

*Machinery.*—They use 1 hoisting engine of 77-horse power; they have flanges of sufficient strength and dimensions attached to the hoisting drum; the boilers have been cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam.

*Remarks.*—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineer seems to be an experienced, competent and sober man; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates. It is a very difficult matter to ventilate this mine, as it is connected with miles of old workings, where the top coal was taken out several years ago; they are now taking the bottom coal out from under the old workings that have caved into the surface in some places, and in other places the old works are in good condition; there is only 3 feet of roof between the bottom vein which they are now working, and the top vein which has been worked out; sometimes there is a cave in of the roof between the two veins, which causes a leak in the current of air, which is almost impossible to prevent. They work one pillar and chamber under the other, or in other words, the workings in the bottom vein is the same as the top vein.

#### COAL BROOK TUNNEL.

This tunnel is located in Carbondale city; it is operated by the Delaware and Hudson canal company. E. E. Thomas is mining boss, and W. P. E. Morss is outside foreman.

*Description.*—There is a breaker connected with this mine, located about 1,400 feet from main opening; they mine and prepare about 250 tons of coal per day; they employ 70 miners, 57 laborers, 24 drivers, 4 door-boys and 6 company men in the mine; 65 slate pickers, 6 head and plate men, 11 drivers, 20 company men, 7 mechanics and 1 boss outside; they have 24 persons working in different capacities in and around the breaker; in all 295 men and boys; they are working the bottom vein of coal, average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars about 14 feet wide to sustain the roof; they leave cross-entrances about 40 feet apart for the purpose of ventilation; the roof is rock; the mine is in a good safe working condition.

*Ventilation* is produced by means of a furnace; the intake is located at mouth of tunnel, area 42 square feet; the upcast is located in furnace air-shaft, area 34 square feet; the amount of pure fresh air is 20,000 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in two splits; the amount of fresh air has been measured and reported; ventilation is good.

*Machinery.*—They use 1 breaker engine, 77-horse power, and 1 hoisting engine, 56-horse power; the boilers have been cleaned and examined and reported in good condition; there is no machinery required at the tunnel, as it is driven to drain itself.

*Remarks.*—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars on the planes in the mine; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe.

#### BREAKER TUNNEL.

This tunnel is located in Carbondale city, and situated about one-fourth of a mile from the Lackawanna river. It is operated by the Delaware and Hudson canal company. E. E. Thomas is mining boss.

*Description.*—The coal mined here is prepared at Coal Brook breaker; they mine about 150 tons of coal per day; they employ 34 miners, 28 laborers, 10 dri-

air that enters their collieries by conducting it systematically through excellent air-ways to the face of each and every working place in the mines. Their air-ways are large and shapely; their stoppings in cross-cuts, or entrances, are all walled with stone and mortar; their ventilators consist almost entirely of fans, which for the present give excellent results; and their furnaces, what they have of them, are first-class and give entire satisfaction. No labor or expense is spared to keep the collieries in good condition in every respect; and the company deserves great credit for their honest efforts to comply cheerfully with all the provisions and requirements of the mine ventilation act.

Of the large corporations, the Pennsylvania coal company must be classed second on the list for efficient ventilation. The general mine superintendents are men of long experience in the business of mining coal; and they seem to be ready and willing to do their whole duty in the matter of providing an adequate amount of pure air for their workmen. They have considerable room for improvement, however, in several of their collieries, but I feel very confident that they will inaugurate the necessary improvements without unnecessary delay.

The Delaware and Hudson canal company is the third large corporation in the district, and the third also in regard to ventilation. The greater number of the collieries of this company are free from explosive gas, and their proper ventilation for that reason has been sadly neglected. Indeed I must say that I was astonished to find this pioneer company in the business of mining coal in the Lackawanna Valley, so far behind its younger competitors. When I entered upon my duties as inspector, this company had some of the very worst ventilated collieries in the Lackawanna Valley. The mine ventilation-law of 1870, so far as those collieries were concerned, was a dead letter. It seemed that the doctrine and practice of the managers of these works was: "As it was in the beginning, so it is now, and ever shall be." There was no effort made to improve the ventilation, and their workmen were suffering untold misery in consequence. The men in their employ have become old in appearance, decrepit, asthmatic and consumptive; and their lives have been materially shortened by a process of slow-starvation for the want of the proper quantity of oxygen to sustain life. It is an astounding fact that the old miners of Carbondale can be recognized from all others throughout the valley by their wornout and asthmatic appearance.

The above remarks are applied especially to No. 1 shaft, White Bridge tunnel, No. 3 shaft and the **Coal Brook** collieries at Carbondale. I cannot understand how matters were allowed to go on in the manner I have faintly described above, nor how the plain requirements of the law were so glaringly ignored for so long a time after the law was enacted. It certainly was not caused by the ignorance of the general mine superintendent, for the gentleman holding that position is above the average in intelligence, and has had many years' experience as a mine manager. The excellent ventilation of other collieries under his charge—Leggett's Creek shaft, Providence, for instance—is positive proof of his intelligence and competency, so that the plea of ignorance will not avail for this inexcusable negligence. Then the cause must be sought for in some other direction, and I believe it is found in the fact that the Carbondale mines have been worked on this health-destroying and man-killing system for the past fifty years or more, and in the absurd tenacity with which the managers cling to the old system, with no better reason for it than that it is old. They have excused, and justified themselves in the course they have pursued, also, to a great degree, with the defence that there is no gas evolved in their collieries;

but that, as I have already shown, is no defence. In the three collieries first named they have relied entirely through all these long years on natural ventilation for a supply of air for their workmen. They have done literally nothing to assist nature to do the work, and as the workings extend from year to year the ventilation gets worse and worse.

Soon after I entered upon the duties of my office, I gave No. 3 shaft, Carbondale, my particular attention; and after making a thorough examination of the workings I immediately called the attention of A. H. Vandling, Esq., general agent for the company, to the condition of the colliery, and in reply to my communication Mr. Vandling assured me that the matter would be attended to immediately. His note is couched in the following words:

"Noting your favor of the 4th inst. (December, 1876,) concerning ventilation in our Carbondale mines—the results of your examinations and conclusions are surprising, for the reason that I was not previously aware of such deficiency or sufficient cause for complaint. The matter will have our due and immediate attention."

I am happy to state that improvements were projected immediately after this correspondence, which, when perfected, will remove all cause for complaint, and will put those collieries on an equality, regarding ventilation, with the best ventilated collieries in the district. An air-shaft is to be sunk for No. 3 shaft, and a fan is to be placed there; and I expect this will be followed with another fan for No. 1 shaft, and another for the **Coal Brook** colliery in place of the miserable little furnaces they now have there at the bottom of very shallow shafts, and hence almost worthless. I feel under great obligation to A. H. Vandling, Esq., general superintendent, for his prompt co-operation and manly course in relation to my efforts to enforce the mine ventilation law; and I am certain that the miners at Carbondale, before another year ends, will have cause to bless him for his prompt action in the premises.

#### MISCELLANEOUS COMPANIES AND OPERATORS.

The collieries of the smaller companies, in regard to ventilation, may be divided into three classes—the first class having good and satisfactory ventilation, the second class having middling, and the third class having poor and very unsatisfactory ventilation. The first class consists of the following collieries: Roaring Brook colliery, Dunmore; Jermyn's shaft, Green Ridge; Mt. Pleasant slope, Hyde Park; Pine Brook shaft, Scranton; Green Ridge slope, Dunmore; Capouse shaft, Hyde Park; and Meadow Brook collieries, Scranton. The second class consists of the following: Erie shaft, Carbondale township; Phoenix shaft, Ravine shaft, Twin shaft, Seneca slope, and Butler shaft, Pittston; Hillside colliery, Pleasant Valley; Filer & Livey's collieries, Winton; Greenwood colliery, Lackawanna township; Columbia colliery, and Beaver mines, Pittston. The following make up the third class: Sibley shaft, Old Forge township; Everhart colliery, Jenkins township; Jermyn's slope and shaft, Jermyn; Park coal company's slope, Hyde Park; Fair Lawn slope, Scranton; Jones & Simpson's colliery, Archbald; and Tompkins shaft, Pittston. All are graded, as regards merit, in the order in which they are named in each class. The collieries which are not named in the above classification, I as yet know comparatively nothing about. I have suggested important improvements in many of the collieries in the third class, and the owners and agents have shown a ready disposition to act on the suggestions given. Some of them, it is true, complain of the hard times and consequent lack of funds to provide themselves with the necessary mechanical power to properly ventilate their mines, but all admit that the improvements demanded are sorely needed. I deeply sym-

11 MINE R.P.

others. This colliery evolves immense volumes of gas, but it is well provided with ventilators, and the ventilation is good. This company keeps its place at the head of the list, and from present indications it will hold its place there for all future time.

