

The Kingston Coal Company.

The **No. 4 shaft** of this company was completed upon reaching the Red Ash seam at a depth of six hundred and sixteen feet. Its size is 30'×12'. This opens a very large tract of convenient coal.

The Gaylord Coal Company.

At the Gaylord colliery a tunnel is in progress from the Ross to the Red Ash seam. Its sectional area is 7'×10', and its length, at present, is six hundred and fifty feet. This is intended to work the coal above the level of the bottom of the Gaylord slope.

A. J. Davis.

At the Warrior Run colliery a tunnel was driven from the C to the D vein. Its sectional area is eighty-five square feet, and its length one hundred and ten feet. The seam of coal was found eleven feet thick, and of good quality.

The Franklin Coal Company.

This company has started to sink a new slope, from the surface diagonally through the measures, to cut and work the Red Ash seam. Its sectional area is one hundred and sixty feet square, grade thirty degrees, and it was driven to a depth of one hundred feet at the end of the year.

W. G. Payne & Co.

At the East Boston mines of this company the shafts are being sunk or extended from the Bennett to the Ross vein. They had not struck the expected point at the close of the year, but they were approaching it closely. The blasting-hole in the air-shaft was thought to have penetrated the coal seam.

The Red Ash Coal Company.

A new tunnel is being driven from surface at the outcrop of the Baltimore seam, and is intended to drain and mine the coal lying above that level, and between that and the Red Ash slope, of both the Ross and Red Ash veins. It was driven a distance of three hundred and seven feet at the end of the year, and is expected to be finished sometime in 1884. This will open a wide extent of very convenient territory and desirable coal.

The West End Coal Company.

This company is opening a new mine and building a new breaker about three miles east of their West End colliery, in Conyngham township. It is to be named East End colliery. The breaker is expected to be ready in March, 1884. The vein is opened by two tunnels—one on each side of the basin—and they will mine and ship coal as soon as the breaker is completed.

The Delaware and Hudson Canal Company.

This company is sinking two new shafts in Plains township, near the Baltimore mines, for the purpose of mining the Red Ash seam. The main

The Kingston Coal Company.

The No. 4 shaft, sunk by this company, reached the Red Ash seam at a depth of six hundred and sixteen feet. This opens a very wide extent of territory and is expected to produce a large supply of coal. The second opening will be effected by opening into the workings of the No. 3 shaft of the same company.

The Franklin Coal Company.

Important improvements are in progress at the Franklin colliery. A new slope is being driven down across the measures to cut the Ross and Red Ash seams, and it has reached a depth of six hundred and ninety-three feet on a grade of thirty-three degrees. Eventually, when the slope cuts the Red Ash, a new breaker will be erected, from which all the coal of this colliery will thereafter be shipped. The ventilation of the old slope mine was considerably improved last year by enlarging the air-ways and by some modifications in the construction of the fan.

W. G. Payne & Company.

The East Boston shafts of this company were extended to lower seams. The main shaft to the Red Ash, a depth of three hundred feet, and the air-shaft to the Ross seam, a depth of two hundred and thirty-four feet. This improvement opens a large area of good coal for this company. The size of the main shaft is 11'×22', and of the air-shaft 10'×18'.

Haddock & Steel.

A new air-shaft is in progress at the Black Diamond colliery of this company, and it has reached the Cooper seam at a depth of one hundred and fifty-two feet. Its sectional area is 12×12 feet. A tunnel was also driven on a rise of seventeen degrees from the Bennett to the Cooper seam, by which a large piece of good coal is intended to be mined from a point some distance below the old Cooper workings.

The Red Ash Coal Company.

The new tunnel reported last year as being driven from the surface to the Red Ash seam by this company is completed. It cuts through the Ross seam at a distance of nine hundred and nineteen feet, where the coal was found to be nine feet thick. The Red Ash was reached at a distance of eleven hundred and ninety-seven feet, and the coal is of excellent quality. This tunnel drains all the workings of this company, and relieves them of the cost of pumping water. The slope was extended to the level of the said tunnel, and opens a new lift, of about five hundred feet in length, in both seams.

Thomas Waddell.

The Raubville shaft was extended from the Bennett to the Ross seams, a depth of two hundred feet. They are now driving a second opening.

Lehigh and Wilkes-Barre Coal Company.

At the Empire colliery of this company a new fan was erected on the No. 2 shaft, which is 24 feet diameter, and produces a ventilation of 145,000 cubic feet of air per minute, running 70 revolutions per minute. A tunnel was also driven, for the purpose of ventilation and haulage, from the bottom to the top split of the Baltimore seam. It is 100 feet long and has a sectional area of 84 square feet. The South Wilkes-Barre shaft is continually sinking, and is now at a depth of 500 feet. The arrangement of the head of this shaft is very good; is heated by steam so that no ice forms in winter, and is thus kept in much safer condition than if ice was formed.

Delaware and Hudson Canal Company.

One of the new shafts at the Baltimore slope is sunk from the surface to the Red Ash seam, where it is found at a depth of 400 feet. The coal is fair and about 10 feet thick. They are now driving toward the other shaft, which will soon be sunk to the same vein, and by which a second opening will be effected.

Susquehanna Coal Company.

A number of improvements, such as tunnels and planes, were made in the mines of this company. In No. 4 slope two planes were made; one is 500 feet long, and the other 800 feet. These will facilitate the haulage of coal, and also enable them to mine coal which could not be reached otherwise. The slope was also extended a distance of 1,060 feet.

In the No. 1 slope a tunnel was driven from the Red Ash to the Ross and Twin veins. It is 9×14 feet area, and has a length of 1,150 feet.

Kingston Coal Company.

At the No. 4 shaft, this company erected a new breaker, which is nearly completed. It is a very large structure, built with a view of preparing the coal of the Ross and Red Ash seams. It will be heated throughout by steam, a new feature in coal-breakers, and for this purpose seven thousand feet of wrought-iron pipe were used in making the heating apparatus. It will be ready to ship coal early in 1886.

A new fan was erected on the No. 4 shaft. It is 24 feet diameter and running 60 revolutions per minute, gives a water gauge pressure of 1.10 inches and 14,000 cubic feet of air. The engine is horizontal, direct-acting, and the cylinder is 18-inch diameter.

Hillman Vein Coal Company.

At the Hillman shaft of this company a new upcast was made having an area of 150 square feet, and a new 24-foot fan was erected upon it. This fan, running 75 revolutions per minute, produces a pressure equal to 1.75 inches water-gauge and a ventilation of 180,000 cubic feet per minute of air. The engine is 15×24 inches and is direct acting. They are driving

eter, was erected to ventilate the Boston mine, and it proved a very satisfactory appliance by increasing the ventilation to the desired extent.

Kingston Coal Company.

At the No. 1 shaft the endless-rope system of haulage was introduced, and it works well. I am informed also that the same system is contemplated to supersede a locomotive at the Gaylord mine, and that it will be adopted at each of this company's collieries at Edwardsville.

