were employing their full hands inside the mine, entirely disregarding the law in this matter. The other one, owned by the Delaware and Hudson coal and canal company, called the Pine Ridge shaft, was working according to law in this particular.

By the 22d day of August, 1870, those parties owning or working mines, having only one mode or means of ingress or egress, were duly notified to suspend operations or comply with the law, by reducing the number of persons working inside the mine at one time to 20, and to put all the force they could of this number to work for the second opening or means of ingress or egress, not confined to any number of shifts, in 24 hours.

Some operators complied with the notice, while others would have worked on had not the men refused to work under the circumstances. However, some 4 or 5 claimed that they had been driving for the second opening or means of ingress or egress; some to surface in coal which did not out-crop on their lands; others to connect with adjoining mines, and at the same time they had not even made a survey to know the distance required to be driven to make the second means of ingress or egress to their mines, but were working the mines in the best manner they could to secure work in future and to facilitate the getting of coal, irrespective of the time it would take to make a second means of ingress or egress to their mines.

Shortly after the notices were served, the parties interested held a meeting, the proceedings of which were not made public. Soon after this surveys were made by most of them, and they began in good earnest to work according to law and make the second opening or means of ingress and egress an accomplished fact, while about this time two shafts stopped altogether for the present. One of them was owned by C. S. Maltby, a small shaft, 108 feet deep, it being nearly worked out, and had a severe breakage of machinery from over-winding. They did not deem it worth while to repair the shaft and machinery, as the new mining law required so many improvements to be made for the safety of the miners employed. It is, therefore abandoned until a new shaft is sunk at some future time.

The Wilkesbarre coal and iron company owned and operated the other shaft, and had commenced to work for the second mode of ingress or egress according to law, with twenty men; but after a survey had been made, the distance was found to be so great, the shaft was stopped and has not since resumed. This shaft is 340 feet deep, but has no breaker attached to the head house; the seam they worked has an out-crop on the mountain side, many hundred yards from the shaft; there is also another abandoned shaft to the west of this, where there is but 125 feet from that to 140 feet to sink through, to cut the same seam of coal with about 1,000 feet to drive through coal to connect the two passes.

THE PINE RIDGE SHAET, SINGLE OPENING.

Owned by the Delaware and Hudson Coal and Canal Company.

This shaft is 400 feet deep, has a large breaker attached to the head house of shaft; this mine gives off a large quantity of gas or fire-damp. It has been on fire several times, but has been fortunately extinguished without much damage. They have been driving to connect with their adjoining Mill Creek mines for the purpose of a second mode of ingress or egress, but have had a rock fault to contend with, or they would have made the connection

some time ago; they are now suspended, like the whole of this company's mines. By looking at the plan, only 1,500 feet appear to be between the two places.

THE HENRY COLLIERY SHAFT, SINGLE OPENING.

H. W. Burroughs, Operator.

This shaft is 384 feet deep, has a large breaker attached to the head house, and the mine gives off a considerable quantity of gas or fire-damp. After being restricted to twenty men in the mine at one time, they decided to sink a second shaft 9 by 12 feet in size, and are entitled to especial commendation for the energy displayed since they began. Four months ago they commenced cutting upwards and sinking from the surface, and are now within 40 feet of being through. Had it not been that they met with large feeders of gas fire-damp in the place they were cutting up from below, compelling them to abandon this mode of completing the work, it would have been through this year, thus showing what can be done where there is a will.

WEST PITTSTON SHAFT, SINGLE OPENING.

The Lehigh Valley Railroad Company, owners.

This shaft is 280 feet deep, giving off considerable gas or fire damp. This company having only lately become the owners, the state of the works being very bad, and this change in the ownership being looked for, little work has been done during my term of office, until lately; they are sinking a slope, prospecting as to the proper location for a new shaft.

THE EAST BOSTON SHAFT, SINGLE OPENING.

The Consumers' Coal Company of New Jersey, owners—Chas. Hutchinson, lessee.

This shaft is 160 feet deep; has a breaker attached to the head house; was not working for some time, the lessee and lessors being in dispute about divers matters and things, amongst others, the question of the second mode of ingress or egress to the mines. The matter was finally settled, and Mr. Hutchinson is now sinking another shaft on the adjacent property, intending to make a connection with the East Boston shaft and mines, thereby making a second means of ingress or egress for each mine. This shaft is expected to be completed early in the spring, and Mr. Hutchinson's lease expiring in April, he will then work the newly leased tract from the new shaft.

THE WATERMAN AND BEAVER SHAFT, SINGLE OPENING.

Situated near Kingston—Messrs. Waterman & Beaver, owners and operators.

This shaft is 347 feet deep, with a very large breaker attached to the head house. They have been driving for a second mode of ingress or

evolves a small quantity of fire-damp. It has a good traveling road, (made in 1871,) for the ingress and egress of persons employed.

Ventilation.—This mine is well ventilated considering that it is done by natural means, without the assistance of any mechanical or artificial means. No. of persons employed, 120.

A. Nicolls, general superintendent; Wm. M'Gregor, assistant superintendent; Wm. W. Reese, mining boss.

Laurel Run slope.—This mine is located near a small village called Laurel Run, about 2¼ miles south-east of Wilkesbarre. There is but one mine between it and the No. 3 Baltimore of the same company. It is a slope on the Baltimore vein, which is split at this point. It has three lifts and has a good traveling road for the ingress and egress of persons employed. The top bed, which is just being opened out, generates explosive gases, but there has not been any discovered in the lower seam as yet.

Condition.—The mine is in a tolerably good condition. The seams are small, 5 or 6 feet in thickness, and take much powder to mine them, thereby requiring a large amount of air to carry off the powder smoke.

All the stoppings along the slope, between the main gangways and their parallel air-ways, are being re-built with stone and morter instead of wooden brattice, producing very good results.

Ventilation.—Amount of air at inlet, 69,800 cubic feet, and at face of mine, 39,500 cubic feet per minute. Number of persons employed inside, 161.

A. Nicolls, general superintendent; Wm. M'Gregor, assistant superintendent: Hugh M'Donald, mining boss.

Pine Ridge Shaft.—This colliery is located east of Wilkesbarre, and near Milners' station.

It is a shaft 400 feet deep sunk into the lower bed of the Baltimore vein. This mine gives off great quantities of carburetted hydrogen, (fire-damp,) as may be seen from the following:

On the 11th day of May, 1872, an explosion of fire-damp by which four persons named David Davis, David Morgan, Thomas Morgan and Evan Davis were fearfully burned, resulting in the death of David Davis and David Morgan. The other two survived, but are much disfigured and crippled in the hands for life to all appearance. On the 13th I examined that portion of the mine where the accident occurred, in company with John J. Moore and others. We found that one of the workmen at the time of the accident, was in the act of taking down some coal over a check A in tunnel, which caused him to let said check-door open for a short time. In the meantime a party of the company's mine surveyors descended the shaft and not meeting the boss at the foot, they proceeded at once to make their way into that part of the mine where they had been making a survey the days previous. They had no idea of any great danger in traveling this road, as they had been led out over the same road the evening previous by the mine boss, to avoid the inconvenience of passing so many cars on the main road, while they had their surveying instruments to carry with them; but just as they were almost through the air-way on the top vein, and near the main road, the explosion above mentioned took place. We then measured the air passing through the top vein, when the door A in the tunnel was open. We tried it for twenty minutes. Gas accumulated three feet deep for quite a distance along the roof in the air-way—air passing through at the time of its accumulation 9,120 cubic feet per minute. We then closed said door A and found that the gas would ignite in the lamp (safety) for eight or ten minutes at the point where the explosion took place, and that while there were 16,320 cubic feet of air per minute passing.