The Delaware and Hudson Canal Company have made some valuable and much needed improvements, but it has been like pulling teeth to get them to do anything. They have taken over a year to do what ought to have been done in two months at the furthest, but I am very grateful for what has been done. They have erected two new seventeen-foot fans at Carbondale, which are to ventilate No. 1 and No. 3 shafts and White Bridge tunnel. These are the first fans ever erected at Carbondale, and if the air courses are improved, so as to conduct the air properly through the face of the workings, they will inaugurate a new era in their ventilation.

The five tunnels, constituting the **Coal Brook** colliery, should and must have two fans in place of the three furnaces which are now robbing the company and cheating the workmen. White Oak mine, Archbald, and Grassy Island shaft, Olyphant, need a fan each, and then the Delaware and Hudson will go ahead of the Pennsylvania Coal Company, and take its place second on the list. They might be placed alongside of the D. L. & W. were it not that they will never have their air courses in as good condition as are those of the latter company. I expect the D. & H. C. Co. will go on making these other improvements during 1878.

The Pennsylvania Coal Company's collieries are not in as good condition as I could wish, taking them altogether. Where they have fans, the ventilation is satisfactory; but where they use furnaces it is far from being so, and in some of the collieries, especially in spring and autumn, when the season changes, it is very bad. The system of ventilation in their collieries in Jenkins township is very objectionable and injurious. Here, the No. 2 slope, No. 4, No. 5, No. 6, No. 7, and No. 11 shafts, and No. 4 slope, are all ventilated with one continuous current passing from one to the other, and carrying the impurities of one mine into the other for several miles. It is true that there are additions made here and there on the route, but nothing like enough to purify the air. The law requires that each mine or colliery shall be provided with "pure air," and every intelligent man knows that air passing from one mine into another cannot be "pure air," but must be heavily charged with "noxious and poisonous gases."

In the latter part of June, I traveled through all the workings of the above named collieries, and examined the system of ventilation with great care; and upon finding it as above stated, I made my views known to J. B. Smith, Esquire, and by his request wrote to Andrew Bryden, Esquire, demanding such improvements made as would remedy the evil. Messrs. Bryden and Law, the mine superintendents, did not admit that their mines were as I represented, and would do nothing until they had made an examination themselves. But on making the examination, they were forced

ful readiness to comply with all that the law requires, and I am happy to say that W. R. Storrs, esquire, the general agent, as well as the president and directors, always manifest the same disposition. They are all evidently convinced that it is to the interest of the company, as well as for the good of their workmen, to keep their collieries in their present excellent condition.

The Delaware and Hudson Canal Company, perhaps have done more to improve the ventilation of their collieries during the last three years, than either of the other larger corporations, and they are now entitled to the second place on the list in this respect, thus changing positions with the Pennsylvania Coal Company. Three years ago, their collieries in Carbondale were about as poorly ventilated as it was possible that they could be, but since that time, they have erected three fans there, the third being added last year, to ventilate the five tunnels composing the **Coal Brook** colliery. Hereafter, there need be no complaint of poor ventilation in the Carbondale collieries, unless the mine bosses fail to conduct the air properly through the workings. There is a very great and agreeable change for the better, and I am very grateful to the superintendents, especially to A. H. Vandling, esquire, for these improvements. There are now only two collieries owned by the Delaware and Hudson Canal Company, in my district, where the ventilation is not satisfactory, the two being the White Oak colliery, in Archbald borough, and the Grassy Island shaft, in Olyphant borough. Neither of these, however, is very bad, nor is either of them good, and I do not expect them to be good until a fan is provided for each.

The Pennsylvania Coal Company have also done considerable, but are more tardy in effecting the necessary improvements than either of the other large companies. One trouble with them is, their persistant clinging to the objectionable, unhealthy, and dangerous system of ventilating collieries successively with the return air passing from one to the other, instead of ventilating each colliery separately with "pure air," as the law requires. It is very fortunate for them that neither of the collieries where this is done is very fiery, or they could not be allowed to work them at all until this evil was remedied. They have extended two of their shafts down to the Marcy vein during the year—No. 4 and No. 11 shafts—and the probability is, that there will be gas enough in this lower vein to oblige them to abandon this dangerous system.

They have some collieries, however, in excellent condition as to ventilation, notably, No. 4, No. 7, No. 8, new No. 9, new No. 10, No. 13, and Law shafts. All their other collieries can be very materially improved, and must be improved before they can be rated as first class, though none of them are very bad. They have erected a new 17.5 feet diameter fan on an air shaft sunk for No. 7 shaft, in Jenkins township, which commenced running October 21, 1879; and another of the same size was put in at the new No. 9 shaft, which commenced running August 2, 1879. These are improvements inaugurated during last year, and were much needed.

**Examination of Applicants for Mine Foreman's Certificates.**

The annual examination of applicants for mine foreman's certificates in the Second district, was held in the Welsh Hill school building, Pittston, Pa., June 25th and 26th. The examiners were H. McDonald, inspector, A. G. Mason, superintendent, both of Pittston, Pa., and Archie McQueen, of Pleasant Valley, Pa.

The following fourteen were successful, John W. Reid, Samuel M. Johnson, James R. Walsh, John Marian, Richard Beer, William J. Thomas, Patrick S. Coyne, Stephen McLinarie, James Blease, James Wilson, Mathew D. Macky, John Hastie, David D. Davis and Evan H. Reese.

James Waddell, of Kingston, Pa., applied for a certificate of service and was recommended to receive one.

**General Condition of the Mines.**

The mines of this district are in comparatively good condition as regards ventilation with the exception of a few which are not in the condition that the law requires, but I am happy to state that these mines are now being attended to, so that in a short time they will be in such condition as to give all the air to the workingmen that is required by law.

The drainage in the mines has been improved more than in former years, yet there is room for improvement in this regard. Likewise the timbering is receiving its share of attention. As there has not been one accident in this district this year attributable directly to the neglect of timbering or propping.

**Mine Improvements during 1888.**

*Pennsylvania Coal Company.*—In shaft No. 6 of this company two underground tunnels were driven from the Pittston to the Marcy seam, a distance of one hundred and twenty, and three hundred feet respectively, which opens up an extensive lift of good coal.

At shaft No. 11 of this company, a new underground slope was sunk in the Pittston seam, a distance of five hundred and twenty-two feet. The engines are located on the surface and the ropes pass down through the air shaft.

A new tunnel was driven by this company about one mile south of No. 14 shaft, from the surface, cutting the Pittston seam at a distance of two hundred feet. The coal is of a good quality and is taken by a small locomotive to No. 14 breaker, to be prepared for market.

A new shaft was sunk by this company close to old No. 4 shaft, in Pittston borough, from the surface to the Powder Mill seam, a distance of four hundred and sixty-four feet. Size of shaft twelve by thirty-two feet. It will be used for hoisting coal.

*Lehigh Valley Coal Company.*—At **Coal Brook** slope an air shaft was sunk to the Red Ash seam, and a new fan twenty feet diameter

At the Marvine the Clark vein which is five feet 6 inches thick and of very good quality was opened up. The second opening slope which was begun in 1893 was completed from the 14-foot vein to the surface, a distance of 384 feet.

