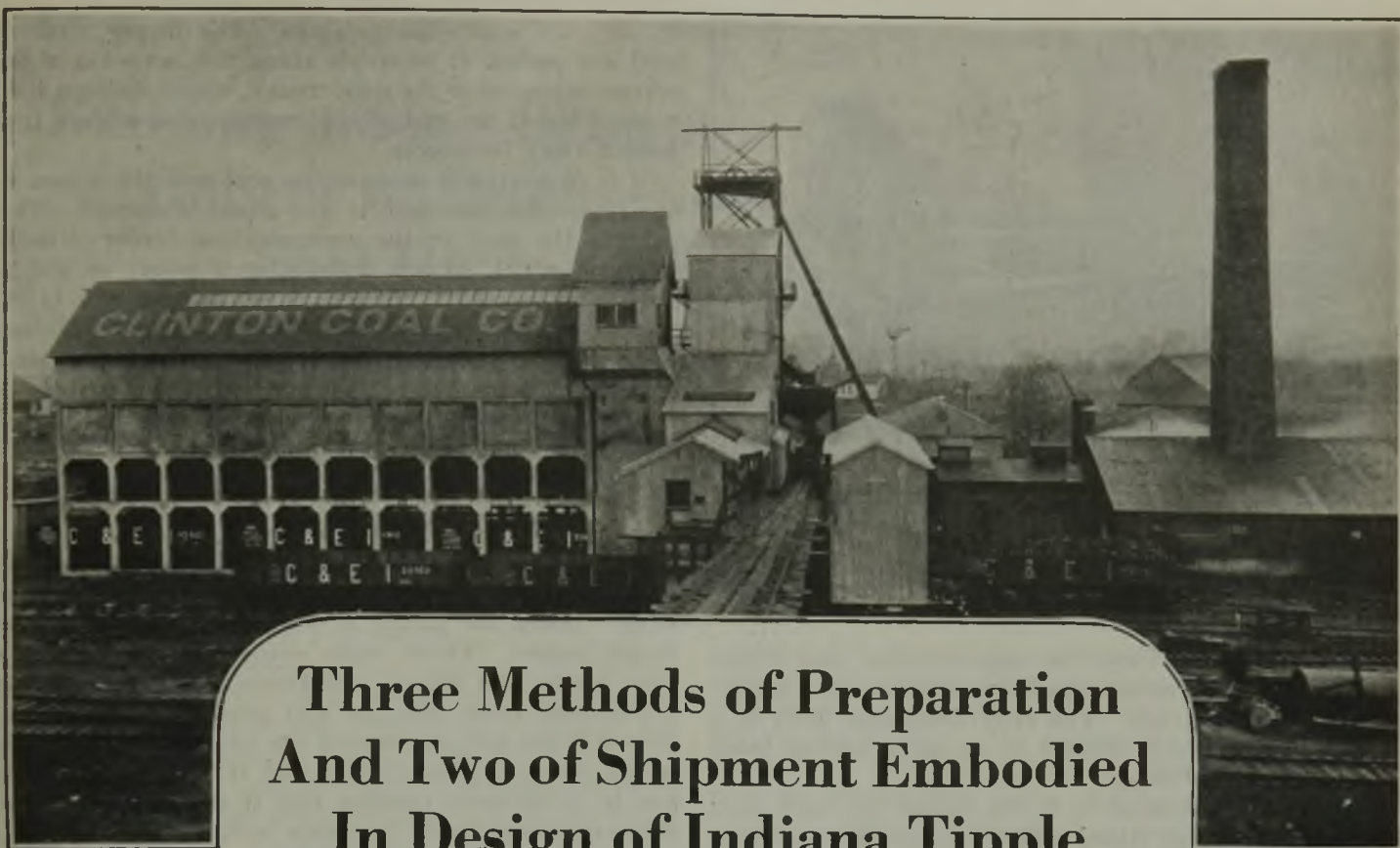
Better Inspectional Forces

RECENT explosions and the high death rate in the mines of the United States make it essential to improve the inspectional service. At present we have no adequate safety organization. In each state we have only chief inspectors and subalterns. The latter have a hard life traveling through the mines and being always away from home. Their salaries are small. Though their tenure of office is reasonably secure and in most cases not threatened by politics, they have no hope of promotion. Increased comfort, decreased exertion with advancing years, growing public appreciation are denied them. Such conditions do not provide the best men. The inspectional service is a blind alley.

In Great Britain, on the other hand, there are grades of inspectors. The upper classes of the service are spared the drudgeries of general inspection. When a problem is presented they act to settle it, and being more competent than the general run of the inspectorate and living on a higher plane of social recognition they are able to approach those who wish to contravene their authority or stretch the law by some technicality with a degree of confidence and understanding that makes their representations respected. It is difficult for a \$4,000 or \$5,000 man to make the \$25,000 or \$50,000 president of a large company realize that he must conform to some practice which safety prescribes or the law requires.

Furthermore, our inspectors in general have not received technical training. They have experience obtained in actual contact with mining problems. They have studied enough to obtain a certificate but most of them know little enough about electricity and almost nothing about the other forms of safety that would throw light on safety at mines. They are rarely traveled men. They know their district well and they know perhaps more than their district knows but there is no incentive to acquire more. They are safe to continue to be inspectors without this further instruction. The safety services of the coal mines are better than we have any right to expect under present conditions, but why not take the steps that will make them still better?

MR. LEWIS' IDEA of the proper place for the wage scale negotiations, concurred in by a few operators, was an unfortunate one from many standpoints. The choice of Jacksonville, Fla., for the Feb. 11 conference too easily gives the impression that operators and miners are entering the forthcoming parley in a playful, vacation mood. The argument that the negotiations ought to be removed as far as possible from the interfering influences of the coal states is thin soup. If the sessions should be drawn out at great length the unpleasant impression of the conference would be intensified over the country. Hence it will be good policy for both sides to knuckle down to business at once upon their arrival in sunny Florida and do the one logical thing without delay—extend the present wage agreement.



Three Methods of Preparation And Two of Shipment Embodied In Design of Indiana Tipple

One Grizzly and Two Shaking Screens Used—Five Sizes May Be Shipped by Truck, Eleven Sizes by Rail—Large Concrete Storage Bins Facilitate Local Shipments and Relieve Car Shortage

A NEW four-track steel tipple recently was completed by the Clinton Coal Co. at its No. 2 Crown Hill Mine located near Clinton, Ind. This improvement has been made at the shaft where two years ago a 1,500-ton rescreening and wagon-sales storage bin was constructed. The combined equipment makes coal preparation at this mine unusually complete. The plant as a whole is the result of the determination of the owners to be ready to meet a recurrence of every market and operating contingency that has arisen in the past as well as those which business experience indicates may be expected in the future.

Three methods of preparing coal are provided in this plant. The first is the preparation of run-of-mine over a 1½-in. bar screen, making standard 1½-in. lump and 1½-in. screenings. This product can be made without operation of any mechanical screening equipment and is intended to satisfy that portion of the trade that has become accustomed to this kind of coal, having used it for years, and which therefore still demands it.

ALL LARGE COAL LOADED OVER BOOMS

Passing the coal over a horizontal screen, where it can be picked, and then loading it into cars on four tracks forms the second method of coal preparation. The three larger sizes are loaded over loading booms. Screening in this manner together with provision for picking and for loading into cars by means of booms

Excellent facilities for wagon shipment are provided at few mines. The headpiece shows how the Clinton Coal Co. has made provision for local delivery. The concrete bins here shown span not only one railroad track but a paved wagon space as well. Shipment of any size may thus be made by either car or truck.

is all that is necessary in order to obtain the best domestic preparation.

The third system of handling coal at this plant consists of delivering the run-of-mine from the weigh hopper in the tipple direct to an elevator, by which it is raised and then screened over a horizontal screen into five sizes, each of which is deposited in a separate concrete bin. The sizes made are designated as screenings, pea, nut, egg and lump coal. The bins are quite wide and each is fitted with two openings, or gates, in the bottom. One of these gates delivers to cars on the screenings track under the tipple. Thus all coal prepared in this manner can be shipped by rail if desired. On the other side of the bins the coal is loaded directly into wagons. A mechanical rescreen is inserted in the wagon chutes, which results in an extremely high-grade coal being available to the town of Clinton, located at a distance of a mile and a half from this mine.

The space below the bins is provided with a concrete floor or pavement. This is extended so as to make connection with a concrete road leading to Clinton. The capacity of the bins is such as to provide for a large wagon and truck business. It also serves for coal storage frequently relieving the situation when there is a car shortage and these sizes are being shipped.

FROM CAGE COAL MAY TAKE SEVERAL ROUTES

A brief description of the method of handling and the mechanical equipment follows: The coal is discharged from self-dumping cages into steel chutes which deliver it to a bottom-door gravity-dump weigh hopper serving a chute and bar screen. In case bar-



Fig. 1—Side View of Tipple

In addition to the four sizes made over the tipple screens, two sizes made by a bar screen, as well as run-of-mine, may also be shipped.

screen coal is to be sold the veils covering this screen are lifted and the screenings delivered direct to a hopper above the slack track. The 1½-in. lump coal flows to a feeder hopper which delivers to an apron loading boom over the nut-coal track.

In case run-of-mine is to be loaded the veils over the bar screen are closed and the entire mine product is loaded over the boom on the nut track. The reciprocating feeder is so adjusted that it delivers the coal to the boom quickly, so that an interval is preserved between dumps from the mine car. Thus this boom can be used for inspecting the contents of each car for docking purposes.

BYPASS SHUNTS THE COAL TO THE BINS

When it is desired to send coal to the concrete bins for preparation a door below the bar screen is opened and the run-of-mine delivered through it to an apron conveyor. This in turn feeds a gravity discharge elevator which delivers the coal at the top to a horizontal screen 5 ft. wide. This screen is provided with

¾-, 1½-, 2½- and 4-in. openings. The larger sizes of coal are picked at intervals along this screen and the refuse deposited in the rock trough, which delivers it to a small bin at the end of the storage bins, whence it is hauled away in wagons.

If it is desired to prepare the coal over the screen in the tipple another door in the chute is opened. This deflects the coal to the reciprocating feeder directly below it, which in turn distributes it evenly on a 6-ft. horizontal screen. This separates the coal into 1½-in., 3-in., 6-in. and lump sizes, thus making grades that are standard in Illinois and Indiana. The larger sizes of coal can be picked on this screen. The pickings are placed in the refuse trough over the screen and delivered beyond the lump track into a bin from which they are hauled away in wagons.

ROCK IS READILY SENT TO WASTE

Another feature of interest embodied in this installation is the means employed in handling rock from the mine. Doors are placed in the dump chute above the weigh hopper. These, when opened, deliver rock to a steel bin at the side of the tipple. A side-dump car draws rock from this bin and proceeds up a 10-deg. incline to the gob pile beyond the railroad tracks. This incline extends directly over the three loading booms and is in the same position that it occupied before the steel tipple was built, its trestle having been incorporated into the new tipple structure.

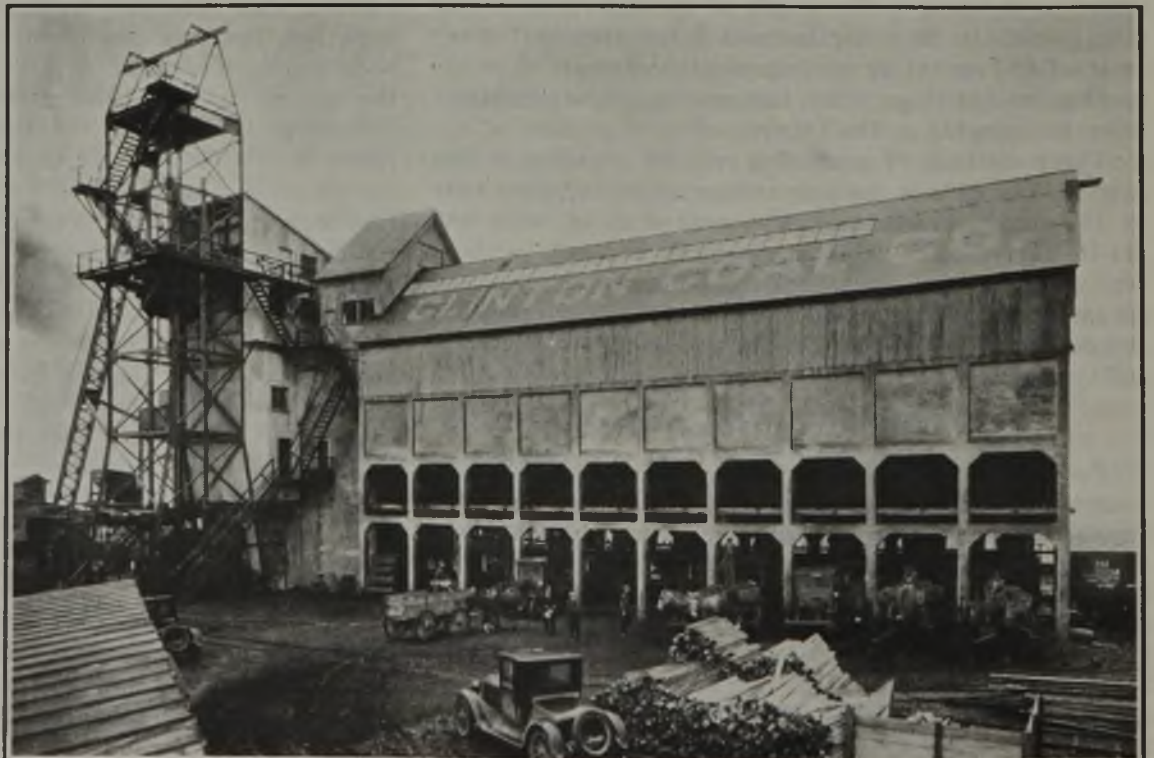
The provision of three distinct methods for preparing the coal is the most unusual feature this preparation plant embodies. In a measure it is exceptional also in the excellent facilities that have been provided for shipping the entire mine output or any portion of it in prepared sizes for local consumption.

At this plant the rescreen and storage bins were built by the coal company while the equipment and machinery was furnished by the Roberts & Schaefer Co., of Chicago. The steel tipple also, including all equipment, was designed and built by this same firm, actual erection being performed by R. G. Lawry, contracting engineer.

FIG. 2

Local Bins

This picture shows the concrete bins extending at right angles to the tipple proper, in which are stored five sizes of coal that are prepared on screens above them. From these bins the coal may be delivered either to trucks or wagons located in the paved space below them or to railroad cars on the slack track. Coal for local delivery is re-screened making an exceptionally good product.



Building a Long Retarding-Conveyor Gallery at Brotherhood Mine, Coal River Collieries

Structure Rises 800 Ft., Is in Places 40 Ft. Above Ground and 1,400 Ft. Long, the Maximum Grade Being 35 Deg.—How Joints Are Stiffened and Strengthened



BY W. J. DENMAN

Assistant Engineer, Coal River Collieries

LONG rope-and-button coal retarders often must be provided with trestles of considerable height and must be erected on such pitches as to bring heavy strains on these structures. When these trestles are built of wood, shrinkage occurs, weakening the joints on which so much depends. Care therefore should be taken to see that the bolts are kept tight at all times lest the structure become loose jointed and crowd down the hill onto the tippie below. The height of the building is not merely to be measured from some point on the hill to the peak of the roof immediately above it but from the bottom of the bin on the top of the hill down to the railroad track. This great height makes the trestle inherently somewhat unstable. It is necessary therefore that it be held rigidly together.

At the Brotherhood mine of the Coal River Collieries, on the Laurel Fork of Big Coal River, Boone County, West Virginia, has been built a headhouse and conveyor gallery of somewhat unusual construction. The new headhouse is located 1,400 ft. away from the railroad and some 800 ft. above it, the coal being conveyed to the

tippie at the railroad by a rope-and-button conveyor (one of the longest, if not actually the longest, ever installed in a single unit). The maximum slope of the conveyor is 35 deg. The headhouse bents in general are built of 10x10-in. timber with 2x8-in. bracing and with all intersections bolted. On the conveyor gallery the bents range from 5 to 40 ft. in height with standard 8x8-in. and 10x10-in. four-post tower construction having 2x8-in. level and cross bracings, all intersections being bolted. With such a structure we expected to have much expense for upkeep and inspection. The joint bolts would have to be tightened continually, that being our experience with bolted structures.

USE PLATES TO STIFFEN TIMBER JOINTS

In order to avoid some of this uncertainty and expense and to make a structure unusually stiff and safe we used a new device consisting of a cold-rolled steel plate of special composition which is made in square and round forms. The dimensions of the square plates are 1½ in., 4 in. and 5 in. The round type has a diameter of 3 in. A hole in the center of each plate is made of ample size to permit the passage of the bolt with which it is used. The edges of the plate are cut so as to form triangular teeth ⅜ in. high and about ½ in. wide at the base. These teeth are turned alternately up and down so that they project on both sides of the plate. They are so designed that when the plates are inserted in the timber joints they relieve the bolts of most of the shear stresses.

In Fig. 2 is shown a view of one of the timber-joint plates, clearly illustrating their construction. These plates can be used in bolted and in other forms of timber joints such as post joints, eliminating thereby the necessity of a pin and mortice. Our first use of them, however, was in connection with bolted work. They were placed between the members of a joint so that the bolts passed through the two members and also through the hole in the center of the plate. The entire joint then was pulled tight, causing the teeth to bite into the wood on both sides of the plate.

When we first considered these timber-joint plates our main desire was to obtain a more rigid structure with a greater factor of safety. Tests made by the Department of Civil Engineering of Columbia University at its testing laboratories showed the results tabulated in Fig. 3. They were made on a number of

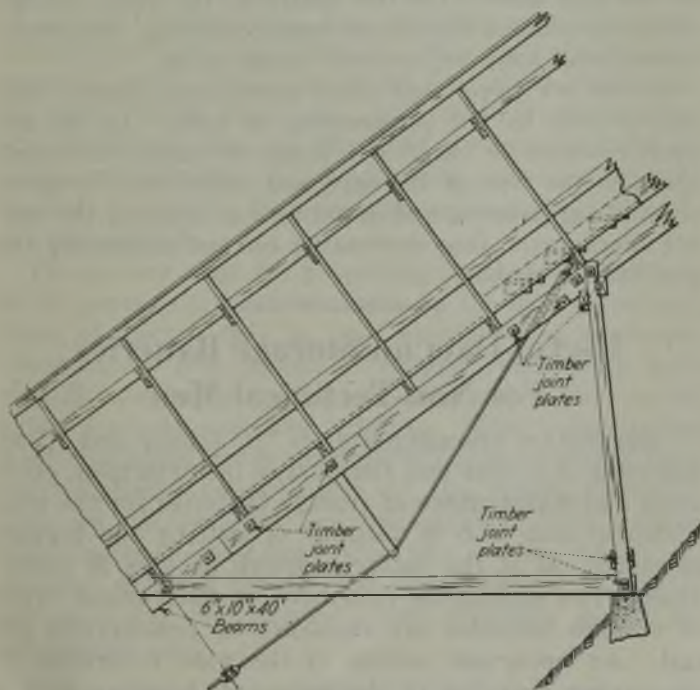


Fig. 1—Rope-and-Button Conveyor Gallery

This longitudinal cross-section shows a half span between two bents, the joints being stiffened by specially designed plates and the spans by an inverted truss.

joints each made up of 4x5.93-in. yellow-pine timber, with two 2.02x5.93-in. yellow-pine splice plates, three 5/8x10-in. bolts, six 3/8x3 1/2x3 1/2-in. washers and four 4x4x0.052-in. timber-joint plates, the bolt holes being of 1 in. diameter and the plates being countersunk in the splice and main members. In the first test the plates were squeezed into the timbers by pressure applied to the top and bottom of the splice plates by means of a testing machine. The other two joints were simply tightened by the 5/8-in. bolts. The three joints were subjected to tension through suitable connections attached to the main and splice timbers and the relative movement of splice plate and main members was measured with an extensometer.

WHEN JOINT IS WELL MADE TIMBER IS SAVED

Because these tests demonstrated that a joint made up with these plates was much stronger than one made up merely with bolts we were able to effect radical savings in the materials and labor required for the work.

The illustration in the headpiece shows the conveyor gallery near the foot of the hill and indicates the type of construction used when the bents required were long. Fig. 1 gives details of the conveyor-gallery bents and indicates how the plates were installed. Four-inch plates were used throughout.

Similar plates were used in connection with the 2x8-in. bracing in the conveyor gallery, making a more rigid job and eliminating one-half the number of bolts which otherwise we would have had to use.

Four-inch plates were used where the 10x10-in. posts of the high tower bents were lap-spliced, a single,

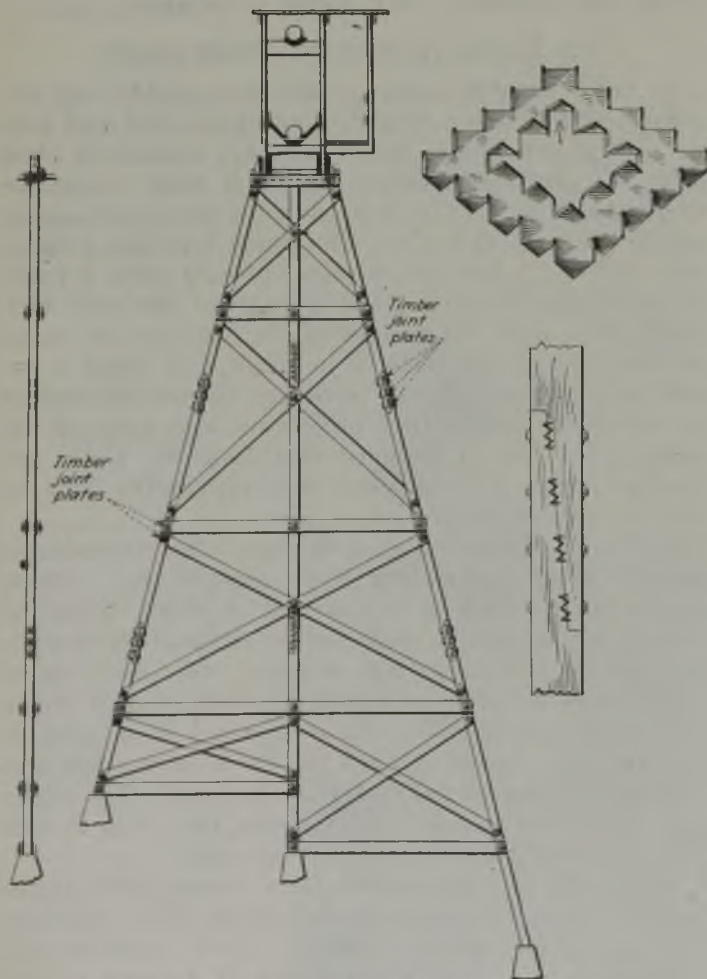


Fig. 2—Bent and Cross-Section of Gallery

In the upper right-hand corner is one of the special plates and on the right a scarf joint stiffened by four of these devices.

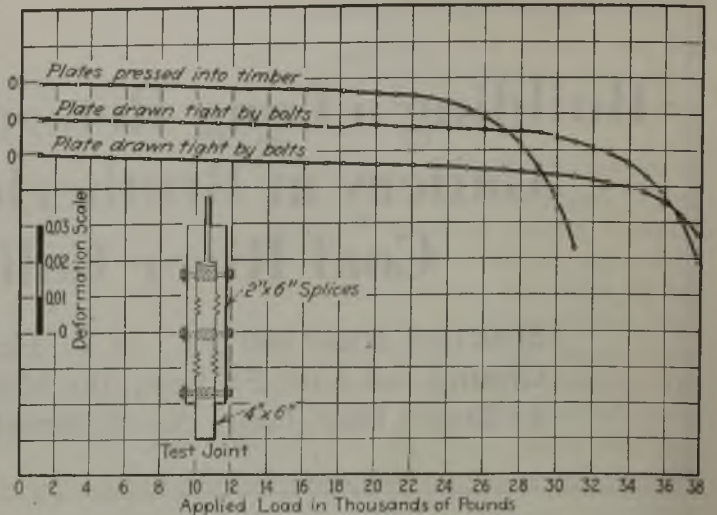


Fig. 3—Tensile Test of Timber Joints with Special Shear-Sustaining Plates

The curves of deformation have each an individual baseline marked "O." Pressing the plates into the timber apparently makes little difference under a tension of 11 tons but allows seriously greater deformation thereafter.

instead of a staggered, line of bolts being used. Despite the reduction in material and complexity, greater stiffness and strength was obtained than could have been afforded by joints of the original design.

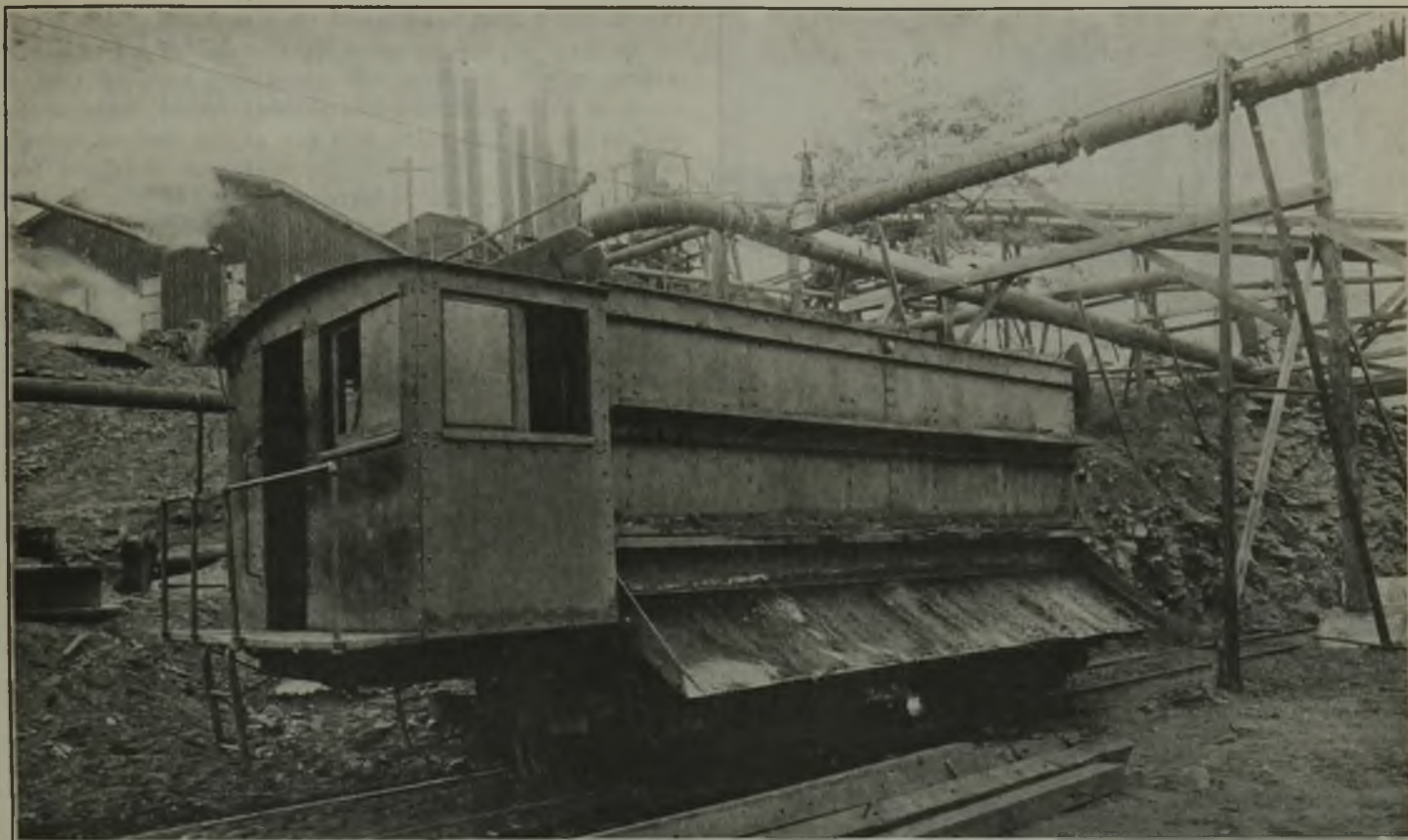
Fig. 1 shows the details on the conveyor gallery on the upper part of the hill. It will be noted that timber-joint plates have been used in splicing 6-in. x 10-in. x 40-ft. built-up beams. These beams were built of two lines of 2x10-in. oak planks, 18 ft. and 22 ft. long, respectively, with filler splices at the ends and centers 8 ft. in length. Plates were used at these splice joints.