The new breaker at the No. 4 shaft laid idle throughout the year, but the main openings of the mine were driven and have opened a large territory ready for breast-work.

Delaware, Lackawanna and Western Company.

The Woodward shaft of this company is in progress of preparation for mining coal. Pumps are being put in place, and also the shaft cages. The breaker is also in course of erection, and it promises to be one of the largest producers in this region. At the Avondale mine a new fan, sixteen feet diameter, was placed on the new air-shaft. It works well, and is reported to exhaust 105,000 cubic feet of air per minute, under a ventilating pressure of eight tenths of an inch water gauge. To produce this pressure, it is running at a speed of eighty-five revolutions per minute.

Accidents in 1886.

The number of accidents causing injuries to workmen are still very frequent, but the number was less in 1886 than it was in each of the past five years, and we have good reasons to hope that the number will still be reduced in the future.

If the workmen, and especially the boys who are employed to drive and run cars, could be induced to exercise more care, the number of accidents could be greatly reduced. The rigid requirements of the new mine law were, no doubt, instrumental in bringing the number of accidents for 1886 down below its usual figure, and a more stringent enforcement of the rules laid down in that law would perhaps result in a further improvement.

There are serious disadvantages to a reduction in the list of accidents. The number of persons employed and the amount of coal produced increase every year, and if the number of accidents does not increase in the same proportion, a decided improvement is effected. And when we consider that the dangers of coal mining increase daily with the extension of the workings and the increase of depth in each mine, a non-increase in the list of accidents would be very gratifying, as well as an indication of improvement in the system of mining. The total number of serious accidents during the year 1886 was three hun-

Delaware and Hudson Canal Company.—A new opening was effected for the Conyngham colliery, connecting with the workings of the Baltimore slope, in October, 1887. It provides a convenient escape way for the workmen of both collieries, and makes everybody connected with those mines feel safer in case anything should happen to prevent exit through the main openings.

The No. 2 Baltimore shaft is now at a depth of over 500 feet, and is expected to cut the Red Ash seam at a depth of 670 feet. At No. 3, which is to constitute the second opening, gangways are being driven to open work, and to be ready to ship coal when the main shaft shall be completed.

At the Boston mines the fan at No. 3 was applied to ventilate its workings, and it gives fair results. Still the ventilation of this mine is not satisfactory, but when the air-ways are fully prepared, an improvement is confidently expected.

Susquehanna Coal Company.—At the No. 1 shaft of this company two new underground slopes were sunk, one in the Forge seam and the other in the Buck Mountain. To avoid the trouble arising from the heat radiating from the steam pipes, the hoisting engines are located on the surface, and the ropes pass through bore-holes made for the purpose. Telephones and electric bells are used to converse and give signals.

At the No. 6 colliery, Glen Lyon, a new fan twenty-five feet diameter was erected. The engine is 24"x36", connected directly to the shaft of the fan. It is used to ventilate the workings of the shaft. The second openings for the workings of this shaft are now completed to each of the seams.

Kingston Coal Company—The new breaker erected at the No. 4 shaft of this company was started to prepare and ship coal in October, 1887, and has been running since. It is one of the largest structures in the district. It is heated throughout by steam, and is equipped with the most efficient machinery.

Delaware, Lackawanna and Western Railroad Company.—At the Avondale colliery a new fan was erected on the new air-shaft. It is an open fan sixteen feet diameter, connected with a horizontal engine by belt gearing. Under a ventilating pressure equal eight-tenth inch of water-gauge it is exhausting 137,600 cubic feet of air per minute. A new opening was made from the lower lift of the Red Ash seam to the Ross. It is a rock tunnel 226 feet long on a grade of 18½ degrees and 7x18 feet area. It opens an extensive field of this coal seam.

The new breaker at the Woodward shafts is nearly completed. Four cages are in operation in the main shaft, and workings are being opened in both the Bennett and Red Ash seams. Second openings are being driven in both seams to connect with the air-shaft.

West End Coal Company.—A new fan was erected on this colliery sixteen feet in diameter and connected directly with the engine. It is

and ringing a bell or bells gives alarm when the pressure becomes lower than it is safe to have it. The bells are placed so that the engineer or officers can hear them. This instrument is preferred because it records the essential part of ventilation and gives alarm when this is dangerously affected. It needs no lubrication and very little attention, other than changing the chart once a week and winding the clock-work. A cut of the instrument as it appears without the electric battery and bell attached is herewith furnished. It is used on the fans of the following collieries in this district:

Dorrance Colliery, Lehigh Valley Coal Company, South Wilkes, Stanton, Lance No. 11. Two Nottingham fans, two fans at No. 9 Sugar Notch, two fans at No. 8 Ashley, and new thirty-five foot fan at South Wilkesbarre, all of the Lehigh and Wilkesbarre Coal Company.

Warren Run Colliery, A. J. Davis.

Hillman Vein Coal Company's Hillman Colliery, Dodson and Black Diamond Collieries of the Plymouth Coal Company.

Parrish Colliery, Parrish Coal Company.

Gaylord, and No. 4 Kingston, of the Kingston Coal Company.

Two fans of the Alden Colliery, Alden Coal Company.

East Boston Colliery, W. G. Payne & Co.

Twin shafts, Newton Coal Mining Companies and on the nine fans of the Susquehanna Coal Company at Nanticoke.

All of these have automatic alarms attached for the purpose of calling the engineer's attention in case the fan should run too slowly thereby causing the ventilation to become less than the minimum quantity desired.

TWO BREAKERS DESTROYED BY FIRE.

At about seven o'clock p. m., on the evening of May 5, 1891, while the engineer of the No. 4 shaft of the Kingston Coal Company was returning after a brief absence, he saw the engine-house on fire and instantly gave alarm. In a few minutes time it had spread to an uncontrollable extent over the whole breaker structure. The heat was so great that the No. 1 breaker also took fire, and both structures including the engine-houses and fans were entirely destroyed.

There were about fifty men in the mines at the time, but they escaped without trouble through the Nos. 2 and 3 shafts. These shafts were downcasts, and the burning breakers made upcasts of the Nos. 1 and 4, so that no smoke entered the workings.

Considerable quantities of gases accumulated, but the fan was soon repaired, and all the work people were removed in safety. It is gratifying to note that no one was injured during the progress of the fire, nor during the time it took to put the mine in a condition of safety.

THE RE-ERECTION OF THE BREAKER OVER THE **NO. 4 SHAFT OF THE KINGSTON** COAL COMPANY ENJOINED.

By a decision of the court of Luzerne county, the Kingston Coal Company was prevented from rebuilding the breaker over the No. 4 shaft for reasons explained in the following petition of the mine Inspector and in the opinion of the court :

In the Court of Common Pleas of Luzerne county, sitting in Equity between the Commonwealth of Pennsylvania upon the application of G. M. Williams, Inspector of Mines of the Fourth Anthracite Coal Inspection District of Pennsylvania, acting in behalf of the said Commonwealth, Plaintiff. and The Kingston Coal Company, Defendant. No. T., 1891.

