

feet in length. A second opening is effected to another lift, and the coal is twenty feet thick, and of good quality.

At No. 9 shaft, Sugar Notch, two tunnels are now in progress of driving from the Ross to the Red Ash seam, having an area of twelve by seven feet.

The Lance shaft was extended from the Bennett down to the Baltimore seam. The depth of extension was two hundred and thirty-three feet, and the total depth of the shaft, at present, is five hundred and fifty-nine feet from the surface. An air shaft is in progress of sinking, which will constitute a second opening for the other. It was down, December 31, 1881, three hundred and thirty-five feet, and, when completed, will probably be five hundred and thirty feet. There was no coal shipped from this colliery during 1881, but it will be ready to ship coal in the course of a few months, when the second opening will be effected. They have been employing an average of sixty-three persons during the year, effecting the work described.

The Stanton air shaft was down December 31, a depth of six hundred and eight feet and is to be extended to the Baltimore seam; a probable depth of eight hundred and thirty feet. This shaft is intended to improve the ventilation of the Audenreid colliery, and a fan, thirty-five feet diameter, will be erected upon it for that purpose. The shaft is twelve by twenty-five feet; part of it will probably be used to work the Hillman seam, the condition of which appears favorable for that in the shaft. They are employing an average of twenty-five persons and had two fatal accidents during the year just past.

The south Wilkes-Barre shaft was down, December 31, a depth of five hundred and eighty-six feet, and when completed to the Baltimore seam will be about one thousand one hundred feet deep. Its size is twelve by twenty-four feet, and is employing an average of twenty-one persons.

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

At the Mill Creek slope a new tunnel was driven from the lower to the upper split of the Baltimore seam. It is two hundred and eighteen feet in length, and has an area of seven by twelve feet. The seam is eight feet thick, and the coal is of good quality.

A new pair of hoisting engines was erected at the top of the slope to supersede the old ones. The dimensions of the steam cylinders are twenty-six by forty-eight inches, and the drum is twelve feet diameter.

At Laurel run slope a new tunnel was driven from the bottom to top split of the Baltimore seam, a distance of sixty-feet; seven by ten feet area, and has opened a convenient territory of coal.

The new tunnel in the Baltimore Tunnel colliery, noted in my last report, is completed, and the second opening effected. It is one thousand four hundred and fifty feet in length, and seven by fifteen feet area. The Baltimore seam in this colliery is very nearly exhausted, and this tunnel was driven from that seam to the Red Ash, of which they have a very large territory intact. The coal is of good quality, and fourteen feet thick. A

TABLE No. 1.--Giving details relative to the progress of new shafts in the Wilkes-Barre District, and their depth, December 31, 1881.

NAMES OF THE SHAFTS.	Names of Operators.	Purposes.	SIZE.		Depth on December 31, 1881.	Number of men employed.	Deepest coal seam to be cut at present.	Probable depth in feet.	Capacity of production per day in tons.	Fatal accidents to employees.	Non-fatal accidents to employees.
			Length in ft.	Breadth in ft.							
1. Dorrance, . . . . .	Lehigh Valley Coal Company, . . . . .	Hoisting coal, . . . . .	52	13	250 ft.	25	Baltimore, .	1 000	1,000		
2. South Wilkes-Barre . . . .	Lehigh and Wilkes-Barre Coal Company, .	Hoisting coal, . . . . .	24	12	586	21	Baltimore, .	1,100			
3. Stanton Air Shaft, . . . . .	Lehigh and Wilkes-Barre Coal Company,	Hoisting and ventilating,	26	12	630	25	Baltimore, .	830	. . . .	2	1
4. Lance Air Shaft, . . . . .	Lehigh and Wilkes-Barre Coal Company, .	Ventilation, . . . . .	18	10	385	} 63	Baltimore, .	530			
5. Extension of Lance Shaft,	Lehigh and Wilkes-Barre Coal Company,	Hoisting coal, . . . . .	28	12	559		Baltimore, .	559	800		
6. Woodward, . . . . .	Del're, Lackawanna, and Western Coal Co.,	Hoisting coal, . . . . .	53	10	30	30	Red Ash, . .	800	1,000		1
7. Alden, . . . . .	Alden Coal Company, . . . . .	Hoisting coal, . . . . .	26	12	28	18	Baltimore, .	270	1,000		
8. Bennett Shaft, . . . . .	Thomas Waddell & Co., . . . . .	Hoisting coal, . . . . .	20	10	290	37	Baltimore, .	310	1,000	2	
9. No. 3 Shaft, Kingston, . .	Kingston Coal Company, . . . . .	Hoisting coal, . . . . .	33	12	544	22	Red Ash, . .	544	800		
10. Gaylord Shaft, . . . . .	Gaylord Coal Company, . . . . .	Hoisting coal, . . . . .	47	12	575	20	Red Ash, . .	575	1,000		
11. Raubville Shaft, . . . . .	Waddell & Walters, . . . . .	Hoisting coal, . . . . .	22	12	192	21	Bennett, . .	192	600		

600 feet in length. This opens to a large tract of coal, which will be extensively mined as soon as a second opening can be effected. The old No. 2 shaft, whose workings were connected with the upper Red Ash tunnel in this mine, was arranged as an escape for the men, in case of emergency, by having good accessible ladders erected up through it.

At the Stanton shaft, a force of men were kept at work through the year re-opening the mine and restoring the ventilation of the old workings. A gangway has been driven a long distance, from which a series of chambers will be opened as soon as connection can be made with the new air-shaft. The latter is now sunk to the Baltimore seam, a depth of 840 feet, and they expect to have it connected with the Stanton workings by the middle of April, 1883. A 35-foot fan was erected on top of this shaft, ready to set to work when the connection is made, which will produce splendid ventilation upon the starting of the operation. The new breaker is completed, ready for operation, as soon as the connection with the air-shaft is made.

At the No. 9 shaft Sugar Notch, the two tunnels reported in last year's report were completed—one from the Ross to the Red Ash seam was 7x12 feet area and 705 feet long, the other, not on the same level, but from the Ross to the Red Ash vein, also was 7x12 feet area and 560 feet long. A new fan was also erected on this colliery, which has improved the ventilation and made the colliery much more comfortable to work in.

At the Lance colliery a new air-shaft was sunk, which is 10x18 feet area and a depth of 520 feet, and its connection with the main shaft effected. A new 35-foot fan was erected, on top of the air-shaft, to ventilate the colliery, when ready for operation. The old breaker was pulled down, and a new one is in progress of construction, which they expect to have completed by the beginning of next May, when the mine will begin to ship coal again.

At the Nottingham shaft a new tunnel was driven from the Red Ash seam to work the Ross, none of which has yet been mined. The tunnel was 7x12 feet area, and 1,075 feet in length, and they are, at this writing, working to effect a second opening to it.

At the Reynolds slope a tunnel is in progress from the Red Ash to work the Ross seam, 7x14 area, and had been driven, at the close of the year, a distance of 300 feet. Another tunnel was driven through a large fault, which opens a large tract of coal hitherto untouched; it was 360 feet long, and has an area of 96 square feet.

At the Wanamie colliery a new tunnel was driven from the Ross to work the Red Ash seam, which has an area of 72 square feet, and is 390 feet long. A new fan, 15 feet diameter, was also erected at this colliery, which has been the means of producing much improvement in the ventilation.

The South Wilkes-Barre shaft is completed to the Hillman seam, a depth of 700 feet, and have found the vein proving better than their expectation. This has opened a large tract of hitherto solid territory of coal, and

**The General Condition of the Mines.**

During the year 1883, several new collieries began to operate in this district, swelling the list to an appreciable degree, and increasing the inspection work in the same proportion. The Clear Spring colliery began to send coal through the breaker January 3; the Alden colliery began January 18; the Hanover March 10; the Fuller colliery the last week in August; the Schooley breaker started September 3, and the Hillman vein breaker September 28. Beside these, the new breaker at the Lance colliery started to ship coal June 30, and the new breaker at the Stanton mine September 1. Thus eight new breakers are added to the list of this district for 1883. These new collieries are all equipped with the latest improved colliery-plant, and each is starting the operation of mining in good condition.

The ventilation of the Lance, Stanton, and Fuller collieries is largely in excess of the need of the present workings, and evidently it will continue so for some time. The ventilating systems of the other new collieries have not been completely established yet, but I expect it will be efficient when the contemplated work is accomplished.

In the old collieries, the good condition reported last year is generally maintained. A few instances exist where there is sufficient ground to complain, but even in these a slow progress is being made, and I am promised that a more satisfactory condition will soon be effected.

With the large amount of coal mined at present, the workings underground spread out rapidly, requiring extraordinary care in the manipulation of the air-currents to supply an efficient quantity of ventilation at the face of the workings. This is done remarkably well, considering the difficulties of the work.

Some difficulty is experienced in maintaining an effective discipline, from which laxity accidents frequently arise, causing injuries to the workmen which might easily be avoided provided the discipline was more effective.

**Events Causing Fire-Damp to Accumulate in Collieries.**

Great danger exists when a large body of fire-damp accumulates in a coal-mine, and this danger had to be contended with at three of the collieries of this district for several months in 1883. During the first part of January the pillars of a large extent of workings in the Baltimore slope were crushing and showing the usual signs of an approaching cave, and about five o'clock, A. M., January 25, the expected cave transpired, breaking the strata clear through to the surface, and damaging a number of houses. While the pillars were being crushed, all the hitherto occluded gases were suddenly relieved and evolved into the cavities of the mine, causing the atmosphere of a large area of workings to become explosive. At the same time, from the same cause, the second opening of the Conyng-ham shaft was deranged and made for a while unavailable as an escape for the latter colliery's workmen in case of emergency. The ventilation of this mine was also affected, so that a large section of the workings became

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 completely 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 ignited and burned briskly behind the casing around the shaft, and set it on

fire. Some said that a flash of lightning ignited the gas, but the men themselves said that they believe it ignited from their lamps. The men instantly came out of the shaft, and a short time after, when two of them were on the bucket about to descend again, an explosion occurred blowing the bucket and cover of fan-drift up in the air, the latter falling on the washing shanty and completely crushing it. The men fortunately escaped with only slight injuries. At first it was feared that the explosion had extended into the Stanton workings, but upon examination of the mine everything was found in its usual order. Owing to the thick smoke ascending the shaft, the air-current was reversed and the smoke was driven down and out through the Stanton gangway to the old fan, and after laying pipe to conduct a sufficient supply of water, the fire was successfully extinguished on May 9. Although it was a difficult place to fight a fire, it was done with careful, prudent steps, and they succeeded in extinguishing it without an accident to any of the men employed at the work. The casing was finally completed, and the fan is since ventilating a part of the Stanton workings. The colliery is now in excellent shape, having large roomy airways and gangways, excellent ventilation, and a large margin of ventilating power to meet future requirements.