To the present our experience has been exceedingly satisfactory and we hope, as is claimed, that even where the timber dries out, the rigidity of the joint will not be impaired. So far, we have not had an opportunity to check up this in detail, but though the wood has already dried out somewhat the joints do not show the slightest tendency to loosen, nor was there any splitting at the bolt holes. On the contrary, the plate seemed rather to prevent this action from occurring. Periodical inspections, however, are still being made.

So far we have used these plates only where they can be held by the compression of bolts. In the approach trestle to our No. 4 tippie we expect to install them on the tops of the caps and under the stringers, eliminating dapping and doweling and keeping the timber faces apart, thus decreasing rot and increasing the life of the timber.

Useful Data on Storage Batteries For Non-Technical Men

"Elements of Storage Batteries," by Jansky and Wood, describes in a clear and simple way the principles, operation and maintenance of storage batteries for the non-technical man who is desirous of getting the highest efficiency out of the batteries which he uses or supervises. The underlying principles of the various types of storage batteries are explained in considerable detail. An important section of the book is devoted to the proper charging of the batteries, together with a description of various types of charging equipment. The book is published by the McGraw-Hill Book Co., 370 Seventh Ave., New York.



Specially Designed Motors for Larry-Car Service

Mechanical Details Are Such as to Accommodate Heavier Axles—Must Have Armature Winding and Gear Ratio Suitable for Slow Speed—Motors Fitted with Ball Bearings

BY C. A. ATWELL

Motor Engineering Department
Westinghouse Electric & Mfg. Co.

ELECTRICALLY driven larry cars have lately come into more general use around the mines as coal transfer cars, slate dumping cars, scale cars, concentrator cars and for many other uses about docks, quarries, steel mills, coke plants and other similar industries. While their uses and types of construction are numerous, they all have the common features of being self-propelled, burden-bearing cars and usually operate at speeds that are low compared to electric railway service.

The motors used for propelling larry cars should be of the same general construction as the modern railway types of motor; that is, they should be series-wound, commutating pole motors of rugged construction suitable for mounting on the car axle and geared to the axle by single reduction gearing. The features that were mentioned above as common to all larry cars place several special requirements on the motors, however, that are not required for the usual railway motors. This makes it necessary that the motors which are entirely suitable for use on larry cars be designed especially for that service. The principal special requirements are:

- (1) Extra large axle bearings.
- (2) Slow-speed winding.
- (3) Ball-type armature bearings.

The fact that larry cars are built primarily for carrying heavy loads necessitates a truck design using a large axle. This in turn requires larger axle bearings than are customary for the usual railway type motor

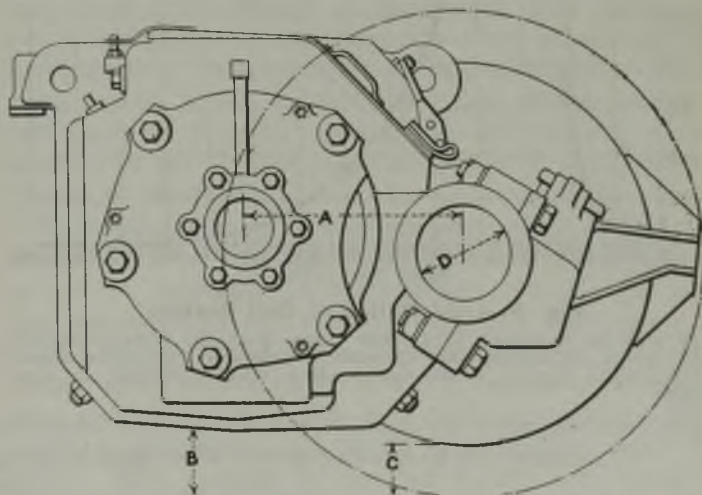


Fig. 1—Outline of Larry-Car Motor

Much depends upon the axle diameter, D , because if it is increased the gear center distance, A , increases and C , the clearance under the gear case, increases because of the use of a larger gear. B is the clearance under the motor frame.

The headpiece shows a typical mine larry car. The use of this car is rapidly increasing, due to the larger capacity and the ease of dumping. The arrangement for dumping usually is made to fit the conditions far better than is possible with the ordinary mine car.

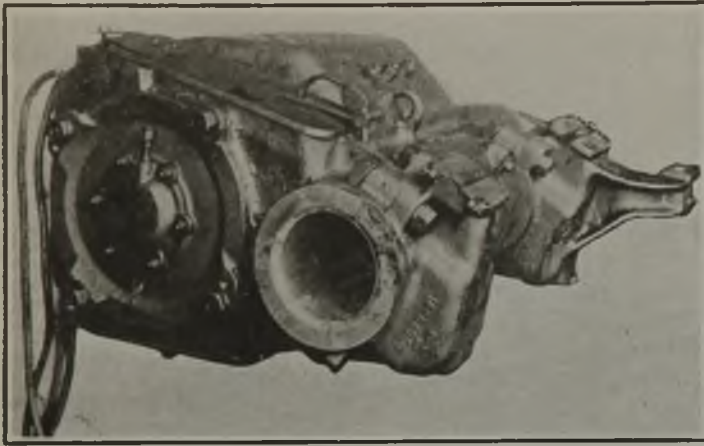


Fig. 2—Larry-Car Motor

This specially designed motor is rated at 80 hp. and 230 or 550 volts. The axle bearings are for an 8-in. rear axle. Ball armature bearings permit higher motor efficiency and proper lubrication of the bearings without overflow into the motor and windings.

of the same size such as are used on street railway, interurban, or even freight locomotive service. In Fig. 1, the dimension "A" represents the "gear center distance." On standard railway motors this distance usually is made a minimum for the largest size axle that is likely to be used with a certain motor. A minimum distance, "A," has the advantage of a maximum clearance, "C," between the gear case and top of rail. In order to increase the axle bearing bore, "D," the gear center distance, "A," must be increased. A gear with more teeth is used to make up for the increase in gear center distance and mesh with the motor pinion. The clearance, "C," is reduced by the same amount that "A" is increased. As it is not necessary for "C" to be as large for slow-speed service as on high-speed railway service, this decrease is not detrimental.

The voltages common about industrial material yards where larry cars are used generally fall within the ranges of 230 to 250 volts or 500 to 550 volts. Of these voltages the most common are 230 and 550. A car speed within the limits of 8 to 12 miles per hour at the nominal rating of the motor usually is desired.

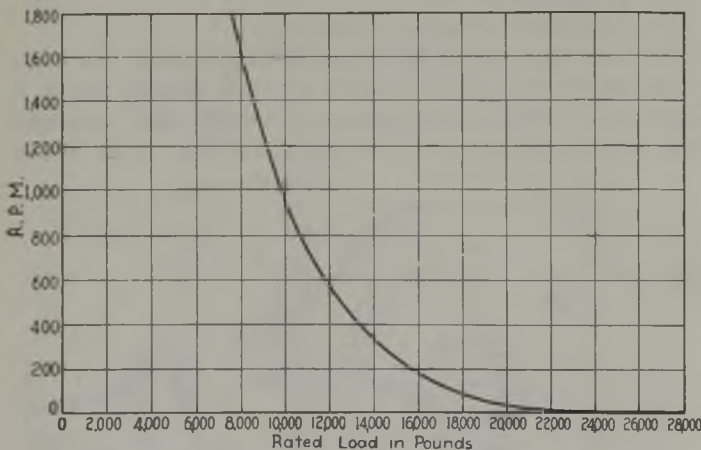


Fig. 3—Load Rating of Ball Bearing

It will be observed from this curve that the manufacturer's load rating decreases with increase in speed. This curve shows the extreme impact loads the bearing will withstand at slow speeds.

The special voltage and speed requirements of the larry car service practically prohibit the use of an existing railway motor winding. It sometimes happens that a standard high-speed 600-volt railway motor, when operated on 230 or 250 volts, will run at the desired speed; but, due to the fact that the motor is designed for 600-volt service, the ampere capacity of the copper conductors in the windings will not be adequate for the lower voltage. This will result in obtaining less horsepower for a given motor size and weight than is ob-

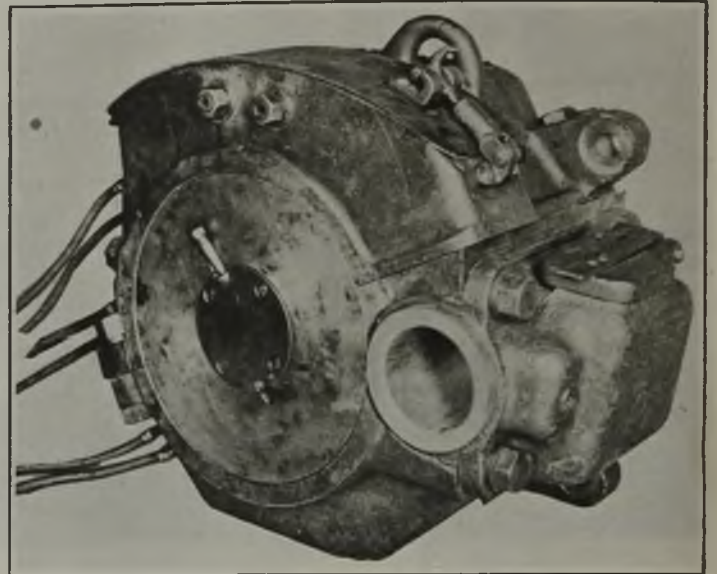


Fig. 4—Motor for Narrow Track Gage

This motor is rated at 7.5 hp. and is made for use on larry cars operated on 18-in. track gage.

tained from a larry car motor which has a winding designed especially for the voltage and speed required in such slow-moving equipment.

Ball armature bearings are preferred to the sleeve type on larry-car motors for the same reason as on mining locomotive motors. They require less lubrication and attention and maintain the armature in a central position with respect to the field poles. Ball bearings usually are lubricated with grease while sleeve bearings are lubricated with oil, which often results in over-oiling and a consequent entrance of oil inside the motor, where it damages the windings or commutator. Ball bearings have not been accepted as standard on the higher speed railway motors, but this is due to the mechanical inability of the ball bearing to stand up under the conditions of high armature speed and impacts received at high car speeds. The average speed of the larry car service is even lower than that of the mining locomotive, so the odds are strongly in favor of the ball type of armature bearings. Fig. 3 shows how the manufacturer's rating of a ball bearing increases as the speed decreases.

Fig. 2 illustrates an 80-hp. larry-car motor that possesses the special requirements mentioned above. The following tabulation shows comparisons of this motor with a high-speed 600-volt railway motor that has the same size of frame and same armature and field-pole dimensions.

Motor	Hp.	Volts	Amp.	R.P.M.	M.P.H.	Lb. Tractive Effort	Gear Ratio	Diam. of Wheel	Wt. of Motor Complete with Gears and Gear Case	Dimensions (See Fig. 1)				Type of Armature Bearings
										A	B	C	D	
										Larry Car Motor	80	230 550	305 128	
High Speed Railway Motor	140	600	202	900	23 2	2,260	16'61	33	4,050	15.4	4½	3¼	6	Sleeve

Preventing Stray Currents from Detonating Explosives

Ground Currents Cause Premature Explosion—Potential Differences Reduced by Interconnections and Grounds—Keep Firing Cable Well Insulated

By E. E. JONES

GROUNDING of electric equipment is highly desirable, but this alone is not sufficient because current leaks into the ground create relatively high potential differences between strata of earth and metals. Whenever liability of explosion exists from gas or blasting caps, the whole surrounding region should have little or no potential difference between objects. The blasting circuit is most important of all. It should be well insulated and free from splices or broken insulation. It should be inspected frequently—at least every day. Usually leakage of stray currents into the blasting circuit are the cause of premature explosions because the cable or conductors often span areas or materials having high potential differences.

JUST as the men employed in sinking a shaft at Stotesbury, W. Va., for the E. E. White Coal Co., were in the bucket descending to the bottom there was a premature detonation of a charge that had been previously set. The shaft was at that time 65 ft. deep and, owing to the fact that the bucket had only started down, a fatal accident was narrowly averted. Investigation showed that the explosion was caused by stray electric currents in the ground and metallic connections to a pump and hoist equipment; hence it was not safe to proceed with the work until this condition was corrected.

Some of the men refused to work in the shaft unless steam was used in place of electricity for operating the hoists and pumps. This was practically out of the question, since the electric equipment had already been installed. It was decided, therefore, to make tests to determine the cause of the explosion and to decide upon the remedy.

The system we were using for power was grounded on one side and supplied by a 1,000-kw. rotary converter,

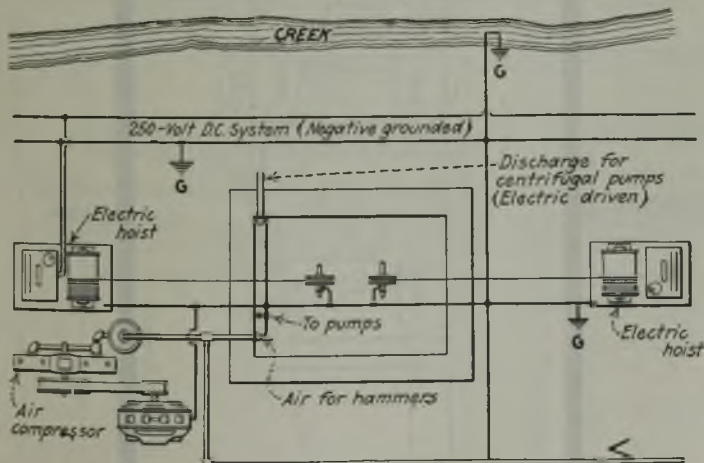


Fig. 1—How the Equipment and Pipes Were Interconnected and Grounded

The heavy lines show where a solid 0000 copper conductor was connected and grounded, thus reducing the potential difference between various objects to a point too low to set off a blasting cap.

From *Explosives Engineer*, September, 1923.

similar to those used in street railway systems except that 250 volts were employed instead of 500 to 700, as in street railways. First, all the switches in the hoist, pump, motor and compressor circuits were opened to make sure that the trouble was not caused by a leak from the positive side of the system to any of these machines.

While the switches were open, an electric blasting cap was connected between a pipe in the air line and

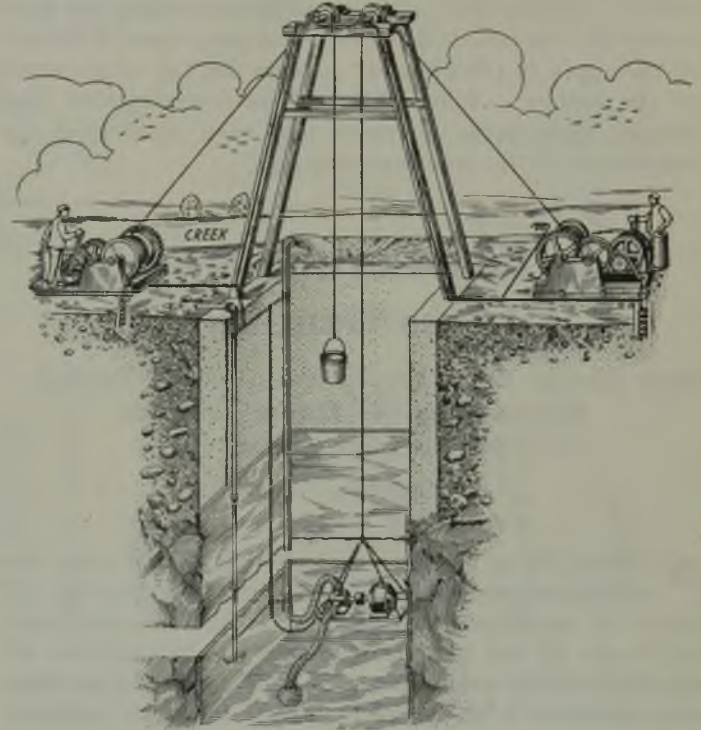


Fig. 2—Elevation View of Shaft Showing Ground Connections

By thus effectively grounding the system of electric apparatus, pipe lines and tower the confidence of the workmen was regained and the work made safe.

the discharge line from the pumps. The instant a connection was made, the blasting cap detonated. A connection was then made between the air line and the ground adjacent to the shaft. The cap detonated, but not instantly, which showed that there was not at all times sufficient voltage between these points to fire a cap.

Next, a connection was made between the metal of the hoist frame and the ground, and the blasting cap fired instantly. Finally, a connection was made between the bottom of the shaft and a wet place near the surface; in a few seconds the cap detonated. From these results it was evident that there was a sufficient difference of potential present in the various places selected to fire blasting caps connected in an ordinary circuit in the shaft.

To equalize the voltage at various points around the surface and at the bottom of the shaft, the frames of all the machines on the surface and the pump at the bottom of the shaft were metallicly interconnected with a heavy copper conductor and grounded. The two hoists were connected by a heavy copper cable which was grounded; this cable also was connected to other surface equipment and to all pipes going down the shaft. The grounds at the two hoists were made by burying a coil of 0000 copper wire in a hole 4 in. deep. Salt water was poured on the coil to increase its earth contact. The different connections and grounds are shown in the accompanying diagrams.

After this work was completed \$25 was offered to some of the most intelligent workmen if they could fire an electric blasting cap by connecting it in any way that it would explode, without, of course, using a blasting machine or the power circuit. None of them was able to fire a cap in this way. After the tests the caps used were fired by connecting into a power line to prove that they were good caps.

Tests were then made with a mili-voltmeter, with which no difference in potential greater than 100 mili-volts could be detected between any two pipes, from any of the pipes to the ground, or from the top of the shaft to the bottom. When it was thus demonstrated that danger from stray currents had been eliminated the confidence of the men was restored.

New Coal-Cutting Machine Drives Gangways

Same Device Cuts, Breaks and Delivers Product—
Entries May Be Driven on Both
Sides of Main Gangway

BY ARTHUR GERKE
Waldenburg, Silesia, Germany

ATTEMPTS at driving galleries in a coal seam by machines date back to the time when boring by means of machines was begun. Technical periodicals and books of the last decades contain descriptions of machines which were successful only in so far as they were patented. Many were put to test, but without the result hoped for. That all these attempts failed probably is due to the fact that it was impossible to produce equipment that could stand the great strain of coal cutting, and to provide a guide that excluded any deviation from the direction intended.

In spite of these failures, however, the activity of inventors has not come to a standstill, and numerous appliances have been patented. The solution of the problem would be of special importance to the mining industry, since driving galleries means waste of money and time. The quicker the gallery advances, the sooner large-scale mining may begin and the larger will be the number of men at work. As the advantages to be gained are many, a description of a new coal-cutting machine, called "Rotatia," is of interest. Some time ago this machine was introduced in the German, Czech and Hungarian mining industry and proved a complete success.

This rotating coal-cutting machine consists of three main parts: (1) The driving device; (2) a system of tubes for lengthening; (3) the cutting device, which consists of cutters composed of several parts, and the mechanism for vertically cutting or breaking the core, likewise composed of several parts.

The driving device, fixed on a carriage, is secured on an inclined plate at any point from which a gallery is to be driven, while the cutting device is kept in close touch with the face of the coal through the system of lengthening tubes, as shown in Fig. 1. The whole system is connected with the shaft of the driving device by a special coupling. The lengthening pieces are tubes with flanges and are connected by keys and two locking screws. The cutting device is fitted to the last lengthening piece and rests on a column provided with

The following rules were strictly enforced:

(1) Explosives must be in an insulated container when lowered down the shaft. (2) No more than two men can be in the shaft while the shots are being prepared. (3) The muck bucket must not touch the bottom of the shaft during the preparations for a blast. (4) The blasting machine must be in possession of the top man and can be used only by the men who prepare the shots in the shaft and then only in the presence of the top man. (5) The shooting cable must be inspected daily from top to bottom. If a bare place is found, the cable must be thrown away and a new one obtained.

I consider No. 5 a very important rule, because if stray currents should develop, the danger would be greatly reduced if the leading and connecting wires were all well insulated. I am glad to say that no one was seriously hurt during the sinking of the shaft.

an adjustable bearing, stayed against the roof or the sides.

At a suitable distance from this column a second column, which also may be stayed and arranged in various positions, is provided with an adjustable bearing. On the cutting shaft behind this second column is mounted the cutting device, as shown in Fig. 2. The arms of the cutting device are connected by means of rings which correspond to the diameter of the cut to be made. The cutting device on the cutting shaft has on its front side a crown cutter for preliminary boring, which serves as a guide for the cutting device and also makes it easier to cut the core.

The arrangement for cutting the cores is mounted in the cutter arms. On every second arm, lying opposite each other, there are cutters of equal size and form, one set for cutting the outer, the other for cut-

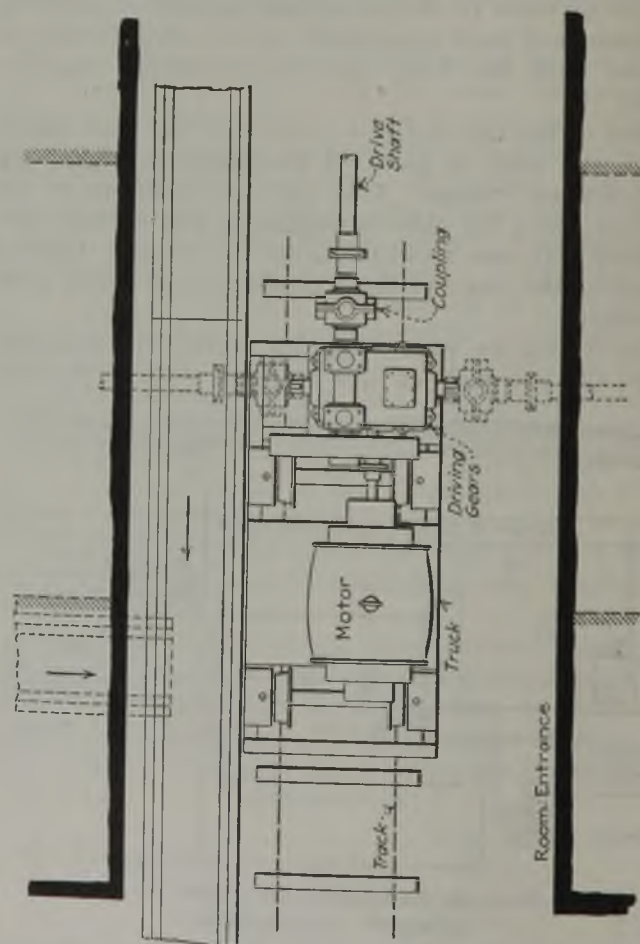


Fig. 1—Machine Which Mines Coal
This device drives a rotary coal cutter which mechanically cuts, breaks and loads coal.

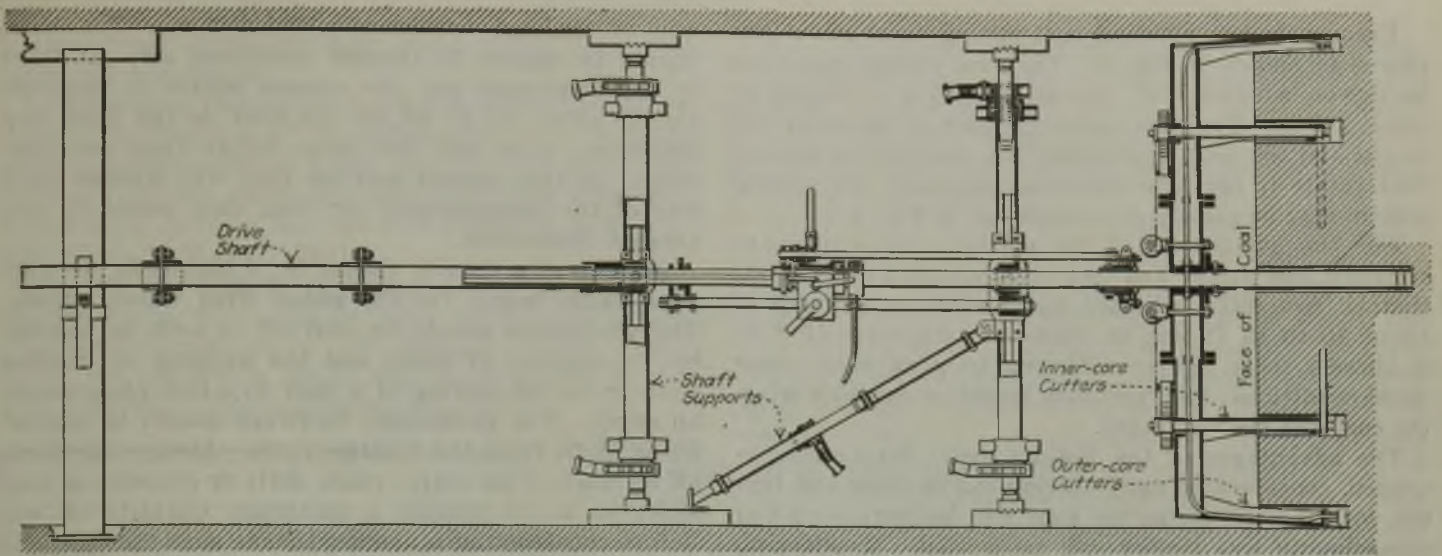
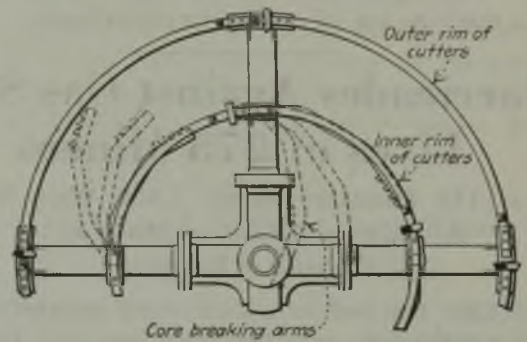


Fig. 2—Cutters Projecting from Two or More Rings Are Driven by a Long Line of Shafting

What will puzzle the American reader will be to tell how the coal can be removed with a line of shafting and posts filling the roadway for a distance which in cases is said to be 230 ft. This is effected by those rocking or swinging chutes, which, introduced in Germany, Belgium and Great Britain, are now finding their way into the mines of the anthracite region of the United States. The shaft is extended as the cutters advance, new columns being erected for its support. This must cause some delay in the operations. The columns are adjusted readily by a screw with ratchets.



ting the inner core. These cutters are arranged in a circle which exactly corresponds to the diameter of the cut to be made. These core cutters are behind the arms of the rings holding the cutting tools and are regulated by springs. When the machine is in operation the driving mechanism is set in motion by compressed air or electric power. The cutting operation begins as soon as the advance work is completed, and the cutting tools begin to work, making one outer and one inner circular cut. If the coal is very solid, a third narrow cut is made near the center.

