

case that persons, holding responsible positions under our large companies and small operators, are selected, less from the practical knowledge possessed by them, or the duties pertaining to the place, than from the fact of relationship to high officers, or other equally unworthy and improper motives. No other condition, save that of fitness for the place should govern the selection of men upon whose skill, coolness and judgment the lives and safety of others depend. More than one fearful accident during the past year, entailing great loss of life and property, have borne witness to the truth of this proposition.

Some expression of opinion has been made upon the subject of increasing the number of inspectors. In my judgment no increase is necessary at present. With a proper appreciation of individual responsibility upon the part of owners and superintendents all the legitimate benefits that can result from the inspection of mines may be attained under the present system. It was not the purpose of the law, as I view it, to create a mine superintendent in the office of inspector, but rather to cloth with official authority one whose watchfulness and care should constantly prompt others to obey the requirements of the law, and in case of flagrant neglect to require its enforcement. It is a mistake, not seldom made, to suppose that the dictum of an inspector can take the place of positive enactment. The responsibility of wrong construction should be upon the violator, even though backed by the erroneous opinion of an inspector.

PROSECUTIONS.

I have caused legal proceedings to be taken to punish infringements of the law, viz: Against five persons for riding upon loaded cars up a slope called the Gaylord slope, near Plymouth.

Also, against three persons for the same offence at the Mineral Spring slope, near Wilkesbarre.

No penalty was insisted upon by me save a payment of costs, these being the first cases prosecuted and the defendants pleading ignorance of the law. The effect upon the whole district has been salutary. Action was taken against the agent of the Consumers' coal company for not reporting accidents, also against Broderick, Conyngham & Co., for a similar offence, which resulted in obtaining judgments for \$25 in each case—the minimum penalty. These also being the first cases of this class.

I caused bills in equity to be filed in the common pleas of Luzerne county against Samuel Bonnell and others, the Consumers' coal company and the Wilkesbarre and Seneca Lake coal company, charging them with a violation of the ventilation law in working their several collieries without having provided the second opening required, and praying for injunctions to restrain them.

In the two former cases injunctions were promptly granted by the court. The latter case being of a somewhat different kind, and late in the year when brought up, was discussed; but no opinion given before the court in this case; it was a slope extended downwards, called a new lift.

Also, against the Northern coal and iron company, charged them with a violation of the ventilation law in not providing a sufficient quantity of pure air in their colliery. The court granting an injunction in this case also promptly.

Also, against Broderick, Conyngham & Co., charging them with a violation of the law in not providing a sufficient quantity of pure air in the mine known as the Washington mine. This case was not disposed of for some time, had several hearings; in the meantime the condition of the mine was somewhat improved.

No. 1 slope.—This slope, as stated before, is located at the northern end of the second opening to the old shaft, and is on the same vein; it is now ready to hoist coal, having its machinery, &c., in working order; some coal is being hoisted at present for local sales; but the new breaker and the road leading thereto are not quite ready.

No. 2 shaft.—This shaft is located north-west of the old shaft some distance, and is intended to work the coal from the north and west as far as their jurisdiction goes. The work is being done by direction of the general superintendent, Daniel Edwards, Esq.

WILKESBARRE AND SENECA LAKE COAL COMPANY'S MINES.

This colliery is located on the plank road near the Hillman old colliery. The same vein is being worked as formerly was worked by Hillman & Son, hence called the Hillman vein. Besides the above, there has been another vein tunneled into, but not much coal worked out from it as yet.

The surface opening is a slope, which is sunk about 600 feet below the old Hillman (or water level) gangway. One lift is just opened out at bottom of slope. The other lift 300 feet below the water level is the one in regard to which we had so much law in regard to the second opening. This matter having been well ventilated through the papers from time to time, I do not deem it necessary to go into the details in this report, but suffice it to say, that the action of the inspector was sustained by the decision of the county court, which has since been affirmed by the Supreme Court.

That part of the mine just referred to has been idle for many months this year, but is now being worked in compliance with the requirements of the ventilation law. There is considerable gas generated in that part of the mine, but with ordinary care on the part of the mine boss and the employees, there should be no serious difficulty in ventilating the place.

There is some work being done on the old water level lift. It is an old working, and is difficult to get any extra current to circulate the face of the mine. There is a small furnace being used at present to ventilate the same.

Ventilation is produced for the lower working by a fan 12 feet diameter. Amount of air at face of mine 10,550 cubic feet per minute; amount at outlet 32,000 cubic feet.

Wm. B. Maffet, general superintendent; J. Teasdale, mining boss.

WILKESBARRE COAL AND IRON COMPANY'S MINES.