We then measured all the air passing in through the tunnel at C, a part of which had to pass over the check-door A, the balance through the air-way in top vein just mentioned, at B, and found 33,862 cubic feet of air per minute passing.

We found that if check-door A would be left open, the more air would enter through the under vein D and pass through door frame of A and tunnel C; notwithstanding this, the gas would ignite at the door A from a lamp on a person's head, there being a large gas-feeder in the roof at that point, besides decreasing the quantity passing in at the top vein B, thereby allowing the gas to accumulate therein. The person that was taking down the coal over door A was doing it according to instructions from his boss, neither of whom thought for a moment of any person traveling in through the top vein B, which had such strong gas feeders so that it was not used for traveling; still the air was circulated through and no danger was anticipated, even should any one travel through the same from the shaft, which was only a distance of some 400 or 500 feet.

The party of engineers acted on the supposition that it was just as safe at that time, as it was the evening previous. There is one thing certain, that this alarming accident might have been avoided, had the suggestions and instructions of the inspector been acted upon and carried out, as the attention of the mine boss Moore, and the assistant superintendent M'Gregor, had been called to the great danger of leaving the air that was required to keep the top vein B clear of gas, travel into the other part of the working mine, October 19, 1871, and requested them to have a separate split of air for the top vein B, so that the great quanti y of gas it generated might have been conveyed to the return air-way immediately; this having been done the calamity would not have occurred in my opinion.

The top vein is extraordinary fiery in this basin. While they were driving or opening the gangways in the top vein B, the gas would ignite by the discharge of each blast, and a hose 2½ inches in diameter, had to be kept attached to the pump column, to be used in putting out the fire after each blast. At one time Mr. Moore and I measured 25,000 cubic feet of air per minute passing through tunnel C; notwithstanding this amount of air, the gas would ignite two feet from the roof, at any point, for 50 feet or more along the main intake road. The same air passed into the other part of the mine north and east, as can be seen in plan No. 2, accompanying this report; the arrows showing the direction of the air current.

The return F—in plan No. 2—requested since October, 1871, from B to E, has been completed since the accident—which had to be driven entirely without the use of gunpowder a distance of about 130 feet. A number of other improvements have been suggested and promise to be done, and some of them are now being done, to wit: A separate split of air for the workings north of the fault, which is between this mine and Mill Creek mine. A shorter road for a traveling and safety (or escape) road from the east side of the shaft at the point H, (on plan,) towards the second opening, a distance of 500 feet, and leading to the Mill Creek mine by way of second opening at point I—a separate split of air from the new slope (marked L on plan) to the upcast at M. A new return air-way along the anticlimal axis from the proposed escape road H, at point K, to the main shaft, a distance of 550 feet.

There is a fan 20 feet in diameter in this mine, and exhausts from 70,000 to 75,000 cubic feet of air per minute, at its usual speed of 75 or 80 revolutions, and a double fan at Mill Creek mines, exhausting about 120,000 cubic feet of air per minute. There is another fan of 20 feet diameter being built, to take part of the air from Mill Creek mine, and part from Pine Ridge mine, to ventilate that part of the mine (Pine Ridge) north of the fault lying between the two mines.

In 1870, the Pine Ridge fan only exhausted 49,500 cubic feet of air per minute, there being a square box about 12 or 15 feet area for the air to return through up the shaft to the fan. Since that time the aforementioned box has been taken out, and one whole compartment of the shaft partitioned off for air, with the present favorable results of over 70,000 cubic feet of air per minute.

A. Nicholls, general superintendent; —— Simptson, assistant superintendent at present; Jno. I. Moore, mining boss.

Mill Creek slope.—This colliery is located about 3 miles north-east of Wilkesbarre, and consists of one slope and one drift, both on the same vein—Baltimore split. The slope has five lifts on the lower seam or bed, besides having three tunnels through which they are working the top seam. The most part of these workings generate explosive gas more or less, but there are some parts that give off extraordinary large quantities of gas, about equal to the Pine Ridge workings.

Condition.—The mine is the largest in this district, and notwithstanding the large amount of gas evolved, it is kept in order generally.

There are several fire-bosses kept by day, and one by night. The working parts of the mine are travelled daily by these officers in their respective districts, in strict accordance with law, besides travelling the old workings about once per week, and in this manner the mine is always kept clear of standing gas.

In order to satisfy myself of the correctness of the officer's report of the condition of this mine, I have at different times—after travelling the working part—traveled through the old workings, but did not find any standing gas, except at one time, immediately after an explosion had taken place; in that case it was a natural consequence, the air-ways being deranged.

Ventilation.—This mine has a larger volumn of air circulated than any other in this district. It is so divided and sub-divided, that each part has its own split of fresh air. The mine is well arranged for ventilation, having a large and roomy up-cast shaft 12×14 feet. It has 7 or 8 separate splits, and 4 in-takes. It is ventilated by a double fan, or two fans built upon the same shaft, each ten feet in

CONSUMER'S COAL COMPANY'S SHAFT, KINGSTON, PA.

East Boston Shaft.—No. 1 carriage dropped, first trial, 13¾ inches; second trial, 6 inches; third trial, 9½ inches. No. 2 carriage not used for hoisting or lowering persons.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY'S SHAFTS.

Avondale Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 1¾ inches; third trial, 1¾ inches. No. 2 carriage dropped, first trial, 1½ inches; second trial, 1½ inches; third trial, 1½ inches.

Boston Shaft.—No. 1 carriage dropped, first trial, 1½ inches; second trial, 1¼ inches; third trial, 1½ inches. No. 2 carriage dropped, first trial, 1½ inches; second trial, 1½ inches.

RIVERSIDE COAL COMPANY'S SHAFT, PLAINSVILLE, PA.

Enterprise Shaft.—No. 1 carriage dropped, first trial, 4 inches; second trial, ¾ inch. No. 2 carriage not used for hoisting or lowering persons.

LUZERNE COAL AND IRON COMPANY'S SHAFTS, PLAINSVILLE, PA.

Henry Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches. No. 2 carriage not used for hoisting or lowering persons.

Prospect Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches; third trial, 2 inches. No. 2 carriage not used for hoisting or lowering persons.

DELAWARE AND HUDSON CANAL COMPANY'S SHAFTS.

Pine Ridge Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches; third trial, 2 inches. No. 2 carriage dropped, first trial, 2 inches; second trial, 2 inches; third trial; 2 inches.

Conyngham Shaft.—No. 1 carriage dropped, first trial, 12 inches; second trial, 14 inches; third trial, 8 inches. No. 2 carriage not used for lowering or hoisting persons.

NORTHERN COAL AND IRON COMPANY'S SHAFTS, PLYMOUTH, PA.

No. 1 Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches. No. 2 carriage dropped, first trial, 2 inches; second trial, 2 inches.

