

25,500 cubic feet; amount at face of mine, 23,300 cubic feet per minute. Number of persons employed inside, 80.

Daniel Reese, mining boss; Jno. T. Griffith, mining superintendent; Wm. Smyth, assistant; Geo. H. Parrish, general superintendent; F. Tiffeney, assistant.

*Gaylord slope.*—This slope is located in Plymouth borough. It is sunk across the measures and has its bottom opened out on the Cooper bed and has a tunnel into the Bennet vein. The body of its present workings are in the Bennet seam, the Cooper not proving as good as it does in other localities. On the western end of the mine the two seams, Bennet and Cooper, are united into one large vein, not having more than six inches of slate between the two beds.

*Condition.*—This mine is a very safe one, has good roof and does not generate any fire-damp. Many important improvements have been made in this mine during the time that this company has had possession of it, such as the putting up of a fan 15 feet in diameter; the laying of new roads; building of stone and mortar stoppings instead of wooden ones, as heretofore; new air-ways, cut through the solid rock, and a new set of steps put in alongside the slope for a traveling road, with a row of ten-inch timber thickly set between the traveling and the hoisting road, and planked on the side nearest the car with two-inch plank; this makes a tolerably good traveling road, about as good as can be made when placed in the slope as this is—a very unfit place to have a traveling road if it can be avoided; but when a slope is sunk through rock it is difficult to overcome this matter.

Ventilation is tolerably good. Amount of air at inlet, 35,200 cubic feet per minute; amount at face of mine, 32,600 cubic feet per minute; number of persons employed inside, 115. George Pickton, mining boss; John T. Griffith, mining superintendent; William Smyth, assistant; George H. Parrish, general superintendent; F. Tiffeney, assistant.

*New shaft.*—This is a new shaft just being sunk. It is down about 50 feet, and ready to put in the permanent timber. Dimensions, 46×13 feet. It is intended to reach the Red-Ash vein with this shaft at a depth of 50 feet. Officers in charge, Smyth, Griffith, Tiffeney and George Parrish.

The following new breakers are being built by the Wilkesbarre coal and iron company: One at Sugar Notch, which is almost ready for operation at present; one at the Diamond shaft, which will be ready early next spring. Besides the above, the Lance breaker, now being remodelled, will be ready for operation next spring.

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#### LOCAL OPERATIONS.

There are some nine of these that I have a record of; most of them, however, work only during the winter months.

##### MESSRS. DAVIS & Co.'s COLLIERY.

This mine is located a short distance north of the West Pittston old shaft. It is a small opening just being opened on the water level to supply a local trade. Employs 14 persons inside and 9 outside. Mr. Joseph Davis, mine boss.

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##### PAYNE PETYBONE'S DRIFT.

This is a small drift located on the back north of the town of Wyoming. It is worked only during winter to supply a local trade. Wm. Jones, mining boss.

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##### MOSS & POLLOCK'S DRIFT AND SLOPE.

These mines are located a short distance west of the Petybone drift, on the back road, and work only during the winter months to supply a local trade.

Ross and Twin veins, its total length being one thousand two hundred and seventy feet. This opens a large territory of coal.

The No. 4 slope was extended, reaching a point two hundred and eighteen feet below the old level, and opens a new lift of excellent coal.

A new colliery is to be opened at Morgantown, four miles west of Nanticoke. The shaft is  $33' \times 12\frac{1}{2}'$  area, and will have a probable depth of eight hundred feet to the Ross seam. A horizontal tunnel is being driven also to cut the same seam, which is seven feet high by sixteen feet wide, and is expected to cut the coal at a length of about one thousand two hundred feet. The shaft was down at the end of the year to a depth of fifty-six feet, and the tunnel was in from the opening a distance of seventy-five feet.

At the Grand Tunnel the water was pumped from the old No. 3 slope, and a new slope is being driven down from a point near the bottom of the old McFarlane shaft, which was, at the end of the year, down a distance of eight hundred and twelve feet below the line of the old workings. This will open an extensive area of coal of the Red Ash seam and of good quality.

#### **The Wyoming Valley Coal Company.**

At the Forty-Fort shaft an underground slope is in progress of being driven to work the coal lying below the shaft level. It was down, at the close of the year, a distance of nine hundred feet, on an average grade of seven degrees, and is still continued.

At the Harry E. colliery a new tunnel was driven from the surface to the Bennett vein, a distance of two hundred and twenty-five feet. Its size is  $9' \times 7'$ , and it has cut the vein nine feet thick of excellent coal.

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

At the Avondale colliery this company is sinking a new air-shaft, with a view of putting a fan on it to increase the ventilation of the underground slope. The shaft is  $16' \times 12'$  area, and was sunk to a depth of one hundred sixty-five feet at the close of the year. The underground slope has opened a large extent of workings, and the new fan will prove an effective addition to the ventilating power.

The Woodward shafts have not yet been completed, and it may take another year to complete their sinking. No. 1 was at a depth of five hundred and thirteen feet and No. 2 four hundred and eleven feet at the close of the year 1883. They are beginning to prepare for the erection of a breaker, and have partly graded the railroad beds leading to that structure.

The Pettibone shaft was started to sink on April 18, 1883, and after encountering great difficulties in passing through clay and sand, they have successfully reached the rock at a depth of eighty feet. The progress of this enterprise has been watched with unusual interest, because it was generally supposed that a shaft could not be sunk on the sandy flats, owing to its great depth of sand. This company contemplate sinking another shaft to constitute the second opening required by law, and it will be started in the course of a few months.

At the Pine Ridge colliery a new double fan was erected to ventilate the workings of the Hillman and the Baltimore seams. The old fan was removed and the new one was placed at a distance from the shaft, so as to insure its safety in case the breaker takes fire. A passage is made, underneath the surface of the ground, leading from the shaft to the fan, through which the return air passes. This is arched by mason work, and is of sufficient area to pass a large quantity of air.

**The Susquehanna Coal Company.**

This company is making preparations to mine a large quantity of coal at the Newport colliery. A brief note was made of it in my previous report. The shaft is now at a depth of four hundred and ninety-five feet, having passed through four seams of workable coal, aggregating a thickness of twenty-six feet. A tunnel is also being driven which has reached a length of nine hundred and forty-two feet, having cut through three seams of coal in the first five hundred and eight feet; at which length it also cuts a fourth seam on the anticlinal axis, the thickness of which is not yet determined. The tunnel is continued across a small basin where more seams of coal are expected to be found.

Preparations are in progress also to sink a slope to work the upper seams. The open cut and a short tunnel to an eight-foot seam is driven, and the slope will now be sunk in that seam, which promises to produce good coal. The coal from all these openings will be shipped from one breaker, which is now being erected, and bids fair to be the largest structure for the purpose ever erected in the anthracite coal region.

