

1 boss, outside; in all, 64 men and boys; they are working the Pittston or 14 feet vein of coal; average thickness, 9 feet; they work headings 10, air-way 15, and chambers from 20 to 24 feet wide; they leave pillars from 14 to 18 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 safe working condition.

*Ventilation.*—The ventilation is produced by means of a furnace, viz: There is a brick partition in second opening and the furnace is on one side of it and steps for men to travel in on the other side; the in-take is located in main shaft; it contains an area of 100 feet; the up-cast is located in air-shaft; it contains an area of 60 feet; the average supply of fresh air is 20,000 cubic feet per minute; there is noxious, poisonous and inflammable gas evolved in the mine; the mine is examined every morning before men are allowed to go to work, and every evening to see that the main doors are all closed; 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 ventilation has been measured and reported according to law; ventilation is good.

*Machinery.*—They use 1 hoisting engine, 40-horse power; they have a metal speaking-tube in the shaft; they have a safety-carriage with all the modern improvements; they have flanges of sufficient strength and dimensions for safety, and an adequate brake, attached to their hoisting drums; the main links, chains and connections are in good condition; the boilers have been cleaned and 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 mine; they have a second opening located 500 feet from main shaft; they have a house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; he has a fire boss to assist him; there are no boys working in the mine under 12 years of age; they do not allow any person to ride on loaded carriages in the shaft; they do not allow more than 10 men to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft-landings are protected by safety-gates; they do not work more than 50 persons in one split of air.

#### No. 10 SHAFT COLLIERY.

This colliery is located in Pittston borough, and lying one-half of a mile south-east of the Susquehanna river. The shaft is 99 feet deep to the Checkered vein and 150 feet deep to the Pittston or 14 feet vein; it is 12 feet wide by 27 feet long; it is operated by the Pennsylvania coal company. Andrew Bryden is general mine superintendent and William Abbott is mining boss.

*Description.*—There is a double breaker connected with these mines; it is connected to the shaft tower by a trestling 50 feet long; they mine and prepare about 500 tons of coal per day; they employ 82 miners, 72 laborers, 20 drivers, 7 door-boys and 18 company men in the mines; 61 slate pickers, 14 head and plate men, 2 drivers, 14 company men, 13 mechanics and 2 bosses outside; in all 305 men and boys. The character of the workings is pillar and chamber; they are working the Checkered and Pittston veins of coal: average thickness of the Checkered is 6 and of the Pittston vein 8½ feet; they are working headings 10, air-ways 15 and chambers from 20 to 26 feet wide; they leave pillars from 14 to 18 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 miners are in good working condition; they are working a slope in the Checkered vein.

*Ventilation.*—The ventilation in the Checkered vein is produced by a furnace and in the Pittston vein by the action of the atmosphere; the intake is located in the main shaft for the Checkered vein, and in No. 8 shaft and second opening for the Pittston or 14 feet vein; the upcast for the Checkered vein is in the furnace air shaft, and for the Pittston or 14 feet vein in No. 8 shaft in winter and in No. 3 shaft in summer; the amount of fresh air in the Checkered vein is 23,000 and in the Pittston or 14 feet vein 23,000 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 an attendant at main doors; the air is conducted to the face of the

workings in a systematic manner; the amount of ventilation has been measured and reported according to law; ventilation is good.

*Machinery.*—The engines in use in this colliery are one hoisting engine of 40-horse power, one pumping and hoisting engine of 40-horse power, one breaker engine of 40-horse power, one steam pump of 30-horse power and one slope engine of 30-horse power. They have two metal speaking tubes in the shaft; they have a safety carriage with all the modern improvements on it; they have flanges of sufficient strength and dimensions for safety and an adequate brake attached to the sides of the hoisting drums; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and 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 mines; they have second openings for both veins located at various distances from the main opening; they have a house for men to wash and change their cloths in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded cars in the shaft or on the slope; they do not allow more than ten men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; they have four hoisting carriages in the shaft, two to each vein; they have two safety-carriages with all the modern improvements, one to each vein; they have a man and mule way from the surface to both veins; all parties working in the mines go in and out by this passage; the shaft landings are protected by safety-gates; the breaker machinery is fenced and boxed off so that operatives are safe.

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#### NO. 2 BREAKER, PITTSTON.