After about one foot of coal has been cut, the advance work stops and the cutting device continues rotating about its shaft without advancing. The core is then cut or broken by the operation of a special mechanism on the arms of the core cutter. This core-

cutting device consists of parts like sickles which are advanced into the coal with an up-and-down motion so as to break the outer and the inner core. The broken core falls in lumps of large and small size and these are carried off by means of a rocking or swinging chute. When the whole of the core is cut, the advance work again begins to act and the cycle of operations repeats. The advance work may be extended to the total length of 3 ft. After 3 ft. has been cut, a lengthening piece is screwed on and work proceeds. Additional lengthening pieces are added as required.

As the roadways advance new columns must be set. The system of lengthening tubes may be extended to about 230 ft. when necessary. The driving device may be shifted from the entrance into the gallery and the work carried on to any desired point.

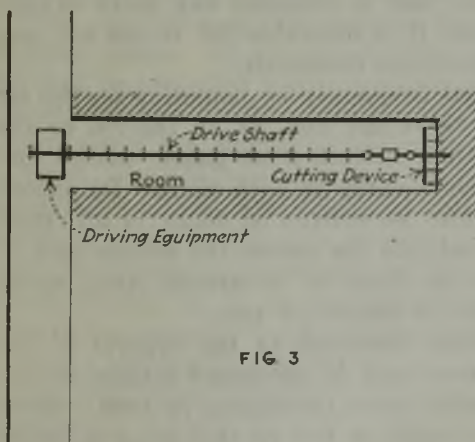


FIG 3

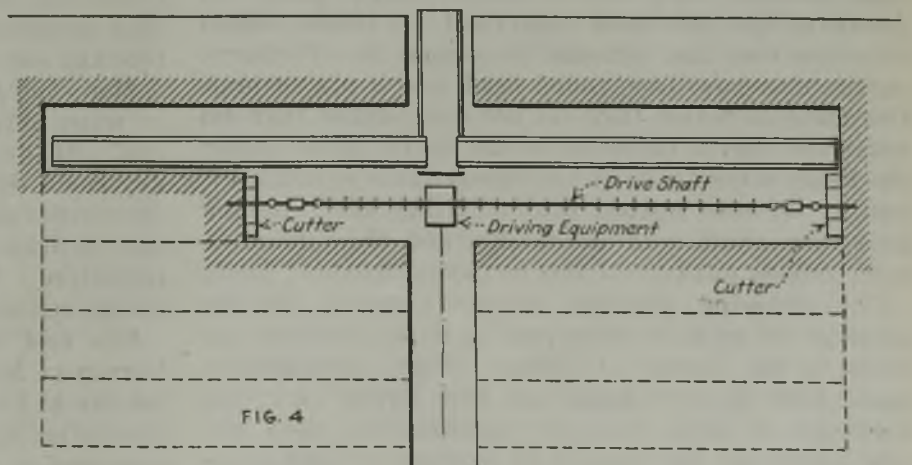


FIG. 4

Figs. 3 and 4—Cutting a Room in One Direction or in Two

The figure on the right shows the cutters working in two directions on a longwall face, the coal left by the cutter doubtless being removed by picks. In this case loading can be performed readily, as the track can be set alongside the drive shaft.

Frequently the rotating coal-cutting machine is employed as shown in Fig. 3. The first gallery may then be driven parallel with the main level to a length of about 230 ft. Then the adjoining part of the seam will be cut and the work continued. In case cutting devices that rotate in opposite directions are used, the mining system may be carried on as depicted in Fig. 4.

For the attendance of the machine three men are required, one driver and two cutters. In a day's work, that is, two shifts of eight hours each, an advance of about 10 to 15 ft. can be made if a diameter of 8 ft. is chosen, these figures referring to work done under usual conditions; they probably would be exceeded when the coal was not very hard.

The advantages of the Rotatia are: No blasting is needed, considerably more cutting can be done and timber costs are lower, as the roof will be more even and consequently less timber will be needed. Considering these advantages, the cost of buying and operating such a machine are of secondary importance.

Barricades Against Gas Save Lives of 275 Miners

But in 140 Disasters About 1,400 Were Killed by Afterdamp, Almost as Many as by Violence of Explosion

MINERS trapped in underground excavations during mine fires or after explosions may frequently save themselves from the peril of deadly gases by the erection of barricades of cloth, board, coal or rock, states the U. S. Bureau of Mines, which has completed a study of the subject. The Bureau of Mines has a record of 275 lives being saved in coal mines by the erection of barricades. The bureau is confident that hundreds of other lives might have been saved if entombed miners had possessed a thorough knowledge of barricade construction.

After many mine disasters in America and in foreign countries examination has shown that many of the men found dead had escaped the violence and flame of the explosion but had succumbed to the afterdamp. The evidence collected shows that at 140 disasters 1,477 persons were killed outright and 1,391 were overcome by afterdamp.

Sometimes miners have traveled long distances from their working places before meeting deadly gases, and groups of men have been found dead in a remote section to which they had retreated to escape the afterdamp. Again, men have been found dead near a pile of brattice material which they did not use because they did not know that a barricade would be of value. After the Reilly mine explosion in Pennsylvania in 1922 several of the men rescued said that they knew nothing about the erection of barricades, and there must be many miners unaware of this method of escaping death.

The following practical recommendations for the guidance of miners entrapped at mine disasters are made by the Bureau of Mines: When entrapped by gases from fires or explosions and forced back into workings in which there is comparatively good air, keep uppermost the thought of building a bulkhead or stopping and collect tools, timber, canvas, water, dinner buckets, hay from the stable, and anything else that might be useful.

If possible wherever air is used the barricade should be placed so that a valve in the compressed-air pipe line

will be inclosed in the barricaded area. The valve should be opened to furnish additional air. If there is no compressed air, the miners behind a barricade should either lie or sit on the floor in the hope that the rescue crew will find them before they are overcome. In this relaxed position they will breathe much less of the contaminated air than they would if they exerted themselves.

As soon as a place is chosen for a barricade, its erection should begin, for the gases often travel quickly. The ventilation should be shut off as soon as possible by the opening of doors and the hanging of brattice cloth or by the moving of a door to a new place across an entry. The permanent barricade should be started 50 to 75 ft. from the brattice cloth. Always barricade off as much of an entry, room, drift or crosscut as possible, so as to provide a maximum quantity of air. Before constructing a bulkhead make sure that there is no manway or other connection with other workings through which gases could pass. At some place outside of the first stopping, if more than one stopping is built, place a sign of some kind to show that men are behind it.

If a barricade be made of lumps of coal, slate or other rock, build two walls 2 to 3 ft. apart and fill the space between them with fine material or mud. The stopping must be airtight. Board stoppings are not as easily made gastight as those built of dirt or rock and dirt. All chinks and holes in the barricade should be stopped with clay, raps, clothes and similar material.

Coal miners should remember that they should not barricade themselves in any working or other place that gives off methane, for the firedamp may accumulate and be ignited in some way, causing the death of the whole party. If a piece of pipe is available it should be placed through the stopping and plugged at the inner end, in order that the air outside the barricade can be tested by removing the plug.

After the barricade has been built, the men should keep as quiet as possible so as to conserve the oxygen present. However, occasionally somebody should walk around so as to mix the air. All the men should not congregate in one place.

When the bulkhead is erected test it for leaks by means of a candle or carbide lamp. The way in which the flame of a lamp or candle burns will show the condition of the confined air and to what degree the oxygen is being consumed. All flame lamps should be extinguished, in order not to consume any more oxygen than necessary; also it is desirable not to use oil, carbide and electric batteries needlessly.

Men should signal frequently by pounding on the air or water pipes if there are any, or on the rib or the roof. If, during their retreat from gases, miners find any chalk they should carry it with them. Directions for a relief party may be written on doors, or an arrow may be drawn to indicate the course the miners took in retreating. With the flame of a carbide lamp legible letters can be made on timber or rock.

The first barricade recorded in the reports of the Bureau of Mines was built by entombed miners during the fire at the Cherry mine, in Illinois, in 1909. Seven days after the outbreak of fire in this mine a rescue crew met a party of eight men who had barricaded themselves with twelve others, saved later, but had broken through and were making toward the shaft. They had walked over half a mile, past cars and dead mules, in the dark, and in an atmosphere that would not support the fl...

comparatively good condition when found, and they recovered completely.

By bratticing themselves in an emergency shelter, by closing the "creep-hole" or sliding door in a stopping above a compressed-air pump, and then breathing the exhaust from the pump, thirteen men saved their lives in the No. 2 mine of the San Bois Coal Co., at McCurtain, Okla., in March, 1912.

Detailed information regarding the erection of barricades during mine fires or after explosions is given in Miners' Circular 25, by J. W. Paul, B. O. Pickard and M. W. von Bernewitz, which may be obtained from the U. S. Bureau of Mines, Washington, D. C.

The Miner's Torch

An Age of Charts; but Not at the Mines

IN RECENT years recording instruments have been devised to furnish checks on almost every operation carried on in connection with the various industries and the manager of many modern plants can, without leaving his desk, get a pretty good idea of the work of each department and put his hand on any department that is not functioning properly. In fact, the first thing that will attract your attention in some offices is the prodigious number of chart files.

But the manager of a coal mine is not so favored.

I had this brought home to me the other day when the manager of a group of mines, who had had little mining experience, asked me to devise a system for him that would allow him to keep tab on his superintendents; he didn't want his mines to explode if careful supervision would prevent it. After giving the matter a good deal of thought I began to realize that the thing he asked for was not only impossible but that even his superintendents could not depend on automatic devices to any great extent to check up on their mine foremen and assistants.

Probably the first man whose work you would want to check inside the mine is the fireboss; he leaves his mark in every working place, and if you go to the working places you can see his mark—that is the only way to find out how he has been spending his time.

Then come the men who sprinkle the headings and the working places. If you travel the routes they travel you may be sure they have carried out instructions, but not otherwise. Wait a minute, says someone; how about taking psychrometer readings in the return airways to see whether the air is saturated; if it is saturated you can feel sure that there was plenty of moisture along the traveling ways. Guess again. Even with the dry atmosphere characteristic of our Western mines the air as it travels through the workings of these mines manages to get enough moisture from somewhere to practically saturate it.

The trip riders who are supposed to keep a light prominently displayed on the rear end of each trip—who will check them?

And how about the numerous inspectors who look after the haulage ropes and the mine-car couplings and wheels and the mining-machine cables and swinging trolley wires, etc., etc.; what kind of a recording instrument will furnish a record of their activities?

The section bosses who supervise the timbering, tamping, shooting and loading of bug dust—how will you keep tab on their activities from the outside? Many an explosion could be traced back to one of these bosses, and the evidence would be full and complete, but such checks are not welcome.

The manager of a coal mine is dependent on his superintendent and the superintendent is dependent on his engineers and foremen and these men in turn are dependent on their assistants, and so on down the line. If the manager, the superintendent and the mine foreman and his assistants are competent to give orders and all of these orders that are passed down the line are carried out, things probably will move along smoothly and satisfactorily, but unless some or all of these "order givers" check up occasionally on the "order takers" you can be quite sure that the time will come when some of the orders won't be passed on down the line, or if they are they will not be carried out.

There may be a way to relieve the conscientious mine manager of some of the worry incident to his position (responsibility for explosions, etc.) other than the "see-for-yourself" method I have suggested above, but if there is I haven't discovered it.

Relative Value of Various Inert Gases in Extinguishing Mine Fires

HITHERTO the inert fire gas mainly used in the putting out of mine fires has been the carbon dioxide made by the fire itself, which has a valuable power of combating the flame when the air in which the fire burns is sealed so that oxygen cannot enter. The question of the use of inert gas was quite generally discussed at a recent meeting of the Coal Mining Institute of America. Joseph J. Walsh, Secretary of Mines of the State of Pennsylvania, declared that a small fire should never be sealed. A miner's lamp sealed in a chamber would not go out but would continue to burn because it would not create enough carbon dioxide or consume enough oxygen to provide its extinguishment. The fire should be at least large enough to involve the width of a single chamber.

Answering R. D. Hall, who said that C. Tarleton, general manager of the West Virginia mines of the Consolidation Coal Co., had declared that the return could not be sealed first in a bituminous mine, Mr. Walsh said the fire should never be sealed at a point closer than 1,000 ft. from the seat of the conflagration. In reply to the same questioner, who stated that B. F. Tillson had declared that he had maintained combustion in a producer with air containing only 5 per cent of oxygen, Mr. Walsh asserted that an investigator has found that the glowing coals ceased to glow as soon as fed with air containing 10 per cent of oxygen. Questioned as to the quantity of carbon dioxide in the flue gases with which he proposed to flood the mine workings to the exclusion of air, Mr. Walsh said that he had regarded the quantity of oxygen in the gas as the determining factor.

J. W. Paul said that carbon dioxide had little more effect than nitrogen in blanketing a flame. He said, and A. C. Fieldner supported him, that the carbon dioxide had more effect only as it was of greater specific gravity and had a higher specific heat. The weight of carbon dioxide is to the weight of nitrogen as 44 is to 28.

Harry Pythyon described an incipient fire started at

Belle Vernon on the outcrop of the Pittsburgh seam by a policeman who collected and burned the garbage of the village in the holes made by small openings excavated to obtain fuel for local consumption. The village authorities refused to be responsible for the fire though started by their employee in what was laid out as a village street. He was asked by the Department of Mines to put out the fire, and obtaining help from the Pittsburgh Coal Co., he had several holes drilled and erected a pump with which he endeavored to flood the area.

The fire was not extinguished even though it was sealed. Finally he backed his Ford over one of the boreholes and let the engine run, exhausting the gases into the hole. With this the fire was finally extinguished. He thought the gases from large internal-combustion engines might be used with profit in extinguishing fires, though he admitted that as a rule they would be deficient in volume.

Someone wanted to know why even a small fire could not be extinguished by the increasing oxygen depletion resulting from the absorption of oxygen by the exposed coal faces. Mr. Walsh said that an experiment had been tried in the anthracite region in which the air was sealed tightly for a month. At the end of that time the air in the sealed area contained 19.20 per cent of oxygen.

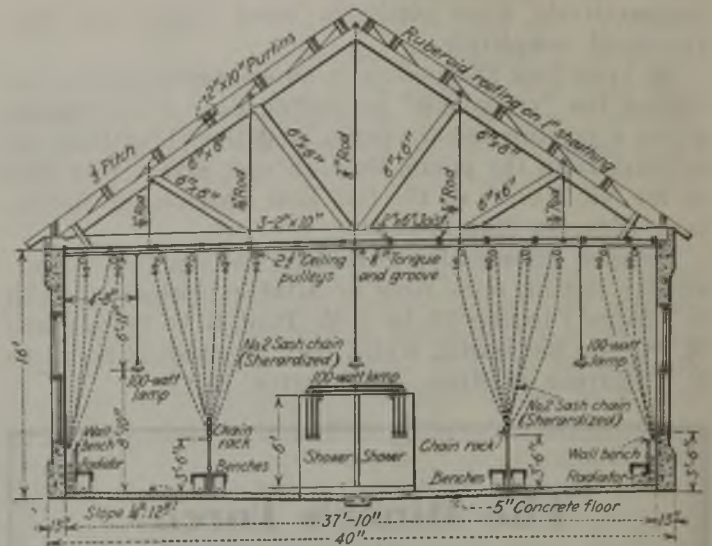
One of the members declared that the absorption of oxygen was more rapid in bituminous than in anthracite mines. Mr. Walsh added that flushing a burning coal area with earthy materials suspended in water had not proved a successful way of quenching a mine fire.

Company Laundries for Mining Towns

BY W. F. BOVARD

President, Keystone Coal & Coke Co., Greensburg, Pa.

OUR laundry installations at the mines of the Keystone Coal & Coke Co. have proved successful beyond all expectations. It is a great gain to rid the miner's kitchen of the large steaming washtub with its malodorous clothing, which filled the house with steam

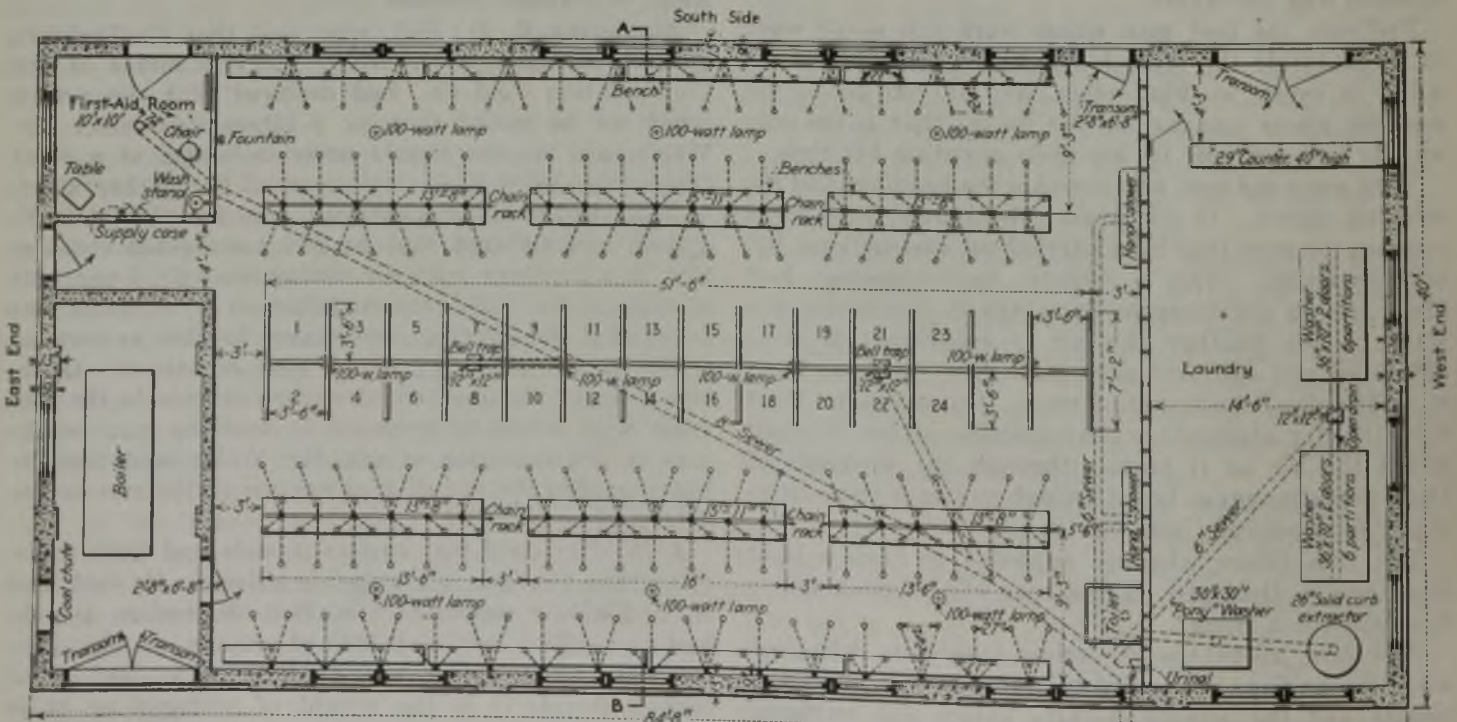


Bathhouse of Keystone Coal and Coke Co.

Radiators behind the wall benches keep them warm and comfortable for those using them when undressing and dressing. This elevation is that of section AB as shown on the plan at the foot of the page.

and rendered the home unhealthful. Now the clothes are bundled weekly and taken to the laundry, where they are passed through the most sanitary washing process that can be conceived. Naturally some of the employees' wives showed some reluctance to make use of this facility, but as time wore on they more and more recognized its advantages, and now the laundries are used by 90 per cent of the community, and every user is well pleased with the change.

No direct return has been derived from this service, our charge to employees actually only offsetting the cost of material used. At our Crows Nest village the laundry consists of two 36 x 70-in. washers, one 30 x 30-in. washer and one 26-in. Extractor. These units are capable of handling forty washings per day. At present we wash the clothes of only thirty families per day at a total cost of \$13.80. We charge 25c a wash, sustaining a loss of \$6.30 a day, but the benefits obtained are well worth the financial outlay.



Plan of Bathhouse, First-Aid Room and Laundry, Crows Nest Mine, Keystone Coal & Coke Co.

Company Doctors in West Virginia Field

IN A REPORT on "Life in a West Virginia Coal Field," published by the American Constitutional Association, of Charleston, W. Va., a record is made of conditions in 58 mining towns in Kanawha, Fayette, Boone, Raleigh, Logan and Putnam Counties. This investigation was made by Miss Margaret H. Bottum, a community sociologist. The report says that in one section of the field studied there were four mining towns with a combined population of approximately five thousand. They are served by one doctor, assisted by a capable full-time trained nurse.

Six cases of typhoid were reported for these towns during the past ten years. This would indicate that sanitary condition in these towns is above par. The fact that one doctor and a nurse could adequately serve so many people proves that much attention has been paid to the protection of the health of the citizens in the towns they serve.

If one doctor could satisfactorily serve the needs of a community having five thousand population, according to this ratio, eight doctors would be sufficient for Charleston, a city of forty thousand population. But this city has 110 doctors and about as many nurses.

The reason for the existence of "the company doctor" is well explained in bulletin 117, 1923, issued by the Children's Bureau of the U. S. Department of Labor dealing with mining town life, a quotation from which is as follows: "Probably the most serious drawback to living outside the company town was the problem of securing a physician in case of illness. The independent settlement referred to was 15 miles from the nearest private physician, and without telephone." This is an accurate description of the situation in regard to many small, independent towns and rural communities that are too small to support a physician.

With the establishment of the mining town arises the necessity of providing medical care for the people living there. Over a period of many years of actual practice, the plan of collecting monthly subscriptions from the payroll to provide for medical assistance, a sort of health insurance, has proved most satisfactory to employees, employers and physicians.

The monthly subscription ranges from \$2, the high-

est payment for families, to \$1.50 the highest charge for single men. The rates vary somewhat in certain communities, but as given they are those in common use throughout this coal field.

There are 53 physicians in mining-town practice in the towns visited, these physicians being paid by monthly subscriptions. Where the communities are small, one doctor serves two towns. There are 34 resident physicians; 15 towns are within 2 miles and 9 towns are from 3 to 7 miles from their doctors.

At the present time there are less than a half-dozen community nurses employed in this section. This is explained by the fact that, as a rule, they are maintained at the expense of the companies, which have not recovered as yet from the long periods of strike and business depression of the past few years. In several towns visited the companies are contemplating obtaining a public-health nurse who will work under the supervision of the full-time county health officer.

Government Finds It Cheaper to Buy Coal

OPERATED for a short time in 1922 by the Alaska Engineering Commission, now called the Alaska R. R., with funds supplied by the Navy Department, the Chickaloon mine in Alaska served to enable a large-scale test to be made of the coal of that vicinity for naval use. Full results of the tests were not made public, but the general conclusions were that the coal makes a good quality of bituminous fuel. However, the navy decided that under present conditions it could transport privately mined coal from the Atlantic seaboard to the Pacific coast for use at a lower total cost than the Alaskan coal could be, in view of the costs of production and transportation along the coast to the states of Washington and California. Moreover, the best Eastern coal is slightly more desirable.

The Chickaloon mine is one of three governmental operations in the Matanuska field of Alaska. None of these is being operated by the government, which does not propose to mine coal so long as private mines are being operated. The Eska mine has been worked for several months by the Evans-Jones Corporation since the destruction by fire of the equipment at the mines of that company.



Chickaloon Mine of Alaska Engineering Commission

Convinced that it ought to find out something about fueling possibilities on the Pacific Ocean, the United States Government started three mines in Alaska, but, partly from a feeling that it should not pit the unbounded resources of the nation against pri-

ivate capital and partly because the price of coal at the point of use was higher than better coal obtainable elsewhere, the government closed two mines down and turned the third over to a private company.



Will Midwest Rivers Reduce Cost Of Illinois Coal To Chicago and Northwest Consumers?

WILL river traffic in coal spread westward to include the Mississippi from St. Louis to Minneapolis and from St. Louis up the Mississippi and Illinois rivers through a canal to Chicago and Lake Michigan? Will southern Illinois and Standard district coal thus enter the Lake trade by an all-water route? The questions are not new but with the steady development of waterways in the Middle West they get more and more discussion. Every car shortage brings them to the fore and every word about raising rail rates on coal throughout the Middle West sets interested men to work with pencil and paper figuring how much the cost of Illinois coal could be reduced by water haulage.

Only the extreme river enthusiast can see possibilities of hauling Illinois coal from the great southern fields of Franklin, Williamson and Saline counties by water northward. There are two main obstacles: The

Headpiece shows towboat Nokomis with famous tow of St. Louis-to-St. Paul coal. In 1915 this shipment of 3,000 tons on six barges was loaded at St. Louis and delivered in fourteen days at the Twin Cities. W. K. Kavanaugh, who dreams of hauling coal up the river and grain down, made the shipment to prove that it could be done.

field is crisscrossed with a network of railroads already and there are few mines that could make river connections without tremendous expense. The necessary thing would be to set up some sort of railroad shuttle service between the mines and river loading points. Such a road as the Wabash, Chester & Western has possibilities for this sort of thing. But the cost and degradation of handling coal from a mine tipple into a railroad car and again from a car into a boat twenty miles away on the Mississippi or Big Muddy would be considerable.

On the other hand, the Belleville mining field, directly east of St. Louis and only 10 or 12 miles from the river, offers a better opportunity for river loading. Steam- or electric-railroad service between field and river tipple generally is recognized as feasible. In fact one company has used such service for years between some of its mines and a river tipple in East St. Louis. Such lines as the St. Louis & O'Fallon and the St. Louis, Troy & Eastern are well located to run a shuttle service that could be made, by the extension of tracks in the mining field, to serve

many a mine. Degradation would not be so costly a factor here because the Belleville field depends to a less extent upon perfect sizing of coal.

From St. Louis northward there is no question among well-informed men that water movement of coal could far undercut present freight rates. The rate from Belleville to Chicago now is \$1.85. It is confidently declared by experienced river and coal men that this could be reduced \$1 with river traffic properly developed. The astonishing but sober estimate for moving coal by barge from a St. Louis river tipple to an unloading point in Chicago is 50c. This is based upon the assumption that a strong and continuous market for Belleville coal could be found in or around Chicago and that the river fleet was made up of big modern towboats of approximately 1,000 hp. and enough barges to guarantee against loading and unloading delays.

"But there can't be any such strong and continuous market because there are not enough coal consumers with water frontage in the Chicago district," say the unbelievers. A survey made in 1915, however, shows that at that time there

was a coal consumption of 5,000,000 tons a year along the Illinois state canal between Joliet and Chicago either at the water's edge or within short trucking distance.

There are those who say: "When you begin talking about hauling coal from barges inland to Chicago consumers you spoil the whole program. It will cost so much to unload boats into cars and haul the cars to destination that all the freight saving is lost." But the river men declare that a vast tonnage could be handled from the canal by trucks at less cost and in shorter time than is possible with railroad equipment and they add that underground conveyors would be feasible for consumers whose plants are near the water but too far away for direct unloading.

WOULD DEVELOP RIVER SYSTEM

W. K. Kavanaugh, of St. Louis, president of the Southern Coal, Coke & Mining Co., is one of the men who believe in water transportation. For years it has been his firm belief that it is practicable to develop a system of river shipping of coal from Mississippi River points clear up to Minneapolis and St. Paul and bring ore, grain and other bulky northwest freight down as return loads. To prove it he and Edward Goltra, veteran St. Louis river transport men, made a single shipment of 3,000 tons of mine-run coal to the Twin Cities without expectation of getting a return load.

