

to keep the boxes containing powder locked; but, by continued practice, they will gradually get into the habit of doing so, and then there will be no further difficulty. It is much harder to maintain discipline and to keep the mines in good condition when they work only about half time than when they are working nearly full time. During a long interval of idleness, everything gets out of order, and, upon starting to work again, much more care is needed on the part of all to insure safety. With steady work I do not think there would be much reason to complain of the condition of the mines of this district.

New Collieries Started to Ship Coal in 1885.

The Newport colliery, or **No. 6** of the Susquehanna Coal Company, is the only new one started during 1885. It is located about four miles west of Nanticoke, and with it the village of Morgantown sprung into existence. There are three openings made to produce coal—a shaft, a slope, and a tunnel. The size of the shaft is 32×15 feet, and its depth is 749 feet, having passed through several coal seams. The slope is sunk on one of the seams, on a grade of 45 degrees, having a sectional area of 11×18 feet, and in to a depth of 510 feet. The tunnel was driven horizontally from the surface into the mountain side to a distance of 1,265 feet, and has cut several coal seams. Its area is 8×14 feet. These openings are ventilated by three fans, one at each place. The tunnel and slope fans are each 20 feet diameter, and the shaft fan (which is only a temporary one) is 16 feet diameter. The coal from the three mines is prepared for the market by passing it through one large breaker. This was started August 17, 1885, but there was not much coal shipped till about the middle of September, and from that to the end of the year they shipped a total of 40,943 tons. This will eventually be one of the largest collieries in this district. There are four pairs of hoisting engines—two pairs and one single engine—to run the fans; one breaker engine and two pumps, and there are sixty boilers to produce steam. Everything is constructed in the best order, which speaks well of the persons who have it in charge.

Colliery Improvements during 1885.

The spirit of improvement was not so active in 1885 as it was in the years preceding it. The depression in the coal trade caused several collieries to be thrown idle, and those kept in operation, excepting those of the Susquehanna Coal Company, worked only a little over half time throughout the whole year. The No. 10 colliery of the Lehigh and Wilkes-Barre Coal Company did not work any, and the Baltimore tunnel and No. 2 collieries of the Delaware and Hudson Canal Company were idle, the former for the first nine months, and the latter for the first ten months of the year. Thus it is shown that more than enough collieries are already opened to produce the coal required by the market; yet, in order to maintain the producing capacity, some improvements were made, and also improvements for the ventilation were effected.

S. 26

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

SUSQ COAL

At the **No. 6 shaft**, Glen Lyon, another opening was effected by driving to connect with the No. 6 tunnel, and a part of this is utilized as a gravity plane, which has a grade of 30°. This was driven through disturbed faulty strata from the Ross seam and connects to the side of No. 6 tunnel.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

At the Avondale colliery the new underground slope on the Red Ash seam is being sunk. It extended below the lower level gangway a distance of 750' on an average grade of 12°.

At the Woodward colliery a new slope was sunk on the Red Ash seam, from the east level gangway, a distance of 700' on a grade of about 5°. A tunnel was driven from the same seam, west of the shaft, to the Ross seam a distance of 500' and having an area of 7'×14'. Important improvements were also made in the ventilation of this colliery by erecting new air bridges of substantial brick work. This colliery is opened in excellent shape, and the officials spare no pains in having everything arranged in the best order.

Improvements by the Lehigh Valley Coal Company.

At the Franklin colliery a new air shaft, 8'×10', was sunk near the outcrop of the Abbott seam and connecting with the workings of that seam. This effected a very desirable improvement in the ventilation of the thin upper seams of this mine.

Improvements by the Alden Coal Company.

The main shaft of this company was extended from the Twin to the Red Ash seam and has now a total depth of 586'. An underground slope has also been sunk in the Red Ash seam to a length of 1,741' on a grade of 14°, the average dip of the seam. This work is chiefly in the Ross and Red Ash seams.

Improvements by the Plymouth Coal Company.

At the Dodson colliery a new slope was sunk through the rock across the strata from the Bennett to the Ross seam. Its area is 7'×15' and its length 382' on a grade of 21°. A second opening is now being driven and will be completed in a few weeks. The hoisting engine is located underground near the head of the slope and the engines are worked by compressed air taken down from compressors on surface.

Improvements by the Parrish Coal Company.

The Baltimore seam slope of this company was extended a distance of 700' and opened a productive extent of excellent coal. They leased also the old Buttonwood shaft property and are at work enlarging the old shaft and making preparations to reopen the mine on a large scale.

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 7½×12 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 7½×11 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.

Colliery Improvements During the Year 1896.

The coal trade was unusually lax, requiring work for less than two-thirds time; such improvements only as were urgently needed were made during 1896, and such as were made and had effect on the condition of the mines are recorded in the following:

Improvements by the Lehigh and Wilkes-Barre Coal Company.

In the Empire mine a rock plane on a rise of 25 degrees was driven from the Ross to Baltimore seam in the abandoned Diamond colliery. It is 10x10 feet area and 435 feet in length. It enables the ventilation to be improved and they can work the remainder of the coal in that part of the Diamond mine.

At the South Wilkes-Barre colliery the No. 4 tunnel was extended to a length of 1,200 feet. It is driven from the Hillman through an anticlinal to cut the same seam on the other pitch.

No. 2 slope was sunk and connected to the No. 1 air shaft, effecting a third opening by which the ventilation will be effectively improved.