The No. 1 shaft, at Nanticoke, was extended from the Hillman to the Red Ash seam, and they are now driving a second opening, which is to be effected by holing into the workings of the No. 2 shaft.

A new fan was erected to ventilate a part of the workings of Nos. 1 and 2 shafts; the details relative to this may be seen in the table of new fans presented in this report.

**The Delaware, Lackawanna and Western Railroad Company.**

A new air shaft was sunk at the Avondale colliery of this company with the view of placing a new fan upon it to improve the ventilation. Its size is 12'x26" and its depth to the workings of the Red Ash seam is two hundred and forty-one feet.

The No. 1 Woodward shaft is now at a depth of eight hundred and fifty-one feet, and is still being sunk. The No. 2 was sunk to a depth of one thousand and three feet, where it cut the lowest seam of coal supposed to be in the property. These shafts pass through several excellent seams of coal, and the capacity of these openings, when ready for mining coal, promises to be very large.

The Pettibone shaft is still in progress of sinking and has reached a depth of three hundred feet.

**Average Number of Days Worked and Tons of Coal Mined Per Day for Each Person Employed.**

NAME OF COMPANIES.	Days worked.	Tons mined per employe.
Pennsylvania Coal Company, . . . . .	192.90	2.05
Lehigh Valley Coal Company, . . . . .	154.14	2.34
Delaware, Lackawanna and Western Railroad Company, . . . . .	186.00	1.43
Delaware and Hudson Canal Company, . . . . .	198.00	1.89
Butler Coal Company, . . . . .	151.71	2.30
Wyoming Valley Coal Company, . . . . .	250.55	1.43
Miscellaneous coal companies, . . . . .	180.68	2.04
All coal companies, . . . . .	187.71	1.94

**COLLIERY IMPROVEMENTS DURING 1885.**

**The Pennsylvania Coal Company.**

At the Barnum Shaft, No. 2 was sunk from the Ross to the Red Ash vein, a distance of two hundred and thirteen feet. This improvement opens a large area of good coal for this company.

**Pennsylvania Coal Company.**

Shaft No. 14, located in Jenkins township, having reached the Fourteen-Foot vein, at a depth of three hundred and sixty-five feet. This shaft cuts the Seven Foot vein at a depth of two hundred and fifty-six feet. Its use will be for hoisting coal. The size is 12' x 52'. They are sinking the second opening, and have reached the Seven Foot vein, at a distance of two hundred and forty-six feet. The breaker is completed all but putting in the machinery.

**Lehigh Valley Coal Company.**

At the Wyoming Colliery a tunnel was driven from the lower to the upper split of the Baltimore vein, to be used for ventilation.

**Delaware, Lackawanna and Western Railroad Company**

Are sinking the second opening to the **Pettebone shaft**. There is no work doing in the mine shaft, as it has reached the vein they intended to work some time ago.

**Delaware and Hudson Canal Company.**

At the Pine Ridge Colliery, two shafts were sunk, one in the Baltimore vein, to a depth of one thousand feet. The size is 7½' x 12', with a gradient of ten degrees. The other is sunk in the Hillman vein, to a depth of

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.

how the accident occurred. The theory which I arrived at, was that Ross and Timboy being in the shanty putting the exploders or caps in the cartridges which were thawed out, by some means exploded one of them, as Ross' hand had some of the wire from the exploder driven into it.

The sticks of dynamite were eight inches long and one and one-quarter inches in diameter, of the B. X. climax brand. The explosive power of the exploder or cap was 85 pounds. Luke Michael, one of the headmen, was standing close to the shaft at the time, and had a narrow escape from being blown down the shaft, his wrist being broken, but he escaped without other injuries.

#### COLLIERY IMPROVEMENTS DURING THE YEAR 1891.

##### *Pennsylvania Coal Company.*

In shaft No. 4 a new gravity plane was driven in the Marcy seam, a distance of 153 feet, with a sectional area of 100 square feet.

In shaft No. 9 a new plane was driven in the Red Ash seam, a distance of 485 feet, with a sectional area of 90 square feet.

On the Old Forge shaft No. 2, a new fan 20 feet in diameter was erected, which gives very good results with a working speed of 50 revolutions, exhausting 108,000 cubic feet of air per minute, with a water gauge of 2.75 inches. The engine is a horizontal cylinder 15 by 36 inches, connected direct to fan shaft.

A new fan 20 feet in diameter was erected on a shaft for the purpose to ventilate No. 8 shaft workings; while running 36 revolutions it exhausts 95,000 cubic feet of air per minute, with a water gauge of 2 inches. The engine is a horizontal cylinder 15 by 24 inches, connected direct to fan shaft.

##### *Delaware and Hudson Canal Company.*

In the Delaware shaft two inside tunnels were driven from the bottom to the top split of the Baltimore seam, a distance of 45 feet each, with a sectional area of seven by nine feet. Likewise two gravity planes, one 1,000 feet and the other 1,200 feet long, with a gravity of 7°, and sectional area of 14 by 8 feet.

In Pine Ridge shaft an underground tunnel was driven from the top to the bottom split of the Baltimore seam, a distance of 150 feet, with an area of 84 square feet.

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

The new breaker at the **Pettebone shaft** has been completed, which was mentioned in my report of 1889. It is a large and commodious structure. The coal from the shaft being hoisted to the surface and taken to the hoisting tower at the breaker to be rehoisted to the dump. The breaker is well finished throughout, having ample room to clean and prepare a large tonnage of coal. The breaker commenced to prepare coal for market in February, 1891.

and over the fall he found the body of Bryden lying on the gangway road. He was severely burned on face and hands, but undoubtedly lost his life by the afterdamp, as he evidently got confused and went the wrong way to a distance of 150 feet from where his staff was found. He was a man of large experience in mining and had for a number of years conducted mines that gave off large quantities of gas.

Taking the Water out of the **Pettebone** and Hallstead Shafts.

In my report of 1893 the Pettebone shaft, operated by the Delaware, Lackawanna and Western Railroad Company, was reported flooded to extinguish a fire caused by an explosion of gas. I therefore wrote Superintendent Benj. Hughes, of the above company, for information in regard to the taking out of the water and likewise to give me the information regarding the flooding of the Hallstead shaft located at Duryea and operated by the above company.

The following information was kindly sent to me for this report:

Scranton, Pa., Jan. 18, 1895.

Mr. B. Hughes, General Inside Superintendent:

Dear Sir: Referring to Mine Inspector McDonald's request for information as to **Pettebone** and Hallstead.