This breaker is located in Pittston borough, at the head of No. 2 plane. They break, screen and prepare the coal here from the different shafts around Pittston that have no breaker connected with them; they employ 38 slate pickers and 14 men; in all 52 men and boys.

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#### NO. 8 SHAFT COLLIERY.

This shaft is located in Pittston township, and lying 1 mile south-east of the Susquehanna river; it is 68 feet deep to the Checkered vein, and 136 feet deep to the Pittston or 14 feet vein; size of shaft is 14 feet long and 9½ wide. This mine is operated by the Pennsylvania coal company. Andrew Bryden is general mine superintendent and James Moffatt is mining boss.

*Description.*—There is a breaker connected with this mine about 400 feet north of the shaft; they mine and prepare about 450 tons of coal per day—350 tons from the shaft and 100 tons from No. 6 slope; they employ 52 miners, 47 laborers, 13 drivers and 7 company men, in the mine; 42 slate pickers, 12 head and plate men, 2 drivers, 13 company men, 5 mechanics and 2 bosses, outside; in all 195 men and boys. This mine is worked by 4 planes and 1 slope; 1st plane is 400, 2d plane 230, 3d plane 300, and 4th plane 440 feet long; the slope is 440 feet long. The character of the workings: They drive headings and air-ways at water level, and they open chambers off the air-ways to the pitch; they are working the Pittston vein of coal; average thickness, 10 feet; they work headings 10, air-ways 15 and chambers from 20 to 24 feet wide; they leave pillars from 14 to 18 feet to sustain the roof; they leave cross entrances from 20 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 intake is located at shafts Nos. 10 and 3 in the winter time, and in No. 6 slope and main shaft in the summer time; the intake in Nos. 10 and 3 shafts each contain an area of 100 feet; the area of main shaft is 100 feet, and No. 6 slope contains an area of 54 feet; the average supply of fresh air is 20,650 cubic feet per minute;

angle of inclination is  $9^{\circ} 35'$ . The slope was driven part of the way through coal, at a cost of \$364, but there were  $28\frac{3}{4}$  yards of rock to cut, from nought up to eight feet, which cost \$283 33, and 77 yards driven through sandstone, which cost \$3,080. The whole cost for sinking the slope was only \$3,952 33. They have a pair of engines, 13-inch cylinder and 18-inch stroke; estimated horse power, 50; the size of their drum is six feet diameter, which has an approved brake attached to it. There is no second opening to the slope, but they are driving for one toward No. 1 drift, and expect to make a connection soon.

#### OTHER NEW OPENINGS AND CONNECTIONS.

The Delaware, Lackawanna and Western railroad company have made connections between the Hampton shaft and the Oxford shaft, at Hyde Park, and between Tripp's slope and the Brisbin shaft, in the Third ward, Scranton. They have also sunk an air shaft, at Hyde Park, into the workings of the Oxford shaft, and connects also with the Hampton shaft workings. A fan is to be placed at this air shaft which will assist in ventilating both collieries named.

The Pennsylvania coal company have completed a new slope at No. 1 tunnel, in Pittston township, which is intended for hoisting coal. They have also made a second opening for No. 4 slope, in Jenkins township, which is to be used also for ventilation; and the workings of old No. 10 shaft in the 14-foot seam, have been connected with the new No. 10 shaft, in Pittston. No. 2 shaft, Dunmore, was sunk to the lower seam.

The Delaware and Hudson canal company have made a connection, in the 14-foot seam, between Marvine and Leggetts Creek shafts, Providence; and at No. 1 shaft, Carbondale, an air shaft has been sunk, and two more air shafts at No. 3 shaft, and still another at the Coal Brook colliery. These air shafts are only poor-make shafts, unless mechanical means are used to produce ventilation. There are too many of them in Carbondale. What is needed there is a system of air courses inside of the collieries.

At the Filer colliery, Winton, a drift has been driven from a ravine into the workings, for a traveling way for the men to go to and from their work. A new drift has been opened at the Greenwood colliery for mining coal, and the same company have made an additional opening for coal at the Sibly colliery, in Old Forge township. An opening has been made at the Green Ridge slope for ventilation. The above are all the openings and connections made in the district during the year, so far as I am informed.

