

REPORT

OF INSPECTOR OF COAL MINES FOR THE MIDDLE DISTRICT OF
LUZERNE AND CARBON COUNTIES, FOR THE YEAR 1875.

OFFICE OF INSPECTOR OF COAL MINES, }
WILKESBARRE, PA., *March 18, 1876.* }

His Excellency, JOHN F. HARTRANFT,
Governor of the Commonwealth of Pennsylvania:

SIR:—I have the honor to submit herewith my sixth annual report as inspector of coal mines for this district, ending December, 1875.

My first term of office having expired July 19, 1875, and having received the appointment for another term, the present report covers the last six months of the first term of five years and the first six months of the new or present term.

The report contains, among others, the following items, each bearing, directly or indirectly, on the subject "health and safety of persons employed in coal mines," to wit: A brief note relating to the Empire and Baltimore fires, both of which I gave lengthy accounts of in 1874 reports; tables showing the number of fans in use in the district in 1870; also the number since erected; other tables relating to and comparing the ratios of accidents in various forms and different countries; table, No. 5, showing the quantity of coal produced at each colliery, location, &c.; table, No. 6, shows the number of persons killed during the year; and table, No. 7, shows the number of persons injured during the year, names, &c.; articles on improvements, on steam boiler inspection, ventilation, &c.; also plan of iron head house employed in district.

Yours truly,

T. M. WILLIAMS,
Inspector of Mines.

IMPROVEMENTS.

Shaft sinking has not been carried to such an extent during the year just ended as it was during the previous year, although several pits were sunk during the year, notwithstanding the panic and its effects.

SHAFTS COMPLETED DURING 1875.

J. H. Swoyer's Forty Fort Shaft.—This shaft was commenced and completed since my report for 1874, breaking ground for the sinking in July and completing the same early in the fall, which enabled them to send away four or five hundred tons of coal per day by the end of December, 1875.

The total depth of hoisting shaft being about 100 feet, the second opening was secured by sinking about 50 feet from an overlying seam. The work of sinking shafts, building a breaker, erecting the proper machinery in the said breaker, together with the hoisting tackle for the shaft, and the building of a fan 15 feet diameter, besides opening the mine sufficient to enable them to mine amount of coal above stated, in so limited a time, is certainly speaking volumes for the energy and enterprise of Mr. J. H. Swoyer and his efficient staff of officers.

11 MINE REP.

they complete the sinking of their present shafts and erecting of another breaker, which they have in contemplation, near the location of their drifts. This second breaker spoken of is intended, so stated, to prepare the coals from the Red Ash seam alone, upon which two of these drifts are opened out. Work is progressing finely in these drifts by driving gangways and opening chambers ready so as to enable them to mine quite extensively as soon as their first breaker will be completed, which will be ready early in the spring of 1876.

The two shafts above referred to have not yet penetrated the coal, having had considerable trouble in passing through the surface wash or alluvium of about 60 feet. The rock was found at the aforementioned depth, which gives them the necessary foundation for their shaft timber and a good roof for covering for their coal seam. Those shafts are located about 200 feet apart and sank simultaneously, so that not much delay will be occasioned in the time necessary to make a lawful second opening, the distance between them being so small.

The area of the mining territory of this company is stated to be about 800 acres, and very favorably located for outside arrangements.

MALTBY NEW CIRCULAR SHAFT.

This shaft, although commenced in 1872, has not been completed up to the present time. I stated in my previous reports that it was a circular shaft. The shaft lining, being a brick wall 21 inches through, which was let down by building continuously upon the top, its weight pressing it down as the sand and other material was taken out. The wall finally became so bound by timber pressing upon its sides that its strength was not sufficient to resist the unequal pressure upon its outside, and its cast-iron plates having broken work was discontinued for some time. During this summer Mr. A. O. Fowler, the superintendent, has changed the plan, and has had a cast-iron tube cast in whole rings in sections of about 4 feet in length, and has succeeded in putting the same inside of the brick wall and reached a depth of about 100 feet, or about 20 feet below the brick wall. A short distance below the brick wall they struck a bed of clay, perfectly dry; but this did not last long before they were surprised and driven right out by a force or pressure from below, driving the sand, clay and water up through the bottom until they had to adopt still another new apparatus called a digger, a kind of an automatic shovel, which acts exceedingly well so far as tried, as by this means they are enabled to draw up the sand and clay without taking out the water and the great weight of the cast-iron tubing, pressing it down many feet below the excavated part, thereby forming a leader or shoe. It is thought that matters looks more favorable now than at any other time from its commencement to reach the solid rock, which is at a distance of about 40 feet below their present tubing.