That trip is famous. The coal was hauled from the Shiloh mine of the Southern Coal, Coke & Mining Co. by rail to the company's river tipples at St. Louis and loaded into six barges. The staunch towboat Nokomis took the tow and headed north. Mr. Kavanaugh's directions to the captain were to deliver that coal into the Twin Cities within ten days. The tow plowed its way up the river—a trail blazer.

There was no report of it for several days. Then word came back that the Nokomis and her 3,000 tons of coal had lost two precious days at Rock Island, Ill., trying to get a government river pilot, without which the northward trip could not be made. The next word was that two more equally precious days had been lost because of a broken pitman strap on the steamer.

Mr. Kavanaugh took a train and journeyed up to St. Paul, however, and met his shipment a few miles below the city. He went aboard and rode into town with the coal, stepped

ashore, and, without previous cultivation of the market, disposed of the whole cargo before nightfall at a price which he says was "a good profit." The captain of the Nokomis could account so well for all the excess time consumed over and above the specified ten days that Mr. Kavanaugh, with the money for his coal in his pocket, figured the experiment a success.

Today there is even more serious contemplation of hauling coal up to the Twin Cities and of bringing grain and ore down. "But it must be considered only as filled," according to Colonel T. W. Ashburn, in charge of inland waterway transportation for the War Department, which owns a number of big barges now in freight service on the Mississippi. The main sources of revenue, he thinks, will be general cargo. Ever since war days the government's enterprise, The River Transit Co., has been handling great volumes of general freight up and down the river between St. Louis and New Orleans at a profit, and there is reason to believe that the same thing can be achieved from St. Louis northward.

Railroads are freely charged with trying to choke this sort of river traffic to death, however. Congressman Cleveland A. Newton, of St. Louis, has publicly stated that there is organized railroad effort to strangle river shipping and that it ought to be stopped. It is his idea that all transportation systems in this country, whether rail, water or highway, ought to be welded into one great system. The strangulation method, he says, is simple. Railroads, realizing that the river serves mainly only those towns on its banks, proceeds to reduce to ridiculously low levels, rail rates into those towns at the expense of the towns a few miles back from water, thus stealing river freight.

This sort of competition between rails and water on coal is not so easy to apply. Coal men who see possibilities for river shipment of coal into the Chicago switching district declare there could be no distinction made by railroads between consignees on water front and any others because the rate fabric within the switching district could not be so juggled. They feel there is enough coal business at the water's edge to support a large river coal transportation system and that therefore some day it will be established.

There can be no shipping between

St. Louis and Chicago until an extensive program of canal development now under way is completed between LaSalle, the present north limit of Illinois River navigation, and Joliet, on the Chicago Drainage Canal. An appropriation of \$20,000,000 has been made for this project with an additional \$8,000,000 for water-power development, and some of this money has already been spent. It was the original intention to have this state waterway open for barge navigation by 1924, but delays of various sorts, political and otherwise, have held the work back in spite of pressure brought to bear upon laggard state officials by agitators for the Great Lakes-to-the-Gulf waterway.

The canal eventually will be open for shipping, however. What about coal traffic then? There are one hundred different answers to the question supplied by every one hundred men in the coal business. Meanwhile freight rates on coal to Chicago from Southern Illinois continue at \$1.95 instead of the "dollar" so freely prophesied by a few river boosters; from Belleville, \$1.85 instead of 75c., and \$2.16 from western Kentucky, a coal field that often ships heavily to Chicago and which can put coal on water with considerable ease.

Coal-Mine Development In West Virginia

Fifty new mine plants were put in operation in West Virginia during the fiscal year ended June 30, 1922, according to the annual report of the State Department of Mines. In the same period 43 new power plants were constructed and 81 fans.

One of the most important equipment improvements made, indicating at the same time the growth of the industry, was the purchase of 8,235 mine cars, the Logan field leading with 1,329, the McDowell mines coming second with 1,144 cars, followed by Fayette mines with 1,113 and Raleigh mines with 1,070. In all 85 new tipples were built, Logan having 9 of such structures to its credit, Raleigh 8, Fayette 7, Greenbrier 7 and Monongalia 7.

Companies operating in the state built 828 new houses for miners, Wyoming mines building the largest number, 114. Another important addition to equipment was locomotives. There were 187 new locomotives put in use, Logan mines obtaining the largest number, 35. McDowell and Raleigh county mines purchased 23 and 24 locomotives, respectively. There were 124 new mine openings; Preston County led in such development, with the opening of 18 new mines, McDowell County ranking next with 11 new openings.

News Of the Industry

Wage Parley Begins at Jacksonville; John Lewis Presents Miners' Demands

(Special Dispatch to Coal Age)

JACKSONVILLE, FLA., Feb. 11.—The joint conference of union miners and bituminous-coal operators of the Central Competitive Field organized here this morning with Michael Gallagher, Ohio operator, chairman; William Green, secretary of the miners' union, as secretary, and Ezra Van Horn, Ohio operator, assistant secretary.

John L. Lewis, international president of the miners' union, made a brief statement of the miners' demands, reading the report of the scale committee adopted at the Indianapolis convention, which instructed the miners' representatives to "obtain the best possible agreement on the basis of no reduction in wages," and recommended that the contract extend for a period of four years. Van Horn then moved that the conference adjourn until 10 o'clock tomorrow morning.

Directly afterward the operators went into caucus, but did nothing. Statements by the operators indicate that they are not organized and will

be unable to act as a unit until they confer further and determine upon a counter offer to the miners. Operators are here from all four districts. They are as follows: Illinois—Rice Miller, L. H. Smith, E. C. Searls, George B. Harrington, W. J. Spencer, C. H. Kraus, H. C. Perry and Harry C. Adams; Indiana—David Ingle, M. L. Gould, J. A. Templeton, Hugh Shirkie, W. J. Freeman, A. M. Ogle, E. D. Logsdon, and P. H. Penna; Ohio—Michael Gallagher, S. H. Robbins, Ezra Van Horn, R. L. Wildermuth, W. H. Haskins, T. R. Biddle, J. S. Jones and A. A. Augustus; Western Pennsylvania—J. A. Donaldson, J. M. Armstrong, W. M. Henderson, T. W. Guthrie, John A. Bell, Jr., R. C. Crawford, M. W. McClain and A. M. Marion.

Miners are represented in the conference by their three International officers and the Central Competitive Field scale committee, named during the Indianapolis convention, which ended Feb. 2.

Industrial Relations Program Of A.I.M.E. and N.S.C.

Co-operating on a safety and industrial relations program the American Institute of Mining and Metallurgical Engineers and the National Safety Council will hold sessions on Monday, Feb. 18, Tuesday, Feb. 19, and Wednesday, Feb. 20, at the Engineering Societies Building in connection with the annual session of the first-mentioned society. At Monday's session the various subcommittees of the Industrial Relations Section will make their report. At the meeting of Tuesday W. W. Adams, of the U. S. Bureau of Mines, will read a paper on "Mine Accident Statistics" based on the carefully collected experience of member companies, using of course only aggregated figures, and not revealing company names. R. L. Sanford, of the U. S. Bureau of Standards, will relate his progress in the magnetic testing of hoisting rope. T. T. Read, of the U. S. Bureau of Mines, will deliver an address on the efforts of that institution to promote safety.

On Wednesday morning, Arthur Notman presiding, Dr. A. J. Lanza, who has just returned from a long foreign trip in the interest of occupational-disease prevention, will give an address entitled "Some Recent Experiences in Australasia"; Robert E. Tally,

an address on industrial relations; L. K. Sillcox will speak on the same subject, emphasizing the dual responsibilities, and D. L. Sterling, secretary, Australasian Institute of Mining and Metallurgy, will give an address on a subject not yet announced.

On Wednesday afternoon Sidney Rolle, secretary of the Industrial Relations Committee, will introduce G. M. Gillette, general manager, Consolidation Coal Co., Maryland Division, who will speak on "Vital Factors in Industrial Relations." John T. Ryan will discuss "Industrial Relations in the European Coal Fields" and D. Harrington "Dust and the Health of the Miner." W. R. Chedsey will present a paper on the living wage.

Herrin Again

Eight companies of Illinois state troops on Feb. 9 took over the administration of law in the region around Herrin, in "bloody Williamson County," scene of the mine massacre of 1922. This is the second time within a month that troops have gone in to stop open warfare between Ku Klux Klansmen, who have been recklessly raiding various dives and homes of liquor suspects, and Knights of the Flaming Circle, organized to oppose the Klan.

Inspectors Soon to Report on Shanktown Disaster

Mine Inspectors Nicholas Evans, of Johnstown; Thomas S. Lowther, of Indiana, and Thomas J. Lewis, of Punxsutawney, on Feb. 8 completed their examination of the Lancashire mine, at Shanktown, Pa., in which 36 men lost their lives in a gas explosion on Jan. 24. The inspectors will formulate a report on their findings and submit it to State Secretary of Mines Joseph J. Walsh.

Coal operators are generally of the opinion that the inspectors located the source of the gas which filtered into the mine and caused the explosion. It is the belief of the producers that the commission will strongly recommend measures meant to prevent a recurrence of the disaster that occurred in the Shanktown plant. Agents representing compensation insurance companies are examining the mine and may file statements covering the points of mine equipment, etc., which they believe need replacement. On going to press we learn that the Coroner of Indiana County will hold an inquest Feb. 12.

Form Mine Safety Association In Central Pennsylvania

Sixty representative coal operators of Cambria, Blair, Clearfield, Centre, Somerset, Westmoreland and Indiana counties, Pennsylvania, met in Johnstown on Thursday evening, Feb. 7, and organized a mine safety association. The purpose will be to co-operate with the U. S. Bureau of Mines and to obtain a safety or emergency car for the central Pennsylvania district. The importance of having several emergency stations for possible disasters such as occurred at Shanktown recently was advocated by P. J. Morrissey of Johnstown, who presented an outline of the proposed work of the association, whose purpose, he explained, will be to establish emergency stations to which all mines in trouble may call and receive aid by crews as soon as possible.

M. J. Bracken spoke of the necessity of co-operating with the Bureau of Mines and a representative of the Bureau of Mines outlined plans for the work of organizing the state operators for the purpose of obtaining a central Pennsylvania relief car. To further the work, the following were named as a committee: P. J. Morrissey, Pennsylvania Public Service Corporation; John R. Thomas, state mine inspector; Timothy McCarthy, superintendent of the Clearfield Bituminous Coal Corporation; William Patterson, Pennsylvania Coal & Coke Corporation, and

Death Claims Edwin Ludlow In Muskogee

After an exceptionally brilliant career as a mining and railroad engineer Edwin Ludlow passed away Feb. 10 in a hospital at Muskogee, Okla., after a short illness, of pneumonia. He was almost 66 years of age.

The deceased was born at Oakland, Long Island, N. Y., March 12, 1858. He attended the Flushing Institute and the Columbia School of Mines, being graduated from the latter institution in 1879.

From 1879 to 1881 he was assistant engineer on river and harbor work at Philadelphia, leaving this position for Mexico, where he was one of the engineers on the Mexican National R.R. running from Laredo, Texas, to Mexico City. That company being in financial straits he returned to the United States and became assistant superintendent and later superintendent of the Mineral R.R. & Mining Co., at Shamokin, Pa. This was one of the subsidiaries of the Pennsylvania R.R.

Later he became superintendent of the Union Coal Co., a concern which had just leased two of the Mineral company's collieries. When in 1885 Major Stearns was made general manager of all the coal properties of the Pennsylvania R.R. Co. Mr. Ludlow was promoted to the superintendency of the Mineral company. This was the time when he introduced into the anthracite region water-tube boilers and chain conveyors.

In 1899 he was asked to take charge, as superintendent, of the mines of the Choctaw, Oklahoma & Gulf R.R., Harts-horne, Okla., then a virgin coal field. While employed there he married Miss Anna Wright, who, by her ability as a hostess, in later years added much to the social events of the A.I.M.E. The mining field that Mr. Ludlow opened was some 80 miles long and communications were not of the best. In consequence he did not find time lagging while directing the operations of the field.

After ten years of Oklahoma Mr. Ludlow returned to Mexico, becoming general manager of the Mexican Coal & Coke Co. at Las Esperanzas. Here he succeeded so well that his company made \$600,000 in a single year, but the operation of the mines became increasingly difficult and the success of his work brought rivals in the field.

In 1911 he became vice-president and general manager of the New River Collieries Co. at Eccles, W. Va., and in 1912 exchanged that position for a similar one with the Lehigh Coal & Navigation Co., at Lansford, Pa. This position he occupied till 1919, when he resigned to become a consulting engineer. In 1921 he became president of the American Institute of Mining and Metallurgical Engineers and traveled extensively over the country in its interest.

In Mr. Ludlow the mining engineers have lost one of the most aggressive of their leaders. He was from the first a firm believer in modernizing equipment, and he took an active interest in mining education and industrial relations. None more than he believed



Edwin Ludlow

in the importance of membership and co-operation in the work of engineering societies, and those who were at any time under his direction contributed generously to the technical societies' programs and to the columns of the technical press.

New Record at Zeigler Mines

The cold weather of January so increased the demand for coal that a new production record was made at the Zeigler mines, in Illinois, 310,077 tons having been hauled to the surface, prepared and shipped by the Bell & Zoller organization during the month. The daily average production was approximately 12,000 tons. The highest daily run of the mines was made on Jan. 23, when 14,205 tons was hoisted to the surface.

To handle the coal required 6,752 railroad cars, which would make a train which would reach about 63 miles, or very nearly the distance from Chicago to Rockford, Ill. A train of this length would require 137 engines to move it, or, divided into separate trains, there would be approximately 50 cars to each engine. Production like this necessitates the shipment of about five such trains each working day.

Ten years ago, in January, 1914, what was then a record of production for the Zeigler mines was established when 58,000 tons was loaded and shipped. The 1924 record was nearly six times greater.

Pittsburgh Coal Co. Back in Fold

The Pittsburgh Coal Co., which resigned from the Pittsburgh Coal Producers' Association at the time of the Cleveland settlement, in August, 1922, has rejoined the association. At a meeting Feb. 8 Pittsburgh district operators decided to attend the wage conference at Jacksonville. They had some difficulty in reaching an agreement and would not give out an official statement.

Sees Mergers as Only Hope for Some Companies in 1924

"Consolidate!" is the cry ringing through many a coal field. For a year fitful starts have been made to bring together favorably located groups of mines. Now the movement is definitely on its way. It is absorbing direct attention in central Illinois, in Saline County, Illinois, and in both ends of Kentucky. The first direct accomplishment was in the fusion of the Taylor Coal Co. and the Bickett Coal & Coke Co. several weeks ago, bringing together a group of six good mines in southern Illinois backed by Cassatt & Co., the same financial interests which are behind the Old Ben Coal Corporation, long a dominant operating concern in southern Illinois.

The proposed consolidation of central Illinois operators took a definite turn a month ago when one of the active operators there proposed that a majority of the tonnage of the field, other than that produced by the Peabody Coal Co., the biggest influence in the field, be pooled. The plan was for each participating company to put its properties under the control of an operating company, the tonnage to be sold through one agency. This plan failed. Nevertheless the consolidation movement did not stop. A new plan is now under consideration which would group a number of properties under one ownership and leave the proposed company and the Peabody Coal Co. in control of so nearly all the No. 5 vein tonnage that ruinous competition would be reduced.

The various other proposed groupings have advanced far enough to require engineering reports and appraisals and for the collection of bushels of options on this and that.

"There is no doubt," said one of the wisest coal operators in the Middle West, "that consolidations must come—and lots of them. There is no other way that I know of for a good many companies to weather 1924. This country is going to require its usual 500,000,000 tons of coal, but if the 1923 number of operators try to stay in business, they are going to fall by hundreds. The only question in my mind is: Will enough of them be willing to make mutual concessions now in order to form consolidations on sound bases, or will too many of them insist upon independence until they are driven to the wall?"

"It is painful, in a way, to see all this going on, but it is exactly what the coal industry needs to make it healthy. There is no better way to reduce the number of mines and miners in this country than by voluntary grouping of operating interests, which would cull out the high-cost and undesirable mines, and put the whole industry on a firm, substantial foundation."

A.I.M.E. Meet in Birmingham

The American Institute of Mining and Metallurgical Engineers has accepted an invitation of the Alabama Mining Institute and the Birmingham Chamber of Commerce to hold its autumn meeting at Birmingham. The meeting probably will be held in October.

New Safety Film for Bureau of Mines

In memory of his father, the late F. S. Peabody, Stuyvesant Peabody has agreed to finance a new Bureau of Mines film showing the application to coal mining of the most advanced safety practice. The only motion pictures dealing with the safety problem in coal mines which the Bureau of Mines now has for display are old. They were made at a time when the technique of motion-picture making had not reached its present stage of development. Since they were made there also has been much progress in safety practice. For these reasons there is a great demand for the production of a high-class film which will include the latest safety developments.

Congress never has appropriated for films to be used in connection with the Bureau of Mines' work. The many motion pictures being displayed under Bureau auspices have been made possible by contributions from industry. Most of these pictures, however, deal with technical problems from an economic point of view.

U. S. December Coal Exports By Customs Districts

	(In Gross Tons)		
	Anthracite	Bituminous	Coke
Maine and New Hampshire	198	36	250
Vermont	492	371	977
Massachusetts	36		25
St. Lawrence	110,212	145,092	515
Rochester	6,052	36,236	18
Buffalo	197,572	272,945	15,737
New York	2,711	1,654	300
Philadelphia	50	20,970	603
Maryland		6,248	4,203
Virginia		181,876	
South Carolina		22,349	
Florida			367
Mobile		183	654
New Orleans		460	1,275
Sabine			2,008
San Antonio	46	241	1,332
El Paso	23	2,178	
Arizona	260	3,924	3,644
Los Angeles	23	8	
San Francisco	2		3
Washington	605	1,264	
Alaska		25	
Dakota	5,147	7,496	510
Duluth and Superior	2,447	8,349	372
Michigan	3,061	119,569	10,915
Indiana			
Ohio	6	246,327	1,243
Porto Rico		227	
Totals	328,945	1,078,028	44,951

Fewer Mine Fatalities in 1923

Accidents at coal mines in the United States in 1923 caused the death of 2,452 men, according to a report by the U. S. Bureau of Mines. Of these fatalities, 2,249 occurred as the result of accidents underground, 46 were due to shaft accidents, and 157 to accidents in and around surface plants. The production of coal during the year was 641,476,000 tons; hence the fatality rate for the year was 3.82 per million tons, as compared with 4.15 for 1922.

This reduction of 8 per cent in the fatal-accident rate per million tons of coal produced in 1923 is equivalent to the saving of 210 lives.

Falls of roof and coal, which generally account for nearly half of all deaths in coal mines, were responsible for 1,158 fatalities in 1923, which represents a rate of 1.81 per million tons, as compared with 1.90 in 1922. Haulage accidents underground usually cause



William Kelly

Nominee and probably next president of the American Institute of Mining and Metallurgical Engineers; general manager, Penn Iron Mining Co., Vulcan, Mich., and Republic Iron Co., Republic, Mich.

about 18 per cent of all fatalities, and the reports for 1923 show that 413 deaths were due to this cause, indicating a rate of 0.64 per million tons, as against 0.72 for the previous year. Gas and dust explosions killed 372 men, the fatality rate being 0.58; the previous year's rate was 0.65. Seventy-five deaths were due to electricity, for which class of accidents the fatality rate per million tons was 0.12 as compared with 0.16 the year before. Powder and other explosives caused 114 deaths, representing a rate of 0.18 as compared with 0.19 for 1922.

Production of 10,225,000 Tons in 1922 Shows Importance of Soft-Coal Strip Pits

The growing importance of strip pits as producers of soft coal is indicated by the fact that in 1922 10,225,000 tons—equivalent to 2.4 per cent of the total output—was produced by the strip mines, according to the U. S. Geological Survey. They employed 9,108 men. The total number of steam and electric shovels used was 379. The mines at which these shovels were employed produced 9,886,431 tons of coal. In addition,

Miners' Union Prepares to Fight Pinchot Bill

The United Mine Workers, it is announced, are preparing to fight Governor Pinchot's coal bill as introduced in Congress by Senator Borah. It is declared the measure aims at anti-strikes and for that reason organized labor is against it. An official of the miners in Washington is quoted as opposing the bill because it would tie up the funds of the organization and threatens to jail the officers.

The bill provides that in the event of an emergency growing out of a strike threat the President may exercise through a proposed coal division of the Interstate Commerce Commission all the powers conferred by the Lever Act in effect during the war.

The courts have interpreted this act as giving the authorities power to enjoin the calling of a strike in any industry affecting the nation's fuel and food supply.

"This is anti-strike legislation in its most vicious form," said the mine workers' official. "Were it enacted the mine workers' union might as well close up shop. Our experience in 1920 convinces us that it would not be a difficult matter to induce a federal judge to repeat what was done by Judge Anderson at Indianapolis, who reduced us to the status of a debating society. His injunction prevented us from giving relief through our own funds to members who were in need. Governor Pinchot may consider himself a friend of the worker, but his coal bill is one of the most destructive blows ever aimed at the miners' union. We will do everything we can to defeat it."

tion, 338,711 tons were produced at workings where some method other than a steam or electric shovel was used in removing the overburden and loading the coal.

Ohio leads all other states in the tonnage of strip-mined coal. Nearly one-third of the 1922 output was reported from that state. Other leading producers were, in order of rank, Pennsylvania, Indiana, Missouri and Illinois.

Production, Number of Employees and Number of Steam and Electric Shovels At Bituminous-Coal Strip Pits

State	Production, in Net Tons			Average Number of Men Employed	Number of Steam and Electric Shovels a
	1920	1921	1922		
Alabama	224,491	342,033	375,166	421	15
Arkansas	1,860	3,350	39,761	151	3
Colorado			2,700	1	
Georgia		10,563	40,036	59	
Illinois	610,209	586,203	720,060	520	23
Indiana	1,361,869	800,738	1,374,715	1,323	50
Kansas	706,586	367,207	404,947	482	19
Kentucky	20,687	134,729	468,845	321	15
Missouri	1,142,617	782,243	835,427	967	32
North Dakota	108,376	122,889	274,722	209	5
Ohio	3,322,387	1,260,815	3,156,615	2,297	108
Oklahoma	239,422	230,059	321,580	262	14
Pennsylvania	1,244,537	488,253	1,951,316	1,906	83
Tennessee	15,706	2,406	6,411	20	1
West Virginia	31,854	6,000	179,841	109	8
Wyoming	50,000	68,322	75,000	60	3
Other States	800				
Total	9,081,401	5,205,810	10,225,142	9,108	379

(a) Includes a small number of shovels used underground.

Oddie Putting Finishing Touches on Administration Coal Bill

Basic Fact Finding Proves Knotty Problem—Situation Complicated by Attitude of Department of Justice Toward Trade Associations—Issuance of Export Certificates Planned

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

After nearly three months of intensive effort, Senator Oddie is whipping into final shape his ideas as to the legislation which will be necessary to carry into effect the recommendations of the Harding Coal Commission. Before making the bill public he is anxious to confer with representatives of the various branches of the industry and with those of the different types of consumers.

One of the knotty problems which Senator Oddie has been called upon to consider is that of basic fact finding. He has acquainted himself with the arguments for and against compulsory reporting of essential data. He has found such wide differences of opinion as to the best procedure in fact finding that he now is considering an alternative suggestion which he believes possesses sufficient merit to justify careful study. At this writing, however, it has not been embodied in the draft of the bill.

The idea is to collect the information through the existing trade associations, both national and local. The reporting is to be done on a voluntary basis with the understanding that the federal government is to have the right to check all returns at any time a need should arise. In this way the federal government would be spared great expense and the industry would not be subjected to federal interference except when suspicion might arise as to the correctness of certain returns.

Under such an arrangement, it is thought, there would be few occasions for the government to exercise its right to audit any statement that may have been made. Even were it to become necessary to exercise it, the checking probably would be confined to a small area and possibly to individual mines.

Such a system probably would have to be supplemented in some way, as there are districts which have no local associations. Senator Oddie sees no adequate reason why a scheme of fact finding may not be worked out through friendly co-operation of trade associations, pledged to give the full picture of the situation with the right to check any returns as an assurance against the small minority which exists in any business which might submit false returns.

Senator Oddie realizes that the situation in this connection is complicated by the policy of the Department of Justice toward trade associations. In the course of the investigations of the Commission of Gold and Silver Inquiry, of which he is chairman, he has been reminded frequently of the uncertainties which have settled down upon all business statistics as a result of the Attorney General's action. He realizes, however, that a coal bill is no place to attempt to settle the status of statis-

tical activities and as he believes the trade associations in the coal industry perform a highly valuable function and are in the interest of the public generally he does not expect any permanent interference with their work.

Senator Oddie also is considering embodying in the bill a provision giving authority to the Cabinet officer in whom the power conferred by the bill will be vested, to effect a plan for the issuance of export certificates on coal, should that official reach the conclusion that such a plan is wise. Senator Oddie is impressed with the need for some certification as to the quality of coal shipped in export trade.

Teapot Dome has so monopolized the attention on Capitol Hill that no great amount of attention has been given to proposed coal legislation, but despite sensational developments in the oil situation, the convention of the United Mine Workers at Indianapolis did not pass without notice. There is little difference of opinion among the lawmakers as to what ought to be done.

The general feeling is that the operators should sign the proposal of the United Mine Workers that present wages and working agreements be continued for four years. There is a general feeling, however, that in such an agreement some provision should be made for flexibility. The thought has been advanced that a clause should be inserted in the agreement providing for automatic adjustments in wage rates

each time there should be a rise or fall in the cost-of-living index figure. If the operators should object to accepting the index number of the Department of Labor, it is believed an arrangement could be worked out to accept the average of the index numbers of the Industrial Conference Board and of the Department of Labor. Any such plan would necessitate putting into the contract detailed provisions for putting the adjustment into effect.

Members of Congress are particularly aware of the inequity worked upon the man with a fixed income by fluctuations in living costs. For that reason, they sense at once the difficulties of a fixed and rigid wage scale intended to apply over a four-year period. They have not forgotten the supplemental agreements of 1917, which caused the strike of 1919. It is realized that if prices should fluctuate as much during the next four years as they have during the past, violent labor troubles would result.

Just at this time Congress is considering revenue revision. This has led its members to acquaint themselves with the economic prospects. They find that the Federal Reserve Board is apprehensive as to the possibility of our being on the verge of another period of inflation. It is recognized that the abundance of gold and the banking situation generally lends itself to the recurrence of an unhealthy boom such as that of 1920. With these thoughts uppermost in mind, many legislators and federal executive officers entertain the hope that some provisions will be made whereby wages in the coal industry will follow the purchasing power of money.

Much satisfaction is expressed in official quarters as a result of the decision of the Pittsburgh district to send a scale committee to Jacksonville. It was not realized in Washington at first that the position of the Pittsburgh operators was being influenced by their doubt as to the legality of an interstate conference. Sight had been lost of the fact that the Attorney General never has expressed himself other than to say that such a conference is illegal. Secretary Hoover's letter to the Pittsburgh Operators' Association was thought to be hardly sufficient since it was his expression, and not that of Mr. Daugherty. Mr. Hoover's conference with the President, however, put the administration on record and cleared the air.

