

been abandoned. They are also developing the Marcy vein at No. 4, and No. 11 shafts, in Jenkins township. But the main enterprise of the year, was the sinking of the Barnum shaft, on what is known as the Waddell farm, near Pittston. This shaft is one hundred and seventy-three feet and five inches in depth, from the top of the stone work at the surface, to the bottom of the "fourteen feet" vein, and is forty-seven feet long by twelve feet wide in the clear, giving a sectional area of five hundred and sixty-four square feet. It is to be divided into six compartments, one, eight feet five inches by twelve feet for an upcast, four hoisting ways, six by twelve feet each, and a pump-way, twelve feet square.

The sinking was commenced in October, 1878, by the company, who drove it down 36.5 feet by day labor. The balance of the work was done under contract, by James C. Smythe & Co., between the 1st of July, 1879, and January 1, 1880. The nature of the strata penetrated by the shaft is as follows: First, There is earth, slate, and rock for 49 feet and 5 inches, when a vein of coal three feet thick is met with; then there is 63.75 feet of fire clay and rock to the "seven feet" or "checkered" vein, which, at this point, proves to be 11.33 feet thick, and is said to be of good quality; then there is 27 feet and 11 inches of rock to the top of the "fourteen feet" vein, which, however, at this point is only 9 feet thick.

No timber is yet on the ground for the breaker, and it is, therefore, rather premature to venture any prediction as to what its capacity will be when built, but it is not likely to be less than one thousand tons per day. The time when shipping of coal will commence cannot at present be approximated, as there is a vast amount of work yet to be done before the colliery will be ready to commence operations; and the dispatch with which the work is driven will depend, in a great measure, on the demand for coal. They must make their connection with their second opening, which is eight hundred feet distant in both veins, and must drive their gangways, &c., in each vein before they can do much in the way of shipping coal.

The second opening is another new shaft eight hundred feet distant from the main shaft which is now being sunk, but is not yet over half way down. There is a large tract of land to be worked through these shafts; but the number of acres cannot be stated, as there are other collieries that will take in more or less of the territory. But it is very evident that when this colliery is completed and opened, it will be the model colliery of the company.

The Butler Coal Company is about to sink a new shaft, and the Lehigh Valley company is commencing to sink a shaft on their property adjoining the Butler colliery, in Pittston township; and the Pennsylvania Anthracite Coal Company are also sinking a shaft at their Greenwood colliery, in Lackawanna township, but neither of these are yet anywhere near the coal.

An Association of Mine Bosses Recommended.

There are about one hundred and fifty mine bosses, mine superintendents,

the other class. Take our collieries in the Lackawanna and Wyoming valleys; there are many of them that are now working under the beds of the Lackawanna and Susquehanna rivers, and in the near future the number will undoubtedly be greatly multiplied; and there is every reason to fear that, sooner or later, caves will occur, which will cause the bottom of these rivers to drop out and inundate the workings beneath their beds, and all workings adjoining them. In such a case, under the present system of working collieries through indiscriminately into one another, there is no possibility of preventing all of them being inundated.

About the only objections that are made against the change recommended is, that it would reduce the number of modes of egress in case of an accident requiring the use of such, and that it would prevent the passage of air from one colliery to the other, and that the coal thus left would be lost. But, as I have already intimated, the coal need not be lost, nor is it necessary to work down so fine as to close all connection between the collieries. Narrow openings can be driven through at the most convenient points, but have them in such shape that they can be firmly closed, if necessary, in a few minutes' time. This can be easily done, and the opening made strong enough to withstand an ocean of water in case of sudden flooding, or where flooding becomes necessary in order to extinguish fires. But, it is said that such a system of working would interfere with the passage of air from one colliery to another. Yes, it would effectually put an end to the objectionable practice of ventilating collieries consecutively with one continuous current of air, for there would be no openings to admit its passage; but instead of being an evil, this would be an improvement that is greatly needed. Every colliery would then have to be provided with pure air in place of the noxious and poisonous return air of its neighbor, and the sooner the change is made the better will it be for the health of the workmen.

There are collieries in this district that are in danger of being inundated as above stated, and my object in referring to the matter is to sound the alarm in time. If I had time I could name the collieries which are now exposed to this danger and explain their connections with other collieries adjoining, but I must be satisfied with simply calling attention to the matter in this hurried manner, trusting that no more is necessary.

New Colliery Improvements.

A number of new shafts have been sunk and other shafts and slopes extended to lower veins, and new breakers built during the year. Some of these were commenced in 1879 and were completed in 1880, while others were only commenced last year and are not yet finished. It will be seen from these improvements that the companies and operators are prepared for any increase that may come in the demand for coal.