We commenced hoisting the water at the second opening on May twenty-third, 1894, and hoisted continuously in this shaft, excepting on Sundays, and about thirty days lost for repairs of shaft timbers, etc., until September 22.

A pair of iron tanks fitted to travel on the guides, each of a capacity of 1.175 gallons, and arranged for automatic filling and self emptying, were used. With allowance for leakage, etc., it is estimated that they hoisted 1,100 gallons each trip.

The greatest number of tanks hoisted in one shift of eight hours was 593. During the 75 days of actual hoisting, a total of 65,809 tanks were raised, or a daily average of 877 tanks.

As the water stood at the beginning 320 feet down the shaft, and the total depth is 1,150 feet, the average hoist was 735 feet, and the quantity nearly 1,000,000 gallons every 24 hours.

This hoisting was done with a pair of 30x60 slide valve direct connected engines.

From July 6th to 17th we also hoisted in the main shaft, using wooden tanks placed on the regular carriages, one with a capacity of 530 gallons, the other of 750 gallons, or an average of 750 gallons.

Of these we hoisted a total of 8.194 tanks.

The total water hoisted is estimated from the above data at 78,000,000 gallons. In addition to this, there were pumped from the

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.



### Delaware and Hudson Canal Company.

In the Delaware shaft a tunnel was driven from the top split of the Baltimore to the bottom split, a distance of 105 feet. It is used for transporting coal. Sectional area 7x9 feet.

The Laurel Run Colliery, located in the borough of Parson's, which had been operated by the Delaware and Hudson Canal Company since 1869, passed into the possession of the Laurel Run Coal Company on the 1st day of April, 1895, on account of the expiration of the lease.

### Newton Coal Mining Company.

Three rock tunnels were driven in this company's colliery from the sixth to the fifth seam a distance of 300 feet each, which are used for the transportation of coal.

### Old Forge Coal Mining Company.

An underground slope was sunk in this company's Columbia shaft, a distance of 200 feet; sectional area, 84 feet.

In the Phoenix shaft a tunnel was driven through a fault or roll in the Red Ash seam, a distance of 200 feet; area 7x10 feet. A new plane was erected 500 feet in length with gradient of one foot in five.

A new fan 20 feet in diameter was erected at the Columbia shaft to ventilate the workings of the sixth, or Red Ash seam in both of those shafts which are connected with the upcast to fan. While running 60 revolutions, 164,462 cubic feet of air per minute is exhausted.

### Delaware, Lackawanna and Western Railroad Company.

An underground slope was sunk in the Hallstead colliery of this company to a depth of 1,000 feet; 6x12 feet area. A rock tunnel was driven a distance of 398 feet, 6x12 feet which has not tapped the coal at this writing.

In the Pettebone shaft a tunnel was driven 138 feet sectional area, 128 feet. An underground slope was sunk 86 feet on a 25 degree pitch. A new fan 35 feet in diameter, 9 feet face with two inlets enclosed in brick work was put in place. At a speed of 43 revolutions per minute 129,960 cubic feet of air is exhausted with a water gauge of 1 9-10 inches.

### Florence Coal Company, Limited.

At the No. 2 shaft the second opening to the Marcy seam was driven to the surface, a distance of 120 feet.

### Condition of the Mines and Improvements During the Year

The condition of the mines on the whole is very satisfactory. The ventilation is improved, the drainage is much better, and special efforts are being made in regard to propping roof. All these things I rigidly demand. The observance of the law, in reference to the employment of boys is also enforced to the letter. Only one case occurred in the district, where there was any need to resort to law, and was against the Avoca Coal Company. A copy of the whole proceedings in this case was forwarded to the Department.

#### KINGSTON COAL COMPANY

##### No. 4 Colliery

They have put up a fuel conveyor line to boiler house, made some slight changes in the breaker and put down a number of bore holes to prove rock cover over Orchard vein.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

##### Pettebone

A 20 foot ventilating fan, which was partly constructed in 1902, has been reconstructed and is now in working order, showing a very good percentage of efficiency. The erection of a locomotive boiler plant is in progress at this colliery, to be composed of 10 fire box locomotive boiler, which will be completed early during the year 1904. Three rock tunnels were driven through faults or anticlinals in the Hillman vein for development, transportation and ventilation. The Kidney vein has been opened in these shafts and developments will be pushed as rapidly as possible.

Pettebone washery, which has been practically idle during the year, has now resumed operations, and the refuse from the same is being placed in the Cooper vein of this colliery.

#### RAUB COAL COMPANY

##### Louise

Gravity plane at "Mt. Thomas," about 450 feet long, one pair of new 16x20 engines geared 4 to 1, with foundation and house complete for hoisting.

Outside.—Coal from Red Ash and Ross veins, on Eley tract, to foot of Bennett slope. Rope to run through bore hole, from surface to head of inside plane from eleven foot vein to Ross.

Inside.—No. 3 tunnel Klondyke, driven on mountain side from

10x36 inch, in Bennett vein and pumping through bore hole direct to surface. One small electric pump, 4x5 inch.

Have been driving slopes in Orchard, Bennett and Ross veins.

Are driving rock plane upon 15 degrees from Bennett vein to upper veins, which will cut Cooper, Lance, Orchard and Hillman veins.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—The new boiler plant referred to in my last report has been completed and is composed of 10 fore-box locomotive boilers.

Breaker improvements consist of mechanical pickers, elevators, conveyors and spring balance shakers for the preparation and cleaning of coal.

Inside improvements consist of two 7x12 rock tunnels, one driven from the Cooper to the Lance vein, the other was driven through what is known as the Pettebone anticlinal Hillman vein. The condition of haulage roads and return airways has been improved upon.

#### TEMPLE IRON COMPANY

Mount Lookout Colliery.—New boiler house (frame building) 140x40 feet inclosing 8 sets of Sterling boilers and one new rock crusher to crush all the mine rock which is returned and deposited in the mine.

#### CLEAR SPRING COAL COMPANY

Clear Spring Colliery.—Have erected a new washery at this colliery to prepare the marketable coal in their large culm dump. They run all the sedge and refuse from this washery into the mine. The cost of this washery was about \$25,000, and in addition to this the company expended nearly \$3,000 in yard improvements, which include the changing of their tracks, etc., making a total expenditure of about \$28,000.

#### PEOPLE'S BANK, RECEIVER (PLYMOUTH COAL COMPANY.)

Black Diamond Colliery—Inside.—Driving one tunnel from Red Ash to Ross veins.

Erected at breaker one set of Emery slate pickers for separating slate from stove coal.

Outside.—Scraper line and rolls for breaking and conveying slate to mines for flushing mines.

Completed 12x72 inch x 18 feet return tubular boilers. These boilers were begun in 1903.