At the Lance No. 11 colliery two short tunnels were driven from the Cooper to the Five Foot seam. Their lengths are 200 and 250 feet respectively, and they have sectional area of 7x12 feet.

Improvements by the Delaware and Hudson Canal Company.

At the No. 2 colliery the shaft was driven from the Bennett to the Red Ash seam on an extension of 273 feet, making the total depth of the shaft from the surface 859 feet.

Improvements by the Susquehanna Coal Company.

At the No. 1 shaft a rock tunnel was driven from the Lee to the Lee seam through an anticlinal. It is 600 feet in length and 8x16 feet area.

A rope haulage was installed in the Forge seam in place of a mine locomotive, which is a decided improvement to the quality of the air.

In the No. 4 slope and No. 2 shaft several minor improvements were made. A tunnel was driven from the Hillman to the Mills seam. It is 500 feet in length with 7x14 area. An extension was made to the No. 5 slope which added 600 feet to its length. Size, 7x14 feet, grade 11 degrees. An extension of 300 feet was also made to the No. 11 slope.

In the No. 6 colliery Glen Lyon, 5 new gravity planes were made, varying in length from 200 to 500 feet, and a tunnel was driven from the Twin to the Ross seam. It is 700 feet in length and 7x14 feet area.

A compressed air locomotive was put in the **No. 6 slope** to haul the coal from the foot of the planes to the bottom of the slope. This is the second one put in at this colliery and they work very satisfactorily.

Improvements by the Kingston Coal Company.

In the No. 1 shaft a tunnel was driven from the Cooper to the Lance, having 8x12 feet area and 300 feet in length.

One gravity plane 600 feet long was finished and another is being made.

In the No. 3 shaft a tunnel was driven from the Ross to the Red Ash, 420 feet in length and 8x12 feet area.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

In the Bliss colliery two new rock tunnels were driven; one 681 feet long, from the Ross to the Ross seam across a basin, and one from the Baltimore to the Baltimore seam 400 feet across the same basin. Both have a sectional area of 84 square feet.

The Auchincloss shafts were both sunk at the close of the year to a greater depth than any other shafts in this region. The No. 1 was at a depth of 1,719 feet and the No. 2 at a depth of 1,692 feet. Both will be completed during 1897.

Improvements by the Parrish Coal Company.

In the Buttonwood mine four new gravity planes varying in length from 300 to 800 feet were made. Three are in the Hillman and one in the Kidney seam. A slope is in progress of sinking on the Hillman to work the coal to the dip from the shaft. It was at a length of 240 feet at the close of the year.

Improvements by the Plymouth Coal Company.

The rock slope in the Dodson mine was extended from the Ross to the Red Ash seam, an extension of 298 feet. Size, 14x8 feet. Also, another rock slope for second opening 275 feet and 14x8 feet area. These slopes open the Red Ash seam for this colliery.

There were a number of short tunnels, gravity planes and other minor improvements made at a number of the mines, but they were of minor importance and so are not recorded.

the coal from the shaft to the breaker. Another conveyor line was constructed to convey the coal of the Baltimore No. 4 shaft to this breaker.

At the Boston colliery the breaker hoisting tower was torn down and a conveyor was constructed to scrape the coal from the dump at the shaft to the head of the breaker, and in the mine a tunnel has been driven from the bottom to the top split of the Red Ash seam. It is 400 feet in length and 7x12 feet area.

The No. 2 shaft at Plymouth was extended from the Bennett to the Red Ash seam 312 feet, making the total depth of the shaft 898 feet.

A new fan was erected to take the place of the old one. It is 22 feet in diameter, encased by a brick wall. It runs 70 revolutions and is exhausting 97,800 cubic feet of air. The engine is horizontal direct acting, 16x30 inch cylinder.

At the No. 3 colliery, Plymouth, the Hillman seam was opened and a slope was sunk to a length of 620 feet; average grade 12 degrees; 7x12 feet area.

At the No. 4 colliery a new slope has been sunk in the Red Ash seam to a length of 800 and it is still being driven. It is 7x14 feet area and has an average grade of 7 degrees. It opens a large area of excellent coal.

Improvements by the Susquehanna Coal Company.

In the No. 1 shaft, Nanticoke, an extension of tunnel has been driven from the Lee to the Ross seam a length of 960 feet, and 7x14 feet sectional area. A tunnel has been driven from the Forge through troubled ground a length of 1,570 feet, 7x14 feet area and is still being driven. An extension has been made by a tunnel from the Hillman to the Forge seam 650 feet in length, 7x14 feet area. A tunnel has been driven for ventilation purposes from the Hillman to the Hillman 240 feet in length and 7x14 feet area.

In the No. 4 slope, Nanticoke, the main slope has been extended through the rock from the Hillman towards the Forge seam a length of 350 feet and it is still being driven. The No. 21 tunnel was extended a length of 700 feet from the Mills to the Mills and Tunnel No. 23 driven on from the Hillman to the Mills a length of 500 feet. The area of all is 7x12 feet.

In the No. 2 shaft, Nanticoke, No. 5 slope was extended through an anticlinal from the Lee to the Lee a length of 420 feet and the No. 11 slope was driven through the rock from the Ross to the Lee seam an extended length of 850 feet. A new gravity plane 850 feet in length was made in the Ross seam.