No. 1, **BARNUM'S** SHAFT.—This shaft was briefly noticed in my report for 1879, and no description of the shaft is at present needed. The first vein of coal worked is the "Checker vein," which is one hundred and twenty-seven feet from the surface to the bottom of the coal. The marketable coal

in the vein is from six to eight feet in thickness, the coal being short-grained but of good quality. One heading has been driven east and another running west from the shaft, with air-ways running parallel to each, and each heading is driven a distance of seven hundred feet. The general course of the headings is about south seventy degrees west and north seventy degrees east. There are also two parallel headings or air-ways running from the east side of the shaft to connect with the No. 2 shaft, which is the second opening, a distance of seven hundred feet away. The inclination of the strata is irregular, running from dead level to an angle of thirteen degrees, and the course of the inclination is about south twenty degrees east. The shaft is down in a basin and the coal will therefore rise also in going north-west. The vein as yet makes but little water and but little carbureted hydrogen gas.

The second vein now being worked in this shaft is the Big vein, which is at this point from seven to nine feet thick. This coal is long-grained, clear, and of excellent quality. Two headings have been driven in this vein, also in the same general direction as those in the vein above, for about five hundred feet each way, with parallel air-ways, and a connection has also been made with the second opening, and the inclination of the strata is in every respect about the same as in the vein above. A heading and air-way have been driven north from the heading on the east side of the shaft in this vein for about two hundred and fifty feet for the purpose of testing the inclination of the strata in that direction which was found to range from dead level to four degrees. There is but little water as yet, but there is considerable carbureted hydrogen gas evolved. The ventilation is produced by an exhaust fan, 17.5 feet diameter and five feet face, and is run by a twenty-five horse-power horizontal engine. The pumping is done by a forty horse-power engine and two fifteen inch Plunger pumps.

The coal is hoisted by two forty horse-power engines, one of which is used to hoist from the upper and the other to hoist from the lower vein. There are five boilers, thirty-six feet in length and thirty inches diameter to provide steam, and a place ready for five more in the boiler-room when they shall be found necessary. The breaker engine is forty horse-power, and the machinery in the breaker consists of one set of large breaker rolls, two sets of pony rolls, and twenty revolving screens for the preparation of all sizes of coal from grate to buckwheat. The breaker is excellently arranged for the cleaning of coal, having ample room for picking the coal near the top of the breaker before it enters the screens. The breaker is eighty feet high from the level of railroad track under the chutes to the mine track on top, and the distance from the shaft to the angle at the head of the breaker is about one hundred and eighty feet. The capacity of the breaker is from one thousand to one thousand two hundred tons per day. Everything about the breaker is now nearly finished, but it is not intended to run it until next spring.

No. 2, **BARNUM'S** SHAFT.—This shaft is eight hundred feet away from No. 1 shaft, and is the second opening for the latter. It is twenty-one feet in

length and ten feet wide, and is divided into spaces as follows: Two carriage ways, six feet each, and an upcast air space, eight by ten feet. The depth to the bottom of the seven feet vein is one hundred and fifty-one feet. The marketable coal at this point is seven feet thick, of good quality, and but little slate or bony coal in the vein. But little work has been done here as yet. The headings and air-ways are driven only about fifty yards from the foot of the shaft in either direction. It is connected with No. 1 shaft by the heading and air-way driven from the latter, as already stated.

The Big vein, or that known as the "Fourteen Feet" vein, is the lowest yet reached in this shaft also. The headings have been driven about fifty yards as in the upper vein. The shaft is down in a small basin or swamp, and is about nine feet lower than the highest point between it and No. 1. They have also encountered a second small basin on the southeast side, but they have driven through it to the rise on the opposite side, and by ripping some roof will have a good level road.

The coal is hoisted here by a forty horse-power engine, with three boilers of the usual dimensions to provide steam. The water is disposed of by a small donkey pump, which shows that the water is not heavy. There is some gas here also; and the ventilation is produced, as yet, by the fan at No. 1 shaft. I am assured, however, that a fan will be immediately provided for this shaft similar in all respects to the one at the other shaft, which will enable them to ventilate the workings of each separately, as they should be.

The surface landing at this shaft is about eighty-five feet higher than the top of No. 1, and the coal will be taken to the top of the breaker over high trestling, as the breaker is intended to dispose of the coal mined in both shafts. Nothing but headings and air-ways have yet been driven in either shaft, but there are ninety-three men and boys employed there already, and the coal mined last year amounted to 30,316 tons.