Communications from Pittsburgh show that the operators there, as well as in all other fields, are divided as to which is the better course to take in formulating the new agreement. All agree that the renewal of the present scale carries with it the possibilities of serious consequences, but the alternative is the closure of mines by a strike. No single operator in the Pittsburgh district is advocating a strike rather than recede from what the operators want. The Pittsburgh operators are far from being belligerent, as is indicated by their sending a scale committee instructed only to obtain the best agreement that they can get. One of the reasons they will advance for a contract to run less than four years is that it should terminate in other than a presidential year.

Coolidge Urges Attendance At Jacksonville Parley

After conferring with President Coolidge, Secretary Hoover issued a formal statement Feb. 6 declaring it was the administration's wish that representatives of the bituminous-coal operators and the mine workers in the Central Competitive Field attend the wage conference at Jacksonville, Fla., Feb. 11. The purpose of the statement, it was said, was to set at rest reports that those attending might be attacked as attending a price-fixing meeting in violation of the Sherman Act.

"It is the understanding of the administration" said the statement, "that the conference is solely for the purpose of settling a contract covering wages and conditions of labor. This is intended to confirm my recommendation to certain coal operators' associations on Jan. 26 and to finally quiet rumors on the administration's attitude that have been current during the past few days."

British Columbia 1923 Output 37,000 Tons Below 1922

Total coal production of British Columbia for 1923 is placed at 2,543,675 tons as against 2,580,915 tons for the previous year, or a decrease of 37,240 tons. To arrive at the net output for the year it is necessary to take 87,834 tons from the figure given, as approximately that amount was used in the manufacture of coke or lost as waste. Thus it is found that the net production was 2,455,841 tons, in comparison with a net output for 1922 of 2,511,843 tons, or a decline, in point of value, of about \$280,010. The manufacture of coke increased from 45,836 to 58,000 tons. This was due to the activity of the Michel ovens of the Crows Nest Pass Coal Co.

For comparative purposes the following statistics on total production, in tons are interesting:

	1922	1923
Vancouver Island	1,754,656	1,551,926
Nicola-Princeton	270,890	246,865
Crow's Nest Pass	551,761	744,568
Telkwa Mines	1,008	36
Totals	2,580,915	2,543,675

Production by collieries for 1923 with estimated figures for December follow:

VANCOUVER ISLAND FIELD

Canadian Collieries (D) Ltd.		
Comox Colliery	366,837	268,535
Extension	223,954	215,753
South Wellington	27,348	75,449
	676,139	559,727
Western Fuel Corporation of Canada		
No. 1 Mile	347,234	319,398
Reserve	225,857	210,075
Wakosiah	79,515	103,513
Harewood (abandoned Jan., 1923)	43,795	2,000
	691,401	634,976
Other Collieries		
Granby C.M.S. & P. Co.	276,919	230,851
Nanoose Wellington	99,049	86,394
East Wellington (Opened Apr. 23)		28,573
King & Foster	9,148	11,405
	385,116	357,223
Grand totals	1,754,656	1,551,927

NICOLA-PRINCETON DISTRICT

Middlesboro Colliery	69,330	84,458
Fleming Colliery (abandoned)	38,485	3,969
Princeton Colliery	19,418	17,808
Coalmont Colliery	142,806	140,630
Community Coal & Coke Co.	233	
Chu Chua Coal Co., Ltd.	618	
Totals	270,890	246,865

CROWS NEST PASS DISTRICT

Coal Creek Colliery	291,671	443,096
Michel Colliery	216,668	253,198
Corbin Colliery	46,022	48,274
Totals	554,361	744,568

Check-Off Is Large

Figures of the National Association of Manufacturers show the monthly check-offs paid by United Mine Workers to be as follows:

State	Monthly Wage of Union Tonnage Miners in 1921	Monthly Check-off in 1921	Check-off Per Cent
Pennsylvania	\$104	\$3.50	3.4
Ohio	118	3.00	2.5
Indiana	129	2.25	1.7
Illinois	121	3.00	2.5
West Virginia	125	5.00	4.0
Oklahoma	138	8.05	5.8
Arkansas	106	8.05	7.6
Missouri	111	8.05	7.3
Washington	155	20.26	13.1



William L. Saunders

Newly elected president, United Engineering Society; chairman of board, Ingersoll-Rand Co.; past president, American Institute of Mining and Metallurgical Engineers, New York Chamber of Commerce and Manufacturers Export Association.

Engineers Study Industrial Preparedness for War

Industrial preparedness for a possible war was the subject which attracted more than 700 engineers to a dinner at the Hotel Commodore, New York City, on Tuesday, Feb. 5, under the auspices of the Army Ordnance Association and the five national engineering societies, the A.S.C.E., A.I.M.E., A.S.M.E., A.I.E.E., and the S.A.E. Judge Elbert H. Gary presided, the other speakers being Colonel Dwight F. Davis, assistant Secretary of War; Colonel James L. Walsh, chief of the New York Ordnance District, and General John J. Carty, vice-president American Telephone & Telegraph Co.

Colonel Davis explained that work on industrial mobilization has been under way for three years and much progress has been made. The seven supply branches of the government have fig-

ured out what will be required should the country find it advisable to engage in war, and the next question that arose was where can the necessary supplies be obtained. To answer this a survey of the industrial resources of the country is in progress.

Mr. Carty read an address in which he paid a tribute to the part played by American engineers in the last war and emphasized the necessity of being better prepared for the next one.

In an ante-room to the banquet hall was an exhibit of modern developments in munitions, including a 4,000-lb. aerial bomb, ten times the weight of the largest bomb used in the World War. A caterpillar tractor has been produced that will climb a 45-degree slope at the rate of 30 miles an hour. The Ordnance Department has designed a 75-mm. gun with twice the range of the French guns of the same caliber used in the late war. Newly perfected automatic shoulder rifles bid fair to replace the magazine rifle of World War days. The 0.50 caliber super-machine gun recently developed shoots a bullet weighing four times as much as the 0.30 caliber Browning and throws it nearly three times as far. Although development of munitions is so rapid, Colonel Walsh said that the Ordnance Department would not halt production to await new inventions but would proceed with the manufacture of those certain to give reasonable satisfaction in battle, and which could be made in America in sufficient quantity.

Colonel Walsh recommended complete arrangements being made for the manufacture of munitions on a war-time scale so that if there were any springing to arms overnight there would be arms to spring to. He also urged that engineers aid by forming local committees whose chairmen would comprise a district advisory committee. Furthermore, engineers should become reserve officers, and he expressed the hope that we will some day have reserve ordnance plants which in time of business depression would be given educational orders by the government.

British Miners Produce Short Ton per Man in Single Shift

Presenting a statement of output and production costs for the quarter ending June 30, 1923, of mines producing about 95 per cent of the total quantity of salable coal mined in Great Britain, the November (1923) issue of the Ministry of Labor Gazette says that the production costs, after deducting the proceeds of the miners' coal, were \$3.74 (par) per net ton and the credit balance averaged 70c. (par) per net ton. In three districts costs exceeded proceeds; in other districts credit balances ranged from 2c. to \$1.10 per ton.

The number of workers employed during the quarter was 1,102,380 and the number of man-shifts worked 73,205,708. Based on the tonnage of salable coal mined the average output per man-shift worked was one net ton, the average for the different coal-mining districts ranging from 0.67 to 1.14 net tons. The average earnings per man-shift were \$2.13 (par), the earnings varying from \$1.64 to \$2.69 (par), according to the district.

The accompanying table shows the quantity of coal mined, number of workers and output and earnings per man for the quarters ending March 31, 1922, to June 30, 1923.

Operating Data of British Mines by Quarters

(Shilling at par 24.3c.; penny 2.03c.)

Quarter Ending	Salable Coal Mined, Net Tons	Credit (+) or Debit (-) Balance per Net Ton, Cents	Number of Workers	Output per Man-shift, Net Tons	Earnings per Man-shift Worked
March 31, 1922	64,549,667	+24	1,020,207	1.0209	2.68
June 30, 1922	59,652,347	-003	1,025,542	0.9968	2.49
Sept. 30, 1922	65,763,899	+23	1,027,853	1.0046	2.27
Dec. 31, 1922	72,282,783	+32	1,068,594	1.0136	2.30
March 31, 1923	75,126,848	+52	1,087,733	1.0220	2.35
June 30, 1923	73,390,760	+69	1,102,380	1.0024	2.39



Practical Pointers For Electrical And Mechanical Men



How to Keep Rock Drills on the Job and Out of the Repair Shop

MANUFACTURERS always have realized that the very nature of the work of a rock drill required that it be made to withstand rough service and consequently have made durability one of the prime essentials of all types. Nevertheless, like all other mechanical devices, it requires proper operation and occasional lubrication, inspection and repair.

The trouble records of one of the largest rock-drill manufacturers disclose the fact that most troubles result from improper repair and assembly after the drill has been taken apart. Some of this difficulty is due to poor workmanship in the repair shop and some of it is due to careless tinkering and repair of the drill while on the job. In any event it is mostly attributable to a lack of understanding of the importance of each part on the successful functioning of the drill.

REPAIR MAN NOT ALWAYS AT FAULT

Trouble often may be traced to the condition of the drill when sent back on the job after repair, and in many cases to the condition of the drill steel. The repair man is not always at fault, for often the operator—unknown and against the rules of most companies—will take a drill apart on the job, with the result that dirt is included in the assemblage, and the side rods are pulled up unevenly. This condition results in excessive wear of the parts, decreased power and broken through bolts.

Very often the operator complains of loss of power and decrease of drilling speed. The drill apparently works well enough, but the results are lacking. The service man's attention in this case is directed to the condition of the steel. If the bits are holding up and are of proper gage, the trouble usually can be found in the shank being of improper length or the drill socket not being fully opened. If these conditions are found to be satisfactory the trouble is looked for inside the drill. If the

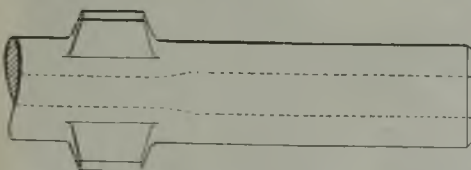


Fig. 1—Properly Shaped Drill End

To get the full force of the striking piston it is important that the drill end be accurately squared off. Do not rely on guess work, use accurate tools.

piston is badly cupped or short, the power of the blow is not fully transmitted to the steel but is taken up by the front head through rods and springs.

A large part of drill trouble can be traced, especially where hand sharpening of drill steel is employed, to the size of bits used. Often the bits are too large, thereby cutting more rock than necessary, and also they are not of uniform gage. The non-uniformity of gage results in steels being wedged, excessive torque on the rotation parts and a boring or reaming operation in the rock instead of a cutting operation. Unbalanced or poorly made bits often result in rifled holes.

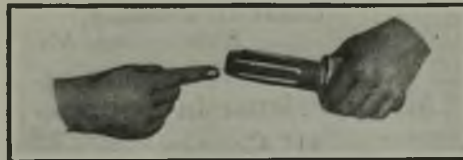
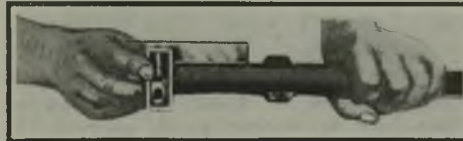


Fig. 2—Piston Face Must Be Square Also

If the piston becomes slightly cup shaped on the striking end and a drill with a good square shank is used, the striking edge of the piston will chip off. The striking surface of the piston should therefore be ground off square and maintained in this condition.

Where the cuttings are not properly blown from the hole, they form a cushion on the bottom and the energy of the drill is expended in cutting and recutting these loose particles instead of cutting new rock with each blow of the hammer.

Concerted efforts are being made by rock-drill manufacturers all over the country to emphasize the importance of lubrication and to introduce the proper methods of applying lubricants.

Many operators rely on the all too prevalent method of lubrication through the inlet hose. This practice should be discouraged as quickly as possible, for it is not dependable and cannot supply a continuous supply of oil to the various parts of the drill. If lubricated often enough—say every few minutes—this method would prove satisfactory. It is usual, however, to introduce a few spoonfuls of grease at the time the

hose is connected to the drill, then run the drill until it no longer operates.

Lubricators and grease pockets provided in each machine are ample to afford continuous lubrication to all parts of the drill if they are kept filled with the proper grade of lubricant.

Important points to be emphasized to obtain the best service from drills may be outlined as follows:

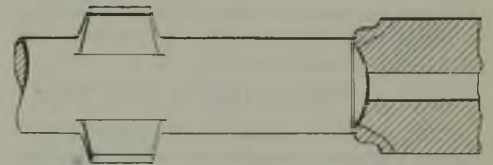


Fig. 3—Battered Drill Shank

Chips off the damaged drill end may become lodged in such a position that the drill will stick.

Lubrication.—See that all moving parts are always well lubricated with the proper grade of grease, as recommended by the manufacturer. It is good practice to fill the grease pockets twice each shift, as it guards against wear, increases the drilling speed and also the life of the machine.

Steels.—Be sure the drill steel is of the best quality and suitable for hard usage. See that the shanks and bits are properly made and of correct dimensions. Also give the steel the proper heat treatment, for more good drill steel is condemned and discarded because of careless, inaccurate heat treating than for any other reason. The proper heat treatment for any grade drill steel can be obtained from the drill steel manufacturer.

Air.—Know that your air supply is plentiful. Be sure that pressure at the drill is sufficient to operate it to the best advantage. Too low air pressure will decrease the drilling speed of any drill, so an examination of the air line may eliminate such trouble.

Worn Parts.—It is good practice, even when a drill seems to be giving the best of service, to take it apart occasionally and clean the parts. Wash with kerosene and examine carefully for any wear, oil all parts and reassemble. Most drill manufacturers supply limit gages which indicate when a part is worn to the point for replacing. This inspection and care will greatly increase the life of the drill.

E. H. PAULL.

One ft.-lb. equals:	
1.3558	joules.
0.13826	kilogram meters.
0.0000003766	kw.-hr.
0.0012861	heat unit.
0.0000005	hp.-hr.

Physical Characteristics of Insulating Varnishes

To meet adequately the many requirements of the electrical industry, insulating varnishes having widely different physical characteristics are necessary. It has not been possible to develop standard tests by which these physical qualities could be definitely measured, which makes it necessary for the user to supplement the standard tests by others to determine whether the physical characteristics are suitable for his purpose.

Generally, these tests are a practical application of the varnish to the apparatus for which it is being selected. If intended for use in making varnished cambric, the important physical characteristics would be elasticity and flexibility. The varnish could be applied to cloth and these characteristics noted. The ability of the varnish to withstand stretching without cracking could be determined by using bias-cut strips of treated cloth.

ACTUAL APPLICATION IS BEST TEST

For use on small high-speed armatures, where toughness and binding and cementing qualities are most essential, the best test, of course, is actual application to the apparatus, but this characteristic can be observed also by cutting or tearing a film of the varnish. For large form-wound coils, particularly those which may be held in stock a considerable time before use, a plastic type varnish generally is used. The varnish should soften slightly when heated, in order that the coils can be formed to exact dimensions, and be flexible, so that they can be readily assembled in the slots.

Only a few of the many uses of insulating varnish with the necessary qualities have been suggested. There are numerous others that require various combinations of qualities and each case will have to be considered individually, and the characteristics of the varnish studied with reference to the requirements of the apparatus on which it is to be used.

These tests that have been passed in review will give some general idea of the choice of varnishes to meet the many requirements of the electrical industry. Most users, by a slight change in their processes, could employ one of a number of varnishes successfully, especially if they would give a little thought to the test results and comparisons. This is, of course, difficult without a basis of evaluation.

VALUE OF STANDARD TESTS

The standard tests are of great value to both producers and users of insulating varnish, affording a common basis for discussion of the characteristics and merits of such materials. The tests of the liquid material indicate the approximate composition, relative value and general working characteristics of the varnish. The tests of the hardened films indicate the electrical characteristics and resistance to the various destructive agents.

These tests should be supplemented by other tests, preferably the actual application of the varnish to the apparatus on which it is to be used, to

verify the suitability of the varnish for the purpose intended.

Qualities as measured by the standardized tests may be made the basis of specifications for varnishes.

Would Use Fiber-Duct Where Conductors Heat Up

In regard to the article by B. K. Shaner, assistant electrical engineer, Frackville, Pa., in which he requests tables regarding the heating of conductors in iron conduits, I regret to state that I have been unable to find anything on the heating of conduits. But if it is an actual problem that he describes I think this trouble is caused by using too small wire.

One table on the carrying capacities of wires gives 3/0 for 200 amp. at 440 volts. Another gives 200,000 cm., and with rough figuring I arrived at the size of 2/0 for 200 amp. These figures do not take voltage drop into consideration. For slow-burning wire the capacity could be increased about 15 per cent, and if the conditions are dry and warm I believe this would be the best insulation to use.

It seems to me that if the power factor of the load is low abnormal heating quickly results. If the load is a meter load I would think that the power factor would be about 80 per cent. If Mr. Shaner has not installed the conduit I would like to suggest using fiber-duct as I believe it would be more suitable. At one large mine that I know of about two miles of fiber-duct is giving good service. It is encased in cement, however.

GRADY H. EMERSON,
Birmingham, Ala.

An Experience in Sickness Of Copper

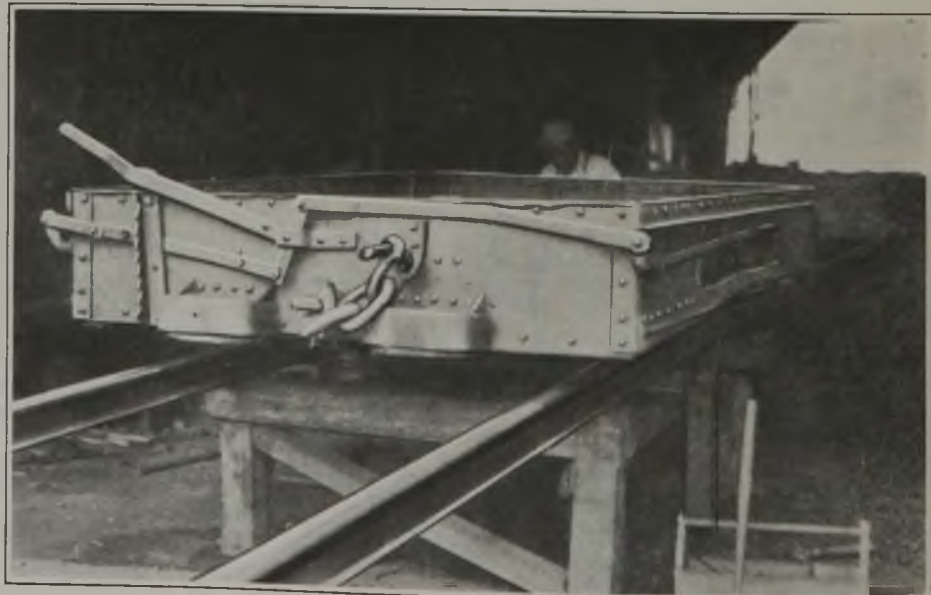
An armature was being wound with coils having German silver resistance leads, with copper tips brazed onto their ends. A number of coils had been put in place when it was found that the first one had to be removed. In

doing this, the copper tips were bent back to get them out of the way. With only a single bend one of the tips broke off in the workman's hands. On examining all the tips of the coils, twelve more defective ones were found. At first it was thought that it was a bad lot of copper. Tests showed that the copper from which the tips were made was of good quality. A study of the process of handling the copper revealed that the defective tips had been heated in a flame containing unburned hydrogen.

Since one cannot see, without breaking the strap or wire, whether the copper has been affected by this sickness, it follows that to be safe copper should not be heated in a flame containing an excess of hydrogen. This means that with a blow torch the copper should be kept outside of the inner cone of blue flame. When heating copper in a gas and air furnace, an excess amount of air always should be used, as too little air will produce an excess of free hydrogen. Smoke from such a furnace always indicates too little air and the mixer should be adjusted to give a little more air than is necessary to prevent any trace of smoke. Wherever possible the copper should be heated without coming into direct contact with the flame.

Elevated Track Aids in Repair Of Mine Cars

In the car-repair shops at the Lynch mines of the United States Coal & Coke Co. one of the efficiencies of the Ford automobile factories has been adopted to facilitate repairs of mine cars. A mine track elevated on bents runs through each shop. The cars to be repaired are pulled up an incline by a small hoist and rope to the top of the elevated track. In this position the workmen can more efficiently replace or adjust mine-car riggings. Especially is such an arrangement advantageous at Lynch, where a low, wide mine car only 22 in. above the rail is used. As the illustration shows, this type of mine car is constructed so that its body overhangs and partly covers its truck.



At Lynch Mine Cars Are Put on Elevated Track for Repair



Problems In Underground Management



Proper Air Spaces Help Bring Down All Coal Undercut, Saving Coal and Powder

By Using a Small Dummy That Does Not Fill the Hole
the Pressure of Gas Is Spread Over the Whole
Length of Undermined Coal

BY W. J. GERMAN
Technical Representative
E. I. du Pont de Nemours & Co.

IMPROPER methods of loading and tamping shotholes often cause the coal to break improperly. In mines where the coal seam is only 3 to 4 ft. thick and the cuts are put in 8 to 9 ft. deep and where caps and fuse are used, coal usually is shot too hard. I have visited hundreds of miners at their working places in such mines and have found that they shoot the coal as follows:

They bore the hole, prepare the primer for the breaker shot with a short fuse, place two sticks of explosive at the back of the hole, set the primer stick in the mouth of the opening, light the short fuse and shove it back to meet the other two sticks. Then they ram in a short dummy not longer than 10 in. on top of the charge. When these three sticks explode, the coal breaks down just under the charge and most of the explosive force is lost.

This loss is unavoidable with the method of loading described because the explosive force naturally follows the line of least resistance. As there are only about 36 in. of coal under the charge, the explosion breaks the coal down at the back of the cut, and most of the gases from the explosive pass out by this channel. This leaves the face of the coal still standing so that the miner must dig it out with his pick. He does not enjoy this labor and determines to avoid it on the next cut by putting in another stick or two of

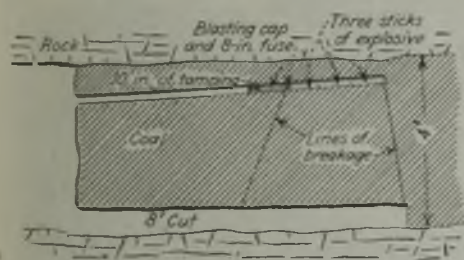


Fig. 1—Unsatisfactory Way of Loading Drillhole in Thin Seams

The gases are held in by the tamping so that they can press only on the coal around the cartridges. Consequently the end of the shothole blows the rear of the undercut coal down, leaving the front part of the undercut for the miner to handle with his pick.

explosive—as a consequence the coal resulting from this shot is almost all pulverized.

This waste of explosives and pulverizing of the coal can be prevented by

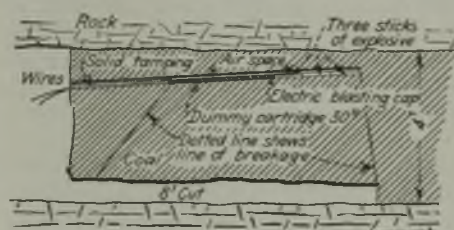


Fig. 2—A Better Way of Loading the Hole

In this instance the hole is not tightly filled for nearly 5 ft. of its length. The gases bear on the whole area undercut and all the coal falls. The same result would be obtained by using more powder but it would cost more and damage the coal more. It might also cause a dust explosion. Why use explosive when clay allows the work to be done better, safer and cheaper?

using electric blasting caps and a different method of tamping. The desired number of cartridges should be placed in the mouth of the hole, end to end, with the primer containing the electric blasting cap last, and then the entire charge should be pushed to the back of the hole.

Next a dummy of tamping about 1½ in. in diameter and 30 in. long should be shoved into the hole until it meets the charge. Finally the hole should be tamped solidly from the outside end of this long dummy to the mouth. As shown in Fig. 2 this method of tamping will leave an air space around both the charge and the dummy and this will permit the distribution of the explosive force. The gases from the explosive will spread through the coal and break up a much larger portion of it than in the first loading described and without pulverizing the coal. There is a saving in explosives and the coal is in better condition.

This method of confining the explosive charge is the most satisfactory way to balance the shot where the depth of the cut is twice as great as the thickness of the coal. It also gives excellent

results in thick seams where the coal is cut in the center, leaving two thin benches of coal to be blasted.

Keep Moisture from Telephones

BY GEORGE EDWARDS
Pikeville, Ky.

Many mines have continual trouble with their underground telephones, on the interior of which moisture is always condensing. Some superintendents have met this difficulty by placing a 25-watt electric incandescent lamp with a short globe at the back of the telephone box inclosing it in a small box of its own with five holes drilled in the two sides ½ in. in diameter. This insures ample ventilation, absence of excessive heat and uniform temperature.

Of course, if the telephone box is absolutely tight this is not necessary, but many mine telephones are not so carefully warded against dampness. It is not well to tamper with the telephone box except as a last resort.

Another plan that has given good service in damp mines is to place the telephone in a larger box with a tight door and two incandescent electric globes on each side of the telephone. This plan works well unless some careless workman leaves the door open.

More About Eyestrain and Nystagmus

Writing in the *Colliery Guardian*, D. W. Rees discussed the use of special tinted glasses to reduce the eyestrain of miners, saying that "eyestrain is recognized as causing fatigue of the nervous system, ultimately ending in nystagmus." He says that metallic-filament lamps, especially those that are gas-filled, give an intensely bright light, a considerable part of which consists of ultra-violet rays, which are recognized as being harmful to the eyesight.

He recommends tinting the glass preferably a yellowish green or, better yet, a yellowish brown. The most efficient antidote to the ultra-violet rays is at the other end of the spectrum, but a penalty must be paid in the form of greater loss of light. Protection against the excessive radiance of searchlights during the war was achieved by the use of veils and net gloves of the exact tint of sunburn, and undoubtedly this tint is the most protective against the chemical action of ultra-violet rays. To compensate for the loss of light Mr. Rees recommends using some type of prismatic glass to focus the light.

Discussion

French Operators Aid Their Miners And Repair Devastated Plants

Parental Relation Between Employer and Employee—Interest Shown in
Workers' Families—Repair of Shafts Destroyed by Germans—
Craft of Latter in Work of Destruction

BY GODFREY M. S. TAIT*
Consulting Engineer, Washington, D. C.

I read with interest the article appearing in your Jan. 10 issue by John T. Ryan entitled "What American Coal Mining May Learn from European Mines," for when the armistice was declared I found myself located in the devastated northwestern coal fields of France and was shortly thereafter assigned to the preparation of a report on which the Allied Governments might base their decision as to the reparations to be demanded.

I, therefore, take the liberty of corroborating and supplementing Mr. Ryan's remarks as to French mining equipment and as to the satisfactory relations existing between employers and employees.

For example, on the subject of pay: In the Marles section the underground men averaged 7½ fr. per day and day men 5½ fr. in 1913. In the Noeux section the underground men received 7 fr. and surface and day laborers 5 fr.

In 1918, however, wages had jumped tremendously, due to the shrinkage in value of the franc and to the general high cost of living, so that at Marles the wages were 15 fr. and 12½ fr., respectively, for the two types of labor, whereas at Noeux they were 16½ and 9½ fr., respectively.

This, as Mr. Ryan writes, has been reduced down to the basis to which he refers, but it is interesting to note that there is no standardization between the wages paid at adjacent collieries. In some cases the discrepancy in wage is as much as 2 fr.