At the **No. 6 shaft**, Glen Lyon, No. 5 tunnel was driven to a length

Subs. Coal
No. 5

No. 1 shaft, to take the place of the Hillman seam pump, which has been moved to the Lee seam, obviating the necessity of hoisting the No. 1 shaft water by tanks suspended under the cages.

A new washery was built during the strike to supply boiler coal from the old No. 1 breaker bank; this is located near the old No. 1 slope.

There have been driven ten minor rock tunnels for ventilation and second opening and six planes extended, two of them in rock, as well as a shaft sunk 102 feet from the Hillman toward the Forge seam, in No. 4 slope; the total depth of this will be about 175 feet, making second opening from the No. 4 slope, Forge seam, workings.

At **No. 6 colliery** extensive retimbering has been done, but no new work of importance.

Delaware, Lackawanna and Western Company, 1899.

Woodward Colliery.—Slope in Cooper seam, 7x14 feet, 300 feet long; not completed. Slope in Ross seam, 7x14 feet, 600 feet long; not completed. Engine plane in Bennett seam 7x14 feet, 3,000 feet long. One electric hoist for plane, 80 horse power.

Bliss Colliery.—One shaft for second opening to the Hillman seam; size, 5x6 feet, and 45 feet depth. Tunnel from Baltimore to Hillman, 7x12 feet and 290 feet in length. Slope in Baltimore seam, 7x12 feet, 1,500 feet long; not completed. Slope in Ross seam, 7x20 feet, 1,000 feet long; not completed. Tunnel Forge seam to Red Ash, 7x16 feet, 125 feet long; not completed.

West End Coal Company, 1899.

Outside.—Five-foot high pressure return tubular boilers; three at boiler plant, on top of hill, and two at long drift boiler plant. One 6-inch steam line from long drift boilers to bore hole near barns. One 5-inch steam line from boilers on top of hill to old airshaft and down through bore hole to head of slope. One bore hole for 6-inch steam line near barns and bore hole for water column near same place. One bore hole for rope, from surface to head of Sand drift slope, and engine and engine house placed on surface for same. Removed fan from old Conyngham drift and placed it at mouth of old Black Creek tunnel.

Inside.—Rock tunnel driven from bottom split, Red Ash, to top split, a distance of 310 feet. Rock plane driven from second lift, Baltimore slope, to top split, a distance of 246 feet. Gravity plane in "Klondyke," about 200 feet long.

Improvements by the Susquehanna Coal Company During 1901.

Colliery No. 5.—Shaft No. 2, Nanticoke, completed rock plane from Lee to Ross seams, total length 430 feet—outlet for second opening from head of No. 5 plane to connect with old workings in No. 4 tunnel—airshaft 100 feet deep from surface to head of No. 5 plane.

Shaft No. 4.—Extended rock foot on east side of shaft 125 feet, turned south and drove tunnel 220 feet and struck the coal; drove a tunnel on the north side 600 feet from the foot before reaching the seam, and an outlet for the second opening.

Shaft No. 5.—A plane 350 feet long to the top of the anticlinal on east side of shaft.

Slope No. 4.—Reopened the slope from No. 7 to No. 8 lifts.

Colliery No. 5.—Outside, Babcock & Wilcox boiler plant 500 horse power, and a large addition to the breaker to be used as a jig house.

Colliery No. 6.—Opened up Rider seam in No. 6 tunnel; open cut ten feet deep and 370 feet long for the purpose of getting around to the other pitch at No. 6 slope; No. 6 South shaft, a new traveling way from the head of No. 4 plane to the foot of shafts so that the men need not walk on the motor road. Outside, installed 1,000 horse power Babcock & Wilcox boilers, and large addition to the breaker.

Colliery No. 7.—No. 1 North shaft reopened Cooper seam from No. 17 tunnel, that had been abandoned for several years. No. 1 South shaft, reopened No. 10 slope from top to bottom to take the coal from southeasterly portion up No. 10 slope instead of up No. 5 slope; drove trail slope 500 feet long in Ross seam to develop basin; sunk a bore hole from the surface to the head of No. 10 slope eight inches in diameter for the slope rope. Outside, 500 horse power Babcock & Wilcox boilers; compressor plant to run air motor in No. 1 South shaft, and in the breaker, several Anthracite separators or spiral slate pickers.

In compliance with act No. 212, session of 1901, approved by the Governor the 29th day of May, 1901, this company has at each mine an emergency hospital for the care of injured employes, at least eight feet by twelve feet, and containing the following articles for immediate use: Four woolen blankets, two rubber blankets, eight quarts carron oil, two small rubber tourniquets; one large body rubber tourniquets, one bottle antiseptic lotion, one bottle aromatic spirits of ammonia, one dozen roller bandages, three triangular bandages, one roll adhesive plaster, ten wooden splints, one wash basin, one tin cup, two linen towels, one paper of No. 3 pins, one dozen safety pins No. 2½, one teaspoon, one scissors, two bars surgeon's soap, twelve oz. absorbent lint; twelve oz. absorbent cotton; a sufficient supply is kept at the office to supply the hospitals when necessary; also a record book, two kerosene lamps, two chairs, two benches, two stretchers and a table. The rooms are heated by steam and are very comfortable. Every mine that I have visited since this law went into

during 1901. An 8" bore hole, 749 feet in depth, was sunk from the surface to the Red Ash seam, for operating a new slope in this seam.