MOSIER COLLIERY.—This is a new shaft sunk by the Butler Colliery Company, under the supervision of S. B. Bennett, Esquire, the efficient superintendent of the Butler colliery. It is located on fifty-six acres of land owned by D. D. Mosier, Esquire, Hughestown borough, and lies north of No. 8 and No. 10 shafts of the Pennsylvania Coal Company, into whose workings a second opening will be made. Shaft is sunk through the Big vein to the bottom of the Marcy vein, a total depth of one hundred and seventy feet. The size is ten and a half by seventeen feet, which is divided into two hoisting ways and an upcast for air, the latter having an area of about sixty square feet—just about half what it should be. The pumping is to be done by a large Knowles' pattern plunger pump, the column pipe to be put in one corner of the upcast, which is another objectionable feature as regards the provision for ventilation, which is to be produced by a fan not yet constructed.

Ground was broken in sinking on April 29, and the sinking was completed September 25, 1880. There was first forty feet of fine sand, and then good rock to the Fourteen Feet vein, and from thence sixty-five feet of very hard

charged to the account of years in the past, long before Mr. Vandling assumed the control of the mines, and this fact should be credited to him. He has always been found ready to admit the necessity of improving the mines, and has shown a desire to do everything possible for the health and safety of the workmen.

The Pennsylvania Coal Company's collieries stand about as they did one year ago. No material improvement has been effected in any of their old collieries. The new No. 1 **Barnum** shaft, however, is provided with a fan which will produce ample ventilation for this new colliery, and another fan will be provided for the No. 2 shaft. I am very sorry that I cannot report all the collieries of this company in as good condition as could be wished. John B. Smith, Esquire, the general agent of the company, has always treated me with uniform kindness, and has always professed a desire to improve the condition of the mines under his charge; but the mine superintendents have not seemed so ready to do what is needed. My remarks on the condition of these collieries in my report for 1879, will apply to them still.

The collieries of the smaller companies and operators in the district are in excellent condition as to ventilation, excepting the following: Everhart colliery, Jenkins' township; Beaver colliery, Pittston borough; Columbia mines, Pittston township; Hillside colliery, Pleasant Valley borough; Greenwood colliery, Lackawanna township; Elk Hill colliery, Dickson City borough; Filer colliery, Winton borough; Jermyn's shaft and slope, Jermyn borough; Brennan colliery, Fell township; and Forest City colliery, Forest City. Some of these have been improved during the year, but none of them will ever have good ventilation until they are provided with a fan in place of the miserable furnaces now in use in them. The workings are so shallow in these collieries that furnaces cannot ventilate them. None of these can be classed as very bad, excepting the Jermyn shaft and slope and the Brennan colliery.

An air shaft has been sunk for the Hillside colliery, Pleasant Valley, and as soon as connection is made with the workings a fan will be placed on this shaft, which will remove all cause for complaint in this case.

A new fan has been erected by Messrs. Jones, Simpson & Co., at the Eaton colliery, Archbald borough, which was sorely needed. This improvement will place the Eaton colliery in the first class as soon as the air courses are put in proper shape inside.

The main roads and traveling ways have been improved in many of the collieries, but there is a great deal yet to be done before they are all satisfactory in this respect. The importance of having clean and unobstructed roads is not realized by many of the mine bosses, but I am more convinced of it every day, and I am positively certain that many accidents to drivers and runners would be averted if the roads were kept reasonably clear of obstructions. All places where drivers are obliged to hitch and unhitch their mules from cars in motion, such as passing branches, the approaches to the foot of shafts or slopes, and inside at the chambers, should be cleared

COLLIERY IMPROVEMENTS DURING THE YEAR 1892.

Pennsylvania Coal Company.

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

Lehigh Valley Coal Company.

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

Delaware and Hudson Coal Company.

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

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

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

Butler Mine Company, Limited.

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

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

Newton Coal Company.

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

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

second lift, west heading, in the six foot or lower Baltimore seam to shut off an inflow of water which was coming through the strata in the roof close to the face of the chamber, in such quantities as to almost overcome the pumps. There is a considerable depth of wash over this portion of the vein, and it was thought advisable to abandon, for the present, all mining in this lift until the coal to the dip would be worked out. Therefore a dam was built (see accompanying sketch of dam) close to the break in roof, so that no large quantity of water would be standing behind the dam. The dam is built of brick, five feet thick, laid in cement; length from pillar to pillar, twenty-five feet; arching from bottom top at an angle of forty-five degrees.

Two Breakers and the "Twin Shaft" Tower Destroyed by Fire.