To the Honorable, the Judges of the said Court :

Your orator complains and says :

First. That he is the mine Inspector of the fourth anthracite coal inspection district of Pennsylvania, embracing that portion of the Wyoming coal field west of Plains and Kingston townships, including the city of Wilkesbarre and the boroughs of Kingston and Edwardsville.

Second. That the above named defendant is a corporation duly organized under the laws of this commonwealth, and engaged in the mining and preparation of anthracite coal for market within the limits of the Fourth Anthracite coal inspection district aforesaid.

Third. That prior to the evening of May 5, 1891, the said defendant owned two breakers, two shaft towers and two engine houses, the first breaker, shaft tower and engine house, being used to prepare, store and hoist coal from said defendant's shaft No. 4, situate in the borough of Edwardsville, and in the district aforesaid, the said breaker was connected to the said tower, over said shaft, and said tower was connected with said engine house, the breaker was north and the engine house was south of said shaft, so that the breaker, shaft tower and engine house formed one structure. The second breaker, shaft tower and engine house being used to prepare, store and hoist coal from said defendant's shaft No. 1, situate also in the borough and district aforesaid; the said breaker was connected to the said tower, over said shaft, and said tower was connected with said engine house, the breaker was south and the engine house was north of said shaft, so that the breakers, shaft tower and engine house formed one structure.

Fourth. That on the evening of May 5, 1891, the breakers, shaft towers and engine houses, aforesaid, were entirely destroyed and consumed by fire, down to their foundations.

Fifth. That the said defendant is about to erect a new frame breaker, shaft tower and engine house to be used for the preparation, storage and hoisting of coal, upon the site of the old breaker, shaft tower and engine

house, at shaft No. 4 aforesaid, and the new breaker will be connected with the new shaft tower and new engine house in the same manner that the old breaker was connected with the old shaft tower and engine house.

Sixth. That said new breaker, if the defendant is permitted to erect the same, will be within two hundred feet of the mouth of shaft No. 4 aforesaid, which said shaft connects the surface with the underground workings of the mines of the defendant and up which shaft from the mines aforesaid, the defendant intends to hoist coal when the new breaker aforesaid is completed.

Seventh. That the erection of the said new breaker in the manner aforesaid is contrary to law, viz., to the fifth section of the act of assembly approved the second day of June, 1891, and entitled "An act to provide for the health and safety of persons employed in and about the anthracite coal mines of Pennsylvania and for the protection and preservation of property connected therewith," and the erection of said breaker will also work irreparable injury to your orator.

Your orator would therefore respectfully pray for relief as follows :

First. For an injunction, first preliminary and afterwards upon final hearing perpetual, against the said defendant, her agents, superintendents, servants, contractors and employes, restraining them or any of them from erecting a breaker, or other inflammable structure, for the preparation and storage of coal within two hundred feet of shaft No. 4 belonging to the said defendant and located in the borough of Edwardsville, Luzerne county.

Second. For such other and general relief as may seem proper to your Honors in the premises.

Luzerne County, ss :

G. M. Williams, the mine Inspector of the Fourth Anthracite coal district above named, being duly sworn, doth depose and say that the facts set forth and contained in the foregoing bill are just and true to his personal knowledge.

Sworn and subscribed before me }
this 17th day of June, 1891. }

Written notice, as required by law, of the intention to apply for the injunction prayed for in foregoing bill is hereby waived.

.....
Attorney for Defendant.

proved that a volume of 1,800 cubic feet of carbonic acid gas, per minute was generated, and that there must be a brisk fire existing somewhere in the mine to produce such a large quantity. Shortly after the temperature rose so as to verify our apprehensions. At the South Wilkes-Barre colliery, and also at the Nanticoke collieries, the instrument is used to ascertain the percentage of fire-damp in the air of each split, and it enables them to regulate the air so that the gas can be diluted evenly in the different air currents.

AN AUTOMATIC CAR TRANSFER SYSTEM.

A drawing is here presented showing an automatic system for transferring cars from the shaft-head to the breaker dump at the Baltimore No. 2 shaft of the Delaware and Hudson Canal Company. It has been in operation for about one year, and works satisfactorily. This was designed by Mr. C. H. Scharar, chief engineer of the coal department, who kindly consented to have it appear in this report. It explains itself, and can be easily understood from the drawing.

THREE NEW COAL BREAKERS.

Three new breakers were erected in this district during the year 1892. The first one completed was that of the Susquehanna Coal Company, a short distance north of their No. 1 shaft at Nanticoke. It is to prepare the coal previously shipped through the old No. 2 breaker, now abandoned, and is known as the No. 7 breaker.

The second was the No. 5 breaker at the South Wilkes-Barre colliery of the Lehigh and Wilkes-Barre Coal Company. This breaker was completed in the latter part of September, and has been operating successfully since.

The third is the **No. 4 breaker of the Kingston Coal Company**, erected to replace and do the work of the two breakers burned May 5, 1891. This new breaker started to prepare coal for the market in December, 1892.

The three breakers are large structures, equipped with the latest and most efficient machinery, and on the most approved plans for the purpose of cleaning and preparing a large production of coal. They are safe for the employes, and heated comfortably by steam. The stairs and machinery are well guarded, so that no one can be hurt inadvertently.

RECORD OF COLLIERY IMPROVEMENTS DURING 1892.

The spirit of improvement was active during the year 1892 in this district, and a detailed account of its work is shown in the following:

Improvements by the Lehigh and Wilkes-Barre Coal Company.

At the Hollenback No. 2 colliery a new fan was erected to ventilate the new Red Ash seam workings. It is 35 feet diameter, and in run-

Improvements by the Susquehanna Coal Company.

At the No. 1 shaft a tunnel was driven from the "Forge" to the Hillman seam. It is 650 feet in length and 7×14 feet area. It is intended to work the coal of No. 2 slope through this tunnel and abandon the slope.

The workings of the Forge Vein No. 1 shaft were connected by a tunnel from the No. 2 shaft and it is intended to convey the coal from a part of the Forge Vein workings by that way, to the No. 2 shaft when necessary.

In the No. 4 slope a tunnel was driven from the Mills to the George seam on a grade of twenty degrees, to make a gravity plane. It is 300 feet in length and $7\frac{1}{2} \times 12$ feet area. A second opening was driven to connect with the workings of the George seam in the No. 1 shaft, and from there an airway was driven out to the surface. Upon this airway to ventilate the George seam workings, a new fan was erected, 18 feet in diameter, which is exhausting about 50,000 cubic feet of air per minute. At the No. 6 shaft a rock gravity plane has been completed, extending up to the No. 6 tunnel. It is 700 feet in length on an average grade of 14 degrees.

A great deal of work has been done in enlarging the return airways in several of the mines of this company, which has effected a marked improvement in the ventilation in each case.

Improvements by the Kingston Coal Company.

