

Description.—The coal mined here is cleaned and prepared at No. 6 breaker, which is located 1,800 feet north-west. They employ 24 miners, 25 laborers, 5 drivers, 2 door-boys, 4 company men, in mine; 2 head and plate men, 1 driver, 1 company man, 2 mechanics, outside; in all, 66 men and boys. They are working the Pittston or 14 feet vein; average thickness, 10 feet; they drive headings 10, air-ways 15, and chambers from 20 to 24 feet wide. The roof is good slate; they have pillars to sustain it from 14 to 18 feet wide. They leave cross entrances for the purpose of ventilation, from 18 to 50 feet apart.

Ventilation.—The ventilation is produced by steam and the action of the atmosphere. They have air-doors and gates on the main traveled road, so as to control the air currents and force the air to all the working places. They have double doors on main traveled roads, with attendants, so as to keep them closed. The main doors are hung so that they will close of their own accord. The air is conducted to the face of the workings in one volume. They work 60 men in this volume. The amount of ventilation has been measured and reported according to law. The amount of ventilation averages 16,500 feet per minute. The in-take is located at shaft No. 5 and slopes Nos. 3 and 4; area about 100 feet. The out-cast is in main shaft; area about 100 feet.

Machinery.—They use 2 hoisting carriages in the shaft; one is a safety carriage with all the modern improvements. They use flanges of sufficient dimensions attached to the sides of the hoisting drum; they have an adequate break on hoisting drum. The strength of ropes, links, chains and connections are tested every day by hoisting coal. They have bridle chains attached to the safety carriage. They do not allow more than 10 men to ride on any wagon or cage at one time. The boilers, feed-pipes, water-gauge cocks, &c., have been cleaned and examined, and reported in good condition, according to law. They have a steam gauge to indicate the pressure of steam per square inch. They use 1 steam engine of 40-horse power.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change their clothes in; they have no noxious or poisonous gasses involved in this mine; the mining boss and engineer seem to be practical, competent and sober men; the parties having charge know their duty in case of death or serious accident; the mine is in a good, safe, working condition; the shaft-landings are protected by safety gates; the shaft is located 1,500 feet south at No. 5 shaft.

Note.—The mines operated by the Pennsylvania coal company are worked regularly and systematically.

No. 7 SHAFT.

This shaft is located in Jenkins township, about 1½ miles south-west of Pittston, and about ¼ mile south-east of the Susquehanna river. It is 160 feet to the Checkered vein and 312 feet to the Pittston or 14 feet vein. This mine is operated by the Pennsylvania coal company. Wm. Law is general mine superintendent, Wm. Reed is mining boss.

Description.—There is no breaker attached to this mine, but they have large schutes attached to shaft tower; they mine and clean 350 tons of coal per day; they employ 40 miners, 44 laborers, 14 drivers, 6 door-boys, 17 company men, in mine; 4 slate pickers, 16 company men, 3 mechanics and 1 boss, outside; in all, 145 men and boys; they are working the Pittston or 14 feet vein; average thickness, 12 feet; they drive headings 10 feet, air-ways 15 feet, and chambers 24 feet wide. The nature of the roof is coal and rock; they leave pillars to sustain it, from 15 to 25 feet wide; they have cross entrances, for the purpose of ventilation, from 18 to 30 feet apart; they have 2 gravity planes in the mine operated, on the same principle as they are in No. 6 shaft; one is 350 and the other 196 feet long.

Ventilation.—Ventilation is produced by means of a suction fan; at No. 4 shaft they have air-doors and gates in the main traveled roads, so as to control the air currents and force the air to the face of all the working places; they have no double doors or traveled roads; they have attendants at all main doors, so as to keep them closed; the air is conducted to the face of the workings in 2 splits; they work 8 men in one split and 76 men in the other; the amount of ventilation has been measured and reported monthly, according to law; the in-take is located at No. 7 shaft; amount of air per measurement is 25,200 feet per

minute; the out-cast is located at No. 4 shaft; the area of the in-take is 100 cubic feet and the area of the out-cast is 81 cubic feet; ventilation is good.