Baltimore No. 2.—The hoisting engine house, fans and fan houses and a new steel tower over-shaft were rebuilt. A new plane was constructed from the top of shaft to railroad level for handling the output of this shaft.

Baltimore Tunnel.—No. 6 Slope, Red Ash seam, extended 300 feet; No. 7 Slope extended 400 feet and No. 10 Plane extended 400 feet.

Improvements at the Collieries of the Susquehanna Coal Company During the Year 1902.

No. 5 Colliery.—Outside: Remodelling breaker and rebuilding jig house.

New boiler plant, 2,000 horse power B. & W. boilers, replacing old cylinder boiler plant.

New compressor house, with two-stage Ingersoll-Sergeant compressor, 20" steam, 20 $\frac{1}{4}$ " and 32 $\frac{1}{4}$ " air, 24" stroke.

Inside: No. 2 Shaft, No. 13 $\frac{1}{2}$ inside slope, opened 400 feet to replace No. 13 Slope closed during strike.

Second opening on head of No. 12 rock plane from Lee to Ross.

No. 4 Shaft: New airway in Ross seam from North tunnel to No. 4 air shaft.

Second opening from South tunnel.

Steel roof supports at lower landing, Shaft No. 4.

No. 4 Slope: Rock plane from Mills to George seams, 434 feet long, 7'x14' on a 20-degree pitch.

No. 6 Colliery.—Outside: New B. & W. boiler plant, 2,000 horse power, with steam lines to No. 6 Shaft, replacing cylinder boilers.

New water hoist tanks in No. 6 North Shaft, which is being made into a water hoist shaft.

No. 7 Colliery.—Outside: New hoisting engines, 32"x48", with 13' cast drum, double air brake, and over-winding device, replacing old 28"x72" engines at No. 1 deep shaft.

Pneumatic haulage plant, No. 1 to No. 3 Shafts, completed with three-stage Norwalk compressor, 22" steam, 16", 5 $\frac{5}{8}$ " and 11 $\frac{1}{2}$ " air, 24" stroke, and Porter pneumatic locomotive, 8"x14", with air line carrying 900 pounds pressure, replacing rope haulage.

Old rope haulage engines repaired and put in place for Slope No. 10.

New lamp house constructed, from old rope haulage engine house.

B. & W. boiler plant, 2,500 horse power, replacing 48 cylinder boilers.

to determine safe working rock cover on the flats near the river. New concrete cribs have replaced the old wooden ones in both hoist and ventilating shafts. New and improved safety gates and stop blocks put on Baltimore shaft. New brick electric light house. New brick and concrete safety lamp house. New concrete pump house on river bank.

Franklin Colliery

No. 8 slope extended 320 feet to Brown pillar line. No. 8 tunnel extended 190 feet to Ross vein. No. 15 tunnel is being driven from Red Ash rock slope to Ross, 480 feet to date. Tunnel extended 150 feet in Baltimore slope district to Abbot vein. New tunnel from top to bottom split of Red Ash completed. A new slope started in Ross vein. A new inside slope begun in top split of Red Ash. The old Brown slope reopened. Work is progressing on installation of 300 additional H. P. return tubular boilers. New fan, blowing engine installed. New 14x20 engine set in place at Red Ash second outlet shaft. New corrugated iron powder house. New dam and corrugated iron pump house. Washery completed and working. Number of repairs and alterations made in breaker. Baltimore fan house rebuilt.

SUSQUEHANNA COAL COMPANY

Colliery No. 5

Outside.—Jig house completed. New steel bridge over breaker tracks. New compressor house, and 2-20 $\frac{1}{2}$ and 36x20x36 Ingersoll-Sergeant duplex two stage compressors. One hundred new steel mine cars.

Inside.—Rock plane, Mills to George, unfinished.

Stearns

Inside.—No. 4 shaft tunnels and returns completed, rock turnout for empty cars unfinished. New plane in Ross unfinished.

Colliery No. 7

Outside.—New lamp house completed. New timber yard completed. Remodelling No. 7 breaker, unfinished.

Inside.—New plane in Cooper seam unfinished. Slope No. 14, Ross seam.

Colliery No. 6

Outside.—Two thousand five hundred H. P. B. & W. boiler plant completed, and old cylinder boilers at No. 6 shaft and No. 6 slope abandoned. New rolls and screens in breaker. New railroad from No. 7 shaft to breaker, about 1 $\frac{1}{2}$ miles, completed.

Inside.—New tunnel slope No. 6 to N. shaft No. 6, unfinished.

Sugar Notch No. 9 Colliery

Outside.—Fuel conveyer breaker to boiler house.

Inside.—No. 18 tunnel Baltimore to Cooper, 57 yards; No. 13 tunnel Baltimore to Stanton, 135 yards; No. 16 tunnel Twin to Cooper, 33 yards; No. 17 tunnel Ross to Twin, 37 yards.

Maxwell No. 20 Colliery

Inside.—No. 18 tunnel Red Ash to Ross, 98 yards; No. 10 tunnel extended to Ross, 124 yards; tunnel airway for No. 7 slope, 67 yards; No. 7 tunnel Red Ash to Red Ash, 39 yards; rock plane airway Red Ash to Ross for No. 18 tunnel, 51 yards.

SUSQUEHANNA COAL COMPANY

Colliery No. 5

Outside.—Two new bridges built across Forge Creek for transportation from shafts Nos. 4 and 5, also from No. 14 slope and No. 4 and 4½ drifts. A new Ingersoll duplex compound air compressor placed to further increase the amount of air for hoisting and pumping from No. 2 shafts and No. 4 slope.