It has an area of 98 square feet and a grade of "one in four." It is also used for a down cast for air.

At the Grassy Island mine a new plane 400 feet long on a grade of 12 degrees was completed.

A new tunnel was driven from the surface to the number 2 vein at White Oak. It is 507 feet long.

The vein here is 3 feet 6 inches thick.

A new fan is also in course of erection to ventilate all the White Oak workings.

At Coal Brook, near the face of the present workings, a new shaft was sunk a distance of 87 feet, for the purpose of ventilation.

A new tunnel was also driven at this mine from the surface to the bottom coal, cutting a five-foot vein at a distance of 100 feet.

#### Lackawanna Coal Company.

A tunnel 550 long having a sectional area of 84 square feet was driven by this company from the surface to the lower Dunmore vein, which is four and one-half feet thick.

A shaft for the purpose of ventilation was also sunk from the surface to this vein, a distance of 190 feet.

#### Delaware, Lackawanna and Western Railroad Company.

At Storr's mine, a tunnel 6x12 and 750 feet long was driven from the "big" vein to the Diamond.

A new plane 450 feet long on a grade of 11 degrees was also made.

At Storrs No. 3 two new planes were made, one 450, the other 500 feet long.

#### John Jermyn.

At Jermyn No. 3 a tunnel is being driven north across the measure. It is now 600 feet long and is expected to go 900 feet more to cut the lower Dunmore vein.

The coal from this new opening will be brought to the surface through the slope.

A shaft through which the tunnel workings will be ventilated has been sunk to the vein, a distance of 120 feet.

The vein at this point is reported seven feet thick and of good quality.

A new plane 450 feet long has also been made in this mine. It has a pitch of 12 degrees.

Two new tunnels have been driven at **Coal Brook**, one from the top vein to the surface, a distance of one hundred and sixty feet, and one from the third vein to the surface, a distance of one hundred and seventy-five feet.

At Clinton two new slopes have been driven; one is 3,100 feet long, the other 700 feet. The first has an average grade of 8 feet in 100, the other 6 feet in 100.

Richmond No. 3 shaft has been sunk from the Clark to Dunmore Nos. 1 and 2 veins, a distance of 132 feet. Its size is 10x22 feet.

At Richmond No. 4 a new plane 800 feet long has been made.

At Mt. Jessup a tunnel 464 feet long has been completed from the Clark to the No. 3 Dunmore vein.

Near their No. 1 colliery the Pennsylvania Coal Company has erected six Babcock and Wilcox water tube boilers of 900 horse power. The pressure carried per square inch is 110 pounds.

Steam is supplied for No. 1 colliery breaker and shaft, to Gypsy Grove colliery breaker and its two shafts, and have supplanted the 27 cylindrical boilers 36x30 feet formerly used at these places.

The Lackawanna Coal Company has sunk an air shaft, having a sectional area of 120 feet and a dept of 55 feet.

A new air shaft was sunk from the surface to the Dunmore vein by the Johnson Coal Company. Its depth is 310 feet and has 120 feet area.

A tunnel 7x14 feet and 1,300 feet long has been driven from the big vein to the Dunmore.

At Pancoast a new slope 800 feet long has been sunk in Clark vein and another is being sunk in No. 3 vein.

The Dolph Coal Company has sunk two new slopes, one 350 and the other 650 feet deep. One is 6x16 and the other 6x12. They have also made a new plane 500 feet long, and sunk two new air shafts each 62 feet deep.

The Riverside Coal Company has made a new slope 900 feet long.

Many other small air shafts, tunnels, slopes and planes have been made during the year for the purpose of properly ventilating the workings and to keep up the output of coal, but they are not reported.

#### A FEW REMARKS ON THE STATISTICS FOR FIVE YEARS.

By a retrospective glance at the mining statistics of this district for the five years ending December 31, 1896, we find that there were 30,702,284 tons of coal produced and 29,367,733 tons shipped; 79,645 persons were employed for 939 days, during which time 1,056,055 kegs of powder of 25 pounds each, were consumed.

Of the total number employed 243, or a small fraction more than three-tenths of one per cent. were killed. Of the 243 killed, 154 lost



A new plane fourteen hundred feet long has been made in the Grassy Island vein, taking the place of two shorter ones.

Another large tubular boiler was placed in position, as was also a ten-foot fan for making draft for boilers.

At Grassy Island slope, new first motion engines for hoisting from Diamond vein to surface were installed, and new engines are replacing old ones at Grassy Island shaft.

A new breaker has been built at White Oak, on site of the old one that was burned in July, and a new tunnel has been driven to bottom vein.

Jermyn No. 1, a new rock plane 650 feet long has been driven from Archbald to Grassy Island vein. A new slope has been made, and a branch to hold from 70 to 100 cars is being made at foot of shaft.

The breaker has been rebuilt and now has a capacity of 1,500 tons per day.

Also, a new plane 1,500 feet long has been driven on a light grade from foot of shaft to old workings, where it is proposed to rob pillars.

A tail rope system of haulage has been adopted in No. 1 shaft, which hauls a trip of fourteen cars 3,850 feet, replacing five mules and drivers. Also, a new slope has been sunk a distance of 400 feet to "third vein," and two gravity planes, 750 and 650 feet, respectively, have been made.

A new drift has been opened at Powderly, in Grassy Island vein, and a surface railroad 3,000 feet long has been built to convey the coal from the drift to the chutes, and another pump has been added, making three pumps delivering water to surface through a 16-inch bore hole. A new lowering plane 1,800 feet long is about completed.

At Racket Brook a new washery with a capacity of 600 tons per day has been erected.

A new breaker of 2,500 to 2,800 tons daily capacity has been built at **Coal Brook**. It is modern in every particular and has replaced the old Coal Brook and Racket Brook breakers. The coal from No. 1 shaft and tunnel, Powderly slope and tunnel and Coal Brook mines will be prepared by it.

A new drift, known as the Mills drift, has been opened up, and is ventilated by a new Guibal fan, ten feet diameter, driven by a gasoline engine, with very good results.

At Wilson Creek a new rock plane from bottom to top coal has been made. It is 250 feet long. Also, two gravity planes, 750 and 1,025 feet long, respectively, have been made, and a small air motor three feet high has been added in top coal drift, making three in all doing all the work for forty-five places, besides rendering rock blasting unnecessary, except that the vein becomes less than three and a half feet.

TABLE F—Nationalities of Persons Killed or Injured.

Nationalities.	Killed.	Injured.	Totals.
Pole, .....	6	24	30
American, .....	6	22	28
Irish, .....	5	17	22
English, .....	6	14	20
Welsh, .....	2	13	15
Slavs, .....	2	9	11
Italian, .....	3	6	9
Austrian, .....	2	4	6
Hungarian, .....	2	4	6
Russian, .....	4	1	5
German, .....	2	2	4
Scotch, .....		2	2
Totals, .....	40	118	158

### Improvements at Collieries.

#### Delaware and Hudson Company's Improvements.

At Clinton a new air shaft 10x12 feet and 240 feet deep was sunk for ventilating purposes, and a new fan was installed to ventilate the East Side tunnel.

At **Coal Brook** a rock plane 300 feet long was driven from bottom to top vein, and an air shaft sunk. A new air compressor was installed and three new air motors added for haulage. A new drift was opened on East Mountain; and an air shaft sunk.

At Jermyn No. 1 a new 22-foot fan was installed, to replace the old one. A rock plane 600 feet long, driven to shorten transportation, and improve ventilation, was made.

Grassy Island.—The rock vein was opened and air connections made.

At Eddy Creek a slope was sunk from surface to rock vein to improve ventilation on Mills tract workings.

#### Hillside Coal and Iron Company.

A new breaker was built at Forest City to replace the old one, which was destroyed by fire in early part of the year.