No. 2 Shaft.—No. 1 carriage dropped, first trial, 3 inches; second trial, 2 inches. No. 2 carriage dropped, first trial, 3 inches; second trial, 2 inches.

No. 3 Shaft.—No. 1 carriage dropped, first trial, 3 inches; second trial, 2 inches. No. 2 carriage not used for hoisting or lowering persons.

No. 4 Shaft.—No. 1 carriage dropped, first trial, 6 inches; second trial, 2½ inches. No. 2 carriage dropped, first trial, 6 inches; second trial, 2½ inches.

WILKES BARRE COAL AND IRON COMPANY'S SHAFTS.

Dodson Shaft.—No. 1 carriage dropped, first trial, 6 inches; second trial, 6 inches; third trial, 6 inches. No. 2 carriage dropped, first trial, 6 inches; second trial, 6 inches; third trial, 6 inches.

Lance Shaft.—No. 1 carriage dropped, first trial, 5 inches; second trial, 4 inches; third trial, 6 inches. No. 2 carriage dropped, first trial, 6 inches; second trial, 6 inches; third trial, 6 inches.

Sugar Notch Shaft.—No. 1 carriage dropped, first trial, 6 inches; second trial, 4 inches; third trial, 5 inches. No. 2 carriage dropped, first trial, 7 inches; second trial, 5 inches; third trial, 4½ inches.

Empire Shaft.—No. 1 carriage dropped, first trial, 1¼ inches; second trial, 1⅛ inches; third trial, 1¼ inches. No. 2 carriage dropped, first trial, 1½ inches; second trial, 1¼ inches; third trial, 1½ inches.

Diamond Shaft,—No. 1 carriage dropped, first trial, 1 inch; second trial, 1¼ inches; third trial, 1½ inches. No. 2 carriage dropped, first trial, 1¼ inches; second trial, 1¼ inches; third trial, 1½ inches.

IMPROVEMENTS.

Among other improvements of importance that have been made during the year, quite a number of ventilating fans have been built, all in the most suitable places, according to the views of the parties erecting the same. Some were erected on the surface, others were erected under ground.

The Delaware and Hudson Canal Company had one fan 20′ 0″ dia, built at the Mill Creek colliery. This fan exhausts about 72,000 cubic feet of air per minute. Of this amount, 38,000 are from the Pine Ridge shaft workings, and 34,000 are being circulated through the Mill Creek slope workings, in addition to 106,000 cubic feet exhausted by another fan, making an aggregate quantity of 140,000 cubic feet of air per minute circulated through the workings of the Mill Creek slope. The current exhausted from the Pine Ridge shaft ventilates the workings north of a large fault lying between the workings of the two collieries. Besides the amount of 38,000 cubic feet of air caused to be circulated by the aforementioned new fan, there is another current circulated and exhausted by another fan 20′ dia, located at the Pine Ridge shaft, averaging about 70,000 cubic feet, giving a total of 108,000 cubic feet of air per minute for the workings in the Pine Ridge shaft.

The Delaware, Lackawanna and Western Railroad Company had a fan erected at Jersey colliery, near Plymouth. This fan is similar in dimensions and construction to that at Avondale, being a short iron casing revolving disk, 12′ 8″ dia, with open periphery. Much better ventilation is had in said mine since the fan has been started.

The Wilkes Barre Coal and Iron Company has had the following fans built during the year, to wit: At the Diamond shaft a fan 15′ 0″ dia was built inside the shaft workings for the purpose of ventilating the workings in the new slope. This fan receives its fresh air from the hoisting shaft, which is some few hundred feet east of the point where the fan is located, and it discharges its foul air into a large air-way, conveying it to the main upcast leading to the surface. The main air-ways, both in the upcast and intake, are of large areas. This fan, when being driven about 75 revolutions per minute, exhausts 40,000 cubic feet of air.

At the Sugar Notch colliery a fan 15′ 0″ dia has been built inside the shaft workings to ventilate the workings of the new slope. It is built under similar circumstance to that at the Diamond shaft. Other things not being quite ready, the fan has not yet been started.

The Franklin Coal Company has had one fan 15′ 0″ dia erected to ventilate their new tunnel workings on the Red Ash vein. This is comparatively a new mine, and the fan having but very recently been built, has not yet had much trial; but there can be no doubt of its being just what is required.

During the latter part of August the whole extent of workings on the west side of the underground slope in the Pine Ridge shaft crushed and closed in, but the ventilation was maintained so that they experienced no trouble with the emitted gases, although an enormous quantity was evolved from the crushed pillars.

On the morning of December 10, when the fire-boss of this mine was starting on his morning examination of the west side workings, he was surprised to find the mine filled with fire-damp to a point within about three hundred feet of the bottom of the shaft. Fortunately he was a careful officer, complying strictly with the good rule of carrying no light but that of a safety-lamp, while making his examination of the mine; and with his safety-lamp he discovered the dangerous element promptly upon entering the explosive atmosphere without causing an explosion, thus saving his life and the lives of the persons who were exploring other sections of the mine at the same time. If this man had carelessly taken with him a naked lamp and inadvertently exploded the gas, the result would have been terrible, the men would certainly have been killed, and the mine perhaps com pletely ruined.

These incidents direct our attention to the possibilities of extensive explosions in this district, and it behooves all persons connected with the mines to profit by them and be careful under similar circumstances at every colliery. When pillars are crushing unusual care should be exercised, no curiosity-seeking persons allowed around, and no naked light permitted to persons whose presence may be required.

The incident at Pine Ridge shows how important it is for fire-bosses to carry no naked light along while examining the mines after a cessation of work. No one can predict what may happen in a night, and the only safe method of procedure is to permit no light but the light of a safety-lamp to enter a mine until its condition is fully ascertained.

Fire in the Stanton Air-Shaft.

This shaft was connected with the Stanton mine-workings on April 18, 1883, by a heading driven at right angles from one of the main gangways. A thirty-five feet fan was already planted at the top, and a gang of men, under the charge of John Wasley, who had sunk the shaft, was engaged to line the air-shaft with match boards, and make the upcast compartment air-tight. On the 4th day of May, they had done this work from the bottom of the shaft up to a point nearly midway between the Baltimore and Hillman seams, where a small vein of coal was found. This vein of coal evolved a large volume of fire-damp, and lest the blowers should take fire, the men were instructed by the superintendent to use no naked lights anywhere in the shaft. Notwithstanding this, owing to the intricacy of the work, they appear to have disregarded this instruction and used open lamps, and during a severe thunder storm early in the evening, the blowers ig nited and burned briskly behind the casing around the shaft, and set it on

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

The Susquehanna Coal Company.

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

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

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

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

The Delaware, Lackawanna and Western Railroad Company.

A new air shaft was sunk at the Avondale colliery of this company with the view of placing a new fan upon it to improve the ventilation. Its size is $12' \times 26''$ and its depth to the workings of the Red Ash seam is two hundred and forty-one feet.

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

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

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

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

COLLIERY IMPROVEMENTS DURING 1885.

The Pennsylvania Coal Company.

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

Pennsylvania Coal Company.

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

Lehigh Valley Coal Company.

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

Delaware, Lackawanna and Western Railroad Company

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

Delaware and Hudson Canal Company.