SECOND OPENINGS.

The following mines have had their second openings completed this year, to wit:

J. H. Swoyer's Forty Fort Colliery.—This mine has had a small shaft, 50 feet deep, sank from an overlying seam, which is intended to be used as a second opening for this mine, and also to be used for ventilating purposes, and eventually be enlarged and afterwards used for a hoisting shaft for the coals from their present seam, while that the present main or hoisting shaft will be continued down to an underlying seam, &c.

The Gaylord Coal Company.

This company is sinking a very large shaft near their present colliery in Plymouth. It is twelve by forty-eight feet, and is to cut all the veins from the surface to the Red-Ash. They are down now a depth of four hundred and twelve feet, and have gone through the Cooper, Bennett, and Ross veins

J. H. Swoyer.

At the **Forty Fort** colliery the shaft was extended down from the Bennett to the Ross vein, a distance of two hundred feet, and is now beginning to open on that vein. At the Wyoming colliery an underground slope was driven down one lift.

W. G. Payne.

At the East Boston colliery a new tunnel was driven a distance of one hundred and fifty feet, from the Bennett, to work the Cooper vein.

Plymouth Coal Company.

The Dodson shaft, of this company, was extended down a depth of one hundred and eighty feet and struck an excellent vein of coal, which is believed to be the Baltimore. This mine is about finishing to work in the Bennett vein, which was thought to be a split of the Baltimore, and the discovery of the vein just struck was a very agreeable surprise. It is sixteen feet thick, and the coal is of excellent quality. The second opening, at this writing, is down ninety feet, and will soon be sunk into the new vein, when communication will immediately be made with the workings from the shaft.

NEW FANS ERECTED DURING 1880.

The importance of furnishing the means for supplying good ventilation is more fully realized every year, and it is very gratifying to see the increased efforts made towards improvements in the construction of the ventilators.

Ten new fans have been erected in this district during the last year, and they are all giving excellent results, which amply compensate the expenditure made in their construction. Two of them are thirty-five feet in diameter, viz: The one erected at the Hollenback shaft by the Lehigh and Wilkes-Barre Coal Company, and the other at Mill Creek slope by the Delaware and Hudson Canal Company.

A plan of the Hollenback fan is kindly furnished for this report by Mr. Thomas R. Griffith, one of the company's mining engineers, and it gives a very full description of it, to which the reader is referred. It is erected upon a massive foundation of mason-work, and has a brick-house covered with sheet iron roof. It is running at a speed of twenty-five revolutions per minute, and is exhausting one hundred and twenty-five thousand cubic feet of air per minute with a half inch of water-gauge. Another fan of the same dimensions was previously erected upon this colliery, but was not built on so substantial a foundation. Both are kept running at low speed,

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.

8 MINE INS.

The Parrish Coal Company.

This company began to operate the Parrish colliery, and started the breaker in the latter part of December, 1884. The breaker is a model of neatness, and everything in the structure is well arranged for producing its intended work. There are two forty-horse-power engines, one to hoist the coal over the inclined plane up to the breaker, and the other to run the breaker machinery. Both are supplied with steam from two new boilers located close to the structure. They are mining the Baltimore and Ross seams, have four horizontal openings or drifts, one of which is on a level with the bottom of the breaker-plane, and the coal from the others is lowered over gravity planes. It is a new colliery operated by a company organized in 1884.

Destruction of Coal Breakers by Fire.

The old Hartford, or No. 6, breaker of the Lehigh and Wilkes-Barre Coal Company, at Ashley, took fire in some mysterious manner about eight o'clock, P. M., January 22, 1884, and was burned to the ground. It was the oldest structure of this kind in this valley, and was still capable of passing a large quantity of coal.

The **Forty-Fort** breaker of the Wyoming Valley Coal Company took fire early in the morning of November 27, and was totally destroyed. It is not known how it took fire, and this will very probably remain a mystery. The coal is now taken to the Harry E. breaker and shipped from there.

1884

split of the Baltimore vein to top split, length 90 feet, to be used for transporting coal.

Butler Coal Company.

At the Mosier colliery, a new shaft was sunk to the Red Ash seam, a distance of 375 feet, sectional area, 120 feet, to be used as a second opening to the Mosier shaft.

Waddell & Walters.

At the Bennett colliery they have extended the old slope in the top split of the Baltimore vein 520 feet.