The Price Pancoast Coal Company has sunk the main shaft to Dunmore veins; also, installed a new fan 35 feet in diameter.

The Johnson Coal Company has driven a 1,000-foot tunnel from prove ventilation on mills tract workings.

for winding flat ropes five-eight inches thick by six inches wide. These ropes are now in service and giving great satisfaction.

A rock tunnel was driven from the Baltimore vein to the Five foot, a distance of 488 feet. The vein was found in good condition and about five feet thick. The second opening for this tunnel is a rock plane on a pitch of thirty degrees. The total length of which is 199 feet. At the end of the year a connection was made in the coal from the plane to the tunnel.

In the above colliery a tunnel has been driven through the fault at the fourth lift of the Midvale Hillman slope which enables the company to concentrate all the transportation from the lower levels of the Midvale slope at one point.

At the Prospect Hillman slope a fire was discovered in the airway of the proving slope Hillman vein, on the 12th of April, which was caused by a gas feeder becoming ignited from a Bratticeman's lamp. The fire was fought for some hours but it was found that gas was accumulating inside of the location of the fire. It was therefore decided to fill the slope with water which was promptly done and the fire was extinguished.

During the year it was decided by the Lehigh Valley Coal Company to reopen the Mineral Spring Colliery which has been shut down since 1889, and work was commenced sinking two shafts to the Red Ash vein. The old Baltimore slope has been reopened to the third lift and preparations are being made for sinking a slope in the Checker vein to open up the coal to the north. A ventilating fan has been erected which will ventilate this slope.

The **Coal Brook** slope which has been idle since 1889, is being put in condition. The water has been pumped out and the gangways are being put in order for mining coal. The foundation for a new breaker has been constructed and the foundation for a 1,000 horse power boiler plant of the Babcock and Wilcox type, has been completed.

The Henry breaker has been converted into a washery and is now being operated as such. Two shafts have been commenced from the surface to reach the Red Ash vein, which are being sunk through a large pillar left in the Baltimore vein for that purpose. The idea being that all veins under the Baltimore, shall be mined without any connection with the overlying seams. Both of these shafts were down to the rock, and about twenty-five feet into the solid rock at the end of the year, and the concrete cribbing was completed. The cribbing is forty-five feet in depth.

A rock tunnel has been driven from the Upper to Lower Baltimore vein in the north workings of the Henry colliery. The total length of which is 569 feet. The second opening for this tunnel is a shaft from the Upper to Lower Baltimore vein, forty-one feet in depth.

### Condition of Collieries

The mines in this district are in a safe condition. As to ventilation and drainage, I report the following:

#### Scranton Coal Company

Johnson No. 1.—Dunmore vein gives off some gas, and for this reason the ventilation is good. Diamond vein is practically a non-gaseous seam; the ventilation is fair, but was being improved on my last inspection.

Johnson No. 2.—This is a non-gaseous mine. A large portion of it is dependent upon natural ventilation, and for this reason the ventilation is bad for a few days at a time, particularly when the weather changes. The officials have done everything in their power to improve this condition. By placing doors on all chambers they have greatly improved the conditions.

Raymond.—The mining at this colliery consists principally in taking down what is called "top coal" in abandoned chambers, and while it would be impracticable to establish a systematic arrangement of air currents on account of the openness of the workings, the men are well provided with pure air. This is due to the unusual thickness of the vein at this locality, and the arranging of small groups of men at different places throughout the mine.

The haulage and drainage at this colliery are in excellent condition. Much attention is paid to maintaining room along tracks, and keeping the roads surfaced with ashes.

Ontario.—The veins at this colliery are very thin. The ventilation is good. The connecting of Jermyn No. 6 and Klondyke workings, has improved the ventilation, haulage and drainage considerably.

On account of the thinness and irregularity of these veins, it requires tact and good judgment to successfully mine them, and their condition is the best endorsement of the management.

Richmond No. 3.—This colliery has seen a complete reformation during the year. The ventilation has been very much improved, the roads cleaned, with ample room for the handling of cars, and the colliery throughout is in a very satisfactory condition.

Riverside.—Mining in the lower vein at this colliery is not very extensive, but one of the upper veins is being developed.

Richmond No. 4.—Operations at this colliery are not in any way extensive, but the ventilation is good.

#### Delaware and Hudson Company

**Coal Brook** Colliery.—On December 1, a mine fire was discovered under the culm bank in the workings of the Coal Brook tunnel that had been abandoned some forty years ago.

From indications it must have been burning some time, but was not discovered until snow was seen to melt on the surface over the affected territory, when an examination inside revealed the presence of the fire.

Operations were commenced to extinguish it, and a short slope was sunk from the surface to a point near the fire, which opening was to be used as a base of operations to fight the fire.

In the meanwhile work was in progress conducting an air current to the fire, and when the ventilation was within a short distance of the fire, it moved a quantity of after-damp that it was thought would get to the Coal Brook fan, but instead went to the live workings and in to the men. Some consternation followed, and had it not been that the workings were well ventilated, serious consequences might have followed.

Fuller examinations were made, which showed that the maps made some forty years ago, were very incomplete, and were not to be relied on. The conditions were made more complicated by the fact that another vein only four feet above had been partially mined out; whereupon it was decided to make an accurate survey, so that the true conditions might be known.

At first it was decided to get into the upper vein, and allow the water to play on the fire, but when an idea of the extensiveness of the fire was formed, this plan was abandoned. The idea of flooding was discussed, but on examination it was found that on account of the caved condition of the workings, this would not be practicable.

It was then decided to mine around the base of the fire, and to fill this place with some non-conducting material.

A small fan was installed at one of the surface openings, so that it might ventilate the fire affected territory, and also protect the men from any danger that might arise. They are still fighting this fire.

The ventilation and drainage at this colliery are in good condition; five separate fans are provided, and furnish ample ventilation for these extensive workings, and the haulage is also in good condition.

At Marvine and Legitt's Creek, the ventilation is in good condition. The returns at these mines receive a great deal of attention. Both of these mines give off considerable gas, and it is absolutely necessary to provide the best of ventilation.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs Colliery.—This is a very extensive colliery, being one of the greatest producers in the region, and throughout is in good

with the old drift fire room, and be a considerable saving in fuel with improved service.

At Ontario a slope has been sunk from the tunnel level, to take out the pillars and some solid coal from the Ontario tunnel workings.

A Scranton duplex plunger pump 18x8x18 has been installed in the above slope.

The working of the old Jermyn No. 6 has been connected to the Klondyke working by tunnel, which made it possible to abandon the Jermyn No. 6 shaft, and favored the haulage of these two mines so that coal and water are delivered to one surface opening by gravity. This was a great saving to the colliery; it improved the service and was a good move in mining.

On May 7, the tower and fan house of the Blue Ridge opening were destroyed by fire; the effect on production was only temporary, and the buildings were rebuilt as soon as possible.

At Richmond No. 3, a gravity plane 700 feet long, running four cars on each track, was built in the Clark vein, which will deliver coal from a newly acquired tract.

#### DELAWARE AND HUDSON COMPANY

At Coal Brook colliery, a rope haulage 6,300 feet long, has been installed, delivering coal to surface from Coal Brook tunnel. It is an up to date haulage; great care was exercised in the alignment, and there is ample room along the track everywhere.

An electric plant of 450 Kilowatt capacity has been installed at this same colliery, furnishing light for the Company's Carbondale railroad yard, lighting the coal taken outside, and furnishing power for three fans where it was quite impracticable to use steam as a power.

The engine room is a substantial brick building with a concrete floor. The equipment and building present a substantial appearance.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

At the Storrs colliery, the wooden towers at Shafts Nos. 1, 2 and 3, have been replaced by substantial steel towers.

A rock slope 300 feet long has been sunk, to connect the Big and New County veins in No. 1 shaft.

The 25 pound rail track on nearly all main headings, has been re-laid with heavier rails, using the lighter rails in the chambers where motors with reel attachments haul cars.

