

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

OTHER NEW OPENINGS AND CONNECTIONS.

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

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

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

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

IDLE AND ABANDONED COLLIERIES.

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

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

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

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

cept what were necessary for development of territory to supply their quota of coal to the market.

Pennsylvania Coal Company.

This company have sunk a new shaft in Dunmore borough on what is known as the Gilbert Dunning tract, called **No. 1 shaft**. Commenced sinking in rock on November 26, 1885, and finished on November 18, 1886. Shaft is $171\frac{3}{4}$ feet from surface to bottom of first Dunmore vein, $218\frac{5}{8}$ feet to bottom of second Dunmore vein, $272\frac{1}{8}$ feet to bottom of lower Dunmore vein, and $289\frac{1}{8}$ feet to bottom of sump. No coal has been shipped yet. They are opening up the mine and preparing to build a large breaker in connection with the shaft 600 feet east of it. No coal will be shipped until the latter end of year.

Spencer's Shaft.

Spencer Bros. have extended their underground slope 1,280 feet; angle of pitch, 3° ; sectional area, 90 square feet.

Richmond Shaft.

This shaft has been sunk 60 feet to a lower vein; size of shaft, 12×24 feet. They are opening out the mines at present.

Pancoast Shaft.

The company sunk a new slope 550 feet long in mines on a pitch or angle of 6° ; also had a new tunnel driven 128 feet long in rock from top to bottom split of 14-foot, or G, vein; sectional area of tunnel, 60 square feet.

Marshwood Colliery.

This is a new colliery, owned and operated by the Moosic Mountain Coal Company. It is located in Olyphant borough, and 3 miles southeast of Lackawanna river. It consists of one drift driven into crop of first Dunmore vein; slope sunk across the measures, cutting the second Dunmore vein, and to the bottom of the lower Dunmore vein. It is 292 feet long; angle of pitch, $19^{\circ} 25''$; sectional area, 8×12 feet = 96 square feet. The breaker is not finished yet. It will have a capacity of 1,000 tons of coal per day. There are eight boilers in place, also one pair of hoisting engines and one breaker engine. The company have also built several houses for their employés. From present appearances, it is intended for a first-class colliery. John R. Davis, general manager; B. F. Fillmore, assistant; James R. Wilson, mine foreman. The company will be ready to ship coal as soon as the main outside track is finished to the colliery. They are sinking an air shaft 12×16 feet to cut all the veins of coal.

Capouse Shaft.

A new plane has been graded at an angle of 15° and 450 feet long.

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

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

Colliery Improvements During 1886.

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

Pennsylvania Coal Company.

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

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

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

Delaware and Hudson Canal Company.

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

Lehigh Valley Coal Company.

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

Jessup Coal Company—Filer's Slope.—This company is sinking a new slope in coal; it is now down 900 feet. Sectional area, 96 feet.

Hillside Coal and Iron Company—Glenwood Shafts.—The work on the two shafts and breaker, reported in last year's report, 1886, under the head of Erie colliery improvements, has been advanced as follows: The shaft to top vein has been completed at a depth of 100 feet. The shaft to bottom vein has reached a depth of 160 feet. Work is being pushed rapidly forward in this shaft. The breaker to prepare the out-put of these two shafts for market is about finished, and is expected to prepare coal from the top vein about February 1, 1888. This Company is also sinking the Clifford shaft, at Forest City, as rapidly as possible.

John Jermyn—Jermyn No. 4 Shaft has built a new reservoir for spring water to supply the boilers. Started sinking a new slope November 5, 1887, and are down 170 feet. Slope opening, 14'x7'; pitch, 1 foot in 3 feet. Has set three new boilers in place; one pair of engines, 10'x10"; one fan engine, 12'x12", and one pumping engine.

Wm. T. Smith—Mount Pleasant Slope.—Sinking a new shaft to Clark vein. Size of shaft opening is 30'x11'. Depth of shaft from surface to bottom of little vein, 27 feet; Diamond vein, 139 feet; Rock vein, 171 feet; G or Big vein, 241 feet; new County vein, 292 feet; and to Clark vein, 365½ feet.

Moosic Mountain Coal Company—Marshwood Colliery have everything ready to ship coal when branch track to breaker is finished. Are now pushing the work rapidly forward.

William H. Richmonds—Richmond Shaft.—Finished sinking shaft reported in 1886, and are now mining coal in No. 2 vein.

Winton Coal Company—S. V. White Mine has sunk a new shaft and built a new furnace.

Pennsylvania Coal Company—Shaft No. 1 Dunmore.—The second opening of this shaft is not yet completed.

William Connell & Co.—Stafford Shaft has been put in good working order. A new hoisting tower and new engine and boiler houses have been erected. A new nine foot diameter fan has been put in place, and a new railroad track has been laid connecting this shaft with the National breaker, where the coal is prepared for market.

Watkin's Son & Co.—Watkin's Colliery.—This company has erected a new breaker, having a capacity to prepare 500 tons of coal per day of ten hours. Have also erected a boiler house, blacksmith shop, barn and office, etc. Also sunk slope, opened a tunnel, sunk air shaft, and built air stack and furnace for ventilating purposes.

vein. Headings and air-ways have also been driven, but the greatest progress has been made in the top or first Dunmore seam. A new breaker has been built 1,160 feet east of Shaft No. 1, but there has been no coal run through it yet, owing to the dullness of the coal trade.

Shaft No. 4, "Gypsy Grove."—We are grading a new plane to cut off Hale's upper gangway. It is located about seven hundred feet from the D. & H. C. Co. line on the Horsefield tract, in bottom seam of coal.

Shaft No 5.—We have about completed a plane on the northeast side of shaft in No. 3 seam. It will be about 800 feet long and driven on a course of S. 50° E. We have also commenced grading another plane in No. 2 seam driven on the same course as the plane in No. 3 seam. It is located on the southwest side of shaft. An incline was driven through the anticlinal that exists between shafts Nos. 2 and 5 for the purpose of a second opening and drainage. This passage connects the bottom seam of No. 2 Shaft with the first Dunmore seam in Shaft No. 5. This does away with all pumps and other machinery at Shaft No. 2, which was abandoned September 1, 1888.

Hillside Coal and Iron Company.

Clifford Colliery, with a capacity of 1,000 tons of coal per day, was completed. This plant is made up of a breaker with the latest improvements, simplified as much as possible, keeping in view three essentials, sufficient height to pick out slate and rock before the product reaches the rolls, and to avoid putting through the rolls anything that had been broken in the process of mining; a shaft 12'x30' opening and 300 feet deep has been finished. It is operated by a pair of 22"x36" direct acting engines equipped with two Dickson safety carriages; a slope for second opening 360 feet long to hoist rock, of which, owing to the thinness of the seam, there is a great quantity, and for a manway. The breaker is located 700 feet from the shaft. The coal is hauled from the shaft to the breaker, and the empty cars hauled back by a wire rope haulage.

Erie Shaft.—A slope 250 feet long for a second opening and for a manway has been finished on the west side of the Lackawanna river.