At the Raubville colliery, the second opening has been completed a distance of 2,000 feet, sectional area, 60 feet, to a drift on the mountain. They have placed a new fan, 16 feet in diameter, in position in the opening, with direct gearing working speed of 45 revolutions per minute. Amount of air exhausted, 50,000 cubic feet per minute. A new Pale pump was put in with 8-foot stroke, 14-inch working barrel, also three new steel boilers, 40×45 feet, and a pair of first-motion engines with conical drum on their hoisting shaft.

Clear Spring Coal Company.

At the Clear Spring colliery, a new inside slope was sunk in the Pittston vein, a distance of 500 feet, sectional area, 126 feet, with a grade of 10 degrees.

Elliott, McClure & Co.

The Sibly breaker of Elliott & McClure was burned down on the morning of February 6, 1886. They immediately rebuilt, and started their new breaker on July 20, 1886.

State Line and Sullivan Railroad Company.

At the Bernice colliery, Sullivan county, a new shaft was sunk to the vein now working, a distance of 69 feet, sectional area, 120 feet. They are going to place a fan on this shaft for ventilation to take the place of a furnace which does not give satisfaction. A tunnel was driven 604 feet from the bottom seam to top seam for transporting coal.

W. G. Payne & Co.

At the East Boston colliery, a tunnel was driven from the Red Ash to the Ross seam, a distance of 457 feet, sectional area, 84 feet. This tunnel opens a large territory of good coal for this company.

Wyoming Valley Coal Company.

The **Forty Fort** breaker of this company was burned down in 1885. The coal was taken to their Harry E breaker, about one mile distant, until the breaker could be rebuilt, which work was started immediately and finished July 25, 1886.

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-

tional area of 84 square feet for a distance of 650 feet, on a pitch of about 8°, at which point a fault was encountered, cutting the vein out entirely. The sinking at this point was abandoned until a drill hole was bored with a diamond drill from the surface down. The reason for boring from the surface was for the purpose of ascertaining the thickness of rock overlying the vein, as there is a considerable depth of quick sand in that locality, and also to find the extent of the fault. The vein was found to have gone up 8 or 9 feet, and it was also found that the strata of rock was ample in thickness to proceed in safety with the slope to get the vein again. Therefore the sinking was resumed in the rock with a grade of 1 in 20 feet for a distance of 145 feet, at which point the vein was again tapped and the slope sunk in the vein 400 feet from the fault, and gangways opened up east and west. The second opening was also completed through the fault, and the air connections completed.

The endless or tail-rope system has been placed in this slope for hoisting, which is giving great satisfaction. The motive power is a pair of second motion steam engines, located in No. 1 tunnel. Cylinders 16" by 30", which takes all the coal from the Baltimore seam through No. 1 tunnel to the foot of the eleven-foot slope, a distance of 3,100 feet.

A new steam pump of Goyon Bros., of Ashland, Pa. make, was put in at the foot of the shaft to take care of the water, of which there is a large supply. Steam cylinders 26" by 37", which is giving good results.

Butler Coal Company, Limited.

This company has started a new colliery called the Fernwood, a half mile north of the old Everhart or Boston colliery, located in Jenkins' township. The openings consist of two shafts sunk from the surface to the Red Ash seam, a depth of 100 feet. The main or hoisting shaft is 11x18 feet, the other 11x12 feet in area. The connections between the shafts are not completed at this writing.

A new breaker has been built about five hundred feet north of the shafts, to clean and prepare the coal coming from these openings as well as the coal coming from the Boston tunnels which is taken around the mountain by a track more than 2,000 feet long to be prepared for market in the new breaker. Capacity of breaker about 800 tons per day.

At the Phoenix Colliery the old breaker which has been idle for a number of years was taken down and replaced by a new one which is built on the site of the old one. The machinery in this breaker is of the best for cleaning and preparing coal for market; the capacity is about 800 tons per day. It is heated all through by steam and all the dangerous parts of the machinery boxed or fenced off. The shaft has been re-timbered and placed in good condition for hoisting coal. A new 20-foot Guibal fan has been erected on the air shaft to ventilate the workings of the shaft.

Delaware and Hudson Canal Company.

By this company, Laurel Run Colliery, a rock tunnel was driven from the bottom split of the Baltimore to the Checker seam, a distance of 80 feet, with a sectional area of 12x6 feet, to be used for the transportation of coal.

Wyoming Valley Coal Company.

In the **Forty-Fort** shaft a rock slope, 8x14 feet was sunk from the 11-foot vein to the red ash, a distance of 525 feet, on a grade of 15 degrees. This slope opens up a large field of good coal for this company. A new Guibal fan, 20 feet in diameter, was placed on the air shaft to take the place of the one removed, it having been too small to give the ventilation required.

Keystone Coal Company.