Inside.—New tunnel No. 4½ from surface towards Ross seam above drainage level. New slope sunk in Twin Seam inside tunnel No. 8 in No. 2 shaft.

Colliery No. 6

Outside.—A new jig house was commenced for the better preparation of coal at this breaker.

Inside.—An air shaft was sunk to the bottom split Ross seam No. 6 slope; a new shaft 13x16 feet 6 inches was sunk to a depth of 402 feet to the bottom split Ross vein, also head frame, hoisting engines and foundation, compressor, boilers and boiler house, steam line and tracks on surface for same shafts.

Colliery No. 7

Outside.—New jig house as previously mentioned completed and now in operation, also boiler house to contain 4,000 H. P. Babcock and Wilcox boilers has been begun and will be completed during the present year.

Inside.—No. 13 tunnel extension to Hillman seam in No. 1 North shaft; a 12 inch bore hole a depth of 979 feet was driven from the surface to the Lee vein for steam line to furnish steam for pumping from the various levels in No. 1 shaft. There were also purchased during the year at No. 5 colliery, 200 steel mine cars.

IMPROVEMENTS

SUSQUEHANNA COAL COMPANY

Number 5 Colliery, Outside

One pair 16x30 engines erected at No. 5 Breaker to hoist coal into breaker.

One pair 16x24 engines erected on dirt bank.

One battery of 500 H. P., B. and W. boilers erected, making this plant now 2,500 H. P.

One 400 H. P. Climax boiler erected on No. 5 dirt bank, replacing old cylinder boiler plant.

Inside

Number 2 Shaft.—New pneumatic haulage plant installed with three stage Norwalk compressor 22 inch steam, 16 inch and $\frac{1}{2}$ inch by $5\frac{1}{8}$ inch air, 24 inch stroke and Porter pneumatic locomotive 8x14 inch with air line carrying 1,000 pounds pressure.

Number 4 Shaft.—New plane from Bottom to Top Ross.

Tunnel from South tunnel to Twin vein.

New slope from the Basin to Top Ross.

Number 6 Colliery, Outside

Two 400 H. P. Climax boilers at No. 7 Shaft.

Inside

Tunnel from Bottom to Top Ross in No. 6 tunnel.

New plane No. 1, Shaft No. 7, 159 yards.

New plane No. 2, Shaft No. 7, 196 yards.

New dirt and rock conveyor to carry waste material from breaker to foot of dirt plane. Outside.

New Slope Bottom Ross, Shaft No. 7, 80 yards. Inside.

Number 7 Colliery, Outside

New boiler coal conveyor.

Inside

A plane from Forge to Cooper Seams, No. 1 N. Shaft, 79 yards.

Second opening Hillman vein.

New slope Forge Seam.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss Colliery

Four rock tunnels 7x12 have been driven through faults, connecting Ross and Baltimore veins, also Mills and Hillman veins, for ventilation, development, etc.

The installation of a 16 foot dust fan, mechanical pickers, etc., in this breaker, has added decidedly to its efficiency.

A $19\frac{1}{2}$ x $19\frac{1}{2}$ brick and concrete lamp house has been erected.

Bliss Colliery

Two rock tunnels 7x12 have been driven from Baltimore vein to Forge vein,

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

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

WEST END COAL COMPANY

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

LEHIGH AND WILKES-BARRE COAL COMPANY

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

ALDEN COAL COMPANY

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

IMPROVEMENTS

SUSQUEHANNA COAL COMPANY

Colliery No. 5, Outside.—Installed a new fan to remove the dust from the breaker.

Addition to breaker and machinery.

Inside, No. 2 Shaft.—One new air locomotive.

No. 8 tunnel extended to connect No. 2 shaft with No. 4 slope, 182 yards.

New plane No. 6 in Ross seam.

New slope No. 20 in new lift in Ross seam, 148 yards.

No. 4 Slope.—New slope in Forge seam, 193 yards.

No. 4 Shaft.—Second opening for No. 3 slope, new slope No. 3, 141 yards.

Colliery No. 6, Outside.—Two new locomotives to haul coal from No. 7 shaft, No. 10 slope and No. 1 drift to the breaker.

Inside.—New electric haulage in No. 6 tunnel.

New engines for No. 1 plane in No. 7 shaft.

Tunnel Ross to Twin seams in No. 6 tunnel, 71 yards.

No. 11 slope in No. 7 shaft, 228 yards.

Colliery No. 7, Inside.—Two new air motors with air lines for No. 1 North shaft.

No. 17 plane in No. 15 tunnel, 100½ yards.

One new air motor for No. 3 shaft in South shaft No. 1.

New slope No. 23 West Ross in No. 1 South shaft, 205 1-3 yards.

New slope from head No. 12 plane to the Ross seam, in No. 1 South shaft, 228 yards.

Number 6.—Ventilation good; drainage fair; condition as to safety good.

Number 7.—Ventilation, drainage and general condition, good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss.—Ventilation, drainage and general condition, good.

Bliss.—Ventilation, drainage and general condition good.

Truesdale.—Ventilation good; drainage fair; condition as to safety, good.

WEST END COAL COMPANY

West End.—Ventilation and drainage fair; condition as to safety, good.