Glenwood Shaft No. 2, to the Archbold vein was completed; the total depth from the head to the foot is 350 feet. A pair of direct acting engines, 22x48, with two Dickson safety carriages, is the motive power. A fan 18 feet in diameter by six feet face has been erected to ventilate Glenwood No. 1 Shaft, and it is run by an engine 16x36. Rope haulage is used at this colliery. At all the collieries of this company electric lights are in use in and around the breakers. They were first put in as an experiment at the Erie breaker and they were so complete a success that their general introduction soon followed. The arc light is used, and coal can be cleaned by its light even better than by daylight.

DELAWARE + HUDSON CANAL CO. COAL

OFF. DOC.]

FIRST ANTHRACITE DISTRICT.

5

by a system of rope-haulage, sectional area of slope is 6'x12' equal 72 square feet.

Jermyn No. 1 shaft.—Finished new plane 400' long on a grade of 1' in 5'.

No. 1 shaft, Carbondale.—New tunnel driven from daylight to top coal 550' long, sectional area 63 square feet.

White Oak mines.—Opened up old No. 5 mines by means of two tunnels one 300' long, sectional area equal 60 square feet; also, another 100' feet long, area of opening 56 square feet; these openings are made to the Archbald vein of coal.

OFFICE OF THE PENNSYLVANIA COAL COMPANY,
DUNMORE, PA., February 8, 1890.

MR. PATRICK BLEWITT:

DEAR SIR: The following are some of the improvements made during the year ending December 31, 1889:

No. 5 shaft.—A slope was started from northeast heading in second vein (First Dunmore) angle of slope located about 250' from shaft landing in this seam, we drove slope in vein on north 50 west course for a distance of 900' at which point we encountered a fault. The width of fault was ascertained by boring from top or Clark vein, and the slope again resumed in rock same course as above mentioned, and on a grade of 1' in 20', for a distance of 160', at which point we again opened up vein. The slope will terminate at the lower one, west end of Wilkins' tract. One pair small engines 40 horse-power, Pennsylvania Coal Company's make, located between heading and angle of slope will be used to hoist the coal. The plane on northeast side of shaft in third seam was finished and put in successful operation in February, 1889. The one in second seam was finished in June.

No. 1 shaft.—We resumed operations at this shaft in November, since which time we have been trying to increase the length of our headings and the capacity of lodgment.

Bunker Hill No. 1.—This new working is situated on line of Taylor tract near end of the E. & W. V. truss and about 600' east of Roaring Brook. At or near the point at which the shaft is sunk, a tunnel had been driven (about thirty-five years ago) into what is known as the Dunmore middle vein, and from this tunnel two narrow passages were driven in coal, one to the rise, south 39° east, and abandoned in coal, the other driven to daylight on a course of south 7° west. At this point, a furnace has been built for the purpose of ventilating this seam, our second opening will also be at this point. The shaft is 44' 8" deep and sunk to the Dunmore bottom vein. A second opening to shaft workings has been made close to the bank of Roaring Brook and almost directly under the track of the E. & W. V. railroad, driven in the coal of the Dunmore bottom vein about 500' feet east of shaft. The coal from both shaft and tunnel will be hoisted to an elevation of 30' above sur-

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

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

MINE IMPROVEMENTS DURING 1890.

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

Pennsylvania Coal Company.

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

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

6 MINES.

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

Lehigh Valley Coal Company.

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

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

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

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

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

Delaware and Hudson Canal Company.

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

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

Delaware, Lackawanna and Western Railroad Company.

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

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

Wyoming Valley Coal Company.

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

Two new tunnels have been driven at Coal Brook, one from the top vein to the surface, a distance of one hundred and sixty feet, and one from the third vein to the surface, a distance of one hundred and seventy-five feet.

At Clinton two new slopes have been driven; one is 3,100 feet long, the other 700 feet. The first has an average grade of 8 feet in 100, the other 6 feet in 100.

Richmond No. 3 shaft has been sunk from the Clark to Dunmore Nos. 1 and 2 veins, a distance of 132 feet. Its size is 10x22 feet.

At Richmond No. 4 a new plane 800 feet long has been made.

At Mt. Jessup a tunnel 464 feet long has been completed from the Clark to the No. 3 Dunmore vein.

Near their No. 1 colliery the Pennsylvania Coal Company has erected six Babcock and Wilcox water tube boilers of 900 horse power. The pressure carried per square inch is 110 pounds.

Steam is supplied for No. 1 colliery breaker and shaft, to Gypsy Grove colliery breaker and its two shafts, and have supplanted the 27 cylindrical boilers 36x30 feet formerly used at these places.

The Lackawanna Coal Company has sunk an air shaft, having a sectional area of 120 feet and a dept of 55 feet.

A new air shaft was sunk from the surface to the Dunmore vein by the Johnson Coal Company. Its depth is 310 feet and has 1200 feet area.

A tunnel 7x14 feet and 1,300 feet long has been driven from the big vein to the Dunmore.

At Pancoast a new slope 800 feet long has been sunk in Clark vein and another is being sunk in No. 3 vein.

The Dolph Coal Company has sunk two new slopes, one 350 and the other 650 feet deep. One is 6x16 and the other 6x12. They have also made a new plane 500 feet long, and sunk two new air shafts each 62 feet deep.

The Riverside Coal Company has made a new slope 900 feet long.

Many other small air shafts, tunnels, slopes and planes have been made during the year for the purpose of properly ventilating the workings and to keep up the output of coal, but they are not reported.

A FEW REMARKS ON THE STATISTICS FOR FIVE YEARS.

By a retrospective glance at the mining statistics of this district for the five years ending December 31, 1896, we find that there were 30,702,284 tons of coal produced and 29,367,733 tons shipped; 79,645 persons were employed for 939 days, during which time 1,056,055 kegs of powder of 25 pounds each, were consumed.

Of the total number employed 243, or a small fraction more than three-tenths of one per cent. were killed. Of the 243 killed, 154 lost

COLLIERY IMPROVEMENTS FOR YEAR 1888.

Delaware, Lackawanna and Western Railroad Company.

Bellevue Shaft.—A new fan was erected close to the old one, size 16 feet diameter by $4\frac{1}{2}$ feet width of face. A pair of new hoisting engines were put in place at head of inside slope 12"x30" to replace old ones removed.

Bellevue Slope.—A new tunnel was driven from Rock to Diamond vein, 150 feet long.

Cayuga Shaft.—A new shaft was sunk for second opening about one mile north from main shaft, size 10'x37 $\frac{1}{2}$ '; area of opening 375 square feet, and sunk to G or Big vein, a distance of 436 feet.

Central Shaft.—A new slope driven in G or Big Vein 500 feet long on a dip of 1' in 6'. Also a new pair of first motion hoisting engines 24"x60".

Hyde Park Shaft.—A new tunnel was driven from New County to Clark Vein.

Pyne Shaft.—A new fan 14 feet diameter by 4 feet face was put in to replace old fan which was not sufficient to ventilate the mine.