At the Pine Ridge Colliery, two shafts were sunk, one in the Baltimore vein, to a depth of one thousand feet. The size is $7\frac{1}{2}' \times 12'$, with a gradient of ten degrees. The other is sunk in the Hillman vein, to a depth of

Improvements by the Forty Fort Coal Company.

Two new exhaust fans, 15 and 20 feet in diameter respectively were installed at the "Harry E" Colliery, replacing the old ones, which were inadequate to supply the ventilation required. The new fans exhaust 219,040 cubic feet of air per minute.

Improvements by the Hillside Coal and Iron Company.

A new air shaft has been sunk to a depth of 70 feet sectional area 10x10 feet, in the Consolidated Colliery, to be used for ventilation.

Improvement by the Westminster Coal Company.

A new fan 12 feet in diameter has been erected at this colliery to ventilate the underground slope workings. Engine 14x13-inch with a working speed of 60 revolutions.

Improvements by the Raub Coal Company, Limited.

A tunnel has been driven in the out crop of the Red Ash vein, a distance of 300 feet at the Louise colliery of this company, the coal from which is run down a gravity plane to the breaker. A new fan 12 feet in diameter has been installed on this tunnel which exhausts 60,000 cubic feet of air per minute to ventilate the workings.

Improvements by Robertson and Law.

A new slope has been sunk at the Katy Did Colliery a distance of 450 feet from the surface; area, 7x8 feet, with a gradient of 18 degrees.

A tunnel has been driven from the surface to the "Brown" seam, a distance of 100 feet; area, 10x10 feet, which is used for transporting coal.

Improvements by the Algonquin Coal Company.

On the Pine Ridge shaft of this company a new underground slope has been driven from the "Kidney" to the "Hillman vein," a distance of 632 feet, area, 7x20 feet. Three new gravity planes were made, varying in length from 380 to 460 feet. A tunnel has been driven from the Hillman to the Rock vein, a distance of 63 1-2 feet; area, 7x12 feet.

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 Heidelburg 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-

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

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

COLLIERY IMPROVEMENTS DURING THE YEAR 1891.

Pennsylvania Coal Company.

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

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

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

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

Delaware and Hudson Canal Company.

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

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

Delaware, Lackawanna and Western Railroad Company.

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

COLLIERY IMPROVEMENTS DURING THE YEAR 1892.

Pennsylvania Coal Company.

In Barnum No. 1 shaft, a new Guibal fan 18 feet in diameter, has been erected on the site of the one which was destroyed by the fire, which occurred on the evening of July 22, 1892. The old air-shaft of No. 2 Barnum has been enlarged from the surface to the depth of 150 feet, and a pair of double engines placed to hoist the coal through it from the 7 and 14 foot seams.

Lehigh Valley Coal Company.

In the Maltby shaft a rock tunnel was driven from the bottom of the 11-foot slope to the 6-foot vein, with a sectional area 7×14 feet, opening up a large territory of good coal.

Delaware and Hudson Coal Company.

In Laurel Run slope a rock tunnel was driven from the Checker vein to the lower Baltimore, a distance of 220 feet, with an area of 60 feet, to be used for transportation.

In the Pine Ridge shaft an air-shaft was sunk a distance of 22½ feet, from the upper to the lower Baltimore seam, to be used for ventilation.

In the Delaware shaft three rock tunnels, 8×10 feet area, were driven between the lower and upper Baltimore seams a distance of 40 feet each, to be used for transporting coal, and a new gravity plane was completed, 400 feet long, 8×10 area, with a gradient of 12°.

Butler Mine Company, Limited.

In the Fernwood shaft an inside slope was sunk a distance of 325 feet in the red-ash seam. A new Guibal fan, 12 feet in diameter, was also erected on the second opening to ventilate the workings, exhausting 22,000 cubic feet of air per minute with a water gauge of 3 inches, working speed of 35 revolutions per minute, driven by a horizontal engine, cylinder 10×24 inches.

In the Chapman shaft the second opening has been completed 130 feet in depth, with an area of 10×12 feet. A new fan, 12 feet in diameter, has been placed thereon to ventilate the workings, exhausting 30,000 cubic feet of air, with a water gauge of 2 inches, running 45 revolutions per minute. The fan is driven by a 20-horse power horizontal engine, cylinder 10×30 inches.

Newton Coal Company.

On the twin shaft a large pair of first motion engines were erected in place of the ones which were destroyed by the fire of September 11, 1892. They were built by the Dixon Manufacturing Company, Wilkes-Barre.

A rock tunnel was driven through an anticlinal from the bottom of the shaft in the Red Ash seam, a distance of 300 feet with an area of 7×16 feet which greatly shortens the transportation of coal to the foot of shaft.

the night of October 9, at 12.15 o'clock, the old airshaft collapsed, the timbering having given out. There was 35 feet of rock in the new shaft to be gone through to reach the Cooper seam when this occurred, and 90 feet of an airway to be driven through solid coal to complete the airway for the new shaft. In the morning when the superintendent, James B. Davis, arrived, he concluded to divide the hoisting shaft into two compartments and connect one-half with the fan, temporarily, in order to keep the mine clear of gas. They also put the column pipe of the pump in one-half, in order to keep the water out of the mine. On October 26 they started to hoist coal with one carriage, and continued to do so until the new air shaft was completed and the new fan erected.

The coal was hoisted on one carriage from the red ash to the Bennett seam, then taken off and replaced on the other carriage, to be hoisted up to the breaker. There were hoisted, in this manner, as many as 428 mine cars, although they were handling the cars five times instead of once, as they were doing when they could hoist to the top with both carriages.

On October 18 the foundation of the new fan was started, which contained 150 perches of stone. On this a new fan, 20 feet in diameter, was erected and steam turned on on November 6, 19 days from the time the foundation was started. The fan and building were completed in two days after. A new "Rand" duplex air compressor, 48x20 inches, had just been started to furnish air to run the pumps in the mines when the air shaft caved, which was very fortunate for them, as it helped to ventilate the workings.

The old fan has been put in repair and connected with the new air shaft, to be used as a duplicate in case of an emergency.

I am happy to say that to James B. Davis, superintendent, and the officials and workmen under him, I must give great credit for the amount of work done in such a short time, and the carefulness which was at all times exercised by them to guard against accidents, as not one person employed in or around the shaft was injured while the work was in progress, although this shaft is a very gaseous one and required a constant watch on the part of those having charge to avert an explosion.

Change of Operators.

The Pine Ridge Colliery, located at Miners Mills borough, has changed hands. It was operated by the Delaware and Hudson Canal Company until September 30, 1893, when it was surrendered on account of the expiration of their lease, when the Algonquin Coal Company became the operators, who immediately proceeded to do considerable repairing to the shaft before they started to mine and ship coal, which they began doing in the month of December, having worked 13½ days.

Improvements by the Lehigh Valley Coal Company.

At the Oakwood shaft the second opening to the underground slope has been sunk to the red ash seam a distance of 325 feet, with a sectional area of 230 feet.

An underground slope was also sunk in the red ash vein a distance of 614 feet on a grade of four and one-half degrees. This slope opens up a large field of good coal for this colliery.

The Exeter breaker has been remodelled and enlarged and a new tower erected over the hoisting shaft. The shaft has been repaired from the top to the bottom and the inside workings placed in shape for a large transportation of coal. The buildings at the second opening with the shaft have undergone complete repairs.