At the No. 1 shaft a tunnel was driven 1,200 feet from the Bennett seam to what is supposed to be again the Bennett. Its size is $7\frac{1}{2} \times 11$ feet. In the No. 2 shaft an outlet has been driven to the outcrop to be used as an intake and travelling way.

At the No. 4 shaft two underground slopes were completed in the Red Ash seam.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

At the Avondale mine each of the two underground slopes were extended, and they have commenced to drive a tunnel from the Red Ash to the Ross. Its size is 7×12 feet. At the Woodward colliery, a rock tunnel was driven from the Red Ash seam to the Ross, and continued to be driven to the Baltimore seam. Its length now is 1,200 feet, having an area of 7×14 feet. The two slopes, one in the Red Ash seam, and the other in the Baltimore, were extended to a length of 1,713 and 3,700 feet respectively, the Baltimore slope being the longest. This is now an extensive mine, well ventilated and kept in good order.

Avondale.—One 300-horse power McEven engine to one C. W. 200 K. W. Multipolar electric generator.

Bliss.—One 200-horse power McEven engine, directly connected with one Bullock 150 K. W. Multipolar electric generator.

One rock tunnel, 7x16 feet, from Forge to the Red Ash seam, 650 feet long.

Improvements by the Kingston Coal Company.

At the Nos. 1 and 4 shafts electric haulage was installed during the year 1900. The length of haul in each shaft is 3,500 feet. The motors are ten tons each in weight, 25 horse power, constructed by the General Electric Company. Each does the work of 12 mules and hauls 20 car trips on level road. The generator is located on surface. A McEven engine 22x24½ inches, 350 horse power. Multipolar generator operated by belt gearing. Voltage, 250. Full load, 275 volts. Speed, 450. Amperes, 727.

Condition of the Mines and Improvements During the Year

The condition of the mines on the whole is very satisfactory. The ventilation is improved, the drainage is much better, and special efforts are being made in regard to propping roof. All these things I rigidly demand. The observance of the law, in reference to the employment of boys is also enforced to the letter. Only one case occurred in the district, where there was any need to resort to law, and was against the Avoca Coal Company. A copy of the whole proceedings in this case was forwarded to the Department.

KINGSTON COAL COMPANY

No. 4 Colliery

They have put up a fuel conveyor line to boiler house, made some slight changes in the breaker and put down a number of bore holes to prove rock cover over Orchard vein.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone

A 20 foot ventilating fan, which was partly constructed in 1902, has been reconstructed and is now in working order, showing a very good percentage of efficiency. The erection of a locomotive boiler plant is in progress at this colliery, to be composed of 10 fire box locomotive boiler, which will be completed early during the year 1904. Three rock tunnels were driven through faults or anticlinals in the Hillman vein for development, transportation and ventilation. The Kidney vein has been opened in these shafts and developments will be pushed as rapidly as possible.

Pettebone washery, which has been practically idle during the year, has now resumed operations, and the refuse from the same is being placed in the Cooper vein of this colliery.

RAUB COAL COMPANY

Louise

Gravity plane at "Mt. Thomas," about 450 feet long, one pair of new 16x20 engines geared 4 to 1, with foundation and house complete for hoisting.

Outside.—Coal from Red Ash and Ross veins, on Eley tract, to foot of Bennett slope. Rope to run through bore hole, from surface to head of inside plane from eleven foot vein to Ross.

Inside.—No. 3 tunnel Klondyke, driven on mountain side from

ton air locomotives which feed from the face of the chambers to main passing branches.

Permanent air bridges of brick and cement in Red Ash.

A new 20 foot Guibal double intake fan driven by 18x20 inch Corliss engine; brick house is under construction at Red Ash second opening.

New 10 inch steam line, 1,200 feet long, to Red Ash shaft hoist engine.

One hundred new mine cars.

Eighteen degree rock plane completed from Red Ash to Babylon vein, 110 feet.

A series of surface test holes continued to determine safe rock cover over Checker vein.

Extensive repairs made to breaker and washery.

Maltby Colliery.—Finished construction of new brick boiler house, and complete installation of 1,800 H. P. Babcock & Wilcox water tube boilers. The plant is in every way up to date. Equipped with force draught fan, duplicate feed pumps, Cochran water heater, utilizing exhaust from surrounding engines, fire proof, ashes washed into mines, rope conveyors bringing fuel from breaker. This new plant displaces 18 cylinder and 7 return tubular boilers.

Addition built to breaker, and new shakers displace revolving screens on Buck, Rice and Barley.

New conveyor lines on Rice and Buckwheat.

New mechanical pickers.

Extensive repairs and renewals to breaker frame.

New concrete fire house, and emergency water lines. Lehigh Valley Collieries have trained, well-equipped fire companies.

No. 9 tunnel water level, driven 790 feet, and No. 16 tunnel, driven 525 feet from surface to Red Ash vein, and surface road 1,200 feet long connecting same completed to chain haulage system.

No. 12 tunnel from Ross to Red Ash completed, 150 feet.

One hundred new mine cars.

KINGSTON COAL COMPANY

No. 4 Colliery—Have erected one 175 K. W. direct connected generator 250 volts; one pair 24x48 inch first motion slope engines, with two friction drums for use by bore holes upon Red Ash and Ross slopes (not yet in operation); one boiler plant (not yet in operation), consisting of 4 sets Babcock and Wilcox boilers, 300 H. P. each; one brick oil house.

They have added machinery and spiral pickers in breaker, which is a decided improvement in the preparation.

Inside

Have placed one Goyne duplex compound pump 16x28 inch and
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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.

about 200 feet southeast from the slope, from which the water is discharged through a new 14 inch bore hole, 150 feet deep, to the surface, where it is utilized in handling the material from the culm bank now being prepared.

The Red Ash workings east of the Lackawanna river are being silted preparatory to robbing the pillars.

At Babylon about 1,500 feet of standard gauge track have been laid and a steam shovel placed for the removal of the culm bank to the Lawrence washery for preparation.

TEMPLE IRON COMPANY

Mount Lookout Colliery.—Three 120 K. W. 250 volt direct-current generators have been installed in the electric plant to replace three 100 K. W. 500 volt generators, and the circuit in the mine changed to conform with the 250 volt current.

A new fire-proof brick boiler house, 33 x 51 feet, with steel roof and adjoining coal bin, 15 feet 2 inches x 51 feet x 17 feet deep, of reinforced concrete, has been built, and two 250 H. P. Stirling water tube boilers installed therein.

Harry E. Colliery.—A new brick boiler house, 144 feet 4 inches x 41 feet, with steel roof and adjoining coal bin of reinforced concrete, 17 feet 6 inches x 144 feet 4 inches x 20 feet deep, has been built. The five original Stirling boilers have been rebuilt and two others of 250 H. P. each added, making a plant of 1,625 H. P. at this colliery. Forced draft by blower fan, feed water regulators, fuel and ash conveyors have also been installed.