Tripp Shaft.—A new slope was driven in Clark vein about 500 feet in length. Dip is 1' in 6'. A new pair of engines, second motion, dimensions 10"x30", was placed outside at Diamond for hoisting culm.

Delaware and Hudson Canal Company.

Dickson Shaft.—Built new fan 20 feet diameter by 5 feet face, closed periphery, run by direct motion engines, one on each end of shaft to replace a fan of 12 feet diameter and 3 feet face, which was not of sufficient capacity to ventilate the mines. They sunk a slope in Clark vein 600 feet in length and placed in position a pair of hoisting engines 12"x16" at head of slope.

Leggetts' Creek Shaft.—Sunk main shaft 10x26 feet, 177 feet from 14 feet or G to Clark vein and made connection with Von Storch mine workings for second opening.

White Oak Mines.—Reopened old No. 5 drift near head of No. 27 plane on the Gravity railroad with a tunnel through hard pan 365 feet in length to coal. Sunk an air-shaft in rock 11 feet in diameter and 36 feet deep to coal. Built a furnace with a fire surface of 64 square feet. Built 3,900 feet of railroad track to head of plane which plane is 1,328 feet long, having a gauge of $2\frac{1}{2}$ feet, to take coal to the breaker, for which a small locomotive is used.

Pennsylvania Coal Company.

Shaft No. 1.—A second opening has been made in "Top Vein" by making a connection with Shaft No. 3 or Gypsy Grove. An air-shaft was sunk from top to "Second Vein," giving a second opening to this

New Shaft.—Present depth 525 feet. Section of shaft 12x50 feet to be continued to Dunmore vein. Erection of new Guibal fan at this shaft 28x8 feet, driven by a pair of Corliss engines 18x36 inches each.

Eddy Creek.—Tunnel being driven from Rock vein to Big vein, section 7x12 feet, not completed. Four new openings located along East bank of the Lackawanna river, near Priceburg. One of these to open the Pierce vein, and three to open the Church vein. New air shaft commenced, circular in shape, 14 feet diameter. One centrifugal pump of 500 gallon capacity, driven by electric motor.

Three Gardiner electric drills for coal mining put in use.

No. 2 Olyphant.—Three locomotive type boilers of 250 horse power each installed. One 22 and 38x16x48 inch Jeansville Duplex pump, capacity 3,000 gallons per minute.

One 60 K. W. electric generator belted to a 13x12 inch Ball engine.

By the Sterrick Creek Coal Company

Sterrick Creek.—To improve the ventilation, a rock air-way was driven from the slope workings of the Dunmore vein up to the Clark vein, and two air shafts from the surface to the Clark vein were also completed. Several intake drifts from the surface to the Grassy vein have been abandoned, owing to their proximity to the Grassy Island Creek, and in their stead an air shaft, some distance away from the creek, has been sunk from the surface to said Grassy vein.

A new Jeansville pump has been placed in the Clark vein, near foot of No. 1 shaft, with a capacity of 2,000 gallons per minute.

A new Ingersoll-Sergeant Duplex air compressor, 20x24 inch steam cylinder, and compound air end 33 $\frac{1}{4}$ inches and 20 $\frac{1}{4}$ x24 inches was added to original air plant.

A new shaft 12x30 feet is sunk to a depth of 100 feet, to be continued until it reaches the Dunmore vein.

Three bore holes have been sunk from the surface, two to the Dunmore vein, and one to the Clark vein.

The present two inside hoisting engines, together with a large one, are to be placed on the surface, and ropes are to be run down the bore holes into the mine. This will enlarge the present capacity, eventually making this colliery one of the largest producers.

By the Pennsylvania Coal Company

Work has been commenced at both ends of a new tunnel to be driven from the Lackawanna river to **No. 1 shaft**, No. 1 colliery, for

the purpose of draining all of the collieries above No. 1 shaft in the Dunmore district.

This tunnel when completed will be about 7,000 feet in length. The dimensions are as follows:

First 1,200 feet to be 8x6 feet.

The next 5,000 feet to be 15x7 feet.

The last 800 feet to be 8x6 feet.

The tunnel to be driven with a uniform grade of 4 inches in each and every 100 feet.

By the Price-Pancoast Coal Company

Pancoast Shaft.—Erection of two new brick supply houses, one 20x30 feet and the other 20x40 feet.

The old 20 foot ventilating fan has been repaired and put in fit condition to ventilate the Dunmore vein.

In No. 1 or Diamond vein a new gravity plane has been constructed 700 feet in length.

In No. 3 vein, two new gravity planes, and in No. 4 vein two new gravity planes have been constructed. The West slope has been extended for a distance of 700 feet to line near Lackawanna river.

The Dunmore vein has been opened and a slope driven on the north dip 1,000 feet. A hoisting engine has been put in here, capable of hoisting 200 cars per day. A slope on West side is being driven, present length 400 feet, with gangways driven east and southeast. Seven splits of air have been made with two more under way. A new barn has been made in this vein to hold 35 mules.

By the Finn Coal Company

Erection of new breaker, dimensions of which are 51x51 feet and height over wall 65 feet. One large screen, two sets of shakers 30 feet long. One set of elevators, distance between centers 45 feet.

Breaker engine 16x24 inch cylinder, 75 horse power. Capacity of breaker about 350 tons daily.

A tunnel driven from No. 1 Dunmore to No. 2 Dunmore vein; length 66 feet, section 6x14 feet.

A new second opening was driven from inside to the surface, a distance of 100 feet.

By the Black Diamond Coal Company

Erection of new fan, 12 feet in diameter, to ventilate No. 1 vein. The result is a marked improvement in the ventilation.

Eddy Creek.—Erection of new Guibal fan 28x8 feet with new brick engine room. The shaft is being enlarged from 10x23 feet in section to 12x33 feet 4 inches. At "Birds Eye" a Guibal fan 8x3 feet has been erected, driven by electricity at a speed of 200 revolutions per minute.

Olyphant No. 2.—The 4-foot vein has been cut by two rock planes.

PENNSYLVANIA COAL COMPANY

Gipsy Grove, Outside.—New pair of 15x24 inch geared hoisting engines for shaft. Stable inside with capacity of 20 mules in second Dunmore vein. In third Dunmore vein a stable of same capacity was made.

No. 1 Colliery.—Work is progressing on installation of additional horse power Babcock and Wilcox boilers, which will increase the capacity to 1,200 horse power. A new 10-foot forced draft fan is being erected for the same; also, new Cochrane feed water heater and 12x8x12 inch duplex Scranton pump. A new water tank is being built with a capacity of 50,000 gallons. One alternating current generator 2,300 volts 7 5-10 amperes, speed 1,200 revolutions, belted to a 10x10 inch, 62 horse power McEwen engine. This furnishes power to run the drills and a 20 horse power induction motor, with 220 volts 50 amperes. The 20 horse power induction motor is located at the river end of the tunnel, about 7,500 feet from the generator and is used to run a 57 inch exhaust fan which supplies air to the tunnel. It is connected by belt to a 5 horse power dynamo which gives the direct current to the motors which run the drills. Also one Rand air compressor to furnish power to run air drills at No. 1 end of tunnel. New car and blacksmith shop 30x112 feet with 16x20 feet ell. New supply house 34x50 feet.