On the evening of July 22, 1892, the **Barnum breaker**, operated by the Pennsylvania Coal Company, was discovered by the night engineer to be on fire. The flames bursting through the roof of the pump house. From this point it caught the shaft tower which was soon enveloped in flames; then caught the trestling which connects the shaft with the breaker. The water arrangements, which are kept at the colliery for emergencies, not being available on this occasion, the fire companies of Pittston were sent for, and when they arrived at the fire the breaker and other buildings connected with it were so far consumed that nothing could be saved, but the firemen did good service in extinguishing the burning timber which had fallen down the shaft. Preparations were immediately commenced to build a large chute to dump the coal hoisted from No. 2 shaft, and to get the men to work again.

The chute was completed and work resumed on August 1.

The coal is taken to the Bunker Hill breaker, at Dunmore, for preparation for market.

The new breaker, which is in course of erection, is well under way at this writing and is expected to be completed by early spring.

The Burning of the Engine House and Head Frame of the "Twin Shaft."

On Thursday evening, September 11, 1892, the Twin engine house and shaft tower, situated in the borough of Pittston, and operated by the Newton Coal Company, was burned to the ground. The fire was caused by the explosion of a lamp in the engine house. As soon as the engineer found he could not extinguish the flames, he gave the alarm which brought the fire companies of the borough to the scene. Although strenuous efforts were made by the firemen to save the buildings their labor was in vain, as the fire had gained such headway before their arrival as to encompass the tower over the shaft. But the firemen succeeded in saving a portion of the boiler house and adjoining buildings and extinguishing the flames of the burning timbers, which fell down the shaft, thereby saving the mines from being destroyed by an explo-

Undoubtedly the cause of the explosion was that when the gas became ignited from the previous blast, a small feeder was left burning unseen behind the brattice and the brushing brought the gas down in contact with it. The quantity of gas which exploded in the place was very small, but the place being narrow, the men received all there was of it, with no chance of escaping.

RECORD OF COLLIERY IMPROVEMENTS DURING 1893.

Pennsylvania Coal Company.

The new **Barnum** breaker, which was mentioned in my last report as being in course of construction, was completed and started to prepare coal for market in June, 1893. It is a large and commodious structure, having all the latest improved machinery.

At No. 7 colliery of this company a new air shaft, 12x12 feet, was sunk from the surface a distance of 331 feet to the checker seam, to be used for ventilation. A rock tunnel was also driven from the Pittston to the Marcy seam, a distance of 80 feet, for transportation of coal. In the Hoyt shaft a rock tunnel was driven from the Marcy to the Pittston vein, a distance of 480 feet, sectional area, 91 feet, to be used for the transportation of coal.

At No. 10 shaft a new exhaust fan, 20 feet in diameter was erected on the air shaft, in place of the one removed, it being too small; it will ventilate the workings of the red ash seam.

In No. 14 breaker an 8-foot fan was erected to take the coal dust from the breaker, which was greatly needed, as the coal coming to this breaker was very dry, so that the men and boys were terribly annoyed by the dust.

Lehigh Valley Coal Company.

This company has sunk an underground slope in their Oakwood shaft from the Checker to the red ash vein, a distance of 631 feet, on a grade of 30 degrees; sectional area, 10x13 feet. This slope opened up a large field of good coal in this vein, which is 14 feet in height.

In the Maltby Colliery the company has put in the "tail rope" system on their inside slope, which works very satisfactorily. A pair of first motion engines are situated close to the foot of the shaft which does the hoisting on the slope. The breaker has been rebuilt and enlarged, so that it will have a capacity of 1,500 tons of coal per day. The most approved machinery has been placed in it to clean and prepare the coal. An endless chain haulage, of about 500 yards in length, has been placed on the outside from the breaker to the shaft, which does away with all mules that were used heretofore.

A rock tunnel was driven in the Wyoming Colliery of this company from the five-foot to the Hillman seam, a distance of 195 feet, with a sectional area of 8x12 feet, to be used for transporting coal.

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

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

COLLIERY IMPROVEMENTS DURING 1885.

The Pennsylvania Coal Company.

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

Pennsylvania Coal Company.

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

Lehigh Valley Coal Company.

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

Delaware, Lackawanna and Western Railroad Company

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

Delaware and Hudson Canal Company.

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

of the said Thomas McDonald, Cortland Rolls and Alex. Young on 31st day of December, 1895, caused by boiler explosion.

JOHN E. PERKINS,
Deputy Coroner.

JOHN MOORE,
M. J. REAP,
MICHAEL FADDEN,
HENRY SAVANNAH,
CON. McLAUGHLIN,
JAMES CONNELLY,
Jury.

COLLIERY IMPROVEMENTS DURING 1895.