A new ventilating fan, 25 foot diameter, 8 foot face, has been erected at the No. 2 Shaft, driven by an 18 x 36 inch engine. The fan house, casing spiral and chimney are all of reinforced concrete.

KINGSTON COAL COMPANY

Kingston No. 4.—A new brick electric generator house completed, in which three 240 K. W. direct driven generators have been installed.

A new four-stage centrifugal pump placed in the Orchard vein.

One 24 x 10 x 36 Duplex pump at Orchard Level.

One new 28 x 10 x 36 Duplex pump at Bennett vein, together with new culm and steam lines for same.

One 20 x 38 x 10 x 36 Compound pump installed at Red Ash shaft discharging through a new 10 inch bore hole, 650 feet long, to the surface.

One new concrete reservoir, with a capacity of 750,000 gallons, to supply the breaker and washery.

Two 20 x 12 x 36 pumps located at the reservoir.

Brick addition to the warehouse.

One brick waiting room for the miners and safety lamp station built at the head of No. 1 Shaft.

Boring surface test holes continued throughout the year.

A new 8 x 25 foot fan in concrete casing and house finished, new fan in operation since March.

A new school for the instruction of the foreign miners and other employes of the company has been opened and has met with encouraging success. The course of lectures on mining questions has also been continued throughout the year.

IMPROVEMENTS

KINGSTON COAL COMPANY

Kingston No. 2 Colliery.—Great attention has been given to the development of the water level coal in the mountain district.

Four tunnels have been driven from the surface cutting through the Ross and Red Ash veins.

A new coal road 3,000 feet long, also a self-acting plane connecting these tunnels to the main haulage road to No. 2 breaker.

A new concrete crib has been substituted for the wooden timbers at the permanent opening of No. 2 Slope.

450 H. P. return tubular B. and W. boilers have been installed at the old slope, and are enclosed in a corrugated iron-brick house.

Three tunnels have been completed in the Old Slope district between the Ross and Red Ash veins.

A new addition has been built to the east side of No. 2 breaker, new shakers taking the place of revolving screens.

A new 8 inch wooden pipe line 2,000 feet long connecting No. 3 shaft with No. 2 breaker.

A new system of fire protection and electric light.

A new washery has been erected independent of the breaker.

Kingston No. 4 Colliery.—Two new tunnels between the Bennett and Checker veins.

An additional pump and bore hole completed to Central pumping plant in Bennett vein.

A new 8x25 foot fan and expanded metal-concrete casing and house for same are in course of construction and will soon be completed.

300 H. P. return tubular B. and W. boilers added to main boiler plant.

The electric power plant has been increased by the addition of two 240 K. W. direct driven generators, new brick house enclosing same.

A number of changes and additions made to the breaker.

New addition to warehouse.

Through the generosity of the company a free library has been opened for the use of the employes, where they can spend their evenings in reading and studying. No books or magazines of a sectarian nature will be allowed in the library. Everything is free. Lectures are given on the "first aid to the injured" by Doctor Lake once a month. Also lectures are given on mining questions once or twice a month.

TEMPLE IRON COMPANY

Mount Lookout Colliery.—The wooden cribbing in the Mount Lookout shaft, which is 14x22 feet, and 110 feet from the surface to top of rock, became partially decayed to a depth of 50 feet, which is the low water mark. The cribbing below this level is constantly wet and consequently well preserved. The problem of renewing this cribbing without a lengthy suspension of work was a serious one,

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

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

TEMPLE IRON COMPANY

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

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

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

KINGSTON COAL COMPANY

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

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

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

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

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

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

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

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

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

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

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

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

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

KINGSTON COAL COMPANY

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

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

A new ventilating shaft, expanded metal concrete crib, together with expanded metal division in shaft, completed from the surface to the Orchard vein, intake 10 feet by 12 feet, upcast 10 feet by 12 feet. Connected with this opening there has been erected, encased in an expanded metal concrete building, a 25 by 8 foot fan, driven by an 18 by 30 inch Vulcan engine. This gives separate ventilating current to the Orchard vein, also acting in case of emergency as a duplicate to the other concrete fan completed in 1909.

300 horse power additional Babcock and Wilcox water tube boilers have been installed.

Installed in Red Ash slope a new quintuplex pump, 1,200 gallons per minute capacity. A 6 inch bore hole for electric wires driven from the surface to the Orchard vein, thus removing the wires from slope hoistway.

Installed in Red Ash slope a new duplex compound condensing pump, with semi-rotary valves, automatic cut off, size of pump 30 by 16 by 10 by 36, said pump discharging through a new 8 inch concrete-cement lined bore hole to surface. Pump house being timbered with steel-concrete.

Rock plane 460 feet long, 15 degrees, completed from the Ross vein through Eleven Foot vein and Checker vein to Bennett vein, making a new second opening between Nos. 1 and 4 shafts.

In No. 1 shaft a tunnel has been completed from the Bennett vein to the Eleven Foot vein, also two tunnels from the Lance vein to the Cooper vein.

Four small shafts for ventilating and silting purposes from Orchard to Lance vein.

The electric wires have been taken out of Nos. 4 and 1 shafts and placed in a bore hole sunk for that purpose.

A new fire boss station built at the foot of No. 1 shaft.

Several new air bridges have been made in Nos. 1 and 4 shaft districts. Silting has been carried on extensively in Nos. 1 and 4 shaft districts during the year.

Installed a new 75 K. W. A. C. electric light outfit.

A new play-ground has been completed with swings, wading basin, horizontal bars, turnstiles, hand ball alley, etc., at the extreme end of No. 4 yard, where the miners have a chance for recreation with the children of said families. The play-ground has met with great success.

The system of night school has been continued during the year, and also the schools for the instruction of the "First Aid to the Injured Corps."

The general appearance of this property has been considerably improved during the year.

EAST BOSTON COAL COMPANY

East Boston Colliery.—One new pump 17 and 33 by 14 and 36 compound Jeanesville pump installed at Bennett Foot with 14-inch column pipe from the same to the surface.

RAUB COAL COMPANY

Louise Colliery.—Slope in Bottom Ross, Mt. Thomas. Slope in Top Ross Klondike. Slope in Bottom Ross Klondike. New plane outside at Klondike. Opening from Bottom to Top Ross in shaft. Opening Cooper vein in shaft.

tended 27 feet and the head of the Marcy slope graded, in connection with the work of concentrating the hoisting of all the coal up the Marcy slope.

Outside: A 10-inch silt hole lined with terra cotta pipe was put down from surface to the Marcy vein, this hole to serve in case of emergency. A pair of 28-inch by 48-inch first motion engines was installed on the surface the rope operating through a new 8-inch bore hole put down on the mountain side from the surface to the head of the Marcy slope. These engines are housed in a new building of tile construction and steam is carried to these engines from the boiler house through a new 8-inch steam line 550 feet long. Test holes were put down on the Reynolds property to prove the Six-Foot vein rock cover. Extensive repairs were made to the breaker and the pockets were renewed. A new office building, containing rooms for outside foremen, colliery clerks and shipper, and with warehouse and oilhouse attached, all of tile construction, was erected and the old frame office building dismantled. 500 feet concrete retaining wall put up, 200 feet of same being along loaded track leading to the breaker plane, and the balance 50 feet and 250 feet on the west and east side of breaker respectively. A new concrete fanhouse with new engine and 20-foot fan was installed to replace the fan of wooden construction. 375 feet of 18-inch terra cotta pipe laid to carry the water from the Marcy pump discharge hole to the creek. A new 18-inch by 36-inch breaker engine was installed.