#### DELAWARE AND HUDSON COMPANY

Langcliffe Colliery.—No. 1 slope Checker vein, driven 400 feet to crop. No. 2 slope Red Ash vein driven 500 feet to crop.

## STEVENS COAL COMPANY

Inside.—Extended electric haulage road in west gangway 1,800 feet; extended electric motor haulage road through No. 1 tunnel into fifth vein 900 feet long.

Rock tunnel 160 feet long was driven from bottom of west side slope to fifth vein and another rock cut opening to fifth vein on line of Red Ash vein, main slope.

A 6 inch bore hole was put down from the surface to the Ross vein 120 feet deep, to fill a portion of the Marcy vein working with silt from the breaker; about 7 acres of this was filled and about 17 acres of working in Red Ash was filled with silt; and a line of 4 inch pipe 3,000 feet long had to be laid to the workings for this purpose.

The mule barn in Red Ash vein had to be rebuilt and refitted on account of bad roof over it, which had to be taken down.

An engine was put up on the new slope in the Ross vein and a slope and an airway was driven down 140 feet.

An engine had been replaced on top of the old inside Simonson slope, Red Ash vein, on the east end of the property.

A passing branch 300 feet long was fitted up at the lower end of Marcy slope and a rock cut was made on top of this slope to reduce the heavy grade.

On the west end of the property 15 bore holes containing 975 lineal feet were made by driving 3 inch pipe to locate the elevation of the rock over the veins of coal and depth of surface.

Outside.—A concrete retaining wall 3 feet x 8 feet x 80 feet long was built at the entrance to the main slope to replace the old wooden cribbing.

A 12 foot x 16 foot x 15 foot concrete foundation was put up at the back of the breaker to contain the shafting of the shaker screens.

A wash house 16 feet x 18 feet, two-story high, was erected and bath tubs and lockers provided for the inside and outside workmen.

An engine shed was built outside to shelter the locomotive from the weather.

Concrete foundations were built on both sides of Carpenter's creek to replace the truss work for the 6 inch steam pipe that was torn down by the wind, so that a good portion of this truss work will be done away with and rock filling take its place.

Two new spiral pickers were placed in the breaker.

Condition of the colliery is good.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—Inside.—One 7x12x248 foot rock tunnel has been driven from Hillman vein to Hillman vein for ventilation and development, this being necessary on account of the gaseous condition of this seam.

Outside.—A 250 K. W. belt driven generator has been installed at this colliery, which will furnish electric motive power for the 10 ton locomotive to be operated in the Hillman vein.

## RAUB COAL COMPANY

The only improvement here is they are driving a tunnel from bottom split, Ross vein, to top split of same vein, in Mt. Thomas, Ross Slope, a distance of about 100 feet. The tunnel, which they have

## RAUB COAL COMPANY

Louise Colliery.—Rock tunnel at Mount Thomas from Ross to Red Ash seams, 271 feet long. One plane at Mount Thomas in Red Ash seam, 1175 feet long. New boiler plant at breaker. Two Maxim boilers 300 H. P. each.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—The work of installing a Jeanesville steam pump, 20x7½x24, in Baltimore vein in concrete and steel pump room is now under way.

A rock tunnel has been driven from the Cooper vein to Five Foot vein, north of No. 2 Shaft, which will be used for developing and transportation.

The work of driving a rock tunnel from Cooper vein to Five Foot vein, west of No. 2 Shaft, on a 15 degree pitch, is now under way.

When these seams are fully developed they expect an enormous increase in the tonnage, which has been exceedingly low for the past year.

The conditions have also changed to enable them to mine the Hillman vein, south east of No. 1 Shaft.

## DUNN COAL COMPANY

Mountain Top Colliery.—A new breaker has been erected and equipped with all necessary machinery, and an office, powder house, boiler room and blacksmith house have also been built.

They have opened the mine with two slopes.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone.**—Two rock tunnels were driven from the Cooper to the Five Foot vein. One of these is to be used exclusively for ventilation.

One rock plane has been driven from Five Foot to Five Foot vein through fault.

A large concrete and steel air bridge has been erected off of the second opening tunnel from Cooper to Five Foot vein.

*Pettebone*

## STEVENS COAL COMPANY

Stevens Colliery—Outside—New four deck L. V. Pattern shaker, 22 feet long, with the driving gear placed on a large block of concrete on the side of the breaker. This prevents the trembling effect in the breaker and has given good results. The refuse plane at the side of the breaker was extended 300 feet to the ridge of the mountain, which gives 75 feet of vertical height to go over the old refuse dump. A boiler house fuel conveyor 350 feet long was put in operation to take the fuel from breaker to boiler room, instead of taking it in cars by mule power. A new coal haulage arrangement was installed. A 36-inch x 10 inch Vulcan coal conveyor, 300 feet long, was placed on the east side of the breaker, and a plane from this conveyor about 600 feet long was erected. The loaded cars now run from top of shaft by gravity to foot of this plane. This arrangement does away with this organization formerly maintained at top of breaker.

Stevens—Inside.—A rock slope on a pitch of 20 degrees was driven from the Ross or Clark vein slope to the Babylon vein. The electric motor haulage roads in the Fifth vein tunnel, were extended 1,700 feet on the west side and on the east side 900 feet; and in the Red Ash vein the electric haulage roads were extended 200 feet on west side.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—This colliery was closed down for general repairs on August 16. The work of retimbering the main shaft is now under way. When the timbering is completed a brick partition will be erected separating the hoistway and airway from the Red Ash vein to the surface, at a depth of 1,147 feet, which they anticipate will improve the ventilation considerably. The work of installing a 150 horse power electric hoist on No. 1 plane, Cooper vein, to operate Cooper and Five foot veins has been completed, the No. 1 plane having been extended to the Five Foot seam. A rock tunnel of 40 degrees pitch has been driven from the Cooper to connect with the extension of No. 1 plane referred to above, which will be used for second opening and return airway. The following rock tunnels have also been completed during the year:

- (a) Tunnel Lance to Five Foot vein on 5 per cent. grade.
- (b) Tunnel Lance to Five Foot on 30 degrees pitch for second opening.
- (c) Short rock tunnel was also driven to connect the main return from Bennett vein to old workings of Cooper vein, which will be used later to convey the air currents from No. 1 plane workings.

(d) "B" gangway has been extended from Hillman to Kidney vein.

Pettebone Colliery—Outside.—A 1,250 horse power Cochrane heater, feed water regulators, pump governors, etc., have been installed at this boiler plant, which have improved conditions very materially.