Water tunnel from Lackawanna river to **No. 1 shaft** has been driven in 1,200 feet during the year, and on the No. 1 end of the tunnel 500 feet. In the third Dunmore vein a new gravity plane has been made, section 6x15 feet and 800 feet in length. A new stable has been made in same vein with capacity of 30 mules; also new air bridge sectional area 60 feet and new 16x8½x14 inch Scranton pump.

No. 2 Shaft.—New locomotive boiler, outside. Work is progressing on new engine plant. When completed will be about 5,000 feet in length and will be operated by a pair of 15x24 inch geared hoisting engines, which are now on the foundation. New air course and traveling way have been made at No. 1 tunnel.

STERRICK CREEK COAL COMPANY

Sterrick Creek.—The new shaft 12x30 feet in section which was commenced to sink in 1903 has been completed. This shaft is sunk

IMPROVEMENTS

DELAWARE AND HUDSON COMPANY

Clinton.—New tail rope installed 1,000 feet in length, with a pair of double engines 14x20 inch in River Side Slope to pull coal north and south. A new hospital "First Aid," and wash house has been erected outside for employes of the Dunmore vein. Two new ventilating fans erected, each 20 feet in diameter.

No. 1. Carbondale.—Tail rope has been extended 1,000 feet, delivering cars to main line.

Powderly.—New car shop, supply house and blacksmith shop erected.

Jermyn.—Rock tunnel completed from the Archbald vein to the Dunmore vein, distance 125 feet. New electric motor $4\frac{1}{2}$ tons with 12x18 inch reel on top for lowering loaded and hoisting empty cars in chambers.

White Oak.—New car shop has been erected. New plane in Dunmore vein finished.

PRICE-PANCOAST COAL COMPANY

A rock slope has been sunk in the Diamond vein over the "Anticlinal." A pair of double engines has been put in same vein to hoist the coal from this slope; size of engines 24x36 inch. In No. 3 vein a slope has been sunk 600 feet in length to the river line, and a pair of engines put in to hoist the coal, 12x12 inch in size. No. 2 Gravity Plane that was abandoned six years ago has been opened. In the Clark vein a new plane has been built, 600 feet in length. Dunmore No. 2 vein, the west slope, 900 feet in length, has been graded, and a pair of engines 12x12 inch in size erected outside to hoist the coal. One 250 horse power boiler was installed.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery, Outside—In 1904, work was commenced on the installation of 300 additional horse power "Babcock and Wilcox" boilers, and new 10 foot forced draft fan; also new "Cochrane" feed water heater and 12x8x12 inch "Duplex Scranton Pump" and new 50,000 gallon water tank. This work has all been completed during the year. The following buildings have been erected during the year. A new stone powder house 12x14 feet; a new stone oil house 12x12 feet 7 inch; also new brick wash house for miners 16x24 feet. Work is progressing on new brick building 16x36 feet to contain three rooms; office for outside foreman, shifting shanty for firemen, and shifting place for breaker men.

No. 2 Shaft, Outside.—The fan and head house, which was burned during the year, has been replaced by concrete buildings. A 12 inch concrete wall has been built between the down-cast and up-cast from foot of shaft to fan.

No. 1 Shaft, Inside.—Water tunnel from Lackawanna river to No. 1 Shaft. No. 1 Colliery has been driven in 1,600 feet during the year, and on the No. 1 end, 1,900 feet. Total distance driven since the tunnel was commenced, 5,200 feet. Distance yet to be driven, 1,600 feet. Another tunnel has been driven 675 feet from the third Dunmore vein to the second Dunmore vein, to carry the water to main tunnel, sectional area 6x9 inch.

IMPROVEMENTS

SCRANTON COAL COMPANY

Johnson.—No improvements reported.

Ontario.—The portion of the breaker blown down by the tornado last fall, has been rebuilt and is expected to resume operations about March 12. The Raymond washery was torn down and moved to this colliery and is now being rebuilt. This will necessitate an increase in the power plant, and it is intended to add two boilers to the present plant for this purpose.

Richmond No. 3.—An additional 200 H. P. Maxim boiler has been added to the present plant. The new shaft has been named in honor of General Manager John R. Bryden, and is now known as Bryden Shaft.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs.—Seven hundred feet of the Clark Vein Slope at No. 3 shaft have been graded; average thickness 5 feet. This was done in order to enable them to run the cars to the bottom lift of the slope.

The floors of the boiler house have been concreted; also concrete fronts at their No. 3 shaft. Four new Emery Pickers were installed in the breaker. A scraper line was constructed to convey the culm from the breaker to the washery in order to do away with the handling of cars.

DELAWARE AND HUDSON COMPANY

Eddy Creek.—Grassy Island No. 2 shaft sinking completed to the No. 4 Dunmore vein, a distance of 117 feet. The sinking of No. 4 shaft has been started and is down a distance of 50 feet. This shaft is to be used as a second opening to the No. 2 shaft.

One 78 inch locomotive boiler has been installed at the Grassy Island Washery, also a 10 inch x 14 inch engine and a 600 foot scraper line for feeding bank to washery.

Miles slope extended in rock from the Rock Vein towards the No. 4 Dunmore Vein, a distance of 750 feet. This slope is to be used as a second opening to the Eddy Creek.

A 28 foot Guibal fan has been installed at the Eddy Creek. The shaft has been widened from 10 feet x 24 feet to 12 feet x 33.4 feet from surface to the 14 foot vein.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery.—In 1904 work was commenced on a new brick building 16x36 to contain three rooms; office for the outside foreman, shifting shanty for the fireman and a shifting shanty for the breaker men. This work has been completed.

No. 2 Shaft, Outside.—The following buildings have been erected during the year: a new concrete building 14 feet x 40 feet with three rooms; office for the inside foreman, shifting shanty for the fireman and a shanty for the miners. Two additional locomotive boilers have been installed and a new corrugated iron boiler house 40 feet x 60 feet has been built.

No. 2 Shaft, Inside—A new air bridge has been built in the second Dunmore vein, sectional area 120 square feet. A new engine plane 3,000 feet long has been built in the third Dunmore vein, and a new pair of hoisting engines 15 inches x 36 inches installed to operate the plane.

No. 1 Shaft Inside.—The water tunnel from the Lackawanna River to the No. 1 Shaft was completed August 30. The total length of the tunnel is 6,800 feet.

LACKAWANNA COAL COMPANY, LIMITED

Lackawanna.—At the new shaft on the Lillibridge tract gangways have been driven in the Dunmore vein 500 feet east and west, and a sump driven on the south dip a distance of 275 feet. No chambers have been turned within 200 feet of the shaft.