**Opinion and Decision of the Supreme Court.**

An appeal was made from the decision of the court of common pleas of Luzerne county to the Supreme Court of Pennsylvania, in the case of Commonwealth *ex rel.* Williams, mine inspector, *vs.* Haddock *et al.* See opinion of Court below in mine inspectors' report for 1881. I regret to state that the decision of the Court below was reversed, for reasons set forth in the following opinion:

*Mine Ventilation Law—New Workings.*

1. The delendants were owners of a coal mine operated through a shaft, and it was alleged, and not denied, that they permitted men to work in the first and third seams (which were connected with a second opening) at the same time that other employes, not exceeding twenty in number, were at work in the fifth seam of coal "for the purpose of working a gangway to connect with a second opening not yet completed to said seam." Held,—
  - (a.) That this was not in violation of section three of the act of March 3, 1870, (P. L., 3.)
  - (b.) That the phrase, "for the time being at work," is clearly used to qualify and limit the seams or strata which are embraced in the prohibition of the third section of the act, and not the period of time, daily or otherwise, when the laborers are actually employed.
  - (c.) That removing coal from a gangway, not for the coal, but for the purpose of driving the gangway so as to connect the same with a second opening, is not working the seam, but opening it for work. Such work does not make it a seam "for the time being at work" within the meaning of section three of the act.
2. Commonwealth *vs.* Haddock, (10 Luz. Reg., 81,) reversed.

Appeal from the court of common pleas of Luzerne county.

[For opinion of Court below, see 10 Luz. Reg., 81.]

The opinion of the Court was delivered October 1, 1883, by

from the said tunnel by a drill-hole two and a fourth inches in diameter and eighteen feet long, about five o'clock, A. M., September 14, 1883. The water has been running continually since, but it is not all out yet.

A tunnel was driven in this mine from the Baltimore to the Hillman seam. It is seven hundred feet in length, and one hundred and twelve feet area, on a grade of eighteen degrees. The second opening was made by driving a passage to the shaft.

The new breaker erected at the Stanton mine started to put coal through September 1st, 1883. This colliery had been idle since the fire which caused the flooding of the mine in 1879. The new air-shaft was connected to the working on April 18, 1883, and they immediately went to work casing the air-shaft preparatory to setting the new thirty-five-foot fan to work.

The mine is now in excellent condition, having a very large quantity of air circulating, and plenty of margin to meet any extra requirements.

At No. 11, the Lance colliery, the old breaker was torn down and a new structure erected in its place. This started to work June 30, 1883. The colliery was equipped with a complete set of new machinery, consisting of a set of direct-acting hoisting-engines and conic drum, a breaker-engine, a pair of hoisting-engines for underground slope, but located on surface, and a thirty-five-foot fan, all of the best kind of machinery.

At the Reynolds colliery, the tunnel reported last year was completed to the Ross vein. Its total length is six hundred and forty feet. They are now working to effect a second opening to it.

At the South Wilkes-Barre shaft, a fan was erected fifteen feet diameter, dimensions of which can be seen in table of new fans.

#### **The Susquehanna Coal Company.**

This company is making rapid and sure progress in all their collieries. A pair of massive engines was erected to sink the No. 1 shaft extension from the forge seam to the red ash, and the three compartments at the southern end of the shaft were extended to a depth of two hundred and sixty-six feet below the forge vein, and they expect to cut the red ash seam in the first part of 1884. Two new shafts were opened for ventilating purposes from the surface to the Mills seam. Both are eighteen by thirteen feet area, and one is one hundred and eighty feet, and the other sixty-three feet deep. The ventilation of this company's collieries has been much improved during last year, and the spirit of the management from the highest officer to the lowest seems to be alert watching improved methods and adapting them to their mines.

A new double fan was erected on one of the above shafts, designed by Mr. J. H. Bowden, chief engineer of this company, and it produces excellent results, improving the ventilation greatly in two or three of the mines.

The underground slope in No. 2 shaft was extended during this year to a length of one thousand five hundred feet, on an average grade of eleven degrees. The tunnel reported last year in this shaft was completed to the

is continued, but another year, at least, will pass before it will reach its destination.

In the Red Ash seam of the Empire mine, a slope was made to hoist the coal from the lowest point in the mine to a point on a level with the bottom of shaft. It is one thousand one hundred and sixty feet in length, on a grade of about twenty-five degrees, and it facilitates the drawing of coal from a wide extent of territory which was hitherto out of their reach.

The old Hartford breaker took fire and burned down about eight o'clock in the evening, January 22, and the old Jersey, or No. 8 breaker, was remodeled to take its place. This, however, is not large enough to pass the coal of more than one opening—the new slope, the other two slopes remaining idle. The tunnel at the bottom of the new slope was extended from the Ross to the Red Ash seam, a distance of 380 feet, from which a large extent of coal can be mined. The slope was also extended to a further depth of 950 feet where it touched the synclinal of the basin and opened a wide field of the Baltimore seam.

In the Stanton mine a slope was driven towards the basin in line with the bottom of the new air-shaft, which opens a new lift of excellent coal. The hoisting-engine is located at the top of the air-shaft on the surface and the rope is passed down the shaft and to the slope over pulley-wheels. It works admirably, and the inconvenience of having steam pipes in the mine, and the detrimental effects of the heat radiating therefrom, is thus successfully avoided.

A tunnel is being driven from the Baltimore to the Hillman seam, the size of which is 16×8 feet on a rising grade of nineteen degrees. By the close of the year, it was driven a distance of 222 feet, and it is expected to cut the Hillman seam at a distance of about 775 feet.

In the No. 11, or Lance colliery, a slope was sunk reaching from the level of the shaft-bottom to a length of 1,350 feet, the average grade of the coal-seam being seven degrees. A new gravity plane was made also in the same mine to lower the coal from the highest point of the workings.

#### Delaware and Hudson Canal Company.

A new shaft was started by this company in April, 1884, and completed to the Baltimore seam before the end of the year. It is located about a quarter of a mile south-east of the Mill Creek colliery. The depth of the shaft is 132 feet, and its size 10ft.×22ft. 8 in. It was sunk for the purpose of working the coal from a small basin, which cannot be reached from the Mill Creek slope. The coal will be shipped from the Mill Creek breaker. Therefore, it is intended to maintain the present production of the colliery, although some portions of the slope are about being exhausted.

The Baltimore Red Ash shafts reported last year are still in progress of sinking. The depth of No. 1 was 304 feet at the end of the year, and of No. 2, 382 feet. Both these shafts are located in Wilkes-Barre township, and are intended to work the Red Ash seam. For dimensions see table in this report.



paired and the mine started to ship coal again in the fore part of November. At this fire it was demonstrated very clearly that a pipe is not of any use to permit air to escape from high points during a fire if water can stand in the pipe. It had a fair trial here and it failed.

**A Powerful Explosion of Gas at the Stanton Colliery, Lehigh and Wilkes-Barre Coal Company.**

The Stanton Shaft is located in Wilkes Barre, about a mile south of the center of the city. The air-shaft is on the side of Hazle street, about two thousand feet north-west of the main shaft. The old workings are ventilated by a fan, located at the mouth of a slope sunk from the outcrop of the Baltimore seam, and the workings now in progress are ventilated by a thirty-five-foot fan, located at the air-shaft, which is divided into two compartments, one a downcast, and the other an upcast. The boilers generating steam to run this fan were near the top of the shaft, and the stack, made of boiler-plate iron, was standing just one hundred feet off, south-east of the outcast of the fan, and it was thirty feet high. On Sunday afternoon, May 10, 1885, this fan was stopped to pack the engine and do some repairs. Prior to this the mine was examined twice, to ascertain that no gas-blowers were burning, and it was pronounced safe. In one hour after stopping the fan, the explosive gases were full in the mine, up to the top of the shaft. It exploded in the safety-lamp on the surface at the mouth of the shaft, and a fire-boss was stationed there to watch and keep persons away, lest it might be carelessly fired. The fan was standing for three hours, and it was started again at six o'clock, p. m. After running about five minutes, throwing out about one hundred and fifty thousand cubic feet of fire-damp every minute, a flame was seen in the air, between the fan and the boiler-stack, which instantly descended the shaft through the fan, causing a slight shock, and raising the roof of the fan-drift about a foot out of place. The wind was blowing directly from the outcast toward the boiler-stack, and it is supposed the gas ignited from flame ascending the stack. The damage was only slight on the surface. William M. Thomas, the mine-foreman, and William G. Thomas and John Joseph, fire-bosses, descended the main shaft, and went in as far as the bottom of the air-shaft to see the result in the mine. This was very dangerous work, as another explosion might follow, but it was thought safer to go immediately after the explosion than after a delay. They returned in a short time, saying that considerable damage had been done inside, but they saw no indication of fire existing, and to make sure of being safe, they concluded to wait till the following morning before entering again. The next day they began to repair the damage, and an examination showed that the explosion had been very extensive, and had developed tremendous force, but the peculiar shape of the passages of the bottom of the air-shaft diverted its course, and thus saved the fan and the structure on top from destruction. All the doors from the shaft to the face of the workings were torn to frag-

ments. A large number of props were loosened along the gangway and in the breasts. Near the air-shaft, on the gangway, a number of loaded cars were piled into a mass of ruins. Near here, also, a bar of T iron, raised from the track, was broken in two pieces, one of which was bent to a figure resembling the number 8. The walls and débris filling the cross-headings between the gangways, and airways were swept out from all the cross-cuts that were inside of the air-shaft. The wood was charred with fire, and all the tool-boxes destroyed in all the breasts, from Nos. 30 to 49, inclusive, and the powder was exploded in most of these breasts. In several breasts full kegs of powder were exploded. Everywhere there were unmistakable signs that a terrific explosion had occurred, filling this portion of the mine with flame from roof to floor, a height of about eighteen feet. There was no sign discovered that coal had been on fire, and this confirms the supposition that the gas ignited from the boiler-stack. Fortunately, there was no one in the mine, and, therefore, there was no one injured. The company concluded to remove the boilers, and thus avert the possibility of another explosion occurring in the same manner.

#### **Electric Signals in Mines.**

Telephones were placed in the Old Franklin and Warrior Run slopes during the past year. These enable them to communicate freely from top to bottom and from bottom to top. The Lehigh and Wilkes-Barre Coal Company have introduced electric alarm bells from the fans into a number of their mines, so that the miners could be instantly called out in case the fan should break or fail to run.

