

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;

the main doors on headings and air-ways 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 four splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

*Machinery.*—The engines in use at this colliery are one pair of hoisting engines of 40-horse power, one breaker engine of 30-horse power and one donkey engine in mine for pumping purposes, &c.; 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; they have an adequate brake on the hoisting drums; the main links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge and safety-valves for safety and to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

*Remarks.*—They have furnished a map of the mine; they have second openings located at various distances from the main 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 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 on the planes in the mine; 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; the shaft landings are protected by safety-gates.

#### NO. 6 SLOPE.

This slope is located in Pittston township, and lying about 600 feet south-east of No. 8 shaft; it is 900 feet long, 6 feet high and 10 feet wide; it is operated by the Pennsylvania coal company. Andrew Bryden is general mine superintendent and James Moffat is mining boss.

*Description.*—There is a breaker connected with this mine about 1,200 feet away; they mine and prepare about 100 tons of coal per day; they employ 22 miners, 13 laborers, 3 drivers and 2 company men in the mine, 2 drivers, 3 company men and 3 mechanics outside, in all 48 men and boys; they are working the 7 feet vein of coal; average thickness 6 feet; they work 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 mine is in a good working condition.

*Ventilation.*—Ventilation is produced by the action of the atmosphere; the intake is located in No. 10 shaft and No. 6 tunnel; it contains an area of 100 feet at No. 10 shaft and an area of 36 feet at the drift or slope; the outcast is located at mouth of slope; it contains an area of 54 feet; the average supply of fresh air is 19,670 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 ventilation has been measured and reported according to law. Ventilation is good.

*Machinery.*—They use two hoisting engines of 20-horse power each and one steam pump of 25-horse power; they have a metal speaking tube in the mine; they have flanges of sufficient strength and dimensions for safety attached to the sides of their hoisting drum; they have an adequate brake on their hoisting-drum; 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 their mine; they have second openings located at various distances from main opening; they have no house for men to wash or change their clothes in; the mining boss seems to be a competent and practical man; there are no boys working in the mine 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 wagons or cars in the slope; the persons having charge know their duty in case of death or serious accident.

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 workingmen, 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.

the rubber bag contained  $2\frac{15}{100}$  per cent. of gas, or 2,030 cubic feet of gas given off every minute, showing the danger to be apprehended in case of a break or stoppage of the fan, from any cause, for any length of time. This mine is only one of the many in the anthracite coal field which is in the same critical condition. I have frequently asked the superintendents of some of those mines to place electric alarm bells in some convenient place in the mines, close to the workingmen, in case of an accident to the ventilator, so that the men could be notified instantly, yet I fail to find one that has done so, although there is an electric alarm gotten up for the purpose, and patented by the inventor, Mr. G. M. Williams, of Wilkes-Barre, and which I am happy to recommend, as it would fill all the requirements instantly in alarming the workmen should anything go wrong with the ventilating fan, and thus remove much of the care and anxiety of the foreman and engineers in charge.

For the better protection of the miner and other workmen employed in the mines, I would suggest that legislative action be had to compel, if necessary, the putting on of the electric alarms or any other device which would give the men an immediate chance of escaping in case of a disarrangement of the ventilating fan.

#### EXAMINATION OF APPLICANTS FOR MINE FOREMAN'S CERTIFICATES.

The annual examination of applicants for mine foremen was held in this district at Pittston, Pa., June 19 and 20, 1889.

The board of examiners were H. McDonald, inspector of mines, A. G. Mason, superintendent, and A. B. McQueen, miner. Twenty-five applicants appeared for examination, and the following were recommended for certificates:

John Gibbons, David Cranston, George T. Chester, Archibald Young, Charles Davis, Wm. J. Bugelhole, James Graham and Wm. Smallcomb, of Avoca; Wm. Campbell, James R. Thompson, Edward J. Huges and Martin Quinn, of Pittston; Wm. Dawson, James F. Moran, James Butler, John Hailstone, Wm. G. Hailstone and Patrick H. McDonald, of Moosic, and Charles W. Scharer, of Scranton, David Linskill, of Plymouth, and Thomas Stoneham of Parsons.