A 100 K. W. G. E. generator, direct connected to a 16 inch x 15 inch McEwen engine, has been installed at the breaker and carried overland 2,400 feet to the new shaft and down the same to the Dunmore vein, where it operates one seven ton locomotive with reel attachment for chamber work. This locomotive is handling transportation in the Dunmore vein. They have also two percussion drills in operation for drilling rock in this vein, which give good satisfaction. A conveyor line with 10 inches x 48 inches flights 258 foot centres, with an automatic feed and car tip, has been erected to convey the new shaft coal to the breaker. This conveyor is built on a five and a quarter inch pitch and is operated by a 12 inch x 18 inch single engine with rope drive.

The three 250 H. P. boilers and 8 inch steam line which were commenced last year have been completed.

On account of the increase in this plant, it became necessary to install a larger blast fan and to increase the area of the air duct accordingly, and also to install a 2,000 H. P. Cochrane water heater in place of the old one which was only 1,200 H. P. 12x12x7 duplex feed pump was installed to work in connection with the old one.

A 14 inch exhaust steam pipe 200 feet long was erected between the breaker and the new heater and all the exhaust of the pumps and engines, except the shaft hoist, are coupled to the same.

The four stacks on the Cahall boilers were lengthened 32 feet to give better draught for these boilers.

A conveyor was installed to carry fuel from the present fire room conveyor to the bins in front of the Maxim boilers.

The annex breaker engine foundation has been replaced by concrete foundations built of wood, and a substantial frame building has been erected over the same.

The cribbing under the breaker shaft tower was replaced to a depth of 80 feet. Concrete foundations were made outside of this cribbing on which new sills were placed to carry the tower. This tower was also reinforced to the car dump, from the ground.

Three single-decked shaking screens were installed on head of the breaker to handle the run of mine coal and are giving very good results.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Blue Ridge Tunnel.—Condition as to safety good, drainage and ventilation fair. They are robbing pillars.

Richmond No. 3 Colliery.—Condition as to safety good, drainage fair, ventilation good.

DELAWARE AND HUDSON COMPANY

Olyphant Colliery No. 2 Shaft.—Condition as to safety and drainage good, ventilation generally good.

Grassy Island Slope.—Condition as to safety and drainage good, ventilation good with the exception of the Four Foot vein. This vein is very difficult to ventilate as it is thin and the roof is continually falling in the air courses.

Grassy Island Shaft.—Condition as to safety and drainage good, ventilation fair. There is room for improvement.

Eddy Creek Colliery, Birds Eye Mines.—Condition as to safety, drainage and ventilation good.

No. 4 Drift.—Condition as to safety good, drainage and ventilation fair.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs Colliery No. 1 Shaft.—Condition as to safety, drainage and ventilation good.

No. 2 Shaft.—Condition as to safety and drainage good, ventilation fair. There is room for improvement.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery No. 1 Shaft.—Condition as to safety and drainage good, ventilation fair.

No. 2 Shaft.—Condition as to safety and drainage good, ventilation fair.

Gipsy Grove Colliery.—Condition as to safety, drainage and ventilation good. This mine has been very much improved.

STERRICK CREEK COAL COMPANY

Sterrck Creek Colliery.—Condition as to safety, drainage and ventilation good. Six air bridges were built during the year, which improved the ventilation.

LACKAWANNA COAL COMPANY

Lackawanna Colliery.—Condition as to safety, drainage and ventilation good.

DOLPH COAL COMPANY

Dolph Colliery, Hackley Slope.—Condition as to safety, drainage and ventilation good.

Hannah Bell.—Condition as to safety good, drainage and ventilation fair.

MOUNT JESSUP COAL COMPANY

Mount Jessup Colliery, Peck's Shaft.—Condition as to safety good, drainage fair, ventilation good.

MOOSIC MOUNTAIN COAL COMPANY

Marshwood Drift.—Condition as to safety good, drainage poor, but it is being improved. Ventilation fair.

BLAKELY COAL COMPANY

Blakely.—Condition as to safety, drainage and ventilation good.

MOTT HAVEN COAL COMPANY

Mott Haven.—Condition as to safety, drainage and ventilation good.

IMPROVEMENTS

SCRANTON COAL COMPANY

Johnson.—Man shaft tower rebuilt.

Ontario.—Three new locomotive type boilers installed. New washery built.

Bryden Shaft.—Fourteen foot fan constructed in brick and concrete.

DELAWARE AND HUDSON COMPANY

Olyphant.—No. 16 Rock Plane driven from Diamond to Four Foot, a distance of 103 feet.

No. 18 Rock Plane driven 475 feet through fault in Diamond vein.

No. 10 Rock Slope (Miles) driven 842 feet from Rock to No. 4 Dunmore vein.

Grading 400 feet of No. 3 Tunnel from Rock to Fourteen Foot vein.

No. 9 Rock Plane driven 108 feet from Fourteen Foot toward Rock vein.

Grassy Island.—At Grassy No. 1 Rock Tunnel from New County to Fourteen Foot vein, driven 210 feet for second opening.

Rock Plane from Four Foot to No. 2 vein driven 200 feet.

Shaft from surface to No. 2 vein sunk 36 feet for second opening.

No. 4 Dunmore vein opened in Grassy No. 2 Shaft, 250 feet on east side and 100 feet on west side, and Clark vein opened 75 feet on east side.

Grassy Island No. 4 shaft sinking down a distance of 611 feet, not completed.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs No. 3.—A new ventilating fan has been placed and is in operation at Storrs No. 3 steel casting and brick building.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery Outside.—A brick building 18 feet x 18 feet to be used as an electric light plant, containing one 8 x 10, 40 H. P. engine, 100 ampere, continuous current 250 volts. Also one brick building 24 feet x 38 feet, with an annex 9 feet x 23 feet. This building contains one pair 12 x 24 hoisting engines to operate two inside slopes in No. 1 Shaft, one in the third Dunmore vein and one in the second Dunmore vein, which is being driven.

PACoAL Co

No. 1 Shaft, Inside.—One 10-inch bore hole from surface to third Dunmore vein for steam line; this will do away with steam line in the shaft. Also one 3-inch bore hole to second Dunmore vein, both of which are to be used for rope haulage on slopes. New slope in second Dunmore vein 6 feet x 12 feet has been extended 450 feet.

No. 2 Shaft, Inside.—Engine plane in second Dunmore vein extended 400 feet.

Gipsy Grove, Inside.—One 10-inch bore hole from surface to third Dunmore vein, one 3-inch bore hole from surface to third Dunmore vein. One Dunmore pump 102 plunger, 30-inch stroke, to be used for the purpose of pumping water to supply No. 1 washery.

STERRICK CREEK COAL COMPANY

Sterrick Creek Colliery.—A steam boiler plant, consisting of four 250 horse power Maxim boilers, was erected to replace the two small plants, which consisted of one high and low pressure plant. The foundations of the new boiler house are of concrete and the building is constructed of gray brick, with iron roof trusses and corrugated iron roof. The boiler foundations are constructed of building stone, and the boiler settings of red brick.