At the Wyoming Colliery a 15-foot fan was erected on the old opening of the Hillman shaft, which gives very good results; it is run by a horizontal engine 14x24 inch, and driven by belting.

Improvements by the Old Forge Coal Mining Company.

The Columbia shaft of this company was sunk from the Marcy to the red ash seam, connecting with the workings of their Phoenix shaft and completing the second opening for both shafts.

Improvements by the Butler Coal Company, Limited.

A slope was sunk by this company on the outcrop of the Marcy vein to a depth of 200 feet on a grade of 18 degrees, sectional area 84 feet. The coal is taken to the breaker by a small locomotive.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

A tunnel was driven in the Hallstead shaft from the second to the third seam, a distance of 656 feet, area 6x12.

Improvements by the Algonquin Coal Company.

Two underground slopes were sunk in the Pine Ridge shaft, a distance of 1,100 and 300 feet respectively.

Improvements by John C. Haddock.

In the Black Diamond shaft a tunnel was driven from the Bennett to the eleven foot seam, a distance of 200 feet, area 8x12. An inside gravity plane was built a distance of 1,500 feet for transporting coal to foot of shaft.

Improvements by the East Boston Coal Company.

A tunnel was driven in the East Boston shaft a distance of 108 feet, from the Cooper to the Lance seam; area 7x14 feet.

In the Baltimore seam an underground slope was sunk 250 feet, 8x12 on a pitch of 7 degrees.

At the Langcliffe colliery an air shaft was sunk 70 feet to ventilate the tunnel workings; area, 30 feet.

Laflin Coal Company.

This company erected a new breaker on the site of the old one which was burned, and which was recorded in my last report. It is a model structure and contains about 900,000 feet of lumber and is fitted with the most approved machinery for cleaning and preparing the coal. It has a capacity of 1,000 tons per day and was started to ship coal in November, 1895. All the dangerous parts are protected by railing or covering as the law requires. A new shaft was sunk 600 feet northeast of the breaker; size, 12x26 feet, cutting the Marcy Ross and the both splits of the Red Ash seams at a depth of 256 feet. The second opening will connect with the slope workings when completed. A new fan 17 feet in diameter was erected to ventilate the shaft workings. The engine is 15x18 inches directly connected.

Babylon Coal Company.

A tunnel was driven in this colliery from the top to the bottom split of the Red Ash seam, a distance of 140 feet for transporting coal.

Mount Lookout Coal Company.

A tunnel was driven through a rock roll in the Pittston seam in this colliery a distance of 1,000 feet, area 7x12 feet. A new fan 20 feet in diameter was erected to help ventilate the workings which are very extensive. This is the third ventilating fan erected in this colliery. An underground slope was sunk 600 feet; area, 8x12 feet.

The main and air shafts are now being sunk to the Red Ash seam.

Algonquin Coal Company.

In the Pine Ridge colliery a shaft was sunk to the Checker seam, 28 feet for ventilation. A tunnel was driven from the Hillman to the Rock seam a distance of 116 feet; area, 7x12 feet. A shaft was sunk from the Hillman to the Kidney seam as a second opening to those veins.

Lehigh Valley Coal Co

placed at the head of slope to hoist the coal to breaker. Likewise a pair of engines was erected at the head of Coal Brook slope to hoist the coal.

At the Prospect Shaft a brick addition to the boiler house was made enclosing a 250 horse power B. & W. boiler. A new brick engine house has been completed. In the Midvale slope on different levels. Three rock tunnels were driven from the Hillman to Brookley veins, which will be used for the transportation of coal.

In the Hillman slope a rock tunnel was driven from the Hillman to the Bowkley veins.

At the Henry colliery the hoisting shaft was extended from the Baltimore to Skidmore veins. A rock tunnel was driven through an overlap to the five-foot, 220 feet. The second opening tunnel is being driven at present.

The two new shafts begun in 1902, were sunk to Red Ash vein, a distance of 675 feet from the surface. A brick engine house 34x72 feet was erected for the hoisting engines of these shafts.

The Wyoming shaft, the old wood cribbing from the surface to the rock, was replaced by concrete, which makes a good job at this shaft.

At the Heidelburg No. 1 slope a new rock plane, 18 degree pitch, was driven from the lower split to the upper split of Red Ash vein, a distance of 212 feet. The second opening was driven on a 30 degree pitch. A rock slope is being sunk from the Marcy to Clark vein, also a second opening shaft for same.

A new 12-foot diameter ventilating fan was erected. A new brick boiler house was built, enclosing a 450 horse power return tubular boiler. Dispensing with the old boiler plant.

Improvements by the Delaware and Hudson Company

At the Baltimore tunnel the General Electric Company has installed an electrical haulage which handles all the coal from the Red Ash vein to the mouth of tunnel, doing away with the use of a rope haulage plant and hoisting plant at No. 4 shaft. The Stanton vein slope has been extended 250 feet. A new breaker is in course of erection to prepare the coal which is now taken to No. 5 breaker for preparation.

Improvements by the Hudson Coal Company

A new breaker has been completed at Pine Ridge with a new steel head frame erected over the shaft. The foot of the shaft has been remodeled by brick arching and a chain hoist put in for handling the empty cars. To accomplish all of the above work at the foot of

Hudson Coal Co

shaft three rock tunnels were driven a total of 357 feet. Likewise a rock tunnel was driven from checker to Ross vein, a distance of 246 feet.

At the Laflin colliery the No. 4 slope was sunk 500 feet. The No. 3 Rock slope was driven from the Marcy to Red Ash vein, a distance of 321 feet. New hoisting engines have been placed in position to hoist the coal from the above slopes.

Improvements by the Clarence Coal Company

A new breaker was built with a capacity of 500 tons per day. It went into active operation May 1, 1903.

A new fan of the Guibal pattern, 12 feet in diameter, was erected on the return air shaft to furnish ventilation for the inside workings.

Mine Foremen's Examinations

The examination of applicants for certificates of qualification for mine foremen and assistant mine foremen was held in this district on the 9th and 10th of September, 1903, at Pittston, Pa. The board of examiners was H. McDonald, Mine Inspector; J. L. Cake, Supt., and John J. Morahan and David P. Williams, miners.

The following twenty-one applicants for mine foremen were recommended to the Chief of the Department of Mines for certificates:

Mine Foremen

John J. Hoban, Michael Gilroy, Michael Healey, Hamlet Corrigan, Peter Parry, Wm. J. Williams, Roland F. Jones and John S. Campbell, of Avoca, Pa., Frank Hanahoe and George Bradley, Michael Madden, Richard Harris and George Rowan, of Pittston, Pa., James Pollard, Henry North'off and John P. Daley, of Luzerne, Pa., Morgan E. Griffiths, of Taylor, Pa., Thomas Ninnis, of Duryea, Pa., Maurice Finn, Parsons, Pa., Michael S. Martin, Port Griffith, Pa., and James H. Gibbons, Hudson, Pa.

Twenty applicants for assistant mine foremen's certificates were recommended.

Assistant Mine Foremen

Gwilym Evans, Caleb Jones, William Coleman, John Noonan, West Pittston, Patrick Walsh, Alfred M. Hefferan, John King, James Weston, Pittston, Charles Cottel, Edward F. Reilley, Avoca, Joseph Chynoweth, John J. Martin, Port Griffith, August Zitterman, Michael J. Brady, Luzerne, Daniel R. Edmunds, Parsons, David J. Thomas, Plains, Thomas Sheehan, Thomas Reidy, Wyoming, Thomas Hooper, Maltby, Thomas McNamara, Miners Mills.