Pennsylvania Coal Company.

A new shaft was sunk a distance of 79 feet with a sectional area of 100 feet. It is used for ventilation at their Barnum colliery. A new 14 foot fan was erected which exhausts 95,000 cubic feet of air per minute while running 62 revolutions. It is driven by a horizontal engine steam cylinder 10x24 inches.

At Law's shaft a new 20 foot fan was erected which exhausts 95,500 cubic feet of air per minute, steam cylinder 15x30 inches.

At the Hoyte shaft a new 20 foot fan was erected as a duplicate to the one in present use and so arranged that it can be started at a minute's notice in case of the disarrangement of the other one.

The No. 5 shaft was enlarged from the surface to the Pittston seam, and cribbed from the rock to the surface with stone. It was then sunk from the Pittston to the Red Ash seam, a distance of 232 feet which opens up a large territory of coal. The second opening has been started for some time and will be connected with Number 11 shaft which will answer in the same capacity for it. A new fan 20 feet in diameter has been erected to ventilate the workings but it is not in operation at this writing.

Lehigh Valley Coal Company.

At the Exeter colliery of this company the culm washery was enlarged and fitted with the latest improved machinery for cleaning the smaller size coal. A new steam shovel was put in use to convey the culm to the washery, which works very successfully.

A rope haul from the Checker haul to the mouth of No. 1 Checker drift has been installed.

New Jeanesville pump 18x12x18 inch has been installed at foot of shaft which pumps to the surface.

ROBERTSON AND LAW COAL COMPANY

Katydid Colliery—Inside.—A new slope driven. They drove a rock slope 600 feet from the Spring Brook vein to bottom vein for the purpose of making a shorter haulage way; also made another opening for better ventilation and another way out for the men employed in that section of the mine.

CONNELL ANTHRACITE MINING COMPANY

Bernice Colliery.—No improvements at the Griffith colliery.

At the Bernice Colliery all improvements have been completed and are to be included in report for 1905.

In connecting the bottom vein with the upper vein by slope, contracts were made for under-cutting machines and a third rail locomotive.

The electrical power has been increased by the installment of a high speed engine and dynamo.

Details will be given in report for 1905.

PENNSYLVANIA COAL COMPANY

Barnum Colliery—Outside.—Breaker remodeled to enable company to clean the mud screen coal separate from the coarse coal.

Shakers introduced on head to separate coal instead of bars.

Mechanical pickers throughout to clean the coal.

Steam tip at head of breaker to dump the cars.

Inside.—No. 1 shaft abandoned; coal taken to No. 2 shaft inside.

No. 2 shaft, new shaft tower and first motion engines 24x48 inch.

Culm slushed in the mines and new pumping plant to take care of water.

The mine car changed from 28 inch to 36 inch gauge.

No. 3 shaft, rock tunnel from Pittston vein to Checker vein.

New barns in Marcy vein No. 2 shaft and bottom vein No. 3 shaft and mules stabled inside, outside barns abolished.

Central Colliery—Outside.—Addition built to breaker to wash all fine sizes and convey culm dump to breaker.

New boiler house with 8-150 H. P. Keeler locomotive boilers, equipped with all modern improvements.

New tower is being erected for Law shaft.

New slope from surface to Clark vein and Marcy. This coal to be pulled up slope and gravitated to breaker.

A new 26x12x36 inch duplex Coyne pump was installed at the foot of shaft, and 410 feet of 14 inch cast pipe erected in the shaft to carry water from this pump to the surface.

A 6x7 foot manway, 56 feet in length, was driven from the Red Ash to the Ross vein, on 35 degrees pitch.

A new mule stable with 14 stalls has been built in the 11 foot vein.

PENNSYLVANIA COAL COMPANY

Central Colliery.—Car shop 63x33 feet, built of brick.

Wood shed 75x17 feet, built of wood.

Slope engine house, 36x26 feet, built of brick. Clark slope Laws shaft.

Engine house 45x21 feet 7 inches. Built of brick. Laws shaft.

Wash house, 30 feet 3 inches x 18 feet 4 inches. Built of brick. Divided into three compartments.

Boiler house 114x59 feet, wooden frame, covered with corrugated iron and consists of 8 Keeler boilers of 150 H. P. each.

New shaft tower on Laws shaft.

Mine car haulage for empty mine cars at breaker.

Rearrangement of the outside mine car tracks.

Barnum Colliery.—Brick locomotive house at No. 2 shaft.

Brick wash house at No. 2 shaft, divided into apartments for the miners, outside men and foremen.

New barn at No. 2 shaft outside.

Brick oil house at Barnum breaker furnished with oil pumps complete for lubricants.