The mines operated by this company are located some on the north and others south of the Susquehanna river, and consist of 4 shafts, 7 slopes, 1 tunnel and 1 drift producing coal, exclusive of two drifts abandoned, Hollenback No. 1 and the Hartford water level drifts. In addition to the above, there are 4 shafts, 3 tunnels and 2 slopes now being opened or sunk.

No. — tunnel.—This is a new opening. It is located at Espy, a small village between Warrior Run and Wanamie. It has been driven southward into the base of the mountain about 1,500 feet. The intention is to reach the Red Ash vein. It is discontinued for the present.

No. — Slope.—This slope also is located at Espy. It is a new one; just being sunk, and is down at present about 200 feet. It is opened on the cropping of a vein just outside of the tunnel entrance. No breaker has been built at this place yet.

Geo. Parrish, general superintendent.

No. 9 shaft.—This shaft is located within the borough of Sugar Notch. It is sunk into a small vein called the five feet, from which a tunnel has been driven into what is generally called the Ross vein here.

This has been rather a troublesome mine to ventilate, on account of having met with so many large rock faults. Besides that, their fan is placed at so great a distance away from the working that much of its power is expended by friction outside of the working part of the mine. Notwithstanding this, the mining boss,

SENECA COLLIERY.

This colliery is located in Pittston borough, and situated one-fourth of a mile south-east of the Susquehanna river. The opening consists of a slope three hundred and thirty feet long, driven at an angle of 19°; the opening is 6 by 8 feet; it is operated by the Pittston and Elmira coal company. Jos. Cool is general mine superintendent and Israel Watkins is mining boss.

Description.—There is a breaker connected with these mines, situated about three hundred feet away; they mine and prepare about three hundred and twenty-five tons of coal per day; they employ 33 miners, 33 laborers, 23 drivers, 6 door-boys and 22 company men in the mines; 27 slate pickers, 4 head and plate men, 3 drivers, 11 company men, 4 mechanics and 1 boss outside; in all 167 men and boys; there is a plane in operation in the mines; length 220 feet. They are working the Pittston and Checkered veins; average thickness of the Pittston 10 feet, and of the Checkered 6½ feet; they work headings 10, air-ways from 12 to 15, and chambers 24 feet wide; they leave pillars in each vein about 15 feet wide to sustain the roof; they leave cross-entrances in the Pittston about 30 feet, and in the Checkered vein about 25 feet apart, for the purpose of ventilation; the roof is 3 feet of slate next the coal and the rest is good rock. The mines are in a good working condition.

Ventilation.—Ventilation in the Checkered vein is produced by means of a furnace, and in the Pittston vein it is produced by the action of the atmosphere; the intake for both veins is located in main opening; the outcast for the Checkered vein is located in furnace air shaft; the outcast for the Pittston vein is located in Ravine shaft; the area of the intake is forty-eight feet and the area of the outcast is twenty-six feet; the amount of pure air is 25,000 cubic feet per minute; there is some inflammable gas evolved in the mines; the mines are examined every morning before men go to work and every evening to see that the main doors are all closed; the main doors are hung so that they will close of their own accord; they have attendants at the main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in one volume in both veins; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine of 30-horse power and one hoisting engine at the slope of 40-horse power; they have flanges of sufficient strength and dimensions attached to their hoisting drums; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of the mines; in the Pittston vein they are connected with Ravine shaft, which can be used as a second opening, and the second opening for the Checkered vein is located sixteen hundred feet from the main opening; they have no house for men to wash or change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded cars in the mines; the parties having charge know their duty in case of death or serious accident; the breaker machinery is fenced and boxed off so that operatives are safe.

RAVINE COLLIERY.

This colliery is located in Pittston borough, and is situated one thousand feet south-east of the Susquehanna river; the opening consists of a shaft; it is eighty feet deep to the Checkered and one hundred and fifty feet deep to the Pittston vein; the opening is ten by sixteen feet; it is operated by the Pittston and Elmira coal company. Jos. Cool is general mining superintendent and Israel Watkins is mining boss.

Description.—There is a breaker over the shaft; they mine and prepare about three hundred tons of coal per day; they employ in the Pittston vein 10 miners, 10 laborers, 7 drivers, 2 door-boys and 6 company men, and in the Checkered vein 18 miners, 18 laborers, 7 drivers, 4 door-boys and 8 company men; 27 slate pickers, 6 head and plate men, 6 drivers, 12 company men, 5 mechanics and 1 boss outside; in all 147 men and boys; they are working a slope in the Checkered vein 250 feet long; they are working the Pittston and Checkered veins; average thickness of

accidents to the thoughtless and inexperienced workers in mines, thereby relieving the tax-paying community of the support of widows, orphans, and cripples, which might become a public burden.