## FATAL ACCIDENTS

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### Explosion of Gas at Pettebone Colliery

On February 22 an explosion of gas occurred in the Bennett vein, Pettebone Colliery, of the Delaware, Lackawanna and Western Railroad Company, by which Michael Lavelle and William Urban were fatally burned, and George Fulton, John S. Davis, and John E. Jones seriously injured. The men were engaged in driving a short rock tunnel from the Bennett vein to the Cooper vein, old workings, to be used as a return airway for a new rock tunnel that was driven to the Five Foot vein. A bore hole had been driven through the dividing rock sometime previously, which proved that the old workings contained gas that came through the hole to the Bennett vein, but it finally exhausted itself and the hole was plugged. When the men commenced work Jones thought it a wise idea to remove the plug, to allow the gas to be carried away with the ventilation, but instead of being carried away it accumulated behind them. When Davis detected the presence of gas, he sent Lavelle and Urban back from the face to the second cross head, telling them to stay there and have their dinner. One of these men must have struck a match to light their naked lights, as, after the explosion, two naked lights and a match box belonging to Urban was found, which conclusively proved that this was the cause of the explosion.

## CONDITION OF COLLIERIES

### LEHIGH VALLEY COAL COMPANY

Maltby.—Ventilation, drainage and condition as to safety good.

Exeter.—Ventilation, drainage and general condition very good.

Westmoreland.—Ventilation fair, drainage and general condition good.

Seneca.—Ventilation, drainage and condition as to safety good.

Stevens.—Ventilation good, drainage and condition as to safety good.

William A.—Ventilation good, drainage and general condition fair. The principal work done at these mines is robbing pillars and they are about as safe as it is possible to make them under the conditions.

### TEMPLE IRON COMPANY

Harry E.—Ventilation, drainage and condition as to safety very good.

Mt. Lookout.—Ventilation fair, drainage and condition as to safety good.

Forty Fort.—Ventilation good, drainage fair, and condition as to safety good.

### KINGSTON COAL COMPANY

Kingston No. 4.—Ventilation, drainage and condition as to safety very good.



## CLEAR SPRING COAL COMPANY

Clear Spring Colliery.—New plane connecting the two splits in the Marcy vein and the installation of one new 325 horse power Sterling boiler.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—Work of retimbering both shafts has been completed from surface to Red Ash vein. The erection of a brick partition separating hoistway and airway in No. 1 shaft, is now completed. Ventilation has been very materially improved by the installation of this partition.

Two rock tunnels have been driven from Hillman to Kidney vein, south of No. 1 shaft, one for haulage and development purposes, and the other for ventilation and second opening.

This colliery is now in operation after being idle on account of repairs to these shafts since August 16, 1909.

## PLYMOUTH COAL COMPANY

Black Diamond Colliery.—One new rock plane 19 degrees pitch, from Cooper vein to Lance vein, on the south, east end, and one new rock tunnel from Cooper vein to Lance vein, on the south, west side of the property. Sinking a slope in Lance vein inside of this tunnel with one pair of 10 by 12 Bangor engines.

## MINE FOREMEN'S EXAMINATIONS

The examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Kingston, April 19 and 20th. The Board of Examiners was composed of the following: P. M. Boyle, Inspector, Kingston; James J. McCarthy, Luzerne; Harry Jones, Wyoming, and Edward Carlin, Luzerne.

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

## Mine Foremen

John R. Owens, Westmoor; William H. Davies, Wyoming; George Davies, West Pittston; William D. Thomas, Edwardsville; Alfred H. Gibbs, Forty Fort; William Rowley, Luzerne; M. J. Cunningham, Wilkes-Barre; John Mellow, Wyoming; David Walsh, Swoyersville; M. J. Brady, Luzerne; George D. Lewis, Forty Fort; John T. Jones, Edwardsville; Jacob F. Miller, Maltby; Anthony Gallagher, Pittston, and Albert Edwin Thomas, Edwardsville.

## Assistant Mine Foremen

William F. Taylor, Wyoming; M. H. Corrigan, Luzerne; Isidore Hochriter, Luzerne; Jacob Rosnick, Jr., Luzerne; John R. Thomas, Luzerne, Michael Kelly, Wyoming; John L. Williams, West Pittston; David Richards, West Pittston; Martin Tigue, Exeter; John Hosey, Forty Fort; James Donaldson, Avoca; William J. Costello, Kingstont; John E. Dworske, Wyoming, and Samuel Booth, Wyoming.

The breaker has been wired and lighted by electricity. A Cross Compound Corliss valve movement Ingersoll-Rand air compressor 20 by 38 by 30 by 33 inches, was installed. A new brick central shipping station was built. A new underground fuel conveyor line was built from breaker to boiler house. An additional track was built for No. 4 loaded and supply. Two new powder houses were constructed.

The system of night schools has been continued during the year, also the school for the instruction of "First Aid to the Injured Corps." The general appearance of the property has been considerably improved during the year, a number of miners' dwelling houses having been enlarged and sanitary sewerage installed.

#### PLYMOUTH COAL COMPANY

**Black Diamond Colliery.**—Inside: Opened Eleven-Foot or Marcy vein in shaft. Built concrete mule stable in Cooper vein, concrete and steel stable in Ross vein and Red Ash vein; also concrete and steel engine room head of Ross slope. Drove a rock tunnel from Cooper vein to Lance vein, 150 feet, and drove a rock slope from Lance vein to Cooper vein 150 feet; also drove a rock tunnel from Red Ash vein to "A" vein 50 feet.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—Inside: A rock plane has been driven on a 15 degree pitch from the Hillman to Kidney vein, No. 2 shaft, which is now about completed, and a second opening for the same has been driven to the coal, but connections have not as yet been made. The work of sinking No. 11 slope, from Bennett to Red Ash vein, is under way. The Ross vein in No. 1 and No. 2 shafts has been opened and connected to shaft airway. The work of rebuilding mule barns, pump rooms, engine house, etc., with incombustible material, is under way, and will soon be completed.

#### MINE FOREMEN'S EXAMINATIONS

The examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held at Kingston, April 4 and 5. The Board of Examiners was composed of P. M. Boyle, Mine Inspector, Kingston; James J. McCarthy, Superintendent, Luzerne; Harry Jones, Miner, Wyoming; and Edward Carlin, Miner, Luzerne.

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

##### Mine Foremen

Michael H. Corgan, Luzerne; William Michael Toner, Plymouth; Frank J. Carter, Nicholas Cooke, Forty Fort; John Lewis Williams, David Richards, David William Owens, West Pittston; John McHugh, Edwardsville.

##### Assistant Mine Foremen

Thomas Francis Levin, Maltby; William L. Geyer, Dorranceton; William Coutts, David Coutts, Forty Fort; Peter Berry, Pringle; Philip Williams, Charles W. Thomas, John Williamson, John M. Williams, Jr., Wyoming.