A shaft 12x12 feet was sunk from the surface a distance of 375 feet to the red ash seam to be used for hoisting coal and ventilating the mine.

Raub Coal Company, Limited,

The Louise Colliery, owned and operated by this company, started in the month of September to prepare and ship coal to market. It is located northwest of the Mill Hollow Colliery in the borough of Luzerne. They have opened up the old drifts into the Ross and red ash seams, formerly operated by Thomas Waddell. A small breaker, having a capacity of 300 tons per day, was built to prepare the coal for market, and an air shaft was sunk from the Ross to the red ash seam, a distance of 45 feet, with a sectional area of 120 square feet, to ventilate the workings.

Hillside Coal and Iron Company.

This company has erected a new Guibal fan 14 feet in diameter at their new shaft to ventilate the workings, which exhausts 35,000 cubic feet of air while running 50 revolutions per minute.

Stevens Coal Company.

This company has sunk a new shaft 25x11 feet from the surface to the Pittston seam, a distance of 172 feet, to be used for hoisting coal. It is located south of the breaker, a distance of 500 yards from the slope opening, close to the borough of West Pittston. The coal from this shaft is taken by a small locomotive and hoisted up a plane to the breaker. The second opening was driven from the outcrop in the Checker seam down to the shaft level, a distance of 460 feet on a 4 degree pitch. A rock gravity plane has been started from the Pittston seam to be driven to the Checker above to complete the opening to the bottom. The distance to be driven will be 75 feet on a 20-de-

Improvements by the Florence Coal Company.

This company sunk a shaft from the surface to the Marcy seam, a distance of 227 feet. It has a sectional area of 220 feet. The coal is taken to the Elmwood breaker by a small locomotive a distance of 1,933 yards. The second opening has not been completed at this writing.

A 15 foot Guibal fan was erected on one of the compartments of the shaft, which is run by a horizontal engine 12x18 inches.

Improvements by Robertson and Law.

A new slope was sunk at the Katydid colliery from the surface to the Checker seam, a distance of 200 feet, area 7x9, grade 18 degrees. The coal from this slope is taken 2,000 feet to the breaker by a locomotive. The workings are ventilated by the Consolidated slope fan.

Improvements by the Babylon Coal Company.

A tunnel was driven from the top to the bottom split of the red ash seam, a distance of 162 feet, area 7x12, to be used for transportation of coal.

Improvements by the **Forty Fort** Coal Company.

The "Harry E." shaft of this company was sunk from the eleven foot to the red ash seam a distance of 229 feet, area 22x12 feet. The second opening shaft was sunk to the red ash seam at the same time, and a new 20 foot Guibal fan erected therein, run by a vertical engine directly connected to fan shaft.

Improvements by the Delaware and Hudson Coal Company.

Two tunnels were driven in the Delaware shaft, one between the Baltimore splits, a distance of 150 feet, the other to the Ross seam, 300 feet in length, to be used for transporting coal. Two air shafts were sunk to a depth of 30 and 50 feet respectively, to air the workings of these tunnels. Two inside slopes are being sunk on a 15 degree pitch and are 160 and 180 feet down at present.

Improvement by the Mt. Lookout Coal Company.

Electric Power Plant, Mt. Lookout Coal Company, Wyoming, Penna.

The power house containing the generators and engine is a separate brick building forty by thirty feet, situated about two hundred feet from the mouth of the main hoisting shaft and about one hundred feet from the air shaft. The generating plant consists of one M. P. 4. 100 Kilowatt, (135 H. P.) generator, driven at a speed of 650 revolutions per minute and developing 575

surface to Ross and Red Ash veins, upper workings—serving as means of better ventilation, also as more convenient and safe entrance and exit to that portion of workings which are located so far from main opening.

TEMPLE IRON COMPANY

Harry E Colliery

Outside.—On the hoisting shafts they have put in new 10 foot drum on the hoisting engines, clutch gearing, which enables them to hoist from either of the three levels with both cages, which is we think a very decided improvement. The old drum was an 8 foot diameter drum without clutch, with which they could only hoist from lower level with both cages at one time.

Inside.—Slope being driven in 11 foot vein from shaft level down towards basin, with plane going to outcrop on same line as slope, this will be slope and plane combined, with pair of 14x16 engines in place to operate the same.

Ross

There has been a tunnel driven from Red Ash to Ross vein, size 12x8 feet on a pitch of 15 degrees. This will be the outlet for coal from new slope and plane which is being constructed in Ross vein.

Harry E. Colliery, Ross Vein

Inside.—There is also another tunnel from Red Ash to Ross, 10x6 feet on a pitch of 40 degrees which is return airway for new slope and plane.