Added one battery 300 H. P. B. and W. boilers to the boiler plant.

KINGSTON COAL COMPANY

No. 4 Colliery.—Completed the new boiler plant of 1,200 H. P. Babcock and Wilcox boilers. This is only one-half of the final boiler plant planned.

Built conveyor lines for fuel from breaker to boiler house.

Built a conveyor line to carry refuse from breaker to Williams' patent crusher. This rock is then crushed and flushed with the culm into the mine workings.

They have built new warehouse and office.

They have drilled about 12 bore holes to prove rock cover over Orchard vein.

They are driving a rock plane from Bennett vein on 15 degrees pitch to cut upper vein.

The plane has reached during the year the Orchard vein.

STEVENS COAL COMPANY

Stevens Colliery.—Installed 20 foot fan at new plant; put in a division partition shaft for upcast airway to fan.

Completed hoisting arrangements at new shaft, by installing cage on south side, fans, etc.

Installed 90 H. P. electric engine and generator for electric haulage in mines.

CONDITION OF COLLIERIES AND IMPROVEMENTS

PENNSYLVANIA COAL COMPANY

Old Forge Colliery.—The two mountain drifts have been completed, and the Clark and Marcy veins are being developed. An air shaft has been sunk from the surface to the Clark vein. A new stone fan house has been erected, equipped with a 20 foot Guibal fan, driven by a 55 H. P. electric motor, which will soon be in operation. A system of electric haulage is being installed; the boiler house was extended 100 feet, and two batteries of Sterling boilers installed, each battery having 568 H. P. A new power house has been erected 90 x 40, equipped with three dynamos, 2-325 K. W. and 1-100 K. W., 2,300 volts, for lighting purposes. The latest motor is run by a 15x16 engine; the other two, which are used distinctly for haulage purposes, are driven by two 24x26 simple automatic engines, 550 H. P. each. The power house is erected at the breaker, and the power carried by wire to Old Forge No. 1 shaft and slope, Old Forge No. 2 shaft, and the Mountain drifts; also to Laws and No. 13 shaft of Central Colliery. In all 20 motors will be installed, five 13 ton, and fifteen seven and one-half ton. Foundations are ready for a new addition to Old Forge washery and jigs will be installed to prepare buck, pea and chestnut sizes. A conveyor line has been built to take the culm from Old Forge dump to new washery. A new store house and office has been built; 50x25.

Inside.—A large pumping plant has been built in red ash vein, at Old Forge No. 2, and two pumps installed, having a combined capacity of 4,000 gallons per M.

Central Colliery.—The breaker has been remodeled from top to bottom, and additional screens, shakers and mechanical slate pickers have been installed, to clean and prepare mud screen coal. The breaker will have a capacity of 1,800 tons, an increase of 600 tons; the pockets are enlarged and strengthened and other necessary changes made in the machinery. At Law shaft a new fan shaft has been sunk from the surface to the red ash vein, size 12x12.

Over this new shaft has been built a modern brick fan house equipped with a 20 foot Guibal fan, driven by steam. The old Central washery was abandoned and a new one built having a capacity of 1,000 tons per day, equipped with jigs for chestnut, pea and buckwheat coal. The store house which was destroyed by fire in December, 1905, was replaced by a brick structure 25x60. A ten inch bore hole has been sunk to the bottom of Red Ash vein, through which water will be pumped to the surface. A tail rope haulage system has been installed in the Clark vein slope. One $7\frac{1}{2}$ ton electric motor is in operation in No. 13 shaft, and three of the same type in Law shaft; two more will be added in a short time. A rock tunnel, 7x10, driven on a 21 per centum grade will connect the bottom vein at Law shaft with the top red ash vein at the Avoca. The coal in the Avoca property will be taken through this rock tunnel and prepared for market at the Central Colliery, and the Avoca plant will be abandoned.

Barnum Colliery, Inside.—Have driven a rock tunnel from the Marcy to the Clark vein in No. 2 shaft. Also a rock plane from the bottom or red ash vein to the top split or Babylon vein. Coal to be dropped down to bottom vein by an engine. Outside.—Have erected

a brick washhouse at boiler house for the firemen, equipped with steel lockers and other improvements which make it modern in every respect.

LEHIGH VALLEY COAL COMPANY

Seneca Colliery, Outside.—The fire that developed from a smouldering condition in the old culm bank, and threatened the destruction of the breaker, was isolated by a trench cut through the bank. The Coxey shaft fan house was protected from sparks of passing engines by a corrugated iron, and the shaft is completely recribbed. 5276 feet of diamond drill test holes were completed for protection against accidents, in testing cover limits over Pittston and Marcy veins. A Williams crusher was installed for Pittston vein flushing. Inside.—A 4 inch drainage hole drilled from Marcy to red ash vein was completed. Two rock tunnels, driven through the upthrow in the red ash vein, were finished during the year.