MINE FOREMEN'S EXAMINATIONS

The following persons having passed a satisfactory examination were granted certificates of qualification:

Mine Foremen

Frank Good, Scranton; William Lewis, Scranton; Thomas J. Moyle, Simpson; James Horan, Carbondale; George T. Williams, Peckville; Joseph J. Munley, Dickson City; Herbert Spencer, Carpenter, Scranton.

Assistant Mine Foremen

David D. Morgan, Peckville; Isaac Morgan, Scranton; Andrew H. Smith, Jr. Scranton; Edwin S. Jones, Scranton; Joseph A. McCabe, Blakely; Thomas D. Llewellyn, Peckville; James Stephens, Taylor; James H. James, Olyphant; George W. Morgan, Olyphant; Charles J. Latcham, Scranton; Edward R. Edwards, Olyphant; John Brooks, Olyphant.

Grassy Island No. 4 Shaft.—Completed sinking shaft to No. 4 Dunmore vein to a depth of 740 feet, connecting with workings from Grassy Island No. 2 shaft for a second opening. Shaft was concreted from surface 56 feet down the shaft, including concrete buntons.

No. 10 Slope.—Placed an electric pump at foot of slope; installed an electric hoist to hoist coal up inside slope and lower down plane. Installed a 24 inch x 48 foot engine for hoisting on main slope, 2,600 feet long.

Eddy Creek Colliery: Eddy Creek.—Sunk shaft from Fourteen Foot vein to Dunmore No. 4, a depth of 414 feet; gangways opened on North side 120 feet and on South side 70 feet in No. 4 Dunmore.

Birds Eye.—Drilled a 6½ inch electric cable hole 120 feet from surface to Clark vein, and a 12 inch water hole the same depth a few feet from it.

No. 11 Slope.—Was driven to No. 2 vein a distance of 120 feet on grade of 20 per cent. An engine house was erected containing 3 engines; one 10 x 12 inches to operate No. 11 slope; one 10 x 12 inches to operate plane to rock dump, and one 12¼ x 15 inches to operate No. 18 plane in Diamond vein.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery.—Outside. Built a 45 x 29 foot concrete building with steel truss roof, containing one pair of 15 x 36 inch engines which will operate two slopes, one to the Clark vein and the other to the New County vein.

No. 2 Shaft.—Outside. Built a concrete building 42 x 15 feet to be used as an emergency hospital, tool room and blacksmith shop.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in City Hall, Scranton, June 15 and 16. The Board of Examiners was composed of L. M. Evans, Inspector, Scranton; F. G. Wolfe, Engineer, Scranton; W. F. Malloy, Carbondale, and David Evans, Olyphant, Miners.

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

Mine Foremen

John Conway, Old Forge; Harry E. Heckman, Jessup; Leo P. Gibbons, Carbondale; William Love, Scranton; Thomas J. Gillen, Carbondale; James F. Feeney, Olyphant; Charles O'Boyle, Olyphant; Howell R. Morgan, Throop; John J. Haggerty, Scranton; Sylvester J. Kane, Forest City; George Watson, Scranton; Thomas W. Lewis, Olyphant; Benjamin Anthony, Carbondale; Edward Newton, Scranton; James Elias, Scranton; John T. Loftus, Jessup; Charles E.

NORTH END COAL COMPANY

North End.—Ventilation, roads and drainage fair. Condition as to safety good.

A. D. AND F. M. SPENCER COAL COMPANY

Spencer.—Ventilation, roads and drainage fair. Condition as to safety good. The principal work done is robbing pillars.

CARNEY AND BROWN COAL COMPANY

Carney and Brown.—Ventilation, roads and drainage good. Condition as to safety good. The principal work done is robbing pillars.

NAY AUG COAL COMPANY

Nay Aug.—Ventilation, roads and drainage fair. Condition as to safety good. The principal work done is robbing pillars.

BULLS HEAD COAL COMPANY

Bulls Head.—Ventilation, roads and drainage fair. Condition as to safety good. The principal work done is robbing pillars.

CLEARVIEW COAL COMPANY

Clearview.—Ventilation, roads and drainage good. Condition as to safety good.

 IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Diamond.—A rock tunnel, 7 x 12 x 325 feet long, driven through fault from Surface vein to Surface vein.

Diamond Tripp shaft. A rock tunnel, 7 x 12 x 250 feet, driven from Rock vein to Diamond vein. A concrete and fire-proof blacksmith and carpenter shop combined. A new wash house to accommodate the employes in and around the colliery. One Duplex pump installed in No. 2 shaft, capacity 3,500 gallons.

PENNSYLVANIA COAL COMPANY

Pennsylvania No. 1.—Opened up the Clark and Marcy veins near the breaker by a slope.

Pennsylvania No. 5.—Erected a fire-proof steam boiler plant, 100 x 58 feet, and placed therein three batteries of B. and W. boilers, a total of 1,200 horse power, together with feed water heater, fan, etc. Repaired and remodeled the breaker. It is now practically a new breaker. Installed electric hoist inside for the purpose of dropping the coal from the 1st and 2d Dunmore veins above the fault, down through the Clark vein to the shaft below the fault. Drove a 7 x 10 rock tunnel, 370 feet long, from second Dunmore vein to first Dunmore vein, to be used for haulage. Placed a concrete cribbing from the surface to the rock, a distance of about forty feet in old No. 2 shaft, and erected a ventilating fan.

NORTH END COAL COMPANY

North End.—Ventilation, roads and drainage fair. Condition as to safety good.

A. D. AND F. M. SPENCER COAL COMPANY

Spencer.—Ventilation, roads and drainage fair. Condition as to safety good. The principal work done is robbing pillars.

CARNEY AND BROWN COAL COMPANY

Carney and Brown.—Ventilation, roads and drainage good. Condition as to safety good. The principal work done is robbing pillars.

CLEARVIEW COAL COMPANY

Clearview.—Ventilation, roads and drainage good. Condition as to safety good.

NAY AUG COAL COMPANY

Nay Aug.—Ventilation, roads and drainage fair. Condition as to safety good. The principal work done is robbing pillars.

BULLS HEAD COAL COMPANY

Bulls Head.—Ventilation, roads and drainage fair. Condition as to safety good. The principal work done is robbing pillars.

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Cayuga Colliery.—Drove a rock slope 7 by 14 by 750 feet, from Clark to Dunmore No. 3 vein. Drove a second opening, 7 by 12 by 750 feet, for the above slope. Erected a new steel and concrete fireproof pump-room in Clark vein.

Brisbin Colliery.—Built new brick wash house to accommodate two hundred employes. Drove a rock tunnel 7 by 12 by 600 feet from Clark to Dunmore vein. Drove rock tunnel, 7 by 12 by 171 feet, from Clark to New County vein; also a second opening, 7 by 12 by 171 feet, for the above tunnel. Erected new concrete pump-house in Clark vein.

Manville Colliery.—Built new annex to breaker and operations commenced November 8, 1910.