#### MINE IMPROVEMENTS DURING 1889.

During this year a number of important movements towards improving the condition and the producing capacity of the collieries have taken place. The following are a few of the most important:

##### *Pennsylvania Coal Company.*

At No. 8 colliery, a new shaft was sunk from the surface to the Marcy seam a distance of 42', to be used as an air shaft. The intention is to erect a fan on this opening as soon as the shaft is completed.

use a jack-crew and force the post into position if it did not go back of its own accord. The boss told him he must not use a jack-screw by any means, that if he loosened the proper bolts the post would go back again. On Sunday morning, Glady and Olmstead went to work, taking out the bolts referred to. The post not going back as they desired, Glady went to the engineer at the shaft, asking him for a jack-screw, which was given him. He placed it between the upright posts (see sketch) and proceeded to force the posts apart. They had forced the posts eighteen inches apart when they blocked the posts to re-set the jack-screw again. While in the act of doing so, Mr. Vanvaltz, a carpenter, who was working in the breaker repairing some portion of it, had occasion to go to the blacksmith shop for sheet iron. Glady, seeing him, called him over where he, Glady, was working, telling Vanvaltz that he had shoved the post eighteen inches, but had not succeeded in getting it straight. Vanvaltz told him that he was not shoving the post that required straightening; that he was shoving the bent out from under the iron trestling. Glady did not think so, for he continued to force the posts apart. Glady sent Olmstead down for a few pieces of plank while he turned the screw-jack, Vanvaltz going to his work. In a few minutes after the conversation with Vanvaltz, the timber broke which the iron span rested upon, allowing the trestle to fall a distance of (84) eighty-four feet to the ground, instantly killing the three above mentioned. Glady was standing on the cap, marked A, of the first bent using the jack-screw at the time; Pokorny was sitting on the sill, marked B, and Olmstead, being on the ground, heard the crash, started to run and got as far as C, marked on the sketch, when a mine car, which was on the iron span, came down on him. The boy, Pokorny, was not at work at this colliery. While passing, seeing the men at work on the bent, he sat down to watch them.

In my opinion, had Mr. Glady come down on the ground where Vanvaltz was standing while conversing about the post, in all probability he would have seen that he was shoving the post out from under the iron span, as he was considered a careful and competent carpenter.

#### MINE IMPROVEMENTS DURING 1890.

The following are the most important improvements made in and around the mines of this district during the year 1890:

##### *Pennsylvania Coal Company.*

At No. 14 tunnel a new Guibal fan, 17½ feet in diameter was erected on the air shaft. It has two inlets 8' 9" diameter, and running at 42 revolutions per minute, exhausts 94,800 cubic feet of air. This has improved the ventilation of this colliery considerably, as these tunnels were formerly ventilated by a furnace.

At shafts Nos. 1 and 8 a new breaker was built, replacing the old one which was taken down some time previous to the new one being built.

6 MINES.

The new breaker is quite an improvement on the old one. It is furnished with first-class machinery for cleaning and preparing coal for market. Its capacity will be about 800 tons per day. It was started to prepare and ship coal on August 25, 1890.

*Lehigh Valley Coal Company.*

At the Maltby colliery a new Guibal fan, 18' diameter, was erected on a shaft sunk for the purpose close to the out-crop of the 11-foot seam on the mountain north of the main hoisting shaft. This makes the second fan at this colliery.

In the Prospect colliery a rock tunnel was driven from the Baltimore to the Skidmore seam, a distance of 250 feet, with a sectional area of 9.1 square feet. A tunnel was likewise driven from the Abbott to the Bowkly seam in the same colliery, a distance of 100 feet. Thickness of Skidmore vein 4' 6". Thickness of the Bowkly seam 7'.

In the Midvale colliery a rock tunnel was driven from the level of old slope in the Hillman to the five foot seam, a distance of 300 feet. Sectional area 91 square feet. Thickness of seam 4'.

In the Henry colliery two rock planes were driven through the strata from the Baltimore. The first to the Hillman seam on a pitch of 25°, a distance of 650 feet. The other was driven to the five-foot seam, a distance of 550 feet on the same pitch. Sectional area 100 square feet. This opens up a large district of coal for this colliery.

At the Heidelberg No. 1 slope a new fan 15' diameter has been erected on an opening driven for the purpose on the side of the hill, back of the slope opening. It ventilates the new workings at foot of slope, and the old tunnel workings which were formerly ventilated by a furnace

*Delaware and Hudson Canal Company.*

In Pine Ridge colliery a rock tunnel was driven from the top split of the Baltimore seam to the bottom split, a distance of 165 feet. Sectional area 72 square feet.

In the Delaware shaft a new gravity plane was driven on a pitch of 7°, a distance of 1,100 feet, with a sectional area of 128 square feet.

*Delaware, Lackawanna and Western Railroad Company.*

In the Hallstead colliery an underground slope has been sunk in the red ash seam 400 feet, which opens up the coal to the dip of the old slope.