William A and Lawrence Collieries, Outside.—An 8 inch rope haulage hole was drilled from surface to red ash vein at Babylon mine. Beginning January 1, 1907, the Lawrence breaker will be operated as a washery only, the coal being prepared at William A breaker. Inside.—A new haulage road has been driven 2,500 feet through middle split pillars to Babylon mines to minimize transportation. The road was continued in the bottom split across the Babylon tract to the westward, where a 300 foot tunnel opens up the virgin coal. This haulage road will be eventually connected with No. 10 tunnel at Campbell's Ledge, when it will be a continuous road of 16,000 feet in length.

HILLSIDE COAL AND IRON COMPANY

Consolidated Slope.—They are steadily opening on the bottom Red Ash vein at Consolidated slope, and have also just opened on the split of the Checker underlying the main Checker vein, about six feet apart. This has been done direct from the Consolidated main slope.

HUDSON COAL COMPANY

Langcliff Colliery.—No. 2 slope in Red Ash vein extended 380 feet. One 54 inch locomotive type boiler installed.

JERMYN AND COMPANY

Jermyn No. 1 Colliery.—This mine went on strike February 13 and the strike continued until August 23. On October 27 a cyclone destroyed the breaker which is now being rebuilt. During the suspension new sills and pockets were placed under the breaker.

Jermyn No. 2 Colliery.—The men at this mine went on strike February 13 and remained out until November 1, when operations were again resumed. A new rope haulage system was installed in the outside slope to the Clark and Marcy veins.

ELLIOTT, McCLURE AND COMPANY

Sibley Colliery.—On June 23 a fire broke out in the breaker about 10:45 A. M. and destroyed it, also the engine house, boiler house and supply house. A new breaker, boiler plant and other buildings are

September 13, Sibley Colliery, Raffella Astorino, Italian, laborer, outside, was fatally injured by jumping from a car. He was on top of a car, which he with others had dumped, and he jumped to the ground with a shovel in his hands. The shovel slipped from his hand and he struck it with his stomach. He died the next day.

November 9, Old Forge No. 1 Shaft, Frank Miller, Polish, driver boy, was fatally injured. He was running with his mule ahead of the car and in some manner fell across the rail, and was disemboweled. He died the same day.

November 29, Langcliff Colliery, Michael Moskovitz, Polish laborer, employed outside near foot of breaker plane, had his skull crushed and was instantly killed by a runaway car, caused by the breaking of a draw bar. He was warned of the approach of the car and ran to a place of safety, but the car jumped the track, leaped 40 feet through the air and caught him.

Explosion of Gas

March 23, **Barnum** No. 2, Martin Flynn, Irish, rockman, was fatally injured by an explosion of gas. He was employed by a contractor in driving a tunnel from 6th to 5th vein. He and a driver boy went up this plane and encountered a body of gas. The gas exploded, burning both. Flynn died from his injuries 11 days afterward at the Hospital.

Suffocation by Gas

December 4, Central Colliery, Thomas Mulrooney, American, ashman, was found dead in an ash pit, under the boilers, where it was his duty to gather and remove the ashes. The Coroner's verdict was to the effect that they found the victim was overcome by impure air.

CONDITION OF COLLIERIES AND IMPROVEMENTS

PENNSYLVANIA COAL COMPANY

Barnum Colliery.—Barnum Nos. 2 and 3 have been greatly improved. The loss of life has been reduced very materially.

Central Colliery.—A twelve inch bore-hole has been driven to the bottom of the Red Ash vein at Laws Shaft, through which water will be pumped to the surface. A triplex, vertical electrical pump, with a capacity of 1,000 gallons per minute, against a 300 foot head, has been installed for this purpose.

Openings into the top split of the Red Ash vein have been made, and the vein is now being developed.

Three seven and one-half ton cable motors have been added to the equipment at this place.

A new locomotive house 40x25 has been built, also, a new brick barn and wagon shed 100x25, replacing the one destroyed by fire in December, 1906, is now completed; the ventilation in the shaft and Clark and Marcy slope workings has been greatly improved and the mines are in good condition.

CONDITION OF COLLIERIES

PENNSYLVANIA COAL COMPANY

Barnum No 9, Ewen No. 6 and No. 14.—Ventilation, drainage and condition as to safety, good.