PENNSYLVANIA COAL COMPANY

Pennsylvania No. 1 Colliery.—Tore down old wooden head-frame over shaft, and erected a steel head-frame to replace old wooden structure, fireproof in all respects.

NAY AUG COAL COMPANY

Nay Aug.—Ventilation, roads and drainage fair. Condition as to safety, good.

A. D. AND F. M. SPENCER COAL COMPANY

Spencer.—Ventilation good. Roads and drainage fair. Condition as to safety, good.

CARNEY AND BROWN COAL COMPANY

Carney and Brown.—Ventilation, roads and drainage fair. Condition as to safety, good.

BULLS HEAD COAL COMPANY

Bulls Head.—Ventilation, roads and drainage fair. Condition as to safety, good.

CLEARVIEW COAL COMPANY

Clearview.—Ventilation, roads, drainage and condition as to safety, good.

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Diamond Colliery.—Concrete and fireproof barns erected in both the Rock and No. 2 Dunmore veins at Diamond Tripp Shaft. Erected a new annex to the breaker to prepare the finer sizes of coal.

Brisbin Colliery.—Erected concrete fireproof barns in the Four Foot, Five Foot and Clark veins. Installed a new Scranton Duplex steam mine pump, capacity 1,500 gallons per minute.

Cayuga Colliery.—A rock tunnel 7x12x271 feet long on a pitch of 22 degrees was driven through fault from Clark vein to Clark vein. A rock slope 7x10x300 feet on a pitch of 25 degrees was driven from Dunmore No. 1 to Dunmore No. 3 vein for a second opening. A rock slope 7x12x429 feet long on a pitch of 15 degrees was driven from Clark vein to Dunmore vein. Erected concrete and fireproof barns in the Big, Clark and Four Foot veins. Erected a new brick wash-house with shower baths and lockers. Installed one new Duplex Scranton steam pump, capacity 1,500 gallons per minute.

All pump-rooms, engine houses, emergency hospitals, foremen offices inside of the mines are made of incombustible material as required by law.

PENNSYLVANIA COAL COMPANY

Pennsylvania Colliery:

Pennsylvania No. 1.—Added to boiler plant outside two batteries of B. and W. boilers, 300 horsepower each. Added one 250 K. V. A. alternating current 2,300 volt generator to electric plant. Installed one 18-foot fan to ventilate Clark vein slope, housed in building constructed of brick, and one 7-foot Stine fan to ventilate Marcy vein, one 20-foot fan at No. 1 shaft to ventilate Dunmore No. 2, Clark and Fourteen Foot veins. Wooden tower at No. 1 shaft replaced by steel tower. Installed first motion hoisting engines 22x48 at No. 1 shaft, housed in building constructed of brick. New engine house constructed of corrugated iron on surface and old hoistings installed to handle coal in Second and Third Dunmore veins. All mule barns, engine houses, emergency hospitals, foremen offices inside of the mines are made of incombustible material.

THE SPENCER COAL COMPANY

Spencer Colliery.—Ventilation good. Drainage and safety conditions fair.

CARNEY AND BROWN COAL COMPANY

Carney and Brown Colliery.—Ventilation, drainage and safety conditions fair.

BULL'S HEAD COAL COMPANY

Bull's Head Colliery.—Ventilation, drainage and safety conditions fair.

CLEARVIEW COAL COMPANY

Clearview Colliery.—Ventilation and safety conditions fair. Drainage good.

NO. 6 COAL COMPANY

No. 6 Colliery.—Ventilation and drainage fair. Safety conditions good.

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Diamond Colliery.—Erected a new annex to the breaker. Installed boiler feed pump, four flat slate-pickers, rock pulverizer and fuel conveyor.

Brisbin Colliery.—Rock tunnels were driven from Rock vein to Big vein; New County vein to Big vein; Four-Foot vein to Five-Foot vein. A duplex pump and 2 Jeffrey coal-cutting machines were installed.

Cayuga Colliery.—Erected new wash-house and new fan engine-house. A new fan 18 feet by 6 feet by 5 feet 6 inches was installed. Rock tunnel plane was driven from Clark vein to Diamond vein.

PENNSYLVANIA COAL COMPANY

Pennsylvania **No. 1 Colliery.**—Rock plane was driven 300 feet from the Fourteen-Foot vein up through the fault to the Fourteen-Foot vein above. Erected the following concrete fireproof buildings inside the mine: Mule barn, barn-boss's house, motor-house, foreman's office and hospital.

Additional slate-pickers were installed in the breaker.

SCRANTON COAL COMPANY

Pine Brook Colliery.—Installed 45 horse power electric hoist in the West tunnel. Tunnel was driven from Dunmore No. 2 vein to Dunmore No. 1 vein on the head of No. 4 plane, for a return airway from Dunmore No. 1 vein.

West Ridge Colliery.—Removed 400 feet of roof for grading purposes.

Mt. Pleasant Colliery.—Tunnel was driven from Dunmore No. 3 vein to Dunmore No. 2 vein for transportation purposes.

Nay Aug Drift.—Ventilation good. Drainage and safety conditions fair.

Nay Aug No. 3 Drift.—Ventilation good. Drainage and safety conditions fair.

CARNEY AND BROWN COAL COMPANY

Carney and Brown Colliery:

Carney and Brown Slope.—Ventilation, drainage and safety conditions fair.

NO. 6 COAL COMPANY

No. 6 Colliery:

No. 6 Slope.—Ventilation and drainage good. Safety conditions fair.

IMPROVEMENTS

PENNSYLVANIA COAL COMPANY

Pennsylvania No. 1 Colliery.—Extensive repairs are being made to the breaker to make it more efficient.

A hospital on the surface has been provided.

In the Clark vein slope electric haulage has been substituted for mules.

Hospitals have been built in both the Marcy and Clark slopes. Electricity has been introduced into the workings at No. 2 shaft, the motor being placed in the 3rd Dunmore vein. Also installed a hoist and substation. In the 2nd Dunmore vein an electric hoist has been installed to haul the coal to the dip. An electric motor barn of fire-proof construction has been built in the 3rd Dunmore vein.

Pennsylvania No. 5 Colliery.—1,000 feet of pipe line have been laid and a pump installed outside to pump the slush from the breaker into the old abandoned workings.

A hospital on the surface has been provided.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Diamond Colliery.—Installed a new 18 by 16 foot ventilating fan. A new steel tower has been built over Tripp shaft and a rock plane driven from Rock to Diamond vein.

Installed one 7-ton electric locomotive, a rock crusher, boiler feed pumps, and four flat slate-pickers.

A second opening has been driven between No. 3 and No. 2 Dunmore veins.

A new steam line has been laid between boiler plant and shaft.

A surface hospital and a new wash house are being provided.

SCRANTON COAL COMPANY

Pine Brook Colliery.—A rock plane 7 by 14 feet was driven from No. 2 Dunmore vein to No. 1 Dunmore vein, a distance of 375 feet. This was done to shorten the haulage and to develop No. 1 Dunmore vein.