In relaying tracks, great care was taken to modify grades and curves, also to provide more room along tracks.

## DELAWARE AND HUDSON COMPANY

**Coal Brook** Colliery.—One 13-ton and three 4½-ton electric motors have been installed at the Wilson Creek opening. Also one 17 foot and one 20 foot fans to ventilate the Grassy and Top Coal workings, the electric power being supplied from the power plant at the breaker.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY.

Storrs Colliery.—A nest of eight boilers with a total horse power of 2400. Also one locomotive boiler at No. 3 plant rated at 125 horse power. Also No. 1 shaft has been sunk from the Big Vein to the Dunmore a distance of 330 feet.

## TEMPLE IRON COMPANY

Lackawanna Colliery.—The 12x30 shaft commenced in 1903 has been completed; it was sunk from the surface to the Dunmore vein a distance of 580 feet, and the veins are now being opened out.

The Lillibridge shaft, which was sunk from the surface to the Grassy vein, has been moiled out where it was too small, and is now being sunk from the Grassy to the Dunmore vein; it is 10x12 feet, and large enough for one cage and counter balance.

Permanent head frames have been erected over each shaft, and a brick engine house 38x60 feet built to accommodate the engines of both shafts.

A pair of 26x48 foot hoisting engines have been ordered from the Exeter Machine Works, and are now about completed.

An 8x20 foot fan, driven by an 18x30 inch engine has been erected at the head of of the main shaft to ventilate the workings of the Dunmore vein.

The tracks have been laid between the breaker and the shaft, also the branches and connections with the new shaft.

All of these improvements are for the purpose of developing a tract of coal that it was impracticable to take through the present openings.

The 250 H. P. Maxim boilers have been erected at the breaker in connection with the present plant, and an 8 inch steam line has been laid between the boiler plant and the new shaft.

## Mine Foremen's Examinations.

During the year certificates of qualification were granted as follows:

## Mine Foremen

Alfred Baileys, David Parry, Fred K. Derby, John A. Robinson, Thomas Muldowny, Joseph W. Wilce, James W. Nicholls, George S. Cooper, Richard Walsh, David B. Thomas, David M. Williams Thomas Butler.

## Assistant Mine Foremen

Patrick McNulty, David Morris, Craddoc Morris, James Watson, David P. Thomas, Evan B. Williams, William T. Pearce, Thomas R. Jones, James Cook, Stephen C. Middleton, Michael Kane, John Davison, James B. Loftus, Martin J. McGowan, William S. Davis, William F. McCrone.

## CONDITION OF COLLIERIES AND IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY

Clinton Colliery.—A new slope was sunk from the surface to the Grassy vein, distance on pitch 1,800 feet. Coal hoisted to the surface by a pair of 14x20 Flory engines using tail rope system. Breaker has been overhauled and a new trestle 300 feet in length to head of breaker has been completed. Condition of mine roads good; drainage good; ventilation fair.

**Coal Brook** Colliery.—One six-ton electric motor has been added, making 8 air motors and 7 electric in use pulling coal, and one Turbine pump driven by an electric motor and delivering 2,500 gallons of water per minute to surface, has been added to equipment. A new opening to Grassy vein on the company farm connected by railroad 3,000 feet in length has been made. Also one new 16 ton mine locomotive for pulling coal from opening has been added. Ventilation fair; other conditions good.

No. 1 Carbondale Colliery.—New engine plane on east side No. 1 slope, 1,200 feet in length, delivering cars to foot of slope haulage road north of No. 3 shaft, has been rebuilt pulling cars to foot of No. 1 slope distance about 4,000 feet. Condition of colliery, ventilation, roads and drainage, good.

Powderly Colliery.—Locomotives has been placed on east side, pulling coal from Grassy opening to head of plane, a distance of 3,000 feet. Electric lights have been placed in breaker office and buildings. Ventilation fair; other conditions good.

Jermyn Colliery.—New 6-ton electric motor added for pulling coal, and one pair of 10x12 engines delivering supplies from surface to foot of shaft, a distance of 1,800 feet. A new washery, capacity 800 tons per day, equipped with the latest improved machinery, is near completion. Ventilation in many places is bad; other conditions good.

White Oak Colliery.—Slope driven through anticlinal 900 feet in length. Condition of colliery, fair.

## HILLSIDE COAL AND IRON COMPANY

Clifford Colliery.—A tail rope and engine plane combination haulage system has been installed. A transmission line has been run from the power house at No. 2 shaft over a mile away and through bore hole from the surface to the south section of Dunmore vein, for the purpose of haulage and pumping. One motor and one electric pump have been installed there. Condition of colliery, fair.

No. 2 Shaft Colliery.—A new fire-proof boiler house has been erected. One turbine pump of one thousand gallons capacity driven by electricity, and two triplex plunger pumps of 600 gallons capacity each, driven by electricity, have been installed in the Clark vein, the water being delivered to surface through boreholes. A saw mill has been erected, driven by steam power, for the purpose of cutting all prop timber, which is extensively used on account of so much robbing being done. A tunnel has been driven from the bottom Dunmore vein to the second one overlying the bottom, the distance between being 16 feet vertical, the length of tunnel 450 feet, the area 6 feet by 10 feet. Condition of colliery, fair.



## CARBONDALE COAL COMPANY

Bolands Colliery.—Ventilation, drainage and condition as to safety fair.

## BARTON COAL COMPANY

Barton Colliery.—Ventilation, drainage and condition as to safety fair.

## CLINTON FALLS COAL COMPANY

Clinton Falls Colliery.—Ventilation good, drainage fair, condition as to safety fair.

## FINN COAL COMPANY

Finn Colliery.—Ventilation, drainage and condition as to safety fair.

## ARCHBALD COAL COMPANY

Tappans Colliery.—Ventilation and general condition good.

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IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY

Clinton Colliery.—Plane in Clifford vein extended 2,300 feet cutting off 1,800 feet of rope haulage. Steam plane in Clifford vein driven 2,400 feet, dispensing with mule haulage, operated with a Flory engine, 12½ by 16 inch cylinders. A new Guibal fan, 20 feet in diameter, driven by a Dickson engine 16 by 36 inch cylinder, has been installed to ventilate No. 8 slope, Clifford vein, in place of Riverside slope fan. In the Bottom vein a water course is being driven a distance of 3,800 feet to drain the Clinton mine through Coal Brook. 3,300 feet of this water course has been completed. When finished the pumping plant now in use in Clinton will be abandoned. An eight inch bore hole driven from the surface to the Clifford vein a distance of 259 feet for conveyance of steam for plane and pumps. One 12 inch bore hole from surface to Clifford vein a distance of 195 feet for pumping water.

**Coal Brook** Colliery.—One 6 ton electric motor with drum attached, for hoisting and lowering cars in chambers, has been installed. One 12-foot Guibal fan, driven by electric power, to ventilate the New County vein has been installed. A large sump has been made at the foot of Stanton shaft for electric and steam pumping plant. A new outside culm plane of wooden structure has been erected 1,800 feet in length. One 8-inch and one 6-inch bore hole driven from surface to bottom vein for conveyance of air to operate slope. Depth of bore hole 230 feet.

No. 1 Carbondale Colliery.—No. 5 Tunnel driven from surface to Archbald vein, distance 400 feet. No. 4 Tunnel driven from surface to Archbald vein, distance 250 feet. Tail rope haulage road driven and graded from No. 1 Tunnel to No. 4, a distance of 3,050 feet. A new engine house built, and a 14 by 20 inch cylinder engine of the Flory type installed to operate the haulage.

## SPRING HILL COAL COMPANY

Spring Hill Colliery.—Ventilation good; general condition fair.

## FALL BROOK COAL COMPANY

Fall Brook or Murrins Colliery.—Ventilation and general condition fair.

## ARCHBALD COAL COMPANY

Tappans Colliery.—Ventilation and general condition fair.

## FINN COAL COMPANY

Finn Colliery.—Ventilation and general condition bad.