HUDSON COAL COMPANY

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

HILLSIDE COAL AND IRON COMPANY

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

LEHIGH VALLEY COAL COMPANY

Heidelberg No. 1. and Mineral Spring.—Ventilation, drainage and condition as to safety, good.

DELAWARE AND HUDSON COMPANY

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

YOST MINING COMPANY

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

McCAULEY COAL COMPANY

Pickaway.—Ventilation fair. Drainage and condition as to safety, good.

IMPROVEMENTS

PENNSYLVANIA COAL COMPANY

Barnum Colliery.—A rock tunnel 7x12 feet, was driven from the Marcy to the Pittston vein, a distance of 300 feet, to mine the coal under the city of Pittston.

Number 9 Colliery.—The No. 3 shaft on Broad street, Pittston, was concreted from the surface to rock, and is now being sunk to the Red Ash vein, to be used as a second opening for No. 1 shaft and for ventilation; size of shaft, 10x20 feet.

At Leadville shaft a horizontal, triplex expansion, direct-acting wood-lined plunger pump was installed to deliver 2,500 gallons of water per minute against a head of 500 feet.

Number 14 Colliery.—A new slope 7x12 feet was sunk from the surface to the Diamond vein, and is driven in the vein 700 feet. A concrete arch has been put in from the surface to the vein. A new air shaft 12x12 feet has been sunk from the surface to the Diamond vein and concreted from the surface to the rock. A new concrete and steel air bridge, to connect the slope airway to the air shaft, has been completed.

Two new shafts have been in progress of sinking from the surface to the Red Ash vein. No. 1 shaft 12x16 feet is down to the Marcy vein and is concreted from the surface to rock a depth of 50 feet. No. 2 shaft 12x22 feet is down 90 feet to the rock and is concreted the whole distance.

The new air shaft 12x12 feet in progress of sinking in 1910, from the surface to the Checker vein and Pittston vein, has been completed and concreted from the surface to a point about 30 feet below the Hillman vein, making 90 feet of concrete.

WILKES-BARRE COLLIERY COMPANY

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

McCAULEY COAL COMPANY

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

The roads inside of the mines of the Pennsylvania Coal Company and Hillside Coal and Iron Company are kept in first class condition. The gangways are kept free from refuse and standing water, and are of ample width. The passing branches at the foot of most of the shafts are concreted on both sides from bottom to roof, the roof is supported by steel girders and the foot or landings are lighted by electric lights.

IMPROVEMENTS

PENNSYLVANIA COAL COMPANY

Barnum Colliery.—A slush pump 24 by 10 by 36 inches has been installed for pumping slush to the top of the hill, southeast of No. 2 shaft. No. 3 shaft has been abandoned as a hoisting shaft, all coal being taken by motor to No. 2 shaft, Pittston vein landing.

Number 9 Colliery.—No. 3 shaft, on Broad street, Pittston, has been sunk to the Red Ash vein, to be used as a second opening and for ventilation; size of shaft 10 by 20 feet.

Curtis slope has been sunk from the surface to the Checker vein, 7 by 12 by 350 feet long. An electric hoist has been installed outside to hoist the coal from this opening. This is enclosed with a fireproof building, 14 by 18 by 12 feet.

At Leadville shaft the Clark vein has been opened through old No. 9 shaft, the coal being dropped to the Red Ash vein and hoisted up the Leadville shaft.

Number 6 Colliery.—A pair of 10 by 24 inch engines was installed outside in a fireproof building 17 by 32 feet, for hoisting the coal from the New Diamond slope. An air shaft 12 by 12 feet was sunk from the surface to the Marcy vein, a distance of 360 feet, for the purpose of ventilating the Diamond, Babylon and Red Ash veins.

In No. 6 shaft a tunnel was driven 7 by 12 by 200 feet long, for the purpose of recovering the Hillman vein pillars.

In No. 5 shaft two shafts, 10 by 10 by 30 feet deep, were sunk from the top to the bottom split of the Checker vein.

In No. 11 shaft a pair of 16 by 24 inch engines were installed to operate the tail rope haulage in the Babylon vein.

Ewen Colliery.—At No. 4 shaft a pair of 15 by 36 inch engines was installed in a brick building 27 by 40 feet, for the purpose of operating the rope haulage in the Red Ash vein.

In Hoyt shaft a fireproof mule barn was erected in the Red Ash vein, to accommodate 24 mules. An air shaft, 10 by 10 by 70 feet, was sunk from the Pittston to the Marcy vein, for ventilation.

In No. 4 shaft a rock tunnel 7 by 12 by 300 feet, was driven in the Red Ash vein, for transportation. A new rope haulage was installed