No. 33 Tunnel driven through over turn basin in Mineral Spring shaft district, Red Ash vein.

Inside slope extended in Red Ash 600 feet.

Rope hole completed to Red Ash vein.

300 H. P. return tubular boiler installed at Coal Brook.

Breaker has been equipped with mechanical pickers.

William Crusher, new bore holes and pipe lines extended, taking care of all the silt and refuse from breaker.

New 20 foot double intake Guibal fan driven by Corliss engine.

Brick house.

Henry Colliery.—300 H. P. B. and W. water tube boiler installed.

New 25 foot double intake fan driven by Corliss engine.

Concrete air shaft completed in Five Foot vein.

New 25 foot double intake fan driven by Corliss engine, brick house, completed in Red Ash shaft.

New 16x24 hoist engine and brick house completed and Five Foot slope reopened.

New second outlet completed in Borroughs tract, Five Foot vein.

Two tunnels with second outlet completed in Red Ash shaft district.

New inside barn completed in Red Ash.

New brick overcast, empty car foot turnout, column and steam lines installed in Red Ash shaft.

Rock slope completed in Wyoming shaft district, from lower Baltimore to Skidmore vein.

Rock slope from Baltimore to Skidmore vein completed in Henry shaft district.

Nos. 21, 22 and 23 subslopes started in Red Ash district.

Prospect Colliery.—300 H. P. B. and W. water tube boiler added to the plant, brick house.

New inside barn Red Ash.

New electric transportation outfit has been installed consisting of one 175 K. W. 250 volts generator, directly connected to 20x18 McEwen engine, 225 R. P. M.

Two electric locomotives installed in Red Ash and Baltimore.

William crusher and extension of silt lines.

Additional mechanical pickers in breaker.

Additional fire emergency pump 16x10x16.

Laflin.—No. 4 plane, bottom split Red Ash, extended 900 feet in rock and coal.

No. 3. plane, bottom split Red Ash, extended 230 feet.

Pine Ridge.—No. 31 tunnel driven from Rock to Hillman 240 feet.

No. 12 slope Rock vein extended 650 feet and pair of 12x16 inch engines installed.

Pair of 8x12 inch engines installed for sinking No. 13 slope in Hillman vein.

Pair of 8x12 inch engines installed for sinking No. 14 Kidney slope.

Laurel Run.—No. 11 tunnel extended 750 feet toward Red Ash vein. Haulage road toward Pine Ridge driven 950 feet in Checker vein. New 28 foot Guibal fan installed, but as yet not in commission. The laurel Run breaker was abandoned August 1, and all coal from this colliery prepared at Pine Ridge breaker.

Baltimore No. 2.—No. 7 slope extended 950 feet Red Ash vein.

Heidelburg Number 2 Colliery.—Extensive repairs were made in breaker during the year.

Robbing of Red Ash vein was extensively carried out.

Silting of a portion of Red Ash vein under the Delaware and Hudson Railroad tracks was completed.

HILLSIDE COAL AND IRON COMPANY

Number 1 Slope in Thomas Shaft has been driven on the Middle Split of the Red Ash vein from the shaft level toward the basin, a distance of about 600 feet; area 6x16 feet. This Slope is continued as a steam plane to the top split of the Red Ash through the dividing rock, and has been driven a distance of about 300 feet. After entering the top split, the same engines will also serve on a continuation of the plane driven toward the basin as a slope in the top split, which will be driven as far as the coal can be worked.

These engines will therefore handle the coal in the Bottom Red Ash Slope and on the Power Plane Slope in the top split of the Red Ash. The Number 1 Power Plane in the middle split of the Red Ash has been extended a distance of about 350 feet; area, 6x14 feet. Condition, good.

Fernwood Colliery.—A washery 40x60x76 feet high has been built to wash out the Fernwood culm dump.

A power house built of brick 35x35x16 feet, and one 150 K. W. 275 to 300 volt electric generator, with 19x18 inch Ewen engines have been installed, and three 7½ ton electric motors in Number 1 Slope. Condition of colliery, good.

Clarence Colliery.—The Number 1 Slope has been extended 106 yards during the year, area 6x12 feet, and the Number 2 Slope 79 2-3 yards, area 6x12 feet. Condition of colliery, good.

HUDSON COAL COMPANY

Laflin Colliery.—New trestle from plane to breaker to replace one blown down by storm, new blacksmith and carpenter shop, locomotive house and supply house.

Number 5 Slope Bottom Red Ash, driven 600 feet.

Number 3 Plane driven 100 feet in rock from bottom to top split Red Ash and continued in vein 150 feet.

Number 6 Slope opened and driven 100 feet.

Condition of colliery, good.

Pine Ridge Colliery.—Number 13 Slope driven through rock from Hillman to Rock vein a distance of 250 feet, and continued in Rock vein a distance of 550 feet.

An 8 inch bore hole was put down 102 feet for rope for Number 13 Slope.

Number 14 Slope in Kidney vein extended 100 feet and completed, Number 15 Slope in Hillman vein extended 200 feet.

Number 16 Slope in Rock vein opened and driven 425 feet. A 22 inch bore hole was sunk for the purpose of pumping through to the surface from Checker vein, a distance of 464 feet.

A 6 inch bore hole sunk 146 feet to Hillman vein for flushing purposes.

A 6 inch bore hole sunk 203 feet to Rock vein for flushing purposes. Condition of colliery, fair.

IMPROVEMENTS

HILLSIDE COAL AND IRON COMPANY

Butler Colliery.--A tram road two miles in length has been built, by which the coal from the Fernwood slope openings is now being transported to the Butler breaker and there prepared; these openings now being a part of the Butler colliery. This necessitated changing the track gauge in the mines from 28 to 36 inches, as well as the car equipment, and adding about two hundred additional mine cars. A 26 ton steam locomotive was provided for transporting the coal outside, and one 7½ ton and one 10 ton Westinghouse electric motor were added to the inside equipment.

In the Thomas shaft two short rock tunnels were driven from the second to the third Red Ash vein.

In the Butler Marcy vein slope the No. 9 heading was driven up the basin tapping the old Pennsylvania Coal Company workings, and by the aid of two electric pumps the water standing there has been practically all pumped out.

Two General Electric 7½ ton gathering locomotives were added during the year, one in Checker vein slope and one in Thomas shaft. A 4 x 10 foot electrically driven ventilating fan was installed in connection with the Checker vein workings.

A new 240 K. W. General Electric generator and McEwen automatic high speed engine added to the electric power plant, and a new and larger cold air blast outfit to the boiler plant.

HUDSON COAL COMPANY

Laflin Colliery.—No. 4 rock tunnel was driven through the fault from the Red Ash vein 100 feet to same vein.

No. 5 Plane was driven 1,450 feet to fault in the top split of the Red Ash vein.

Pine Ridge Colliery.—Electric plant was installed and put in operation to handle the coal from Laurel Run slope to Pine Ridge shaft underground.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as Mine Foremen and Assistant Mine Foremen was held in the Y. M. C. A. Rooms, Pittston, May 19 and 20.