This is largely, if not entirely, due to the fact that the workers in these French mines have such a genuine affection for their employers, whom they almost regard in the light of parents, that it is almost unknown for the workers in one "concession" to be influenced to go to work in another.

I talked to hundreds of these returned workers and they all left me with the same impression, namely that the place at which they worked was their home. There they were provided with a comfortable little brick house with a tiled roof and with sufficient space in which to grow vegetables for the family. They would not think of leaving that particular concession any

more than they would think of abandoning their own homes. In fact I suggested at that time that they would be much better off if the French were to occupy the Ruhr and move them up there far from the devastated areas, but they unanimously replied "No, no, M'sieur, that would not be France."

I have seen these miners, who had been driven into Paris during the war, tramping along the 65 miles of road pushing their belongings in wheelbarrows and little carts, and arriving at the ruins of what had once been their home, with no apparent possibility of operations being resumed for years, but still looking completely happy at being "home" once more.

Each mining concession was equipped with a large hospital with a free clinic for the care and nourishment of children; the companies usually made it a practice to give a salary bonus of a few francs per week for each child in each family under sixteen years of age (thus undoubtedly showing a far-sighted labor judgment); when children were born to the families of miners the minor expenses were paid by the company; when they entered the church they usually received some little gift; when they married they usually were given something more substantial and probably a house to live in; and when they died the company buried them in the concession churchyard, where you might see, before the Germans destroyed them, the headstones of generations of French miners, giving mute

proof of the stability of the local class of labor.

The country is rather flat and has a fairly rich soil, much beet sugar being grown in that section. Before the war the well-paved roads which stretched away to the horizon usually were shaded by two rows of giant poplar trees, the average thickness at the butt being over 2 ft.

As Mr. Ryan says, this territory was captured in the early stages of the fight, and the Germans took full measure of the facilities offered. All trees were leveled so as to prevent the approach of the enemy unseen; the slate piles, which because of the type of mining were of enormous size, were tunneled and timbered with posts and caps from the company's stockpile. Thus converted to their use the Germans employed them as observation posts and gun emplacements.

The network of railroads was torn up and cut into short lengths for reinforcement in concrete dugouts, and three companies of pioneers of seventy men each made an extensive study as to means for the future destruction of this industry in the event that they could not hold the country against the French.

The buildings employed were almost universally steel structures and every girder and column was marked by the Germans with the number of grams of powder that would be required to destroy it. When the order for retreat was sounded only a few days before the armistice the hoists were loaded with TNT and lowered in the shafts to an average depth of 300 ft., at which point they were opposite the water strata, which in this section appears to be in connection with the ocean. The charge was then fired, tearing a hole in the side of the shaft lining, through which the water poured in a river falling to a depth of from three to four thousand feet, as the case might be.

The underground workings around Lens were all flooded in this manner, but the same treatment was not accorded other mines as in the rapidity of retreat it is generally considered sufficient to destroy the surface plants, and this was done in the following manner:



Top Works of Dechy as Germans Vacated Them

This is not the result of gunfire but of a carefully planned and executed devastation warranted to make reconstruction as difficult as possible. The dimensions of the big shaft is over 3,000 ft. deep.

*Late Captain C.W.S., American Expeditionary Force.

A small charge was placed on the surface of each steam and air cylinder of each engine. A charge was attached to the steam dome of each steam boiler. The supports of the breakers were shot off so as to drop the buildings 5 or 6 ft., thus preventing cars going underneath to take coal and throwing all the shaker screens out of alignment. Finally the giant headframes were destroyed by blowing two legs out from under them, allowing the monster frame to crush through the roof of the power house. I have about two hundred photographs which I took of this type of devastation and the uniformity of method employed is striking.

It is impossible to overrate the courage and ability with which the French restored these mines to production. According to my estimate at the time I figured that it would take ten years to repair the damage, provided abundant financial assistance and a supply of new equipment was forthcoming. As you know, there has been no financial assistance other than that from French pockets, and, due to the shrinkage in value of the franc, little machinery was ordered from abroad.

With regard to the water in the mines at the time of my inspection, reference to my notebook indicates that it was estimated at 100,000,000 cu.yd. and that at the cost of labor then obtaining it could be removed for approximately 70,000,000 fr. I see also among my notes the remark, "The reason that the dewatering cannot proceed at a greater rate than planned is that the flow of water through the underground workings must be kept within moderate limits; otherwise erosion would occur sufficient to displace the foundations of some of the timbers, and one bad slip in mines such as these might seriously damage the entire property. Furthermore, the roof usually encountered is none of the best and unwatering should be accompanied by constant inspection and the replacement of mine props and the installation of new timbers where needed."

TIMBERS AND TREES DESTROYED

In this connection it is interesting to know that the Germans removed or destroyed not only the entire supply of mine props and timbers but cut down and destroyed every tree in that part of the country. Perhaps it may seem to you in reading this that the description of the thoroughness with which the Germans completed their destruction of this great coal field is all out of reason and that no intelligent race would go to the scientific lengths shown in this case for what appeared to be purely vindictive reasons. As to this, I think you will find the explanation in the closing paragraph of my report on this devastated area, which is as follows:

"But the loss to France is far more serious than the mere money value of the coal, as will be apparent when France's steel industry and resources are considered.

"Previous to the war France mined more iron ore than, for want of fuel, she



A Little of the Destruction Wrought by Germans at Notre Dame Colliery

The buildings employed at the Collieries of northern France were almost universally steel structures, and the Germans carefully marked each girder and column with the number of grams that would be needed for its destruction. This illustration shows what happened when the directions were followed.

was able to fabricate. In fact, she was dependent on German and Belgian coke in a large measure. Her surplus iron ore naturally had to be sold to Germany, where in the Somme and Ruhr basins coke was abundant. This situation gave Germany a strong hold at all times on France's steel industry. The strength of this economic domination is in inverse proportion to France's coking coal production, hence any decrease in French coal production correspondingly lowers the value of her iron ore and the volume of her steel production, her only resources being to sell unfabricated iron ore to the German steel works in the Ruhr at their own price.

"This was the reason for the deliberate, systematic and scientific destruction of the French coal mines. It will further be noted that no great damage was done to France's iron mines, although her steel works were utterly destroyed. Germany wants the French iron ore, and failing to hold the property by military means she has created an industrial condition which accomplishes the same purpose."

At this point it may be well to stop and realize just why France seized the Ruhr when she failed to obtain any reparation to apply to the restoration of what was the Ruhr's only business rival.

I note in Mr. Ryan's article that 140 of the mining shafts were destroyed by dynamite in the method which I have recounted above. I have photographs to prove that miners' houses even more substantial and attractive than the ones shown in this article also were totally destroyed, the usual German trick being to throw a hand grenade in the cook stove as a parting shot.

It may be of interest to you to know how the French succeeded in repairing these damaged shafts. Their process strikes me as being so highly ingenious that I never fail to relate it.

When I told you that I had located many shafts by the roar of the water entering them and by observing the

cloud of spray that rose up into the air above them, you can have a faint idea of the mechanical difficulty of checking this flow before complete flooding was accomplished.

However the French engineers are never lacking in resourcefulness, and the method they employed was really exceedingly simple. They first of all erected a temporary headframe to carry the centrifugal pump with which they expected to dewater the mine. Then from this same headframe they lowered what may be described as a caisson consisting of vertical strips of wood like a straight-sided barrel, this structure had a slightly smaller diameter than the circular shaft. This was lowered until it covered the opening through which the water was entering.

Then by means of jacks suitably arranged in the center of this caisson it was expanded until its ribs fitted tightly against the side of the shaft. In thus expanding the caisson the ribs, of course, moved further apart leaving plenty of space for water to continue to enter. These slots were then calked until all leakage ceased.

This left the shaft with the damage stopped, but the shaft itself useless, due to the presence of this caisson which filled the opening. The next step was to drill small holes through the wooden caisson into the water space, to introduce pipes through these holes, and to pump in a dry concrete mixture which in coming into contact with the water gradually formed a solid cement which fitted tightly against the exposed side of the caisson. After the cement had time to set, the jacks were released and the caisson hoisted out of the shaft, the repair in which presented a perfectly smooth surface.

It is needless to say that seams of coal presenting the same mining difficulties as those in France would be considered absolutely worthless in this country, but with the economic situation existing in France it is difficult to estimate the value of such a natural resource to her.



Production And the Market



Soft-Coal Market Shows Strengthening Trend; Consumer Evinces Scant Interest in Wage Parley

Strengthening tendencies are apparent in the soft-coal market. More seasonable weather has increased the demand for domestic bituminous coals and some industrial concerns in Ohio and other sections are adding to their reserve stocks at the present low prices. The Jacksonville meeting does not appear to be attracting much attention from the consumer, and there is a feeling that no serious trouble will be encountered. Those mines that are working in most instances are operating to capacity and some producers are getting ready to open additional operations to meet the demands, but in some cases they are finding it difficult to obtain men.

Contract making is progressing slowly, but the range of prices appears to be from \$2.25 to \$3.25, as compared with \$2.75 to \$4.25 last year.

No Reason Seen for Drop in Output

Production of soft coal during the week ended Feb. 2 declined slightly when compared with the previous week, though no reason is apparent. On the other hand, the output of anthracite shows an increase, although the demand for domestic coals usually present at this season is lacking. Demand for soft coal had been quickened because of the low temperatures and there are fewer reports of "no market" losses.

Comparatively few changes in prices are reported from the various markets, with the result that *Coal Age* Index as of Feb. 11 stands at 188, an increase of one point, with an average price of \$2.27, also an advance of 1c. from the previous week.

In the Middle West the domestic trade has slowed down, due in part to difficult hauling from the retail yards and a letting up in the severe cold weather that struck that section of the country a couple of weeks ago.

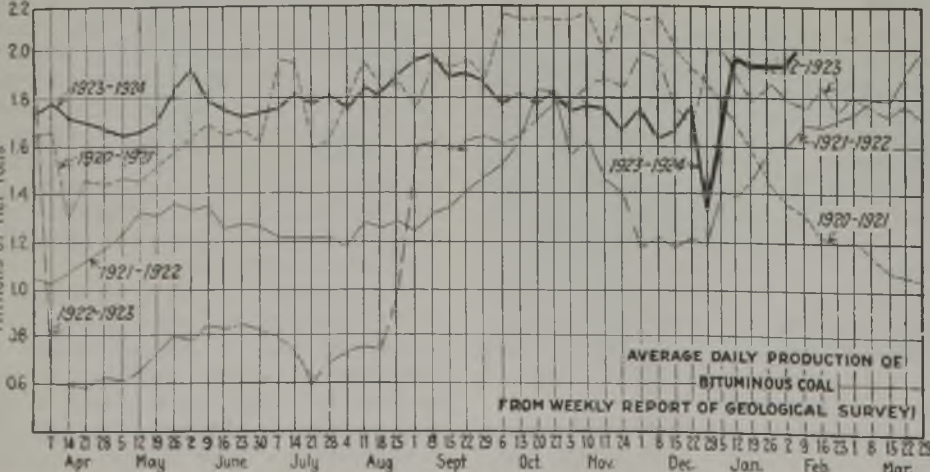
The lower temperatures enabled producers to move their "no bills," but there still remains a large number in southern Illinois. The St. Louis trade in domestic soft coals is active, but anthracite, smokeless coals and coke move slowly. Eastern Kentucky coals are pretty well sold up for the present and the market is slightly firmer. Milwaukee reports a very active market, with business at its peak. Practically similar conditions exist over the Southwest, a blizzard interfering with mine operations early last week.

Active Markets Reported in Ohio

The Ohio markets generally report activity. Smokeless coals are in good demand and deliveries are lower due to a cut down in car supply on one railroad. Free coals are pretty well taken up for the time being, and splint and gas coals show more strength. Steam coals are in fair demand, but with large consumers holding fair reserves there is no tendency to add to them. There is a moderately active market at Pittsburgh, the greatest interest being shown in what will take place at Jacksonville. In New England there is little encouragement in the steam-coal situation and practically no change in the market for Pennsylvania coals. The New York, Philadelphia and Baltimore markets are quiet. There is no activity and buyers of spot coals are taking only enough for immediate needs. Inquiries show no increase.

Output of soft coal for the week ended Feb. 2 was 11,315,000 net tons, a decrease of 254,000 tons when compared with the previous week, according to the Geological Survey, while 1,893,000 net tons of anthracite was produced, as compared with 1,782,000 tons during the week ended Jan. 26.

During January of this year fourteen steamers left



Estimates of Production		
(Net Tons)		
BITUMINOUS		
	1922-1923	1923-1924
Jan. 19	10,925,000	11,622,000
Jan. 26 (b)	10,985,000	11,569,000
Feb. 2 (a)	10,686,000	11,315,000
Daily average	1,781,000	1,886,000
Coal year	343,262,000	459,732,000
Daily av. coal year	1,328,000	1,788,000
ANTHRACITE		
Jan. 19	2,010,000	1,884,000
Jan. 26 (b)	2,119,000	1,782,000
Feb. 1 (a)	2,056,000	1,893,000
Coal year	40,449,000	78,164,000
COKE		
Jan. 26 (b)	343,000	263,000
Feb. 2 (a)	348,000	262,000
Calendar year	1,600,000	1,240,000
(a) Subject to revision. (b) Revised from last report.		

Baltimore carrying 70,225 tons of coal to foreign countries, and one vessel carried 3,491 tons of coke. In January of last year the sailings were three vessels carrying 4,119 tons of coal. Dumpings at Hampton Roads for all accountants during the week ended Feb. 7 totaled 369,171 net tons of coal as compared with 283,447 tons during the previous week.

Midwest Markets Quiet

Trade in domestic coals has slowed down throughout the Middle West. This may be partly due to the difficulty retailers have in moving coal out of their snowbound yards. The call is fair but is not expected to pick up much from now on unless another spell of severely cold weather comes. This means the production of the region is falling and screenings are due for a rise. Not much stiffening on steam coal is noticeable yet, however.

The recent blizzards enabled producers to move out most of the "no bills," but there still remain a good many in southern Illinois loaded with the middle sizes. Central Illinois is less afflicted because of its proximity to the

great Chicago market. It has sold about all of its production readily, but at fairly low prices. Screenings range now from \$1.25 to \$1.35 and lump is \$3@\$.325.

In the Illinois mining fields the southern counties are getting from two to four days a week. Railroad tonnage is light.

Conditions in the DuQuoin and Jackson County field are somewhat similar, with the prices matching those of the independent Franklin County operators. The business in this district, however, is not good and steam coal is difficult to move. The Mt. Olive situation is better. The demand for domestic is good and steam is fairly active, but there is a car shortage that interferes with production at times. In the Standard district the last short cold wave helped conditions materially, although there is plenty of coal of all sizes that has been piled up for the last week at the mines. Steam is hard to move and screenings are down to 75c.@80c.

St. Louis Trade Still Alive

Dealers in St. Louis report local domestic trade active and the demand for middle grade coals good principally on account of the cold wave. Some high-grade lump is moving, but it is small in comparison with middle grades, and

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

Low-Volatile, Eastern		Market Quoted	Feb. 12 1923	Jan. 28 1924	Feb. 4 1924	Feb. 11 1924†	Midwest		Market Quoted	Feb. 12 1923	Jan. 28 1924	Feb. 4 1924	Feb. 11 1924†
Smokeless lump	Columbus	\$7.00	\$3.35	\$3.35	\$3.25@	\$4.00	Franklin, Ill. lump	Chicago	\$5.35	\$3.50	\$3.50	\$3.25@	\$3.75
Smokeless mine run	Columbus	4.75	2.10	2.10	2.00@	2.25	Franklin, Ill. mine run	Chicago	3.85	2.35	2.35	2.25@	2.50
Smokeless screenings	Columbus	4.75	1.50	1.50	1.40@	1.65	Franklin, Ill. screenings	Chicago	2.55	1.85	1.80	1.75@	1.90
Smokeless lump	Chicago	7.00	3.60	3.60	3.50@	3.75	Central, Ill. lump	Chicago	3.60	3.10	3.10	3.00@	3.25
Smokeless mine run	Chicago	4.75	2.25	2.50	2.50		Central, Ill. mine run	Chicago	2.60	2.10	2.10	2.00@	2.25
Smokeless lump	Cincinnati	7.10	3.50	3.75	3.00@	4.25	Central, Ill. screenings	Chicago	1.60	1.45	1.35	1.30@	1.40
Smokeless mine run	Cincinnati	4.75	2.35	2.75	2.50@	2.75	Ind. 4th Vein lump	Chicago	4.35	3.10	3.10	3.00@	3.25
Smokeless screenings	Cincinnati	4.50	1.80	1.80	2.00@	2.25	Ind. 4th Vein mine run	Chicago	3.10	2.60	2.60	2.50@	2.75
*Smokeless mine run	Boston	7.15	5.05	5.05	4.75@	4.90	Ind. 4th Vein screenings	Chicago	2.30	1.85	1.70	1.65@	1.80
Clearfield mine run	Boston	3.85	2.00	2.05	1.65@	2.40	Ind. 5th Vein lump	Chicago	3.60	2.60	2.60	2.50@	2.75
Cambris mine run	Boston	4.50	2.60	2.60	2.25@	2.75	Ind. 5th Vein mine run	Chicago	2.60	2.10	2.10	2.00@	2.25
Somerset mine run	Boston	4.10	2.25	2.15	2.00@	2.50	Ind. 5th Vein screenings	Chicago	1.80	1.45	1.45	1.40@	1.50
Pool 1 (Navy Standard)	New York	5.25	3.00	3.00	2.75@	3.25	Mt. Olive lump	St. Louis		3.10	3.10	3.00@	3.25
Pool 1 (Navy Standard)	Philadelphia	5.10	3.00	3.00	2.75@	3.25	Mt. Olive mine run	St. Louis		2.50	2.50	2.50	
Pool 1 (Navy Standard)	Baltimore	4.60					Mt. Olive screenings	St. Louis		1.50	1.50	1.50	
Pool 9 (Super. Low Vol.)	New York	4.60	2.25	2.25	2.00@	2.50	Standard lump	St. Louis	3.10	2.75	2.75	2.65@	2.90
Pool 9 (Super. Low Vol.)	Philadelphia	4.60	2.30	2.30	2.10@	2.50	Standard mine run	St. Louis	2.25	1.95	1.95	1.90@	2.00
Pool 9 (Super. Low Vol.)	Baltimore	4.35	1.80	1.85	1.80@	2.00	Standard screenings	St. Louis	1.45	1.10	1.10	1.05@	1.20
Pool 10 (H.Gr.Low Vol.)	New York	4.10	1.95	1.95	1.75@	2.10	West Ky. lump	Louisville	3.85	2.85	2.85	2.75@	3.00
Pool 10 (H.Gr.Low Vol.)	Philadelphia	4.10	1.85	1.85	1.70@	2.00	West Ky. mine run	Louisville	2.35	1.65	1.70	1.50@	1.90
Pool 10 (H.Gr.Low Vol.)	Baltimore	4.00	1.80	1.80	1.70@	1.85	West Ky. screenings	Louisville	2.10	1.10	1.05	1.00@	1.25
Pool 11 (Low Vol.)	New York	3.35	1.60	1.60	1.50@	1.75	West Ky. lump	Chicago	3.85	2.85	2.85	2.75@	3.00
Pool 11 (Low Vol.)	Philadelphia	3.10	1.65	1.65	1.55@	1.75	West Ky. mine run	Chicago	2.00	1.75	1.60	1.50@	1.75
Pool 11 (Low Vol.)	Baltimore	3.00	1.65	1.65	1.55@	1.65							

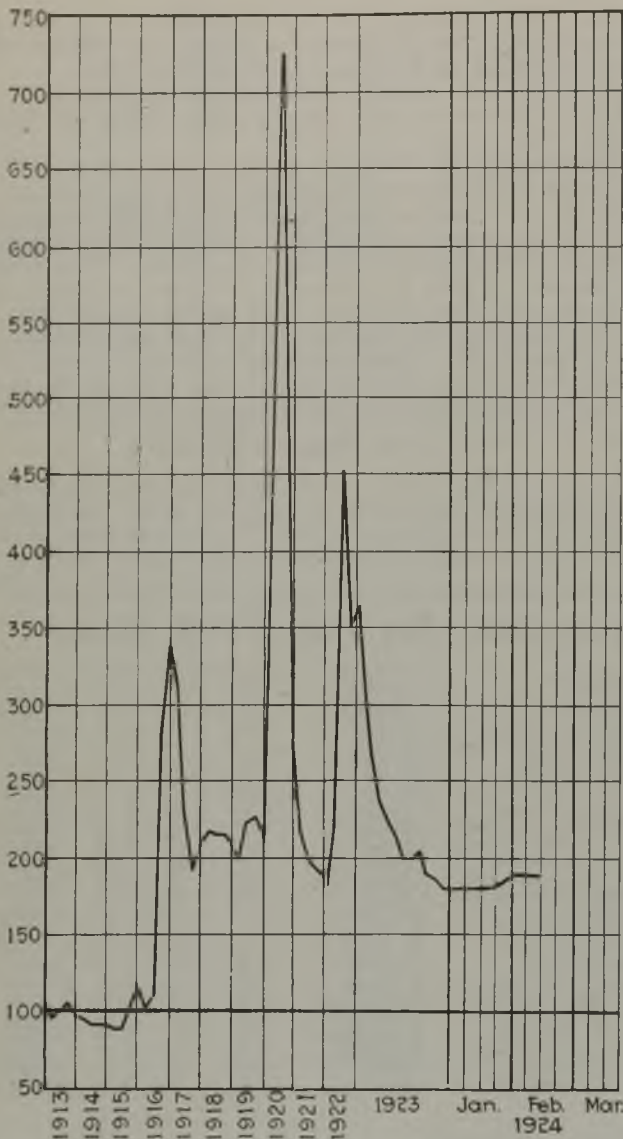
High-Volatile, Eastern		Market Quoted	Feb. 12 1923	Jan. 28 1924	Feb. 4 1924	Feb. 11 1924†	South and Southwest		Market Quoted	Feb. 12 1923	Jan. 28 1924	Feb. 4 1924	Feb. 11 1924†
Pool 54-64 (Gas and St.)	New York	2.95	1.60	1.60	1.50@	1.75	Big Seam lump	Birmingham	3.95	3.85	3.85	3.75@	4.00
Pool 54-64 (Gas and St.)	Philadelphia	2.95	1.70	1.70	1.60@	1.80	Big Seam mine run	Birmingham	2.35	1.80	1.85	1.75@	1.85
Pool 54-64 (Gas and St.)	Baltimore	2.85	1.50	1.50	1.50		Big Seam (washed)	Birmingham	2.60	2.10	2.10	2.00@	2.25
Pittsburgh so'd gas	Pittsburgh	4.10	2.55	2.55	2.50@	2.65	S. E. Ky. lump	Chicago	4.85	3.35	3.25	3.25@	3.50
Pittsburgh gas mine run	Pittsburgh	2.30	2.30	2.30	2.25@	2.35	S. E. Ky. mine run	Chicago	2.85	2.10	1.85	1.75@	2.25
Pittsburgh mine run (St.)	Pittsburgh	2.75	2.00	2.00	1.90@	2.10	S. E. Ky. lump	Louisville	5.25	3.25	3.25	3.25@	3.75
Pittsburgh slack (Gas)	Pittsburgh	3.25	1.60	1.60	1.50@	1.75	S. E. Ky. mine run	Louisville	2.60	1.80	1.80	1.65@	2.00
Kanawha lump	Columbus	4.50	2.60	2.60	2.50@	2.75	S. E. Ky. screenings	Louisville	2.35	1.10	1.15	1.25@	1.50
Kanawha mine run	Columbus	2.60	1.60	1.60	1.50@	1.75	S. E. Ky. lump	Cincinnati	4.25	3.00	2.75	2.85@	3.50
Kanawha screenings	Columbus	2.35	1.35	1.25	1.00@	1.15	S. E. Ky. mine run	Cincinnati	2.35	1.80	1.80	1.85@	2.25
W. Va. lump	Cincinnati	4.25	3.10	2.85	3.00@	3.25	S. E. Ky. screenings	Cincinnati	2.10	1.15	1.30	1.25	
W. Va. gas mine run	Cincinnati	2.60	1.80	1.70	2.00@	2.25	Kansas lump	Kansas City	5.00	5.00	5.00	5.00	
W. Va. steam mine run	Cincinnati	2.60	1.80	1.70	2.00@	2.25	Kansas mine run	Kansas City	3.50	3.50	3.50	3.50	
W. Va. screenings	Cincinnati	2.25	1.20	1.30	1.25		Kansas screenings	Kansas City	2.50	2.25	2.25	2.25	
Hooking lump	Columbus	4.50	2.75	2.75	2.50@	3.00							
Hooking mine run	Columbus	2.50	1.85	1.85	1.75@	2.00							
Hooking screenings	Columbus	2.10	1.40	1.15	1.00@	1.10							
Pitta. No. 8 lump	Cleveland	4.20	2.40	2.40	2.00@	2.85							
Pitta. No. 8 mine run	Cleveland	3.15	1.95	2.05	1.80@	1.85							
Pitta. No. 8 screenings	Cleveland	3.10	1.60	1.60	1.40@	1.50							

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

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

	Market Quoted	Freight Rates	Feb. 12, 1923			February 4, 1924			Feb. 11, 1924†		
			Independent	Company	Independent	Company	Independent	Company			
Broken	New York	\$2.34	\$9.00	\$7.75@	\$8.25	\$8.00@	\$8.50	\$8.00@	\$8.50	\$8.00@	\$9.25
Broken	Philadelphia	2.39		7.90@	8.10	8.50@	9.25	8.75@	9.00	8.25@	9.25
Egg	New York	2.34		9.25@	12.00	8.00@	8.35	8.50@	9.25	8.50@	9.25
Egg	Philadelphia	2.39		9.25@	11.00	8.10@	8.35	8.50@	9.25	8.50@	9.25
Egg	Chicago	5.06		12.00@	12.50	7.20@	8.25	8.00@	8.35	7.50@	8.80
Stove	New York	2.34		9.25@	12.00	8.00@	8.35	9.75@	10.50	9.50@	10.25
Stove	Philadelphia	2.39		9.25@	11.00	8.15@	8.35	9.85@	11.00	9.85@	11.00
Stove	Chicago*	5.06		12.00@	12.50	7.35@	8.25	7.95@	9.25	8.00@	8.35
Chestnut	New York	2.34		9.25@	12.00	8.00@	8.35	9.75@	10.50	8.75@	9.25
Chestnut	Philadelphia	2.39		9.25@	11.00	8.15@	8.35	9.85@	11.50	8.90@	9.25
Chestnut	Chicago*	5.06		12.00@	12.50	7.35@	8.35	7.95@	9.25	8.00@	8.35
Range	New York	2.34				8.25		9.00		9.00	
Pea	New York	2.22		7.50@	11.00	6.15@	6.30	4.75@	6.25	6.15@	6.65
Pea	Philadelphia	2.14		7.00@	9.50	6.15@	6.20	5.25@	7.25	6.35@	6.60
Pea	Chicago*	4.79		7.00@	8.00	5.49@	6.03	5.40@	5.60	5.40@	6.05
Buckwheat No. 1	New York	2.22		5.00@	5.50	4.00@	4.10	2.25@	3.50	2.25@	3.50
Buckwheat No. 1	Philadelphia	2.14		5.00@	5.50	4.00		2.00@	3.50	2.00@	3.50
Rice	New York	2.22		2.25@	2.75	2.75@	3.00	1.75@	2.50	2.00@	2.50
Rice	Philadelphia	2.14		2.75@	3.00	2.75@	3.00	1.50@	2.50	1.50@	2.50
Barley	New York	2.22		1.50@	2.00	1.50@	2.00	1.25@	1.50	1.50@	1.75
Barley	Philadelphia	2.14		1.50@	2.00	2.00		1.00@	1.50	1.00@	1.50
Birdseye	New York	2.22				2.10		1.60		1.60	

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



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

	1924			1923
	Feb. 11	Feb. 4	Jan. 28	Feb. 12
Index	188	187	187	296
Weighted average price	\$2.27	\$2.26	\$2.26	\$3.58

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

there is some activity in Standard. Anthracite, smokeless and coke are slow. Wagonload steam showed considerable improvement the last few days. Country domestic is doing well. It dropped off for a few days, but it is coming back for cheaper coals principally. Country steam is soft and in no demand.