At Conyngham shaft, concrete partition walls were built in shaft from Red Ash Top Split to 150 feet above Baltimore vein. New car haul in Red Ash vein installed at foot of shaft, and a rock plane 108 feet long driven as return airway, Red Ash vein.

At Baltimore No. 2, concreted east side foot of shaft in Red Ash vein, shaft at pump room 7 feet by 10 feet by 60 feet.

Established Mine Rescue Station and lecture room for Wilkes-Barre Division at Conyngham, equipped with Draeger helmets and pulmotors, etc.

Completed the work of concreting barns.

#### WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Inside: Built new fire boss shanty and emergency hospital of fireproof material at foot of shaft, also new 16-stall fireproof stable near foot of shaft. Installed 70-horse power engine at top of No 2. East slope driven 300 feet. Baltimore slope extended 940 feet. Baltimore tunnel driven 630 feet toward Stanton vein as the second opening for Baltimore workings. Two tunnels from Hillman vein to Kidney vein, each 220 feet, connected by a gangway. New 40-horse power engine installed in Hillman slope. Hillman slope driven 450 feet. Electric triplex pump installed in Hillman slope. 40-horse power engine installed for placing of refuse, and 20-horse power engine installed in new Seven Foot slope. New Seven Foot slope driven 300 feet. One triplex pump installed in pump lift to supply washery.

Outside.—New fan installed in boiler house for forced draft on boilers. Two bore holes driven from surface to the Seven Foot vein, about 90 feet each, to be used for slushing. Washery completed and in operation.

#### PITTSTON COAL MINING COMPANY

Hadleigh Colliery.—Outside: A new breaker is being built to replace the old one, which was torn down.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

This Company is sinking two new shafts on the Laurel Run farm near the Parson station of the Delaware and Hudson Company. These shafts will be sunk to a depth of 1,150 feet to the Red Ash vein. The coal will be conveyed in mine cars over the old Wilkes-Barre and Eastern road bed and bridge to the **Pettebone breaker**. Both shafts have been sunk to the rock and concreted to surface.

H section steel columns and concrete. A new mine hospital was constructed in Marcy vein of fireproof material and fully equipped with the necessary appliances. A Jeffrey electric under-cutting machine has been placed in Ross vein, with very satisfactory results. A mule barn, with concrete floors, steel mangers and cast iron feed boxes and water troughs, was constructed in the Marcy vein, to accommodate 32 mules.

Outside: A pair of 14 by 20-inch Vulcan hoisting engines installed on the surface to operate Ross slope inside. The engines replace the Flory engines formerly used, which were inadequate to do the work. A complete telephone system was installed connecting the outside office with all the veins and slopes.

#### PLYMOUTH COAL COMPANY

Black Diamond Colliery.—Inside: Built concrete and steel engine room at the head of the slope in Red Ash vein and concrete and steel stable in Red Ash vein. Retimbered Red Ash plane engine house with steel timbers and iron lagging. Built concrete and steel stable in Ross vein; concrete and steel engine room at the head of the slope in Ross vein; concrete and steel pump room in the Bennett vein, and concrete and steel stable in Cooper vein. Installed a 24 by 10 by 24-inch Scranton steam pump in Bennett vein and a 16 by 8 by 18-inch Scranton steam pump in Red Ash slope; also one 5-ton General Electric Company motor with the necessary wiring and bonding to operate it in Bennett vein.

Outside: Installed one General Electric continuous current, 100 K. W. 400 amperes, 250 volt generator, driven by a General Electric 60 cycle 150 horse power 440 volt motor. An electric power house constructed of brick, 26 feet by 14 feet by 12 feet, was also completed. Installed one 500 horse power two-drum water tube Babcock and Wilcox boiler, enclosed in a fireproof brick boiler room with corrugated iron roof and iron doors. Constructed a pump room of concrete and steel with corrugated iron roof and door. Installed one 16 by 8 by 18-inch duplex Scranton steam pump for boiler feed. Installed three Anthracite Spiral slate-picking machines and one Emery slate-picking machine in breaker.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery**—Inside: The second opening from Hillman vein to Kidney vein, which was mentioned in last year's report, has been completed. The work of rebuilding mule barns, pump rooms, hoist rooms, etc., with incombustible material, is completed.

#### EAST BOSTON COAL COMPANY

East Boston Colliery.—Inside: The foot of the shaft was made fireproof by the use of concrete and steel supports. The mule barn, hospital and pump room in Red Ash vein were built of concrete with steel supports. The slope engine room was also built of concrete with steel supports. There were 43 sets of steel timber placed in Red Ash and Ross veins to take the place of wood. The Ross slope engine

The two shafts being sunk by the Delaware, Lackawanna and Western Railroad Company, at Parsons are progressing very successfully, and **Pettebone No. 3** has reached a depth of 515 feet and No. 4 shaft 393 feet.

The trestle work connecting these shafts with the Pettebone breaker, on the west side of the Susquehanna river, at Dorranceton in the 8th District, is about completed.

It is the intention to stop sinking operations in the main shaft when the Cooper vein is reached. The work of development will then be proceeded with in this seam and the upper seams, and the shaft sunk later from the Bennett vein to the Red Ash vein by a bore hole connection from the Cooper to the Bennett vein.

#### DELAWARE AND HUDSON COMPANY

Baltimore No. 5 Colliery.—Placed 68 I beams 15 by 24 inches at head of No. 1 slope in the Red Ash vein for roof support.

Installed a triplex 12 by 12 inch single-acting electric pump in the Red Ash vein.

Conyngham.—Completed 6 by 8 inch bore hole 607 feet, from surface to Hillman 8 inch and Hillman to Baltimore 6 inch, to slush culm from Baltimore No. 5 breaker to the Conyngham workings.

Completed 8-inch cast iron pipe slush line 1,375 feet long, Baltimore No. 5 breaker to bore hole; 6-inch bore hole 274 feet long for drainage from Hillman to Baltimore vein, and concrete pump room 15 by 22 feet at foot of Conyngham shaft in Red Ash vein.

Installed electric triplex 12 by 12 inch single acting electric pump in Red Ash vein.

Installed 7 by 20 foot Jeffrey fan in Conyngham main shaft.

Baltimore No. 2.—Completed concrete pump room 20 by 24 feet at foot of Baltimore No. 2 shaft in Red Ash vein.

Installed electric triplex 12 by 12 inch single acting pump in Red Ash vein.

Completed 540 feet partition wall in shaft, 12 inches by 14 feet, from Red Ash to surface cribbing.

#### WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Completed tunnel from Kidney to Abbott, and started second opening. Slope driven in Kidney to open coal in upper lifts.

In the Stanton vein a slant sone was driven across pitch from 3-W to 4-W and now is being driven down to Basin.

3-½ West gangway driven to connect Baltimore tunnel to Stanton slope.

In the Baltimore vein a second opening from Baltimore to Stanton vein was completed. Drove straight slope 700 feet to north line of the property.

Commenced driving slant slope east from Straight slope. Installed 100 H. P. 4 stage centrifugal pump in pump lift and 35 H. P. triplex pump at No. 4 west.

Outside: Installed 3 batteries of boilers, 400 H. P. each, on old foundations of boiler house and emergency pump in boiler house.

Sank two bore holes from surface to Hillman vein about 60 feet each, to be used for slushing to bottom of shaft.

one room for keeping Wolfe safety lamps and electric hand lamps and the other for storing the mine rescue apparatus. This room serves as a First Aid Hospital, complete with operating table, surgical appliances, et cetera.

#### FORTY FORT COAL COMPANY

Harry E. Colliery.—Inside: Installed a pumping station in the Six Foot vein. Drilled two bore holes for the purpose of furnishing steam to the pumps and discharging the mine water. A 400-gallon motor driven Alberger turbine pump and a 200 gallon Aldrich triplex electrical pump were installed in the Six Foot vein. 10,000 feet of 1/0 copper wire were installed to transmit power for the operation of these pumps.

Installed a 7-ton Morgan-Gardner electric locomotive and a 6-foot Morgan-Gardner coal cutting machine; also a 200 K. W. Westinghouse induction motor generator set in a fireproof building, 15 by 15 feet, transforming 440 volt alternating current to 250 volt direct current.

Installed a pair of 10 by 12 inch Flory engines to operate No. 2 slope, Top Ross vein.

Outside: Built a 12 by 12 foot brick addition to the transformer station to accommodate additional transformers; also a 12 by 12 by 18 foot brick building at the breaker for a transformer station to furnish power for the Six Foot slope.

Forty Fort Colliery.—Inside: Drove a 6 by 8 foot second opening and manway 105 feet from the Top Ross to the Bottom Ross vein, on an angle of 45 degrees. Installed a pair of 10 by 12 foot Flory engines on the rock slope to drop coal from the Top Ross vein to the Bottom Ross vein; also a pair of 14 by 18 foot Flory engines in the Six Foot vein to operate No. 2 slope in the Eleven Foot vein by running a rope down a borehole.

Outside: Built an addition 8 feet 6 inches by 52 feet to the boiler house and added one 500 H. P. Sterling boiler to the plant. Extensive breaker repairs and improvements were also made.

#### MT. LOOKOUT COAL COMPANY

Mt. Lookout Colliery.—Inside: Installed a 28-A Jeffrey 6 foot coal undercutting machine and constructed a fireproof air bridge in No. 9 slope.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Colliery.—Inside: Completed sinking a rock slope from the Bennett vein to the Red Ash vein. The work of sinking a slope from the Cooper to the Red Ash vein, on the south side of No. 1 shaft, is underway. Preparations are being made for second openings by tunnels from the various seams cut by No. 12 slope from the Bennett vein to the Red Ash vein.

#### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Pittston, April 22 and 23. The Board of Examiners was composed

## WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Completed slope from Hillman to Kidney vein, intercepting Abbott vein; Rock slope from Ross and Red Ash veins, and started development in the Abbott vein. Concrete lining placed in landing at shaft in upper Hillman level, and stable made fireproof.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone No. 3** Colliery.—Shafts Nos. 3 and 4 have been sunk a depth of 270 feet and 954 feet, respectively. The trestle work connecting these shafts with the Pettebone breaker, on the west side of the Susquehanna river, is completed.

Installed duplicate ventilating fans, shaft hoisting engines; and both shafts have been equipped with steel towers.

## EAST BOSTON COAL COMPANY

East Boston Colliery.—Inside: Installed one 3-stage turbine and one 2-stage turbine pump in the Eleven Foot and Bennett veins, respectively. These pumps are electrically driven. Tunnel was driven from the Lance vein to the Cooper vein.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Colliery.—Rock slope driven from the Bennett vein to the Red Ash vein. Extensive repairs are being made to the breaker. A washery is also under construction.



Outside: Constructed a concrete and hollow tile washhouse for employes. Installed a silent chain for operating the overwinding device on the shaft engine. A feed pump of large capacity was installed in the boiler house, and covered the feed water lines. Completed a concrete curbing around the colliery yard.

#### PITTSTON COAL MINING COMPANY

Hadleigh Colliery.—Outside: Completed an 8-inch steam line, 400 feet long, equipped with steel flanges, from boiler house to shaft engines and breaker. All lines have been covered with 8 per cent. magnesia covering. Boilers have been reconstructed and rebuilt. Installed small conveyor line for conveying fuel to boiler house. Also installed one GE D. C. current generator, type MP, connected to Harrisburg engine, and one 9 by 14 inch saddle tank locomotive. Constructed a brick building 18 by 60 feet, for generator room, supply store and office. Also reconstructed ambulance house. Completed a 4 inch line 1200 feet long, for fresh water supply to boiler house.

Inside: Installed electric lights throughout the mines; also two 7-ton Baldwin electric locomotives, with overhead trolley; and hung 6000 feet of 2-0 trolley wire. Bonded all rails where locomotives travel. Installed one 100-H. P. D. C. Lidgerwood electric hoist on Red Ash slope, one Goyne duplex plunger pump at foot of Twin slope, and one Scranton duplex plunger pump at foot of Red Ash slope.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Nos. 3 and No. 4 Collieries.—Completed the shafts to the Red Ash vein, a depth of 1086 feet and 1098 feet. Installed the necessary hoisting equipment and ventilating fans.

#### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held May 18 and 19 in the Y. M. C. A. Building, Wilkes-Barre. The Board of Examiners was composed of Thomas J. Williams, Mine Inspector; Samuel R. Morgan, Superintendent, Wilkes-Barre; Patrick McGrane, Miner, Sugar Notch; William H. Chappell, Miner, Wilkes-Barre.

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

#### MINE FOREMEN

Josiah Beech, Alfred W. Davis, Lewis J. Jenkins, Edmund P. Thomas, Edwardsville; Edward Finn, Thomas A. Welch, Wilkes-Barre; George McKechnie, Courtdale; William James Williams, Parsons; John Wordoski, Peely; Charles D. Dare, Larksville.