The Board was composed of the following members: Hugh McDonald, Inspector, Pittston; James J. McCartey, Superintendent, Luzerne; David P. Williams, Pittston and Michael J. Healey, Avoca, Miners.

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

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

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

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

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

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

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

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

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

HUDSON COAL COMPANY

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

LEHIGH VALLEY COAL COMPANY

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

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

in the Red Ash vein, 3,000 feet. A fireproof mule barn to hold 17 mules was built in Red Ash vein, and one was also built in Marcy vein.

Number 14 Colliery.—A new fireproof mule barn 87 by 114 feet, was built on the outside at the tunnels, to accommodate 54 mules.

At the Courtright slope, a brick building 10 by 12 feet was erected outside for the use of blacksmith.

Two new shafts, one 12 feet by 16 feet 5 inches by 608 feet, and one 12 feet by 22 feet by 585 feet, were sunk from the surface to the Red Ash vein, for the purpose of working the veins below the Marcy.

A rock tunnel 7 feet by 12 feet by 250 feet was driven through the anticlinal in the Pittston vein for transportation.

A fireproof mule barn, to accommodate 45 mules, was built in the Checker vein.

HUDSON COAL COMPANY

Pine Ridge Colliery.—A rock slope was sunk from the Cooper to Red Ash vein, a distance of 900 feet, size 7 feet by 14 feet. The second opening was driven to the Laurel Run workings, a distance of 1,700 feet.

HILLSIDE COAL AND IRON COMPANY

Butler Colliery.—Built a new washery, pockets of concrete and the balance of yellow pine, size 110 feet by 65 feet by 90 feet high. Washery is equipped with the latest machinery to prepare coal.

One-half battery 150 H. P. of B. and W. dutch oven type boilers added to the boiler plant.

One brick wash-house, 18 by 42 by 11 feet erected for the firemen, breaker and washery employes.

Thomas shaft. A rock tunnel 7 by 12 by 540 feet, was driven through the anticlinal for haulage road in the Red Ash vein.

A rock slope 7 by 12 feet is being driven from the Red Ash vein to the Butler workings through the fault, to be used as a second opening for the Butler slope Red Ash vein.

Butler Marcy slope. The Pittston water tunnel has been extended to the Marcy vein.

Fernwood slope. A new mule barn of wood has been erected outside to accommodate 20 mules; size 20 by 120 by 12 feet. A new building of corrugated iron was erected for supplies; size 32 by 112 by 12 feet.

LEHIGH VALLEY COAL COMPANY

Mineral Spring Colliery.—Safety over-hoists were placed on the shaft engines. Two powder cars were built for the transportation of powder to Coal Brook tunnel. Two closed passenger cars were constructed for the transportation of men to and from Coal Brook.

A new loading belt was installed in the breaker.

The mule barn in the Red Ash vein was made fireproof. A new concrete hospital was built in the first lift off the Baltimore slope.

The props and timber in No. 39 tunnel for a distance of 60 feet were replaced by concrete and steel beams.

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

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

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

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

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

HILLSIDE COAL AND IRON COMPANY

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

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

HUDSON COAL COMPANY

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

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

LEHIGH VALLEY COAL COMPANY

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

Outside. Completed a brick, iron and concrete power house 38 by 96 by 16 feet, and installed therein one 330 H. P. McEwen engine driving D. C. generator to furnish electricity to Nos. 5, 6 and 11 shafts. Also completed a concrete, iron and brick building for sand-dryer, cement-house, lime, hay, feed, hospital and storeroom.

Number 14 Colliery.—At the Red Ash shaft installed a hoisting and a fan engine, and built houses for same. Also built an addition to No. 2 tower. At the Hillman slope installed an engine, and built a house for same.

Ewen Colliery.—Inside: Sunk an air shaft, 12 feet by 14 feet, from surface to the Marcy vein at Hoyt shaft. A new concrete pump-room was built in the Schooley shaft, Pittston vein, and a Jeanesville pump, 24 by 48 by 12 by 36 inches was installed therein.

Outside:—Erected a new concrete and steel breaker and washery to replace the breaker destroyed by fire on December 11, 1914. Installed a 14-foot fan, enclosed in a brick building, to ventilate workings in the Hoyt shaft. At the Schooley shaft, a new washery was erected to prepare coal taken from the culm bank for steam purposes.

DELAWARE AND HUDSON COMPANY

Laflin Colliery.—Extended No. 4 plane, Red Ash vein, a distance of 250 feet.

Delaware Colliery.—Extended No. 14 plane in the Red Ash vein, 350 feet through fault to the workable coal beyond. Completed a tunnel, from No. 7 plane Ross vein, a distance of 500 feet, to cut veins in back basin.

Pine Ridge Colliery.—Completed No. 26 slope, Checker to Bennett vein, and No. 30 slope in Red Ash vein was extended a distance of 250 feet toward the basin.

HILLSIDE COAL AND IRON COMPANY

Butler Colliery.—Completed the water tunnel to Fernwood to take the water to the Pittston water tunnel.

LEHIGH VALLEY COAL COMPANY

Mineral Spring Colliery.—Inside: A fire line was installed in the Red Ash vein.

Outside:—A concrete dam was constructed at the reservoir to increase capacity of same. Completed structural steel work under an empty car trestle. Drilled a bore hole from the surface to the Red Ash vein, a depth of 265 feet, to conduct signal wires from outside engine house to No. 5 plane.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the Y. M. C. A. Hall, Pittston, May 18 and 19. The Board of Examiners was composed of Hugh McDonald, Inspector; H. T. McMillan, Superintendent, West Pittston; Frank J. Parks, Miner, Pittston; and Michael J. Ford, Miner, Pittston.

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

Delaware Colliery.—The following tunnels were driven: No. 29, Ross to Red Ash, 1160 feet; No. 30, Red Ash through fault, 850 feet; No. 31, Ross to Checker, 330 feet; No. 32, Ross to Checker, 250 feet; No. 33, Cooper to Five foot, 320 feet. Drove No. 17 plane from Ross to Bennett, 210 feet.

Pine Ridge Colliery.—Extended Laurel Run No. 4 plane 450 feet to the surface for a manway. A second opening connecting No. 19 plane, Red Ash, with Delaware, was extended 160 feet.

The breaker was remodeled and improved.

Baltimore No. 5 Colliery.—Two tunnels, 170 feet long, were driven from the Red Ash to Top Split and one 190 feet from the Abbott to Snake Island.

The Baltimore landings at Conyngham and No. 4 shaft and the Red Ash landing at Baltimore No. 5 shaft were secured by concrete walls and steel beams.

LEHIGH VALLEY COAL COMPANY

Mineral Spring Colliery.—Two concrete fire boss stations were constructed; one in the old slope at Jones lift and the other at the foot of No. 2 shaft, Red Ash vein.

Concrete floor was laid in the carpenter shop, partitions torn out and steel columns substituted for roof support. A substantial concrete platform was constructed in front of the ware-house and minor improvements were made on the inside.

EAST BOSTON COAL COMPANY

East Boston Colliery.—Drove tunnel from Eleven Foot to Bennett, new Bennett slope.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Kingston, June 6 and 7. The Board of Examiners was composed of John B. Corgan, Inspector; Gilbert Jones, Superintendent, Dorranceton; Thomas Thornton, Miner, Parsons; Charles Semanski, Miner, Swoyersville; John J. McNelis, Clerk, Luzerne.