In my investigations into the source of accidents in mines, I find that a great many are caused by the use of an inferior quality of oil, which is used very extensively. It is a compound of lubricating or black oil and kerosene. It throws off large volumes of smoke, vitiating the air to such an extent that it is unhealthy to breath, and its odor is very offensive. It requires a large volume of air to dispel it and render it fit for respiration. The use of this oil in mines I consider a violation of sections seven and twenty of the mine laws of 1870. Whenever I can get such testimony as will justify me in bringing an action in court, I will test the legality of its use in the mines of this district.

There have been mined in this district, for the year 1881, 7,711,660 tons of coal. If the coal trade should demand more coal for the present year, we are in a condition to mine and prepare at least 10,000,000 tons.

Respectfully submitted,

PATRICK BLEWITT,
Inspector of Mines, &c.

GENERAL IMPROVEMENTS.

Fairmount Shaft Colliery.

This is a new colliery, located in Pittston township, on the line of the Susquehanna division of the Central railroad of New Jersey. It consists of a shaft opening, ten by twelve feet, and one hundred and ten feet deep, to the next seam of coal below the Pittston seam. The coal is six feet thick. The breaker has a capacity of preparing about four hundred tons of coal per day. The second opening is a rock tunnel driven from the Pittston seam of coal to the mine workings. Ventilation is produced by a fan twelve feet in diameter by three and two thirds feet face. There is a safety carriage for use when necessary.

Seneca Slope Colliery.

There was a new plane built at this colliery, four hundred and fifty feet long, with friction gear-attached, for hoisting culm from the breaker. They also extended the slope inside three hundred and fifty feet more to the third seam of coal, and put in place a forty horse-power engine, which hoists three cars of coal up the slope each trip; also placed four new boilers at mouth of slope to furnish steam for new engines, &c.

Twin Shaft Colliery.

They erected a new fan at this colliery fifteen feet in diameter, by four and a half feet face, also finished new breaker, with a capacity of four hundred tons of coal per day.

The **Seneca** shaft was extended to the Red Ash vein, a distance from the surface of 492'. The second opening has been completed in this vein with the Ravine shaft.

Greenwood Coal Company (Limited).

A new shaft 11'x26' was sunk by this company, from the surface to the "New County" and Dunmore No. 2 vein, a distance of 232'. The shaft is located convenient to the breaker, and opens a large field of coal which could not be got conveniently from the old shaft. A new 17-foot fan has been erected on this shaft to ventilate the workings of both seams. A slope was extended from the surface down to the seams for second opening. A new shaft was sunk by this company on the lands of the east-side "Bondholders" near the intersection of the C. R. R. of N. J. with the Delaware and Hudson Canal Company at Minooka, Lackawanna county. The breaker was completed in July, 1889, and has a capacity of 800 tons per day. It had not started to prepare coal for market at this writing.

Butler Mine Company (Limited).

At the Schooley colliery a new 18-foot Guibal fan was erected on a part of the second opening. This makes the second fan used in ventilating these shaft-workings, which gives very good results.

Avoca Coal Company.

The old Swoyer shaft located in Avoca borough, and which was abandoned for a number of years, has been re-opened by this company. The shaft is 11'x19', depth 70', sunk on the Stark vein. The workings are ventilated by the consolidated fan which is connected with the workings of this shaft. A new breaker has been built to prepare the coal for market, with a capacity of 400 tons per day. It is heated throughout by steam, and everything in and around the breaker is in as safe a condition as possible.

Lancliffe Coal Company.

The old No. 12 shaft which was sunk to the Red Ash seam located in the borough of Avoca, has been re-opened by this company after having been abandoned for a number of years. They are mining the bottom split of the vein which was left by the Pennsylvania Coal Company, who mined the upper seam. The rock between the seams is very thin, so that great care will have to be exercised with the roof so as to keep it up as they advance. A new 15-foot fan has been erected on the shaft to ventilate the workings. A new breaker, having a capacity of 600 tons per day, has also been built to prepare the coal for market. It is heated by steam and all the dangerous parts of the machinery boxed, or fenced off.

new column complete, installed in Red ash district. New fire proof pump room built for same.

New safety gates built at Red Ash shaft.

New carpenter-blacksmith shop, 52x56 completed.

Seneca Colliery

Several other improvements are under way, but as they are not completed you probably will not care for them. They are as follows:

Two tunnels, one 200 the other 300, through fault in property known as "Old Forge 88," in Twin shaft.