LEHIGH AND WILKES-BARRE COAL COMPANY

Wanamie.—Ventilation, drainage and general condition, good.

ALDEN COAL COMPANY

Alden.—Ventilation, drainage and general condition, good.

IMPROVEMENTS

SUSQUEHANNA COAL COMPANY

No. 5 Colliery.—A new pump house was made at the foot of No. 2 shaft in which a Goyne Duplex pump, 40 x 23 x 48 inches was installed.

No. 8 tunnel, connecting No. 2 shaft with No. 4 slope, was completed.

No. 6 Colliery.—Built a concrete wash-house with four shower baths and clothes lockers.

An electric generator, operated by a 17 x 15-inch Ridgway engine was installed in the power house.

The steam locomotive used in No. 6 tunnel was replaced by a 7½ ton electric motor.

An electric hoist was installed at the top of No. 12 slope.

No. 7 Colliery.—A brick building 10 feet 9 inches by 10 feet 9 inches was erected and is known as the Draeger Rescue Station. All the necessary equipment, including 4 helmets and charging tanks, is kept in the building ready for use. The station is in charge of John B. Jones, whose duty is to visit the several mines of the company once each month and train the different corps selected for this purpose in the proper manipulation of the apparatus. The apparatus is most effective when it is worn by persons who by training have learned to have confidence in its efficiency.

A return airway 108 yards long was driven in the Cooper seam, from No. 17 plane to No. 13 tunnel level.

A return airway was driven in the Mills seam from the west gangway, No. 30 tunnel to the anticlinal, from which point it was driven

CONDITION OF COLLIERIES

SUSQUEHANNA COAL COMPANY

Number 5.—Ventilation good, drainage fair, condition as to safety good.

Number 6.—Ventilation good, drainage fair, condition as to safety good.

Number 7.—Ventilation, drainage and condition as to safety good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss.—Ventilation good, drainage and general condition good.

Bliss.—Ventilation good, drainage fair, condition as to safety good.

Truesdale.—Ventilation good, drainage fair; condition as to safety good.

WEST END COAL COMPANY

West End.—Ventilation and drainage fair, condition as to safety good.

LEHIGH AND WILKES-BARRE COAL COMPANY

Wanamie.—Ventilation, drainage and general condition good.

ALDEN COAL COMPANY

Alden.—Ventilation good, drainage fair, condition as to safety good.

IMPROVEMENTS

SUSQUEHANNA COAL COMPANY

Colliery No. 5.—A two-story chemical laboratory, 20 feet by 26½ feet, was built of concrete-blocks and equipped with all the necessary apparatus for analysis.

Fire alarm system installed in No. 5 breaker.

Three passenger coaches were purchased during the year and placed in service between Nanticoke and Sterns (shafts Nos. 4 and 5) to carry the employes to and from work.

No. 2 Shaft.—Placed in No. 8 tunnel 62 sets of steel timber.

New pump room has been made at the foot for the purpose of installing another 26 by 45 by 14 by 48 Compound Duplex Goyne steam pump.

No. 34 Tunnel was driven 85 yards.

No. 4 Slope.—Tunnel No. 35 in the Mills Seam was driven 52 yards.

No. 24 Slope was driven 114 yards and is completed.

Colliery No. 6.—A two-story concrete-block building to be used as a supply store was completed.

A new A. C. 300 K. W. engine and generator have been installed in the power house and are now in service, supplying electric current for lighting and transportation.

A new Fairbanks scale was installed.

A bore hole was driven from the surface to the bottom of No. 6 shaft.

No. 12 Slope was driven 149½ yards in No. 6 tunnel. New electric haulage was installed in No. 6 shaft.

Tunnel from the Bottom to Top Ross seam was driven 190 yards.

A 20 by 9 by 18 Duplex Plunger pump was installed.

No. 7 Shaft.—New rock plane was driven 109 1-3 yards.

No. 11—Slope was driven 88 yards.

No. 6 Shaft.—Installed new electric haulage.

No. 1 Drift.—An electric hoist with one Westinghouse Railway type No. 101 E 40 horse power 220 volts series wound 500 R. P. M. motor complete with R 32 single hand controller and grid resistance, has been installed in No. 11 slope.

Colliery No. 7.—An A. C. 150 K. W. engine and generator have been installed for the purpose of running electric motors to be installed in No. 1 shaft.

A. D. C. 200 K. W. engine and generator have been installed for the purpose of furnishing power for lighting the various offices, breakers and other buildings about the Nanticoke collieries.

New fan house, with a 5 by 10 foot Capell fan to be driven by electricity, was completed.

No. 1 North Shaft.—New slope No. 28 was driven 62 1-3 yards.

No. 1 South Shaft.—Second opening No. 19 Slope was driven 105 2-3 yards.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss Colliery.—A 25 foot ventilating fan is being installed. The brick partition separating hoistway and airway, referred to in last year's report, is now completed.

Two rock tunnels have been driven from the George to the Baltimore veins, west of No. 2 shaft, by which a tremendous amount of gas has been liberated. It is intended to use one of these roads for development and transportation purposes, while the other will be used for ventilation and return.

There has also been erected on the outside a 10 by 12 concrete and brick building in which is housed the Draeger rescue apparatus, consisting of four helmets, oxygen storage tanks, pulmotor, electric lamps and other necessary equipment.

A 1,000 horse power boiler plant housed in a concrete building has been erected and is in operation.