The above mentioned improvements are the new work that is being done. Aside from that which would be more under the regular order of work, but which is improvements just the same, is the decided improvement in the ventilation which has been accomplished by the enlarging of the areas of airways both inlet and outlet airways at this colliery the past year.

Forty Fort Colliery

Outside.—New breaker capacity 1,000 tons per ten (10) hours. This breaker was put in operation on June 9, with the most modern machinery for the preparation of coal.

Shaft.—Widened out cage ways and retimbered in the new from top to bottom with concrete wall $2\frac{1}{2}$ feet thick, 20 feet from top down, all around the shaft. One new Sterling boiler 125 H. P.

Inside.—In the 11 foot they are extending the slope towards basin, size of slope 12x7. Ross vein they have reopened and extending slope towards basin, they are also extending plane which is in direct line with the slope. Size 12x7 feet. Have driven new tunnel from 6 foot to 4 foot vein, size of tunnel 12x7 feet. Have built a new traveling way separate and independent from the slope.

Inside.—Have built an additional airway (outlet) from 6 feet to 11 feet, size 10x6, which has made a very decided improvement in the ventilation.

Mt. Lookout Colliery

Outside.—Put in breaker, four (4) sets of Reading jigs, and rearranged 6 sets of Christ jigs. Fuel conveyor from breaker to boiler room.

Inside.—Driving new slope from Pittston vein to Marcy (called No. 7 slope). One electric locomotive, 7½ ton, for work in chambers.

LEHIGH VALLEY COAL COMPANY

Maltby Colliery

A new brick boiler house, 120x5 has been constructed. Six sets, 300 H. P. each, or 1,800 H. P., B. & W. boilers are in course of installation. A number of additions and repairs have been made to the breaker, also betterments to the inside pumping capacity, and changes at the foot of the main hoisting shaft.

Exeter Colliery

A brick boiler house is under construction, and 300 H. P., B. & W. water tube boilers are being installed therein.

A new compressed air motor haulage plant is under construction for the Red Ash shaft district. A brick house encloses a Norwalk three stage compressor, size 20x24x14½x11½x5x24. A 15 ton air locomotive is on the ground. A six inch air pipe runs from the surface down the shaft to the inside haulage roads, total length of pipe, 3,700 feet. These roads are laid with 40-pound rails and special care has been given to the alignment and grading; in all, very favorable conditions now exist for a satisfactory haulage plant at this place.

New barns have been built in the Checker and Red Ash districts.

Pittston hoisting shaft and second outlet shaft completed from Pittston vein to Marcy vein.

New Jeanesville compound duplex pump, size 20x38x10x18, with

to do the work required. The engines are enclosed in a fire proof building, size 22x33 feet.

A 10x18 foot frame building was erected to enclose fire pump.

Forty Fort Colliery.—A 10x14 inch locomotive has been installed to haul mine rock from the shaft to the dump, and a 16x24 foot locomotive house erected for same.

A 14x42 foot addition to the carpenter shop has been built; also a 12x16 foot addition to the oil house.

A water pipe consisting of 212 feet of four-inch pipe, and 288 feet of three inch pipe, has been laid from the water main to outside barn, for fire protection.

The 3-inch steam pipe which supplied the Ross slope engines was too small to carry the amount of steam required and they found it necessary to lay 1,000 feet of 4-inch pipe to those engines; also 600 feet of 6-inch pipe to carry exhaust steam to the return airway. This was done at our suggestion.

A slope is being sunk from Road 8 A in the 4 foot vein to reach the basin in the southeast corner of this property.

The Ross slope struck a roll which they are driving through on a 6 degree grade. This slope was driven in the rock a distance of 227 feet, and has about 150 feet more to go before reaching the coal.

The development of the Ross and 11 foot veins is progressing satisfactorily.

Five bore holes were put down from the surface to the 4 foot vein to test the rock cover of the same, along the D., L. and W., Bloomsburg R. R. Division.

A 7x12 foot rock tunnel was driven from Road 13 in the bottom split of the 11 foot vein to the top split, and a 7x8 foot air shaft, fifteen feet deep, was sunk from top to bottom split. This work was done to develop the top split of the 11 foot vein in this locality.

Harry E Colliery.—A new breaker has been erected on the easterly side of the old structure and is now practically completed. All the machinery is in place except the breaker and conveyor engines, which cannot be placed until the old breaker is abandoned, on account of obstructing the present loading tracks. The shaft head frame is framed and ready for erection. New self dumping cages have been made and delivered, ready for installation.