#### IDLE AND ABANDONED COLLIERIES.

The Archbald shaft, Lackawanna township, and Oxford shaft, Hyde Park, owned by the Delaware, Lackawanna and Western railroad company, were idle all through the year; the last work done at the Hyde Park shaft was done in February, and the Scranton coal company's drifts at Bellevue were idle. Bellevue slope and shaft worked only  $22\frac{1}{2}$  days.

No. 1 shaft, Pittston township, owned by Pennsylvania coal company, was idle; No. 2 and No. 3 shafts were abandoned as hoisting shafts, and are now used as pumping shafts.

The Marvine shaft, Providence; Powderly slope, Carbondale township, and Breaker, Forrest and Jefferson tunnels, Carbondale City, all owned by the Delaware and Hudson canal company, were idle.

The following collieries have also been idle: Rolling Mill colliery, Scranton, consisting of a slope, tunnel and drift; the Ontario colliery, Pleasant Valley, and the Heidelberg colliery, Pleasant Valley. Spring Brook No. 1

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



At No. 9 colliery, the hoisting-shaft was sunk from the 14-foot to the Red Ash seam, a distance of 300', which opens a large area of good coal for this colliery.

In No. 10 shaft, a tunnel was driven through an anticlinal 428' with a sectional area of 84'; between this and No. 9 shaft in the Marcy vein it will be used for transporting coal.

In the Hoyt a tunnel was driven from the foot of the shaft in the 14-foot vein to the Marcy, a distance of 300', which opens a large field of good coal. A new slope is being sunk in the Marcy seam to connect the ventilation.

Shaft No. 4, which has been idle since 1886, has been sunk from the Marcy to the Red Ash seam 211'. The air connections have been completed between the shafts in both veins. A new 20-foot fan has been erected on the new shaft sunk in 1888, to ventilate the workings of both veins. The coal hoisted from these shafts will be taken to the Ewen breaker to be prepared for market.

*Lehigh Valley Coal Company.*

The Heidelberg slope No. 1 has been extended through a rock-fault 450', sectional area 7'x12', with a gradient of 16°, which opens a large field of good coal for this colliery. The second opening is now in progress, being rapidly driven to completion, when a new fan will be erected thereon to furnish ventilation.

*Delaware, Lackawanna and Western Railroad Company.*

At the Hallstead colliery a new shaft 10'x12' has been sunk on the west side of the Lackawanna river from the surface to the Red Ash seam, a distance of 279', to be used for a second opening and for pumping water from the mine. A new 16-foot open fan was erected on the old second opening, close to the hoisting-shaft. This makes the second fan used in ventilating this colliery, and it gives general satisfaction.

The new Pettebone shaft of this company was completed to the Red Ash seam, which was cut at a depth of 1,126'. The air-shaft cut the Red Ash seam at a depth of 1,143'. The both shafts have been connected in the bottom seam. A new 17-foot open fan was erected on the main shaft. These shafts open an extensive field of good coal. A pair of direct-acting hoisting engines were placed to hoist therefrom. A new breaker is in the course of erection at this writing, which is expected to be ready to prepare coal for market in the month of July, 1890.

*Newton Coal Company.*

At the Twin shaft a new 24-foot fan was erected to ventilate the workings of the Red Ash vein. This makes the second fan erected on this colliery.

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.



## HILLSIDE COAL AND IRON COMPANY

Consolidated slope.—Condition as to safety good, drainage fair, ventilation fair.

Consolidated shaft.—Condition good as to safety, drainage and ventilation.

Butler, Checker and Marcy slopes and Thomas shaft.—Condition good as to safety, drainage and ventilation.

Fernwood Slope and Tunnel.—Condition as to safety good; drainage and ventilation fair.

## DELAWARE AND HUDSON COMPANY

Baltimore tunnel.—Condition good, ventilation and drainage good.

Baltimore No. 2 shaft.—Condition, drainage and ventilation good.

Baltimore No. 5.—Condition, drainage and ventilation good.

## HUDSON COAL COMPANY

Pine Ridge shaft.—Condition fair as to safety, drainage and ventilation.

Laurel Run.—Condition as to safety good, drainage and ventilation fair.

Lafin shaft and tunnel.—Condition as to safety good, drainage and ventilation fair.

## TRADERS' COAL COMPANY

Ridgewood slope.—Condition as to safety good, drainage and ventilation fair.

## AVOCA COAL COMPANY, LIMITED

Avoca shaft.—Condition as to safety good, drainage fair, ventilation bad.