Stevens Colliery.—Inside: Rock cut was made for handling coal from Marcy vein to shaft. Motor road was completed in upper lift of Marcy vein and now handles coal directly to the shaft, which was previously done by a slope. Top Marcy vein gangways are being driven ahead rapidly and chambers worked from them.

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—Inside: Two tunnels have been driven in Orchard vein through roll and Lance vein to Orchard vein, a distance of 1,500 feet. Three new overcasts have been built in the Orchard vein of steel and concrete. Two new concrete barns have been built, one at Orchard vein and one at Cooper vein, complete with baths. One Scranton 14 by 8 by 18-inch steam pump has been installed for ash water purposes.

In No. 4 shaft, a new condensing house and Scranton duplex condensing pump, 14 by 8 by 18 inches have been added to No. 4 shaft pump house, and pump house has been rebuilt with steel and concrete timbers. A new quintuplex pump, a duplicate of the one installed in 1910, has been erected at the foot of Red Ash slope, and pump room completed of steel and concrete. 300 feet of the main slope above pump house has been timbered with steel timbers and concrete retaining walls. Two new overcasts have been built of concrete and steel in the Ross vein. New concrete barn consisting of fifty stalls have been built in the Red Ash vein, complete with mule baths. A rock slope 250 feet long has been driven through the roll in the Ross vein. Silting has been carried on very extensively in the southern and middle districts of the Ross and Red Ash veins during the year. Nos. 1 and 4 shaft hoisting engines have been equipped with the Welch improved overwinding device, steam reverse and brake.

The breaker has been wired and lighted by electricity. A Cross Compound Corliss valve movement Ingersoll-Rand air compressor 20 by 38 by 30 by 33 inches, was installed. A new brick central shipping station was built. A new underground fuel conveyor line was built from breaker to boiler house. An additional track was built for No. 4 loaded and supply. Two new powder houses were constructed.

The system of night schools has been continued during the year, also the school for the instruction of "First Aid to the Injured Corps." The general appearance of the property has been considerably improved during the year, a number of miners' dwelling houses having been enlarged and sanitary sewerage installed.

PLYMOUTH COAL COMPANY

Black Diamond Colliery.—Inside: Opened Eleven-Foot or Marcy vein in shaft. Built concrete mule stable in Cooper vein, concrete and steel stable in Ross vein and Red Ash vein; also concrete and steel engine room head of Ross slope. Drove a rock tunnel from Cooper vein to Lance vein, 150 feet, and drove a rock slope from Lance vein to Cooper vein 150 feet; also drove a rock tunnel from Red Ash vein to "A" vein 50 feet.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Colliery.—Inside: A rock plane has been driven on a 15 degree pitch from the Hillman to Kidney vein, No. 2 shaft, which is now about completed, and a second opening for the same has been driven to the coal, but connections have not as yet been made. The work of sinking No. 11 slope, from Bennett to Red Ash vein, is under way. The Ross vein in No. 1 and No. 2 shafts has been opened and connected to shaft airway. The work of rebuilding mule barns, pump rooms, engine house, etc., with incombustible material, is under way, and will soon be completed.

MINE FOREMEN'S EXAMINATIONS

The examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held at Kingston, April 4 and 5. The Board of Examiners was composed of P. M. Boyle, Mine Inspector, Kingston; James J. McCarthy, Superintendent, Luzerne; Harry Jones, Miner, Wyoming; and Edward Carlin, Miner, Luzerne.

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

Mine Foremen

Michael H. Corgan, Luzerne; William Michael Toner, Plymouth; Frank J. Carter, Nicholas Cooke, Forty Fort; John Lewis Williams, David Richards, David William Owens, West Pittston; John McHugh, Edwardsville.

Assistant Mine Foremen

Thomas Francis Levin, Maltby; William L. Geyer, Dorranceton; William Coutts, David Coutts, Forty Fort; Peter Berry, Pringle; Philip Williams, Charles W. Thomas, John Williamson, John M. Williams, Jr., Wyoming.

Nos. 2 and 3 shaft hoisting engines were equipped with Welch Improved Overwinding Prevention Device, steam reverse and brake.

Brick-concrete-steel mule bath, shoeing and wagon shed completed.

Twenty-five thousand gallon circular wooden water tank set in place.

Nos. 2 and 3 shaft towers have been stripped of wooden sheathing and head frame removed and strengthened.

No. 2 Shaft.—Inside: In accordance with the Act of June 15, 1911, all buildings inside of the mines have been constructed of incombustible material.

A concrete emergency hospital was built at the bottom of No. 2 shaft.

A concrete fire boss station was built in the Lance vein at the foot of shaft.

Two openings were driven from the Cooper to the Lance vein for second outlet.

A rock tunnel was driven from the Cooper to the Lance vein, a distance of 180 feet for traveling way and mule way.

The Bennett vein barn was extended, with steel and concrete stalls.

No. 3 Shaft.—Inside: Concrete-steel barn was built in Red Ash vein.

Concrete motor pit was built.

Concrete emergency hospital was built at the foot of the shaft.

A concrete fire boss station was built.

A balance plane was made in Red Ash vein.

Kingston Nos. 2 and **4 Washeries**.—No. 2 culm bank was exhausted on October 23, and they are now preparing No. 4 bank through No. 2 washery structure.

Three new conveyor lines were built, running by subway under the railroad tracks, Main Street and No. 4 yard, to transport No. 4 bank to the washery.

Four new jigs were installed.

A 25,000 gallon fresh water circular wooden tank is in course of construction at boiler house.

Roadway for retail wagon trade under washery.

Silting from the washery was carried into No. 3 Ross and Red Ash workings.

Gaylord.—Outside: A brick ambulance wagon shed was erected.

The culm plane bridge over wagon road was rebuilt.

A 50,000 gallon cedar water storage tank was placed on steel and concrete foundations.

A playground was established along Cherry Street, complete with swings, wading basin, horizontal bars, turnstiles, etc., and opened to the children of employes on July 4.

Foundations have been completed for a new Ingersoll-Rand air compressor.

Inside: A concrete engine house was built for the Red Ash slope engines.

A bore hole 450 feet was sunk from the head of culm plane to the Red Ash vein for silting purposes.

Red Ash slope was extended and steel timbers are being tried.

Silting operations have been carried on extensively during the year.