## WEST MOUNTAIN COAL COMPANY

West Mountain Colliery.—Ventilation bad; general condition fair.

## SALEM HILL COAL COMPANY

Bartons Colliery.—Ventilation and general condition fair.

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**IMPROVEMENTS**

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## DELAWARE AND HUDSON COMPANY

Clinton Colliery.—Water course completed connecting with No. 2 shaft of the Hillside Coal and Iron Company. One twelve-inch bore hole drilled 210 feet for pumping purposes. Pumping plant is installed in North side, River Slope. No. 4 plane extended 100 feet and completed. Breaker repairs consist of 12 emery pickers, new 27 inch by 36 inch rolls, and 2 new scales for weighing railroad cars.

**Coal Brook** Colliery.—New drift at Wilson Creek, 400 feet in length, driven to take the place of the old drift, which will be used as a water course in the future. Coal Brook and Clinton mine water course driven 1,100 feet and completed. Breaker repairs consist of steel conveyor, 350 feet long, 16 emery pickers, 8 spiral pickers and 2 lump coal shakers. Electric power house extended 12 feet by 54 feet (extension built of brick). One electric generator, 540 K. W., driven by a Compound Duplex Hamilton Corliss engine, 20 x 36 x 42 inches, has been installed.

Carbondale No. 1 Colliery.—New rope haulage 3,050 feet long, and a fan shaft, 10 feet x 10 feet in area and 50 feet in depth, completed; a Buffalo 5-foot fan, driven by a 10 H. P. electric motor, for ventilating new tunnel, installed; Rock plane from bottom to top vein driven 70 feet.

Powderly Colliery.—Two 8 inch bore holes 60 feet deep drilled; 6 inch slush line laid, 4,000 feet long, preparatory to filling workings

## SPRING HILL COAL COMPANY

Spring Hill.—Ventilation and general condition fair.

## WEST MOUNTAIN COAL COMPANY

West Mountain.—Ventilation bad; general condition fair.

## SALEM HILL COAL COMPANY

Bartons.—Ventilation and general condition bad.

## CLINTON FALLS COAL COMPANY

Clinton Falls.—Ventilation and general condition fair.

## STILLWATER COAL COMPANY

Stillwater.—Ventilation and general condition fair.

## AINSLEY COAL COMPANY

Sunset.—Ventilation and general condition fair.

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**IMPROVEMENTS**

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## DELAWARE AND HUDSON COMPANY

**Coal Brook** Colliery.—A tunnel, 330 feet long, was driven to the Dunmore vein, and an air shaft was sunk 50 feet in depth, and 10 x 12 feet in section. The old Midland tunnel was re-opened and re-timbered for a distance of 300 feet. No. 3 Slope in Grassy vein was extended 300 feet. The electric plant was increased by the addition of a 750 K. W. General Electric generator, driven by a 20 x 42-inch and 36x42-inch Hamilton Corliss Cross compound engine. No. 8 outside engine plane was extended 1,000 feet, to deliver coal to the main haulage road, where two additional 30-ton locomotives have been placed to facilitate transportation. Four Wicks boilers have been added to the steam plant.

Clinton Colliery.—A tunnel 400 feet long, and a rock ditch 400 feet long for draining the workings of the colliery into the Wilson Creek drainage, were completed. Installed a pair of Flory 10x12-inch hoisting engines in the Clifford vein, East Side slope.

Powderly Colliery.—The pumping capacity has been increased by the installation of a single Goyne 22x16x36-inch pump, discharging through a 20-inch concreted bore-hole, 150 feet in depth.

Carbondale No. 1 Colliery.—A rock plane 150 feet long was driven from the Bottom vein to the Top vein in No. 4 tunnel, and a rock plane 100 feet long from the Top vein to the surface, for a second opening. An air shaft was sunk from the surface to the Top vein in No. 4 tunnel, 10x10 feet in section, and a 10-foot Buffalo steel fan, driven by an electric motor, was placed at the top of shaft to improve the ventilation. A narrow gauge track, one mile in length, was built to Powderly breaker and equipped with one 14-ton and one 12-ton

*Carbondale*

## OUTLOOK COAL COMPANY

Outlook.—Ventilation, safety conditions and drainage fair.

## FALL BROOK COAL COMPANY

Murrins.—Ventilation, safety conditions and drainage good.

## CLINTON FALLS COAL COMPANY

Clinton Falls.—Ventilation bad; safety conditions and drainage fair.

## AINSLEY COAL COMPANY

Sunset.—Ventilation, safety conditions and drainage fair.

## IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY AND HUDSON COAL COMPANY

**Coal Brook** Colliery.—Six 6-ton electric motors added to present power for transporting coal inside, which dispenses with compressed air plant; 150 horse power electric hoist operating slope and plane 1,000 feet in length delivering coal to main locomotive road to breaker, 200 horse power electric motor for driving 20-foot fan, replacing steam engine power; 50 horse power electric hoist to replace a 10 by 12 inch double engine driven by compressed air. Concrete base for supply house 28 by 60 feet for storing supplies.

Powderly Colliery.—A 12-ton locomotive added to present power for hauling coal from No. 1 Carbondale mine to Powderly breaker. 2,000 feet of 6-inch pipe laid for slushing of culm under the Lackawanna river to secure the roof in this locality. Three 6-ton electric motors, with drum attachments, to draw up and lower cars from face of chambers, in Carbondale No. 1 mine, which dispenses with eighteen mules. Two rock tunnels, 7 by 12 feet in section and 600 feet long, driven through fault opening large track of coal on south side, No. 1 Carbondale mine; and one blacksmith shop, concrete base, 24 by 50 feet, erected at same mine.

Jermyn Colliery.—Rock plane, 7 by 15 feet in section and 200 feet long, driven through fault for developing coal on west side. Generator 250 horse power, 750 amperes, installed for furnishing additional power. Driving a rock plane from the bottom to top split of the Grassy vein 7 by 15 feet in section, 300 feet long at present time. 35 horse power electric hoist installed for lowering and hoisting supplies at east side opening, dispensing with double steam engine 10 by 12 inch cylinders.

Clinton Colliery.—Rock slope 7 by 12 feet in section and 300 feet long for extension of rope haulage from top to bottom vein. Slope in Clifford vein driven 800 feet to present time, to open new level of coal. One Duplex Jeanesville pump installed in River slope delivering water through a 12-inch bore hole to surface.

White Oak Colliery.—10-foot Buffalo steel fan installed, driven by a steam engine 14 x 16 inch cylinders at No. 6 tunnel. Slope 8 by 11 feet in section in progress of sinking. Fan shaft 12 by 12 in section and 65 feet deep for ventilation of this slope. Engine plane 1,000 feet long is being constructed to deliver coal to surface.

7 feet x 12 feet in area, was driven from Bottom to Third vein and equipped with a 65 H. P. electric hoist. A rock plane, 150 feet in length and 7x12 feet in area, was driven from Top to Grassy vein to improve ventilation. A drift, 7 feet x 12 feet in area and 200 feet in length, was driven from the surface to Third vein, and a 10-foot diameter fan installed driven by electricity.

Powderly Colliery.—At No. 1 tunnel a fan 10 feet in diameter, driven by a 35 H. P. electric engine, was installed for ventilating Third vein. A tunnel, 7 feet x 12 feet in area and 150 feet in length, was driven through a fault in the Top vein. The haulage 1,200 feet in length was converted into an electric motor road. A fan 10 feet in diameter, driven by electricity, was installed to ventilate No. 1 Slope. A 21-ton electric motor transports the coal from No. 1 Carbondale to Powderly breaker. 3,500 feet of rope haulage operated by a 12x15 double drum engine installed for Eastside coal.

Jermyn Colliery.—Norwalk air compressor transferred from Coal Brook. Rock plane, 500 feet in length and 7 feet x 12 feet in area, driven from Bottom to Top Split Grassy vein. Rock slope from surface to Clark vein 7x12 feet in area and 180 feet in length.