## CLARENCE COAL COMPANY

Clarence slopes.—Condition as to safety good, drainage and ventilation fair.

## IMPROVEMENTS

## PENNSYLVANIA COAL COMPANY

Pennsylvania.—At **No. 10 Colliery** a power plant for electric haulage and lighting has been installed; a McEwen 20x18 inches centre crank engine directly connected to 215 K. W. compound generator of the general electric type; four 7½ ton electric mine locomotives to be used in the Marcy and Red Ash veins.

A tunnel was driven from No. 10 Marcy to the Pittston vein in No. 9 shaft to transport the coal from No. 9 to No. 10 shaft; a tunnel was also driven from No. 9 Red Ash to No. 10 Red Ash vein for transportation.

## LEHIGH VALLEY COAL COMPANY

Mineral Spring Colliery.—Surface Coal road 4000 feet long from Coal Brook slope to tunnel No. 34.

Tunnel No. 34 driven 200 feet from surface to Red Ash vein.

Nos. 29, 36 and 37 tunnels driven from inside slope Coal Brook through fault or overturn to main south dip in Red Ash vein.

Tunnel No. 35 being driven through same fault on upper lift.

Number 6 Colliery.—In Number 6 Shaft a new brick car and blacksmith shop was built 30x90 feet; also a new brick wash house 17x17 feet.

A tunnel from Clark vein, Number 6 Shaft, to the Babylon vein, in Number 5 shaft, was completed. This will bring all coal to the same foot. Condition of colliery and ventilation fair; drainage bad.

Number 11 Shaft.—A steam plane was driven from the Babylon to the 14 foot vein to the Laffin basin. This will shorten the distance of transportation of coal over one mile.

A ventilating shaft was sunk from the Babylon to Red Ash vein on south pitch. Condition of colliery, fair.

Number 5 Shaft.—No improvements. Condition of colliery, fair.

Ewen Colliery.—A large washery was erected with a daily capacity of 1,600 tons. It is completed with modern machinery for cleaning the culm from the bank.

Number 4 Shaft.—A new steel tower was erected over the hoisting shaft. A new engine and pump house 41x20 feet was built, also a blacksmith, oil and wash house, 48x17 feet, of brick. A rock tunnel was driven from the Marcy to the 14 foot vein to recover the pillars in the old Number 2 Shaft. Condition of colliery, good.

Hoyte Shaft.—A new steel hoisting tower was erected over this shaft 80 feet in height; a new engine and compressor house was built of brick. A rock slope was also driven from the 14 foot to Marcy vein. This slope will reach the coal in Marcy vein, that otherwise could not be reached. Condition of colliery, good.

**Number 10 Colliery.**—A new breaker and washery was built situated between Number 10 and Number 8 colliery, which will take and prepare the coal from Numbers 1, 8, 9, 10 and 10, Jr., Shafts. It is equipped with all the most modern improvements and has a capacity of 5,000 tons per day.

The coal is carried to the top of breaker by inclined over-lapping open top bucket steel conveyor, which is operated by 185 horse power 250 volt compound wound motor, reciprocating feed on conveyor driven by 10 H. P. 250 volt compound wound motor. The breaker and washery is equipped with mechanical pickers and nine L. V. jigs.

Both buildings are heated by exhaust steam. The engines are the Pennsylvania Coal Company pattern, 18x36 inches, in pairs. A brick building 50x160 feet was built for car and machine shops and is equipped with three lathes, planer, drill press, shaping machines operated by steam.

New mine scales and building erected at foot of conveyor for weighing mine cars. A new track scales for both light and loaded cars have been installed by Barker and Son, Scranton, Pa.

The power house is built of brick 34x74 feet with four engine type direct current compound generators 215 K. W. capacity, four 18x20 inch automatic McEwen engines. This electric power will be carried to Barnum Colliery, Number 1 and Number 10 shafts, and will operate a part of the breaker.

The boiler house is built of brick 76x113 feet, with an addition of 40x33 feet. The boilers are of the Sterling maxim type, consisting of 2,400 H. P. Equipment for boiler plant will be one 4,500 H. P. feed water heater, two 16x10x18 inch Scranton duplex plunger end packed pumps.

McClaves latest improved shaking grates with underground tracks for handling ashes.

Steam locomotives will be used to transport all the coal from Number 1 and Number 10, Sr., Shafts to the new Number 9 breaker, as it will be named.