A second opening, 80 feet long, was driven through the strata between No. 2 and No. 1 Dunmore veins at an angle of 45 degrees. This

CARNEY AND BROWN COAL COMPANY

Carney and Brown Colliery:

Carney and Brown Slope.—Ventilation, drainage and safety conditions, fair.

NO. 6 COAL COMPANY

No. 6 Colliery:

No. 6 Slope.—Ventilation and drainage good. Safety conditions, fair.

IMPROVEMENTS

PENNSYLVANIA COAL COMPANY

Pennsylvania **No. 1 Colliery.**—A rock tunnel 5 by 7 feet and 250 feet long, was driven from the First Dunmore vein, No. 1 shaft, to the First Dunmore vein, through faulty ground, for the purpose of ventilation.

No. 5 Colliery.—Brick building erected, 41 by 150 feet, to take care of outside stock. A new and more modern pump room was finished in Third Dunmore vein near foot of shaft.

A rock tunnel about 500 feet long and 7 by 10 feet in cross-section was driven from the Third Dunmore vein through an upthrow in the Bunker Hill section.

Underwood Colliery.—This colliery was placed in operation April 28. The work of construction has been going on during the year. The boiler plant, power plant, engine house and other necessary buildings are about completed.

SCRANTON COAL COMPANY

Pine Brook Colliery.—Installed 300 Maxim water tube boiler.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Diamond Colliery.—Built new washhouse and sub-station. Installed one 7-ton electric locomotive with reel, etc.

PRICE-PANCOAST COAL COMPANY

Pancoast Colliery.—A tunnel 600 feet long was driven from No. 3 to No. 2 vein.

NAY AUG COAL COMPANY

Nay Aug Colliery.—Built new washhouse. Also built addition to mule barn outside. Installed Hayes derailer above breaker as a safety precaution. A First Aid team was trained in the Y. M. C. A. and Bureau of Mines car.

SPENCER COAL COMPANY

Spencer Colliery.—Installed electric hoist in No. 1 shaft, 100 H. P. motor to replace steam hoist. Installed four 30 H. P. motors in mines, and new rotary pump for washery. Concreted 40 feet of No. 1 shaft from No. 1 to No. 2 Dunmore vein. Built 100 feet of new trestle and new scraper line at breaker.

CARNEY AND BROWN COAL COMPANY

Carney and Brown Colliery.—A second opening driven from Marcy vein to surface, a distance of 150 feet. A new hoisting tower was erected.

PA Mine Inspection 1914

CONDITION OF COLLIERIES

PENNSYLVANIA COAL COMPANY

Pennsylvania **No. 1 Colliery**: No. 1 Shaft, No. 2 Drift, No. 3 Tunnel, Clark, Pittston and Marcy Slopes.—Ventilation, drainage, roads and safety conditions, good.

Underwood Colliery: Underwood Shaft.—Ventilation, roads, drainage and safety conditions, good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs Colliery: Nos. 1, 2 and 3 Shafts, Nos. 2, 3 and 4 Drifts.—Ventilation, drainage and safety conditions, good. Roads, fair.

HUDSON COAL COMPANY

Olyphant Colliery: Grassy-Island No. 2 Shaft, Grassy-Island No. 2 Slope and Miles Slope.—Ventilation, roads, drainage and safety conditions, good.

SCRANTON COAL COMPANY

Johnson Colliery: No. 1 Shaft and No. 2 Slope.—Ventilation, roads, drainage and safety conditions, good. All pillar mining.

Richmond No. 3 Colliery: Richmond No. 3 Shaft.—Ventilation and safety conditions, good. Roads and drainage, fair. Mostly all pillar mining.

NAY-AUG COAL COMPANY

Nay-Aug Colliery: Nos. 1, 2 and 3 Slopes.—Ventilation and safety conditions, good. Roads and drainage, fair. All pillar mining.

CARNEY AND BROWN COAL COMPANY

Carney and Brown Colliery: Clark and Marcy Slopes. Ventilation and safety conditions, good. Roads and drainage, fair.

SPENCER COAL COMPANY

Spencer Colliery: Spencer Shaft.—Ventilation, roads, drainage and safety conditions, good.

QUINN COAL COMPANY

Quinn No. 6 Colliery: No. 6 Slope.—Ventilation, roads, drainage and safety conditions, good.

IMPROVEMENTS

PENNSYLVANIA COAL COMPANY

Pennsylvania No. 1 Colliery.—Installed a Scranton steam pump, size 22 by 12 by 24, at breaker, to furnish water for the washery, replacing a smaller pump that was inadequate. Extensive repairs were

made to the electric sub-station in the Clark vein, the room being arched so as to provide more space. The drainage road that is being driven towards Underwood Colliery was driven 1,221 feet during the year.

Underwood Colliery.—Office building was erected on the surface for the use of the superintendent, outside foreman and colliery clerks. Two 6-inch 1,200-gallon capacity centrifugal pumps were installed to deliver water to the breaker, to replace two 8-inch 700-gallon pumps. Rock tunnel 300 feet long was driven to make car haul to run cars back to tunnel level at foot of No. 1 shaft. New air bridges were built across slopes in the New County and Clark veins, making each lift a separate split of air. Clark vein slope was graded from 4th to 6th lift through basin. Mine foreman's office was built at Clark vein. Hospital was built at Pittston and Rock veins at foot of No. 3 shaft. One Scranton centrifugal pump was installed at lower end of property to discharge water to the surface.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs Colliery: No. 2 Shaft.—Rock tunnel 7 by 12 by 120 feet long was driven from Top Split to Bottom Split of the Fourteen Foot vein for development, and rock tunnel 7 by 12 by 110 feet long was driven from Top Split of Fourteen Foot to Rock vein. Installed one 9 by 12 Ingersoll-Rand portable air compressor for general rock work, and one 7½-ton General Electric locomotive.

No. 3 Shaft.—Rock tunnel 7 by 12 by 110 feet long was driven from Clark to New County vein for development. Installed two 7½-ton General Electric locomotives for transportation.

No. 3 Drift.—Installed one 7½-ton General Electric locomotive for transportation.

QUINN COAL COMPANY

Quinn No. 6 Colliery.—A new coal breaker was erected, with a capacity of 300 tons per day. This breaker is provided with all necessary modern equipment, having an electrical hoist and patent roller pickers, also facilities for unloading coal from railroad cars. A new 1,800-foot haulage road was made from the head of the slope to the new breaker. The old breaker was abandoned August 1.

SPENCER COAL COMPANY

Spencer Colliery.—A new coal breaker was erected, with a capacity of 400 tons per day, to replace the one destroyed February 3, 1917. New concrete blacksmith, carpenter and machinist shop was erected. New concrete engine room was made at No. 1 Shaft to replace the wooden one.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Scranton, April 23 and 24. The Board of Examiners was composed of D. T. Williams, Mine Inspector, Scranton; Joseph P. Jennings, Superintendent, Moosic; James W. Reese and William J. Jenkins, Miners, Scranton.