White Oak Colliery.—Foundations for new breaker completed. Brick boiler house 88 feet x 50 feet, containing 4 Sterling 300 H. P. boilers, was finished. Built blacksmith shop 36 feet by 24 feet; car shop 48 feet x 30 feet; and supply house 20 feet x 40 feet. No. 6 engine plane extended 500 feet, operated by 14-inch x 20-inch engine. Drove manway for No. 3 Slope 200 feet and concreted top, bottom and sides.

#### HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—A new culm scraper line has been installed between Erie washery and the old Keystone culm bank, for the purpose of conveying the same to the washery for preparation.

A new concrete building has been erected for storing lime, cement, feed and hay.

Two air compressors have been installed within a corrugated iron building, adjoining the fire room, the compressed air to be used for drilling the rock in New County vein.

A new concrete mule barn of twenty stalls, feed room, etc., has been constructed near the foot of Erie shaft, replacing the outside barn on West Side.

A Sullivan undercutting coal machine has been installed in the New County vein, East Side. Several new counter headings have been completed in this section, doing away with less satisfactory haulage roads.

Considerable culm has been slushed into the Clark vein workings underneath the Lackawanna River.

#### SCRANTON COAL COMPANY

Riverside Colliery.—Two large locomotive type boilers were installed, displacing nine old cylinder boilers.

Raymond Colliery.—Breaker burned down January 22, 1911, and replaced by a modern breaker of 1,000 tons capacity. The new breaker, which resumed operations December 4, is equipped with the latest improved machinery for the preparation of coal, and has an annex where all the smaller sizes down to No. 3 buck is prepared.

## CONDITION OF COLLIERIES

## DELAWARE AND HUDSON COMPANY

Coal Brook.—Ventilation, drainage and general condition good.

Powderly.—Ventilation, drainage and general condition good.

Jermyn.—Ventilation, roads and drainage fair; condition as to safety good.

White Oak.—Ventilation good; drainage fair; other conditions good.

## HILLSIDE COAL AND IRON COMPANY

Eric.—Ventilation and general condition good.

## SCRANTON COAL COMPANY

Riverside.—Ventilation and general condition fair.

Raymond.—Ventilation and general condition good.

Black Diamond.—Ventilation and general condition fair.

## NORTHWEST COAL COMPANY

Northwest.—Ventilation, roads and drainage fair; other conditions good.

## MORSS HILL COAL COMPANY

Morss Hill.—Ventilation and general condition fair.

## CARBONDALE COAL COMPANY

Bolands.—Ventilation and general condition fair.

## HUMBERT COAL COMPANY

Sunnyside.—Ventilation bad; other conditions fair.

## ARCHBALD COAL COMPANY

Tappans.—Ventilation and other conditions fair.

## FALL BROOK COAL COMPANY

Murrins.—Ventilation and other conditions good.

## OUTLOOK COAL COMPANY

Outlook.—Ventilation and other conditions fair.

## WEST MOUNTAIN COAL COMPANY

West Mountain.—Ventilation and general condition good.

## LINCOLN HILL COAL COMPANY

Bartons.—Ventilation and general condition fair.

## IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY

**Coal Brook** Colliery.—The electric power plant was enlarged by the addition of a brick building 67x54 feet, and the installation of a 1000 K. W. generator, driven by a Corliss compound engine 24x44x42 inches. A Guibal fan, 12 feet in diameter, driven by a 30 H. P. electric motor was installed. A rock slope, 300 feet in length and

## CONDITION OF COLLIERIES

## DELAWARE AND HUDSON COMPANY

Coal Brook, Powderly, Jermyn and White Oak Collieries.—Ventilation, drainage and condition as to safety, good.

## SCRANTON COAL COMPANY

Raymond Colliery.—Ventilation, drainage and condition as to safety, good.

Riverside Colliery.—Ventilation good. Drainage and condition as to safety, fair.

## HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—Ventilation, drainage and condition as to safety, good.

## ARCHBALD COAL COMPANY

Tappans Colliery.—Ventilation bad in New County vein. Drainage bad. Condition as to safety, fair.

Ventilation good in Dunmore vein. Drainage fair. Condition as to safety, good.

## HUMBERT COAL COMPANY

Sunnyside Colliery.—Ventilation, drainage and condition as to safety, fair.

## WEST MOUNTAIN COAL COMPANY

West Mountain Colliery.—Ventilation, drainage and condition as to safety, good.

## FALLBROOK COAL COMPANY

Murrins Colliery.—Ventilation, drainage and condition as to safety, fair.

## IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY

**Coal Brook** Colliery.—Water course to Clinton colliery constructed a distance of 2,000 feet. Installed three 6½-ton electric motors and one 12-ton electric motor for handling coal. Engine plane in No. 21 tunnel, 2,000 feet long, under construction. Installed 16-ton steam locomotive for handling coal from Wilson Creek to the breaker.

Powderly Colliery.—Installed two 6½-ton electric motors with drums. Completed rope haulage in No. 1 tunnel, 3,500 feet long, and rope haulage in No. 1 slope, 1,800 feet long, also completed railroad from Powderly to Jermyn mines, outside. Installed one 21-ton steam locomotive for handling coal from mines to breaker.

Jermyn Colliery.—Finished new slope to bring coal from mines to surface, 350 feet long concreted on four sides, 9 feet by 11 feet, completed 150 H. P. electric hoist on engine plane No. 14. Conveyor line,

20 by 7 feet and built concrete fan drift connecting with upcast compartment of No. 4 shaft. The fan is driven by an 18 by 30 inch Hamilton Corliss engine, single. Completed reinforced concrete partition wall between the upcast and downcast compartments of No. 4 shaft, a distance of 680 feet. Commenced to build new wash house near No. 2 shaft to contain shower baths and 200 lockers.

**Coal Brook Colliery.**—Installed two 6.5-ton electric locomotives with drum attachment for hauling coal and a 10-foot steel Buffalo fan for ventilating No. 6 tunnel. Built an addition to the boiler house 51 by 56 feet. Installed a General Electric 1,000 K. W. generator, driven by a pair of engines, 24 by 44 by 22 inches. Installed a new engine house and a 20 by 24 inch engine for No. 1 haulage and a 21-ton locomotive for hauling coal from the mines to the breaker. No. 22 plane was driven 2,000 feet.

**Powderly Colliery.**—No. 1. Installed a 6½-ton electric locomotive with drum attachment for hauling coal inside. No. 9 plane was equipped with a 20 H. S. P. electric house. Powderly tunnel driven from the surface to the Clark vein, a distance of 600 feet.

**Jermyn Colliery.**—Installed a General Electric 25 K. W. generator, driven by a 22 by 22 inch engine, and built a brick addition to the power-house, 24 by 51 feet. Two 6.5-ton electric locomotives with drum attachment installed for mine work. Tunnel driven 200 feet from surface to Clark vein. Driving a tunnel from the surface to the Dunmore vein to be 300 feet in length when finished. It is about one-third completed.

**Gravity Slope Colliery.**—Completed a breaker, 92 by 114 feet with a capacity of 1,500 tons per day, to supersede the old White Oak breaker. A concreted washhouse, 16 by 50 feet, was built for Gravity slope. A wooden washhouse, 16 by 24 feet was built for No. 6 tunnel. Installed a 16-ton locomotive for hauling coal from the mines to the breaker. Completed a water tight pump room, 20 by 60 feet, and a chute 14 by 18 feet. Installed two centrifugal electrically driven pumps with a capacity of 2,500 gallons each. Completed an engine house, with 14 by 20 foot engines, for lowering coal on No. 8 plane. Installed four 300 H. P. Stirling boilers in brick house and one generator 250 K. W. at breaker, and furnished power for pumping plant and light for breaker. Completed one engine house, 20 by 24 feet, and installed a 14 by 20 foot Flory engine on No. 8 plane and No. 12 tunnel.

### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the Carbondale High School Building, June 23 and 24. The Board of Examiners was composed of P. J. Moore, Inspector; Richard Beers, Superintendent, Carbondale; John F. Boland, Miner, Carbondale, and David Evans, Miner, Olyphant.

The following persons passed a satisfactory examination and were granted certificates:

#### MINE FOREMEN

Thomas Davies, Charles F. Moore, Carbondale; Thomas J. Sullivan, Thomas H. Thomas, Patrick Cowley, Olyphant; Edison Thomas,



14 plane, New County vein, Grassy Island No. 2 shaft. Installed one 18 by 36 inch Dickson first motion hoisting engine on surface, Dunmore vein, No. 4 plane, Grassy Island No. 2 shaft.

Coal Brook Colliery.—Outside: Changed main and steamboat rolls to slow-gearred rolls. Installed in the power plant a 1600 KVA 2300 volt, 25-cycle, 3-phase, G. E. generator, with a 28 by 44 by 42 Hamilton-Corliss compound non-condensing engine, and one 600 KW G. E. frequency changer, changing 25 cycle to 60 cycle, 2300 volts, 3-phase.

Powderly Colliery.—Outside: Installed 6 Wilmot jigs in the east end of the breaker. Equipped each of the six boilers in boiler plant with Coppus blowers.

Jermyn Colliery.—Outside: Boiler plant was enlarged by the installation of 926 HP B. and W. Stirling boilers. An electric hoist was installed No. 8 plane, 730 HP, 250 volt, direct current. Also installed one 250 G. E. Co. 250 KW, 250 volt D. C. belt driven generator, and a 22 by 22 McEwen engine in power house. Installed one Joplin jig in washery.

#### SCRANTON COAL COMPANY

Raymond Colliery.—Two 300 horse power boilers were installed.

#### HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—A rock tunnel, 7 feet by 12 feet and 400 feet in length, was driven from the Clark vein to the New County vein, to facilitate inside transportation. Many of the motor roads have been regraded.

#### ARCHBALD COAL COMPANY

Tappans Colliery.—No. 2 New County slope has been extended a distance of 2500 feet on a gradient of 7 degrees, and two rock slopes were driven from this slope a distance of 300 feet, each, to reach the coal in the Dunmore veins on the Archbald anticlinal. A new slope has been started in the Dunmore vein and is now down a distance of 200 feet on a gradient of 4 degrees.

### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen, was held in Watt's Hall, Carbondale, May 18 and 19. The Board of Examiners was composed of P. J. Moore, Mine Inspector, Carbondale; Richard Beer, Engineer, Carbondale; John F. Boland, Miner, Carbondale; David Evans, Miner, Olyphant.

The following persons passed a satisfactory examination and were granted certificates:

#### MINE FOREMEN

Frank J. Hevers, John J. Ford, Patrick J. O'Rourke, Michael F. Brennan, Martin F. Murphy, Archbald; William Loftus, Olyphant; Thomas H. Williams, Carbondale; Patrick J. Murray, Peckville; Martin J. Loftus, Jessup.

## IMPROVEMENTS

### DELAWARE AND HUDSON COMPANY, INSIDE HUDSON COAL COMPANY, OUTSIDE

Powderly Colliery.—No. 9 tunnel, from Clark to Top Clark was extended 400 feet.

Coal Brook Colliery.—The breaker was remodeled to increase capacity. A rock plane 175 feet long was driven from 3rd vein to Bottom Clark; No. 21 plane was extended 1,600 feet and equipped with electric hoist; 8,700 feet pipe line laid from Wilson Creek to breaker, for water supply.

Four 7-ton electric locomotives were installed to improve transportation.

Jermyn Colliery.—No. 17 rock plane, 350 feet long, was driven from Grassy to Top Grassy. No. 11 tunnel, 150 feet long, from Grassy to Top Grassy. No. 12 tunnel, 260 feet long, extended from Clark to Top Clark, Airshaft, surface to Top Clark, 60 feet.

Gravity Slope Colliery.—A rock slope, 80 feet long, was driven through fault in Archbald bed. Tunnel from surface to Dunmore bed, 325 feet; rock plane through fault in Dunmore bed, 250 feet; airshaft from surface to Archbald bed, connected. An 800-gallon electric pump was installed in No. 3 slope, Archbald bed, and two 10-ton electric locomotives in Dunmore bed.

## MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Carbondale High School, Carbondale, Pa., June 6 and 7. The Board of Examiners was composed of the following persons: P. J. Moore, Mine Inspector, Carbondale; Richard Beer, Superintendent, Carbondale; John F. Boland, Miner, Carbondale; David Evans, Miner, Blakely.

The following persons passed a satisfactory examination and were granted certificates:

### MINE FOREMEN

Michael Munley, Jessup; Wade F. Rodham, Scranton; James T. Stephens, Peckville.

### ASSISTANT MINE FOREMEN

Lewis D. Jones, Olyphant; Frank Moon, Jermyn; Anthony J. Conaboy, Thomas G. Williams, John W. Williams, Leo Healey, Joseph Surdoval, Carbondale; Edward J. Magnar, Jessup; Isaac Benjamin, Scranton.

## CONDITION OF COLLIERIES

### DELAWARE AND HUDSON COMPANY

**Coal Brook,** Gravity, Jermyn and Powderly Collieries.—Ventilation, roads, drainage and condition as to safety, good.

### TEMPLE COAL COMPANY

Sterrick Creek Colliery.—Ventilation, roads, drainage and condition as to safety, good.

### SCRANTON COAL COMPANY

Raymond and Riverside Collieries.—Ventilation, roads and drainage, fair. Condition as to safety, good.

### ARCHBALD COAL COMPANY

Tappans Colliery.—Ventilation, roads, drainage and condition as to safety, good.

### HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

### HUMBERT COAL COMPANY

Sunnyside Colliery.—Ventilation, roads, drainage and condition as to safety, fair.

### WEST MOUNTAIN COAL COMPANY

West Mountain Colliery.—Ventilation, roads, drainage and condition as to safety, good.

### FALL BROOK COAL COMPANY

Murrin's Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

### MAXEY COAL COMPANY

Tipperary Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## IMPROVEMENTS

### DELAWARE AND HUDSON COMPANY

Coal Brook Colliery.—Rock plane was driven to Bottom Clark vein; distance 140 feet. Shaft was sunk from surface to Top Clark vein; distance 50 feet.

Gravity Slope Colliery.—Rock tunnel was driven from No. 3 Dunmore to No. 2 Dunmore vein; distance 117 feet. A tunnel has also been driven from and to the same vein; distance 150 feet. Installed an electric hoist in No. 6 Slope and No. 12 Plane.

## CONDITION OF COLLIERIES

## HUDSON COAL COMPANY

**Coal Brook** Colliery.—Ventilation, roads, drainage and condition as to safety, good.

Gravity Slope, Jermyn and Powderly Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## TEMPLE COAL COMPANY

Sterrick Creek Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## SCRANTON COAL COMPANY

Raymond and Riverside Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## ARCHBALD COAL COMPANY

Tappans Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## HUMBERT COAL COMPANY

Sunnyside Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## WEST MOUNTAIN COAL COMPANY

West Mountain Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## FALL BROOK COAL COMPANY

Murrins Colliery.—Ventilation, roads and condition as to safety, good.

## FALLS COAL COMPANY

Falls Colliery.—Ventilation, roads, drainage and condition as to safety, fair.

## UNITED COLLIERIES COMPANY

Nos. 1 and 2 Collieries.—Ventilation, roads, drainage and condition as to safety, fair.

## IMPROVEMENTS

## HUDSON COAL COMPANY

Coal Brook Colliery.—Rock plane was driven from the 3rd Bed to the Bottom Clark, 148 feet long; rock slope was driven from the Bottom Clark to the 3rd Bed, 179 feet long, and air shaft for same 32 feet deep. Installed mixed pressure turbo generator and cooling tower, also two 396-hp. Babcock and Wilcox boilers with Coxe stokers.