#### **Fans--Speed-Indicator.**

Section seventeen, article ten, of the mine law requires that a recording instrument shall be provided on each fan in gaseous mines to register the number of revolutions, so that if the speed of the fan is retarded it may be detected. Mr. C. H. Scharar, engineer Delaware and Hudson collieries in this district, devised and patented an instrument for this purpose, and it is placed on the fan at the Conyngham colliery. It is working very satisfactorily, recording the speed of the fan for five days without changing the paper. It is attached to the engine, and a pencil draws a diagram on paper, indicating the speed at any time during a period of five days. A photograph of the instrument is presented in this report, to which the reader is referred.

#### **Prosecution Under the New Mine Law.**

The coroner's inquest, conducted by Esquire M. E. Walker, of Shick-shinny, inquiring into the manner and mode of death of the ten men suffocated in the West End colliery, August 11, upon completing their investigation, returned the following verdict as their finding:

"We find, first, that the West End Coal Company is a corporation duly chartered, and is being operated under the mine laws of the Commonwealth.

5 MINES.

**Examination of Applicants for Mine-Foreman's Certificate.**

The annual examination of applicants for mine-forman's certificate in the Third district was held in the Central school building, Wilkes-Barre, Pa., June 21 and 22.

The examiners were G. M. Williams, inspector; Charles Conyng-ham, operator, both of Wilkes-Barre, Pa., and James Fisher, minex, of Nanticoke, Pa.

Forty-five applicants for certificates of qualification appeared for examination, and the following thirty-two were successful:

John W. Joseph, William T. Evans, Daniel P. James, A. J. Gal-lagher, Andrew H. Weir, John Heycock, Jonathan Weir, William P. Howells, Richard Martin, Jacob D. Jones and Samuel Griffith, of Wilkes-Barre, Pa.; R. M. Williams, Samuel R. Morgan, William E. Howells, T. M. Rees, Edward Roderick, Thomas Cross, John I. Wil-liams, H. G. Willams, Benjamin Richards and John R. Williams, of Plymouth, Pa.; Mordecai Dando, John D. Williams and William A. Jones, of Edwardsdale, Pa.; Henry R. Jones, John Winters and John I. Absalom, of Nanticoke, Pa.; Rees Morgan and John R. Morris, of Sugar Notch; Richard Faull and Griffith G. Roberts, of Ashley; W. S. Williams, of Peeley, Pa.

A. Rees, Nanticoke, Pa., applied for certificate of service, and was recommended to receive one.

**Mine Improvements During 1887.**

*Lehigh and Wilkes-Barre Coal Company.*—At the **Stanton** mine air-shaft this company is erecting a new fan thirty-five feet diameter to duplicate the present one, so that one may be used while the other is undergoing repairs. They have found it dangerous to allow the ventilation to cease traversing, because in such a gaseous mine blowers of gas may be burning which cannot be detected by examination, and yet would ignite the gas when the mine would be filled to the point where the burning blower might be.

At the No. 9 colliery, Sugar Notch, a new fan twenty-four feet diameter is in course of erection to ventilate the upper seams. The workings have extended so that this was found necessary.

At the Nottingham colliery, Plymouth, a new air-shaft 12'x30' was sunk from the surface to the Ross seam, where it will be connected to the Red Ash seam by a tunnel now being driven for the purpose of improving the ventilation. A fan twenty-four feet diameter is being erected in the shaft which is expected to effect material improvement.

The new shaft at South Wilkes-Barre is sunk to a point twenty-four feet below the Baltimore seam, a total depth from surface of 1,064 feet. The coal was found in its usual thickness of sixteen feet and of excellent quality. They are now at work putting up partitions and linings preparatory to opening the gangways, etc. The indications are favorable for an unusually productive colliery.

**Mine Improvements during 1888.**

During this year the spirit of improvement was active, and a number of important movements were made towards improving the condition and the producing capacity of the collieries. Among the number the following were perhaps the most important:

**Lehigh and Wilkes-Barre Coal Company.**

At the Hollenback colliery movements are in progress towards working the Red Ash seam. A new air shaft is being sunk from the surface and has, at this writing, passed below the Baltimore seam. Its size is 12x37 feet, and it is expected to cut the Red Ash seam at a depth of about 650 feet. Preparations are in progress also to have the main shaft extended from the Baltimore seam, where it now is, to the Red Ash.

At the **Stanton** colliery a new fan was erected on the air shaft to duplicate their other thirty-five foot fan. The mine gives off such an enormous quantity of fire-damp that it was very hazardous to suspend the course of the air currents for any length of time. To avoid this a new thirty-five foot fan was erected adjacent to the other, and doors were so adjusted that, in case one fan stops running, the other can be operated in a few minutes to ventilate the mine. This mine now has one pair of seventeen-foot double fans and two thirty-five foot fans for the purpose of producing ventilation.

At the South Wilkes-Barre shafts, Nos 3 and 5, extensive preparations are in progress for the completion of the colliery. The main shaft is 1,064 feet deep to the Baltimore seam, where the coal was found in its usual thickness of sixteen feet and of excellent quality. The shaft is divided into four hoisting compartments and an up-cast air shaft. This work is now completed, and a large force is at work erecting foundations for the massive hoisting engines which are to be placed thereon.

The other shaft (No. 3) was sunk to the Baltimore seam also, and cut the latter at a depth of 250 feet below the old terminal or Hillman seam. One of these shafts will constitute a second opening to the other, and coal will be mined from both. A new pair of first-motion hoisting engines were placed on this shaft, and a solid wall of mason work was erected to support the earth from the rock to a point several feet above the surface around the shaft, greatly enhancing its safety. It is expected that a considerable amount of coal will be mined during 1889 from this colliery, which will be shipped from the Diamond breaker.

At the Sugar Notch shaft, No. 9, a new twenty-four foot fan was erected chiefly to ventilate the workings of two seams opened at the bottom of the shaft; *i. e.*, splits of the Baltimore seam. This makes the third fan used in ventilating this colliery, which is quite effective.

At Wanamie the water was pumped out of the old No. 19 slope,

## MINE IMPROVEMENTS DURING 1889.

No improvements were made during the year 1889, except those which were absolutely necessary to keep up the usual production of coal. The coal business was not active and the market did not demand nearly as much as it did in the previous year, and this, perhaps, was the cause of the inactivity in effecting improvements.

*Lehigh and Wilkes-Barre Coal Company.*

At the Hollenback colliery the main shaft was extended from the Baltimore to the Red Ash seam, an increased depth of 373'. Its total depth from surface to the Red Ash seam is 950' and its sectional area is 12'x46'.

The new air-shaft mentioned in my last report was sunk to a depth of 743', having a sectional area of 12'x37'. They have not yet struck the Red Ash seam and it is supposed to have pinched out at that point. This shaft is to constitute the required second opening for the Red Ash workings of the Hollenback colliery.

At the Stanton colliery a new rock tunnel was driven on the southeast side of the main shaft from the Baltimore seam workings to the Ross and Red Ash seams. It cut the Ross at a distance of 550' and the inner or lower split of the Red Ash at a distance of 700'. Its sectional area is 7'x12', and its grade is about 1' in 100'.

At the No. 5 shaft, South Wilkes-Barre, the hoisting appliances were put in place on massive stone foundations. The engine cylinders are 32"x60" connected directly to a cone drum having a diameter in center of 14' and 8' at the ends. The shaft is sunk to a depth of 1,068', the depth to the bottom of the Baltimore seam being 1,045'.

At No. 3 shaft, South Wilkes-Barre, a pair of hoisting engines having cylinders 32"x60" were also erected on solid foundations of massive stone work, and it is directly connected to a drum 14' diameter at center and 8' at ends. The shaft is sunk to the Baltimore seam which was penetrated at a depth of 950'. It is to constitute the required second opening for the No. 5 shaft. Both shafts are already connected by openings in the Hillman seam at a depth of 700'. A long gangway is also driven and connected with a rock plane that was driven from the Stanton mine several years ago.

*Delaware and Hudson Canal Company.*

The second opening to the Baltimore shafts Nos. 2 and 3 was effected during the latter months of this year. The workings of both are now connected and available for the workmen of both mines, and each shaft is equipped with hoisting engines and cages. The main shaft, No. 2, is 660' deep to the Red Ash seam and has a sectional area of

had no time to become familiar with its extensive old workings, and most probably those of the three lower lifts had not been as thoroughly examined as the case required, or the existence of the squeeze would most probably have been discovered in time to avert the dire calamity which followed.

This cave-in caused a large flow of water into the mine, which accumulated at the bottom of the slope. A large volume of fire-damp was also liberated, causing the air in the west workings to become explosive. The colliery was thrown idle for over three months.

#### A CAVE-IN IN THE STANTON COLLIERY.

On Saturday, August 30, one of the fire-bosses noticed some of the pillars chipping and cracking in the breasts east of the No. 5 plane in this mine, and at once notified the officials. From this on to September 6 efforts were made to stay the progress of the squeeze, but with no apparent effect. At this date the enormous volume of explosive gases released made it too dangerous for men to be in the mine, and all, except the foreman and fire-bosses, were withdrawn. They watched its progress until it finally abated and settled, after spreading over a large area of the workings. Although this mine is one of the most dangerous in the region, this period of extreme peril passed without an accident. The gangways are now re-opened, and the mine is in a safe, workable condition.

#### FATAL MINE ACCIDENTS AND MINE MANAGERS.

Before entering upon a detailed description of the disasters which occurred in this district during the year 1890, it is necessary to explain the relation of mine-foremen and superintendents to the mines, and the part they take in causing or preventing accidents. Whenever a disaster occurs in a coal mine, the public is inclined to believe that the mines, in general, are badly managed, and that the officers have no regard for the safety of the workmen, and that the causes which result in disaster have always existed, needing only a slight mistake, or a heedless act, on the part of one of the employes to cause it. This is wrong and unjust. The conditions which make a disaster even possible are seldom known to exist before the moment it takes place, and, in most cases, the existence of danger has not even been suspected. Five disasters occurred in mines of this district in 1890, and in only one was it known that danger existed before the occurrence of the disaster, and it occurred in that one while efforts were being made to remove the cause of danger. It was the one at No. 4 slope, Nanticoke. With the exception of the case at the Holtenback and Jersey collieries, it is not probable that any unusual danger existed which could have been discovered twenty-four hours before the time at which the disasters occurred.

Superintendents and mine-foremen are generally exceedingly careful, but they have hundreds of points to watch, and must trust a large share

At the Empire colliery several short tunnels were driven from the top split of Red Ash to Ross seam and through a fault on the west side.

A new pair of hoisting engines 20"×36" were put up at the No. 2 shaft to hoist from the underground slope.