New cylinders, 26x48 inch, have been purchased to replace the present cylinders on the hoisting engines, which are 22x48 inches, and of sufficient power to operate the new cages, which are much heavier than the old ones.

A 20x22 foot fire proof brick building, with concrete floor and iron roof, has been erected over the Ross Slope engines which are located at the head of the air shaft and in close proximity to the supply and fan house, and replaces an old dilapidated frame building.

A 12x16 foot frame building used as a harness repair shop has been erected at safe distance from the barn, to replace a 10x20 foot frame building which stood so close to the barn as to be a menace in case of fire.

A 16x22 foot addition to the blacksmith shop has been erected owing to insufficient room in the original shop.

A new 16x10x18 inch duplex pump, built by the Scranton Steam Pump Company, was installed at No. 25 lift, Red Ash vein, and 2,300 feet of cast pipe laid from this pump to the foot of the shaft.

Exeter—Inside.—Preparations for the installation of a new pumping plant in the Pittston vein are being made. The air-motor haulage system was installed in the Checker vein. In the Marcy vein preparations are being made for the installation of air motor haulage.

A "Y" slope was completed in the Marcy vein in the west district and engine installed. Considerable changes in the extension of air haulage in the Red Ash vein were completed.

TEMPLE IRON COMPANY

Mt. Lookout Colliery.—A bore hole was drilled from the surface to the Marcy vein, through which a rope operates the Ross slope. A pair of 14x18-inch Flory engines was installed in the 22 x 22 foot brick building for power to operate the above mentioned slope. 516 feet of 8-inch steam pipe from the new boiler house, leading to both fans and both hoisting engines, were installed. This gives them two steam lines to both hoisting engines and fans. An 18 x 30-inch engine was installed to operate the North side fan, to replace the 13 x 16-inch engine formerly in use.

Forty Fort Colliery.—A 7 x 12 foot airway was driven from the Eleven Foot vein to the surface, in a 30 degree pitch, and a 7 x 20 foot ventilating fan, enclosed in a concrete building, installed on airway. A new brick engine house and new foundations were erected immediately in the rear of the old hoisting engine house, and the hoisting engines moved into the new building. A brick building was also erected to cover the breaker pumps.

Harry E. Colliery.—A Carpenter dust-removing system has been installed in the breaker and is giving very good results.

KINGSTON COAL COMPANY

No. 4 Breaker is being overhauled and rebuilt while mining operations are carried on as usual. The work is almost completed. The circular screens have been dispensed with and new mechanical pickers installed, dispensing with all boys under the age of sixteen years. A new brick-concrete wash house for the employes has been constructed, equipped with 100 steel lockers, 12 bath tubs, shower bath, hot and cold water and all conveniences. A new brick addition to boiler house has been completed and 600 H. P. additional B. & W. Water Tube boilers installed. The wooden building encasing the engines at No. 2 bore-hole and Cooper slope substituted with brick-concrete. The No. 1 shaft rock slope 450 feet long driven through roll in rock for the development of the Orchard vein under the Flats. A similar slope has been driven through the fault to reach the Bennett vein. A brick safety lamp station installed on the surface. An additional ambulance, with rubber tires, spring stretchers, etc., has been purchased. The school for the foreign miners was continued throughout the year. A duplex four stage centrifugal pump installed in the Orchard vein, inside slope. Concrete girders have substituted the old wooden timber at No. 4 shaft and turnout. A new Emergency Hospital at foot of the shaft. Three ventilating tunnels completed in Orchard vein. A new quintduplex electric pump, 1,200 gallons per minute, is being installed at the foot of inside Red Ash slope, discharging through 10-inch wood lined pipe 5,000 feet in length. Two new concrete-steel overcasts completed in Ross vein.

blower, driven by a 16 by 16 inch automatic engine, and an 8 inch cast iron pipe used to convey the ashes from the ash pits to the bin. The ashes in this bin can there be loaded into mine cars or run through a set of crushing rolls that have been installed for that purpose, and then flushed into the mines. A 10 inch bore hole was sunk from the surface to the Pittston vein, a depth of 266 feet, for this purpose. The air, which is discharged from the ash bin, is also used for blowing the fires under the boilers.

Eight new plunger jigs were installed in the breaker, six of which were to take the place of old jigs that were worn out.

A 7 by 14 foot rock slope was sunk on a 25 per cent. dip, a distance of 356 feet, from the Marcy vein to the Ross veins on the west side of the property, to develop the Ross veins in that vicinity.

Forty Foot Colliery.—A new barn with a concrete floor, with a capacity for 65 mules, has been erected in the Eleven Foot vein.