Kentucky Moves Much Lump

Over the past week there has been some advance in eastern Kentucky coal due to the fact that a good many operators are sold up for the time being and are quoting high, whether getting business or not, which has a tendency to firm up the market a little. There has been a better demand for gas or byproduct coal, which is beginning to carry a larger premium over non-gas varieties. There also is a better steam business from the North, and good scattered retailer demand from almost all sections.

Eastern Kentucky mine prices have been firmer all along the line over the past week with domestic sizes tightening up 15c. to 25c. while the western Kentucky market is about holding its own, but with prepared coal getting the call and with some houses holding for slightly higher prices.

Western Kentucky screenings have been offered more freely on the local market and at as low as 85c. for the pea and slack grade.

Demand for western Kentucky coal has been fair, but is largely for prepared coal, moving to all sections, but especially the North and Northwest, including Iowa and Michigan, Illinois and Indiana, with a good movement in Kentucky and Tennessee. Movement of prepared has increased selling effort on screenings, which have been a little off in price due to larger production. This is forcing a hard scramble for orders to keep the markets up.

A number of mines that have been down have resumed operations, making the struggle for markets quicken. The strip or daylight mines, meeting bad weather conditions, have not been able to produce coal as cheaply as under better operating conditions, which is helping the shaft operators a little.

Northwest Is Busy

Shipments from the docks at the Head-of-the-Lakes in January were higher than at any period since July, 1922. In all, 25,984 cars left the docks both at Duluth and at Superior, Wis., of which 10,189 were shipped from Duluth. The shipments last month compare with 17,215 in December and 13,683 in January of last year.

Despite the huge shipments, which are mostly on contracts and for buyers who have been shaken loose by cold weather, the price of bituminous coal dropped 25c. a ton all around at Duluth last week. This is a reduction on the prices quoted last week. All coals are affected except Pocahontas, which remains as last quoted. The strength of Pocahontas is caused by the fact that it is proving a most acceptable substitute for anthracite, which is growing scarce in desirable sizes. Stocks on docks now are probably about 4,300,000 tons.

The Milwaukee coal market is very active. The winter business is at its peak, due to widespread low-temperature blizzards. Country business is suffering because of interrupted telephone and telegraph communications and blocked railway traffic. Coal is moving out fairly well, however. Prices are firmly held.

West Active Again

A blizzard over the Southwest early in the week prevented operation of Kansas and Oklahoma mines two or three days. As a result of the enforced idleness and the increased demand which followed the snow and colder weather, no-bills, which again had begun to accumulate, were cleared from the tracks, and mines were assured of steady operation for some time as soon as weather might permit their reopening. Prices are steady at \$5 for Kansas lump, \$4.25 for nut, \$3.50 for mine-run and \$2.25 for screenings.

The coal market in Colorado during the past week continued to remain reasonably active. Mines worked about four and one-half days, attributing only 18 per cent of the lost time to "no orders." Prices remain unchanged and the supply of labor is ample. The transportation and equipment situations have been very favorable throughout the entire state except in Routt County district (which is served only by the D. & S. L. R.R.), where approximately 94 per cent of the full working time for that district was lost on account of weather conditions preventing any transportation movement.

In Utah every shipper is short on both lump and slack, but middle sizes are piling up on operators' hands and causing a lot of grief and lost time. Retailers have been moving a good deal of coal and stocks are getting low. In Salt Lake City, for instance, the total is estimated at less than 10,000 tons. A week of zero weather would clean them out.

Conditions in Ohio Improved

Market conditions at Cincinnati are considerably improved and wholesale dealers are kept busy. Towards the middle of last week there was a rush for smokeless coals and with the New River production cut down by a 50 per cent car supply on the C. & O. and with the Pocahontas operators in the position of being sold up on their "available" coal for a couple of weeks to come, higher prices were obtainable. Low-volatile slack also moved up under the influence of what was coming in from the byproduct plants. Anthracite and gas coals, especially the domestic sizes, were

strengthened because of the general slowing up in transportation north of the river. Demand was better due to cold weather. Block as well as mine run stiffened, while slack took a spurt. There is a feeling that the urgency of orders was due to some of the industrial centers desiring to replenish their storage supplies. For retail delivery Pocahontas lump is quoted at \$10 by a majority of the dealers, with one or two still holding to \$9. On slack the new range is \$4.75@5.

With weather conditions at Columbus unsettled the coal trade was rather spotty, with domestic buying the best feature. Retail stocks are only fair but because of the lateness of the season dealers are not buying for the future. Pocahontas and other smokeless varieties are in good demand and prices are stronger. Splints also are selling well, but lack of an adequate car supply is one of the drawbacks of the West Virginia operators. Ohio-mined coals are selling steadily and operations have increased to about 30 to 35 per cent of capacity in the southern Ohio fields. Several of the large buyers of steam coals continue to remain out of the market. Stocking is not general as most of the larger consumers have adequate stocks on hand. Contracting is at a standstill both because April 1 is the usual contract period and also because of the uncertainty of the market. Reports received by the Southern Ohio Coal Exchange show a production during the week ended Jan. 26 of 207,625 tons out of a total capacity of 677,173 tons. "No market" was responsible for a loss of 398,546 tons.

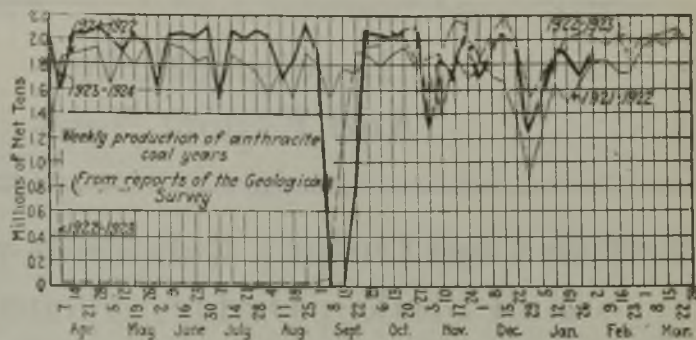
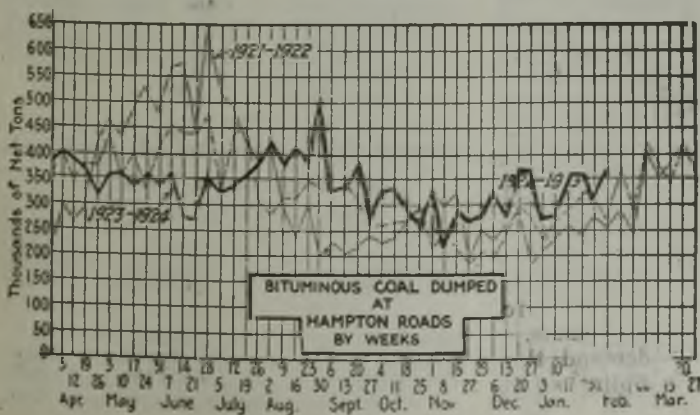
The outstanding feature of the market at Cleveland is the large volume of bituminous-coal receipts 4,323 cars having been received during the week ended Feb. 2, or 460 cars more than the preceding week and 260 cars greater than the previous high record week of Jan. 19. There is considerable distress coal on hand and some has been disposed of at 10c.@15c. below the current market quotations.

The Pittsburgh district market has been moderately active as compared with its condition in December. Competition is very keen and the outlying non-union mines are receiving the chief benefit of any increase in buying. There was an improvement in buying reported in central Pennsylvania during January. Some yearly contracts are reported as having been signed on a basis of \$2.40 for the medium grades and \$2.80 for the better grades of coal. There is a little more activity in the Buffalo market.

New England Steam-Coal Market Dull

The market for steam coal continues to offer little encouragement. Production in the smokeless districts has increased and because there is nothing in the current situation to support a larger tonnage the range of spot prices has suffered another decline. Navy standard Pocahontas and New River can now be had at \$4.75@\$4.90, a drop of at least 15c. from a week ago. Operators are anxious to net \$2 per net ton at the mines, but occasionally a lower return is accepted in order to free cars and make room for further shipments. In this territory there is next to no inquiry and efforts to interest buyers in contracts so far have been without result.

All-rail there is practically no change. Producers find it hard to understand the lack of business in New England. They feel there must be some opening somewhere, but the holes are filled about as soon as made, and by coals from Hampton Roads. The industries still find it hard going, and few are optimistic over 1924 conditions.



For inland delivery there is only very light request. Quotations there, too, have eased off a little, and \$6.25 is now the utmost price sought. As it is, practically the only coal being sold is in the hands of factors with their own depots, and the tonnage is moved to make room for cargoes due to arrive.

Seaboard Soft-Coal Market More Active

There has been somewhat of a change for the better in the soft-coal market at New York but it has not been sufficient to affect prices. Buying has not increased despite the nearness of April 1 and little interest is being taken in the conferences at Jacksonville. Conditions at Philadelphia show little if any difference from those that existed last month. Inquiries are increasing and salesmen do not find it so difficult to get orders although they are not plentiful. Some extra buying is reported. The trade at Baltimore is flat and little buying is reported. Lack of demand continues at Birmingham, particularly for steam coals. Business is scattering and spot buying is for immediate needs. Dealers are buying domestic coals only as needed.

Little Activity in Anthracite Market

There is very little activity in the anthracite market. The demand centers around stove and chestnut coals, but there is no shortage of these sizes. Retail dealers are not rushed regarding deliveries and consumers are not inclined to buy heavily at this season. Egg and pea coals are hard to move, some of the producers storing large quantities of the latter size. Independent producers find it necessary to quote close to company prices in order to keep their coals moving. The steam-coal situation has improved and demand is stronger. The better grades of independent barley coal are being quoted at figures above the company price of \$3.50. Dealers at Baltimore are not complaining of supplies; in addition to receipts of Pennsylvania anthracite they received about 8,000 tons of Welsh anthracite last week.

The Connellsville coke market did not experience the improvement expected a couple of weeks ago, when several inquiries were made for second-quarter furnace coke. Operators were disposed to quote 25c. advance for second quarter over what has been going for the current quarter and this seems to have caused furnace men to lose interest. The usual asking price for the second quarter is around \$4.50. The spot furnace coke market has been stiffer in the past week and is quotable at \$4@\$4.15. Foundry coke remains quotable around \$5@\$5.50 in the spot market. The Geological Survey estimates beehive coke production for the week ended Feb. 2 to have been 262,000 net tons, as compared with 263,000 tons the previous week.

The U. S. Bureau of Labor statistics from the records of U. S. Geological Survey show that on Dec. 22 32.9 per cent of the mines had not worked during the preceding week.

Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Jan. 26, 1924	891,326	204,396
Previous week	895,276	204,694
Same week in 1923	869,464	194,382
	Surplus Cars	
	All Cars	Coal Cars
Jan. 22, 1924	236,174	100,781
Same date in 1923	26,485	6,699
Jan. 14, 1924	292,921	129,846
	Car Shortage	

Foreign Market And Export News

British Coal Output Rebounds with End of Rail Strike; Orders Accumulate

Great Britain's coal output for the week ended Jan. 26 was 4,717,000 tons, according to a cable to *Coal Age*. This compares with 2,848,000 tons for the week ending Jan. 19 and 5,747,000 tons produced in the week ended Jan. 12, which was prior to the strike of the railroad men.

The railroad strike had exerted a paralyzing influence on the Welsh coal trade. Owing to the shortage of railway locomotives, coal could not be conveyed from the pits to the docks. Ships have been held up in consequence and stocks have accumulated at the pit-heads. Aside from this the market is firm and nearly all the pits are booked up until mid-February, and are not taking more orders. Business with Europe is good, except that German orders have fallen off, while Italian business has increased. South American business has improved. It is expected that when the railways have got into their stride again the Welsh market will very much improve in tone.

The Newcastle market has been hit in the same way and considerable difficulty has been experienced in getting coal to the docks for shipment. In the meantime orders have accumulated and the outlook for February is regarded as being distinctly promising.

French Coal and Coke Imports and Exports

France imported 26,268,187 tons of coal during the twelve months ended Dec. 31 as compared with 22,334,126 tons in 1922, an increase of 3,934,061 tons. Of the total Great Britain furnished 17,954,597 tons as compared with 12,098,927 tons in 1922, and the United States furnished 670,823 tons as against 23,255 tons in the previous year. Bel-

gian coal received was 2,179,099 tons, a decrease of 199,598 tons when compared with the previous twelve months. German product received was 1,478,527 tons, as compared with 3,730,605 tons in 1922, while receipts from the Sarre were 3,182,275 tons, as against 3,534,224 tons received in 1922.

Coke imports amounted to 3,628,393 tons, as compared with 5,140,183 tons in 1922, of which 2,073,460 tons was furnished by Germany. In 1922 German coke receipts amounted to 4,303,324 tons. The United States furnished 169,358 tons during 1923, Belgium, 497,839 tons; Great Britain, 384,101 tons and the Sarre, 96,431 tons.

There was exported from France during 1923 127,012 tons more of coal than in 1922, 2,274,447 tons having been shipped during 1923 as compared with 2,147,435 tons in 1922. Of this tonnage Belgium received 1,166,805 tons; Switzerland, 438,461 tons; the Sarre, 241,027 tons; and Germany, 67,740 tons. In 1922 Belgium received 453,075 tons; Switzerland, 704,048 tons; Italy, 59,022 tons; and Germany, 454,950 tons.

Of the 496,348 tons of coke exported in 1923 Italy received 269,060 tons; Switzerland, 163,318 tons; Belgium, 15,298 tons; and Germany, 2,204 tons. In 1922 463,128 tons of coke were exported, of which Italy got 192,880 tons and Switzerland 89,334 tons.

Hampton Roads Market Shows Weakness

Conditions at Hampton Roads were fair last week the market showing a tendency toward weakness, and demand dropping off in all quarters. Foreign business was a trifle more active but the prospect for overseas trade was not bright.

Coastwise and bunker trade was only

fair, and supplies of coal at tidewater were accumulating. Some inquiries for contracts were reported, although the trade generally showed less activity than during previous weeks.

Operators were intimating they would make contracts for \$2.50 net ton mines, which would mean \$5.32 at tidewater, and shippers received some inquiries for bookings at this figure.

Export Clearances, Week Ended Feb. 9, 1924

FROM HAMPTON ROADS		Tons
For Canada		905
Amer. Sch. Jacob W. Hook, for St. Georges		6,467
Amer. SS. Coastwise, for Halifax		3,155
For Chile		
Jap. SS. Brazil Maru, for Valparaiso		2,039
For Cuba		
Dan. SS. Frederiksborg, for Kingston		1,814
Amer. Sch. Zebedee E. Cliff, for Cienfuegos		6,075
For Brazil		
Belg. SS. Burgondier, for Rio de Janeiro		7,217
Ital. SS. Giovanna Florio, for Porto Ferrajone		7,418
For Egypt		
Br. SS. Kenilworth, for Port Said		7,220
Ital. SS. Tagliamento, for Port Said		4,030
For France		
Nor. SS. Fram, for Castres		8,693
Fr. SS. Arkansas, for Havre		7,009
For Italy		
Ital. SS. San Pietro, for Genoa		6,412
For West Indies		
Nor. SS. Bur, for Fort de France		4,122
For Italy		
Amer. SS. West Mahomet, for Genoa		4,122

FROM BALTIMORE		Tons
For Chile		2,400
Jap. SS. Brazil Maru		7,851
For Canada		
Amer. SS. Middlesex		7,851

FROM PHILADELPHIA		Tons
For Cuba		
Nor. SS. Vinddeggen, for Havana		7,851

Hampton Roads Pier Situation

	Jan. 31	Feb. 7
N. & W. piers, Lamberts Pt.:		
Cars on hand	1,194	1,628
Tons on hand	84,466	113,135
Tons dumped for week	134,570	125,431
Tonnage waiting	16,000	15,000
Virginian Ry. piers, Sewalls Pt.:		
Cars on hand	1,013	1,133
Tons on hand	66,600	75,700
Tons dumped for week	75,333	91,474
Tonnage waiting	18,470	3,580
C. & O. piers, Newport News:		
Cars on hand	1,775	1,291
Tons on hand	88,640	64,330
Tons dumped for week	43,175	112,712
Tonnage waiting	10,085	5,550

Pier and Bunker Prices, Gross Tons

	PIERS	
	Feb. 2	Feb. 9†
Pool 9, New York	\$4.90@ \$5.25	\$4.90@ \$5.25
Pool 10, New York	4.65@ 5.00	4.65@ 5.00
Pool 11, New York	4.50@ 4.75	4.50@ 4.75
Pool 9, Philadelphia	4.90@ 5.20	4.90@ 5.20
Pool 10, Philadelphia	4.50@ 4.90	4.50@ 4.90
Pool 11, Philadelphia	4.25@ 4.60	4.25@ 4.60
Pool 1, Hamp. Roads	5.10	4.90@ 5.00
Pools 5-6-7 Hamp. Rds.	4.30	4.25@ 4.35
Pool 2, Hamp. Roads	4.75@ 4.85	4.65

BUNKERS	
Pool 9, New York	5.20@ 5.55
Pool 10, New York	4.95@ 5.30
Pool 11, New York	4.80@ 5.05
Pool 9, Philadelphia	5.15@ 5.55
Pool 10, Philadelphia	4.90@ 5.20
Pool 11, Philadelphia	4.65@ 4.90
Pool 1, Hamp. Roads	5.15
Pool 2, Hamp. Roads	4.85

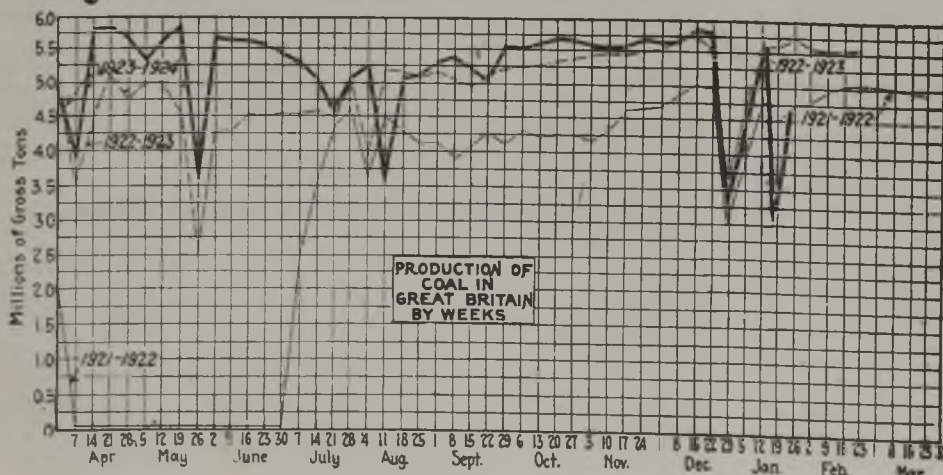
Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to *Coal Age*

	Feb. 2	Feb. 9†
Admiralty, large	30s.@ 31s.	30s.@ 31s.
Steam smalls	23s.@ 25s.	23s.

Newcastle:	
Best steams	25s.6d. 26s.
Best gas	24s.6d.@ 25s. 25s.
Best bunkers	27s.@ 28s. 25s.@ 26s.

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



Traffic News

Lower Rates Sought on Coal For Export

A resolution asking the Norfolk & Western, the Cheapeake & Ohio and the Virginian railroads to adjust the rates on tidewater coal destined for export to the extent of one dollar a ton, has been adopted by the Kiwanis Club, of Welch, W. Va., to the end that mines served by these roads may be in a position to compete with foreign mines for export business.

Operators join in stating that there is not a sufficient domestic demand to permit the mines in West Virginia to operate for more than one and two days a week. Export shipments have dwindled from 13,300,000 tons in 1920 to 2,900,000 tons in 1923, the shrinkage being due to the fact that the present freight rates on coal are so high that southern West Virginia producers are no longer able to compete with foreign countries.

Final Argument on Hard-Coal Joint Rate March 19

Final arguments are to be heard in Washington, March 19 before the Interstate Commerce Commission on the matter of allowing the cancellation of the joint all-rail rate from Buffalo to Minneapolis on hard coal. Stanley B. Houck, counsel for the Twin City Coal Exchange, will present an argument against allowing the withdrawal of the rate. County Attorney Floyd B. Olson, of Minneapolis, will present a brief on the case, but will not be able to attend the hearing on that date.

Illinois Towns Ask Rate Cut

Rockford, Freeport and several other Illinois towns are asking a reduction of coal freight rates to those cities from all Illinois producing groups. The Illinois Commerce Commission hearing on the petition was assigned for Chicago, Feb. 14.

Car Service Has New Quarters

It has been announced by the American Railway Association that, effective Feb. 1, the headquarters of District No. 2, Car Service Division, will be at 2025 First National Bank Building, Detroit, Mich., instead of 1219 Nicholas Building, Toledo, Ohio.

C. & O. to Repair Coal Cars

Contracts for repairing 1,000 steel coal cars have just been awarded by the C. & O. Ry., according to announcement made by W. J. Harahan, president of the company. The repairs will affect the coal trade to a considerable extent, it is stated, inasmuch as it will go far toward a prevention of car shortage should there be the anticipated appreciable revival of the coal business in the spring and summer.

Coal Rate Cut in Illinois

The Illinois Commerce Commission has instructed the Wabash R.R. to establish a rate of 70c. per ton on coal from Springfield, Ill., to Decatur, Ill., this rate comparing with 91c. per ton, the former rate, and giving Decatur one of the most favorable rates in the state. Bloomington has won a victory in its contest for lower freight rates from Lincoln, Ill., the Illinois Commerce Commission denying a rehearing in the Springfield - Lincoln - Bloomington coal rate case.

Industrial Notes

The Tennant Company, with offices in the Union National Bank Building, Houston, now represents the Heine Boiler Co., of St. Louis, in a new territorial division comprising the entire southern half of the State of Texas, J. A. Tennant being in charge of this office. Smith & Whitney of Dallas, Texas, continue as the company's representatives in the northern half of Texas.

Wheeling Coal Co., Warwood, W. Va., near Wheeling, has contracted with the Fairmont Mining Machinery Co., Fairmont, W. Va., for a complete steel tippie with shaker screens and other preparation equipment.

A method of fireproofing jute for brattice cloth has been perfected by J. A. Willard and others and the Canadian Brattice Cloth, Ltd., has been incorporated at Vancouver, B. C., to enlarge and operate a plant on False Creek for its manufacture. At present most of the brattice cloth used in western Canada comes from Scotland.

Milton W. Arrowood announces that he has purchased all the interest held in the Ground Coal Engineering Corp. by the Sanford Riley Stoker Co. since Dec. 22, 1922. The company will now be operated by Mr. Arrowood and his associates in Chicago, under the name Universal Engineers, Inc., as it is believed this name will be well suited for the company's pulverized fuel work and its general line of activities in conveying and handling materials, the success of its method in handling pulverized fuel having led to expansion in other fields. Pending the establishment of offices in New York and Chicago, the company headquarters will be 2 Downing Street, Worcester, Mass.

Barnes & Tucker Co., of Barnesboro, Pa., has ordered from the Fairmont Mining Machinery Co., Fairmont, W. Va., a steel tippie and preparation equipment.

A state charter has been issued to the Summerville Mine Supply Co., Summerville, Pa., the purpose of which is to buy, sell, and deal in coal-mine equipment and machinery. The capital stock of the company is \$15,000 and the incorporators are: Ira B. Brocius, Summerville, treasurer; S. R. Madill, Summerville, and George A. Getty, Summerville.

Association Activities

At the January meeting of the Smokeless Coal Operators Association of West Virginia held in Washington, Major W. P. Tams, Jr., of Tams, second vice president of the association presided. President Robert H. Gross, of Boston, having been seriously ill for the last six or seven weeks and William C. Atwater, of New York, president of the William C. Atwater Co., being abroad.

The association accepted with regret the resignation of George R. Collins of Charleston as treasurer of the association. Mr. Collins retires owing to ill health. G. H. Caperton, of Charleston, was elected to succeed him as secretary. Mr. Collins also

resigned as a member of the board of governors representing the Tug River district, John T. Wilson of Bluefield being elected in his stead.

The association gave much of its time to reports from transportation committees with special reference to the present status of the effort to obtain an all-rail through freight rate from the smokeless fields of West Virginia to the Middle Atlantic and New England states. Attention also was given to the preparation of defending West Virginia's interests in the coming fight on freight rates west, as a part of which operators of the Pittsburgh fields are endeavoring to widen the present freight rate differentials against West Virginia in favor of operators of Pennsylvania. The Faith Smokeless Coal Co. and the Morrison Coal Co., both of Glenn Morrison, Wyoming County, were admitted to membership.

Late in January the Greenbrier Smokeless Coal Operators Association held a session at the Kanawha Hotel, in Charleston, when routine matters and conditions generally affecting the industry were discussed. The following were in attendance: W. S. Wood, Quin Morton, D. C. Kennedy, H. H. Blackburn, John B. Laing, James Laing, Mason Bell, E. S. Simpson, J. G. Hood, W. M. Jasper, O. M. Richardson, J. N. Turner, W. H. Nailor, Dr. J. Y. Leach, J. Wade Bell, H. S. Wilson, Robert T. Bell and W. G. Crichton.

At the last meeting of the Clarksburg Coal Club discussion revolved about the possibility, upon the expiration of the present wage contract, of an adjustment in scale rates in the Harrison County field which would give the territory an opportunity to compete with other fields. Increases in freight rates and inability to reach certain markets, it was developed during the meeting, have precluded the production of a larger tonnage of coal in the Harrison County field within the last year. The operators at the meeting also discussed developments at the convention of United Mine Workers and matters affecting the local field. Hugh G. Smith, president of the club, presided at the meeting. It was stated by operators that despite the large production in West Virginia during 1923, amounting to over 103,000,000 tons, Harrison County had contributed a much smaller proportion to the total than usual.

They were frisky in their announcements of the meeting of the Rocky Mountain Coal Mining Institute at Denver Feb. 13-15. A large yellow circus-looking handbill announced "Last and final notice! Three days of mental food, with a strong seasoning of fun. Girls! Girls! Girls! Lots of 'em. Wives, daughters, sweathearts. Bring 'em with you. We'll do the rest. Unparalleled announcement! George B. Pryde positively will be with us in person. Whales and Elephants. All the heavyweights of the industry will be there to see Bill Brennan on the flying trapeze. He positively will not perform. So come and join the fun. Denver Hotel rates will not be raised." Ben Shubart is secretary and conceived this whizzical notice which was decorated with various sketches and about all the different faces of type the print shop could exhume from its mustiest racks.

Charles Dering, president of the American Wholesale Coal Association, has designated the following committee to take charge of arrangements for the Association's annual convention: Jay W. Johns, Pittsburgh, chairman; J. A. Collette, Pittsburgh, and G. H. Merryweather, Chicago. The convention will be held at White Sulphur Springs, W. Va., June 3 and 4.