Machinery.—They have 2 hoisting carriages in the shaft; one is a safety carriage with all the modern improvements; the ropes, links, chains and connections are in good condition. They use a metal speaking tube in the mine. They have flanges of sufficient dimensions attached to the sides of hoisting drums; they have adequate breaks on hoisting drums; the boilers, feed-pipes, water-gauge cocks, etc., are in good condition; they use a steam gauge to indicate the pressure of steam per square inch; they use 2 hoisting engines=160-horse power.

Remarks.—They have furnished a map of mine; they have no house for men to wash or change their clothes in; they have second openings at Nos. 4, 5, 6 and 11 shafts and No. 2 slope, as all these works are connected together; there are no boys working in the mine under 12 years of age; they have an adequate amount of ventilation in the mine to expel therefrom all noxious or poisonous gases; the mining boss seems to be a practical, careful and competent man; he has an assistant; they examine the mine every morning before the men enter to work, and every evening to see that the mine doors are all closed; the engineers are experienced, competent and sober men; the shaft-landings are well secured by safety gates.

No. 4 SHAFT.

This shaft is located in Pittston borough, and part of the workings are located in Jenkins township, 1 mile south-west of Pittston and $\frac{1}{2}$ mile south-east of the Susquehanna river. This shaft is operated by the Pennsylvania coal company. This shaft is 192 feet deep; size, 16 feet by 9 $\frac{1}{2}$ feet. Andrew Bryden is general mine superintendent, and Peter P. Daley is mining boss.

Description.—They have no breaker connected with this mine, but they have large chutes for loading large railroad cars. The coal from this mine is prepared at No. 2 breaker, Pittston, and at the screens in Dunmore; they mine about 350 tons of coal per day; they employ 52 miners, 50 laborers, 15 drivers, 2 door-boys and 8 company men, in the mine; 13 company men, 2 mechanics and 1 boss, outside; in all, 143 men and boys. They are working the 14 feet vein; average thickness, 11 feet; they work headings 10, air-ways 15, and chambers from 20 to 26 feet wide; they leave pillars from 14 to 20 feet wide to sustain the roof; they leave cross entrances from 18 to 50 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere; the in-take is located in main shaft; it contains an area of 95 feet; the up-casts are located in No. 7 shaft and No. 4 slope at present; they contain an area of 95 feet; the average supply of fresh air is 15,500 cubic feet per minute; the main doors on headings and air-ways are hung so that they will close of their own accord; they have attendants at all main doors to keep them shut, so as to assist the ventilation; they have double doors in main traveled roads, and an extra one in case that any of the others should get broken; the air is circulated to the face of the workings in 3 splits; they employ 52 men in one, 16 in the other and 34 in the other; the amount of ventilation has been measured and reported according to law; ventilation is good; they are putting up a new fan which is not in operation yet, the up-cast then will be in main shaft.

Machinery.—The engines in use in this colliery are 2 40-horse power and 2 10-horse power fan engines, and 2 10-horse power engines used for sinking the new slope. They have a metal speaking tube in the shaft; they have flanges of sufficient strength and dimensions for safety, attached to the sides of their hoisting drums; they have adequate breaks on their hoisting drums; the links, chains, ropes and connections, are in good condition; the boilers have been cleaned, examined and reported in good condition, according to law; they have a steam gauge and safety valves for safety and to indicate the pressure of steam.

Remarks.—They have furnished a map of the mine; they are connected with the workings of No. 7 shaft and No. 4 slope, which can be used as a second opening; they have no house for men to wash or change their clothes in; the mining boss is 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 comply, generally, to the requirements of the law; the shaft-landings are protected by safety-gates.

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 persistent 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.

by natural ventilation by driving openings to the surface. A new breaker was erected to prepare the coal from these openings. It is a substantial building with first-class machinery. All the dangerous parts are fenced and boxed off. The breaker started to prepare coal in the month of November, 1886.

The Pennsylvania Coal Company built a new breaker at Port Griffith, in Jenkins township, to prepare the coal from shafts Nos. 4 and 7, slope No. 4 and tunnel No. 1. It is a large breaker and has the latest improved machinery. It has a capacity for cleaning a large amount of coal per day. The breaker started up in November, 1886.

Colliery Improvements During 1886.

The improvements made in the different collieries of this district have been somewhat more extensive this year than last. Some of the collieries are old ones, and have been worked very extensively; therefore, it has caused the companies to sink to lower veins to get their collieries in condition to maintain the present shipments of coal from them.