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

MINE FOREMEN

Patrick H. Conway, Old Forge; James Dixon, Hudson; John J. Llewellyn, Wilkes-Barre; Frank Davitt, Miners Mills; Timothy Cronin, Nathaniel Dixon, Parsons; William F. Corgan, Luzerne; John Hosey, Kingston.

ASSISTANT MINE FOREMEN

Ellsworth Austin, Joseph Loscoskie, Con Maloney, Thomas Summerson, Parsons; Thomas Bottoms, Jr., Michael J. Condon, Mark Luksic, Louis Sulzbacher, Luzerne; William Brazill, Miners Mills; Albert Joseph Bevan, Wilkes-Barre; Anthony John Mattick, Anthony M. Sudnick, Benjamin Eckertt, Hudson; Thomas Nankwell, Cecil Ninness, Plains; Martin Shields, Forty Fort.

Pine Ridge Colliery.—Rock plane to Ross, back basin, 512 feet; air shaft, surface to Ross bed, 66 feet; tunnel, Cooper to 5-foot No. 14 tunnel, 140 feet; tunnel, Cooper to 5-foot, first lift, 84 feet; rock plane, Kidney to Snake Island bed, 530 feet; air shaft, surface to Snake Island bed, 60 feet; replaced eribbing in shaft with concrete; rock plane, Checker, to Five Foot bed, 350 feet.

Baltimore No. 5 Colliery.—Air shaft sunk from surface to Five Foot, 48 feet; Young's slope reopened in Hillman bed.

LEHIGH VALLEY COAL COMPANY

Mineral Spring Colliery.—Outside. Twelve old company houses were repaired and painted and one constructed.

A shaft was sunk from the surface to No. 1 drift workings, in the Skidmore vein, for conveying the hoisting rope and to facilitate ventilation of the drift workings.

A wooden engine house was built and an engine installed for hoisting on the new slope now being driven into the basin in the Skidmore vein, No. 1, drift. Addition to shaft engine house. Electric lighting plant installed.

Inside. A 16 inch by 8 inch by 18 inch pump was installed in No. 8 slope.

No. 1 Skidmore drift was reopened, retimbered and the sinking of a new slope into the basin was begun.

HADDOCK MINING COMPANY

Black Diamond Colliery.—Outside. Installed a compound Ingersoll-Rand 15 inch by 25 inch by 20 inch air compressor driven by a 300 horse power G. E. motor, inclosed in a 25 foot by 52 foot by 12 foot brick building.

Changed breaker drive from steam to one 100 horse power G. E. motor.

Inside. Installed one 1200 gallon centrifugal pump driven by a 150 H. P. motor, Bennett vein to surface.

Installed one 600 gallon centrifugal pump driven by 50 H.P. motor in Bennett vein.

Installed one 600 gallon 10 by 10 triplex Aldrich plunger pump driven by a 100 H.P. motor in Eleven Foot vein.

Installed one 600 gallon centrifugal pump driven by 75 H.P. motor in Red Ash vein.

Changed hoist on Ross slope from steam to 75 H. P. G. E. motor.

Changed hoist on Eleven Foot slope from steam to 75 H. P. G. E. motor.

CENTRAL COAL COMPANY

Wyoming Colliery.—Outside. New locomotive house, new office, new stable. An addition and plane added to breaker so that soal is now hoisted and dumped at the top instead of the bottom as previously.

Installed 40 H. P. Lidgerwood electric hoist at breaker plane. Installed one set of crushers and three sets triple deck shakers. Two new fan houses; new engine house; new wash house; locomotive road relaid with 60 pound rails.

CONDITION OF COLLIERIES

HUDSON COAL COMPANY

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

LEHIGH VALLEY COAL COMPANY

Henry and Mineral Spring Collieries.—Ventilation, drainage and condition as to safety, good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

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

EAST BOSTON COAL COMPANY

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

HADDOCK MINING COMPANY

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

WILKES-BARRE COLLIERY COMPANY

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

TRADERS COAL COMPANY

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

RAUB COAL COMPANY

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

JOHN CONLON

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

CENTRAL COAL COMPANY

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

HEALEY COAL COMPANY

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

IMPROVEMENTS

HUDSON COAL COMPANY

Delaware Colliery.—Completed a rock plane from Rose to Cooper vein; tunnel through fault in Ross vein, 480 feet long; rock plane from Ross to Top Ross vein, 117 feet long; and a second opening and air return from Red Ash to Three Foot bed.

Pine Ridge Colliery.—Completed No. 42 tunnel from Ross to Checker vein; No. 41 tunnel from Ross to Checker vein; rock plane from the Red Ash to the Three Foot bed, with return airway 22 feet

long; and tunnel to the Ross vein in the Laurel Run section. Installed one 7-ton electric locomotive and one 10-ton electric locomotive. The Pine Ridge shaft was relined and wood cribbing replaced by concrete from the surface to the rock.

LEHIGH VALLEY COAL COMPANY

Henry Colliery.—Installed new stacks on the boilers. Completed the electrification of the mines by running power line from Prospect Colliery. A bore hole was put down on the west side of the river from the surface to the Red Ash vein for carrying electric power line into the mines, and sub-station was constructed in the Five Foot vein. Completed No. 76 tunnel from Skidmore to old workings in the Lower Baltimore vein; No. 77 tunnel in Wyoming slope from Five Foot vein to large virgin area in Hillman vein; No. 78 tunnel in Wyoming Five Foot vein to virgin area in this vein south of the fault. Constructed a concrete air bridge to improve ventilation in Henry Five Foot vein. Drainage bore holes were drilled from Bowkley to Hillman vein, from Hillman to Five Foot vein, and from Hillman to Lower Baltimore vein, for the purpose of concentrating the pumping.

Mineral Spring Colliery.—Completed a rock plane for use as a manway for No. 5 plane, and did considerable rock grading on No. 5 plane. Completed electric power line from Prospect Colliery for the purpose of electrifying Coal Brook workings. Installed a Cochran feed water heater in the boiler house. The mouth of the old slope was improved with reinforced concrete. Made extensive repairs to all the company houses.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Kingston, April 23 and 24. The Board of Examiners was composed of John B. Corgan, Mine Inspector, Kingston; Gilbert S. Jones, Superintendent, Dorranceton; W. J. Cotter, Miner, Wyoming; Thomas Thornton, Miner, Parsons.

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

MINE FOREMEN

Guy E. Connor, Plains; Mark J. Luksic, Louis Sulzbacher, Luzerne; William T. Mattick, Miners Mills; Philip H. Kelly, Raymond Mugford, Charles S. Watkins, Parsons; George F. Charlton, Edwardsville; John R. Pattison, Plainsville.

ASSISTANT MINE FOREMEN

Joseph Bonsall, John Shaughney, William J. Corcoran, Charles Neyhard, Plains; John Cosgrove, William Roberts, Ashley; John J. Dillon, Thomas Schmidt, Wilkes-Barre; Thomas H. Rundle, Forty Fort; Julius Lisinski, John Adams, Benjamin Jones, Frank Christopher, Parsons; Michael D. Angley, Pringle.