Two bore-holes, one 12 inch, the other 14 inch from surface to the Red Ash vein for drainage purposes. It is proposed to pump the water from this vein through these holes and do away with column pipes in shaft.

A shaft has been started to tap the Pittston vein about 500 feet below the Seneca breaker.

Seneca

Which includes the New or Coxey, the Twin, the Columbia, and the Phoenix shafts.

1st. At the Twin shaft the old wood fan-house was replaced by one of corrugated iron. This insures greater safety from fire, for owing to its proximity to the D., L. & W. R. R. danger from this source was always present with the old structure.

2d. The cribbing in the Twin shaft consisted of a single line of 12x12 hemlock timber. Upon this rested the shaft tower, sixty feet in height. The coal cars landed on fans and run off on a trestle twenty-five (25) feet above the ground. The said trestle extends a sufficient distance east of shaft to allow the passage of empty cars which are hauled from the breaker by a 12½ ton locomotive. The cribbing having been in place between nine and ten years began to crush and bulge into the shaft under the weight of the shaft-tower and trestle. Owing to these conditions it was decided to replace the old cribbing with one of concrete, and if possible, without delaying the operation of the shaft. This was successfully accomplished in the following manner.

The inside dimensions of the cribbing (old) was 12x17x35 in depth. In the line of old buntons several hard wood buntons one on another were placed in good hitches cut in the rock at foot of old cribbing. On these buntons rested a line of posts, six in all, which reached to a point above the top of old cribbing. By means of hydraulic jacks the overhead weight was taken off the old cribbing and placed on 12x16x40 oak timber that was put across the shaft, on top of posts,

LEHIGH VALLEY COAL COMPANY

Seneca Colliery.—During the latter part of December, 1903, a disturbance occurred in the Sixth vein workings of the Twin shaft near Susquehanna river.

On Friday morning, January 1, it was discovered that the D., L. and W. bridge, crossing the Susquehanna river had sunk eight inches in the center. As this bridge is located over the Old Twin workings it was reasoned that the present disturbance was caused by the gradual settling of the old workings. To check the trouble a great number of cogs were placed, and the workings thoroughly silted, filling all the places thoroughly. By this means the squeeze was effectually stopped.

Two bore holes were driven from the surface to the sixth vein on the Bank farm tract for pumping purposes.

A rock tunnel was driven from the Marcy vein workings in the Coxey shaft to a point near the foot of the Twin shaft in the same vein. This enabled the abandoning of the Coxey as a coal shaft. Coal is now hauled from the workings in the shaft by an electric motor to the Twin shaft.

Two shafts were sunk to the Pittston vein at a point about 600 feet southwest of the Seneca breaker; one for a coal shaft, the other for a second opening. Coal is now being hoisted from this vein.

The hoisting apparatus has been taken away from the old Columbia shaft. A system of stairs has been put in place in the shaft by which means men can go to and from their work if they so desire.

Two tunnels were driven from the bottom of the upper split of the Marcy in the Coxey shaft.

A tunnel was driven in the Twin shaft from the 6th vein 350 feet at an angle of 20 degrees through a fault on the Bank farm tract.

Two tunnels from top to bottom Ross.

New brick boiler house has been constructed.

One 250 H. P. Root boiler installed, and 300 H. P. Stirling boilers now under construction.

A system of fire protection, water lines, fire hydrants, etc., has been installed.

The fan has been entirely rebuilt.

A new second opening is under construction from the Pittston vein to the surface.

A new central pumping station is being pushed to completion in the Marcey vein.

Steam lines have been taken out of slopes and are now run down new 10 inch bore hole.

A 14 inch column pipe is being constructed.

Six inch silt hole completed from surface to the Marcey vein.

Williams crusher being installed.

A new Duplex pump has been placed in the Marcey vein.

The old flue boilers and cylinder boilers have been dispensed with.

New warehouse built.

New brick boiler fan, feed and fire pump house completed.

Pittston vein is being regraded and enlarged.

Drainage bore hole completed from Pittston to Marcey vein.

Seneca Colliery.—Six new jigs were installed in breaker.

The new shaft to the Pittston vein was completed, and a second opening was also driven.

The Phoenix is now ventilated from the Twin and Coxey, as the fan for that purpose has been removed to the Pittston vein shaft.

TEMPLE IRON COMPANY

Mt. Lookout Colliery.—The main shaft has been sunk from the Marcey vein to the Red Ash vein, a distance of 180 feet. A connection has been driven between the main and supply shafts in the Red Ash vein, and the gangways continued in a southerly course from the main shaft, a distance of 600 feet.