At the South Wilkesbarre shafts, the damage that was done by the fire of 1890 was repaired, and a much more reliable system of ventilation was effected by driving new passages. A new fan 35'×12', having an engine 20"×48", is also in course of construction. The experiment of trying to ventilate this gaseous mine by a twelve-foot Cappell fan has not proven satisfactory, and the new fan is expected to effect a much desired improvement.

At the Stanton colliery the damaging effects of the cave of 1890 were repaired, and so was the effects of the South Wilkesbarre fire on the rock plane connecting the two collieries. This plane is now in working shape and openings are being driven to connect with the air-shaft, which when effected, will place the Hillman vein workings of this mine in good condition for work.

A tunnel was driven across the basin in the Baltimore seam, near the bottom of the underground slope, a distance of 456', which has enabled them to ventilate a very gaseous portion of workings which has been idle for more than four years, owing to the prevalence of an unusual quantity of explosive gas.

A new air-shaft was also sunk for the Red Ash seam a depth of 318' upon which a ventilating fan 24' diameter, an engine 20"×36", and two batteries of Babcock & Wilcox boilers were erected.

At the Jersey No. 8 colliery a new air shaft was sunk, having an area of 12'×12' and a depth of 57', upon which a new fan 24' diameter, having direct acting engine 30"×36", were erected. Several other minor improvements were also made at this colliery.

At the No. 9 colliery, Sugar Notch, the underground slope was regraded and a new lift opened. The hoisting engines were taken out and new ones erected on the surface to do the work. These engines are 24"×48" direct-acting on a parallel drum 9' diameter. This has made a very agreeable change in the ventilation. Three tunnels were driven at different levels to work the Twin, Shaft and Top split seams.

At the Lance No. 11 colliery a new tunnel was driven from the Bennett to the Cooper seam, a distance of 222'. They have also improved the ventilation by enlarging the airways at contracted points through the mine. They also put in a system of water pipes in the gaseous gangways to be ready for extinguishing fires in case the gas-feeders should be ignited. A 100-horse power Dimmick & Smith high-pressure boiler was added to the plant on the surface.

At the Nottingham colliery the third and fourth east gangways closed by the cave of last year were reopened, and the standing gas removed by driving airways around the cave.

## EXPLOSION AT THE STANTON COLLIERY.

On the morning of December 31st, the last day of the year, 1891, while Moses Jones, Thomas Malia and John R. Davies were walking to their work on the gangway against the air-current, each carrying a safety lamp, and no other, unexpectedly entered fire-damp which exploded from their lamps injuring Malia and Davies fatally and Jones very severely. There were no others working in this part of the mine. The workings of this section had to be suspended about five years before, because the current of air became too highly charged with gas. Now a rock tunnel had been driven, to increase the ventilation and these men were working to repair the rotten brattice and timber. They had worked at this for several weeks and had nearly completed the work. They could have traveled through the rock tunnel with the pure air, which was a much shorter and safer route, but for some unexplained reason they took the longest way and went in against the return air. The breasts were rising at a steep angle, and the coal was thick and free, and evidently a fall in the face of one that had gas in, drove it into the current just at the time they were going in to meet it. Malia was walking at a distance of about four feet behind Jones and he saw Jones lamp filling with gas and instantly both were surrounded by flame. Davies had remained some distance back, but he also was severely burned. They were rescued in a short time, and everything was done that could be to alleviate their sufferings, but Jones was the only one who recovered after a long period of suffering.

## REMARKABLE RESCUE OF THREE MEN AT WEST NANTICOKE.

At about twelve o'clock midday, Wednesday, February 4, 1891, John Rineer, William Cragle and Michael Schelank were closed in by water in the workings of the No. 3 colliery, at West Nanticoke, and were rescued at five o'clock a. m., February 9, having been in there for one hundred and thirteen hours.

A sketch of the workings of that part of the mine is herewith furnished. The reader will notice that the unmined coal is that of a long narrow local basin. From each side of this basin above the level gangways which join around it, all the coal had been mined and the pillars were robbed. The roof had also fallen, making these old workings inaccessible, and the falls had blocked the water back on the gangway on the right so that there was quite a large body of it, but it was not known to be there. The three men named were driving the gangway along the synclinal of the basin (marked on map cccc). Thomas Lewis and Daniel R. Davies were driving the passage A on the right to connect with the old level gangway for the purpose of ventilation. On Tuesday, the day prior to the breaking in of the water, they bored a drill hole through to the old gangway, and found considerable water running in. Work was then suspended for the remainder of that day



ning 45 revolutions per minute produces a ventilating pressure of 10.4 pounds per square foot, and is exhausting 250,000 cubic feet of air per minute. A self-recording pressure meter and automatic alarm is also attached to it. The fan engine is 16×48 inches direct acting. A tunnel was driven from the Hillman to the Kidney seam; also a second opening for the same. The main tunnel is 7×12 feet and 300 feet in length; and the second opening for the ventilation is 7×12 feet area and 90 feet in length. This is the first opening to the "Kidney seam," and it will enable them to work a large area of it.

Second openings were driven through the rock from the Red Ash, one to the top split and the other to the Ross seam. The first is 43 feet in length and the second 80 feet, and each has an area of 7×12 feet, which make roomy return airways. Another tunnel is being driven south from the West Red Ash gangway to cut the Diamond basin, which will open an extensive field of coal.

At the Empire colliery three new rock tunnels were driven, the first through a fault in the Red Ash seam a distance of 180 feet, the second from the top split of Red Ash to the Ross seam, a distance of 60 feet, and the third from the Red Ash to the top split, a distance of 130 feet. Each of these have an area of 7×12 feet.

At the South Wilkes-Barre colliery besides the new breaker already noticed, a new 35-foot Guibal fan has been erected which, running at a speed of 45 revolutions per minute, exhausts 240,000 cubic feet of air under a water gauge pressure of 1.9 inches. This fan was erected to supersede the old Capell fan, which was not of sufficient capacity for this gaseous mine. The new fan is supplied with a self recording pressure meter and automatic alarm.

Three new tunnels were driven through the rock, one from the Hillman to the Kidney seam in the No. 3 shaft, a length of 228 feet, and an area of 7×12 feet. This will enable them to work the Kidney seam, which is 4 feet 3 inches in thickness. The second was driven from the Baltimore to the next seam above, called there the "Stanton" seam. This tunnel is 300 feet long and 8×12 feet area. A second opening was driven for ventilation a distance of 84 feet, having an area of 9×12 feet.

An underground slope was sunk in the Hillman seam from the east gangway of the No. 3 shaft. It reached the basin at a length of 425 feet, which opens a productive lift of coal.

At the Stanton colliery a new fan has been erected to ventilate the old Hillman seam workings near the main shaft. Fire-damp would occasionally accumulate in these workings, making it dangerous to pass through the main shaft, and the erection of this fan has removed every vestige of the danger. It is a Sturdevant fan, 8 feet diameter, running 80 revolutions, and exhausting 3,000 cubic feet of air per minute—run by a horizontal direct-acting engine 10×14 inches.

A new gravity plane 1,000 feet long was made in the Hillman seam to work the coal to the rise. It has an average grade of 10 degrees.

The north outcrop of the seam at that point was covered by about sixty feet of sand. That part of the mine has not been worked since, and the gangways have not been cleared, and it is premised that no work will be done in that lift until some time in the future.

This occurred in a locality where there was no stream or body of water anywhere in sight on the surface, and where it was believed that no danger existed.

#### Annual Examination of Mine Foremen.

The annual examination of applicants for certificates of qualification for mine foreman and assistant mine foreman was held in the common council room, city hall, Wilkes-Barre, May 23, 24 and 25, 1899.

The board of examiners was G. M. Williams, Mine Inspector; H. H. Ashley, Edward Mackin and Andrew McGeehan.

The following named applicants passed a satisfactory examination and were recommended to have certificates of qualification as mine foremen, viz: Maurice Williams, Robert Johnson, William N. Thomas and Evan Thomas, of Wilkes-Barre; Richard L. Evans, of Edwardsdale; Lewis Richards, John T. Cartwright and Richard R. Jones, of Nanticoke; David Edwards, of Ashley; William H. Harrison and Richard T. Morgan, of Plymouth.

The following named persons were recommended to have certificates of qualification for assistant mine foremen, viz: Alexander Lawrence, Timothy Cronan and Frank Mills, Alden; Thomas Saunders, Mark Lloyd, William E. Thomas, Robert Richards, John Griffiths, Robert M. Smith, Edward D. Williams and Evan R. Jones, Nanticoke; David B. Morgan, Charles Price, Isaac Greenaway, Reuben Hoffman, William Morgan, Lewis Keen and Lawrence Keen, Glen Lyon; William Dedalis, Ashley; William E. Jones, Sugar Notch; Lewis R. Thomas and Alfred Gibbs, Wilkes-Barre; William Duffy, Thomas Bellamy, Joseph Harrison, Morgan W. Griffith, Morgan Williams and E. P. Evans, Plymouth; William J. Evans, Parsons, and Charles Johnson, Christopher.

#### Improvements made at Lehigh and Wilkes-Barre Collieries During 1899.

Hollenback Colliery.—Tunnel from bottom to top split Red Ash, 40 yards; duplicate steam line from breaker boilers to fans at airshaft.

South Wilkes-Barre Colliery.—Tunnel from Hillman to Kidney, 110 yards. Rock airway, Stanton to Hillman vein, 55 yards. Rock airway, Hillman to Kidney vein, 30 yards. Five hundred horsepower Babcock & Wilcox boilers to replace cylinder boilers.

**Stanton** Colliery.—Tunnel from Baltimore to Five Foot, 55 yards.

Rock airway, Baltimore to Five Foot, 20 yards. Tunnel from bottom to top split red ash, 10 yards. Steel head frame at shaft.

Jersey Colliery.—Rebuilt Jersey breaker to screen culm banks of collieries No. 6 and No. 8.

Sugar Notch Colliery.—Steel head frame at shaft. New trestle from head frame to breaker.

Lance Colliery.—Tunnel from Cooper to Five Foot, 55 yards. Tunnel from Baltimore to Cooper, 35 yards. Rock airway, Baltimore to Cooper, 35 yards. Pair of 18x30-inch engines erected at No. 2 airshaft for operation of Red Ash plane.

Wanamie Colliery.—Tunnel, Baltimore to Cooper, 20 yards. Annex to breaker to secure better preparation and increase output. Two hundred and fifty horse-power Babcock & Wilcox boilers.

Maxwell Colliery.—Rock airway, Ross to Baltimore, 50 yards; 30x48-inch Corliss engines for Red Ash shaft. Two hundred and fifty horse-power Babcock & Wilcox boilers.