A balance plane, 2,300 feet in length, has been installed to handle the coal in the Eleven Foot vein above the shaft level.

A pair of 10 by 12 inch hoisting engines was placed on the west side of the Eleven Foot slope to sink a new slope to the land line, a distance of 950 feet.

A 10 by 12 by 16 inch Jeanesville pump was installed at the foot of the Ross slope, replacing a No. 8 Knowles, which was inadequate to handle the amount of water.

Harry E Colliery.—An 8 inch bore hole was sunk from the surface to the Red Ash vein, a depth of 530 feet, and a 6 inch steam pipe laid from the boiler house to this bore hole, a distance of 1,880 feet, to supply steam to the lower workings of the Eleven Foot vein, and also to the Red Ash vein.

The Six Foot vein workings at this colliery, which were abandoned some years ago on account of the large amount of water flowing into the workings, have been reopened and the water removed. The slope in this vein for a distance of 3,000 feet has been relaid with 40 pound rails, and a 14 inch by 36 inch hoisting engine is used to operate it.

The old air shaft has been reopened and a 13 foot diameter fan installed.

A small area of Four Foot vein overlies these workings, and a 7 by 12 foot rock plane was driven from the Six Foot to the Four Foot vein, a distance of 80 feet. An 8 by 10 foot air shaft was sunk from the surface to the Four Foot vein, a distance of 84 feet.

A mine track has been laid from the mouth of the Six Foot tunnel to connect with the Harry E mine tracks leading to the breaker, a distance of 1,700 feet. This coal is conveyed from the tunnel to the breaker with a 15-ton steam locomotive.

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—The breaker has been equipped with a new "Carpenter" galvanized pipe-water column spray dust eradicator system. A brick extension completed to wash house, entire building now being equipped with two hundred lockers, bath tubs, shower baths, etc.

A brick waiting station completed for miners at the head of the No. 4 shaft. Completed two concrete powder houses, one new carpenter-blacksmith-car shop and a new warehouse ambulance shed.

consisting of one 18 by 30 inch McEwen engine and generator, capacity 700 amperes at 250 volts. The wooden tower over Coxey shaft was replaced with a steel tower and the hoisting engines were changed. A Welch overwinding device was put on the hoisting engines at the Twin shaft. Completed the 17-inch bore hole through which the pump in the Marcy vein, No. 5 slope, delivers water to the surface.

Westmoreland Colliery.—Inside: A 6-ton electric motor was installed in Marcy vein.

Outside: Built a concrete arch at the mouth of No. 1 tunnel; also a wash house of tile construction, equipped with shower baths and lockers.

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—No. 1 Shaft, Inside: Tunnel 200 feet long was driven from Cooper vein to Orchard vein, No. 1 slope. Tunnel 500 feet long was driven from Lance vein to Orchard vein, No. 3 slope. Two tunnels, each 75 feet long, were driven from Lance vein to Cooper rock plane. A tunnel was driven from Checker vein pump room, No. 1 shaft, to connect with No. 4 shaft. Connection was made from No. 6 slope to No. 3 slope in Bennett vein. No. 3 slope is now being used as a traveling way. A new manway was constructed along No. 3 Orchard slope. A new main airway completed from the lower dip workings in No. 1 shaft to No. 6 fan. A new silt line 4,800 feet long was laid from Orchard vein, through Lance and Cooper veins, into the lower level workings in the center of the property.

No. 4 Shaft. Inside: New concrete retaining walls were built between the foot of the shaft and the pump room. Two 4-inch bore holes were drilled from Ross vein to Red Ash vein for silting purposes and one 2-inch hole from Bennett vein to Checker vein for drainage purposes. Silting was carried on extensively during the year in Ross and Red Ash veins.

Outside: A new 8-inch steam line was erected from No. 4 boiler house to No. 2 bore hole fans. Engines and boiler plant at the latter place were dispensed with. Railroad yard facilities were increased for shipping coal over the Lehigh Valley Railroad. Three new air receivers were installed at compressor plant. Erected a 25,000 gallon water tank opposite the boiler house for No. 4 washery.

FORTY FORT COAL COMPANY

Forty Fort Colliery.—Inside: An 8 by 12-inch duplex double-acting pump, driven by a 75-horse power motor, operated by alternating current at 440 volts, was installed in Six Foot vein near the head of Six Foot slope, to pump water from that point to the surface and an 8 by 12-inch triplex, single-acting pump, operated by a 20-horse-power electric motor, was installed in South slope, Six Foot vein, to pump water from the slope to the pumping station near the head of the slope, and 1,500 feet of 6-inch wrought iron column pipe laid between these two pumps. A 22-horse power electric hoist was installed in Four Foot vein, South slope section, and electric hoist was installed to operate the South slope. The object in installing

this electric equipment was to abandon the boiler and compressed air plant, which supplied the lower workings of Forty Fort and Harry E collieries with power, and which was very expensive to operate and maintain.