A rock slope was driven from the Marcey vein to the Red Ash vein on 19 degree dip, 560 feet in length. This slope cut the Red Ash vein about 1,000 feet southerly from main shaft. Gangways were turned on course to meet gangways driven from main shaft, and have 200 feet of drive to make connection. Two new 7½ ton electric locomotives have been installed in Marcey vein and are giving good satisfaction.

The main fan house, containing two 8x20 foot fans, was burned on June 5. The fire is supposed to have started from a hot journal. One fan was repaired sufficiently to enable men to resume work after two days idleness; the other fan was repaired and enclosed by a concrete building. The engine house, fan casing, division wall, air ducts and spiral are entirely made of concrete, making an absolutely fire-proof building. On account of the effect of cold weather on concrete during construction they have decided to defer the erection of the other fan house until spring.

A pair of 20x38 inch hoisting engines were erected on the supply shaft in place of a pair of 14x16 inch engines, which were inadequate

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

LEHIGH VALLEY COAL COMPANY

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

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

HILLSIDE COAL AND IRON COMPANY

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

HUDSON COAL COMPANY

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

JERMYN AND COMPANY

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

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

ELLIOTT, McCLURE AND COMPANY

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

Avoca Shaft.—The tracks in the Avoca mine have been narrowed to the gauge of Laws shaft. Rock was taken down on some heading roads to accommodate the Central mine cars. All the coal in the Avoca mine will be footed at Laws shaft and prepared in Central breaker, when operations are resumed.

Old Forge Colliery.—The addition to the washery is nearly complete; jigs to prepare buck, pea and nut coal have been erected and will be in operation in two weeks.

No. 1 shaft was thoroughly repaired during the year; the old wood cribbing was taken out and replaced with concrete; the wood engine house was torn down, and replaced with a brick building; all buntons, guides and brattice work were renewed and the shaft remodeled.

Six, seven and one-half ton cable reel motors have been added to the electrical equipment, as follows: two at No. 2 shaft, two at No. 1 shaft, and two in the Clark Mountain drift. At Old Forge No. 2 shaft a new mine hospital and foreman's office has been built in the Five Foot vein.

The ventilation is being continually improved. A new air shaft to be sunk near the most advanced workings will give another outlet and an abundance of air.

The Old Forge mines are in good condition.

LEHIGH VALLEY COAL COMPANY

William A. Colliery.—The company drove a plane in the Red Ash vein, connecting the Lawrence and the William A. mines and installed an oil burning locomotive for inside transportation between Babylon and William A. All the coal from the Lawrence shaft workings and drift workings and also from the Babylon shaft workings and drift workings, is being conducted underground to the foot of William A. shaft and prepared in the William A. breaker.

The condition of the Lehigh Valley collieries in this district is such that a great deal of care is required on the part of the Inspector which is very annoying to the officials in charge.

Seneca Colliery.—The No. 9 slope in the Twin Shaft, Marcy vein, has been driven to the 5th and 6th veins, which are being developed near Scovel Island.

Rapsons tunnel has been driven through the big fault near or on the Phoenix lease, and the Marcy veins are being developed on the west side of this line of disturbance; the new air returns for the Columbia shaft workings and the Twin Marcy slope have been completed; a very modern concrete mule barn to accommodate 60 mules has been built, and also a concrete station house inside for the ambulance car. A pump house is being built at the foot of the Marcy vein slope for the installation of some heavy pumping machinery.

In the Pittston vein, the thickness of roof cover is the problem. The workings are parallel to and under the Susquehanna river, and the quantity of sand wash over the vein is a condition sufficiently serious to impress the company with the advisability of keeping the development of this vein isolated from their other workings, and advancing only when a bore-hole, sunk ahead, proves the thick-

A new 3-stage Norwalk high pressure air compressor, 600 cubic feet capacity, was installed in a brick building erected east of the boiler house. A new tower was erected over the Knight shaft. Washery walls rebuilt, jigs renewed; and washery was given a general overhauling.

Installed dust exhaust fan at breaker.

Constructed a 75,000 gallon capacity colliery emergency reservoir.

Westmoreland Colliery.—A new second opening plane had been driven for a manway from the Marcy to the Pittston vein; also a tunnel through the fault in the Pittston vein for a manway.

Electric haulage has been installed in the Marcy and Pittston veins with great success. A concrete and steel over-cast was built in Marcy vein.

Several drainage bore holes have been driven from Pittston to Marcy veins to drain water to the central pumping plant. Silting is being successfully done in the old workings of the Marcy vein.

Maltby Colliery.—Two drainage holes have been driven from Baltimore to Six Foot vein. Old cribbing in No. 1 Shaft was renewed. Steel roof supports are about to be placed at foot of No. 2 Shaft.