#### Improvements by the Delaware and Hudson Company, 1899.

Baltimore No. 2 Colliery.—No. 5 slope in Red Ash vein now down 1,300 feet and probably in basin; 820 feet driven in 1899. No. 1 tunnel from bottom split, Red Ash to top split, 307 feet long. Rock return airway for No. 1 tunnel, 87 feet long. One Ingersoll air compressor 20x18x30 inches. Air used for 10x12-inch engines on plane in Red Ash vein carried down bore hole 630 feet long at Pine street.

Baltimore Tunnel, No. 4 Shaft.—Completion of No. 5 slope in Red Ash vein, 1,600 feet long. Now in operation. Engines, pair 18x36-inch on surface, in stone engine house, 20x40 feet. Rope runs through bore hole. Boiler plant, three locomotive type boilers, 60x23 feet 3 inches in brick boiler house, 46x60 feet. This plant displaces the twelve cylinder boilers at mouth of tunnel and one locomotive boiler at Pine street. No. 6 slope, Red Ash vein, now down 1,000 feet.

Baltimore Slope.—No. 3 slope in Red Ash vein extended. Now down 1,700 feet and in basin; 300 feet driven in 1899. Endless rope haulage, 900 feet long, transporting coal from head of slope to foot of shaft. Engines, 10x10 inches, located at head of shaft. Ropes carried down pump shaft. The track gauge was changed in July, 1899, from 4 feet 8½ inches to 3 feet.

Conyngham.—No. 6 plane, Abbott vein, now up 1,400 feet, still driving. No. 7 plane, Kidney vein, now up 1,020 feet, completed. No. 2 slope, in Baltimore vein, down 900 feet in basin. The air shaft at main shaft has been retimbered and relined, as has the one at Hillman shaft. One Ingersoll air compressor, 20x18x30 feet. Air pipes passes down shaft to Hillman vein, where the air is used to operate two hoisting engines, 10x12 feet, and one pump, 24x10x24 feet.

The board of examiners was G. M. Williams, Mine Inspector; Edward Mackin, superintendent, and Frank Mills and David L. John, miners. Seventeen applicants for mine foreman certificates were examined, and the following named were recommended to have certificates: William T. Davies, Charles A. Brown, Harry Gaughan and Thomas E. Edwards, of Wilkes-Barre; William S. Davies and Oliver Rhydderch, of Edwardsdale; James Wilson and Gomer Evans, of Plymouth; John Rousing and James Stirling, of Westmore.

The following named persons received certificates of qualification for assistant mine foreman: James Coughline, Luzerne; Peter Tully, John Dietz, John C. Parry, Lewis Lewis, William E. Thomas, Edward H. Williams, Thomas W. Jones and Ivor Davies, of Wilkes-Barre; Michael Nork and Thomas Morgans, Glen Lyon; David Morris and James H. Davy, Wanamie; William Newland, Alden Station; John P. Evans, Iltyd Evans, William H. Faust, Benjamin A. Waters, Arthur D. Evans, Lewis B. Lewis, William E. Bowen, Llewelyn Williams and Ivor T. Phillips, of Nanticoke; John Whittington and David Roberts, Sugar Notch; John Abrahamson, William A. Roberts and John Boyer, of Parsons.

#### Improvements by the Lehigh and Wilkes-Barre Coal Company in the Year 1900.

Hollenbach Colliery.—Tunnel from bottom to top split Red Ash, 49 yards. Return airway in rock, 19 yards.

South Wilkes-Barre Colliery—Bore hole to drain water from Kidney to Hillman Vein. Tunnel Hillman to Stanton, 159 yards. No. 4 tunnel extended 50 yards. Tunnel Baltimore to Five-Foot, 63 yards. Fuel conveyor breaker to boiler house.

**Stanton** Colliery—Rock plane Hillman to Kidney vein, 60 yards. One pair 24x48-inch first motion engines erected at Stanton air shaft for operation of No. 4 rock plane. One thousand horse power. Babcock & Wilcox boilers to replace cylinder boilers at breaker plant. Additional 6-inch steam line from breaker plant to air shaft.

Sugar Notch—Tunnel from bottom to top split, Baltimore vein. Tunnel from Ross to Red Ash vein, 70 yards.

Lance Colliery—Tunnel Five-Foot to Hillman, 189 yards, partly finished. Tunnel bottom split to top split, Baltimore, 57 yards. Annex to breaker to prepare buckwheat coal.

Nottingham Colliery—One pair 24x48-inch first motion engines for operation of new slope in Ross vein. An 8-inch bore hole, 280 feet long, to conduct rope from surface to head of slope.

Reynolds Colliery.—Rock plane Red Ash to Ross, 50 yards. Partly finished.

out one of the screens, and the assistant foreman saw him at his work at 3.30 P. M., but he fell into the elevator shaft, seventy-five feet away from his work.

James Dudson, a laborer in the Conyngham, had been notified on the morning of December 22 not to run any loaded cars out of the counter in which he was working, as there were runners employed for that purpose. After loading their last car, he and his partner ran it out to the gangway; the front end of the car struck the head block, throwing the hind end off the road, catching Dudson's head against a prop, killing him instantly.

Joseph Depedaro fell into the conveyors at the North American Washery, although he had been ordered not to go near them, as the culm he was wheeling was blocking up the conveyor line, and should have been dumped at the foot wheel. In spite of his orders he went twenty feet beyond the foot wheel, and when he fell he was dragged around the wheel and killed.

John Pelkis, a miner at No. 1 Shaft, Kingston Coal Company, was struck by a small piece of coal flying from a blast on December 30. The injury he received seemed very slight, as there was only one cut visible on his head, but he died December 31.

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#### Improvements Made by the Lehigh and Wilkes-Barre Coal Company During the Year 1902.

Hollenbeck No. 2.—Erection of new boiler house at shaft and the installation of two batteries of water tubular boilers of 500 horsepower each, with a forced fan draft system, and under ash ducts.

A second opening from the top split to the bottom split in Red Ash seam, No. 2 Tunnel, east, to provide ventilation for these workings.

Extension of No. 2 Slope on a grade of seven degrees through rock, from the bottom split to the bottom split in the Red Ash seam, cutting top split of Red Ash seam. This extension was made for the purpose of opening up a larger area for No. 2 Slope.

South Wilkes-Barre No. 5.—Erection of a 35-foot Guibal fan at No. 1 air shaft for ventilating western portion of South Wilkes-Barre mine.

**Stanton** No. 7.—Erection of forced fan draft system at shaft boiler house.

Sugar Notch No. 9.—Erection of new boiler house and installation of two batteries of tubular boilers of 500 horse power each, with a forced fan draft system and under ash ducts.

Lance No. 11.—Erection of new boiler house at shaft and installation of one battery of 500 horse power water tubular boilers.

for No. 10 tunnel return, 124 yards. Rock plane airway, Kidney to Abbot for No. 9 tunnel return, 70 yards. Rock plane airway, 3d West Hillman to No. 9 tunnel Abbot, 90 yards. Three inch drainage bore hole, No. 5 slope Hillman sump to Baltimore.

#### Stanton No. 7 Colliery

Outside.—Duplex air compressor, simple steam, compound air. Five hundred H. P. battery, B. & W. boilers. Colliery shop.

Inside.—Triple-expansion, condensing, duplex pump, brick arch pump room, and sump tunnel to shaft sump. No. 4 Rock slope, from surface to Abbot, 100 yards.

#### Jersey No. 8 Washery

Conveyor, railroad and steam shovel equipment to work Hartford No. 6 culm bank.

#### Sugar Notch No. 9 Colliery

Outside.—Five hundred H. P. battery, B. & W. boilers.

Inside.—Compound duplex pump and brick and structural steel pump room, located on 3rd West Ross. Rock plane airway, Red Ash to Baltimore, 100 yards. No. 15 tunnel, Baltimore to Stanton vein, 195 yards.

#### Maxwell No. 20 Colliery

Outside.—Five hundred H. P. battery, B. & W. boilers. Duplex air compressor, simple steam, compound air. Brick engine house for compressor and electric lighting plant.

Inside.—No. 10 tunnel, extended from Ross to Baltimore, 312 yards. No. 16 tunnel, Hillman to Hillman across basin, 37 yards. Compound condensing duplex pump, pump rock in rock, and tunnel Baltimore to Twin for sump, Baltimore shaft to level. Sanitary barn to accommodate thirty (30) mules, Red Ash shaft level.

#### LEHIGH VALLEY COAL COMPANY.

#### Dorrance Colliery

Hillman vein slope extended 654 feet into the basin north of cemetery anticlinal. Tunnel finished from Abbot to Snake Island—Middle plane level. Tunnel commenced on Upper level to same vein. Tunnel is being driven from Hillman to Five Foot vein, 232 feet. New slope started from lower Bennett gangway to reach the basin below Slant slope. New inside slope started to work river warrant—Hillman vein. Preparations are being made and work started to sink main hoist shaft from Baltimore to Red Ash, also second opening rock slope for same. A new stable is being made, and improvement to pump houses. Fire emergency water lines extended during the year. A series of test holes were put down from surface

the fire entering the mine, to stop the fan so that the smoke would not be drawn into the mine and smother the workmen.

Second: That the company build two hanging doors, one at each landing in the shaft that could be closed in the event of fire in the breaker, and that the proper persons in charge, both on day and night shift, be fully instructed how and when to close them.

Third: That the manways leading to the two small shafts on second outlets be put and kept in good order at all times and fit for men to travel in, and that large painted signs be put up at different points along the manways for the purpose of showing the workmen the proper route to take to get out quickly.

Fourth: That the company build two iron doors at the mouth of the shaft that could be closed in the event of fire in the breaker. These doors to be so arranged as to prevent any material from falling down the shaft in the event of fire in the breaker.

I am pleased to state that the company has completely followed the recommendations made, and I believe the workmen at this mine are protected as fully against fire as is possible under the existing circumstances.

#### LEHIGH AND WILKES-BARRE COAL COMPANY

##### Hollenback No. 2 Colliery

Outside.—Supply store, barn and carriage house and railroad No. 3 slope to breaker.

Inside.—No. 9 tunnel extended to the Ross, 70 yards; No. 13 tunnel Hillman to Kidney, 82 yards; No. 14 tunnel Hillman to Kidney, 93 yards; No. 15 tunnel Hillman to Kidney, 97 yards; No. 16 tunnel Hillman to Stanton, 52 yards; No. 17 tunnel Red Ash to Top Red Ash 49 yards.

##### South Wilkes-Barre No. 5 Colliery

Outside.—1,000 H. P. water tube boiler; Duplex air compressor, simple steam, compound air.