#### ASSISTANT MINE FOREMEN

Edwin B. Charlton, John Crawford, Corey Cannon, David R. Evans, Edward Griffiths, Charles F. Hoffman, John Kovalick, James G. Morgan, James J. McGrath, Roger Sayes, Wilkes-Barre; Daniel Blaine, Larksville; John Bonsall, Plains; John Morris, William Price, Edwardsville; Leonard Payne, Askam.

## KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—No. 1 shaft: One 8-inch hole was drilled from Bennett vein to Ross vein for drainage. A new concrete air bridge was built in the Orchard vein.

No. 4 Shaft: New fireboss station was constructed at foot of shaft. Shaft was driven from Checker vein to Bennett for drainage and flushing. New 8-inch bore hole was drilled from Ross to Red Ash vein for pumping purposes. A concrete re-enforced partition was completed between the downcast and upcast airways in hoisting shaft. A concrete re-enforced building was erected for encasing a new 28-foot Vulcan fan with Corliss engine. This is a duplicate of the building erected in 1914. A new manway has been completed from the Ross tunnel to the foot of the shaft in the Red Ash vein.

## EAST BOSTON COAL COMPANY

East Boston Colliery.—Installed one 21 by 36 inch air compressor, complete. Built fireproof compressor engine house; also fireproof hospital on the surface. Two electric generators were installed for lighting purposes. Tunnels were driven from Bennett vein to Cooper vein and from Eleven Foot vein to Bennett vein. An air shaft was driven from Cooper vein to Bennett vein.

## HADDOCK MINING COMPANY

Black Diamond Colliery.—Rock plane was driven from Lance vein to Orchard vein, 208 feet, on 21 degree pitch, equipped with one pair of Flori engines. New fireproof engine room was built at head of Eleven Foot slope for housing 12 by 24 inch Vulcan hoisting engines.

## RAUB COAL COMPANY

Louise Colliery.—Installed 3 electric hoists and 4 electric centrifugal pumps.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Colliery.—Breaker was reconstructed and is again in operation. The work of developing thin seams is still underway.

## MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Pittston, May 18 and 19. The Board of Examiners was composed of S. J. Jennings, Mine Inspector, Pittston; James J. McCarty, Superintendent, Luzerne; Thomas Grogan, Miner, Luzerne; John Evers, Miner, Luzerne.

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

All inequalities in the old wood crib behind the steel work have been filled with blue stone concrete, well rammed.

The air shaft shas been relined the upper 26 feet by placing a new interior crib of 10 by 12 hemlock in position inside the original crib, and filling all voids, by removing decayed wood in old crib, with concrete and cement. The new crib measures 10 by 24 feet.

New buntons have been placed for a distance of 76 feet from the mouth of the shaft. The airway brattice has been entirely renewed from the bottom at the Red Ash vein to the top. It is doubled boarded with white pine, with ends bricked up against the rock.

Completed a 7 by 12 foot rock plane on a 25 degree pitch, a distance of 90 feet from the bottom to the Top Ross vein, to improve the haulage; also a 7 by 12 foot tunnel from Bottom Ross to Top Ross on Road 22, to develop the Top Ross vein in that locality.

Installed a Pennsylvania rock crusher, size W-6, which is operated by an 18 by 36 inch steam engine.

Forty Fort Colliery.—Completed a 7 by 12 foot rock plane driven from Road 8-A, Chamber 1, in the Bottom Ross vein, to Road 9, in the Top Ross vein, to further develop the Top Ross vein in that locality and also to improve the transportation.

#### KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—In No. 1 shaft, a new overcast has been built in Orchard vein for ventilation, and a short tunnel completed from Cooper to Lance vein.

In No. 4 shaft, a new overcast was built in the Red Ash vein for ventilation, and a tunnel driven from Checker to Bennett vein.

Installed a 10 by 16 inch air engine at the bottom of Ross vein.

Outside: A bore hole was drilled from surface to Orchard vein for electric wires, removing latter from inside traveling way.

A new playground for children of employes was built in Pringle Borough.

At No. 4 shaft, a 25 foot Guibal steel fan, uniflow steam valve movement, was installed, and a concrete fan house built for same.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—In No. 20 tunnel, Five Foot vein, an electric hoist, equipped with a 75 HP motor, was installed.

Outside: Installed a new electric sub-station equipment; two 27-ton steam locomotives to haul coal from Nos. 3 and 4 shafts to the breaker. Extended electric power lines from Woodward mine to Pettebone. Extended power line from Nos. 1 and 2 shafts to Nos. 3 and 4 shafts. Also installed one electrically driven, 16 foot Sturtevant ventilating fan at Nos. 3 and 4 shafts.

Completed annex to breaker, new wash-house and brick and concrete oil and supply house.

Two rock pulverizers have been installed at the plant.

#### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foreman and assistant mine foreman was held in Pittston on June 5 and 6. The Board of Examiners was composed of Samuel

Installed an air hoist in the West Red Ash slope; also an air hoist at the New Eleven Foot plane. Completed a new pump room of concrete and steel at foot of the shaft.

Outside:—A new bore hole has been drilled from the surface to the Cooper vein near the ash bank, for silting of ashes inside. A new annex to the breaker has been built for preparation of culm bank, separate from fresh mined coal.

#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

**Pettebone Colliery.**—At Nos. 1 and 2 shafts completed a 7 foot by 12 foot, 15 rock plane from upper Five Foot to Hillman vein, also a 7 foot by 12 foot rock tunnel at No. 1 shaft, to hoist all coal from Pettebone Nos. 1 and 2 shaft to No. 1 shaft.

Started flushing breaker refuse in Kidney vein. Completed a new air compressor building, 22 feet by 25 feet for Ingersoll-Rogler compressor. Installed three 7½ ton electric mine locomotives.

At Nos. 3 and 4 shafts completed concrete brattice wall in No. 3 shaft for ventilation. Installed four 150 HP D. C. electric hoists in Abbott, Hillman, Cooper and Red Ash veins, and two 7½ ton electric type, mine locomotives.

#### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the Y. M. C. A. Building, Pittston, May 8 and 9. The Board of Examiners was composed of Edwin C. Curtis, Inspector; James J. McCarthy, Superintendent, Luzerne; John Evers, Miner, Luzerne, and Thomas Grogan, Miner, Luzerne.

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

#### MINE FOREMEN

John Hughes, Dorranceton; John R. Richards, Parsons; Thomas Gibbons, West Pittston; Peter Berry, Pringle; Morgan Rowlands, Edwardsville; Archibald K. Lindsay, Forty Fort.

#### ASSISTANT MINE FOREMEN

John E. Evans, Parsons; Thomas Guilford, Alexander Przestrzelsky, Edwardsville; Richard Parsons, Matthew F. Farrell, David Hughes, Wyoming; Thomas Courts, Edwardsville.