Pennsylvania Coal Company.

This company sunk a new shaft, in Old Forge township, Lackawanna county, to the bottom of the Powder Mill vein, a depth of 145 feet, sectional area, 384 feet. It is used to hoist coal, which is taken to the Old Forge breaker for preparation for market. A new inside plane was driven at the bottom of the shaft, 125 feet in length, with a sectional area of 208 feet, and a grade of $12\frac{1}{2}$ degrees.

In No. 10 shaft, a new slope was sunk (600) six hundred feet, and driven up a new plane, a distance of (150) one hundred and fifty feet, to maintain the present out-put of coal

No. 1A breaker, situated in Jenkins township, was burned down on the evening of November 18, 1886, with all the surrounding buildings. The breaker was a new one, and started up on August 7, 1886. The fire is supposed to have started in the boiler-room. The night engineer had occasion to go to look after a pump some distance from the boiler-house; when he came back the fire had got such headway that he could not put it out. One of the boilers had a defective sheet next the fire, which sprung a leak, throwing the fire out of the furnace door and setting fire to the building.

Delaware and Hudson Canal Company.

At the Laurel Run colliery, a tunnel was driven from the bottom split of the Baltimore vein to the top split, a distance of 110 feet, to be used to transport coal; sectional area, 70 feet. They are now driving their second opening for the same purpose.

Lehigh Valley Coal Company.

At the Mineral Spring colliery, a tunnel was driven from the bottom

Undoubtedly the cause of the explosion was that when the gas became ignited from the previous blast, a small feeder was left burning unseen behind the brattice and the brushing brought the gas down in contact with it. The quantity of gas which exploded in the place was very small, but the place being narrow, the men received all there was of it, with no chance of escaping.

RECORD OF COLLIERY IMPROVEMENTS DURING 1893.

Pennsylvania Coal Company.

The new Barnum breaker, which was mentioned in my last report as being in course of construction, was completed and started to prepare coal for market in June, 1893. It is a large and commodious structure, having all the latest improved machinery.

At No. 7 colliery of this company a new air shaft, 12x12 feet, was sunk from the surface a distance of 331 feet to the checker seam, to be used for ventilation. A rock tunnel was also driven from the Pittston to the Marcy seam, a distance of 80 feet, for transportation of coal. In the Hoyt shaft a rock tunnel was driven from the Marcy to the Pittston vein, a distance of 480 feet, sectional area, 91 feet, to be used for the transportation of coal.

At No. 10 shaft a new exhaust fan, 20 feet in diameter was erected on the air shaft, in place of the one removed, it being too small; it will ventilate the workings of the red ash seam.

In No. 14 breaker an 8-foot fan was erected to take the coal dust from the breaker, which was greatly needed, as the coal coming to this breaker was very dry, so that the men and boys were terribly annoyed by the dust.

Lehigh Valley Coal Company.

This company has sunk an underground slope in their Oakwood shaft from the Checker to the red ash vein, a distance of 631 feet, on a grade of 30 degrees; sectional area, 10x13 feet. This slope opened up a large field of good coal in this vein, which is 14 feet in height.

In the Maltby Colliery the company has put in the "tail rope" system on their inside slope, which works very satisfactorily. A pair of first motion engines are situated close to the foot of the shaft which does the hoisting on the slope. The breaker has been rebuilt and enlarged, so that it will have a capacity of 1,500 tons of coal per day. The most approved machinery has been placed in it to clean and prepare the coal. An endless chain haulage, of about 500 yards in length, has been placed on the outside from the breaker to the shaft, which does away with all mules that were used heretofore.

A rock tunnel was driven in the Wyoming Colliery of this company from the five-foot to the Hillman seam, a distance of 195 feet, with a sectional area of 8x12 feet, to be used for transporting coal.

dips in the several veins, which would not flow to the tanks, from 5,000,000 to 10,000,000 gallons, making a total of about 85,000,000 gallons corresponding very closely to the amount estimated as put in in 1893.