Number 9 Shaft will be abandoned as a hoisting shaft and all coal from Number 9 will be hoisted up **Number 10**. Number 8 Shaft will also be abandoned and all coal will be hoisted up Number 1 Shaft.

Number 1 Shaft.—The following improvements have been made: Rock tunnel from surface to Number 1 Shaft, at which landing coal is hoisted instead of taking to the surface.

Rock slope from this landing to Checker vein pillars, this coal being hauled by engine on surface to the same landing.

In Marcy vein a rock tunnel from the Marcy to the Clark vein. This coal to be taken to the Marcy vein of Number 1 Shaft.

In Bottom or Red Ash vein a rock plane to the Babylon or Top Split of Red Ash. This coal dropped to Bottom vein by engine on surface.

Arrangements made for all coal now hoisted at Number 8 Shaft to come to Number 1 Shaft, the former to be abandoned.

Number 1 Shaft supplied with 22x36 inch first motion engines, piston valve, Exeter make.

In the Marcy vein, a rope haulage engine 18x24 inch, and in the Bottom vein a rope haulage engine 18x24 inch, both to haul coal from west end of property under Pittston and to land the coal at foot of shaft. There is also an engine 16x18 inch in Bottom vein for engine plane to drop coal from hill to foot of shaft, abolishing five balance planes.

Four 7½ ton electric motors in this shaft, two in Marcy vein and two in Bottom vein.

Steam locomotives will be used to transport the coal from Number 1 Shaft to Number 9 Breaker.

**Number 10 Shafts, Jr., and Sr.**—Number 9 Shaft abandoned. Number 10 Shaft, Sr., re-cribbed with concrete, widened out three feet and re-timbered from top to bottom of shaft.

Steel tower erected for Number 10, Jr., and Number 10, Sr., with steel approaches. The coal hoisted to an elevation high enough to be hauled to Number 9 Breaker by steam locomotives. The new tramway from both shafts goes to Number 9 Breaker across Parsonage Street by steel plate girder bridge.

At Number 10, Jr., the old engines have been replaced by 22x36 inch first motion engines that will hoist coal from the Bottom vein only. The Number 10, Sr., to hoist coal from the Marcy, Big and Checker veins. New steel cages to be used in these Shafts.

Engine houses for both shafts have been made of brick and in engine room at Number 10 Shaft, Sr., is erected duplex compound condensing Jeanesville pump 16 inch and 30x14x48 inch for pumping water to new Number 9 Washery.

Inside Number 10, Sr., a rock tunnel loop has been made around the shaft to handle empty cars, and electric haulage extended throughout all the workings. Rope haulage engines 16x18 inches installed to haul all Marcy vein coal below shaft level by way of new slope just completed.

No. 8 Shaft.—A new engine house was erected and a new hoisting engine installed to handle the coal from the Clark and Babylon veins. A Guibal fan, 20 feet in diameter, was erected to take the place of the old one.

A large brick building was erected at No. 8 shaft, size 100 x 20 x 12 feet, to be used as Mine Foreman's office and shifting shanty and oil house combined.

At the No. 9 boiler plant, an additional battery of Sterling boilers, 622 horse power, was installed.

At No. 10 shaft a new engine house was built and engine installed to handle the coal from the Pittston and Marcy veins.

At No. 10 shaft two rock tunnels, 7 x 12 feet and 300 feet long and 7 x 12 feet and 125 feet long, were completed from the Marcy to the Clark veins, on the East Level heading.

No. 6 Colliery.—A rock tunnel, 7 x 12 feet and 200 feet long, was driven from the Marcy to the Pittston vein, in the basin of the entire workings, to take care of the body of water in the Pittston vein and mine out the pillars. A new pump was erected in the Marcy vein, size 24 x 48 x 16 x 48 inches, by the Scranton Steam Pump Company, to pump the water by bore holes to the surface. A tunnel, 7 x 12 feet and 100 feet long, was driven in No. 11 shaft from the Pittston to the Marcy vein, in the Lafin basin. A saw-mill has been built at this colliery to cut the mine timber by steam power.

Ewen.—In the Hoyt shaft a rock slope, 7 x 12 feet and 200 feet long, was driven from the Pittston to the Pittston vein through the anti-clinal on the west side of the river. A rock plane, 7 x 12 feet and 125 feet long, was driven from the Checker to the Checker vein, for the purpose of mining the coal, which was found to be considerably above the regular level.