A new 800 gallon electric-driven pump was placed in west No. 4 lift, and main return airways have been enlarged generally through the mines.

The old Six Foot gangways are being reopened to connect with Hunt shaft workings.

Seneca Colliery.—A new pumping plant was installed in the Marcy vein at the basin. A Jeansville Duplex pump, size 28 x 12 inches, fed by steam dropped from surface through new bore hole, lifts 2,000,000 gallons of water per day through a 16 inch bore hole lined with 12 inch terra cotta pipe cemented, a height of 275 feet, to the surface, where it discharges near the west bank of the Lackawanna river and flows to the river. This improvement over numerous local pumps and drainage holes, with the main pumping station in the Bottom or Sixth vein, has proven satisfactory.

No. 6 Slope in the Bottom Marcy vein has been graded through the dividing rock and top Marcy vein, so as to connect the head with main motor road, thus reducing the haul between head of slope and the shaft 2,500 feet. This slope extends to No. 11 tunnel, driven through the main fault, and is operated by 12 x 16 inch engines with tandem drums and tail rope.

At the Sixth vein landing of the shaft a concrete arch has been built and all timbers removed. This affords ample room to work and has stopped the flow of water previously known.

No. 12 Rock Slope has been sunk from the Marcy vein to the Clark vein, which will develop the Clark vein at a lower level and west of the present Clark vein workings at Phoenix.

The Phoenix Shaft was concreted from the rock, thus replacing the old cribbing. These concrete walls were built to a height of six and one-half feet above the ground, thus replacing the wooden fence that previously enclosed the shaft and making any inflow of water impossible.

William A. Colliery.—At William A. Colliery, in the Red Ash vein, the method of pumping is being changed to handle the water while robbing the pillars at the foot of No. 3 Slope or at the southern corner of the Flagg-Drake property. A Jeansville pump, size 22 x 18 x 10 inches, has been placed on the lower gangway off No. 3 Slope

The mine tracks at No. 10 tunnel were rearranged so as to dump the coal from mine cars into railroad cars, to be transported to the William A breaker for preparation. Coal from railroad cars is dumped on to a 36 inch belt conveyor, about 90 feet long, which conveys coal into the mine cars near William A shaft.

An 8 inch hole, 150 feet deep, lined with 4 inch terra cotta pipe, was drilled from surface to Middle Red Ash near William A breaker, to run silt from the breaker into the mines.

The wooden cribbing and buntons at William A shaft were replaced by steel.

Seneca Colliery.—A new concrete mule hospital for the treatment of sick and injured mules was built near the outside barn. A concrete mule barn was also built at Pittston shaft. Steel cages were placed in the shaft to take the place of the wooden ones. An automatic electric fire alarm was installed.

A new 20 by 30 double geared engine was installed at the head of No. 9 slope; steam is exhausted through a 12 inch bore hole to the surface.

Bore holes were drilled from Marcy vein and Clark veins for drainage, eliminating small pumps.

A 10½ ton motor replaced the 7½ ton motor which hauls coal from Nos. 5 and 9 slopes to the foot of the shaft.

A motor barn was built in the Marcy vein, equipped with electric lights and chain hoist.

Shaft timbers at the Marcy vein landing in Twin shaft were renewed and concrete footing placed under cage fans.

Telephones were installed in different parts of the mines.

No. 11 tunnel was extended to Clark vein north of fault; No. 12 tunnel was driven from Marcy to Clark vein, to develop Clark vein north of fault and west of No. 11 tunnel.

No. 16 slope was driven from Marcy to Clark vein, to develop the Clark vein south of fault. A rock plane for return was driven back to Marcy vein.

A 9 inch by 10 inch triplex electric pump was installed in No. 12 slope, Clark vein.

Motors were installed in the Fifth and Sixth veins to handle coal, replacing mules. A concrete barn to accommodate 20 mules was built in the Sixth vein.

Stevens Colliery.—Inside: Motor road built and motor installed in the Marcy vein, to handle the coal west of slope.

Tunnel was driven from Marcy vein to develop Top Marcy.

Outside: Self dumping cages were installed in the shaft and the coal dumped into railroad cars and transported to the William A breaker for preparation.

Conveyor line built to run culm bank through the old breaker.

TEMPLE IRON COMPANY

Mt. Lookout Colliery.—A brick oil house, 18 feet by 19 feet, with concrete floor and iron roof, has been erected, and is equipped with Bowser oil tanks.

A concrete wash house, 17 feet by 38 feet, with iron roof, has been erected and equipped with 93 sheet steel lockers.