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

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

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

KINGSTON COAL COMPANY

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

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

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

FORTY FORT COAL COMPANY

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

Maltby Colliery.—Inside: A rock tunnel 130 feet long was driven from the Bottom Ross vein to the Red Ash vein in No. 5 slope workings. A 300 gallon triplex electric plunger pump was installed in No. 8 slope in a concrete pump room. Silting was commenced in the Six Foot vein.

Outside: Installed 9 Lehigh Valley four-foot jigs and rebuilt pockets in east side of breaker. Drilled a 12-inch bore hole to Marcy vein for silting purposes. Erected fireproof hospital, saw house and scale house. No. 2 fan shaft was concreted and No. 1 fan house made fireproof.

Seneca Colliery.—Inside: Installed one 500-gallon triplex electric pump in Clark vein, one 16½ by 26 by 36 inch Duplex Jeanesville pump in No. 5 slope, Marcy vein, and a simple pump in the same pump room was compounded. Both pumps are equipped with condensers. Drilled a 17-inch bore hole from surface to Marcy vein. 160 diamond drill test holes were put down to ascertain the rock cover over the Pittston, Marcy and Red Ash veins.

Outside: Built hospital and locomotive house of brick and tile west of breaker.

William A. Colliery.—Inside: Built a medical room of concrete at No. 10 tunnel and completed an additional air shaft from surface to Marcy vein at this opening.

Outside: Built head frame over the tender shaft, and placed new cribbing in Babylon air shaft. Foreman's office was converted into a hospital. A new office is being constructed. Built tile and concrete locomotive house at No. 10 tunnel.

Westmoreland Colliery.—Inside: Installed a 150-gallon horizontal triplex electric pump in the Pittston vein.

Outside: Built hospital of hollow tile. Made roof of boiler house fireproof. Two diamond drill holes were put down to the Pittston vein from the surface and extensive repairs were made to the breaker.

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—Outside: Installed a double intake 8 by 25 foot ventilating fan at No. 4 shaft, driven by 18 by 30 inch direct connected Corliss engine. The fan house and approach to the shaft are made of concrete and steel. The Bennett and Orchard fan engines at No. 2 bore hole were equipped with new 18 by 20 inch Corliss valve engines. Completed 12-inch concrete steel partition in the airway compartment of No. 4 shaft, from the Red Ash to the Bennett vein, and the old brattice in that section was removed. Drilled an eight-inch bore hole from surface to Bennett vein, 330 feet, for pumping purposes. No. 4 breaker engine was replaced by a cross compound Lentz engine, 19½ inch high pressure and 32½ inch low pressure cylinders and a 21 inch stroke. This engine is of the poppet valve type. No elastic or metallic packing is used; the valve stems are kept steam tight by means of the labyrinth system of water seal packing. Made two additions 22 by 68 feet to the wash house, which is now equipped with 6 shower baths, 12 wash stands, 36 concrete wash tubs and 435 lockers. Constructed a new warehouse 30 by 80 feet, with brick walls and concrete floor and roof. Completed fireproof building 30 by 68 feet for electrical department. Concrete fuel bins and a new concrete ash pit were made in the boiler room. The old warehouse has been remodeled so as to allow

CONDITION OF COLLIERIES

LEHIGH VALLEY COAL COMPANY

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

KINGSTON COAL COMPANY

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

FORTY FORT COAL COMPANY

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

MT. LOOKOUT COAL COMPANY

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

EAST BOSTON COAL COMPANY

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

PLYMOUTH COAL COMPANY

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

RAUB COAL COMPANY

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

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

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

RISSINGER BROTHERS AND COMPANY, INCORPORATED

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

IMPROVEMENTS

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—Inside: No. 5 air shaft extended to the
Bennett vein. Made air return course with two concrete and steel
overcasts on east side of No. 1 Orchard slope. Constructed traveling
way from No. 1 shaft to No. 3 shaft in the Bennett vein; also new
traveling way in No. 4 shaft from the Eleven Foot and Checker
veins, Rock plane district, to the Bennett vein landing in No. 1
shaft. Fireproof overcast constructed in Checker vein and four steel
doors built between Nos. 1 and 4 shafts for emergency fire protection.

Outside: All boilers equipped with automatic feed water regu-
lators and safety stop check valves. Equipment in wash house in-
creased to meet the present requirements. Concrete powder house
moved to another location away from the railroad tracks. Regular
instruction given during the year in "First Aid and Rescue" work.

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—No. 1 shaft: One 8-inch hole was drilled from Bennett vein to Ross vein for drainage. A new concrete air bridge was built in the Orchard vein.

No. 4 Shaft: New fireboss station was constructed at foot of shaft. Shaft was driven from Checker vein to Bennett for drainage and flushing. New 8-inch bore hole was drilled from Ross to Red Ash vein for pumping purposes. A concrete re-enforced partition was completed between the downcast and upcast airways in hoisting shaft. A concrete re-enforced building was erected for encasing a new 28-foot Vulcan fan with Corliss engine. This is a duplicate of the building erected in 1914. A new manway has been completed from the Ross tunnel to the foot of the shaft in the Red Ash vein.

EAST BOSTON COAL COMPANY

East Boston Colliery.—Installed one 21 by 36 inch air compressor, complete. Built fireproof compressor engine house; also fireproof hospital on the surface. Two electric generators were installed for lighting purposes. Tunnels were driven from Bennett vein to Cooper vein and from Eleven Foot vein to Bennett vein. An air shaft was driven from Cooper vein to Bennett vein.

HADDOCK MINING COMPANY

Black Diamond Colliery.—Rock plane was driven from Lance vein to Orchard vein, 208 feet, on 21 degree pitch, equipped with one pair of Flori engines. New fireproof engine room was built at head of Eleven Foot slope for housing 12 by 24 inch Vulcan hoisting engines.

RAUB COAL COMPANY

Louise Colliery.—Installed 3 electric hoists and 4 electric centrifugal pumps.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Colliery.—Breaker was reconstructed and is again in operation. The work of developing thin seams is still underway.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Pittston, May 18 and 19. The Board of Examiners was composed of S. J. Jennings, Mine Inspector, Pittston; James J. McCarty, Superintendent, Luzerne; Thomas Grogan, Miner, Luzerne; John Evers, Miner, Luzerne.

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

All inequalities in the old wood crib behind the steel work have been filled with blue stone concrete, well rammed.

The air shaft shas been relined the upper 26 feet by placing a new interior crib of 10 by 12 hemlock in position inside the original crib, and filling all voids, by removing decayed wood in old crib, with concrete and cement. The new crib measures 10 by 24 feet.

New buntons have been placed for a distance of 76 feet from the mouth of the shaft. The airway brattice has been entirely renewed from the bottom at the Red Ash vein to the top. It is doubled boarded with white pine, with ends bricked up against the rock.

Completed a 7 by 12 foot rock plane on a 25 degree pitch, a distance of 90 feet from the bottom to the Top Ross vein, to improve the haulage; also a 7 by 12 foot tunnel from Bottom Ross to Top Ross on Road 22, to develop the Top Ross vein in that locality.