Inside.—Compound condensing pump and pump room; No. 1 air shaft extended to Baltimore 107 yards; Rock plane airway Kidney to Abbott for No. 11 tunnel, return 44 yards; No. 12 tunnel Baltimore to Five Foot, 62 yards; three-inch drainage bore hole No. 8 slope to No. 9 slope.

##### Stanton No. 7 Colliery

Outside.—500 H. P. water tube boiler; colliery supply store; railroad No. 4 slope to breaker; 24x48 inch hoisting engine No. 4 slope.

Inside.—Air shaft surface to Abbott; No. 10 tunnel Skidmore to Ross, 80 yards; 3 inch drainage bore hole No. 4 slope to No. 8 plane.

## South Wilkes-Barre No. 5 Colliery

Outside—Two pairs 24x48 hoisting engines Nos. 6 and 7 slope; brick oil house.

Inside—No. 13 Tunnel Baltimore to Five Foot; No. 14 Tunnel Baltimore to Five Foot; No. 15 Tunnel Five Foot to Stanton.

## Stanton No. 7 Colliery

Inside.—Compound condensing duplex pump and reinforced concrete pump room.

## Sugar Notch No. 9 Colliery

Outside.—Supply store; started erection new breaker.

Inside.—No. 19 Tunnel Twin to Twin; No. 15 Tunnel extended Stanton to Hillman.

## Maxwell No. 20 Colliery

No. 19 Tunnel Hillman to Kidney; No. 20 Tunnel Red Ash to Twin; Rock plane airway Hillman to Kidney; Bore hole for culm slushing.

## LEHIGH VALLEY COAL COMPANY

## Dorrance Colliery

Baltimore shaft extended 170 feet and landings are being turned off from which tunnels will be driven to the Red Ash vein.

No. 13 Rock slope has been finished to the Red Ash vein. This to be used for a second outlet.

No. 6 Rock slope has been finished and a tunnel is being driven through Mill Creek Anticlinal to the main South dip.

No. 14 sub-slope in the Cooper and No. 15 sub-slope in the Bennett vein have been extended 800 feet.

Two tunnels are being driven in the Five Foot plane level to the Hillman vein.

No. 13 Tunnel from the Hillman to the Abbott finished.

No. 10 slope in the Bowkley has been finished to the basin.

Two tunnels, each 125 feet long, were driven from Bennett to Cooper vein in bottom lift of extension slope.

No. 1 Tunnel Hillman to Bowkley has been finished to the Abbott vein.

A new concrete wash-house equipped with 100 lockers has been erected.

One thousand five hundred H. P. Stirling water tube boilers has been installed, dispensing with 1,200 H. P. tubular.

The boiler house has been rebuilt with brick and corrugated iron roof.

The outside barn has been rebuilt, also mule hospital and concrete fire hose house.

## Franklin Colliery

Three hundred H. P. Stirling water tube boilers are being erected.

The water has been pumped out of the fire water submerged district in long slope and the Sump vein No. 7 slope has been extended to the No. 2 old level.



## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2.—Outside: Brick locomotive house, new engines, Hillman slope.

Inside: Number 20 Tunnel Hillman to Stanton, No. 21 Tunnel Hillman to Stanton, No. 22 Tunnel Kidney to Stanton, No. 23 Tunnel Hillman to Stanton. Compressed air haulage plant.

South Wilkes-Barre No. 5.—Inside: No. 16 Tunnel Hillman to Kidney, No. 17 Tunnel Kidney to Hillman. Compressed air haulage plant.

Stanton No. 7.—Outside: 488 H. P. water tube boilers, steel head frame Empire No. 4 shaft, extension railroad to Empire shaft, brick engine house Empire shaft, brick locomotive house, brick oil house.

Inside: Compressed air locomotive. No. 11 Tunnel Red Ash to Ross.

Maxwell No. 20.—Outside: Supply house.

Inside: No. 7 Rock slope. Compressed air haulage plant.

No. 21 Tunnel Red Ash to Red Ash. Tunnel Hillman to Hillman.

## LEHIGH VALLEY COAL COMPANY

Henry Colliery.—A series of safe cover test holes was drilled to determine the working limits in the 5 foot Hillman and Bowkley Veins.

A permanent concrete steel overcast was completed in Red Ash Vein.

New empty car plane and turnout were completed in Red Ash Shaft.

Numbers 21, 23, 27 and 28 sub-slopes have been started in Red Ash Shaft and are being extended.

A new 28x10x36 inch Goyne pump with 12 inch column and 8 inch exhaust pipe from the foot of shaft to the surface has been installed in the Red Ash Vein.

Numbers 51, 53, 54 and 56 tunnels have been finished through the Red Ash anticlinal.

A new permanent concrete steel overcast was completed in Wyoming Marcy Vein.

Preparations have been made and plans outlined and work commenced unwatering the Enterprise workings lying to the east of Henry.

Additional pumps have been placed in the 5 foot vein at the counter level of the Henry Shaft and a series of Diamond drill holes put through the pillar. These holes are being reamed out, so that it is expected by the close of the coming year the Enterprise workings will be unwatered and the coal in that property reclaimed.

Additional steam lines and column pipe lines and emergency pumps incidental to this work have been set in place. The new permanent plant to follow.

The Henry Washery has reclaimed all of the old Wyoming banks on the north side of the L. V. R. R. and the shovel and locomotive outfit has been transferred to the Enterprise banks to reclaim the coal through the Henry Washery.

A new bridge was constructed across the C. R. R. of N. J. and public road for the culm dump.

Outside barn remodeled to Lehigh Valley Standard; concrete floor and mangers. New 18x30 mule hospital.

Enterprise bank west of Plank road exhausted and Henry bank being reclaimed.

Preparations are under way to reclaim old Prospect bank. This is to be taken to Henry Washery by means of locomotive.

Prospect Colliery.—Stables for 75 mules in Red Ash completed. New electric hoist in operation on new slope west workings.

No. 10 Slope regraded through fault. A new concrete steel overcast has been put in this vein over No. 10 Slope. Second opening for Rock slope, Skidmore workings.

New mule stable in Midvale Hillman slope. New 500-ton washery completed and in operation.

Extensive repairs have been made to breaker and jig foundation. Colliery office remodeled and new loaded scales installed.

Dorrance Colliery.—Red Ash tunnel and plane completed. Second opening to No. 6 Extension Tunnel completed. 5 concrete steel overcasts in Baltimore vein completed. 1 Undercast and direct return at head of Slant slope completed.

Vein connection made through Mill Creek anticlinal from No. 18 Tunnel Upper Baltimore to Plank road, Upper Baltimore workings. 2-10 ton electric locomotives installed in Hillman vein.

New slope is being driven in Hillman to connect with No. 15 and No. 17 tunnels from 5 Foot vein.

Extension was made to new Hillman vein stable.

### Outside

New 350 K. W. 250 volt generator installed. Work is now being done on new 25x14 upcast shaft, from surface to Baltimore vein.

Franklin Colliery.—Central pumping plant in Red Ash vein completed. No. 8 Plane equipped with engine, steam from surface through bore hole. Nos. 23 and 24 tunnels Top Red Ash to Bottom Red Ash. No. 9 Slope district completed.

10 inch Water line from Column bore hole to reservoir completed. New steam line from boiler house to Red Ash Central pumping plant completed.

### LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery, Inside.—No. 18 Tunnel extended to Ross.

No. 19 Tunnel extended to Ross.

Rock Plane airway Stanton to Hillman.

No. 5 Slope graded through rock.

South Wilkes-Barre No. 5 Colliery, Inside.—No. 7 Slope extended from Abbott to Hillman. Pumping plant No. 2 Slope.

**Stanton** No. 7 Colliery, Outside.—Slush hole, Surface to Hillman. Slush hole, Surface to Stanton.

Inside.—Mule barn Red Ash Shaft Level. Pumping plant No. 4 Shaft Level.

Maxwell No. 20 Colliery, Outside.—Breaker remodeled. Timber saw mill. 500 H. P. water tube boilers. Engines and rope holes for Nos. 8 and 10 Slopes.

## PITTSTON COAL MINING COMPANY

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

## WILKES-BARRE AND SCRANTON COAL AND IRON COMPANY

Hillman Vein Colliery.—Ventilation good; drainage good; condition as to safety good.

## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery, Inside.—No. 23 Tunnel-Bottom Red Ash to Top Red Ash.

Rock plane airway Bottom Red Ash to Top Red Ash.

New pumping plant Baltimore Shaft level.

Outside.—New shaft hoisting engines for Baltimore level.

Remodeling breaker and annex.

Steel head frame.

South Wilkes-Barre No. 5 Colliery, Inside.—No. 19 Tunnel, Hillman to Kidney.

No. 21 Tunnel, Baltimore to Five Foot.

No. 22 Tunnel, Baltimore to Five Foot.

No. 20 Tunnel, Hillman to Kidney.

No. 23 Tunnel, Top Baltimore to Bottom Baltimore.

Rock plane airway, Bottom Baltimore to Top Baltimore.

Outside.—Paving retail wagon road, and new scales.

**Stanton** No. 7 Colliery, Inside.—No. 13 Tunnel, Hillman to Hillman.

No. 14 Tunnel, Baltimore to Five Foot.

Slush Hole, Surface to Baltimore.

No. 12 Tunnel, Skidmore to Hillman.

No. 29 Tunnel, Stanton to Hillman.

Sugar Notch No. 9 Colliery, Inside.—No. 21 Tunnel, Twin to Cooper.

No. 9 Tunnel, Extended to Five Foot.

No. 20 Tunnel, Ross to Baltimore.

No. 15 Tunnel, Extended to Hillman.

Maxwell No. 20 Colliery, Inside.—Tunnel, Top Red Ash to Bottom Red Ash.

Tunnel, Top Red Ash to Bottom Red Ash.

No. 22 Tunnel, Baltimore to Five Foot.

No. 24 Tunnel, Baltimore to Five Foot.

New pumping plant, 4th Lift.

Outside.—Dust system installed in breaker.

## LEHIGH VALLEY COAL COMPANY

Prospect, Outside.—Repairs to breaker. New refuse conveyor line.

Inside.—Air shaft from Lower to Upper Baltimore in Klondyke Slope district. Motor haulage in Red Ash and Baltimore veins extended.

Outside: Hoisting engines, Baltimore shaft.  
Remodeling breaker.\*  
Steel head frame.  
Dust system.

*South Wilkes-Barre No. 5 Colliery*

Inside: Extension No. 10 tunnel, Top to Bottom Baltimore.  
No. 24 tunnel, Abbott to Hillman vein.