Regarding the Hallstead. The water started to flow into the mine on the morning of September 21st, 1894, and by night was flowing at from 2,500 to 3,000 gallons per minute. This inflow was caused by a cave which extended over about 10 acres, and the cracks from which were visible on the surface. As the ground affected is all underlain with water bearing gravel through which the cracks extended, it seems probable that the water comes through this gravel, partially from the river and partially from the small streams which disappeared near the cracks on the surface. These streams have been carried in flumes for some distance, and this seems to have decreased the flow in the mines.

In order to handle the water, it was necessary to introduce nine pumps of various sizes, 250 horse power of boilers, lay about 5,000 feet of ten-inch and twelve-inch column pipe, and 6,000 feet of five-inch and six-inch steam pipe, in addition to the pumping plant previously in use at the colliery.

These pumps were started one week after the breaking in of the water and steadily lowered the water which had filled up the workings below, and part of the No. 9 level. The colliery resumed the shipment of coal on November 21, 1894. The flow has decreased so that it does not now average over 1,200 gallons per minute.

Colliery Improvements During 1894.

Some very important improvements were made at several of the collieries during the year 1894, a few of which are described in detail as follows:

Improvements by the Pennsylvania Coal Company.

At No. 10 shaft, Jr., a 20-foot Guibal fan was erected run by a horizontal engine 14x30 inches, under a speed of 50 revolutions and half-inch water gauge, exhausting 75,000 cubic feet of air per minute.

At No. 7 shaft a 20-foot Guibal fan was erected run by a horizontal engine, 16x30 inch, directly connected, which gives very good results.

In the Hoyt shaft the second opening from the red ash to the Marcy seam was driven through the rock strata between the seams on a grade of 27 degrees a distance of 270 feet, with a sectional area of 84 feet.

In both of these shafts electric motors, about six in number are used for transportation on main roads. Condition of colliery, good.

FIRE IN NUMBER 7 SHAFT, PENNSYLVANIA COAL COMPANY

On the morning of December 3, a fire was discovered in Number 7 Shaft 14 Foot vein west level heading, on south pitch in chambers, just inside of Marcy vein tunnel. After fighting the fire with hose, etc., for a few days, it was decided to build dams and flood the workings with water from bore holes going down on highest point above the fire. The dams were started on December 9, and finished December 13, about 100,000 bricks having been used. The first bore hole was started December 11, the second December 13, and both were finished in 5 days, working two shifts of 10 hours each.

On December 28 when pressure was $21\frac{3}{4}$ pounds, it was decided to strengthen the dams, which was done by timbering and lagging and filling in between pillars and lagging with $2\frac{1}{2}$ feet of concrete. The depth of the bore holes was 247 and 248 feet, respectively. Highest pressure on dams was reached January 8, at 2 A. M. with 65 pounds pressure to the square inch.

On January 12, 1907, at noon, it was decided to make an opening in one of the dams to ascertain if the fire was out. On January 14, a hole had been broken through the wall and an investigation made and declared that the fire was out.

Condition of the colliery, good.

LEHIGH VALLEY COAL COMPANY

Mineral Spring Colliery.—Additional machinery was placed in Breaker consisting of new elevator conveyor lines, mechanical pickers, etc., to handle culm bank coal in reclaiming banks on west side of breaker.

New standard fence complete around the property.

Number 35 Tunnel finished through Coal Brook anticlinal.

Number 32 Tunnel finished through Mineral Spring anticlinal.

Numbers 38 and 39 Tunnels also finished through such anticlinal.

A pair of 20x30 inch second motion friction drum hoist engines are being installed on surface in concrete brick house for Number 8 Inside Slope Red Ash vein, rope passing through 6 inch cased bore hole.

A new brick-concrete washhouse completed at Coal Brook.

A new brick-concrete washhouse completed at Mineral Spring.

A new brick supply house and blacksmith shop completed at Coal Brook.

Silting has been extensively carried on throughout the year in the Baltimore and Checker veins Mineral Spring. Condition of colliery, good.

Heidelberg Number 1 Colliery.—Inside. A 4,500 foot engine plane was driven and graded for economical transportation in Red Ash vein.

A 1,400 foot gravity plane was installed in Marcy vein, to which a new tunnel, 370 feet, was driven to Clark vein as a tributary. A 45 foot air shaft acting as second opening was also completed.

The ventilation of the Marcy and Clark veins was improved by an air shaft from the surface.

Robbing was extensively carried on in Red Ash vein.