Installed a Pennsylvania rock crusher, size W-6, which is operated by an 18 by 36 inch steam engine.

Forty Fort Colliery.—Completed a 7 by 12 foot rock plane driven from Road 8-A, Chamber 1, in the Bottom Ross vein, to Road 9, in the Top Ross vein, to further develop the Top Ross vein in that locality and also to improve the transportation.

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—In No. 1 shaft, a new overcast has been built in Orchard vein for ventilation, and a short tunnel completed from Cooper to Lance vein.

In No. 4 shaft, a new overcast was built in the Red Ash vein for ventilation, and a tunnel driven from Checker to Bennett vein.

Installed a 10 by 16 inch air engine at the bottom of Ross vein.

Outside: A bore hole was drilled from surface to Orchard vein for electric wires, removing latter from inside traveling way.

A new playground for children of employes was built in Pringle Borough.

At No. 4 shaft, a 25 foot Guibal steel fan, uniflow steam valve movement, was installed, and a concrete fan house built for same.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Colliery.—In No. 20 tunnel, Five Foot vein, an electric hoist, equipped with a 75 HP motor, was installed.

Outside: Installed a new electric sub-station equipment; two 27-ton steam locomotives to haul coal from Nos. 3 and 4 shafts to the breaker. Extended electric power lines from Woodward mine to Pettebone. Extended power line from Nos. 1 and 2 shafts to Nos. 3 and 4 shafts. Also installed one electrically driven, 16 foot Sturtevant ventilating fan at Nos. 3 and 4 shafts.

Completed annex to breaker, new wash-house and brick and concrete oil and supply house.

Two rock pulverizers have been installed at the plant.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foreman and assistant mine foreman was held in Pittston on June 5 and 6. The Board of Examiners was composed of Samuel

CONDITION OF COLLIERIES

LEHIGH VALLEY COAL COMPANY

Broadwell, Seneca, Exeter, Westmoreland and Maltby Collieries.—Ventilation, drainage and condition as to safety, good.

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

William A. Colliery.—Ventilation, fair; drainage, good. Condition as to safety, fair.

TEMPLE COAL COMPANY

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

KINGSTON COAL COMPANY

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

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

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

MT. LOOKOUT COAL COMPANY

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

HEALEY COAL COMPANY

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

WHITE COAL COMPANY

Church Hill Colliery.—Ventilation, fair. Drainage and condition as to safety, good.

IMPROVEMENTS

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—At No. 1 shaft a new tunnel has been driven from the Lance vein to the Cooper vein rock plane district, for haulage purposes, and a new concrete overcast has been built in the Eleven Foot vein.

Installed one 8 inch by 10 inch air hoist in No. 1 slope, Orchard vein; one electric hoist in the Eleven Foot vein; and completed an 8 inch water line from the turbine pump to the bore hole.

In No. 4 shaft a tunnel was completed from the Ross vein to the Ross vein, through roll, for second openings in the lower district. Completed a shaft from the Bennett vein to the Checker vein, for silt-ing purposes. A new 8 inch wood lined water line has been laid from the top of Ross slope to the shaft pumps in the Red Ash vein, for condensing purposes.

Installed an air hoist in the West Red Ash slope; also an air hoist at the New Eleven Foot plane. Completed a new pump room of concrete and steel at foot of the shaft.

Outside:—A new bore hole has been drilled from the surface to the Cooper vein near the ash bank, for silting of ashes inside. A new annex to the breaker has been built for preparation of culm bank, separate from fresh mined coal.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Colliery.—At Nos. 1 and 2 shafts completed a 7 foot by 12 foot, 15 rock plane from upper Five Foot to Hillman vein, also a 7 foot by 12 foot rock tunnel at No. 1 shaft, to hoist all coal from Pettebone Nos. 1 and 2 shaft to No. 1 shaft.

Started flushing breaker refuse in Kidney vein. Completed a new air compressor building, 22 feet by 25 feet for Ingersoll-Rogler compressor. Installed three 7½ ton electric mine locomotives.

At Nos. 3 and 4 shafts completed concrete brattice wall in No. 3 shaft for ventilation. Installed four 150 HP D. C. electric hoists in Abbott, Hillman, Cooper and Red Ash veins, and two 7½ ton electric type, mine locomotives.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the Y. M. C. A. Building, Pittston, May 8 and 9. The Board of Examiners was composed of Edwin C. Curtis, Inspector; James J. McCarthy, Superintendent, Luzerne; John Evers, Miner, Luzerne, and Thomas Grogan, Miner, Luzerne.

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

MINE FOREMEN

John Hughes, Dorranceton; John R. Richards, Parsons; Thomas Gibbons, West Pittston; Peter Berry, Pringle; Morgan Rowlands, Edwardsville; Archibald K. Lindsay, Forty Fort.

ASSISTANT MINE FOREMEN

John E. Evans, Parsons; Thomas Guilford, Alexander Przestrzelsky, Edwardsville; Richard Parsons, Matthew F. Farrell, David Hughes, Wyoming; Thomas Courts, Edwardsville.

Maltby Colliery.—Installed one 9 by 8-inch Ingersoll-Rand portable electric driven air compressor and "Jackhammer" in Ross vein, and Edison portable electric lamps for use in breaker. Made some improvements on engine road in Marcy vein.

Broadwell Colliery.—This mine is fully equipped with the following electric mining machinery: One 150-kw. motor generator; two 8-ton electric locomotives; two coal-cutting machines; one electric drill; one portable air compressor and "Jackhammer," and one 8-foot fan. The mine offices, shop, wash-houses, etc., are constructed of rugged face, hollow tile, and are equipped with modern appliances.

Seneca Colliery.—The Guibal fan at Coxey shaft has been replaced by a 12 by 4-foot Vulcan steel single-inlet fan. Installed an automatic car-handling device at head of Twin shaft. Completed a brick wash-house. Extensive repairs were made to breaker and 10 new jigs installed therein.

KINGSTON COAL COMPANY

Kingston No. 4 Colliery.—Installed two Hamilton-Corliss cross compound engines and one Ingersoll-Rand cross compound air compressor. Completed two 16-inch bore holes from surface to Red Ash vein, one to be used for conveying electric wires and the other as column discharge for turbine pump.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Pittston, April 23 and 24. The Board of Examiners was composed of Edwin C. Curtis, Mine Inspector; James J. McCarty, Superintendent, Luzerne; Thomas Grogan and John Evers, Miners, Luzerne.

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

MINE FOREMEN

Hadyn G. Jones, William L. Jones, West Pittston; John E. Dworske, Wyoming; William D. Weir, Isaac J. Reynolds, Forty Fort.

ASSISTANT MINE FOREMEN

Idris B. Jones, Oscar E. Williams, Pittston; Gomer Jones, George Deeble, Avoca; Arthur J. Button, Wyoming; Jaul J. Borosky, Exeter; Emlyn B. Jones, Forty Fort; Thomas F. Barry, Luzerne.