*Stanton No. 7 Colliery*

Inside: Rock plane airway, No. 12 tunnel west to No. 29 tunnel.  
Extension of No. 13 tunnel to Hillman vein.  
No. 15 tunnel, Hillman to Kidney, No. 6 plane counter.  
Rock manway, No. 4 slope, Abbott vein.  
No. 16 tunnel, Hillman to Kidney, No. 8 plane west.

*Sugar Notch No. 9 Colliery*

Inside: Extension No. 13 tunnel, Stanton to Hillman vein.  
Extension No. 20 tunnel, Baltimore to Five Foot.  
Tunnel, Twin to Cooper, No. 9 tunnel west.

*Maxwell No. 20 Colliery*

Inside: Tunnel, Ross to Twin, No. 18 tunnel west.  
No. 23 tunnel, Baltimore to Five Foot.  
Outside: Engines, etc., for No. 8 slope.

LEHIGH VALLEY COAL COMPANY

*Prospect Colliery*

Outside: Extensive repairs to breaker. Extension of the conveyor line to the washery. Changes to engine and drive for Prospect conveyor line and the construction of two overflow catch basins.

Inside: Midvale Hillman mule stable completed. The electric motor haulage, Red Ash vein, was extended to the extreme east. A concrete steel overcast constructed on the shaft level west district. Changes of head of No. 8 rock slope and installation of automatic head block.

Henry—Outside: A series of rock cover test holes for the Hillman vein were completed. An 8-inch Churn drill bore hole from the surface to the Red Ash vein for the changes in high pressure air line was completed. The Enterprise culm bank east of plank road is being hauled to the Henry Washery. A new Lehigh Valley Coal Company standard wooden head frame completed for No. 2 Red Ash shaft. The water course at Prospect was concrete lined with "I" beam reinforcement for the roof from the mouth to the rock. The coal road between the Henry and Prospect was renewed throughout and the old rails replaced with 56 pound rails. A concrete steel bridge was constructed for the Prospect Hillman slope, Plank road crossing.

Inside: An engine and pump were installed in No. 28 slope north of the fault for the extension of operation in No. 28 slope and airway. Preparations were made to construct an intermediate landing in the Red Ash shaft at the Marcy vein level for the haulage concentration

## RED ASH COAL COMPANY

Red Ash No. 2.—Ventilation, roads and drainage fair. They are robbing pillars. Condition as to safety good.

## PITTSTON COAL MINING COMPANY

Hadleigh.—Ventilation, roads and drainage fair. They are robbing pillars. Condition as to safety good.

## WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein.—Ventilation, roads and drainage good; condition as to safety good.

## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery.—Inside: No. 28 tunnel—Red Ash to Ross.

South Wilkes-Barre No. 5 Colliery.—Outside: Remodeled forced draft system. Inside: Rock plane airway—Kidney to Abbott.

Stanton No. 7 Colliery.—Outside: Installed forced draft fan system at Empire shaft boiler house. Erected outside stable. Inside: Extended No. 3 air shaft—Abbott to Five Foot.

Sugar Notch No. 9 Colliery.—Inside: No. 9 tunnel extended to Hillman. No. 23 tunnel Twin to Cooper. No. 16 tunnel Cooper to Five Foot.

Maxwell No. 20 Colliery.—Inside: No. 25 tunnel—Baltimore to Five Foot.

## LEHIGH VALLEY COAL COMPANY

Prospect Colliery.—Outside: A new machine shop for repairing cars from Dorrance, Prospect and Henry collieries and for general machine work in the division, was completed and the narrow gauge tracks to same installed. The handling of timber, which previously was done at the respective collieries and sawed by hand, is now done at the Prospect yard in connection with the new machine shop. The timber is taken from the railroad cars by an overhead traveling timber trolley, which carries it to the saw house where it is cut with a steam saw and loaded on mine cars for the various collieries. The washery has been abandoned and removed. During the erection of the new steel breaker, Mineral Spring coal was prepared at this place. Repairs to the breaker were made and a complete fire alarm system installed.

An extra pump was placed in the river pump house, which has been remodeled and enlarged. A series of test holes for proving the rock cover in the river district was drilled. Inside: The driving of No. 22 slope from the Midvale pump lift to the surface at the machine shop was started. In the Five Foot vein a new slope was also started and two new slopes in the Baltimore vein were driven. In the Red Ash vein a new electric hoist on No. 18 slope was installed, and also an electric haulage on the second lift east off No. 11 slope. In the lower Baltimore shaft level east, electric haulage was installed with one new motor. Extensive improvement of the Baltimore vein mule barn were carried on. The securing of the foot of the Oakwood shaft with reinforced concrete and "I" beams was started.

## CONDITION OF COLLIERIES

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2, South Wilkes-Barre No. 5, Stanton No. 7, Sugar Notch No. 9, and Maxwell No. 20.—Ventilation, roads, drainage and condition as to safety, good.

## LEHIGH VALLEY COAL COMPANY

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

Franklin.—Ventilation and condition as to safety, good; roads and drainage fair.

## DELAWARE AND HUDSON COMPANY

Baltimore No. 5 and Baltimore Tunnel.—Ventilation, roads, drainage and condition as to safety, good.

## RED ASH COAL COMPANY

Red Ash No. 2.—Ventilation, roads and drainage fair; condition as to safety, good.

## PITTSTON COAL MINING COMPANY

Hadleigh.—Ventilation, roads and drainage fair; condition as to safety, good.

## WILKES-BARRE ANTHRACITE COAL COMPANY

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

## MINERS MILLS COAL MINING COMPANY

Healey.—Ventilation, roads and drainage fair; condition as to safety, good.

## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery:

Outside.—Red Ash shaft hoisting engines and house, electric light plant, feed water heater system.

Inside.—Extended No. 5 tunnel to Ross No. 30 tunnel, Hillman to Kidney.

South Wilkes-Barre No. 5 Colliery:

Outside.—Wash house.

Inside.—12x16-inch hoisting engines provided for Nos. 12 and 13 slopes. Installed two compressed air locomotives. Extended No. 23 tunnel to Five Foot; No. 27 tunnel, Kidney to Abbott; No. 26 tunnel, Stanton to Five Foot.

Stanton No. 7 Colliery:

Outside.—New breaker; steel head frame for breaker hoist. Concrete fuel bin for boiler house. Steam heat in breaker. Dust-collecting system in breaker. Hopper and pocket to receive coal from No. 21. 240 H. P. boilers at Empire Shaft. Fuel conveyor and slush trough. Feed water system. Tower hoisting engine and house. Power house. Yard grading, tracks and car hoist. New steam lines in colliery yards and to Stanton air shaft.

## CONDITION OF COLLIERIES

### LEHIGH AND WILKES-BARRE COAL COMPANY

**Stanton** No. 7, Maxwell No. 20, South Wilkes-Barre No. 5, Hollenback No. 2, Sugar Notch No. 9 Collieries.—Ventilation, roads, drainage and condition as to safety, good.

### LEHIGH VALLEY COAL COMPANY

Prospect and Dorrance Collieries.—Ventilation, roads, drainage and condition as to safety, good.

Franklin Colliery.—Ventilation and condition as to safety, good. Roads and drainage fair .

### DELAWARE AND HUDSON COMPANY

Baltimore No. 5 and Baltimore Tunnel Collieries.—Ventilation, roads, drainage, and condition as to safety, good.

### RED ASH COAL COMPANY

Red Ash No. 2 Colliery.—Ventilation, roads and drainage fair. Condition as to safety, good.

### WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Ventilation, roads, drainage and condition as to safety, good.

### RISSINGER BROTHERS AND COMPANY, INCORPORATED

Miners Mills Colliery.—Ventilation, roads, and drainage fair. Condition as to safety, good.

### PITTSSTON COAL MINING COMPANY

Hadleigh Colliery.—Ventilation, roads and drainage fair. Condition as to safety, good.

## IMPROVEMENTS

### LEHIGH AND WILKES-BARRE COAL COMPANY

**Stanton** No. 7 Colliery.—Completed fireproof mule barn on Empire No. 4 shaft level and tunnel Abbott to Abbott, 2nd east, No. 4 slope. Installed concrete and steel timbering on shaft landing, also in small engine and pump rooms.

Outside.—Completed new steam line from Empire boiler plant to No. 4 slope and No. 15 Plane engines, timber yard and saw mill installed; safety car stops at Nos. 4 and 7 shafts and fire protection system in breaker.

Maxwell No. 20 Colliery.—Inside: Completed fireproof mule barn and concrete manway from surface to Five Foot.

## CONDITION OF COLLIERIES

## LEHIGH AND WILKES-BARRE COAL COMPANY

**Stanton** No. 7, Maxwell No. 20, South Wilkes-Barre No. 5, Hollenback No. 2 and Sugar Notch No. 9 Collieries.—Ventilation, roads, drainage and condition as to safety good.

## LEHIGH VALLEY COAL COMPANY

Dorrance, Henry, Prospect, Franklin and Warrior Run Collieries.—Ventilation, roads, drainage and condition as to safety good.

## DELAWARE AND HUDSON COMPANY

Baltimore Tunnel and Baltimore No. 5 Collieries. — Ventilation, roads, drainage and condition as to safety good.

## WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Ventilation, roads, drainage and condition as to safety good.

## RED ASH COAL COMPANY

Red Ash No. 2 Colliery.—Ventilation, roads and drainage fair; condition as to safety good.

## RISSINGER BROTHERS AND COMPANY, INCORPORATED

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

## PITTSTON COAL MINING COMPANY

Hadleigh Colliery.—Ventilation, roads and drainage fair; condition as to safety good.

## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

**Stanton** No. 7 Colliery.—Inside: Completed No. 31 tunnel, bottom to top, Red Ash; No. 18 tunnel, Hillman to Kidney; No. 19 tunnel, Baltimore to Five Foot. Rock plane airway, top Red Ash to Ross; No. 11 tunnel, West Empire; tunnel top to bottom Red Ash, No. 2 tunnel west.

Outside: Installed slush pump.

Maxwell No. 20 Colliery.—Completed No. 6 plane, bottom to top Red Ash; tunnel top to bottom Red Ash, No. 4 tunnel east; No. 29 tunnel Hillman to Kidney; two tunnels bottom to top Red Ash, No. 20 tunnel east. Installed 10 by 36-inch compound pump on 4th lift, No. 4 slope.

South Wilkes-Barre No. 5 Colliery.—Completed No. 29 tunnel, top to bottom Baltimore; Rock slope, Hillman to Hillman, No. 3 slope; tunnel, Stanton to Stanton, First East No. 12 plane.

Outside: Installed feed water heating system.