The barns, engine rooms, pump rooms, etc., inside are constructed of concrete and steel and are strictly fireproof. A shaft, 6 by 6 feet and 50 feet deep, was sunk between the overlap in Four Foot vein, connecting No. 3 slope Four Foot workings with South slope Four Foot workings. This is an additional opening for the South slope section and will afford more efficient ventilation for this section. A rock plane was driven on a 30 degree pitch between the Eleven Foot and Six Foot veins, a distance of 210 feet, for the purpose of making an additional opening for the Six Foot vein workings.

Outside: No. 1 air shaft was retimbered, the airway between the shaft and fan rebuilt, and the fan and fan house substantially repaired. Twelve new jigs of the plunger type were installed in the breaker. The Jackson tunnel, which is used as a waterway for the Six Foot old workings above the shaft level, was opened up and retimbered a distance of 257 feet. This tunnel is now 8 by 18 feet. A telephone system was installed connecting the office outside with the Eleven Foot, Six Foot and Four Foot veins.

Harry E. Colliery—Inside.—One 8 by 12-inch duplex double-acting plunger pump, operated by a 20-horse power electric motor, was installed in a fireproof building of concrete and steel on No. 38 lift. Red Ash vein, and two 8 by 12-inch duplex double-acting plunger pumps are operated by 75-horse power electric motors, were installed on No. 32 lift in a building constructed of concrete with steel for roof supports. Installed one centrifugal pump, with 3-horse power electric motor in No. 24 lift dip; and three 22-horse power electric hoists, one in No. 28 lift, one in No. 24 lift and one in No. 24 intermediate lift. 3,210 feet of extra heavy cast iron flanged pipe laid from No. 19 to No. 32 lift; 750 feet of 8-inch wrought iron pipe laid from No. 32 to No. 38 lift; 2,000 feet of 6-inch wood pipe laid to carry silt to the lower workings in Red Ash vein. A pair of 13 by 18-inch hoisting engines installed at the head of Eleven Foot slope to replace the old engines, which were inadequate to do the work. A rock plane, 6 by 8 feet, 90 feet long, was driven on a 45-degree pitch between Six and Four Foot seams, for a second opening and to improve the ventilation.

All engine houses, stables and pump rooms inside are constructed in a substantial manner of concrete with steel supports.

Outside: A contract was made with the Luzerne County Gas and Electric Company to supply Harry E. and Forty Fort collieries with electric current. A brick building 12 by 12 feet was erected over a bore hole formerly used to supply the Red Ash workings with compressed air, for a sub-station where the Electric Company delivers the current at a voltage of 6,600 volts and it is transformed to 440 volts for use at the colliery. A similar sub-station was erected in the old compressor house to supply the Forty Fort workings with power. A telephone system was installed connecting the outside with the Red Ash and Ross veins.

MT. LOOKOUT COAL COMPANY

Mount Lookout Colliery.—Inside: All timber supports were removed from the main pump room in Pittston vein and replaced with

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

CONDITION OF COLLIERIES

LEHIGH VALLEY COAL COMPANY

Exeter, Maltby, Seneca, Westmoreland and Stevens Collieries.—Ventilation, drainage and condition as to safety good. William A.—Ventilation and drainage good. Condition as to safety fair.

KINGSTON COAL COMPANY

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

FORTY FORT COAL COMPANY

Harry E. and Forty Fort Collieries.—Ventilation, drainage and condition as to safety good.

MT. LOOKOUT COAL COMPANY

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

EAST BOSTON COAL COMPANY

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

PLYMOUTH COAL COMPANY

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

RAUB COAL COMPANY

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

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

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

RISSINGER BROTHERS AND COMPANY, INCORPORATED

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

IMPROVEMENTS

LEHIGH VALLEY COAL COMPANY

Exeter Colliery.—Inside: A Flory engine was installed in a concrete and steel engine room on the North road in Red Ash vein. Silting was begun in the Red Ash and the fireproof mule barn was completed. Ten additional stalls were placed in the fireproof barn in the Checker vein.

Outside: Knight Shaft.—Built a concrete fan house and fan engine house and installed a 20-foot fan to replace the old one. Pittston Shaft.—Constructed a concrete floor and a corrugated iron roof to replace the old wooden ones. Added one 463 H. P. Sterling boiler to boiler plant.

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