A new inside plane has been completed 900 feet in the same seam on a grade of 4°. These improvements will increase the output of the shaft considerably, likewise shortening the transportation to the foot of the main shaft.

*Wyoming Valley Coal Company.*

At the Forty Fort colliery an underground slope was sunk on a line with No. 1 tunnel in the bottom split of the Baltimore seam, with a sec-

considerably, causing some of the large timbers to be broken and others to be twisted out of place. The machinery likewise is thrown out of line, which in all probability will require the building of a new breaker when the mine is reopened.

#### Colliery Improvements for 1899.

##### Pennsylvania Coal Company.

At the No. 8 colliery a new washery was erected to wash the culm and prepare it for market. It is equipped with all the latest devices in machinery for cleaning and preparing a large tonnage of the smaller sizes of coal. A steam shovel is used to take the culm from the bank which deposits it into a chute, whence it is taken by a line of conveyors into the washery, where it is washed and prepared for market. A large tonnage of good coal is thus secured from the refuse of former years.

##### Florence Coal Company, Limited.

This company built an addition to their Elmwood breaker to clean and prepare culm which is taken from the bank. A large supply of good coal is secured, which adds to the tonnage of the company.

##### Walter B. Gunton, Operator.

A new colliery has been located by the above operator on the estate of the Jackson heirs, in Sullivan county, Pa., and is situated three-quarters of a mile west from the village of Bernice. The colliery consists of a new breaker, which was started to prepare coal in the month of April, 1899, is furnished with good machinery and has a capacity of 500 tons per day.

The opening consists of a drift driven from the surface to the vein, the crop of which is close to the surface and which tapped the old workings formerly operated by the State Line and Sullivan Railroad Company. The coal from the breaker is taken over a branch laid from Lehigh Valley Railroad at Bernice, to market.

##### North American Coal Company.

This company erected a large washery in the borough of Luzerne, in close proximity to the Raub Coal Company's colliery, to prepare coal from the culm bank of the Mill Hollow colliery. Work was commenced at the building in December, 1898, and finished in May, 1899, and coal was shipped on June 1. The capacity of the washery is 600 tons per day and it employs twenty-three men and boys and is equipped with the most improved machinery for cleaning and preparing coal. All dangerous parts of the machinery are covered or protected by fencing.

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 Latlin 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 anticlinal 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.



## CONDITION OF COLLIERIES

## PENNSYLVANIA COAL COMPANY

Barnum No. 9, Ewen, Nos. 6 and 14 Collieries.—Ventilation, drainage and condition as to safety good.

## HILLSIDE COAL AND IRON COMPANY

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

## HUDSON COAL COMPANY

Pine Ridge and Lafin Collieries.—Ventilation, drainage and condition as to safety good.

## LEHIGH VALLEY COAL COMPANY

Mineral Spring and Heidelberg No. 1 Collieries.—Ventilation fair; drainage and condition as to safety good.

## DELAWARE AND HUDSON COMPANY

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

## TRADERS COAL COMPANY

Ridgeway Colliery.—Ventilation fair; drainage and condition as to safety good.

## WILKES-BARRE COLLIERY COMPANY

Madeira Colliery.—Ventilation good; drainage fair; condition as to safety good.

## McCAULEY COAL COMPANY

Pickaway Colliery.—Ventilation and drainage fair; condition as to safety good.

## IMPROVEMENTS

## PENNSYLVANIA COAL COMPANY

No. 9 Colliery.—Installed new electrically driven ventilating fan, 10 by 5 feet, driven by a 20-horsepower motor and built a fan house 12 by 33 by 12 feet, corrugated iron sides and roof, with motor room 10 by 26 by 10 feet of similar material, for ventilating the Curtis slope. The Curtis was driven from the Checker vein through the rock to Pittston vein 200 feet, size 7 by 10 feet. Installed Seneca bank pickup plant, consisting of loading pocket, 17 by 20 by 40 feet, wooden structure, and 1,775 feet of belt and scraper line, the whole being operated by one 25-horsepower motor, one 65-horsepower motor and three 35-horsepower motors.

No. 8 shaft: Installed a new Dunmore pump, 20 by 12 by 30 inches, equipped with pot chambers, et cetera, in the Marcy vein near the foot of No. 3 shaft pumping station. The Clark vein plane was graded for haulage purposes, a total of 2,043 cubic yards of rock being removed. Completed a rock plane from the Marcy vein to the Pittston vein on a 12 per cent. degree grade, 7 by 14 by 346 feet.