A 200 horse power electric hoist has been installed on No. 3 slope, Ross vein.

A 6½ ton electric locomotive has been installed in the Baltimore vein, No. 1 slope.

Bliss Colliery.—A 2,000 horse power boiler, housed in a concrete building, has been erected and is in operation.

A 10-ton locomotive has been installed on West gangway, Espy tunnel, which hauls coal from the interior part of the workings to the surface.

The work of installing a 150 horse power hoist on No. 9 plane, Baltimore vein, is underway.

Truesdale Colliery.—The work of installing two new Jeffrey ventilating fans on Nos. 1 and 6 slopes is underway.

A 24-foot Vulcan fan is being installed on No. 1 shaft.

CONDITION OF COLLIERIES

SUSQUEHANNA COAL COMPANY

Numbers 5 and 7.—Ventilation, drainage and condition as to safety, good.

Number 6.—Ventilation and condition as to safety, good. Drainage fair.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss.—Ventilation, drainage and general condition, good.

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

WEST END COAL COMPANY

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

LEHIGH AND WILKES-BARRE COAL COMPANY

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

ALDEN COAL COMPANY

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

IMPROVEMENTS

SUSQUEHANNA COAL COMPANY

Colliery No. 5.—A steam locomotive 10x16 outside connected, solid frame, saddle tank, with four 30-inch diameter drivers for 42-inch track gauge with 5-foot wheel base, was purchased and placed on the surface between Nos. 4 and 5 shafts.

Old No. 1 slope has been reopened for the purpose of mining pillar and solid coal not previously mined. At the head of the slope an engine and house were erected to hoist the coal to the surface.

No. 26 slope in No. 4 shaft was driven during the year 163 yards and is completed.

A second opening was driven in No. 4 shaft a distance of 126 yards and is completed.

A 26x45x48 Compound Duplex Goyne pump was installed at the foot of No. 2 shaft, and the old Bull pump was removed.

Colliery No. 6.—A new platform conveyor line was installed in the breaker during the year to convey the coal from No. 6 tunnel to the head of the breaker. This coal was formerly hoisted by rope haulage.

Built a new car and smith shop.

Installed in No. 11 slope, No. 6 tunnel, an electric pump, capable of handling 150 gallons of water per minute.

A tunnel was driven in No. 6 shaft a distance of 98 yards.

Electric haulage was installed in No. 7 shaft and three 7-ton, 250 volt electric motors placed in the shaft for transporting coal.

New air shaft in No. 7 shaft was driven 127 yards.

A slope was driven in the Hillman seam, Slope No. 6, 83 yards.

Slope No. 13 in No. 1 drift was driven a distance of 90 yards.

No. 4 slope in No. 4 shaft was driven 88 yards.

Number 6 Colliery.—Installed in breaker new dump shakers and a new dust fan.

One hundred twenty-five new steel body mine cars were added to equipment.

No. 22 tunnel, No. 6 slope, was driven 129 yards, and a 10 by 5 double inlet fan, driven by electricity, was erected for the purpose of ventilating the workings therein.

No. 3 rock plane, No. 6 slope, was driven 60 yards and completed.

No. 35 tunnel, No. 7 shaft, was driven 54 yards and completed.

New airway No. 11 slope, No. 7 shaft, was driven 137 yards and completed.

A new hoisting engine and engine house were erected at the head of No. 7 shaft.

No. 9 slope, No. 7 shaft, was driven 68 yards.

Number 7 Colliery.—Installed in breaker new spiral slate pickers, new dump shakers and a new dust fan.

Installed in electric power house: 1 motor, 2 generators and 2 Ridgeway electric engines, 10 by 10 and 25 by 24.

Placed in North and South shafts 64 sets steel timber—40 sets at foot of North shaft and 24 sets in South shaft barn.

No. 29 slope, North shaft, was driven 171 yards and completed.

No. 31 slope, South shaft, was driven 100 yards.

Nanticoke Washery.—The washery was completed and began operations May 22.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss Colliery.—The 35-foot ventilating fan referred to in last year's report is now in running order.

All mule barns, pump-rooms, hoist-rooms, etc., have been reconstructed of concrete and steel.

Bliss Colliery.—The concrete and brick partition separating hoistway and airway in this shaft is completed to the surface.

Built a new brick and concrete supply storeroom. Completed the rebuilding of mule barns, etc., reported under way in last year's report.

Several rock tunnels driven for development and ventilation purposes.

The hoisting engines on the shaft have been equipped with Welch automatic engine stop.

Truesdale Colliery.—The work of reconstructing this breaker with steel is now completed.

Shaft hoisting engines have been equipped with the Welch automatic engine stop.

Several rock tunnels have been driven for development purposes, return airway, and second openings, from Mills to George vein, Ross to Red Ash vein and from Forge to Baltimore vein.

At No. 20 tunnel, Sugar Notch, Truesdale mine, the work of driving through to Red Ash vein was completed during the early part of the year.

A rock slope is being driven through fault, west of No. 7 tunnel, to the Ross vein.

The entrance to the Espy tunnel section has been made fireproof by removing all timber sets, cribbing, et cetera, and erecting side walls and I beams.

SUSQUEHANNA COAL COMPANY

Colliery No. 5.—49 new steel-body mine cars were added to equipment.

81 sets of steel timber were placed in No. 8 tunnel.