A vacuum system was installed for removing the ashes from the boiler house. This consists of a concrete ash bin, 16 feet by 16 feet by 26 feet high, from which the ashes are exhausted by a No. 6 Root

of the fault from the Pittston to the Marcy vein. The mule barns in the Red Ash and Checker veins and the part of the Marcy barn of wood construction are being reconstructed of concrete. No. 3 tunnel, about 100 feet long, was driven through the fault in the Checker vein in the vicinity of Knight shaft to open up the virgin territory beyond the fault. To handle this coal a new slope was driven in the Checker vein and new engine installed. A tunnel, 150 feet long, was driven, and 250 feet of bottom rock was graded to mine the Marcy vein north of the fault. A 15 degree balance plane was driven from the Bottom to Top Red Ash vein to shorten the mule haulage in the Top Red Ash vein, the coal to be handled by motor in the Bottom Red Ash. Work was started to develop the Clark vein in Red Ash shaft, and two rock planes will be driven, one on 15 degrees to serve as the balance plane to drop the coal to the Red Ash, and the other on 30 degrees to serve as a second opening. The 30 degree plane, about 61 feet long, has been completed. The work of installing the air motor haulage in the Marcy vein, mentioned in last year's report, was completed.

Outside: About 30 test holes were put down to prove the Checker vein rock cover in the northwest and southeast sections. Holes are now being drilled in the northeast section along the Stevens Colliery line. Work was commenced on the installation of a new 463 H. P. Stirling boiler and the same is nearly completed. A Welch overwinding device was installed in the Red Ash engine house. New drums for the first motion engines at the Pittston Shaft are on the ground, and will be installed shortly. Extensive repairs were made to the breaker; breaker pockets were renewed and the old circular screens are being replaced with shakers; moving tables are now being installed and other improvements are being made to handle the preparation of coal. Terra cotta pipe was laid from the Red Ash shaft to the main ditch to convey the Red Ash water. A new flume was constructed along the Lehigh Valley Railroad to carry this water.

Seneca Colliery.—Inside: In the Pittston vein, No. 13 rock tunnel 300 feet long was driven through fault for development, and No. 10 slope was extended through coal to the entrance of this tunnel.

In the Marcy vein a ditch 400 feet long was started from the Basin in Scovill's Island, which will drain the water and supplant 3 electric pumps. This water will pass through a new tunnel 400 feet long through an anticlinal and run by gravity to the sump of No. 5 pumping station. A concrete steel pump house was built, with a 2-ton traveling crane, and a 13 by 21 by 34 by 16 by 36-inch pump was installed, completing Marcy pumping station. New head was driven for No. 5 slope facilitating the handling of coal from this slope. Telephones were installed at various points inside and outside the mines.

Outside: Commenced work on the erection of a 3,000 H. P. boiler plant. A new carpenter and blacksmith shop built and equipped with the latest machinery. Fireproof light and loaded scale office erected and put in use. A branch of the company's mine rescue station was established here and a brick building erected for it. Complete rescue apparatus has been purchased and is in working order, subject to call from any colliery in the Division. Conveyor line built to handle fuel from railroad tracks to old boiler plant. A 17-inch bore hole was started from surface to Marcy vein, through which the new pump in No. 5 slope will deliver water to the surface.

plane. An additional 10-ton compressed air motor was installed in Checker vein. Ten additional concrete stalls were added to the mule barn in Checker vein.

Outside: The erection of the 463 horse power Sterling boiler mentioned in last year's report was completed and work commenced on an additional 463 horse power Sterling boiler. An 8-inch bore hole was drilled from surface to Red Ash vein to be used for slushing ashes from the boiler house. A 10-inch bore hole was drilled from surface to the Red Ash vein for silting purposes. New drums were put on the Pittston Shaft hoisting engines, and Welch overwinding devices were installed on both the Pittston and Marcy shaft hoisting engines.

Maltby Colliery.—Inside: No. 8 rock plane, 230 feet long, was driven on a 30-degree pitch from Ross vein to Nine Foot vein, No. 6 slope, to be used for a second opening. Completed Marcy vein mule barn, which is built of concrete and is fireproof throughout.

Outside: The wooden cribbing in the intake and return air shafts was removed and replaced with concrete. Extensive repairs were made to the main timbers in the breaker and 3 additional Lehigh Valley jigs installed.

William A. Colliery.—Inside: No. 24 slope was driven a distance of 1,000 feet and connection made to the Phoenix old workings north of the fault in the Fifth vein. Electric haulage in Middle Red Ash vein was extended about 3,200 feet. An air shaft was put down to Clarke vein at No. 10 tunnel, to be used as a second opening for this vein.