At No. 4 shaft a large Jeanesville pump was installed in the Pittston vein, to pump the excess water to the surface. A saw-mill was built at this colliery to cut the prop timber with a steam saw.

No. 14 Colliery.—At the Cortright slope a new brick office, emergency hospital, and shifting shanty, were erected. Connections have been made with the Marcy vein and No. 14 shaft and tunnel.

#### HUDSON COAL COMPANY

Pine Ridge.—No. 14 plane in the Hillman vein was driven 600 feet; No. 11 plane in the Rock vein was driven 650 feet; No. 21 slope in the Checker vein was driven 900 feet; No. 22 slope in the Rock vein was driven 350 feet from Checker to the Red Ash vein. Two 8-inch bore holes were drilled from the surface to the Hillman vein, a distance of 135 feet, for flushing purposes. Two new steam boilers of 250 horse power were erected.

#### LEHIGH VALLEY COAL COMPANY

Mineral Spring.—The No. 3 air shaft from the surface to the upper Baltimore vein was lined with concrete. A new building was constructed to examine the mine cars for refuse in the coal.

No. 8 slope was sunk through a rock fault, and No. 9 slope graded. The silting operations in the Red Ash were extended to the west side of the slope.



At No. 10 shaft the rock slope, 7 by 12 by 300 feet, was driven from the Marcy to the Clark vein, and a pair of 12 by 24-inch engines installed. An air shaft 10 by 10 by 60 feet was sunk from the Marcy to the Clark vein near foot of the new slope. A rock plane was driven from the Pittston vein to the Abbot slope section of the Barnum, Checker vein, 7 by 12 by 200 feet.

Ewen Colliery: At No. 4 shaft a new brick enginehouse 27 by 40 feet was built, in which was installed a pair of 15 by 36-inch engines for operating the rope haulage in the Red Ash vein. A brick building was erected near No. 7 shaft, 107 by 33 feet, in which was stored hay, feed, lime, cement and sprags.

No. 6 Colliery.—Installed at the Wright slope a ventilating fan 20 feet in diameter, driven by a 4-valve Ridgway engine, 15 by 20 inches, inclosed with a brick building 18 by 48 feet. Erected a brick building 28 by 30 feet, to house the locomotive.

No. 14 Colliery.—Erected a brick locomotive house, 40 by 40 feet, and installed a 20-foot ventilating fan driven by a 12 by 14-inch Ridgway simplex side crank engine at Diamond slope. Built a brick supply house, 122 by 23 feet, containing loaders' room and cement, lime, feed, hay and sand rooms.

The second opening, 7 by 10 feet, to the New Diamond slope workings to the surface has been finished, a distance of 100 feet.

#### HILLSIDE COAL AND IRON COMPANY

Butler Colliery.—At the Thomas shaft, installed a Vulcan fan, 14 by 6 feet, operated by an 18 by 20-inch Ridgway engine. Built fan house of steel with concrete connection to shaft, 35 feet 9 inches by 21 feet by 11 feet 2 inches, and brick engine house 12 feet by 25 feet by 11 feet 2 inches in connection with the new air shaft sunk to the Red Ash vein workings. Sunk an air shaft for ventilation 12 feet by 12 feet by 200 feet.

At the Butler Marcy slope completed second opening from the Red Ash vein to Thomas shaft workings. A part of the distance was driven through coal and part through rock. This also serves as a return air course to the new fan erected near Thomas shaft. Extended Pittston water tunnel 1,800 feet beyond the Marcy vein toward the Red Ash vein of Thomas shaft.

#### HUDSON COAL COMPANY

Pine Ridge Colliery.—No. 19 plane in the Red Ash vein was driven 800 feet to connect No. 23 slope with Millcreek shaft. Remodelled foot of shaft at Cooper vein. All timber having been removed and replaced by steel "I" beams and concrete.

Lafin Colliery.—No. 8 slope, top bench, top split, Red Ash vein, was driven 900 feet.

#### LEHIGH VALLEY COAL COMPANY

Mineral Spring Colliery.—Outside: The Checker vein fan house was made fireproof by the use of metal lath and plaster. The roof over the Red Ash fan house and over the return airway in the shaft was replaced with fireproof material. Erected a hospital and mine foreman's office. The box car loader at breaker was inclosed in a