No. 21 plane in No. 2 shaft was driven 78 yards.

For protection against fire about the colliery an Ajax chemical fire engine was added to equipment.

Mills slope in No. 4 slope was driven 48 yards and completed.

A new No. 46 tunnel from Mills to Mills seam in No. 4 slope was driven 83 yards.

A new No. 47 tunnel from Forge to Cooper seam in No. 4 slope was driven 68 yards.

A new 14 by 8 by 13 horizontal piston pump was installed in the Hillman slope in No. 2 shaft.

The head of No. 4 slope, which was originally wood, was made fireproof with concrete and steel. There is no wooden timber in this slope within 800 feet of the head.

A new Telephone Exchange was installed in the supply store. The exchange is connected with all openings about Nos. 5 and 7 Collieries and an operator is on duty from 6 a. m. to 6 p. m. daily.

Commenced the building of a new steam line from Colliery No. 7, new Babcock and Wilcox boilers, to Black Hill, Lee, Ross and No. 1 slope. This line will be 15 inches for a distance of 2,200 feet and 5 inches for a distance of 4,300 feet.

No. 4 slope in No. 4 shaft was driven 29 yards and completed.

Colliery No. 6.—Installed in the power house a 20 by 24 by 7 inch R. H. Hamilton engine and Westinghouse generator.

Added to equipment 51 steelbody mine cars and a 10 by 16 inch tank locomotive. The locomotive hauls the coal between No. 7 shaft and the breaker.

No. 22 tunnel was driven 52½ yards and completed.

No. 11 slope in No. 7 shaft was driven 78 yards and completed.

11 sets of steel timber were placed in pump house at foot of No. 6 shaft.

No. 22 tunnel outlet was driven 190 yards.

A new 10 by 5 double inlet exhaust mine fan was installed to ventilate No. 7 shaft workings.

An electric pump was installed in No. 13 slope, No. 1 drift.

Colliery No. 7.—Placed in breaker 7 spiral pickers. In March commenced the erection of 4 batteries, 1818 horsepower Babcock and Wilcox boilers. This plant will furnish steam for the operation of Black Hill, Lee, Ross and No. 1 slope, replacing the old cylinder boilers now located at No. 2 slope, Lee and Ross.

New rock plane in north shaft was driven 86 yards and completed.

No. 31 slope in south shaft was driven 100 yards.

Installed in No. 19 slope in south shaft a pair of 10 by 12, 50 horsepower double cylinder friction drum hoisting engines.

Placed in No. 7 plane in north shaft 33 sets of steel timber.

An airway, top split of Mills, north shaft, was driven 132 yards.

under way for the development of this property. This colliery is the only one in operation in the Anthracite Coal Fields that has shipped to market over one million tons of coal in two successive years.

SUSQUEHANNA COAL COMPANY

Colliery No. 5.—Placed in No. 8 tunnel 50 sets of steel timber. Placed in No. 6 lift, No. 4 slope, 25 sets of steel timber.

Colliery No. 6.—Installed a shortwall electric mining machine. At the head of No. 7 shaft a new steel head frame was built to replace the wooden structure. A wash-house was built during the year and a new fire alarm system was installed in the breaker.

Colliery No. 7.—A rock airway, for the purpose of ventilation, from the lower workings of the south shaft to the surface, was driven 259 yards during the year.

LEHIGH AND WILKES-BARRE COAL COMPANY

Wanamie Colliery.—Tunnel for ventilation driven from Top to Bottom Baltimore, No. 24 tunnel east. No. 37 tunnel driven from Top Baltimore to Hillman. Tunnel driven from Hillman to Hillman, No. 12 tunnel west. No. 13 slope extended Top Baltimore to Baltimore.

CONDITION OF COLLIERIES

SUSQUEHANNA COAL COMPANY

Numbers 5, 6 and 7 Collieries.—Ventilation, fair. Drainage and condition as to safety, good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss and Bliss Collieries.—Ventilation, drainage and condition as to safety, good.

WEST END COAL COMPANY

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

LEHIGH AND WILKES-BARRE COAL COMPANY

Wanamie No. 18 Colliery.—Ventilation fair. Drainage and condition as to safety, good.

ALDEN COAL COMPANY

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

E. S. STACKHOUSE COAL COMPANY

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

EAST ALDEN COAL COMPANY

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

IMPROVEMENTS

SUSQUEHANNA COAL COMPANY

Colliery No. 5.—Purchased 24 new steel body mine cars. Installed in No. 5 breaker 4 new Wilmot jigs.

Placed 151 sets of steel timber. Erected electric sub-station for electric haulage. Completed 12 inch steam line for new power plant.

Rock tunnel No. 6, in No. 4 shaft, Stearns, from Bottom to Top Ross seam, was driven 109 2-3 yards during the year.

Colliery No. 6.—Purchased and placed in service 28 new steel body mine cars.

No. 5 tunnel, from Bottom Ross seam in the Glen Lyon basin to the Bottom Ross seam in the Priscilla Lee basin, was driven 186 yards during the year, making a total of 1,043 yards driven to date.

No. 5 plane, from No. 5 tunnel, was driven 297 1-3 yards during the year. No. 32 tunnel, from No. 5 tunnel, was driven 69 2-3 yards during the year.

A new wash-house was erected at No. 7 shaft.

Colliery No. 7.—Installed 12 Wilmot jigs and 3 Norman pickers in No. 7 breaker.