Outside: On August 25, the engine house at No. 10 tunnel was destroyed by fire. It has been replaced with a fireproof building of tile. The 6-foot diameter fan at No. 10 tunnel has been replaced by an 8-foot fan. A Welch overwinding device was installed on the shaft hoisting engines at William A. shaft.

Seneca Colliery.—Inside: No. 15 rock tunnel was driven through the anticlinal 280 feet long for a second opening. No. 8 rock plane, 68 feet long, was driven from Clarke vein to Marcy vein for a second opening. No. 15 slope, Marcy vein, was graded through the anticlinal a distance of 52 feet and steel timber put in for roof support.

Outside: On June 28, the two 20-foot ventilating fans at the Twin shaft were destroyed by fire. These fans have been replaced with a 24-foot steel fan of the Guibal type, propelled by an 18 by 30 inch 4 valve rotary Vulcan engine, in a fireproof building of concrete and steel. The 3,000 horse power boiler plant mentioned in last year's report was completed. It contains 6 batteries of 2 drum Sterling boilers, each battery having a capacity of 501 horse power. The engine room contains one 4,000 horse power Cochran heater, two 7 by 12 inch Goyne feed water pumps, and a 12-foot Sturtevant blast fan, propelled by a 16 by 18 inch Vulcan engine; the building, 28 feet by 183 feet 6 inches, is constructed of brick with a steel roof. An electric driven conveyor line of steel construction was built from the breaker to the new boiler house to supply boiler fuel. A concrete subway was constructed under the main line of the Lehigh Valley Railroad at Coxey shaft to provide a safe traveling way for men who are employed in and about the breaker. The old power house at Coxey shaft was torn down and replaced with a building of tile construction. An additional equipment was also installed

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

fire protection was installed in the breaker and washery. Repairs to boiler plant were completed. Red Ash shaft engine house was rebuilt with brick and made fireproof. Tile hose house and scale office were erected. Colliery yard was regraded.

Maltby Colliery.—The pumping plant at this colliery has been abandoned. The water in the Marcy vein is carried in pipes to the lower elevation and forced up through an 8-inch bore hole to the Six Foot vein. It then flows to bore holes which were put through the barrier pillar to the workings of the Henry colliery, where it is pumped to the surface. A slope is being sunk in the abandoned Six Foot workings, Fuller shaft. Until recently these workings were under water. A Morgan-Gardner undercutting machine was installed in the Top Red Ash split. A spray system was installed in the breaker for fire protection. A concrete reservoir having a capacity of 50,000 gallons, together with a pumping plant, was installed near the breaker, to furnish water for the fire system. A steam shovel is at work picking up the culm bank at the Fuller colliery. A plane was constructed at the breaker and a locomotive track constructed for the purpose of transporting the culm to the breaker.

Seneca Colliery.—Two tunnels were driven from the bottom split of the Marcy vein to the top split. Two 7½-ton Jeffery electric motors were installed in the Clarke vein. One 6-inch bore hole was drilled through the barrier pillar to the workings of the Stevens Colliery in the Marcy vein. A Jeanesville pump was installed and a fireproof pumphouse erected at the Twin shaft to supply the breaker with water. A Pennsylvania crusher was installed at the breaker to crush the refuse for silting in the Marcy vein. Safety automatic gates were installed at Twin shaft. Colliery yard was regraded.

William A. Colliery.—Electric haulage was installed from No. 10 tunnel to Evan's Farm section and the system was rebuilt to William A. shaft. This will allow all coal to be transported underground instead of dumping part of the output into railroad cars for shipment to the breaker for preparation. A new concrete engine house was constructed inside and a bore hole put down for exhaust steam to handle the coal on the Lawrence plane. A tile washhouse and foreman's office was built at No. 10 tunnel. Steel lockers for 32 men have been provided. A substation for electric power has been established at Babylon shaft. A spray system for fire protection has been installed at the breaker. Automatic safety gates were installed at William A. shaft.

Westmoreland Colliery.—A new second opening was driven from the Pittston vein to the surface. The plant for generating electricity and a new substation built. Power is now purchased from Luzerne County Gas and Electric Company. The feed wire system was also rebuilt. A new tile shop building is under construction. A spray system for fire protection was also installed.

Stevens Colliery.—Two 6-inch bore holes were drilled through the barrier pillar in the Pittston vein and two in the Red Ash vein. These bore holes were 250 feet long, and will be used for the purpose of draining Stevens colliery and abandoning the pumping plant. Steam blowers were dispensed with at the boilers and a blast fan installed. Old boiler plant was dismantled. Work was commenced to reopen the Pittston and Checker veins for pillars. Refuse banks are being silted into the mines through a new 10-inch bore hole. A rock crusher is used to crush the material.

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.