Coming Meetings

American Institute of Mining and Metallurgical Engineers. Annual meeting Feb. 18-21, 29 West 39th Street, New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

Upper Potomac Coal Association. Annual meeting March 3, Cumberland, Md. Secretary, J. F. Palmer, Cumberland, Md.

Canadian Institute of Mining and Metallurgy. Annual meeting March 5-7, King Edward Hotel, Toronto, Ontario, Canada. Secretary, G. C. Mackenzie, Drummond Building, Montreal, Quebec, Canada.

New England Coal Dealers' Association. Annual meeting March 20-21, Boston, Mass. President, W. A. Clark, Boston, Mass.

Northwestern Pennsylvania Coal Operators' Association. Annual meeting March 4, Butler, Pa. Secretary, T. F. Diefenderfer, Butler, Pa.

News Items From Field and Trade

ARKANSAS

Sale of the Arkansas Anthracite Coal & Land Co.'s property at Clarksville, made in accordance with decree of the court, has been confirmed by Federal Judge Frank A. Youmans. The sale was made by H. Denman, receiver, to R. A. Blackwood, who bid \$99,000.

ILLINOIS

Affairs of the Southern Gem Coal Corporation have come to a grand pause for the time being. The company, now in the hands of W. S. Wilson and Judge C. B. Thomas, of East St. Louis, as receivers, has not produced a pound of coal since an eight days' run under the direction of Judge Thomas and Mr. Wilson late in January. The books are now being audited to learn the exact status of the concern. The offices soon will be moved to Pinckneyville, leaving only a sales office in Chicago. An effort is to be made to reopen the mines soon. Jesse Dimond and John M. Dillavou have left the company, but Chester A. Harris continues as vice-president. The directors have elected D. M. Parkhill, of Benton, to be president and secretary. H. M. Rea as treasurer. The status of Simon Levy's "snowbird" contract for the entire output of two Franklin County mines of the corporation is in doubt. Thus far Mr. Levy has received nearly \$100,000 worth of coal.

Charles F. Schrage, for years vice-president and treasurer of the Peabody Coal Co. of Chicago, is withdrawing from his connection with the company. Walter A. Fisher, assistant treasurer, succeeds him, although no official announcement has yet been made.

Officers for the Chicago Collieries Co., Danville, have been named as follows: Ben B. Taylor, president; T. C. Keller, vice-president; William Dolan, treasurer; C. E. Parker, secretary. These men, with Joseph Meitzler, A. Plaut and T. T. Keller compose the board of directors. The election was held at Catlin. The Taylor-English Co. elected the following officers: Ben B. Taylor, president; William Dolan, treasurer, and H. E. Douglas, secretary. These men, with George Meiser, Ft. Wayne, Ind.; Clarence Davis, Danville, Ill., and T. A. Taylor, Catlin, Ill., compose the board of directors. The Chicago Collieries Co. which absorbed the Lone Oak Coal Co. Jan. 1, has changed the name of the Lone Oak mine to the Chicago Collieries No. 3 and expects to have 300 men employed this season.

B. J. Gibson of Danville, has been elected president of the White, Barger, White Coal Mining Co. of that city. The company has been reorganized. Mr. Gibson purchasing 51 per cent of the stock of the company. The new organization will continue operations on the property, south of Danville, on the Chicago & Eastern Illinois R.R., and has obtained options on 80 acres more, where stripping operations will be continued. Negotiations are pending with Indianapolis parties for purchase of the property. The company was incorporated five years ago for \$100,000.

The Illinois Fuel Co. was awarded judgment for \$51,811.48 by Circuit Judge Hugo Grimm, of St. Louis, Feb. 5 in its suit against the Mobile & Ohio R.R. A jury trial was waived. The suit was based on a contract for 50,000 tons of mine-run coal at \$2.45 a ton subject to readjustment of price under certain circumstances. The coal company claimed \$125,126.77 under the contract of which the railroad had paid \$68,954.02.

INDIANA

Two hundred miners who have been employed on day and night shifts at Francisco Mine No. 2, four miles west of Princeton, will be idle for several weeks, it has been announced. The shutdown is due to fire inside the mines which is believed to have been caused by defective wiring. Mine officials have sealed the mine in order to suffocate the fire from want of oxygen.

The Dugger Mutual Coal & Mining Co., of Dugger, has been incorporated with a capital of \$100,000. The directors of the company are Eli Edwards, Perry Deckard, Fred

Mason, Otho Seldomridge and Thomas L. Jones.

Cairy Littlejohn, chief mine inspector and secretary of the Indiana Board of Mines and Mining, is seriously ill at the Methodist Hospital in Indianapolis, with a complication of diseases.

Recent electric-power contracts have been signed by several Indiana coal operating companies with the Central Indiana Power Co., which is now putting the new 100,000-kw. steam plant at Terre Haute into operation. The Glencoe Coal Co., of Terre Haute, has contracted for electric power equivalent to 600 hp.; the Binkley Coal Co. for 300 hp. for its Essanbee mines; the Shirkie Coal Co. for 500 hp. for its Shirkieville mine and the Newport Coal Co. for 300 hp. for use at Newport.

KENTUCKY

Several coal tax bills have been introduced in the General Assembly. One provides for a tonnage tax on coal based on either 24 or 3 per cent of the sales value of the coal produced and sold.

On the night of Jan. 29 persons using a pass-key entered the district office of the United Mine Workers at Harlan and took the union's complete set of books, including cash book, ledgers, and minute books of six locals which kept their records at the Harlan office. On Jan. 1, it was reported that a stick of dynamite with cap attached was found hanging in the building, and since that time the union officials quit sleeping at the headquarters office.

An arrangement has been closed with the Phoenix Coal Mining Co., of Louisville and Nashville, with mines at Drakesboro, whereby the Nashville Coal Co., of Nashville, Tenn., a jobbing concern, will take the entire output of the Phoenix mines under contract. The Nashville Coal Co. has arranged to open an office in Louisville, in charge of C. W. Logan, who has been sales manager for the Dixie Fuel Co. The Nashville Coal Co. has the output of the Southland Coal Co., of Henderson, and the Panama Coal Co., of Robards, under contract.

It is reported from Hopkinsville that the Dixie mine, of the Memphis Coal Co., at Mannington, has been leased to Holly Jackson and G. B. Watson, of that place, who have started operations again. It also was stated that this is the only tippie mine in Christian County doing a railroad shipping business that is operating at present.

MINNESOTA

The Lignite Coal & Byproducts Corporation, of St. Paul, has filed application with the State Securities Commission of North Dakota to sell stock to the amount of \$100,000 in a \$1,000,000 corporation. The company is headed by Dr. Hans Holzwarth, a German chemist, and is incorporated under the laws of Delaware. It proposes to build a plant at Richardton, N. D. P. Hoenerback, of Richardton, is president. A similar petition has been made to the State Securities Commission of Minnesota.

MISSOURI

Surface water flooded the Jacob Gohring coal mine, three and one-half miles west of Fulton, on the Columbia road, doing damage that cannot be repaired and that forced the closing of the mine. Mr. Gohring said that the rock top of the mine broke at night and let the water flood in. The shaft was put down three years ago.

NEW YORK

An exhibit of the hard-coal industry under the direction of the General Committee of Anthracite Operators, at 13 East 45th Street, New York City, is being largely attended. The exhibit is similar to that opened in Philadelphia several weeks ago.

P. G. Paris, director of the Westport mill investigation and testing laboratory of the Dorr Company, engineers, has resigned to return to the Bethlehem Steel Co., with which he was formerly affiliated. He will be connected with the patent and research department and will be a consultant on ordnance work. The directorship of the

Westport Mill will be taken over in the near future by J. A. Baker, who was formerly connected with the Dorr Company.

Fines totaling \$80,000 were imposed against the Buffalo, Rochester & Pittsburgh Railway Co. and the Rochester & Pittsburgh Coal & Iron Co. on Jan. 30, when they pleaded guilty to charges of violating the Elkins act. The case was before Judge Morris, in federal court at Buffalo. The two companies were alleged to have agreed that the railroad should not collect demurrage charges. The period in question was 1922, when the coal strike was on.

Stockholders of the Lehigh Valley R.R. will be able to subscribe to the stock of the Lehigh Valley Coal Co. until June 15, the right having been extended from April 15, according to a letter sent out by President E. E. Loomis, of the railroad company.

NORTH DAKOTA

The Lignite Coal & Byproducts Corporation has been formed to develop the lignite fields of North Dakota. Hans Holzwarth, an engineer, who is to be the president, announced during an address delivered in Minneapolis, that a distillation process developed by Thyssen & Co., in the Ruhr under the supervision of the former chief engineer of the company, is to be used in a \$350,000 plant at Richardton, N. D., to convert lignite into briquets with the heat value of anthracite; into rare and valuable gases, into pitch, tar, fuel oil, benzene, and if profitable, into a score of other products.

Production at the mine at Haynes, N. D. owned by the State of South Dakota has reached a high point during the past year, touching average monthly shipments of 150 cars. These figures are far from capacity production, but are really around 50 per cent.

OHIO

The Virginia & Kentucky Coal Co., Cincinnati, has been chartered with an authorized capital of \$25,000 to mine coal and sell and deal in coal and coke. Incorporators are M. Wellman, F. H. Dunker, Elizabeth Dunker, Margaret Shumate and J. B. Shumate.

The Preston-Morgan Coal Co., of Columbus, has been chartered with an authorized capital of \$50,000 to mine, buy, sell and deal in coal and coke. The company has a mine located near Nelsonville. In addition to handling their own product the company will also do a general jobbing business. Offices are located in the Atlas Building. Organization has taken place by the action of C. L. Preston, president and Vance Morgan, secretary and treasurer, both of whom were formerly connected with the Snake Hollow Coal Co., of Columbus. Other incorporators are E. L. Preston, F. L. Preston and Mabelle E. Preston. The Snake Hollow Coal Co., located at 547 Atlas Building, has been partially reorganized since the chartering of the Preston-Morgan Coal Co., George M. Merritt having been made president and George W. Merritt, sales manager, taking the place of Charles L. Preston, who heads the Preston-Morgan Coal Co. The company maintains operating offices at Nelsonville and in addition does a general jobbing business.

The Harribel Coal Co., Bridgeport, has been incorporated with a capital of \$100,000 to buy, sell and mine coal. Incorporators are P. F. Gilhooly, D. W. Bowen, David McGary, John E. Fulton and S. M. Barr.

OKLAHOMA

The Pine Mountain Coal Co. of Heavener has increased its capital stock from \$47,000 to \$65,000. This company carries on coal-mining operations in the vicinity of Heavener and is planning to enlarge its operations there.

C. H. Hyde has filed before the Corporation Commission of Oklahoma a petition asking that the commission take up the question of coal prices in Oklahoma. Mr. Hyde represents the Farmers' Union of Oklahoma in the action taken. It is alleged that prices charged the farmers for coal at Henryetta are unreasonable and excessive, and it is asked that the commission take cognizance of the situation and under its authority in anti-trust matters that it regulate prices charged for coal in the state.

The Lamont Fuel Co. of Henryetta has been organized with a capital stock of \$25,000. The company will conduct coal-mining operations in the vicinity of Henryetta. Incorporators are J. R. Lamont, Sue Lamont and H. A. Booth, all of Henryetta.

PENNSYLVANIA

Joseph J. Walsh, State Secretary of Mines, has named a special committee to investigate the cause of the Shanktown mine disaster, in which thirty-six miners lost their lives. The committee consists of Thomas S. Lowther, of Indiana, Pa.; T. J. Lewis, of Punxsutawney, and Nicholas Evans, of Johnstown. All of the members of the investigating committee are bituminous-mine inspectors and they started their investigation Feb. 6. The committee will be joined during its investigation by J. W. Paul, of the U. S. Bureau of Mines.

The State Workmen's Compensation Board has modified its ruling relative to hospital expenses in compensation cases. The original ruling, adopted in 1919, provided that in accidents happening after Jan. 1, 1920, "where there are both medical and hospital charges, or hospital charges alone, the board will rule \$100 as a maximum charge of the latter." This \$100 maximum payment to hospitals has now been removed but the burden of proof that the expenses have been greater than this amount is placed upon the hospital. The board will consider all cases on their merits.

The Okonite Company, Passaic, N. J., has recently opened a branch office at Pittsburgh. It will be in charge of Edward A. Damrau, district manager.

The Department of Mining and Industry at Harrisburg reports that during the forty-seven weeks that the mines were operating 18,873,000 net tons of anthracite was mined in Lackawanna County. In 1922, when work was suspended for five months and eleven days, only 11,283,004 tons was produced. Last year's tonnage, however, fell short of the output of 1919. In 1920 and 1921, when 19,631,494, 20,023,567 and 19,695,315 net tons was mined, respectively. The total output in Pennsylvania for the year 1923 is shown in the reports to have been 89,600,000 net tons.

Not a single fatality occurred in 1923 from gas or dust explosions in the bituminous mines of Pennsylvania, according to Joseph J. Walsh, Secretary of Mines. There were 195,000 persons employed in the bituminous mines. Secretary Walsh said that there is sufficient methane expelled daily from the bituminous mines to make 30,000 tons of firedamp. Eight hundred million tons of air was pumped into the mines to drive out the gas and, according to the Mines Department chief, the air passing through the mines last year in the ventilating systems weighed approximately eight times as much as the coal mined.

A state charter has been issued at Harrisburg for the Southern Anthracite Collieries Co. of Wilkes-Barre, with a capital stock of \$5,000. The incorporators are T. H. Rippard, Wilkes-Barre, treasurer; Walter J. Bennett, Towanda, and Harry A. Mackie, Kingston. The purpose of the corporation is to acquire coal and coal land.

The Davis Coal & Coke Co., Uniontown, has been incorporated with \$25,000 capital. The company will mine coal and manufacture coke and sell them. John A. Henry, Uniontown, is the treasurer of the company and the incorporators are W. J. Reilly and M. W. Callaghan, of Uniontown, and J. L. Miller, Wilkingsburg.

A state charter has been issued to the Blanchard Youghiogheny Coal Co., Pittsburgh, mining and preparing coal for the market. The company has a capital stock of \$5,000 and J. S. Trageser, Pittsburgh, is treasurer. The incorporators are William G. Blanchard, P. W. Rainer and W. C. Jamison, Pittsburgh.

UTAH

A. D. Pierson, former head of the sales department of the Utah Fuel Co. and widely known throughout the mountain states and Pacific Northwest as a coal man, has left for San Francisco, where he will act as district sales-manager of the Utah Coal Sales Agency, a branch of the United States Fuel Co. of Salt Lake City. Of late Mr. Pierson has served the United States Fuel Co. as railroad fuel agent. He will be accompanied to the Coast by Frank W. Morrison, chief clerk.

Coal production in Utah in 1923 totaled 4,827,570 tons, compared with 4,892,657 in 1922. The State Mining Department said another 40,000 could be added to the 1923 output on account of mines worked by farmers.

The Star Coal Co., of Ogden, has filed articles of incorporation showing capital stock amounting to \$1,100,000, divided into 100,000 shares of common stock of par value of \$1 and 100,000 shares of preferred stock of \$10 par value. Charles H. Smith is president and James L. Donnelly secretary-treasurer. The property of the company is in Lincoln County, Wyoming.

The Utah Briquetting Co. has applied to the State Securities Commission for permission to sell 5,000 shares of common stock at \$10 per share. The company proposes to manufacture briquets for fuel from slack coal and lignites.

WEST VIRGINIA

Interests identified with the Youghiogheny & Ohio Coal Co. have organized the Simpson Creek Collieries Co. and have taken over the property and holdings of the Simpson Creek Coal Co. in West Virginia it was announced at the annual meeting of stockholders at Baltimore on Feb. 6. This property consists of approximately 2,700 acres of thick-vein Pittsburgh coal in Taylor and Barbour counties, in the Fairmont region. The consideration involved in the transaction was not made public. It was announced that the Simpson Creek Coal Co. would retain its corporate existence, with its present staff of officers.

The Kingston Pocahontas Coal Co., operating at Hemphill, announced a reduction in wages effective Feb. 1, notices to that effect having been posted at the mines. It is stated that there has been a reduction in all classes of labor amounting to 10 per cent at the Exeter operation and affecting 125 men. At the Warwick operation of the same company the cut amounts to about 20 per cent and affects about 350 men. For some time these plants have been running only about 20 days a month. The company hopes, by adjusting its wage scale, to be able to run the mines day in and day out.

According to compilation made by the West Virginia Department of Mines 70,188,203 gross tons of coal was produced in the state during the fiscal year ending June 30, 1922, through the use of 5,786,752 lb. of permissible explosives. A table prepared by the department shows that 396,561 kegs of powder and that 380,268 lb. of dynamite were used, with 888 operations reporting. The cost per keg of powder to the miner, taking the state as a whole, was \$2.39 and the cost per pound of dynamite 22c. More powder was used in Logan County than in any other county in the state in the fiscal year, the quantity being 88,008 kegs of powder and 495,263 lb. of dynamite. Mines in McDowell County used more dynamite than the mines in any other county in the state, the quantity being 132,792 lb. In the same county 86,008 kegs of powder was used. McDowell County mines led those of any other county in the quantity of permissible explosives used, 1,334,254 lb.

Two large blocks of coal have been shipped by the Consolidation Coal Co. to Italy for exhibition purposes. One block weighing six tons was removed from Mine No. 22 of the company, at Monongah, and sent to Baltimore to be shipped to Genoa, Italy, as a part of the company's industrial display. This block was 4½ x 4½ x 8 ft. and is described as one of the largest ever removed from northern West Virginia. It is low sulphur coal. Another block weighing five and a half tons, 9 ft. high and 4 ft. square was shipped on Feb. 3 from the Hoffman No. 3 mine, near Eckhart, in the Georges Creek field, to Baltimore and is now on its way to Milan, Italy, where it will be displayed at an industrial exposition. The coal is from the Georges Creek big vein. It required seven days works by four miners to cut and remove the large block.

As a result of wage reductions in some of the fields of southern West Virginia some mines are operating on the 1917 scale. No general or concerted action, however, has been taken among the operators of non-union mines in adjusting wages to meet prevailing market conditions. Such action has been taken only where it was necessary in order to continue operations or to resume operations. Some of the mines in the New River field are operating under such readjustment also some in the Winding Gulf and the Kanawha fields. The basic wage for mine labor in the New River field amounts to about \$7.50 a day. The reduction approximates about \$2 a day in some instances. As a rule wherever the new scale has been posted the miners have accepted the decrease and in some instances have asked for it, in order to permit a continuation of operations.

WISCONSIN

The Carnegie Dock & Fuel Co. has won its tax case in the U. S. District Court at Superior. The company was taxed about \$8,000 for railroad coal held on its docks. The District Court held that the coal was railroad property, despite its location, and was non-taxable. This case was in the nature of a test, as all other docks in Superior have similar tax problems.

January shipments from the Head-of-the-Lakes docks will run close to 24,000 cars, as compared with 17,000 cars in December. Much of this movement is on back orders. It is estimated that 4,600,000 free tons are still on the docks.

WASHINGTON, D. C.

The committee appointed by the National Coal Association to study the English coal exchanges consists of the following members: F. W. Wilshire (Chairman), vice-president, Consolidation Coal Co., New York City; T. F. Farrell, second vice-president, Pocahontas Fuel Co., New York City; H. N. Taylor, president, United States Distributing Corporation, New York City.

W. M. Fridell, district manager, Washington Coal Co., announces that the company has opened a new office in the Kresge Building, 11th & G Sts. This concern is a large wholesale coal dealer.

CANADA

Canadian Collieries (Dunsmuir), Ltd., is unwatering No. 8 mine, at Courtenay, Vancouver Island, and will commence mining operations as soon as the mine is free from water. Locally, the mine is known as the mystery mine, because some ten years ago it was equipped with the most modern machinery available at that time but no coal has been taken from the property since, probably because of low market. Included on the property were 60 houses for employees, 20 of which, however, were destroyed by a brush fire last spring. The coal in some of the company's other mines is now being mined at long distances from the surface and No. 8 mine can be operated more cheaply.

The Vancouver Island Branch of the Canadian Institute of Mining & Metallurgy met in Cumberland, B. C., on Jan. 12. Charles Graham, district superintendent of the Canadian Collieries (D), Ltd., presided. George O'Brien, safety engineer with the Canadian Collieries, gave a talk on "Ancient and Modern Methods of Gas Detection and Mine Illumination," in which he referred especially to the efficiency of the Burrell Gas Detector. He predicted that it would not be long before the flame gas detector was entirely eliminated in coal-mine work.

A demonstration of the coking of several carloads of Nova Scotia and New Brunswick soft coal took place at the official opening of the new coking plant of the Hamilton Byproducts Coke Ovens, Ltd., at Hamilton, by Charles Stewart, Minister of the Interior and of Mines. Dr. Charles Camsell, chairman of the Dominion Fuel Board, and a number of other government and company officials were in attendance. The result was regarded as highly satisfactory confirming the tests made by the Dominion Fuel Board at the laboratory at Ottawa. Mr. Stewart deferred making any positive statement until an analysis had been made by the government chemists, who will continue their investigations at the plant for a week or so. He, however, expressed himself as most hopeful that their findings would be favorable and prove that a solution of the fuel problem had been reached by the coking of soft coal for domestic use. The Hamilton plant represents an investment of \$4,000,000 and was designed and built by the Semet-Solvay Co.

During the month of December, 1923, there were produced in British Columbia 210,151 tons of coal, an increase as compared with the output for November of 9,636 tons. Of this the Vancouver Island field is credited with 135,361 tons, or 64.46 per cent of the provincial total, an increase as against the previous month's figures of 2,966 tons. The Nicola-Princeton Mines produced 20,067 tons in December, which is 775 tons less than in November, while the output for the Crow's Nest Pass field during December was 54,723 tons, an increase of 7,445 tons, or 26.04 per cent of British Columbia's production for December.

New Equipment

An Underfeed Stoker

The Combustion Engineering Corporation, of New York, has recently developed a new stoker called the Frederick Multiple Retort. It operates upon the true underfeed principle and is built in central and superstation types.

The retorts have a relatively large

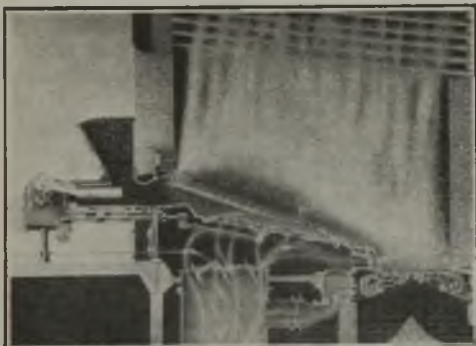


Fig. 1—Stoker Using Underfeed Principle

The fuel is first fed to the coking region and then on into the center of the fuel bed, where it burns over tuyeres of novel design.

main feeding ram 9½ in. in diameter, feeding approximately 20 lb. of fuel per stroke. The strength of the connecting rod, steel crankshaft and bearing brackets is considerably increased to provide a large margin of safety. The shearing pin is designed to receive a positive shearing stress at all times.

Two sprockets of different ratio are employed on the speed shaft, allowing each gear box to be operated at a different capacity. In the large types this makes the maintenance of an even fuel bed more positive.

The secondary ram, as shown in Fig. 2, is said to be one of the most notable of recent advances in the development of stokers; the fuel-feeding and fuel-agitating parts are composed of tuyeres forming an active fuel-burning surface. The tuyere design—also a



Fig. 2—Secondary Ram

The design of this ram is such that it pushes the fuel and supplies air to the re-arranged coal.

new feature—has curved vanes which insure proper guiding of the air into the fuel bed and an even air distribution without any shock.

The underfeed section is inclined 20 deg. from the horizontal and its large area within a certain furnace dimension provides for the prevalent tendency to increase combustion rates and makes it possible to do so without excessively high combustion rates per square foot of grate surface. This increase in underfeed grate area is accomplished

by dispensing with the usual long extension grate. In this way it is possible for the secondary ram to gradually force the green or uncoked coal into the entire fuel bed.

A row of non-clinkering furnace blocks is installed above the retort caps as part of the stoker. These blocks form an air space to which air is supplied from the stoker windbox. The air passes through the hollow retort caps, cooling them, and then passes across the fuel bed through the perforation of each block.

Each stoker also is equipped with air-cooled dumping grates, which prevent the forming of clinkers.

E M B Resistance Again Obtainable

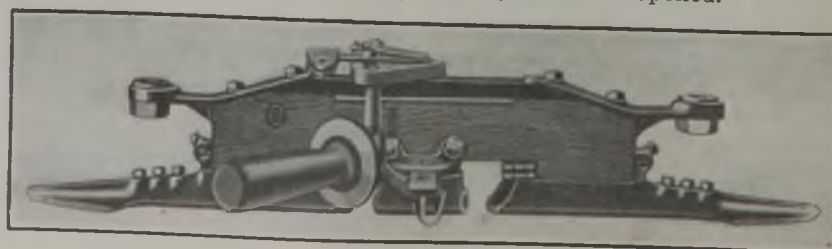
During the war many mining men found that E M B Resistance was not obtainable and no doubt they will be pleased to know that this resistance is now being handled by the C. H. McCul-



Fig. 1—E M B Resistance Elements

lough Engineering Co., 2327 Oliver Bldg., Pittsburgh, Pa.

This resistance is produced from long drawn out ribbons of unbreakable and rustless material. Each bank of resistance consists of a long jointless piece of this material set in the usual form of resistance box frame. The material making up the resistance is drawn absolutely uniform in cross-section and therefore, according to the manufacturer, there is no risk of local fusing. To take out taps or connections, terminals of high-grade gun metal are bolted to loops in the resistance and therefore the spacing of controller attachment points is very readily made.



Section Insulator Switch

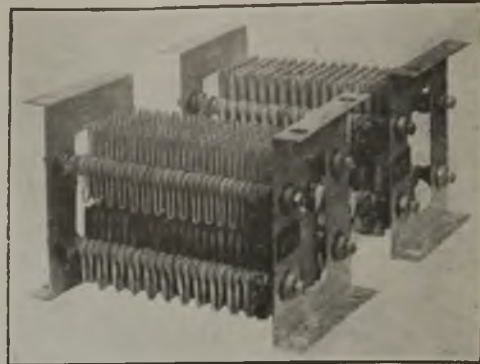


Fig. 2—Resistance Banks for Mine Locomotives

For mining service, these resistances have been applied to various types of machines, being most successful on mine locomotives, coal-cutting machines, coal loaders and hoists where there always is considerable vibration.

Locking-Type Section Insulator Switch

A locking-type section insulator switch, primarily designed to comply with the Pennsylvania compensation rating schedule, but a desirable design for any mine, is the latest addition to Ohio Brass Co. section switches.

The switch has a knife-switch blade and contact clip on the top which are engaged when the switch proper is opened. A permanent grounding cable can be installed in a lug on the switch, so that when the trolley circuit is opened, the dead side becomes grounded. The switch clip on the top has holes for insertion of a padlock, which locks the switch open.

These two features make compliance with the Pennsylvania schedule quite simple, as they incorporate all of the requirements for a section insulator into one piece of apparatus and preclude the need of special attachments or special methods of overhead construction.

The lock switch also has the new method of suspension provided on the later O-B switches, which consists of support brackets set at a comparatively low point on the ends of the insulating member. This shaping permits the use of insulated hangers without need for cutting into the roof for clearance or for raising the switch. The switch is supported in a higher position so that the general height of the trolley is not affected where a section switch is installed.

Setscrew lugs at each end of the switch provide a means for running a feeder line through the switch, the feeder line thus being opened when the trolley circuit is opened.