## CONDITION OF COLLIERIES

## LEHIGH AND WILKES-BARRE COAL COMPANY

**Stanton** No. 7, South Wilkes-Barre No. 5, Maxwell No 20, Hollenback No. 2, and Sugar Notch No. 9.—Ventilation, roads, drainage and condition as to safety, good.

## LEHIGH VALLEY COAL COMPANY

Dorrance, Henry, Prospect, Franklin and Warrior Run.—Ventilation, roads, drainage and condition as to safety, good.

## DELAWARE AND HUDSON COMPANY

Baltimore No. 5 and Baltimore Tunnel.—Ventilation, roads, drainage and condition as to safety, good.

## RED ASH COAL COMPANY

Red Ash No. 2.—Ventilation, roads, drainage and condition as to safety, good.

## WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein.—Ventilation, drainage and condition as to safety, good.

## PITTSTON COAL MINING COMPANY

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

## RISSINGER BROTHERS AND COMPANY, INCORPORATED

Miners Mills.—Ventilation, drainage and roads, fair. Condition as to safety, good.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone No. 3.—New mine. Sinking shafts.

## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

**Stanton** No. 7 Colliery.—Inside: Completed tunnel, Abbott to Abbott, 6th East, No. 4 slope; No. 17 tunnel, Abbott to Kidney; No. 32 tunnel, Skidmore to Hillman; and tunnel, Hillman to Top Stanton, No. 6 Plane West. Installed two 14-inch by 8-inch by 18-inch pumps in Nos. 2 and 3 slopes; also compressed air haulage on Empire No. 4 shaft level. Remodeled shaft level barn.

South Wilkes-Barre No. 5 Colliery.—Completed No. 30 tunnel, Baltimore to Baltimore; No. 31 tunnel, Kidney to Kidney; Rock Plane airway, Top Baltimore to Five Foot, 2nd West No. 2 slope. Installed 14 inch by 8 inch by 18 inch pump in No. 4. slope.

## CONDITION OF COLLIERIES

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2, South Wilkes-Barre No. 5, Stanton No. 7, Sugar Notch No. 9 and Maxwell No. 20 Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## LEHIGH VALLEY COAL COMPANY

Franklin, Dorrance, Prospect, Henry and Warrior Run Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## DELAWARE AND HUDSON COMPANY

Baltimore No. 5 and Baltimore Tunnel Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## RED ASH COAL COMPANY

Red Ash Nos. 1 and 2 Collieries.—Ventilation, roads and drainage, fair. Condition as to safety, good.

## PITTSTON COAL MINING COMPANY

Hadleigh Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

## CAMPBELL AND JOHNS

Miners Mills Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Nos. 3 and 4 Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery.—Inside: Completed No. 39 tunnel, Baltimore to five foot; tunnel. Ross to Red Ash, 5th East. No. 6 plane; No. 41 tunnel, Hillman to Kidney; and No. 42 tunnel, Stanton to Five Foot vein.

Outside: Installed a 24 by 48 inch hoisting engine for No. 3 plane.

South Wilkes-Barre No. 5 Colliery.—Completed No. 32 tunnel, Abbott to Hillman; rock plane, Hillman to Kidney; and No. 33 tunnel, Stanton to Baltimore vein.

Stanton No. 7 Colliery.—Completed No. 20 tunnel, Abbott to No. 1 vein; rock plane, Abbott to No. 1 vein; No. 21 tunnel, Top Red

Ash to Ross; rock plane, Hillman to No. 17 tunnel; tunnel, Abbott to Abbott, 1st East; No. 22 tunnel, Top to Bottom Red Ash; tunnel, Ross to Top Red Ash, and No. 23 tunnel, Abbott to Kidney vein. Extended No. 17 tunnel to Kidney. Drove 10-inch bore hole to the Baltimore vein.

Sugar Notch No. 9 Colliery.—Completed No. 31 tunnel. Twin to Hillman, and a tunnel from Station to Five Foot vein.

Maxwell No. 20 Colliery.—Completed a tunnel from Red Ash to Red Ash, and No. 31 tunnel, Red Ash to Ross vein.

Empire Washery.—Installed pea and chestnut spirals.

#### LEHIGH VALLEY COAL COMPANY

Dorrance Colliery.—Inside: Two electric motors were placed in service in the Lance, Cooper and Bennett veins. A 4-inch drainage bore-hole was drilled from the Baltimore to the Red Ash to drain silt water. No. 26 tunnel was driven from the Bowkley to Abbott vein, 210 feet long. No. 27 tunnel was driven from No. 21 tunnel into Lance vein. No. 24 slope, in the Red Ash vein, was graded and tunnel commenced through the anticlinal at the foot of the slope, in order to facilitate haulage. Completed No. 24 haulage, Cooper to Lance vein.

Outside: Installed an additional 300 horse power boiler in boiler plant. A spray system was placed in breaker, and a pump installed, and pump line laid from pump to breaker, and pump house erected near reservoir. The construction of a steel fuel conveyor was continued. A fence was built around tracks, and bridge constructed over tracks near head of shaft for traveling way and safety.

Prospect Colliery.—Electric cables in shaft were renewed. Considerable grading was done at the head of Nos. 26 and 29 slopes in the Skidmore vein. A 15-degree rock slope, 80 feet long, was sunk through fault from Lower Baltimore to Upper Baltimore vein, for a return airway. Two bore holes were drilled from the Five Foot vein to drain water from Prospect Hillman slope workings to the Oakwood pump. Edison electric safety lamps were purchased for use in the Red Ash vein. Concrete and steel timbering at foot of Red Ash shaft continued.

Outside: Steam lines were recovered. The fuel line from breaker to boiler house was rebuilt. A new roof was placed on the boiler house. The supply yard was rearranged. Steel bents were put under main conveyor from the Prospect shaft to the head of the breaker. A condenser was placed in the river pump-house. The old boiler house at Oakwood shaft was remodeled for a washhouse and lamphouse.

Henry Colliery.—No. 74 tunnel from the Hillman to the Bowkley vein was completed, and a 30-degree rock plane 152 feet long was driven for a second opening. A 45-degree rock plane was driven from the Five Foot to the Hillman vein, the Wyoming Five Foot slope, for a return airway, and to improve the ventilating conditions. The concrete hospital at the head of No. 11 slope was completed. A concrete roof was constructed over the barn in the Red Ash vein, west of the shaft. A 10-degree rock plane, from the Five Foot to the Hillman vein, was started. An air shaft was sunk and concreted to the Hillman vein, Prospect slope, for an intake. Considerable rock grading was done on No. 39 slope in the Skidmore vein, to improve haulage conditions. The Henry shaft was abandoned.

## CONDITION OF COLLIERIES

### LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2, South Wilkes-Barre No. 5 and Stanton No. 7 Collieries.—Ventilation, drainage and condition as to safety, good.

### LEHIGH VALLEY COAL COMPANY

Dorrance, Prospect and Henry Collieries.—Ventilation, drainage and condition as to safety, good.

### RED ASH COAL COMPANY

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

### WILKES-BARRE ANTHRACITE COAL COMPANY

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

## IMPROVEMENTS

### LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery.—Completed rock plane airway from Hillman to Kidney veins.

Outside. Installed one 250 H.P. electric hoist at No. 5 slope; one 500 K. W. turbo generating plant. Completed electric transmission line, bore hole, etc., from Hollenback No. 2 colliery to Stanton No. 7 colliery.

Stanton No. 7 Colliery.—Completed No. 25 tunnel, Skidmore to Skidmore vein; No. 28 tunnel, Stanton to Stanton vein; No. 11 tunnel, extension to Bottom Red Ash; No. 34 tunnel, Bottom to Top Red Ash (Empire) and No. 35 tunnel, Top Red Ash to Ross, Empire section.

Outside. Installed a 500 K. W. turbo generating plant.

### LEHIGH VALLEY COAL COMPANY

Dorrance Colliery.—Completed No. 28 tunnel, Baltimore to Lance and Five Foot veins; No. 29 tunnel and second opening from Hillman to Bowkley vein; extension of West Hillman plane; 4 inch bore hole from Hillman to the Five Foot vein; 6 inch bore hole from No. 21 slope basin in the Hillman vein to the Five Foot vein, and a new foreman's office of concrete at foot of the Red Ash shaft. Started No. 28 slope for development purposes.

Installed an Exter engine on No. 27 slope and an 8 ton gathering motor was put into service at the foot of No. 24 slope in the Red Ash vein.

Outside. A fire proof engine house was constructed near the pump house for hoisting on the Hillman west plane. An 8 inch rope hole for this purpose was drilled from the surface to the Hillman vein.

Installed a 175 K. W. 250 volt engine and generator for emergency purposes and three additional fire hydrants in the vicinity of the breaker. Diamond drilling was conducted on the river flats for proving the rock cover over the upper veins.

## CONDITION OF COLLIERIES

## LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2, South Wilkes-Barre No. 5 and **Stanton** No. 7 Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## LEHIGH VALLEY COAL COMPANY

Prospect and Dorrance Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## HUDSON COAL COMPANY

Baltimore No. 5 Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## RED ASH COAL COMPANY

Red Ash No. 2 Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

## WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## IMPROVEMENTS

## LEHIGH AND WILKES-BARRE COAL COMPANY

**Stanton** No. 7 Colliery.—Completed extension of No. 3 tunnel from Ross to Red Ash vein; rock slope return from Top Red Ash to Ross vein; No. 18 rock plane from Abbott to Abbott vein; tunnel from Abbott to Abbott vein, through fault in No. 4 slope; rock plane airway from No. 15 plane to No. 28 tunnel; extension of No. 11 tunnel from Top Red Ash to Bottom Red Ash vein; No. 12 plane, Skidmore No. 16 tunnel to shaft level on No. 2 plane.

South Wilkes-Barre No. 5 Colliery.—Completed rock plane airway from Stanton to Hillman vein.

## LEHIGH VALLEY COAL COMPANY

Prospect Colliery.—Installed a wooden box-car loader to replace old metallic loader. Installed a new 400-hp. Erie City boiler; also air hoist in Red Ash vein, and electric motors at foot of No. 13 slope, Red Ash vein, and on No. 5 slope, in Baltimore vein. Completed No. 60 tunnel, Midvale slope, from Hillman to Five Foot vein; No. 8 plane from Skidmore to old workings in Lower Baltimore vein, for the purpose of improving ventilation, and No. 10 slope manway, Red Ash vein.

Dorrance Colliery.—The Lance vein was opened from No. 28 tunnel. Completed No. 29 tunnel from Hillman to Bowkley vein; No. 30 tunnel from Five Foot to open up the Cooper, Bennett, Lance and